



5 February 2024

Ref: 10584/10205

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: DECEMBER 2023 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended and unattended noise monitoring conducted for the Ardglan Quarry (AQ) between Monday 18<sup>th</sup> and Thursday 21<sup>st</sup> December, 2023. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

Notes:

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## NOISE MONITORING LOCATIONS

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2250 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from the quarry operated weather station with real time observations made at the start of each 15 minute monitoring period (and confirmed with reference to the summary data provided by the proponent at the time of reporting). The weather throughout the survey was mild with clear skies. The wind speed was moderate and generally from the southeast.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “*Evaluator*” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise

level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

Table 2 Ardglen Quarry Noise Monitoring Results – 21 <sup>st</sup> December 2023 (Day)				
Location	Time	dB(A), $L_{eq}$	Wind speed/ direction°	Identified Noise Sources
4. Thompson	10:22am	51	4.1 / 146	Traffic (50), birds (45), <b>AQ inaudible</b>
13. McGhie	10:40am	49	4.8 / 128	Train (49), traffic (38), birds (27), <b>AQ inaudible</b>
14. Purtell	11:00am	56	4.8 / 144	Traffic (55), train (50), birds (37), <b>AQ inaudible</b>
16. Bojba	9:59am	56	3.3 / 113	Traffic (56), birds (34), <b>AQ inaudible</b>

The results in Table 2 show that, under the meteorological and operating conditions at the time, the noise emissions from AQ were compliant with the relevant noise criteria at all monitoring locations.

At the time of the noise monitoring the following plant items were operational at the quarry;

- 1 x 35t Excavator
- 1 x 972 Front end loader
- 1 x Generator
- 1 x Water truck
- 1 x 2" water pump running intermittently
- 1 x 12t Excavator

The noise from AQ was not audible at any of the monitoring locations.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of three days, part of which coincides with the quarterly attended noise monitoring.

To measure the acoustic environment an ARL EL-315 environmental noise logger and an ARL Ngara environmental noise logger, were located as shown in Figure 2 from 18<sup>th</sup> to 21<sup>st</sup> December, 2023. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix A**.



TABLE 3 Measured Logger Noise Levels dB(A) – 18 <sup>th</sup> to 21 <sup>st</sup> December 2023						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
Logger 1	56	44	53	39	49	32
Logger 2	55	34	51	34	50	30



**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R14. This is adjacent to the attended noise monitoring location for this residence.

Logger 2 was in an open paddock north of the house.

The unattended noise loggers measure the total noise level in the environment, but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 0412 023 455.

Yours faithfully,

**SPECTRUM ACOUSTICS PTY LIMITED**

Author:

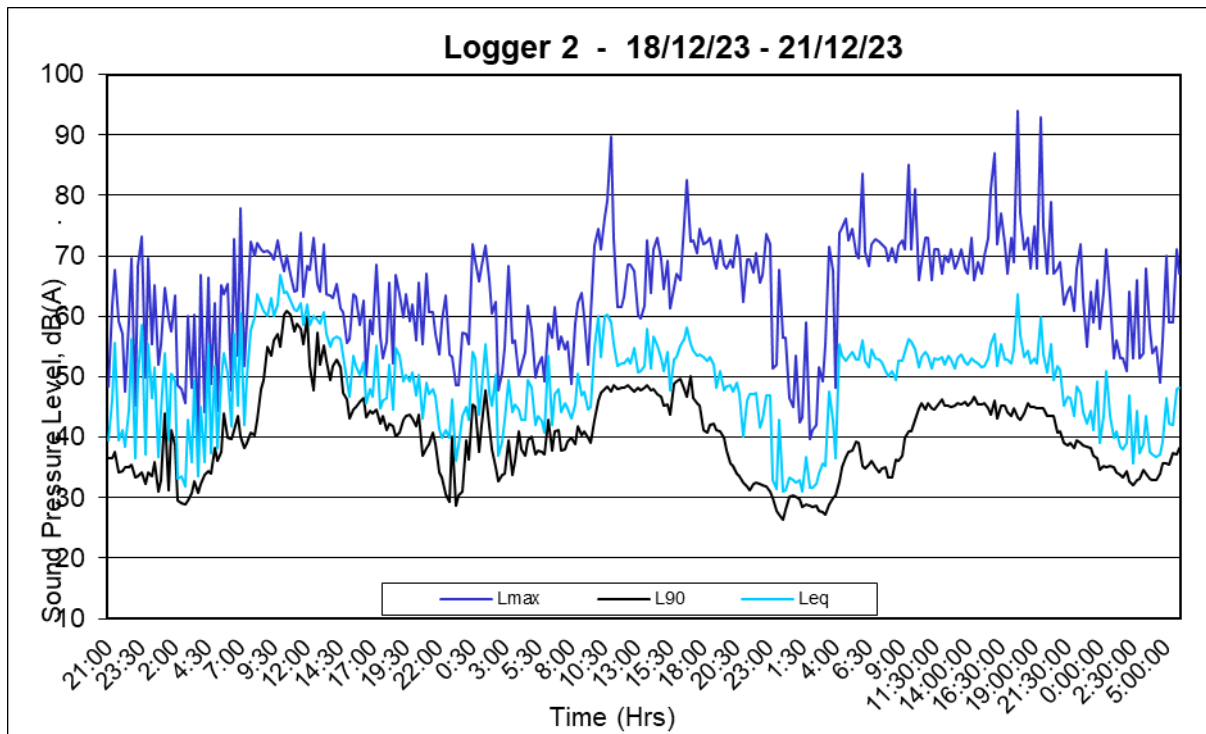
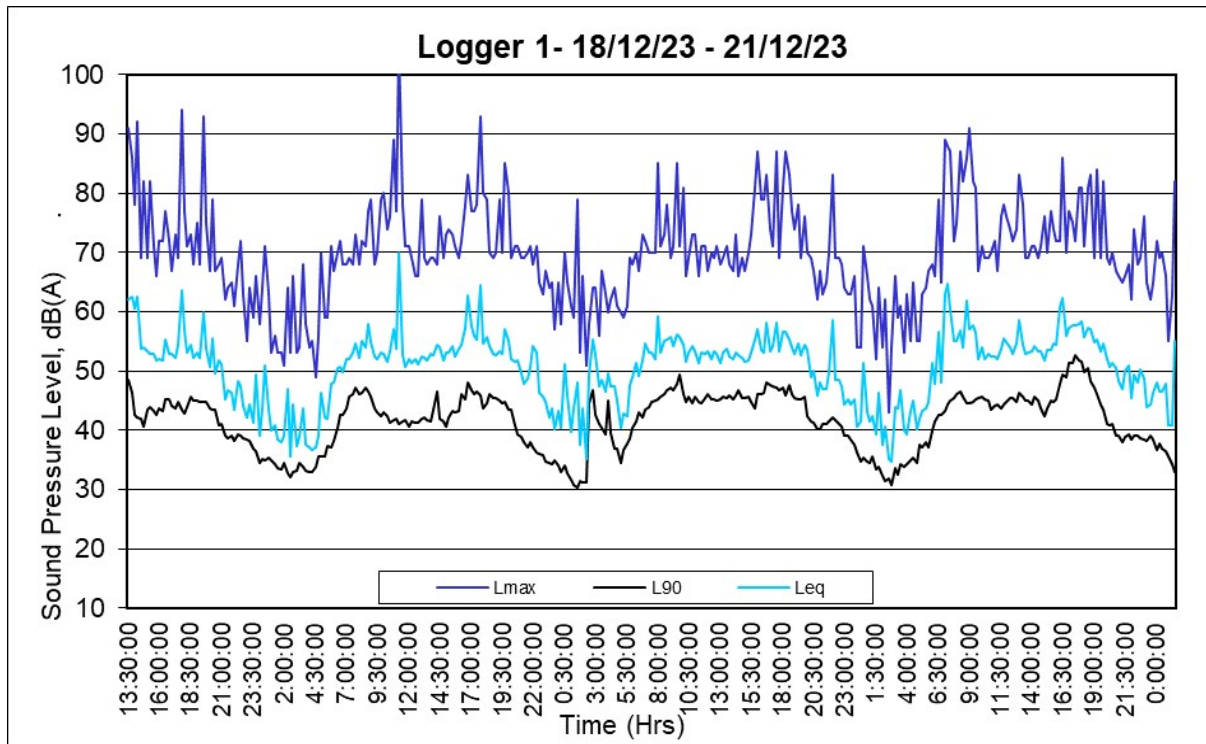


**Neil Pennington MAIP, MAAS, MASA**

*B. Sc., B.Math. (Hons)*

Principal / Director

APPENDIX A  
NOISE LOGGER CHARTS





9 January 2024

Ref: 10584/10170

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: NOVEMBER 2023 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended and unattended noise monitoring conducted for the Ardglenn Quarry (AQ) between Friday 24<sup>th</sup> and Monday 27<sup>th</sup> November, 2023. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45



However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

Notes:

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## NOISE MONITORING LOCATIONS

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2250 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from the quarry operated weather station with real time observations made at the start of each 15 minute monitoring period (and confirmed with reference to the summary data provided by the proponent at the time of reporting). The weather throughout the survey was mild with clear skies. The wind speed was light to moderate and generally from the north to west.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “*Evaluator*” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise

level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

<b>Table 2</b> <b>Ardglen Quarry Noise Monitoring Results – 27<sup>th</sup> November 2023 (Day)</b>				
<b>Location</b>	<b>Time</b>	<b>dB(A),<sub>L<sub>eq</sub></sub></b>	<b>Wind speed/ direction°</b>	<b>Identified Noise Sources</b>
4. Thompson	1:07pm	53	2.4 / 011	Train (52), traffic (44), birds (42), <b>AQ occasionally audible</b>
13. McGhie	2:03pm	37	2.8 / 108	Birds (34), dogs (32), traffic (28), <b>AQ inaudible</b>
14. Purtell	1:41pm	58	2.6 / 298	Traffic (58), birds (43), <b>AQ inaudible</b>
16. Bojba	12:46pm	57	0.9 / 268	Traffic (57), birds (35), <b>AQ inaudible</b>

The results in Table 2 show that, under the meteorological and operating conditions at the time, the noise emissions from AQ were compliant with the relevant noise criteria at all monitoring locations.

At the time of the noise monitoring the following plant items were operational at the quarry;

- 1x Cat 972 loader;
- 1x Komatsu 30t dump truck;
- 1x Volvo 35t Excavator;
- 3x rigid trucks and 30 truck and dog movements for the day;
- 1x hilux ute with a trailer mounted water cart operating;
- 1x 2" water pump running intermittently;
- 2x Generators.

The noise from AQ was occasionally audible at location 4. At this location the noise was attributable to the general hum and occasional engine revs. The noise was not loud, or consistent, enough to be measured.

At locations 13, 14 and 16 AQ was not audible.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of three days, part of which coincides with the quarterly attended noise monitoring.

To measure the acoustic environment an ARL EL-315 environmental noise logger and an ARL Ngara environmental noise logger, were located as shown in Figure 2 from 24<sup>th</sup> to 27<sup>th</sup> November, 2023 (which includes a weekend). **Table 3** shows a summary of the relevant measured data from the



loggers which is also shown graphically in **Appendix A**. Note that the summary data presented in Table 3 is excludes the weekend period, whilst the graphical data is for the entire monitoring period.

TABLE 3 Measured Logger Noise Levels dB(A) – 24 <sup>th</sup> to 27 <sup>th</sup> November 2023						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
Logger 1	48	36	50	37	50	38
Logger 2	56	41	45	36	43	37



**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R14. This is adjacent to the attended noise monitoring location for this residence.

Logger 2 was in an open paddock north of the house.

The unattended noise loggers measure the total noise level in the environment, but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.



We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 0412 023 455.

Yours faithfully,

**SPECTRUM ACOUSTICS PTY LIMITED**

Author:

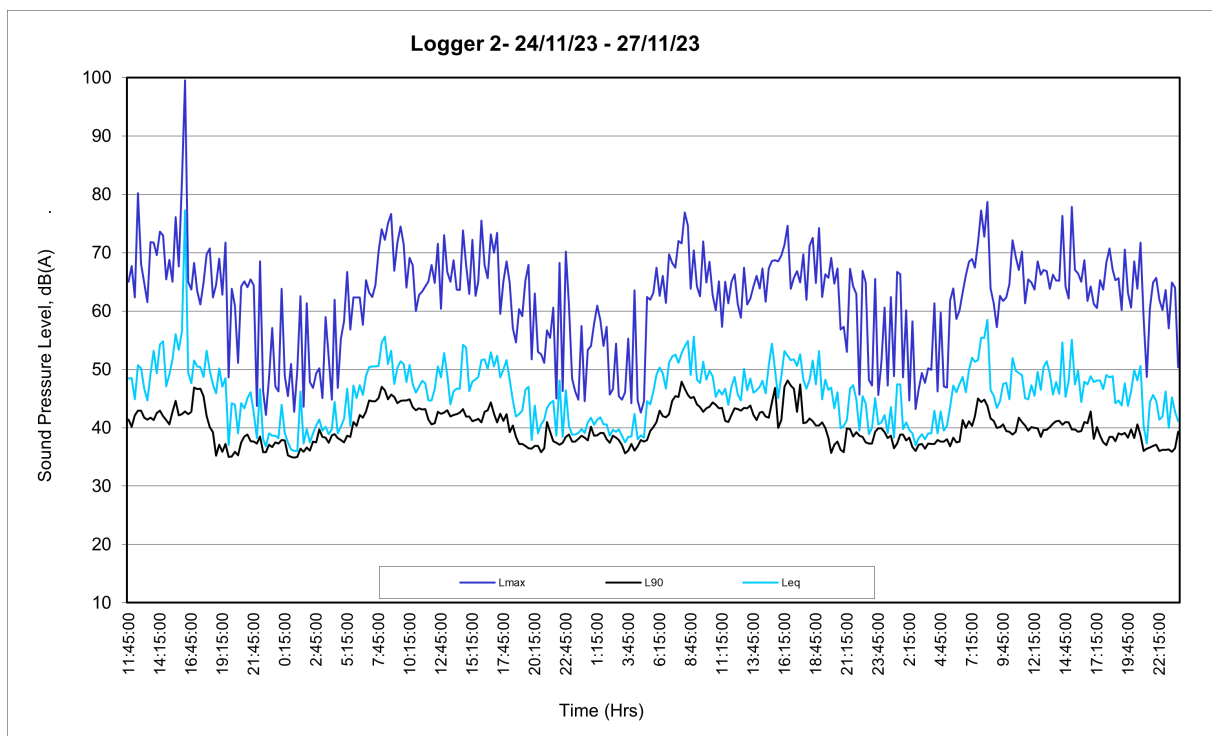
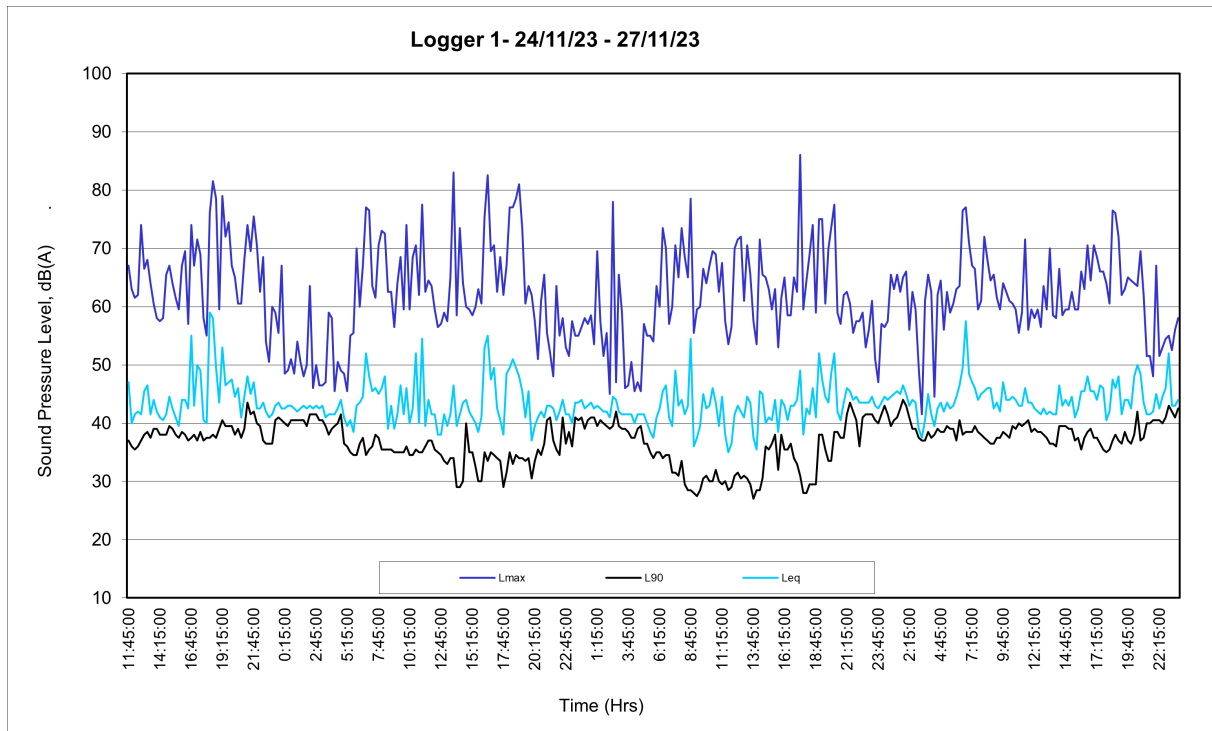


**Neil Pennington MAIP, MAAS, MASA**

*B. Sc., B.Math. (Hons)*

Principal / Director

## APPENDIX A NOISE LOGGER CHARTS





1 November 2023

Ref: 212176R/30152

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: OCTOBER 2023 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended and unattended noise monitoring conducted for the Ardglan Quarry (AQ) between Tuesday 17<sup>th</sup> and Friday 20<sup>th</sup> October, 2023. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the  $L1$  (1 min) and  $Leq$  (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

Notes:

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the  $LAeq$  (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the  $L1$  (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## NOISE MONITORING LOCATIONS

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4:	C M Thompson
Location 13:	McGhie
Location 14:	Purtell
Location 16:	Bojba





**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2250 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from the wind rose for the period taken from the quarry operated weather station with real time observations made at the start of each 15 minute monitoring period (and confirmed with reference to the summary data provided by the proponent at the time of reporting). The weather throughout the survey was mild with clear skies. The wind speed was light from the west north west.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “*Evaluator*” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise

level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

Table 2 Ardglen Quarry Noise Monitoring Results – 20 <sup>th</sup> October 2023 (Day)				
Location	Time	dB(A), L <sub>eq</sub>	Wind speed/ direction°	Identified Noise Sources
4. Thompson	11:40 am	38	2.1 m/s 321°	Birds (36), traffic (32), <b>AQ occasionally audible</b>
13. McGhie	11:00 am	32	2.2 m/s 286°	Birds (31), traffic (26), <b>AQ inaudible</b>
14. Purtell	11:20 am	41	1.8 m/s 300°	Traffic (39), birds (32), <b>AQ occasionally audible</b>
16. Bojba	10:41 am	47	1.4 m/s 285°	Traffic (46), birds (40), <b>AQ inaudible</b>

The results in Table 2 show that, under the meteorological and operating conditions at the time, the noise emissions from AQ were compliant with the relevant noise criteria at all monitoring locations.

At the time of the noise monitoring the following plant items were operational at the quarry;

- 1 x 30t Excavator,
- 1 x 30t dump truck,
- 1 x truck and dog carting material,
- 1 x 972 Front end loader,
- 1 x 2inch water pump running intermittently, and
- 1 x water trailer for dust suppression.

The noise from AQ was occasionally audible at locations 4 and 14. At these locations the noise was attributable to the general hum and occasional engine revs. The noise was not loud, or consistent, enough to be measured.

At locations 13 and 16 AQ was not audible.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of three days, part of which coincides with the quarterly attended noise monitoring.

To measure the acoustic environment an ARL EL-315 environmental noise logger and an ARL Ngara environmental noise logger, were located as shown in Figure 2 from 17<sup>th</sup> to 20<sup>th</sup> October, 2023. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix A**.



TABLE 3 Measured Logger Noise Levels dB(A) – 17 <sup>th</sup> to 20 <sup>th</sup> October 2023						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
Logger 1	50	34	53	37	52	33
Logger 2	54	37	55	41	54	37



**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R14. This is adjacent to the attended noise monitoring location for this residence.

Logger 2 was in an open paddock north of the house.


The unattended noise loggers measure the total noise level in the environment, but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 0412 023 455.

Yours faithfully,

**SPECTRUM ACOUSTICS PTY LIMITED**

Author:

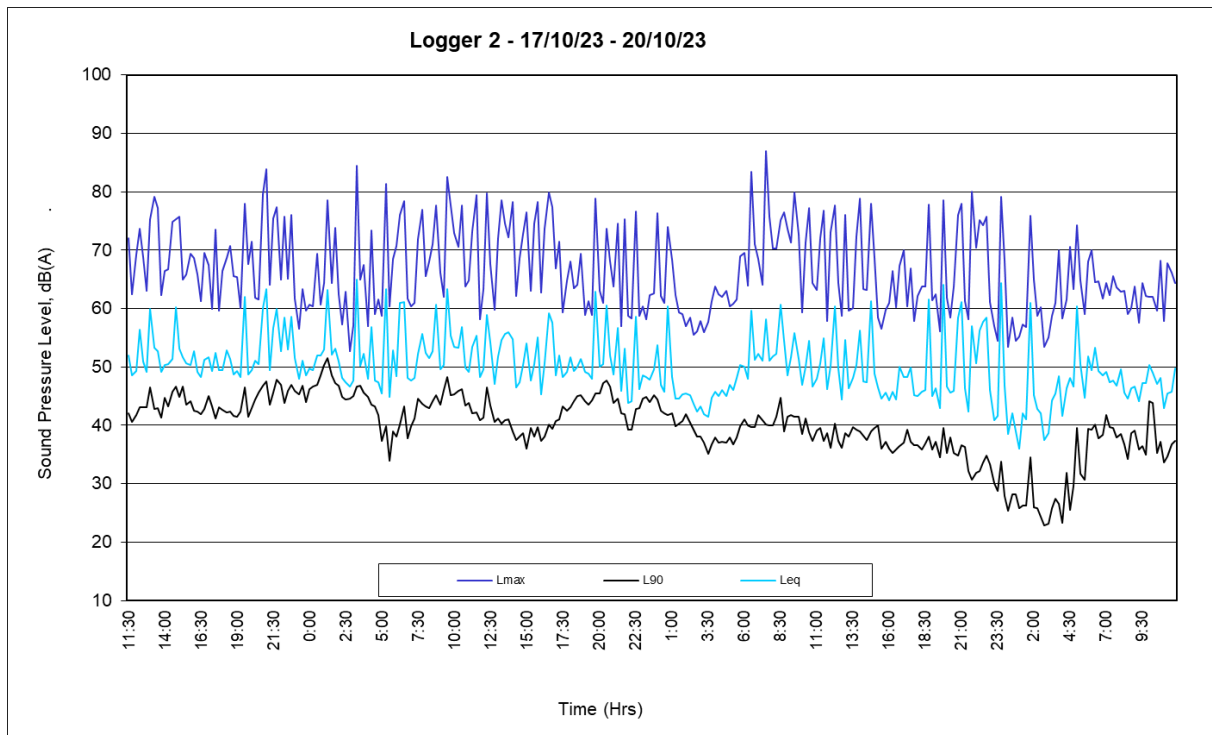
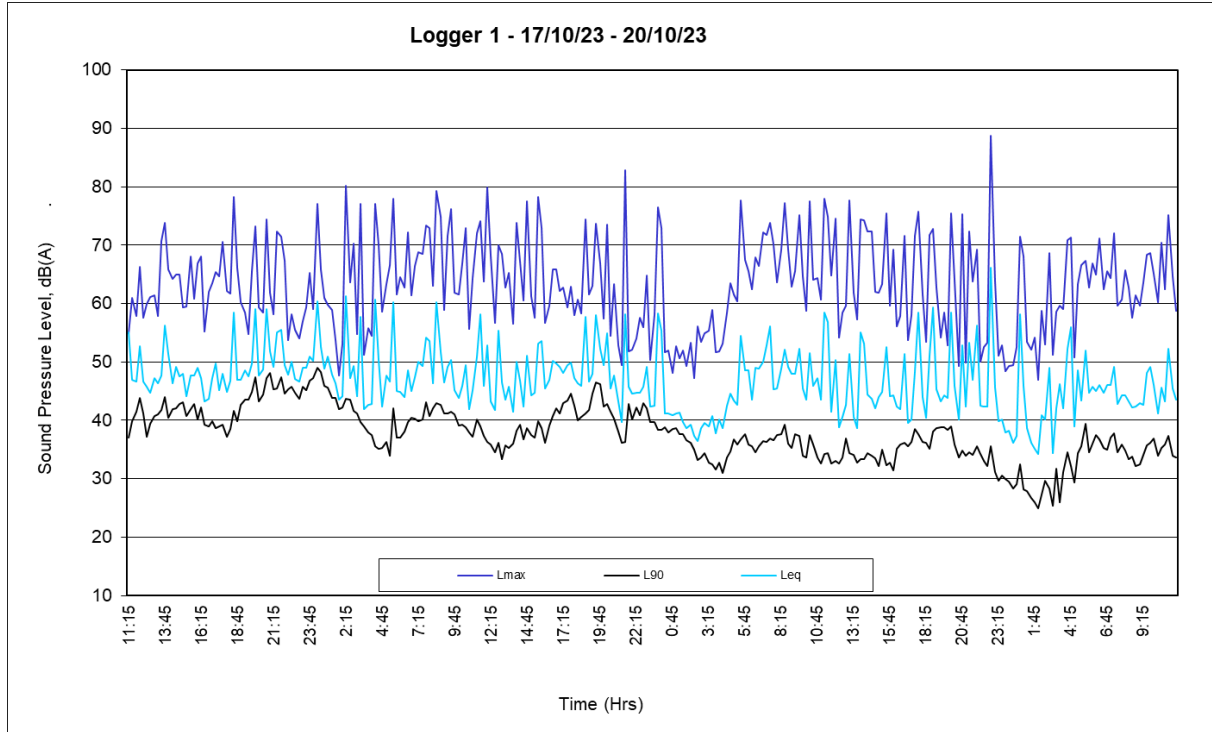


**Ross Hodge M.A.A.S.**

Acoustical Consultant



## APPENDIX A NOISE LOGGER CHARTS





4 October 2023

Ref: 212176R/30136

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: SEPTEMBER 2023 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended and unattended noise monitoring conducted for the Ardglen Quarry (AQ) between Friday 22<sup>nd</sup> and Wednesday 27<sup>th</sup> September, 2023. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
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3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
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6 S Thompson	45	35	35	45
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10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the  $L1$  (1 min) and  $Leq$  (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

Notes:

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the  $LAeq$  (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the  $L1$  (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## NOISE MONITORING LOCATIONS

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2250 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from the quarry operated weather station with real time observations made at the start of each 15 minute monitoring period (and confirmed with reference to the summary data provided by the proponent at the time of reporting). The weather throughout the survey was mild with clear skies. The wind speed was light from the west north west.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “Evaluator” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).



Table 2 Ardglen Quarry Noise Monitoring Results – 27 <sup>th</sup> September 2023 (Day)				
Location	Time	dB(A), <sub>Leq</sub>	Wind speed/ direction°	Identified Noise Sources
4. Thompson	10:30 am	43	1.7 m/s 298°	Traffic (41), <b>AQ (37)</b> , birds (35)
13. McGhie	9:55 am	33	0.8 m/s 286°	Traffic (31), birds (30), <b>AQ inaudible</b>
14. Purtell	10:12 am	46	1.0 m/s 294°	Birds (43), traffic (42), <b>AQ occasionally audible</b>
16. Bojba	10:50 am	50	6.6 m/s 318°	Traffic (50), birds (35), <b>AQ occasionally audible</b>

The results in Table 2 show that, under the meteorological and operating conditions at the time, the noise emissions from AQ were compliant with the relevant noise criteria at all monitoring locations.

At the time of the noise monitoring the following plant items were operational at the quarry;

- 1 x 35t Volvo excavator,
- 1 x Caterpillar 972 loader,
- 1 x Warrior screen screening rock,
- 2 x steel bin Truck and dogs carting oversize rock, being loaded by 972 loader,
- 1 x 2" water pump running intermittently, and
- 1 x Light vehicle with watercart trailer operating intermittently.

The noise from AQ was audible and measurable only at location 4. At this location the noise was attributable to the screening activity.

At location 14 the noise from AQ was occasionally faintly audible but it was not loud or consistent enough to be measured. The noise was from the screening activity.

At location 16 the noise from AQ was audible as occasional loud noise events possibly associated truck movements on site.

At location 13 AQ was not audible.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

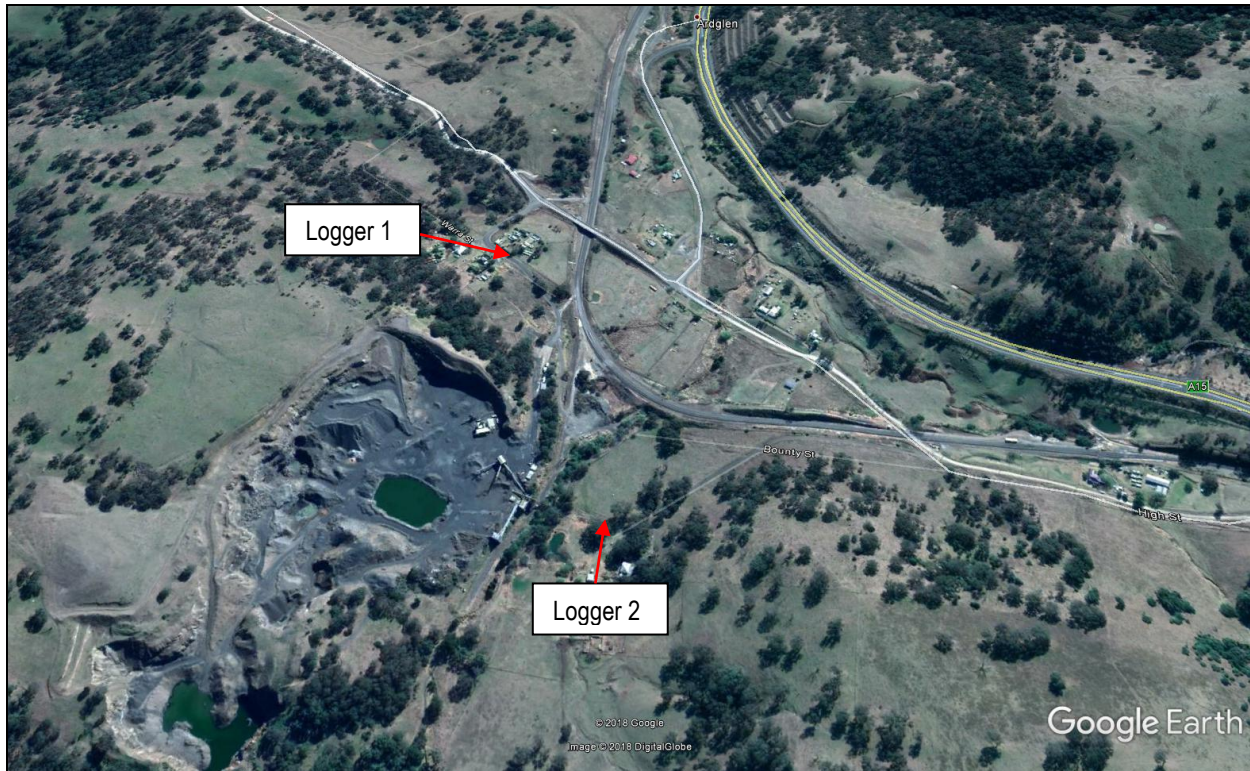
## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of three days, part of which coincides with the quarterly attended noise monitoring.

To measure the acoustic environment an ARL EL-315 environmental noise logger and an ARL Ngara environmental noise logger, were located as shown in Figure 2 from 22<sup>nd</sup> to 27<sup>th</sup> September, 2023 (which includes a weekend). **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix A**. Note that the summary data presented in Table 3 is excludes the weekend period, whilst the graphical data is for the entire monitoring period.

TABLE 3 Measured Logger Noise Levels dB(A) – 22 <sup>nd</sup> to 27 <sup>th</sup> September 2023 <sup>1</sup>						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
Logger 1	58	37	54	34	53	25
Logger 2	53	31	51	33	50	28

<sup>1</sup> see text regarding dates of monitoring



**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R14. This is adjacent to the attended noise monitoring location for this residence.

Logger 2 was in an open paddock north of the house.


The unattended noise loggers measure the total noise level in the environment, but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 0412 023 455.

Yours faithfully,

**SPECTRUM ACOUSTICS PTY LIMITED**

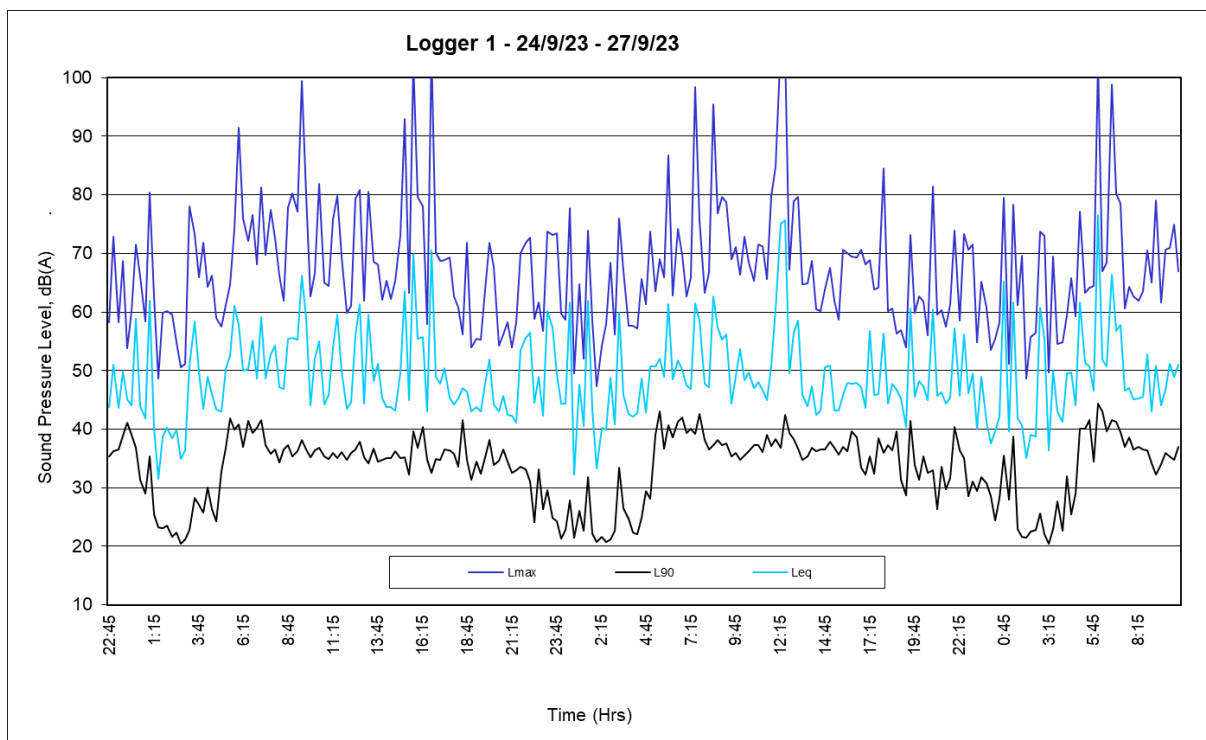
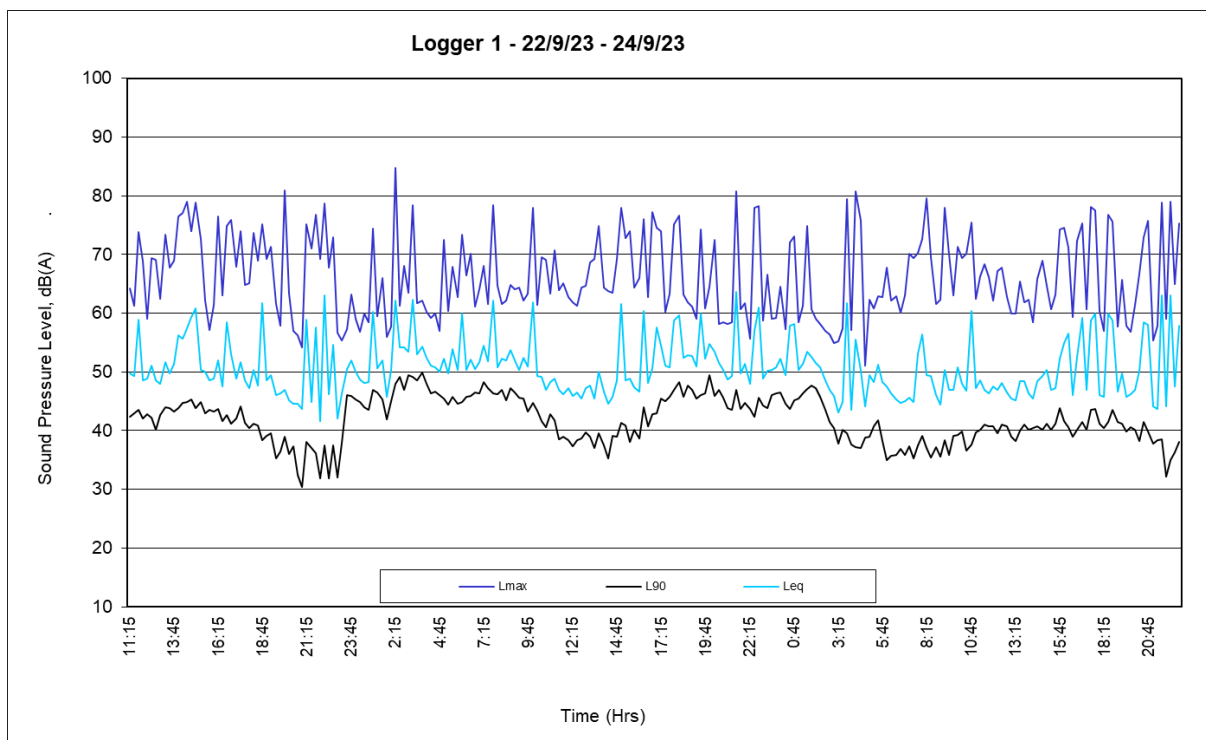
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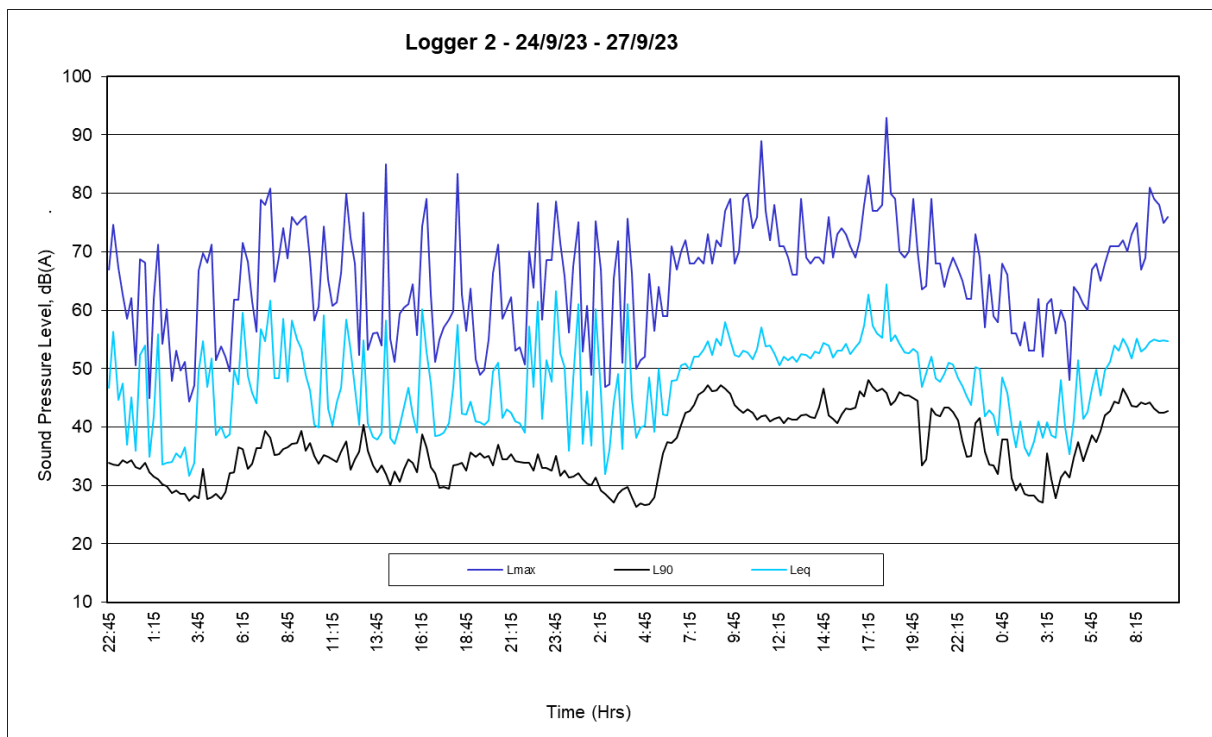
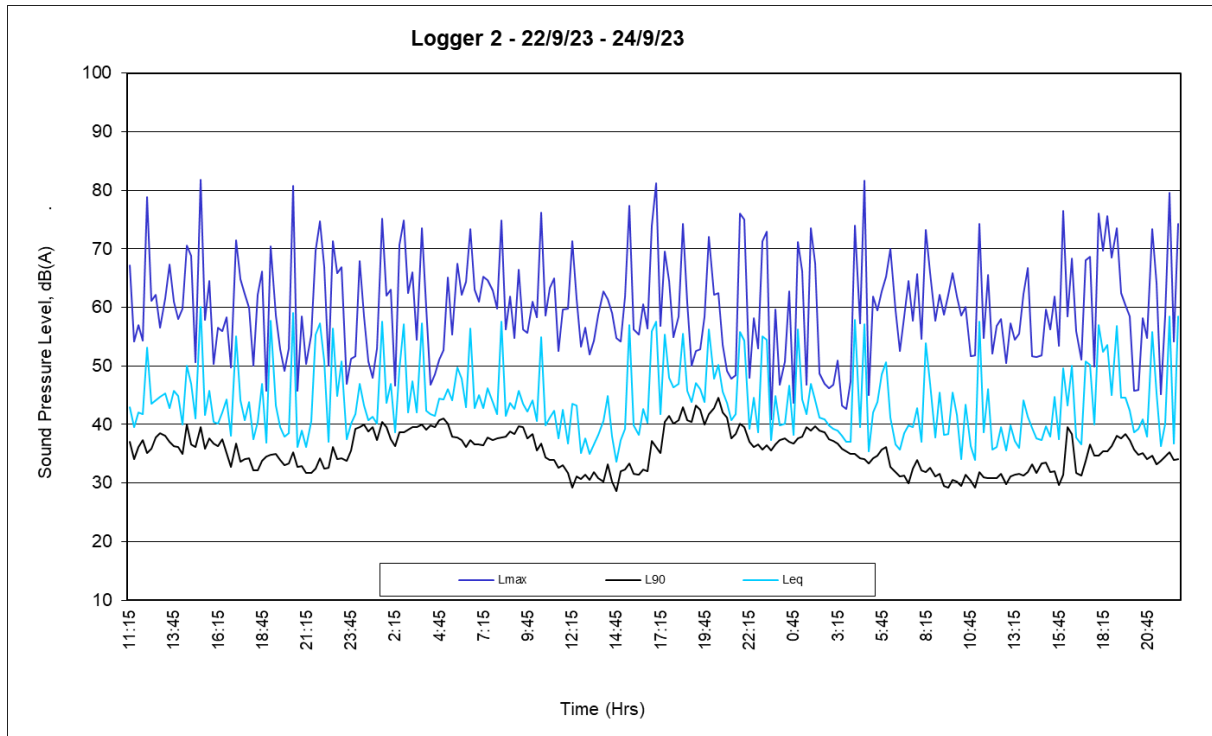
**Ross Hodge M.A.A.S.**

Acoustical Consultant

## APPENDIX A NOISE LOGGER CHARTS









9 August 2023

Ref: 212176R/30083

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: AUGUST 2023 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended and unattended noise monitoring conducted for the Ardglen Quarry (AQ) between Monday 31<sup>st</sup> July and Thursday 3<sup>rd</sup> August, 2023. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

Notes:

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## NOISE MONITORING LOCATIONS

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2250 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from the quarry operated weather station with real time observations made at the start of each 15 minute monitoring period (and confirmed with reference to the summary data provided by the proponent at the time of reporting. The weather throughout the survey was mild with clear skies. The wind speed was light from the west north west.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “Evaluator” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).



Table 2 Ardglen Quarry Noise Monitoring Results – 3 <sup>rd</sup> August 2023 (Day)				
Location	Time	dB(A), <sub>Leq</sub>	Wind speed/ direction°	Identified Noise Sources
4. Thompson	10:45 am	49	2.2 m/s 298°	Birds (47), traffic (41), <b>AQ (40)</b>
13. McGhie	10:10 am	37	2.0 m/s 260°	Traffic (36), birds (31), <b>AQ inaudible</b>
14. Purtell	10:28 am	46	2.3 m/s 284°	Birds (44), traffic (42), <b>AQ occasionally audible</b>
16. Bojba	11:10 am	45	1.8 m/s 309°	Traffic (43), birds (42), <b>AQ inaudible</b>

The results in Table 2 show that, under the meteorological and operating conditions at the time, the noise emissions from AQ were compliant with the relevant noise criteria at all monitoring locations.

At the time of the noise monitoring the following plant items were operational at the quarry;

- 1x Warrior screen,
- 1x 35t Excavator,
- 1x 972 front end loader, and
- 1x Hilux ute with trailer mounted water cart.

The noise from AQ was audible and measurable only at location 4. At this location the noise was attributable to the screening activity, including noise from the loader feeding material into the screen. The noise level varied cyclically depending on the stage of screening process.

At location 14 the noise from AQ was occasionally faintly audible but it was not loud or consistent enough to be measured. The noise was from the screening activity.

At the other two monitoring locations AQ was inaudible.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of three days, part of which coincides with the quarterly attended noise monitoring.

To measure the acoustic environment an ARL EL-315 environmental noise logger and an ARL Ngara environmental noise logger, were located as shown in Figure 2 from 31<sup>st</sup> July to 3<sup>rd</sup> August, 2023.

**Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix A**.

TABLE 3 Measured Logger Noise Levels dB(A) – 31st July to 3rd August 2023						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
Logger 1	57	42	53	39	48	32
Logger 2	57	44	55	38	55	32



**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R14. This is adjacent to the attended noise monitoring location for this residence.

Logger 2 was in an open paddock north of the house.

The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 0412 023 455.

Yours faithfully,

**SPECTRUM ACOUSTICS PTY LIMITED**

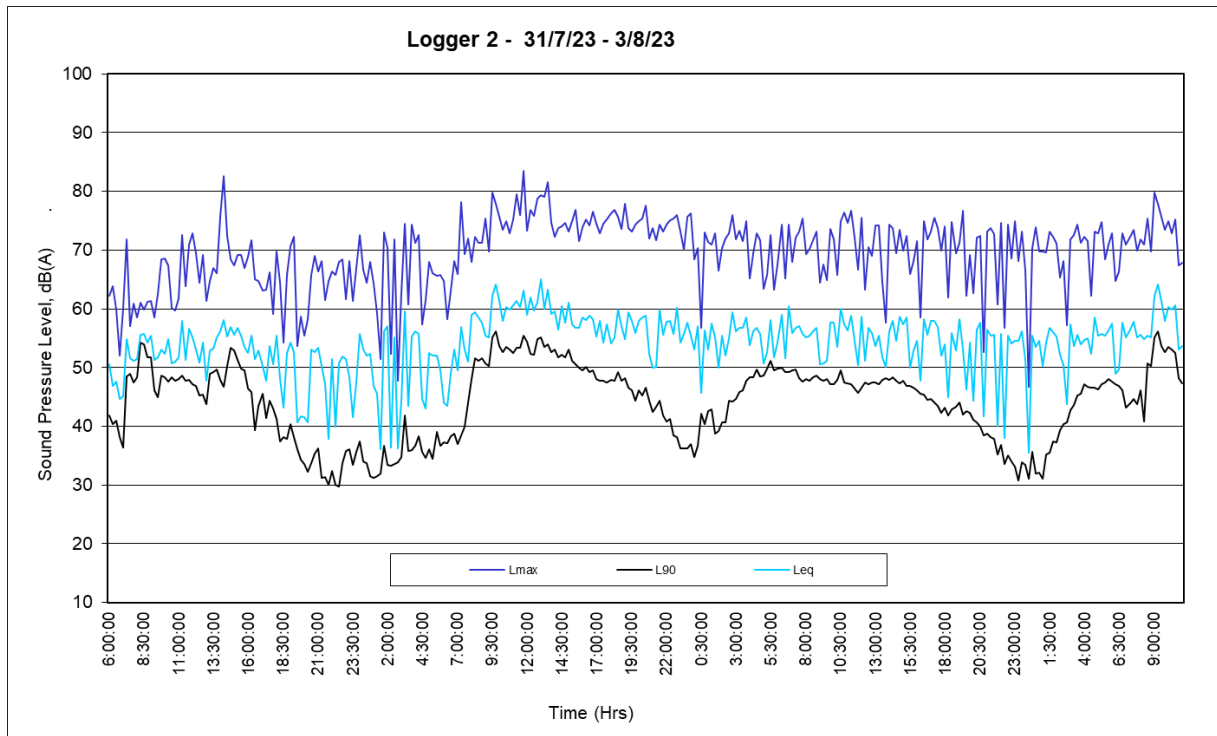
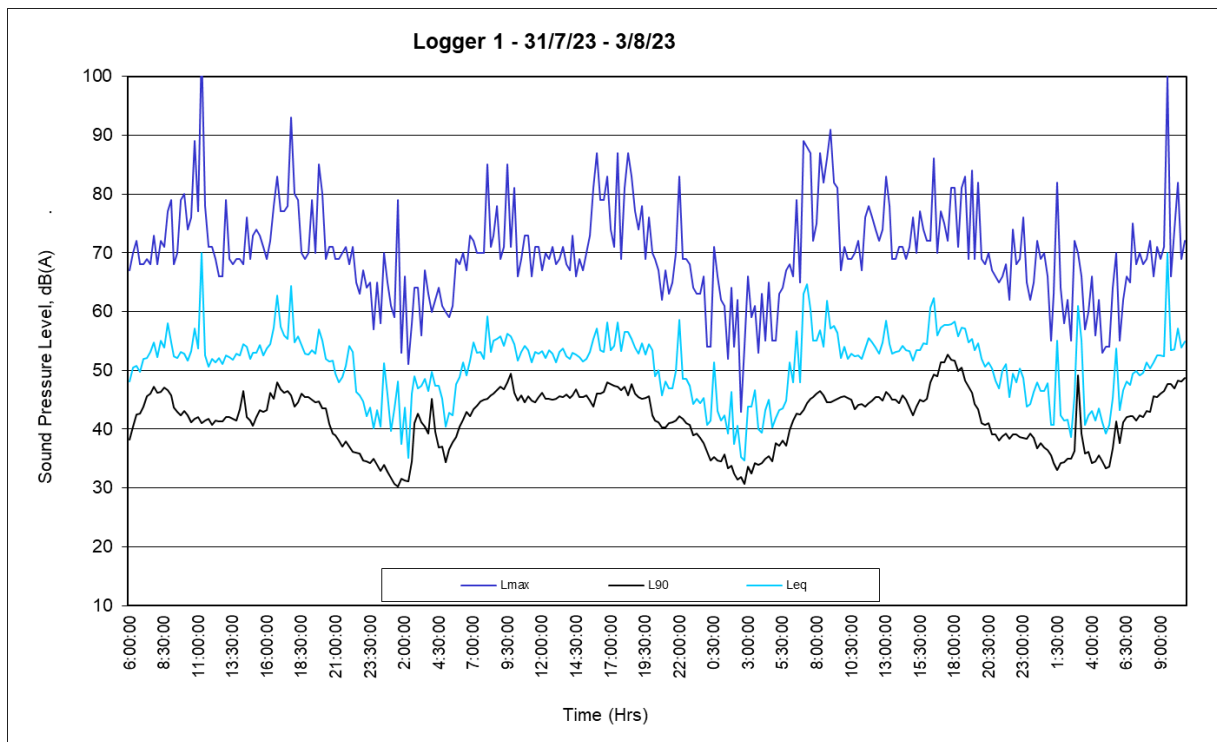
Author:



**Ross Hodge M.A.A.S.**

Acoustical Consultant

## APPENDIX A NOISE LOGGER CHARTS







25 November 2021

Ref: 161308/29591

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: NOVEMBER 2021 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended and unattended noise monitoring conducted for the Ardglen Quarry (AQ) between Wednesday 17<sup>th</sup> and Wednesday 24<sup>th</sup> November, 2021. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

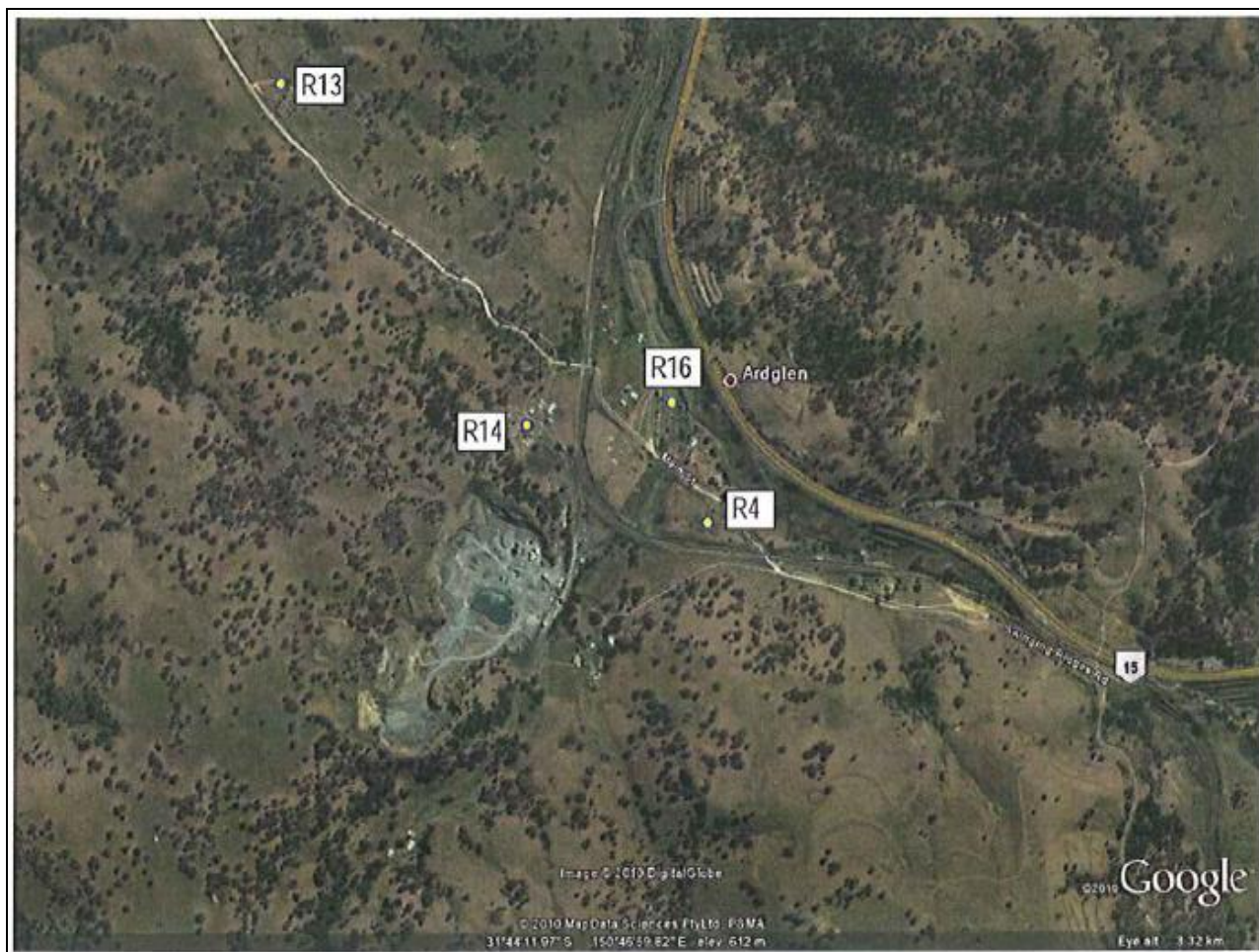
*Notes:*

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## **NOISE MONITORING LOCATIONS**

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2250 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2.5m above ground level. The weather throughout the survey was mild with clear skies. The wind speed was light from the south to south east.

The quarry operates on an ad hoc basis as and when demand dictates. Throughout the current monitoring period there were no quarrying operations being undertaken.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “Evaluator” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

<b>TABLE 2</b>				
<b>Ardglen Quarry Noise Monitoring Results – 17<sup>th</sup> November 2021 (Day)</b>				
<b>Location</b>	<b>Time</b>	<b>dB(A)<sub>Leq</sub></b>	<b>Wind speed/ direction</b>	<b>Identified Noise Sources</b>
4. Thompson	10:30 am	37	2.0 m/s SE	Traffic (36), birds (30), <b>AQ inaudible</b>
13. McGhie	11:10 am	40	2.2 m/s SE	Traffic (38), birds & insects (32), <b>AQ inaudible</b>
14. Purtell	10:50 am	44	2.0 m/s SE	Traffic (43), birds & insects (35), <b>AQ inaudible</b>
16. Bojba	11:30 am	48	2.5 m/s S	Traffic (48), birds (35), frogs (30), <b>AQ faintly audible</b>

The results in Table 2 show that, under the meteorological and operating conditions at the time, the noise emissions from AQ were compliant with the relevant noise criteria at all monitoring locations.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

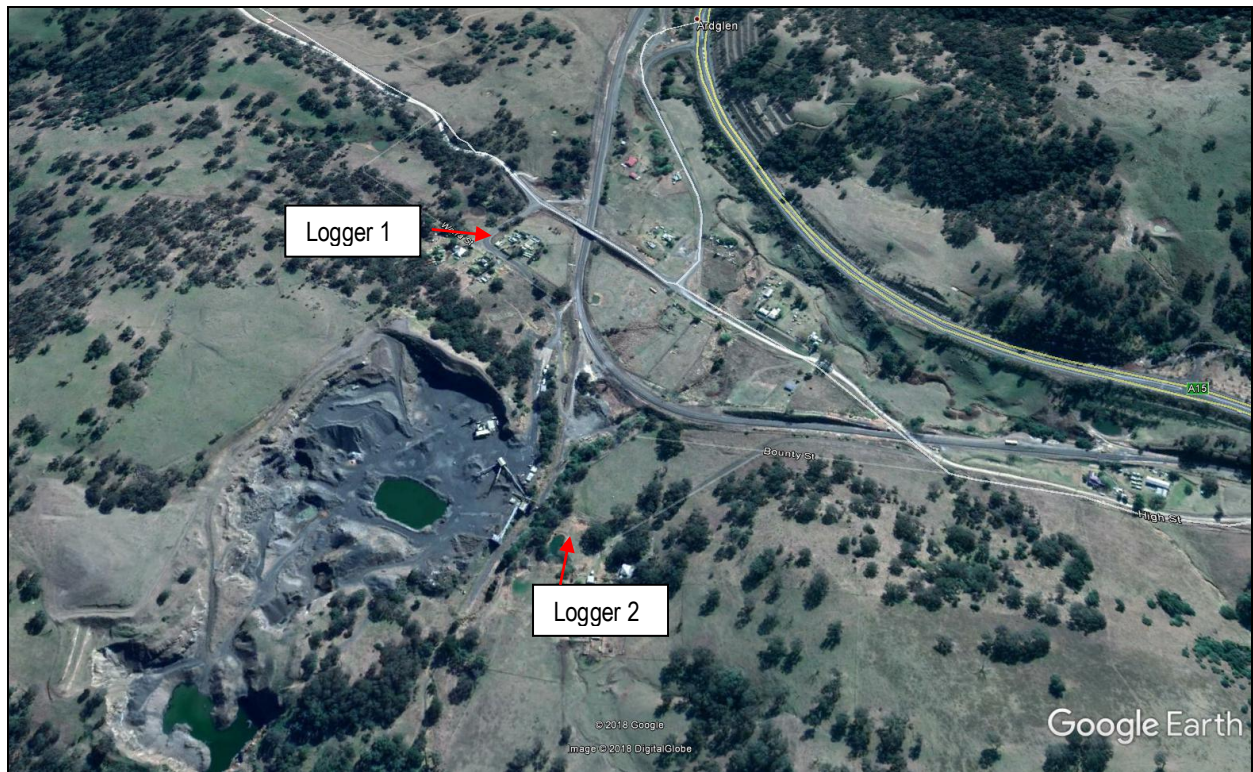
## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of seven days, part of which coincides with the quarterly attended noise monitoring.

To measure the acoustic environment an ARL EL-315 environmental noise logger and an ARL Ngara environmental noise logger, were located as shown in Figure 2 from 17<sup>th</sup> to 24<sup>th</sup> November, 2021. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix I**. Periods of adverse met conditions (high winds and rain) occurred during the monitoring period (that being the night of 21<sup>st</sup> and day, evening and night of 22<sup>nd</sup>). The data from these periods were excluded from the set prior to analysis).

<b>TABLE 3</b>						
<b>Measured Logger Noise Levels dB(A) – 17<sup>th</sup> to 24<sup>th</sup> November 2021</b>						
<b>Logger Location</b>	<b>Day (7am to 6pm)</b>		<b>Evening (6pm to 10 pm)</b>		<b>Night (10pm to 7am)</b>	
	<b>Leq</b>	<b>L90</b>	<b>Leq</b>	<b>L90</b>	<b>Leq</b>	<b>L90</b>
Logger 1	54	39	53	40	52	33
Logger 2	51	36	48	32	44	31





***Figure 2 – Unattended Noise Monitoring Locations***

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R14. This is adjacent to the attended noise monitoring location for this residence.

Logger 2 was in an open paddock north of the house.

The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 0412 023 455.

Yours faithfully,

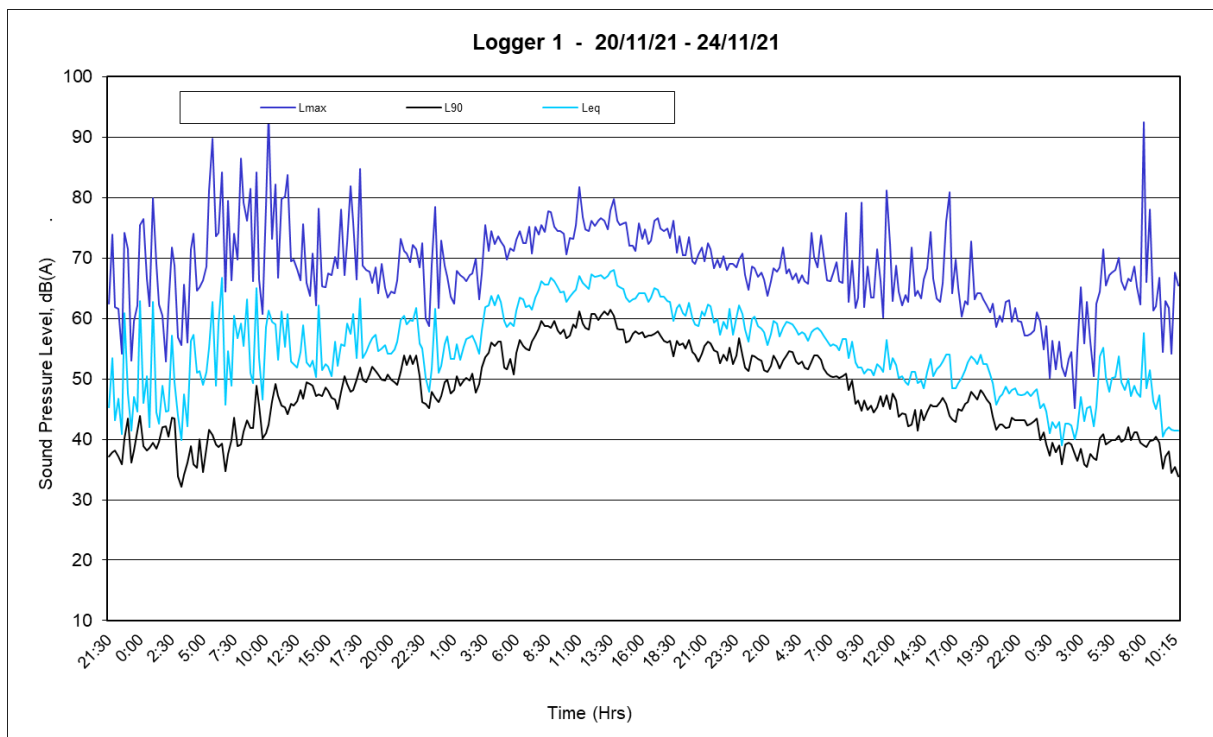
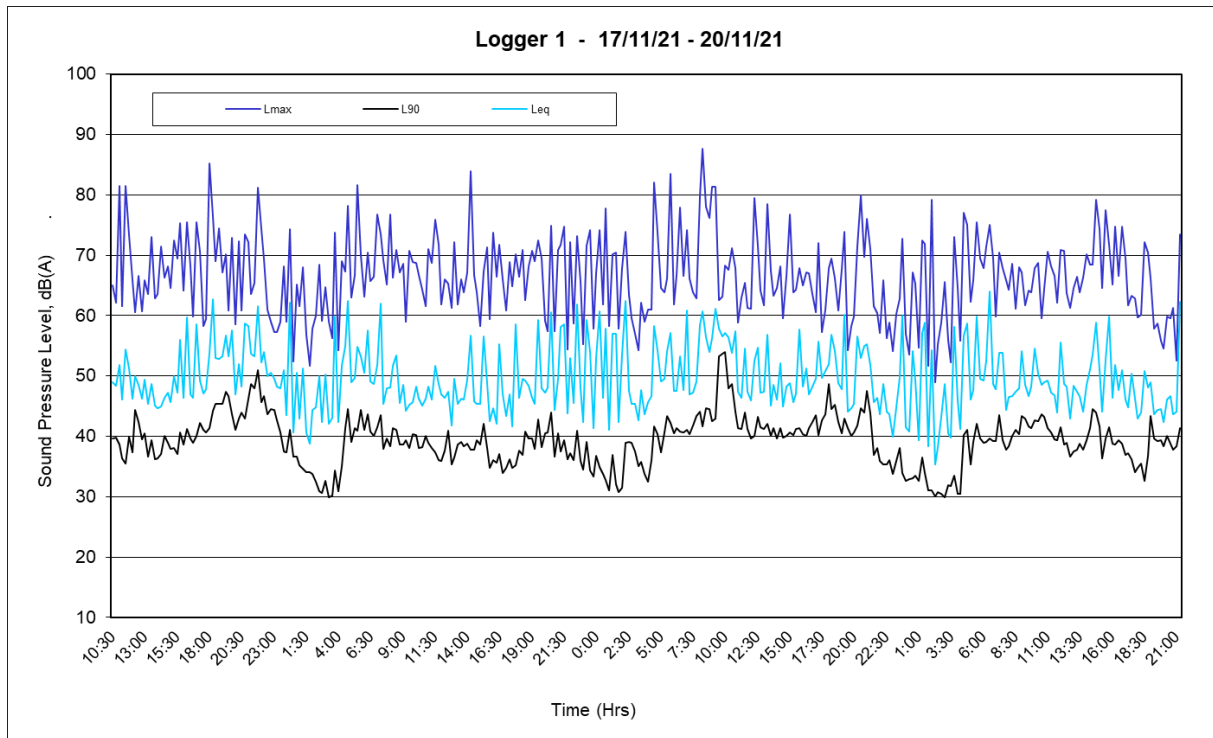
**SPECTRUM ACOUSTICS PTY LIMITED**

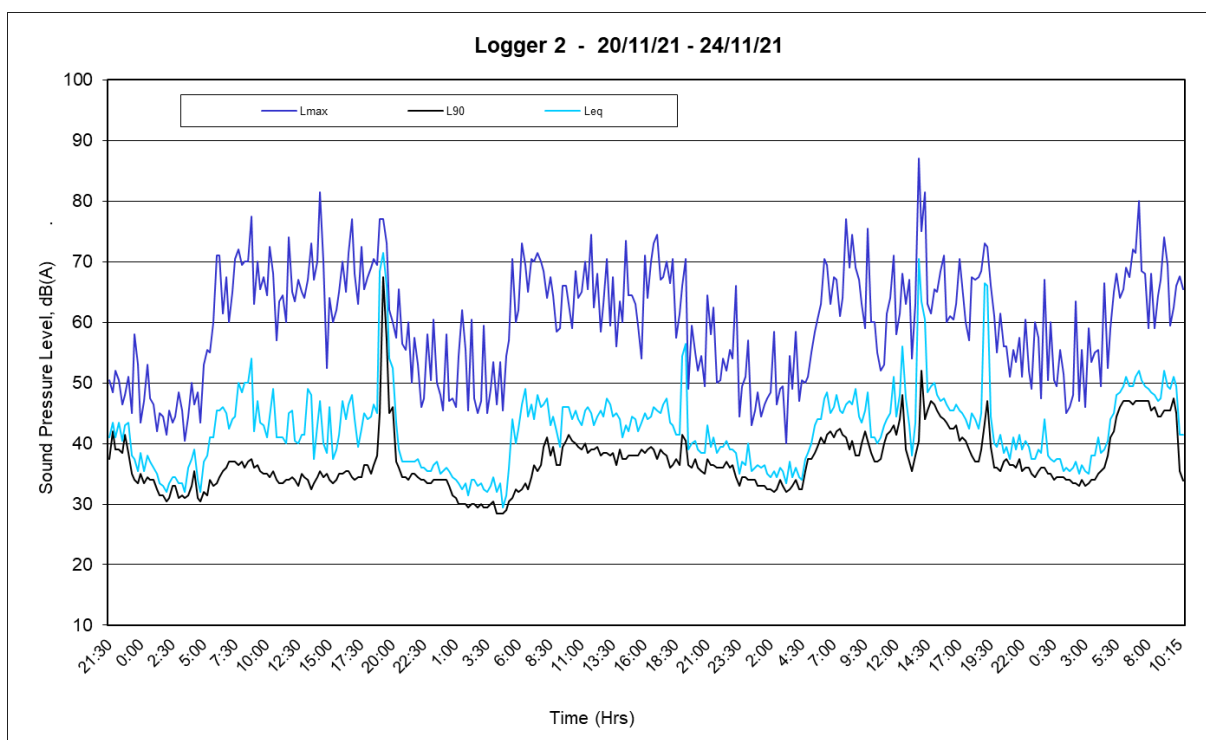
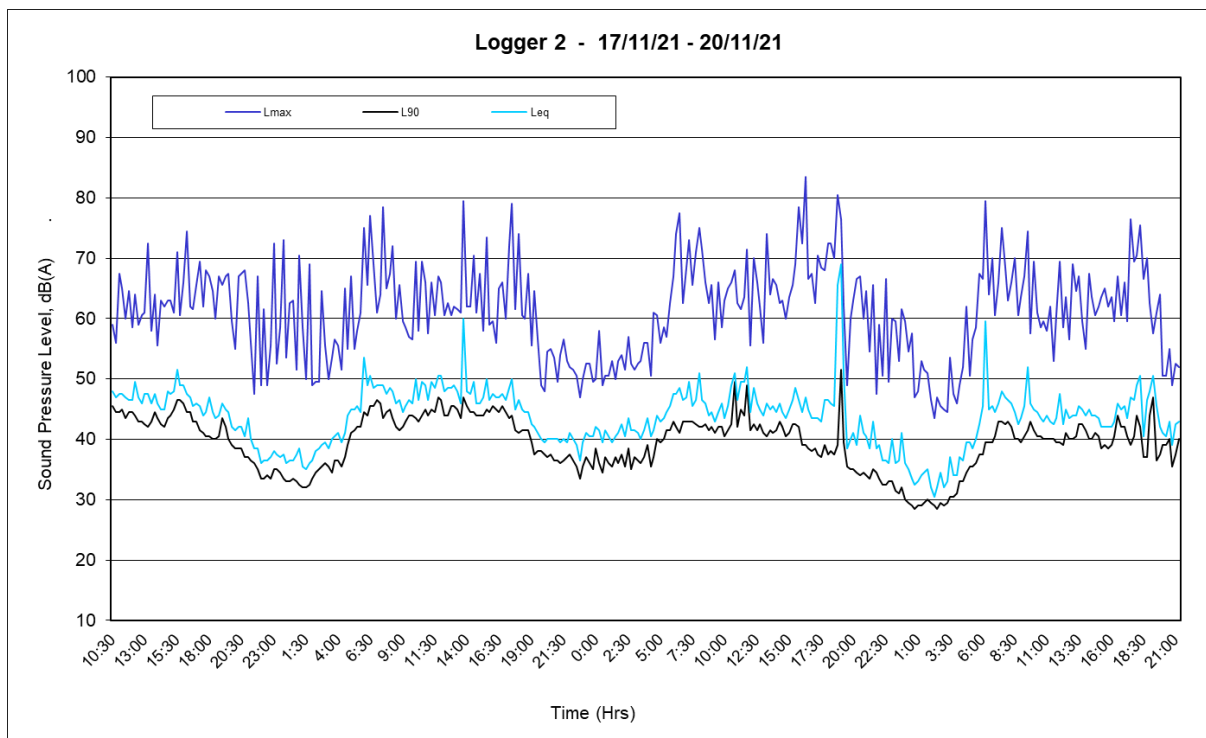
Author:

**Ross Hodge M.A.A.S.**

Acoustical Consultant

**APPENDIX A  
NOISE LOGGER CHARTS**







23 August 2021

Ref: 161308/29476

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: AUGUST 2021 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended and unattended noise monitoring conducted for the Ardglen Quarry (AQ) between Friday 13<sup>th</sup> and Friday 20<sup>th</sup> August, 2021. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

<b>Table 1</b>				
<b>Noise Impact Assessment Criteria</b>				
<i>Land</i>	<i>Day Leq (15 min)</i>	<i>Evening Leq (15 min)</i>	<i>Night</i>	
			<i>Leq (15 min)</i>	<i>L1 (1 min)</i>
<i>1 Burraston</i>	35	35	35	45
<i>3 Rose</i>	35	35	35	45
<i>4 C M Thompson</i>	44	35	35	45
<i>5 M Taylor</i>	45	35	35	45
<i>6 S Thompson</i>	45	35	35	45
<i>9 Bates</i>	37	35	35	45
<i>10 Avery</i>	38	35	35	45
<i>11 Shipman</i>	37	35	35	45
<i>12 Hall</i>	36	35	35	45
<i>13 McGhie</i>	35	35	35	45
<i>14 Purtell</i>	36	35	35	45
<i>15 J Taylor</i>	43	35	35	45
<i>16 Bojba</i>	40	35	35	45
<i>All other privately owned land</i>	35	35	35	45



However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the  $L1$  (1 min) and  $Leq$  (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

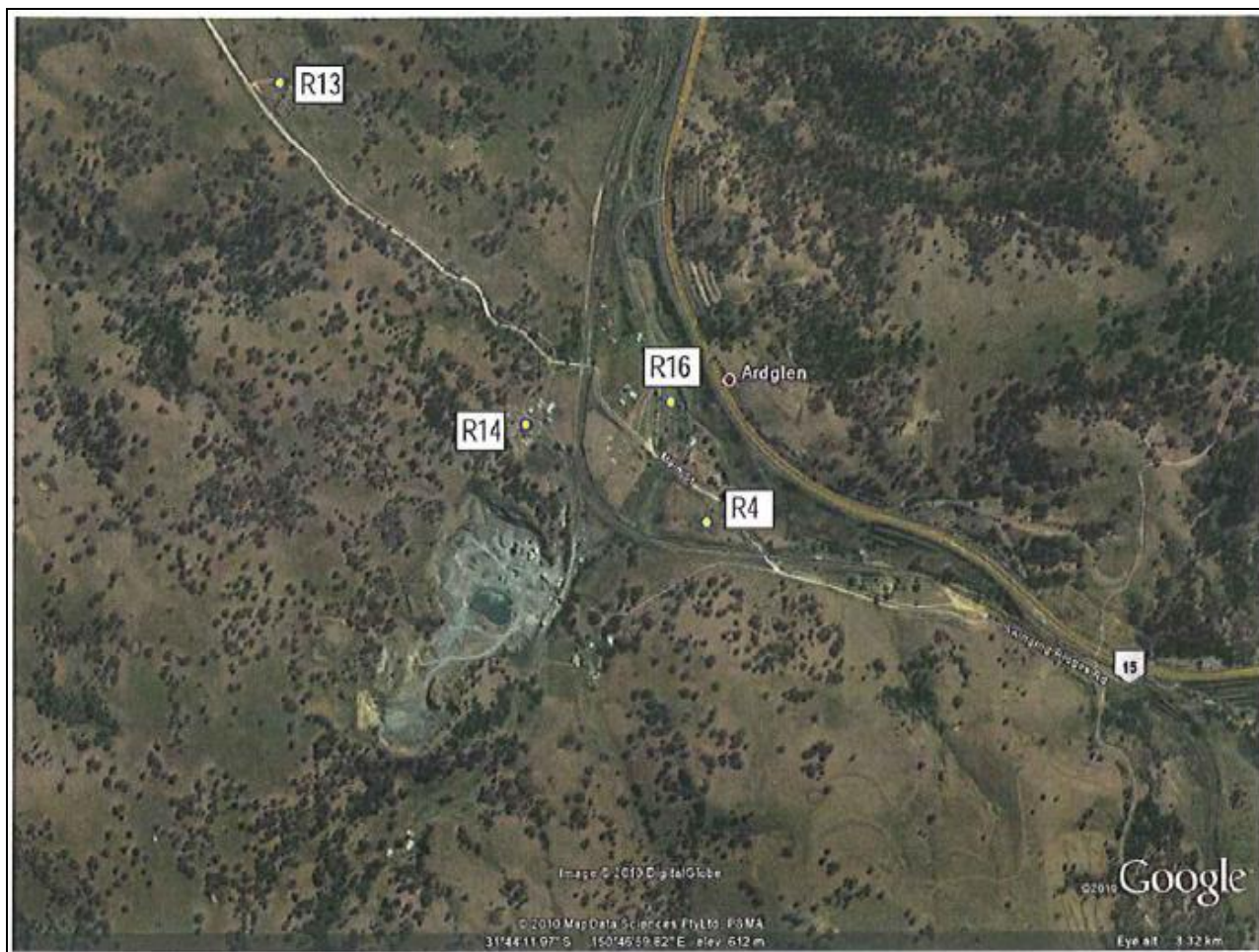
Notes:

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the  $LAeq$  (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the  $L1$  (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## NOISE MONITORING LOCATIONS

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2250 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2.5m above ground level. The weather throughout the survey was mild with clear skies. The wind speed was light from the north west.

The quarry operates on an ad hoc basis as and when demand dictates. Throughout the current monitoring period there were no quarrying operations being undertaken. There was, however, drilling being carried out at various locations on the site. The drill rig was on site throughout the week of unattended monitoring and whilst the attended monitoring was done.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “*Evaluator*” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

TABLE 2 Ardglen Quarry Noise Monitoring Results – 20 <sup>th</sup> August 2021 (Day)				
Location	Time	dB(A), Leq	Wind speed/ direction	Identified Noise Sources
4. Thompson	9:40 am	44	1.0 m/s NW	Traffic (44), birds (32), <b>AQ inaudible</b>
13. McGhie	10:10 am	36	2.0 m/s NW	Birds (35), traffic (30) <b>AQ faintly audible</b>
14. Purtell	10:30 am	46	2.0 m/s NW	Traffic (44), birds (40), <b>AQ inaudible</b>
16. Bojba	10:50 am	44	2.5 m/s NW	Traffic (42), birds (38), frogs (25), <b>AQ faintly audible</b>

The results in Table 2 show that, under the meteorological and operating conditions at the time, the noise emissions from AQ were compliant with the relevant noise criteria at all monitoring locations. At locations 4 and 16 a faint hum was audible from the direction of the quarry, but the noise was at very low levels and not consistent enough for a viable measurement to be made.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of seven days, part of which coincides with the quarterly attended noise monitoring.

To measure the acoustic environment an ARL EL-315 environmental noise logger and an ARL Ngara environmental noise logger, were located as shown in Figure 2 from 13<sup>th</sup> to 20<sup>th</sup> August, 2021. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix I**.



TABLE 3 Measured Logger Noise Levels dB(A) – 13 <sup>th</sup> to 20 <sup>th</sup> August 2021						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
Logger 1	52	33	55	29	55	26
Logger 2	47	33	45	33	43	24



**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R14. This is adjacent to the attended noise monitoring location for this residence.

Logger 2 was in an open paddock north of the house.

The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.



We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 0412 023 455.

Yours faithfully,

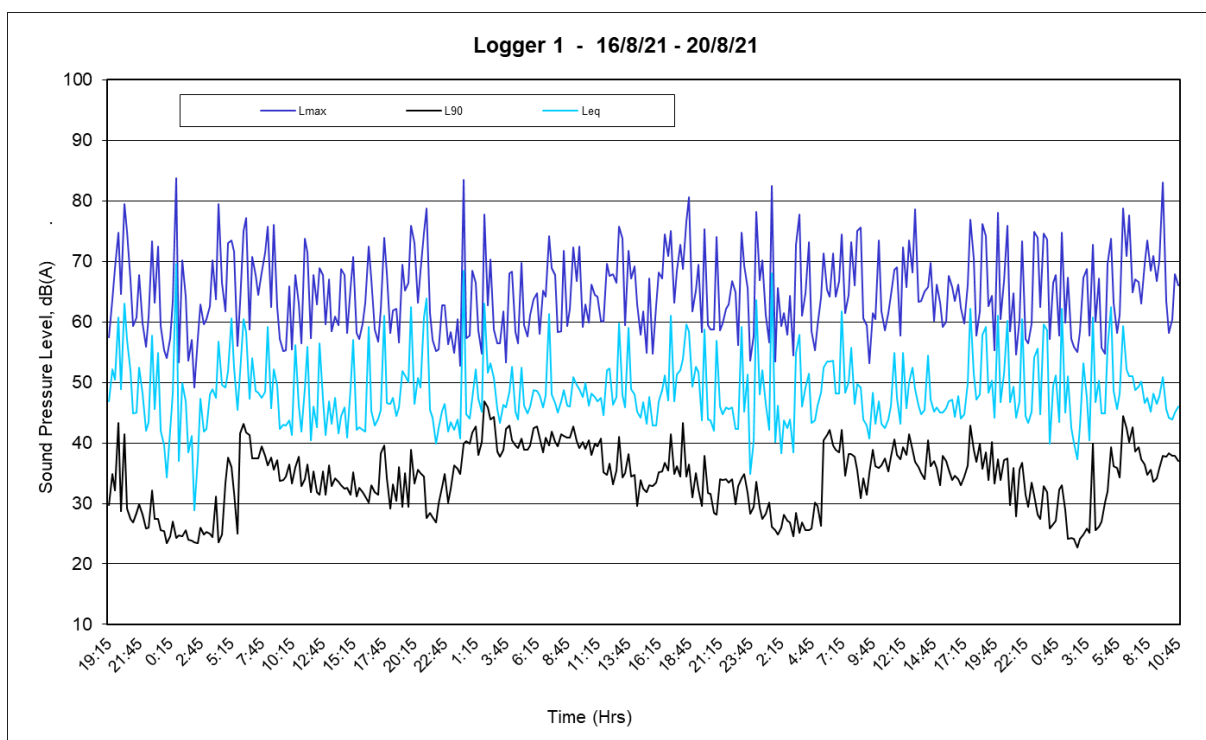
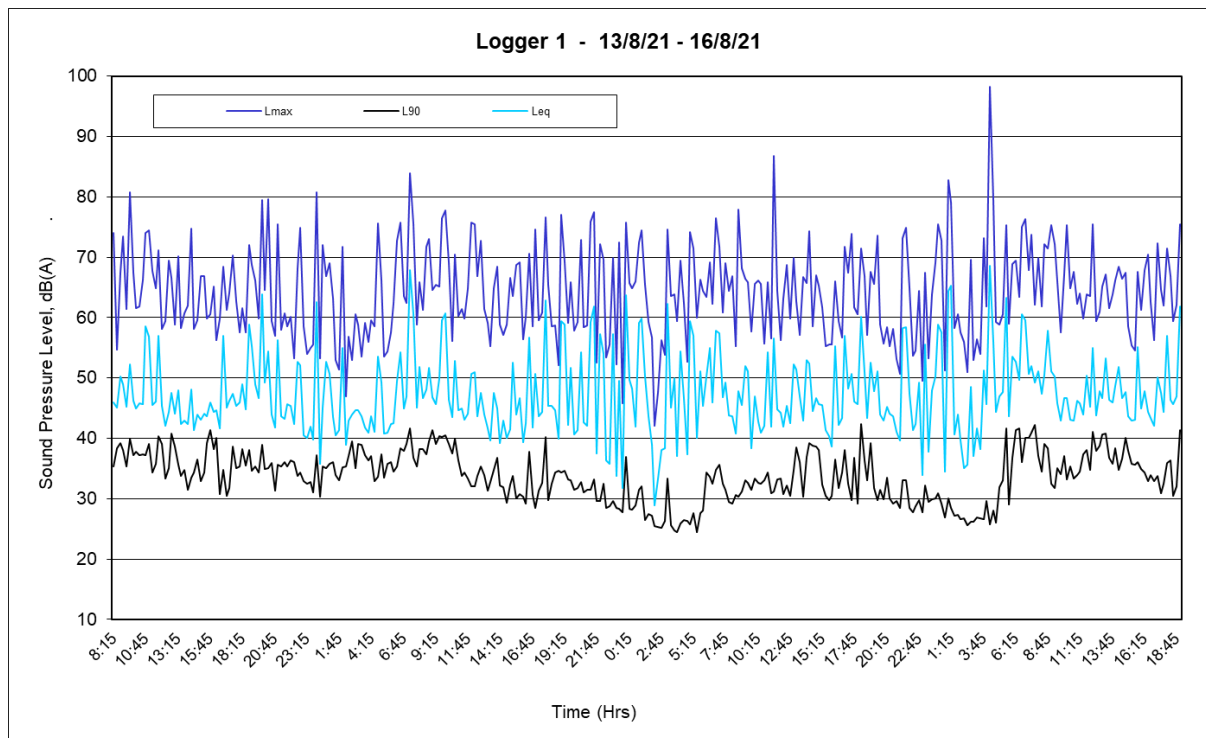
**SPECTRUM ACOUSTICS PTY LIMITED**

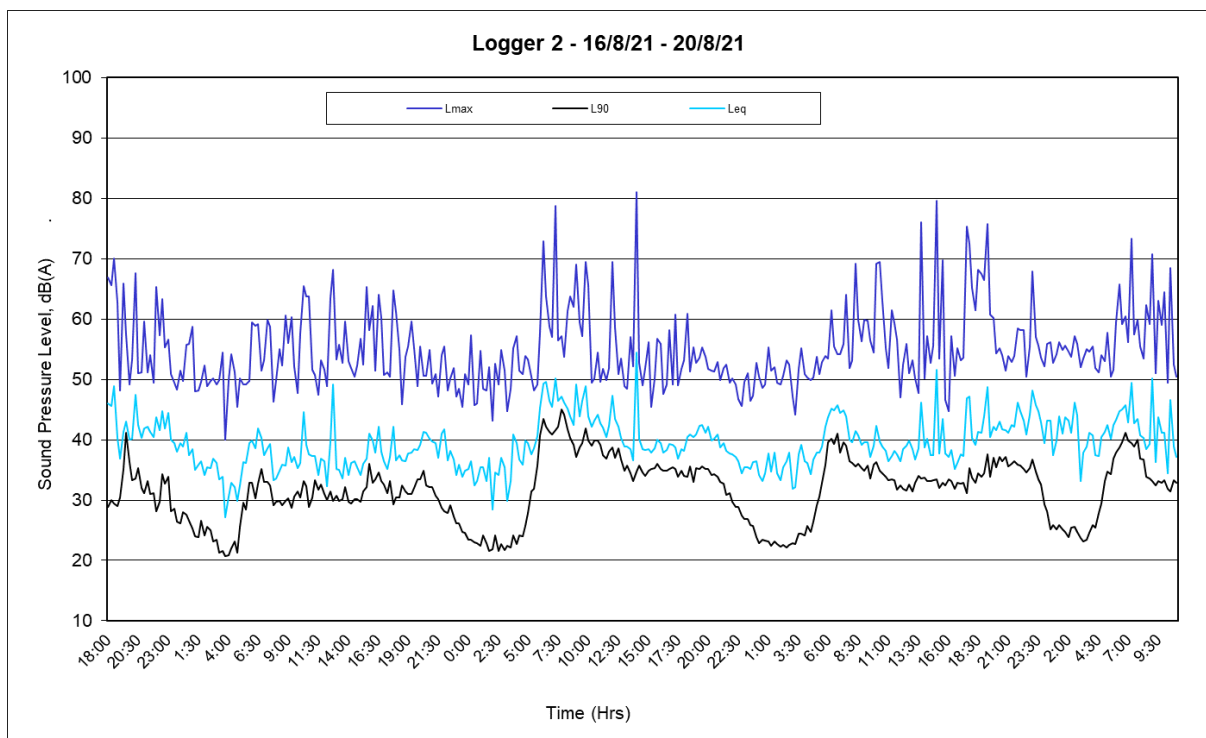
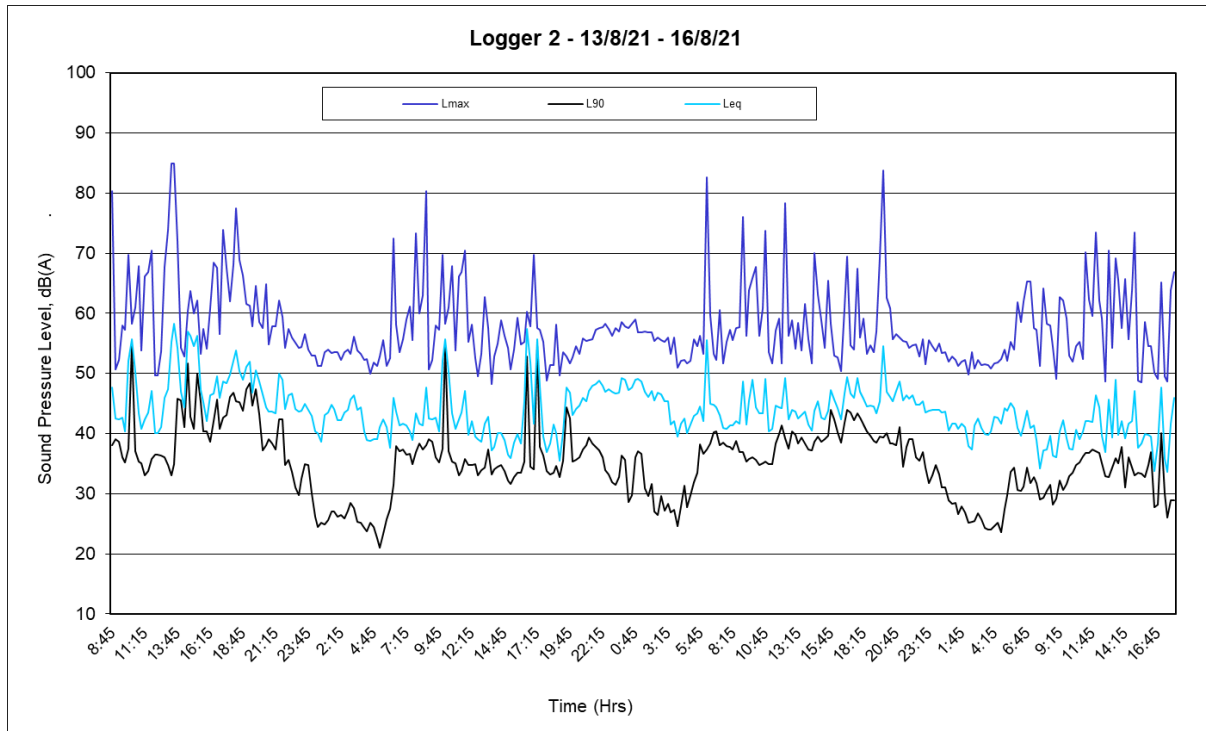
Author:



**Ross Hodge M.A.A.S.**  
Acoustical Consultant

## APPENDIX A NOISE LOGGER CHARTS







27 May 2021

Ref: 161308/29385

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: MAY 2021 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended and unattended noise monitoring conducted for the Ardglen Quarry (AQ) between Wednesday 19<sup>th</sup> and Wednesday 26<sup>th</sup> May, 2021. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45



However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

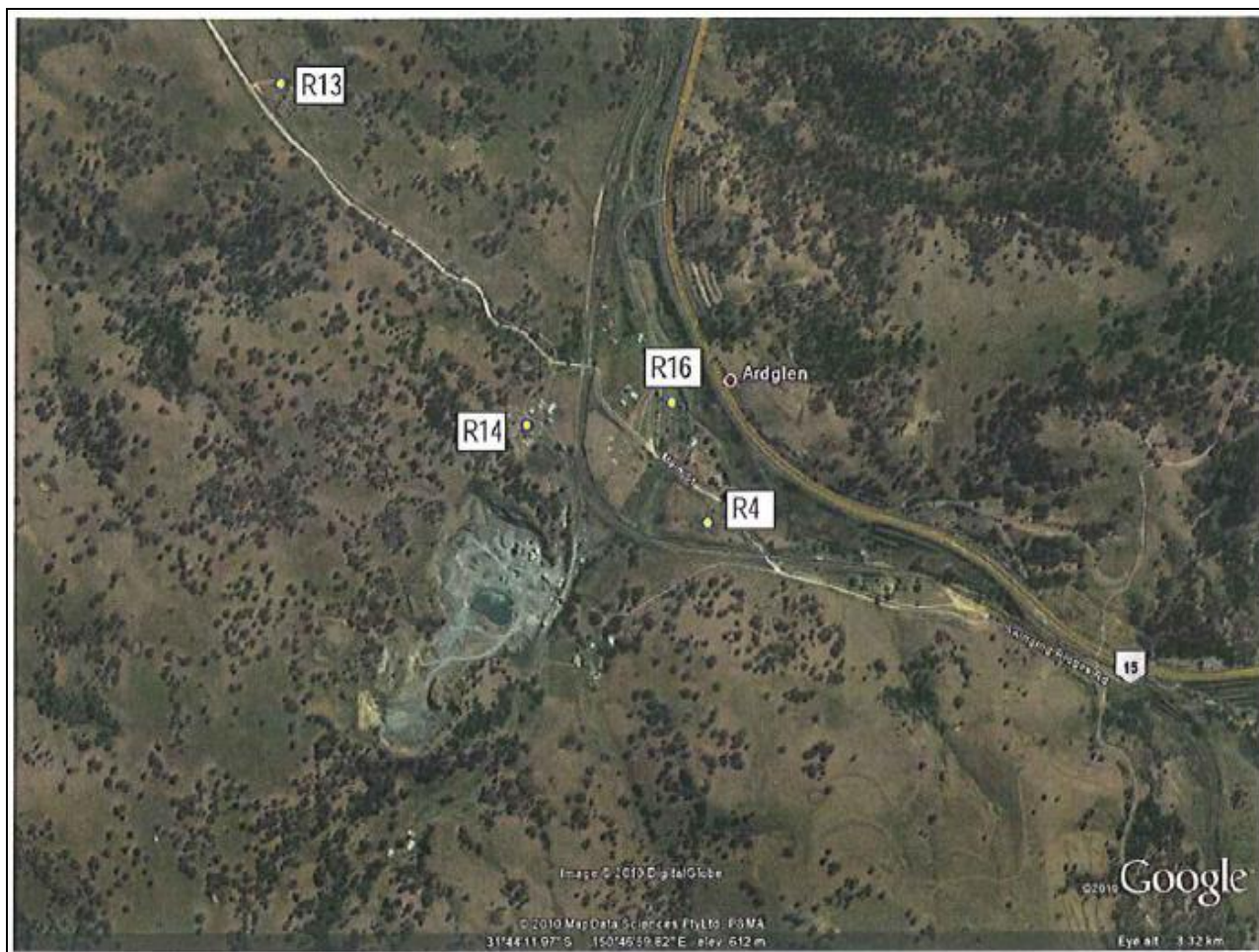
Notes:

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## NOISE MONITORING LOCATIONS

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2.5m above ground level. The weather throughout the survey was mild with clear skies. The wind speed was calm to light from the east and south east.

The quarry operates on an ad hoc basis as and when demand dictates. Throughout the current monitoring period the quarry was not operating.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “Evaluator” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

TABLE 2 Ardglen Quarry Noise Monitoring Results – 19 <sup>th</sup> May 2021 (Day)				
Location	Time	dB(A) <sub>Leq</sub>	Wind speed/ direction	Identified Noise Sources
4. Thompson	9:40 am	41	Calm	Traffic (39), birds (37), <b>AQ inaudible</b>
13. McGhie	10:25 am	38	0.5 m/s SE	Traffic (37), birds (31), <b>AQ inaudible</b>
14. Purtell	10:08 am	44	0.5 m/s E	Traffic (42), birds (40), <b>AQ inaudible</b>
16. Bojba	10:45 am	51	1.0 m/s SE	Traffic (51), birds (40), <b>AQ inaudible</b>

The results in Table 2 show that under the operating conditions at the time the noise emissions from AQ were inaudible and, therefore, compliant with the relevant noise criteria at all monitoring locations.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of seven days, part of which coincides with the quarterly attended noise monitoring.

To measure the acoustic environment an ARL EL-315 environmental noise logger and an ARL Ngara environmental noise logger, were located as shown in Figure 2 from 19<sup>th</sup> to 26<sup>th</sup> May, 2021. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix I**.

TABLE 3 Measured Logger Noise Levels dB(A) – 19 <sup>th</sup> to 26 <sup>th</sup> May 2021						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
Logger 1	54	39	55	34	54	24
Logger 2	57	40	53	32	52	29





**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R14. This is adjacent to the attended noise monitoring location for this residence. Logger 2 was in an open paddock north of the house.

The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 0412 023 455.

Yours faithfully,

**SPECTRUM ACOUSTICS PTY LIMITED**

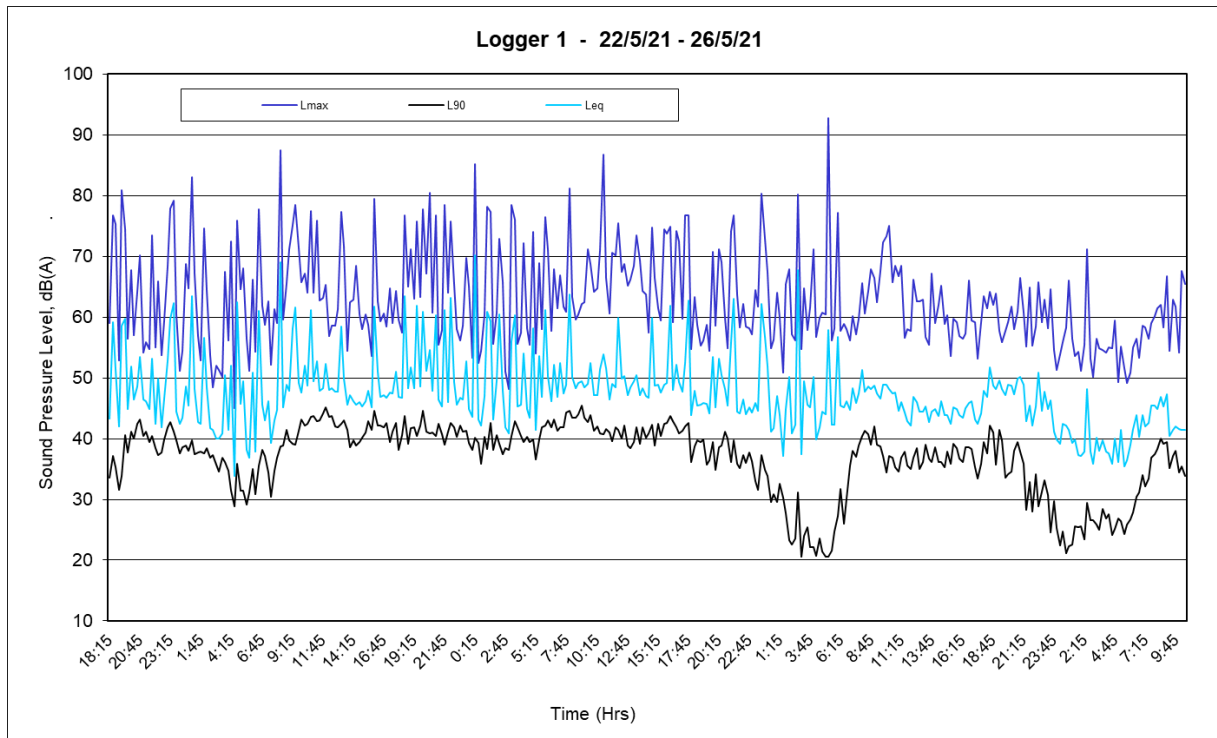
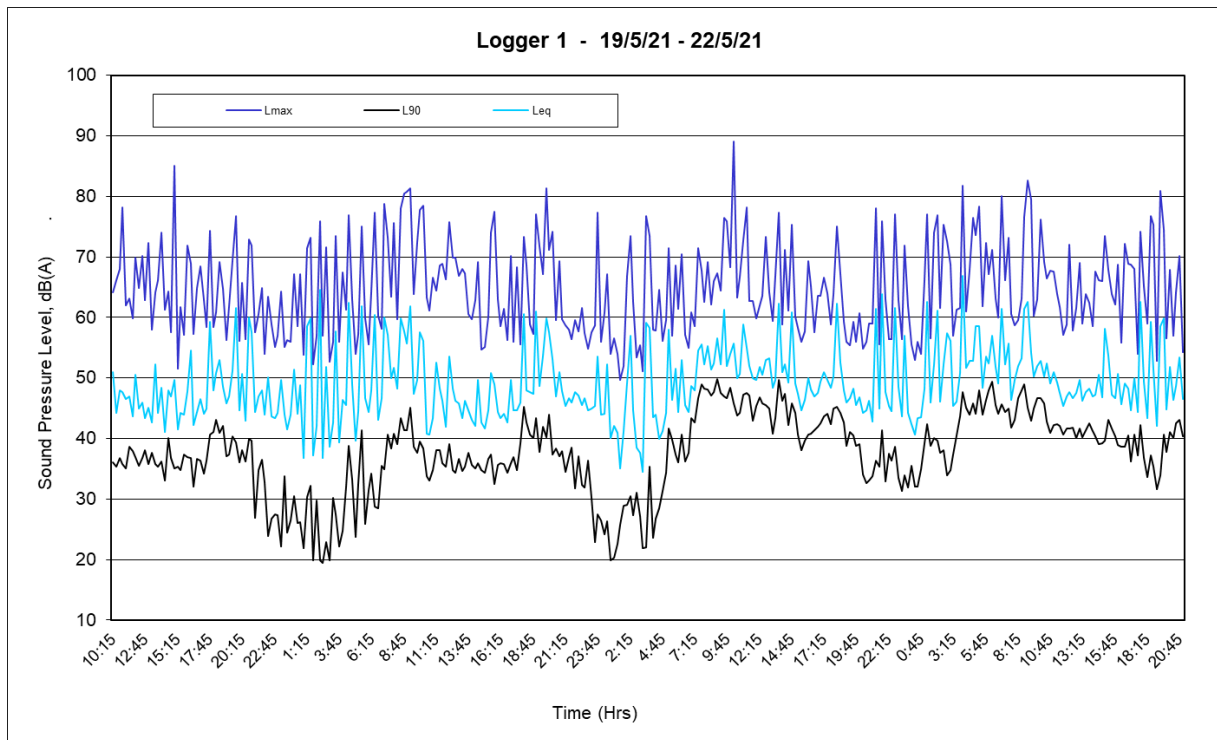
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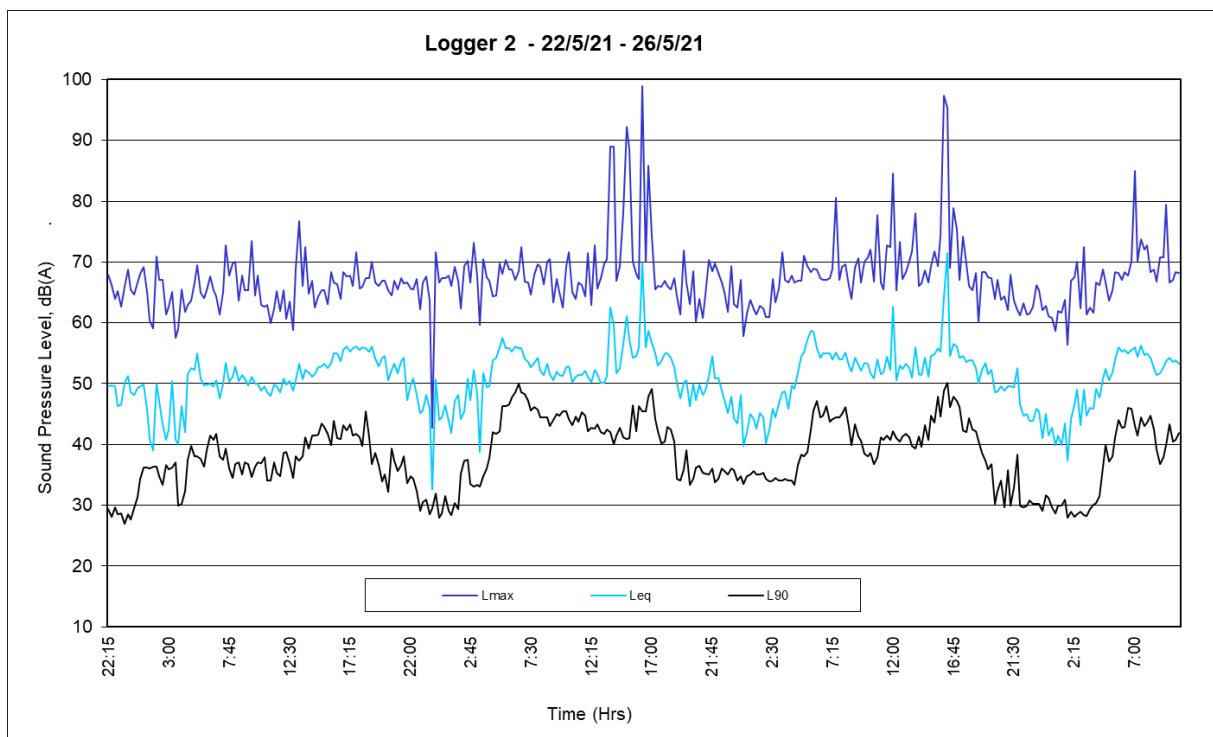
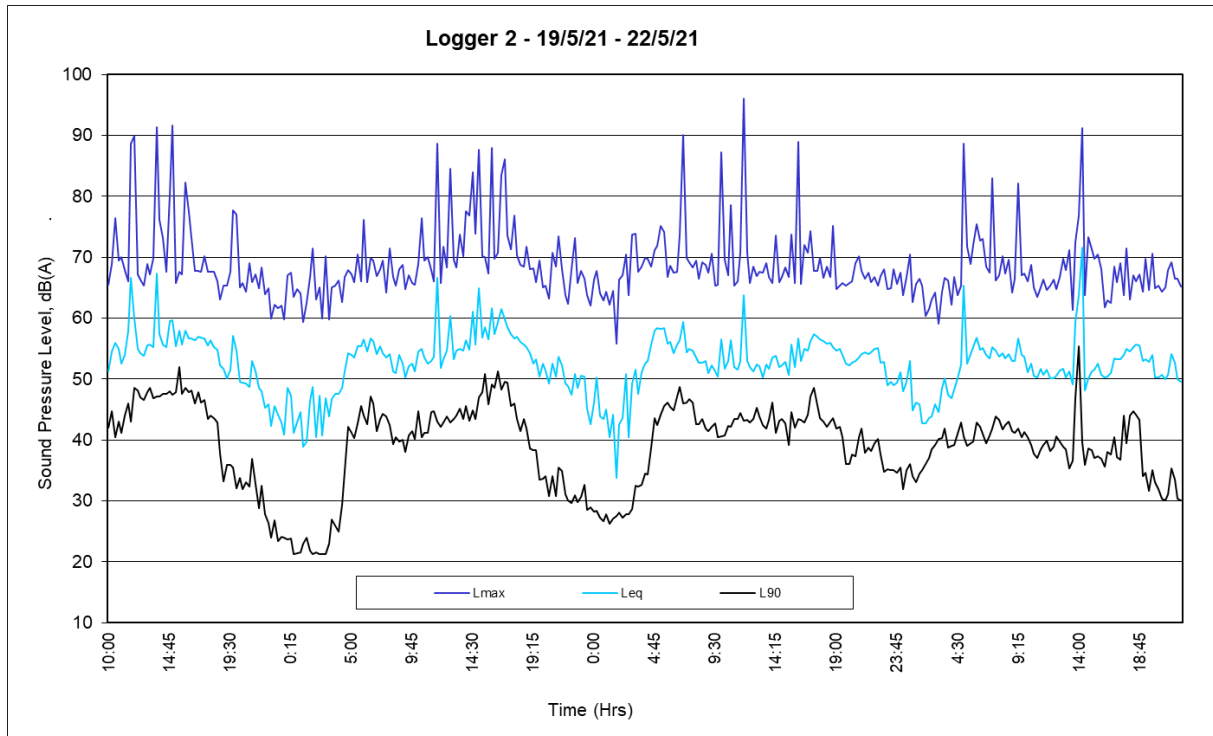


**Ross Hodge M.A.A.S.**  
Acoustical Consultant



## APPENDIX A NOISE LOGGER CHARTS







22 March 2021

Ref: 161308/29311

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: FEBRUARY 2021 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended and unattended noise monitoring conducted for the Ardglenn Quarry (AQ) between Wednesday 17<sup>th</sup> and Wednesday 24<sup>th</sup> February, 2021. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

Notes:

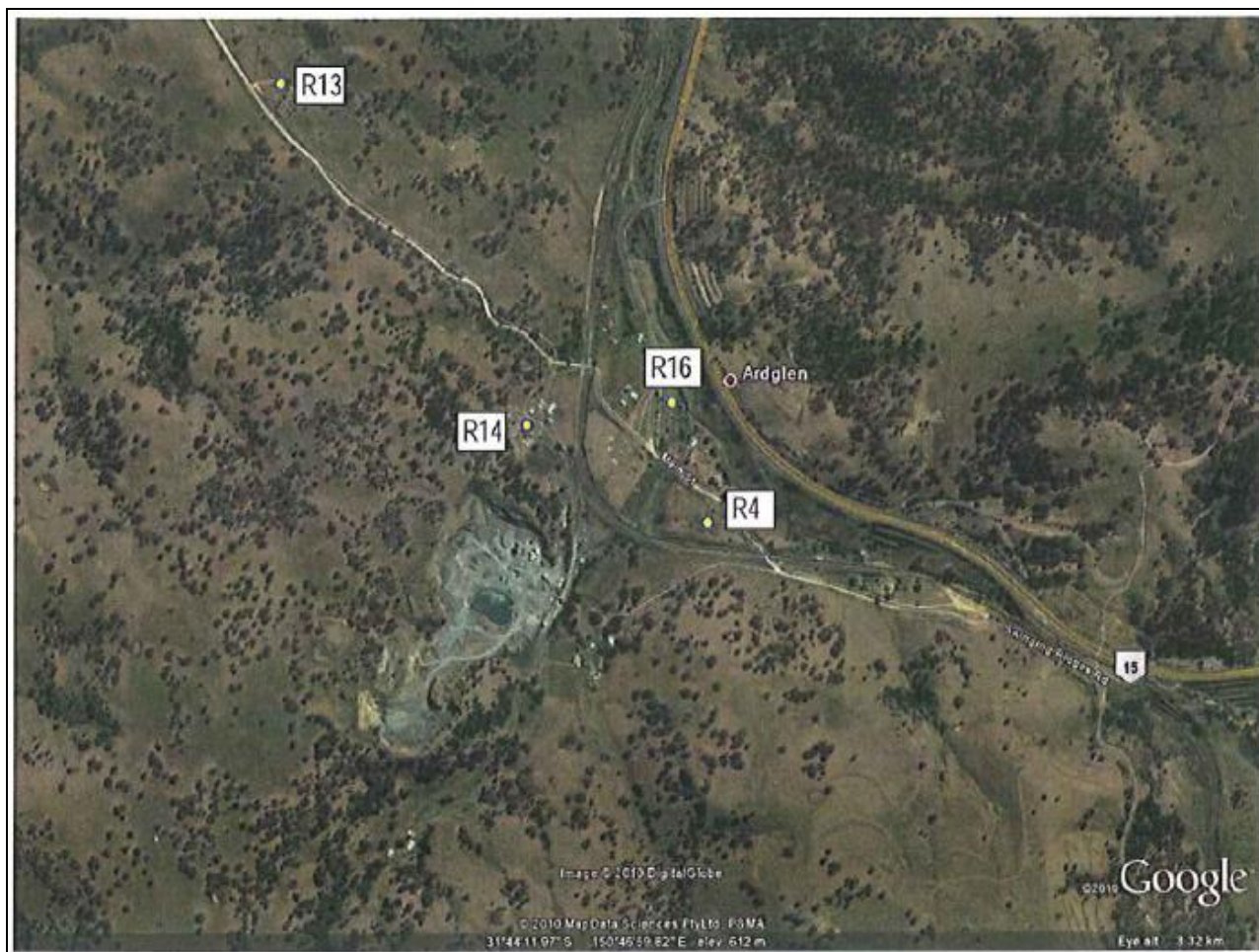
- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## NOISE MONITORING LOCATIONS

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba





**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2.5m above ground level. The weather throughout the survey was warm with overcast skies. Light rain had fallen before the survey. The wind speed was light to moderate from the east south east.

The quarry operates on an ad hoc basis as and when demand dictates. Throughout the current monitoring period the quarry was not operating.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “*Evaluator*” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

TABLE 2 Ardglen Quarry Noise Monitoring Results – 24 <sup>th</sup> February 2021 (Day)				
Location	Time	dB(A), Leq	Wind speed/ direction	Identified Noise Sources
4. Thompson	3:40 pm	45	2.0 m/s SSE	Traffic (45), birds (28), <b>AQ inaudible</b>
13. McGhie	4:20 pm	45	2.5 m/s SSE	Traffic (45), birds (30), <b>AQ inaudible</b>
14. Purtell	4:05 pm	41	2.0 m/s SSE	Traffic (40), birds (33), <b>AQ inaudible</b>
16. Bojba	4:40 pm	50	2.5 m/s SSE	Traffic (50), birds & insects (40), <b>AQ inaudible</b>

The results in Table 2 show that under the operating conditions at the time the noise emissions from AQ were inaudible and, therefore, compliant with the relevant noise criteria at all monitoring locations.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of seven days, part of which coincides with the quarterly attended noise monitoring.

To measure the acoustic environment an ARL EL-315 environmental noise logger and a Rion NL-42 sound level meter, set up as environmental noise logger, were located as shown in Figure 2 from 17<sup>th</sup> to 24<sup>th</sup> February, 2021. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix I**.

TABLE 3 Measured Logger Noise Levels dB(A) – 17 <sup>th</sup> to 24 <sup>th</sup> February 2021						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
Logger 1	55	45	53	41	47	28
Logger 2	59	39	54	41	51	31





**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R 14. This is adjacent to the attended noise monitoring location for this residence. Logger 2 was in an open paddock north of the house.

The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 0412 023 455.

Yours faithfully,

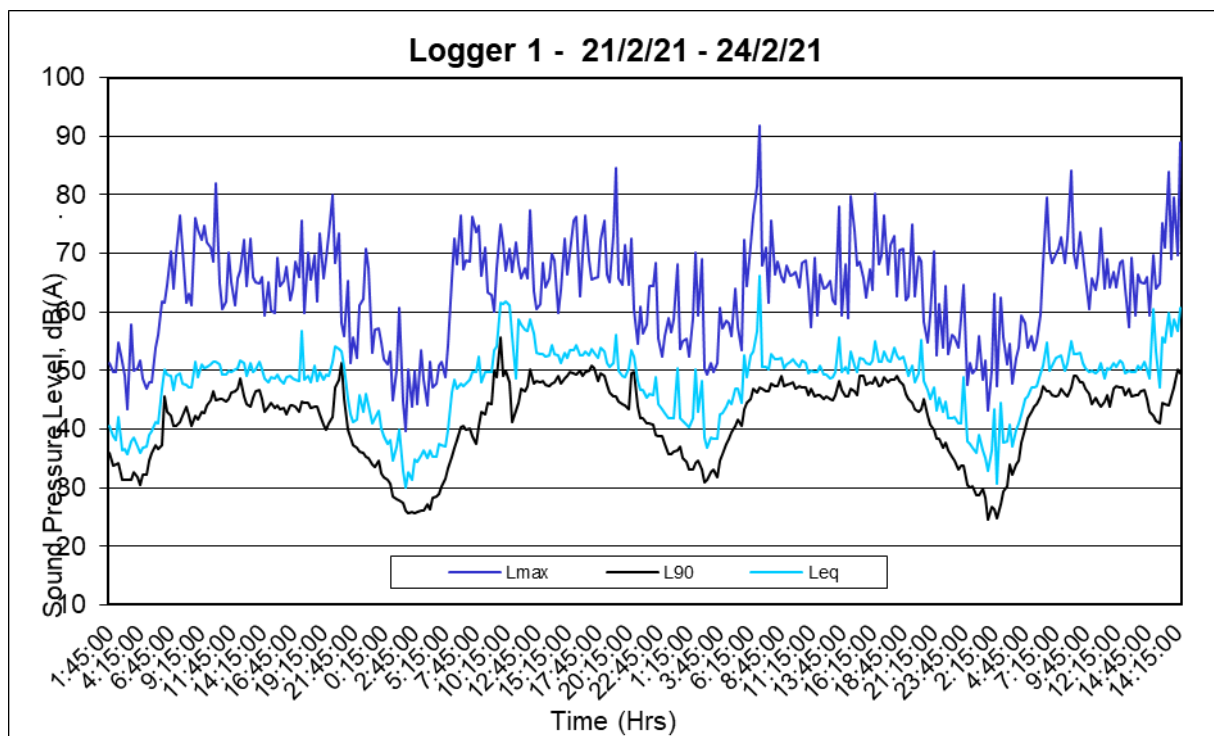
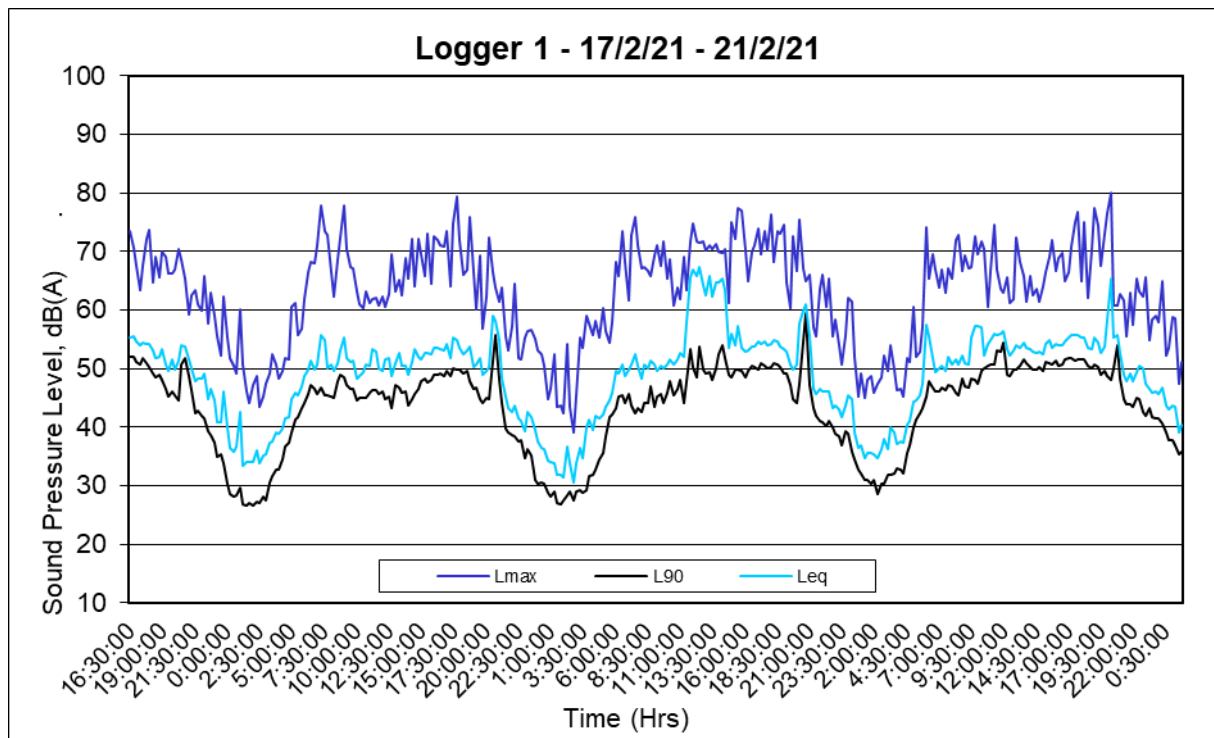
**SPECTRUM ACOUSTICS PTY LIMITED**

Author:

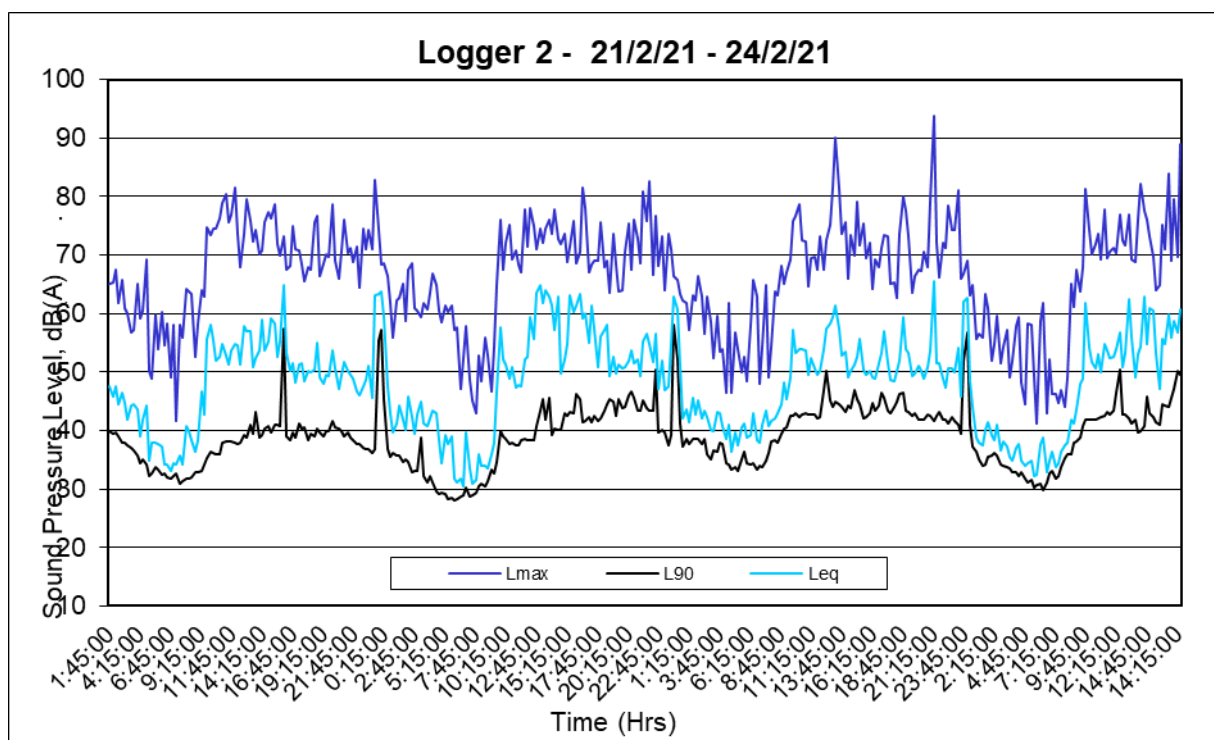
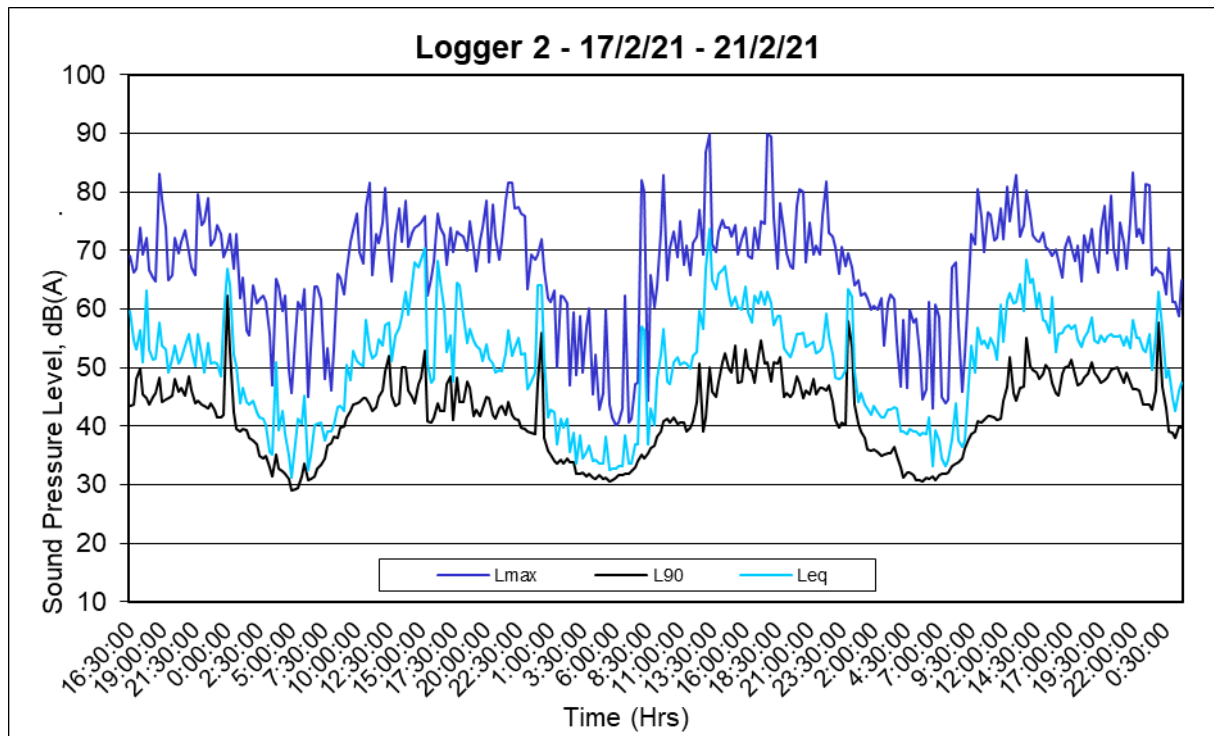


**Ross Hodge M.A.A.S.**  
Acoustical Consultant

APPENDIX A  
NOISE LOGGER CHARTS









16 December 2020

Ref: 161308/29183

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: NOVEMBER 2020 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended and unattended noise monitoring conducted for the Ardglen Quarry (AQ) between 18<sup>th</sup> and 25<sup>th</sup> November, 2020. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

<b>Table 1</b> <b>Noise Impact Assessment Criteria</b>				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

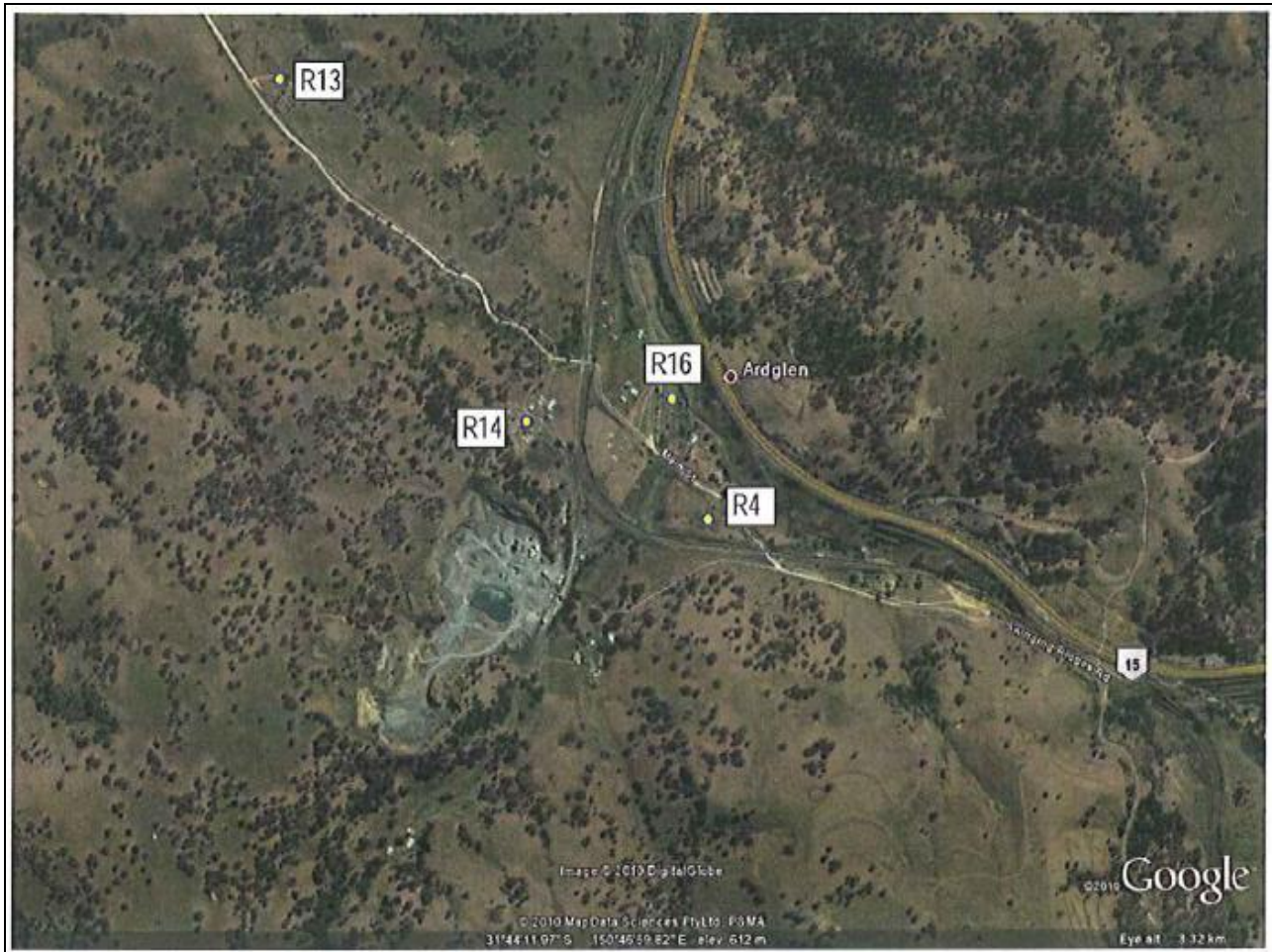
Notes:

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## NOISE MONITORING LOCATIONS

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand-held weather station with measurements made at approximately 2.5m above ground level. The weather throughout the survey was warm with relatively clear skies. The wind speed was light from the south east.

The quarry operates on an ad hoc basis as and when demand dictates. Throughout the current monitoring period the quarry was not operating.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “Evaluator” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.



Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

<b>TABLE 2</b>				
<b>Ardglen Quarry Noise Monitoring Results – 25<sup>th</sup> November 2020 (Day)</b>				
<b>Location</b>	<b>Time</b>	<b>dB(A), Leq</b>	<b>Wind speed/ direction</b>	<b>Identified Noise Sources</b>
4. Thompson	10:00 am	46	2 m/s SE	Traffic (45), birds (37), <b>AQ inaudible</b>
13. McGhie	10:45 am	47	2.5 m/s S	Traffic (44), birds (43), <b>AQ inaudible</b>
14. Purtell	10:25 am	46	2 m/s SE	Traffic (45), birds (39), <b>AQ inaudible</b>
16. Bojba	9:40 am	46	2 m/s SE	Traffic (45), birds & insects (40), <b>AQ inaudible</b>

The results in Table 2 show that, under the operating conditions at the time, the noise emissions from AQ were inaudible and, therefore, compliant with the relevant noise criteria at all monitoring locations.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of seven days, part of which coincides with the quarterly attended noise monitoring.

To measure the acoustic environment two x ARL EL-315 environmental noise loggers, were located as shown in Figure 2 from 18<sup>th</sup> to 25<sup>th</sup> November, 2020. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix I**.

<b>TABLE 3</b>						
<b>Measured Logger Noise Levels dB(A) – 18<sup>th</sup> to 25<sup>th</sup> November 2020</b>						
<b>Logger Location</b>	<b>Day (7am to 6pm)</b>		<b>Evening (6pm to 10 pm)</b>		<b>Night (10pm to 7am)</b>	
	<b>Leq</b>	<b>L90</b>	<b>Leq</b>	<b>L90</b>	<b>Leq</b>	<b>L90</b>
Logger 1	52	40	56	39	53	32
Logger 2	55	38	52	33	53	30



**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R 14. This is adjacent to the attended noise monitoring location for this residence. Logger 2 was in an open paddock north of the house.

The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 0412 023 455.

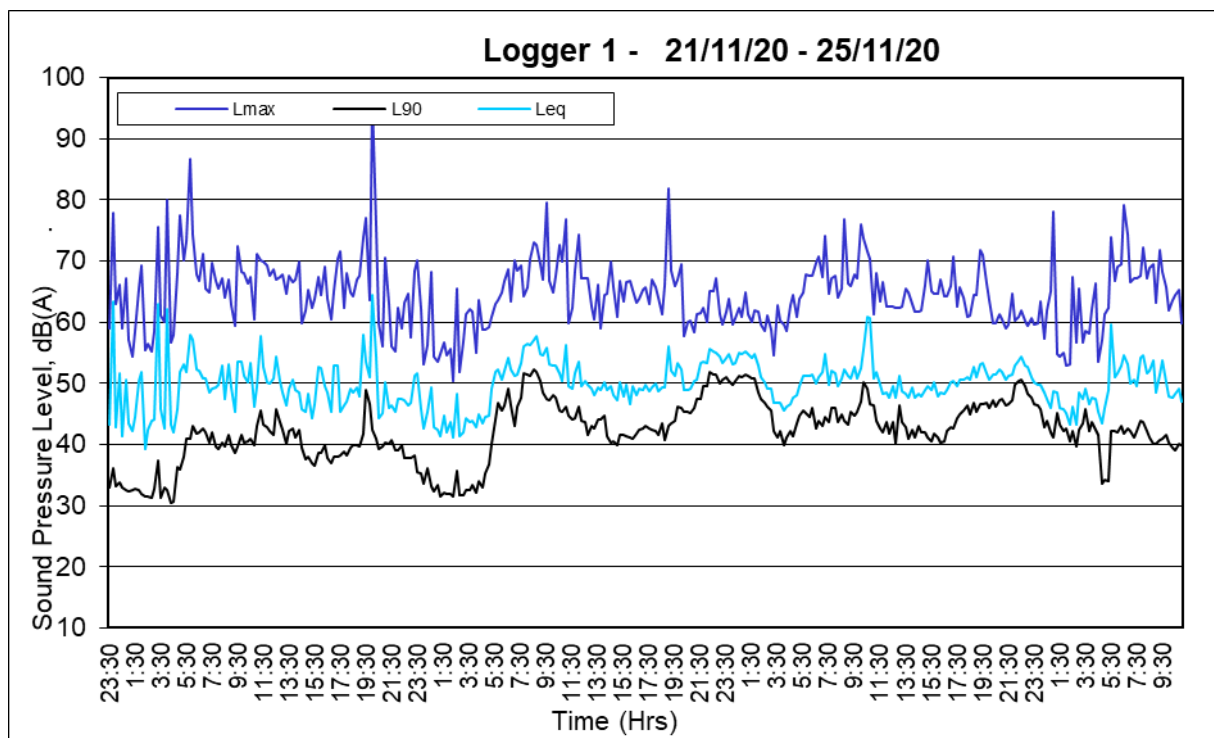
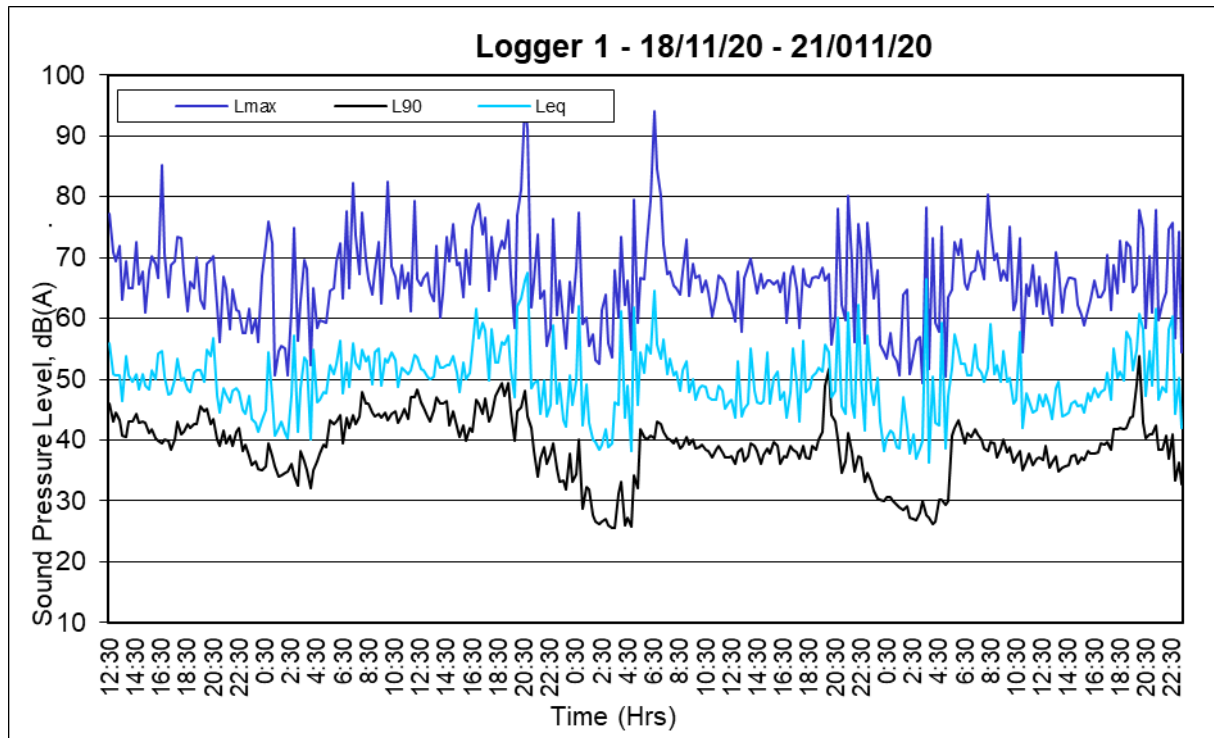
Yours faithfully,

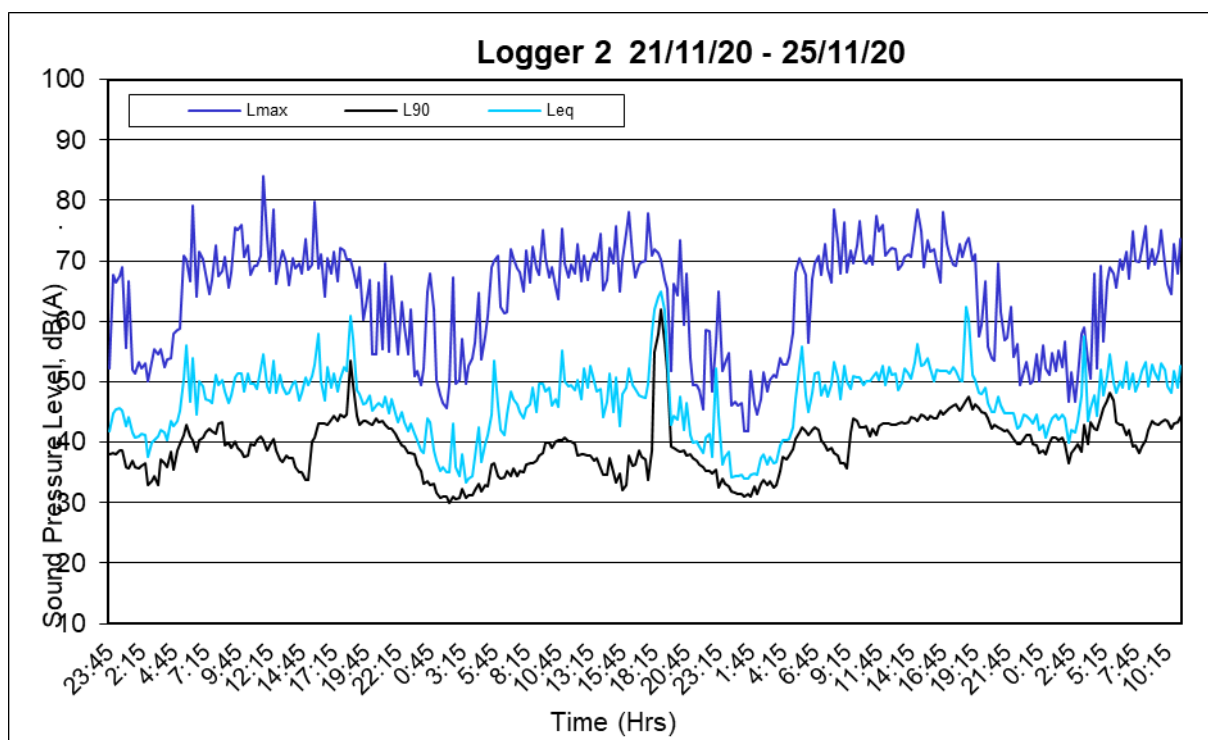
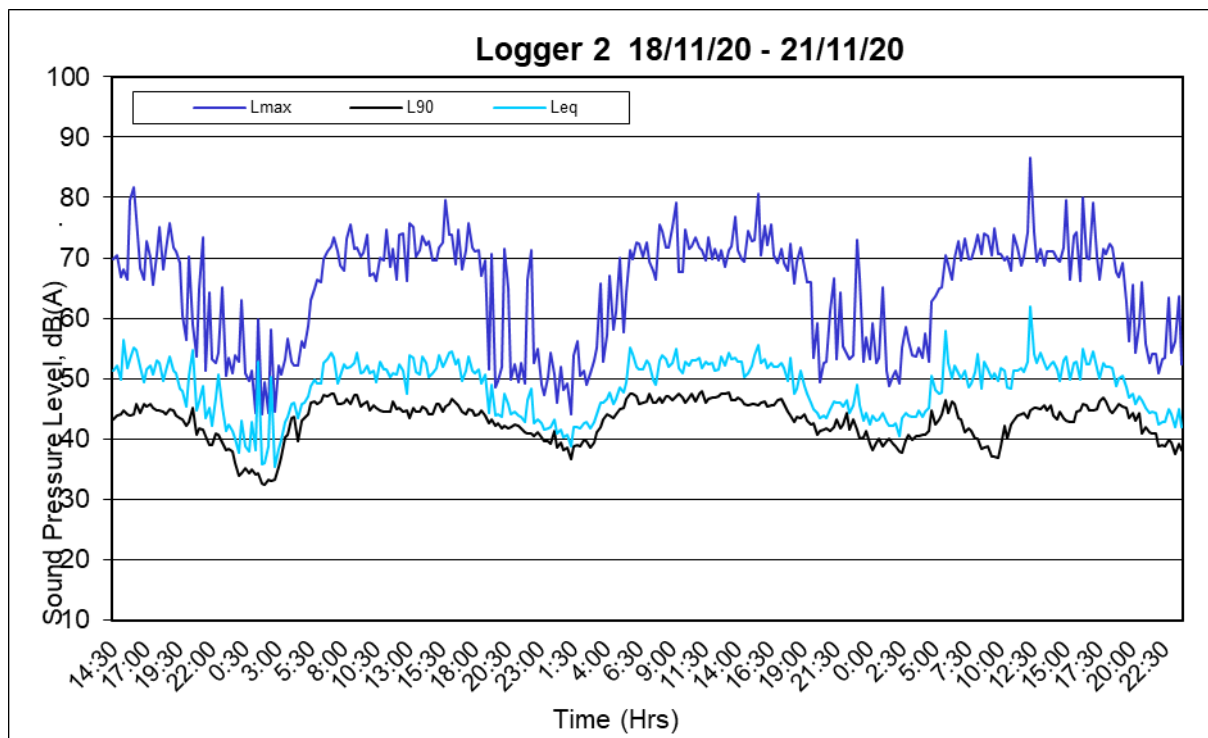
**SPECTRUM ACOUSTICS PTY LIMITED**

**Ross Hodge**

Acoustical Consultant

APPENDIX A  
NOISE LOGGER CHARTS









17 August 2020

Ref: 161308/29028

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: AUGUST 2020 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended and unattended noise monitoring conducted for the Ardglen Quarry (AQ) between 4<sup>th</sup> and 11<sup>th</sup> August, 2020. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

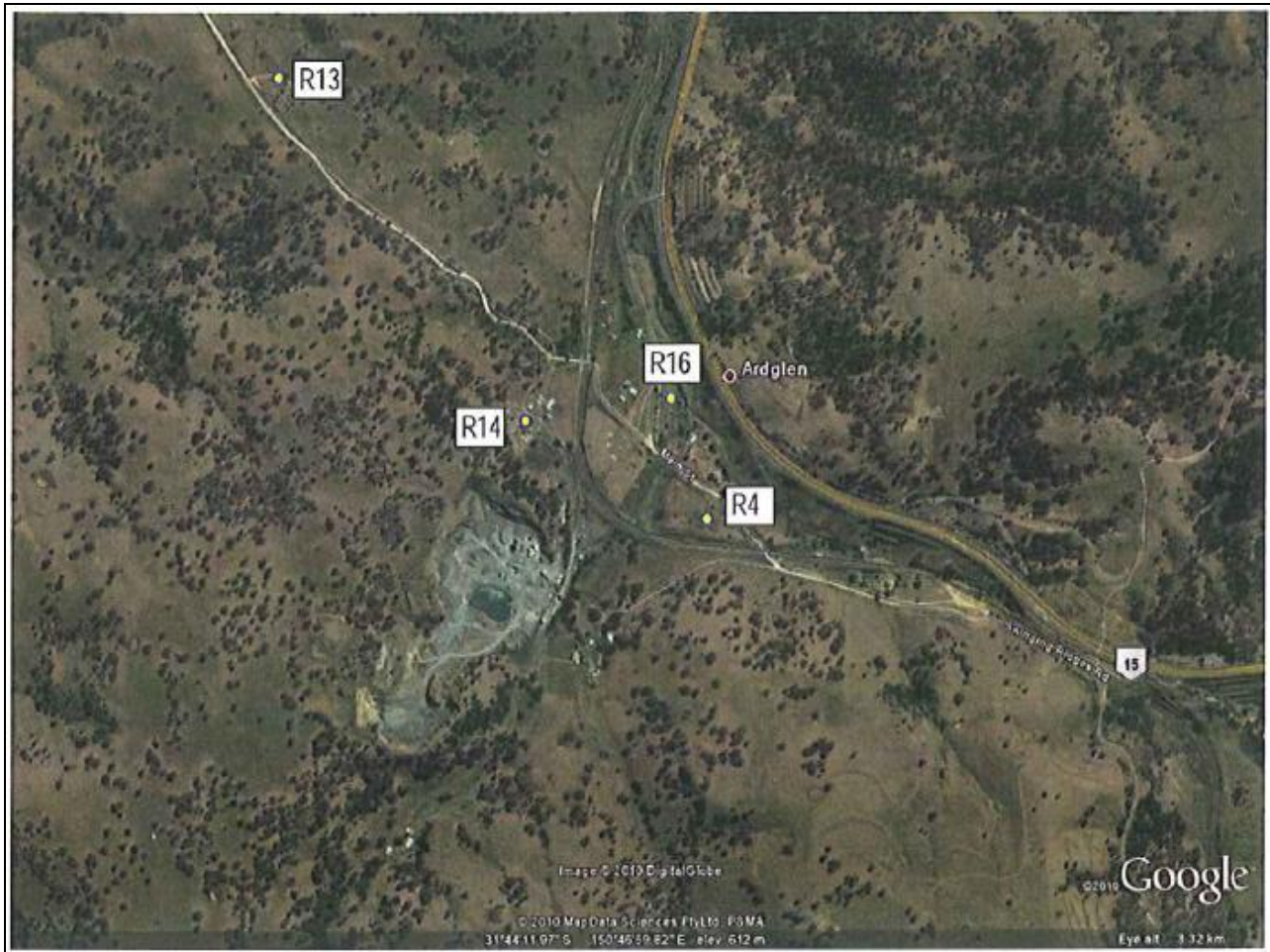
Notes:

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## **NOISE MONITORING LOCATIONS**

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2.5m above ground level. The weather throughout the survey was warm with relatively clear skies. The wind speed was light from the north west.

The quarry operates on an ad hoc basis as and when demand dictates. Throughout the current monitoring period the quarry was not operating.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “Evaluator” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

<b>TABLE 2</b>				
<b>Ardglen Quarry Noise Monitoring Results – 4<sup>th</sup> August 2020 (Day)</b>				
<b>Location</b>	<b>Time</b>	<b>dB(A)<sub>Leq</sub></b>	<b>Wind speed/ direction</b>	<b>Identified Noise Sources</b>
4. Thompson	12:10 pm	44	1 m/s NW	Traffic (44), birds (34), <b>AQ inaudible</b>
13. McGhie	1:00 pm	41	1.5 m/s NW	Traffic (40), birds (34), <b>AQ inaudible</b>
14. Purtell	12:35 pm	45	1.5 m/s NW	Traffic (45), birds (28), <b>AQ inaudible</b>
16. Bojba	11:50 am	48	1 m/s NW	Traffic (48), birds (30), <b>AQ inaudible</b>

The results in Table 2 show that under the operating conditions at the time the noise emissions from AQ were inaudible and, therefore, compliant with the relevant noise criteria at all monitoring locations.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of seven days, part of which coincides with the quarterly attended noise monitoring.

To measure the acoustic environment a Rion NL-42 sound level meter, and an ARL EL-315 environmental noise logger, were located as shown in Figure 2 from 4<sup>th</sup> to 11<sup>th</sup> August, 2020. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix I**.

<b>TABLE 3</b>						
<b>Measured Logger Noise Levels dB(A) – 4<sup>th</sup> to 11<sup>th</sup> August 2020</b>						
<b>Logger Location</b>	<b>Day (7am to 6pm)</b>		<b>Evening (6pm to 10 pm)</b>		<b>Night (10pm to 7am)</b>	
	<b>Leq</b>	<b>L90</b>	<b>Leq</b>	<b>L90</b>	<b>Leq</b>	<b>L90</b>
Logger 1	57	40	53	32	52	29
Logger 2	55	38	52	33	53	30





**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R 14. This is adjacent to the attended noise monitoring location for this residence. Logger 2 was in an open paddock north of the house.

The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 0412 023 455.

Yours faithfully,

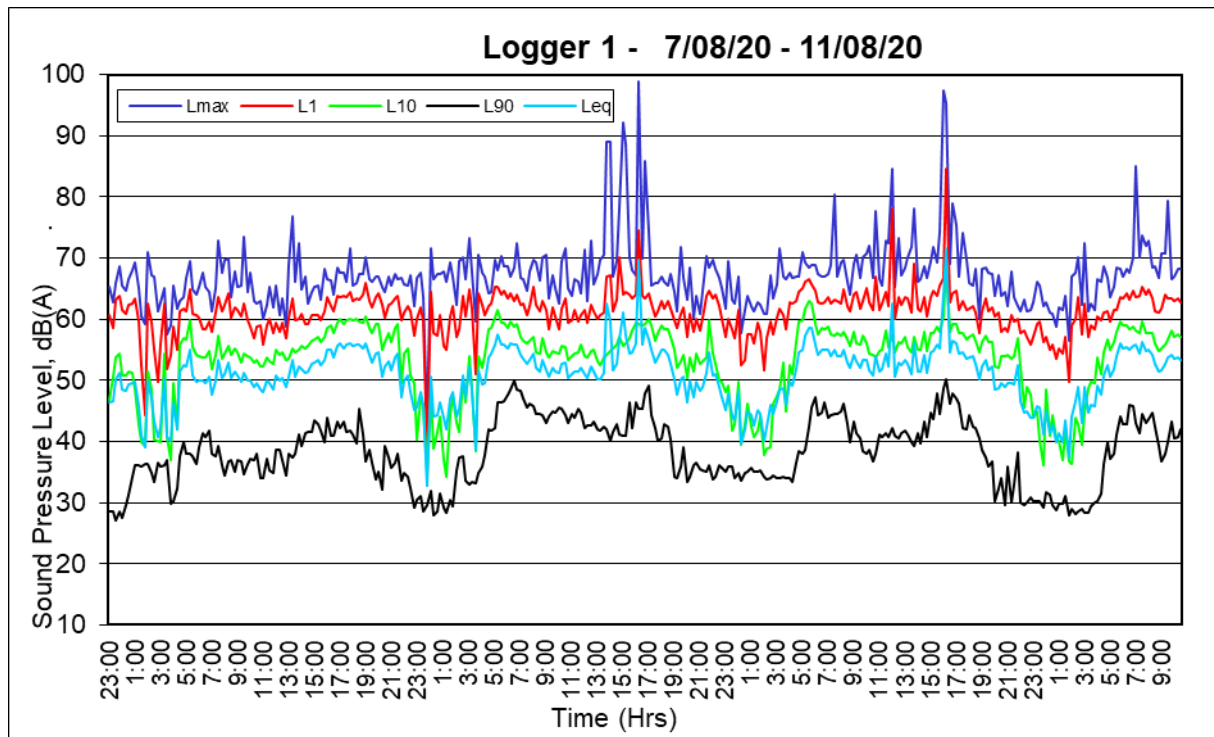
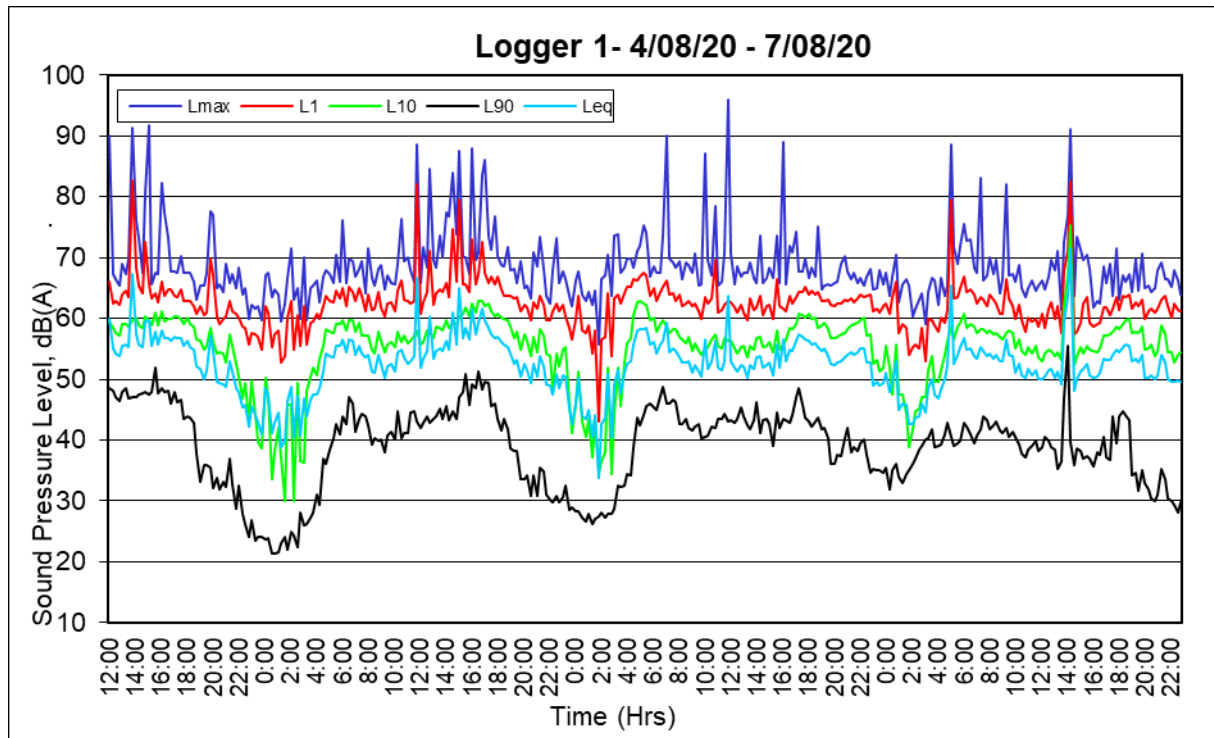
**SPECTRUM ACOUSTICS PTY LIMITED**

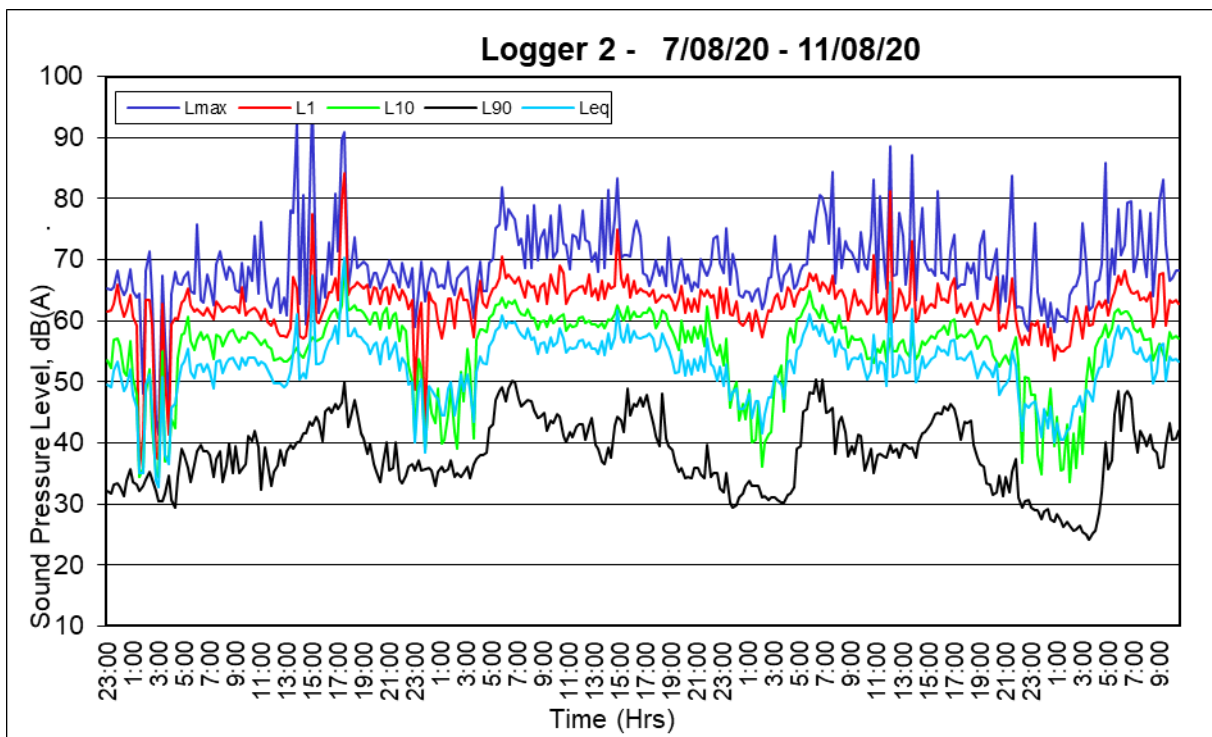
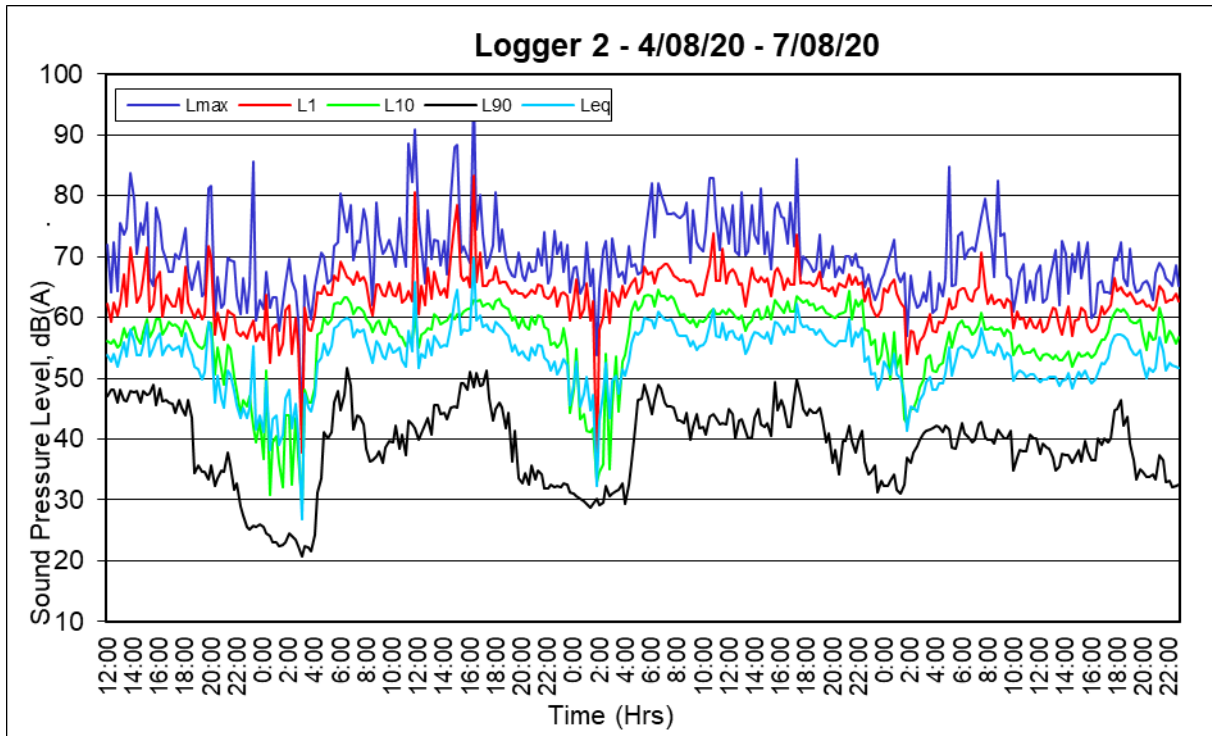


**Ross Hodge**

Acoustical Consultant

APPENDIX A  
NOISE LOGGER CHARTS







11 June 2020

Ref: 161308/28949

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: MAY 2020 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended and unattended noise monitoring conducted for the Ardglen Quarry (AQ) between 21<sup>st</sup> and 28<sup>th</sup> May, 2020. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45



However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

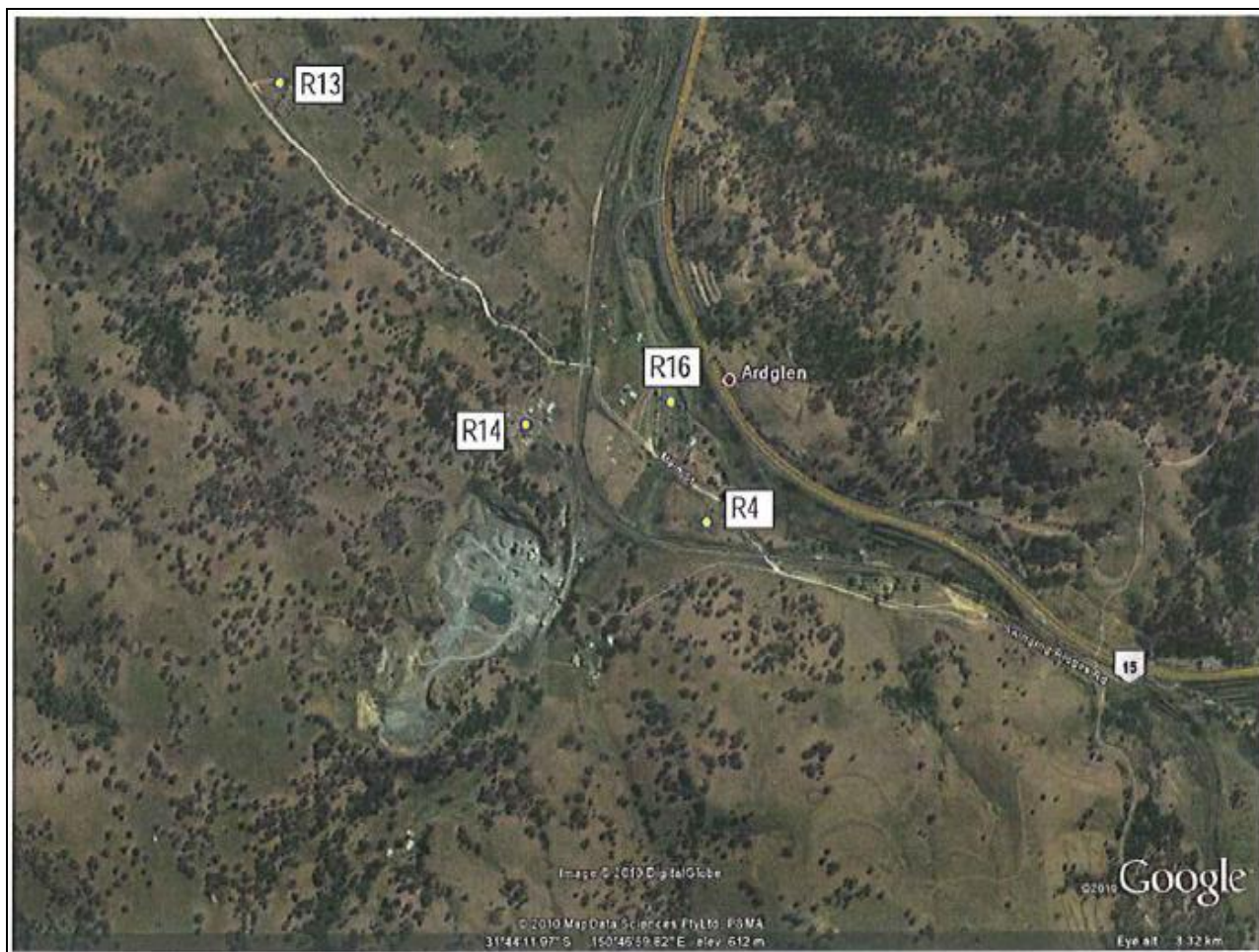
Notes:

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## **NOISE MONITORING LOCATIONS**

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2.5m above ground level. The weather throughout the survey was warm with relatively clear skies. The wind speed was generally light but varying in direction from the south west and north west.

The quarry operates on an ad hoc basis as and when demand dictates. Throughout the current monitoring period the quarry was not operating.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “*Evaluator*” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

TABLE 2 Ardglen Quarry Noise Monitoring Results – 28 <sup>th</sup> May 2020 (Day)				
Location	Time	dB(A), Leq	Wind speed/ direction	Identified Noise Sources
4. Thompson	1:00 pm	43	2.5 m/s W	Traffic (43), birds (31), <b>AQ inaudible</b>
13. McGhie	1:55 pm	35	2.5 m/s SW	Birds (33), traffic (30), <b>AQ inaudible</b>
14. Purtell	1:35 pm	48	2.0 m/s NW	Traffic (47), birds (41), <b>AQ inaudible</b>
16. Bojba	12:35 pm	54	1.5 m/s NW	Traffic (54), birds (38), <b>AQ inaudible</b>

The results in Table 2 show that under the operating conditions at the time the noise emissions from AQ were inaudible and, therefore, compliant with the relevant noise criteria at all monitoring locations.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of seven days, part of which coincides with the quarterly attended noise monitoring.

To measure the acoustic environment Rion NL-42 sound level meters, set up as environmental noise loggers, were located as shown in Figure 2 from 21<sup>st</sup> to 28<sup>th</sup> May, 2020. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix I**.

TABLE 3 Measured Logger Noise Levels dB(A) – 21 <sup>st</sup> to 28 <sup>th</sup> May 2020						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
Logger 1	47	35	40	34	44	31
Logger 2	55	36	45	33	45	29





**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R 14. This is adjacent to the attended noise monitoring location for this residence. Logger 2 was in an open paddock north of the house.

The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 0412 023 455.

Yours faithfully,

**SPECTRUM ACOUSTICS PTY LIMITED**

Author:

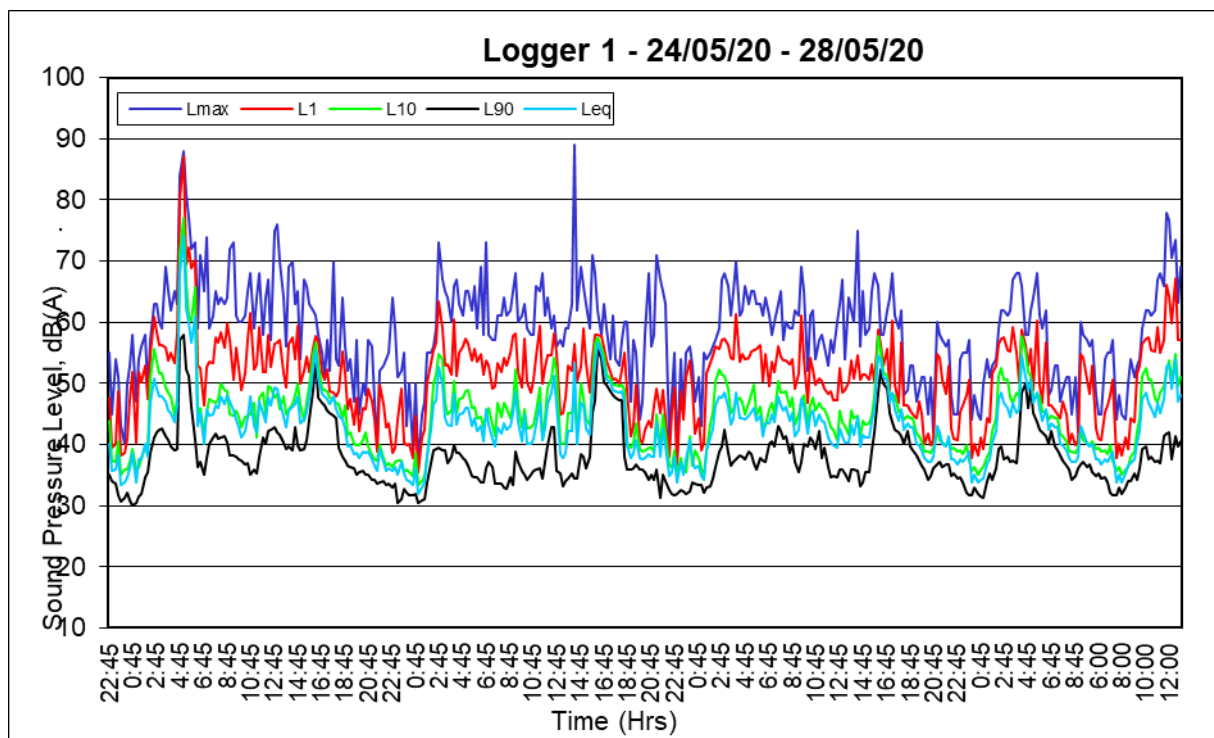
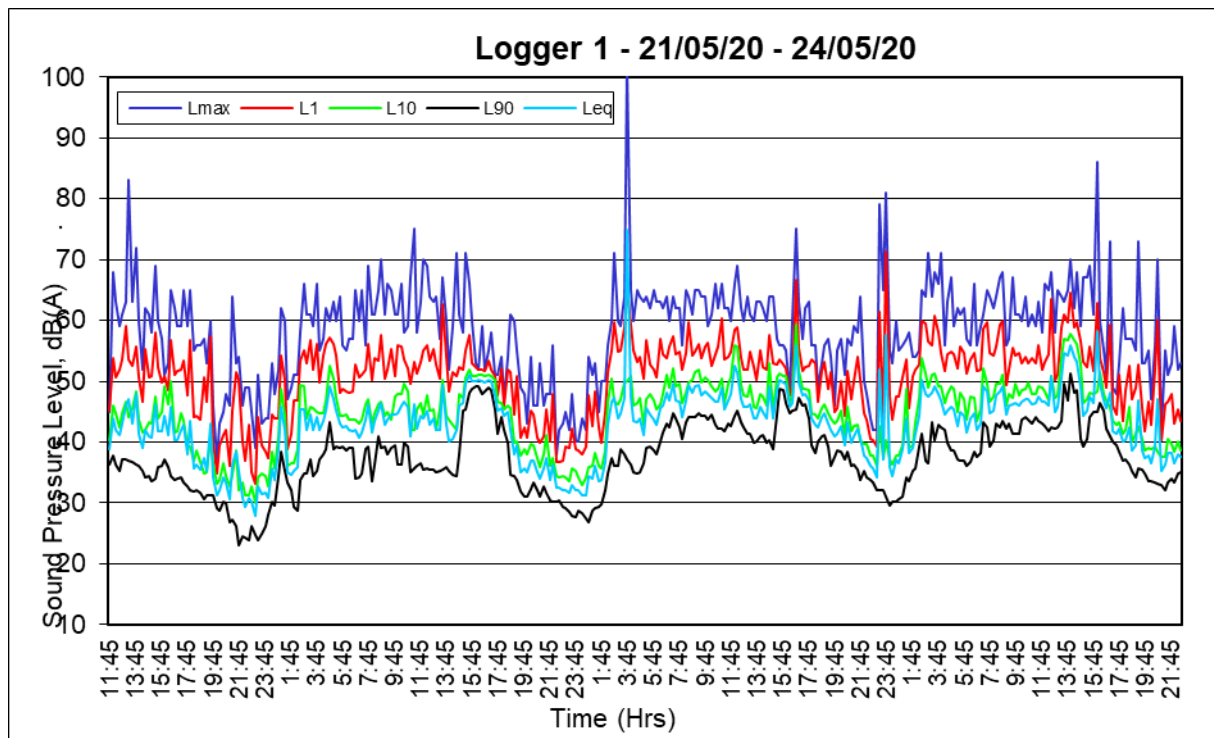


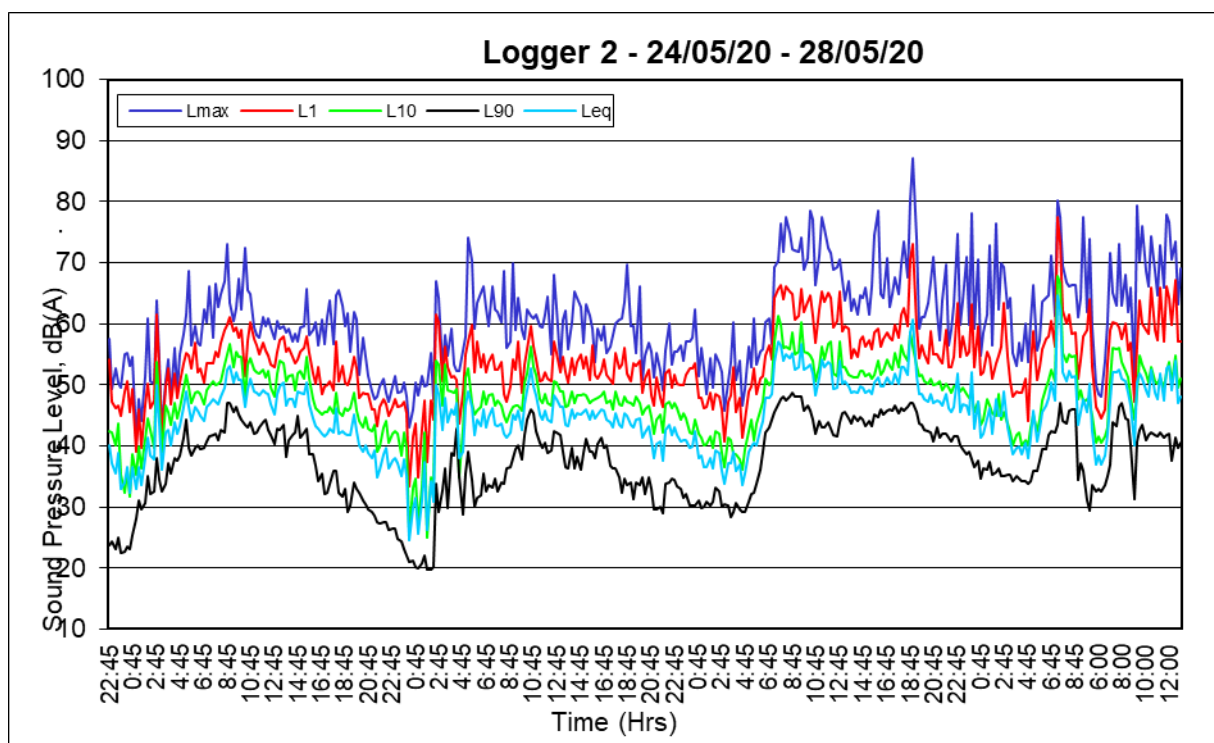
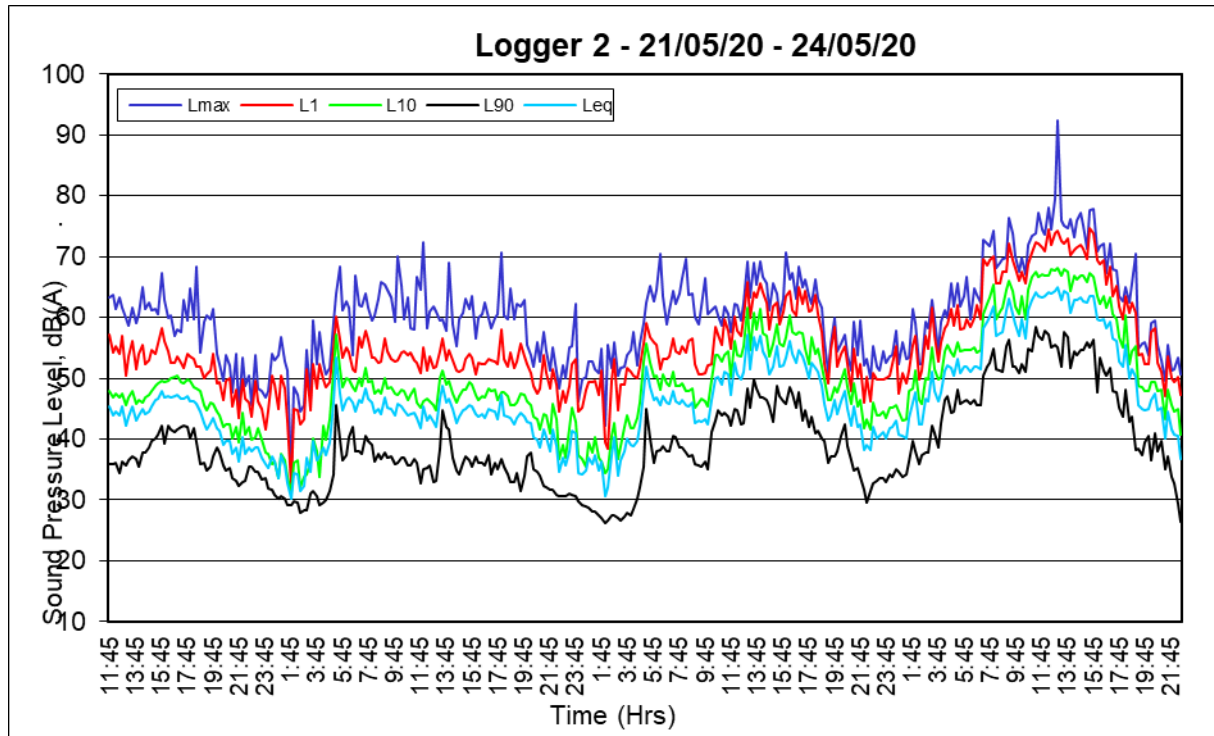
**Ross Hodge**

Acoustical Consultant



APPENDIX A  
NOISE LOGGER CHARTS







16 April 2020

Ref: 161308/28873

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: FEBRUARY 2020 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended and unattended noise monitoring conducted for the Ardglen Quarry (AQ) between Friday 21<sup>st</sup> and 28<sup>th</sup> February, 2020. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the  $L1$  (1 min) and  $Leq$  (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

Notes:

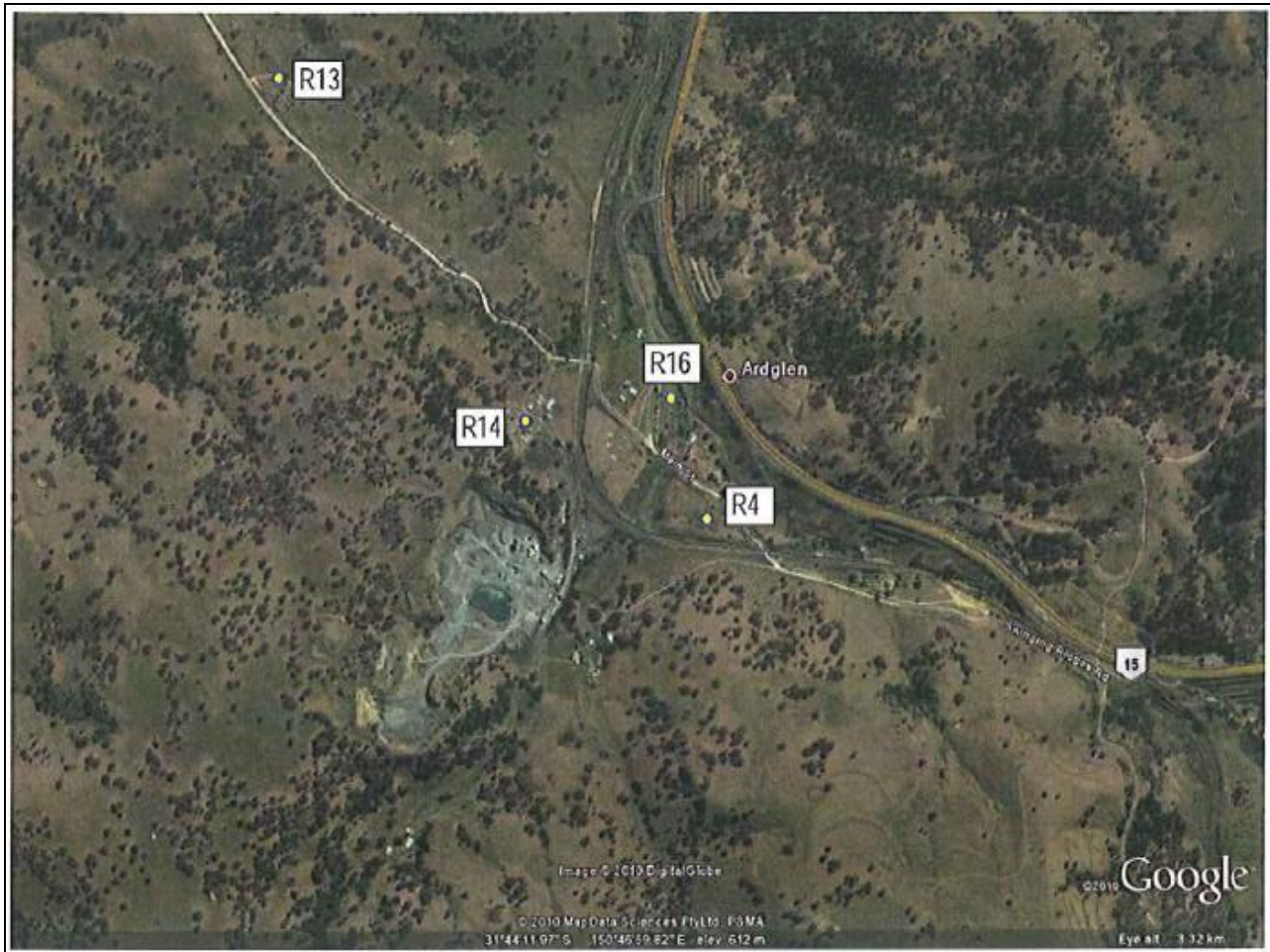
- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the  $LAeq$  (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the  $L1$  (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## NOISE MONITORING LOCATIONS

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba





**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2.5m above ground level. The weather throughout the survey was warm with relatively clear skies. The wind speed was generally calm to light from the east to south east.

The quarry operates on an ad hoc basis as and when demand dictates. Throughout the current monitoring period the quarry was not operating.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “*Evaluator*” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

TABLE 2 Ardglen Quarry Noise Monitoring Results – 28 <sup>th</sup> February 2020 (Day)				
Location	Time	dB(A), Leq	Wind speed/ direction	Identified Noise Sources
4. Thompson	12:52 pm	42	0.5 m/s SE	Traffic (41), birds & insects (35), <b>AQ inaudible</b>
13. McGhie	1:50 pm	40	1.5 m/s ESE	Traffic (40), birds (25), <b>AQ inaudible</b>
14. Purtell	1:25 pm	34	1.0 m/s ESE	Birds & insects (33), traffic (25), <b>AQ inaudible</b>
16. Bojba	12:30 pm	62	0.5 m/s SE	Traffic (62), birds & insects (38), <b>AQ inaudible</b>

The results in Table 2 show that under the operating conditions at the time the noise emissions from AQ were inaudible and, therefore, compliant with the relevant noise criteria at all monitoring locations.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of seven days, part of which coincides with the quarterly attended noise monitoring.

To measure the acoustic environment Rion NL-42 sound level meters, set up as environmental noise loggers, were located as shown in Figure 2 from 15<sup>th</sup> to 22<sup>nd</sup> November, 2019. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix I**.

TABLE 3 Measured Logger Noise Levels dB(A) – 21 <sup>st</sup> to 28 <sup>th</sup> February 2020						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
Logger 1	52	35	50	33	43	31
Logger 2	51	41	48	43	50	40





**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R 14. This is adjacent to the attended noise monitoring location for this residence. Logger 2 was in an open paddock north of the house.

The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

**SPECTRUM ACOUSTICS PTY LIMITED**

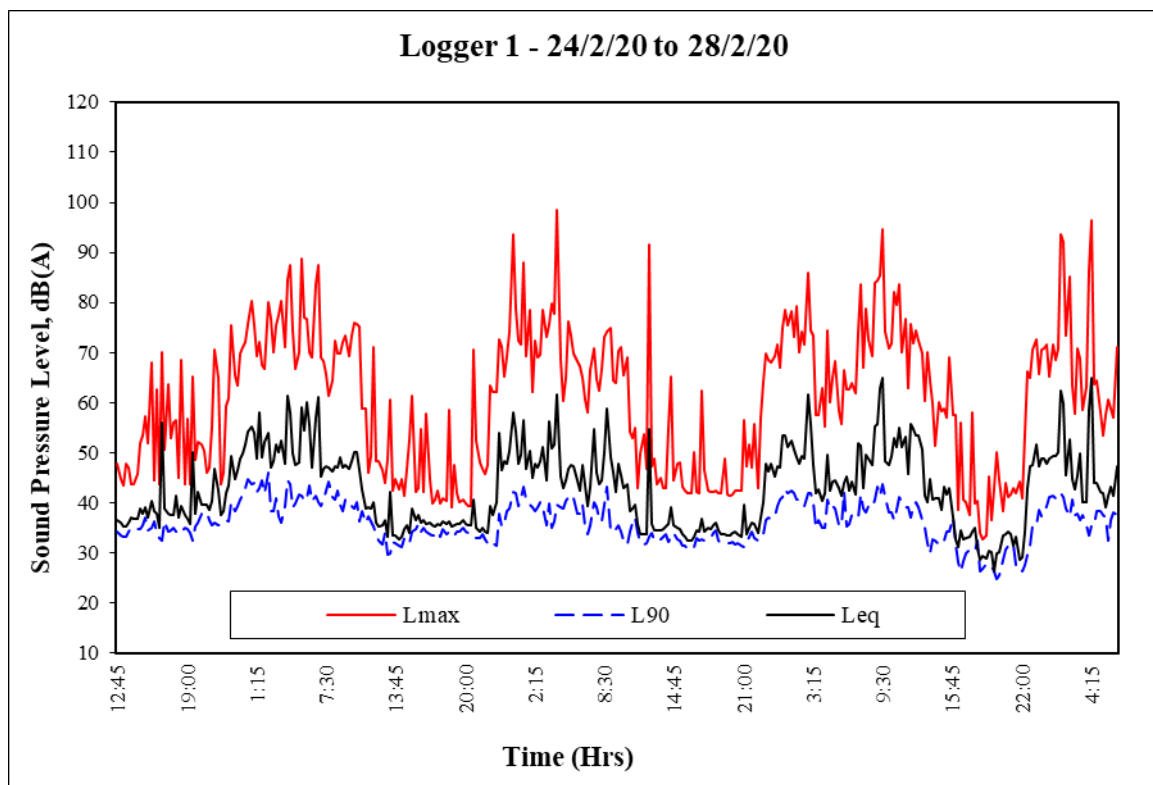
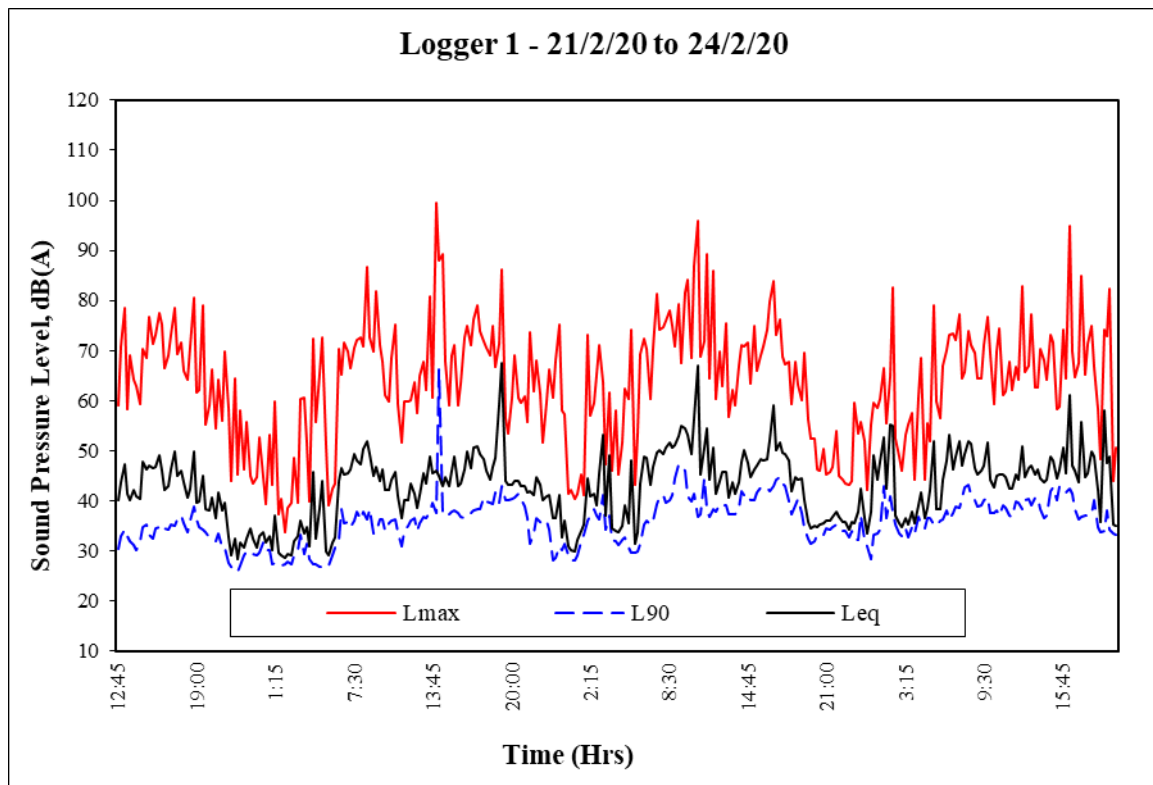
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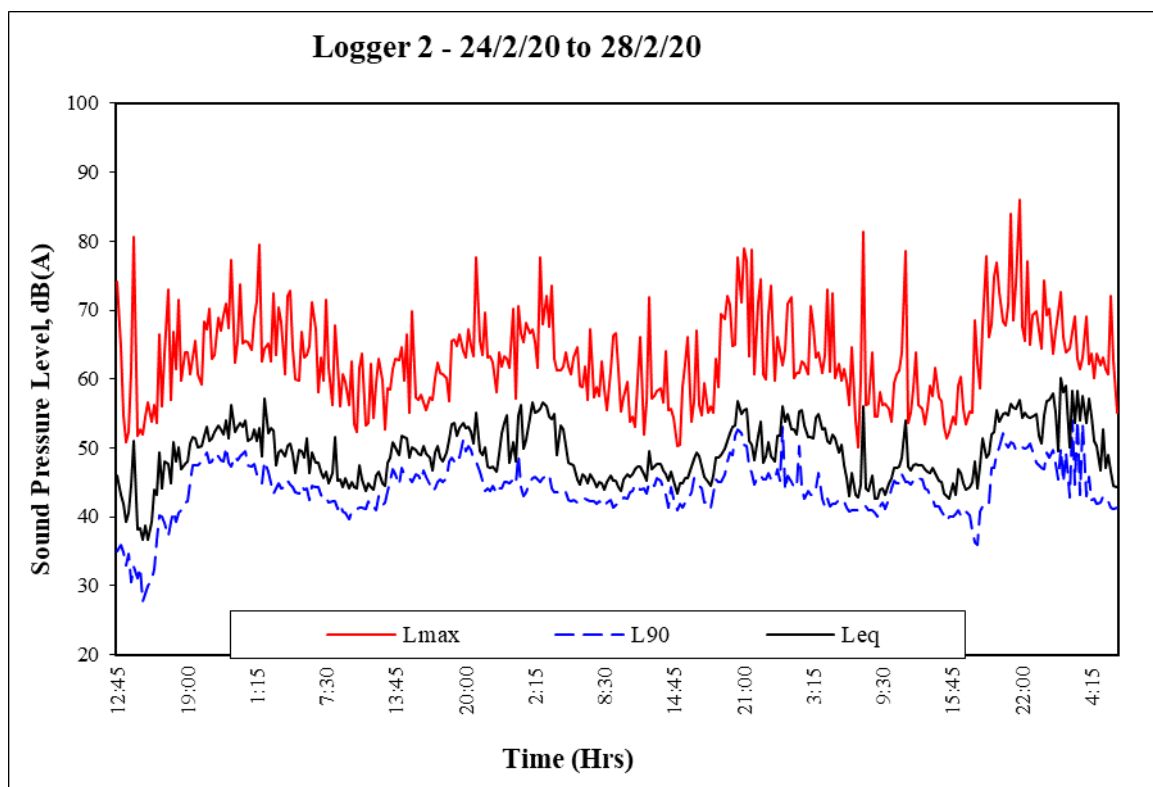
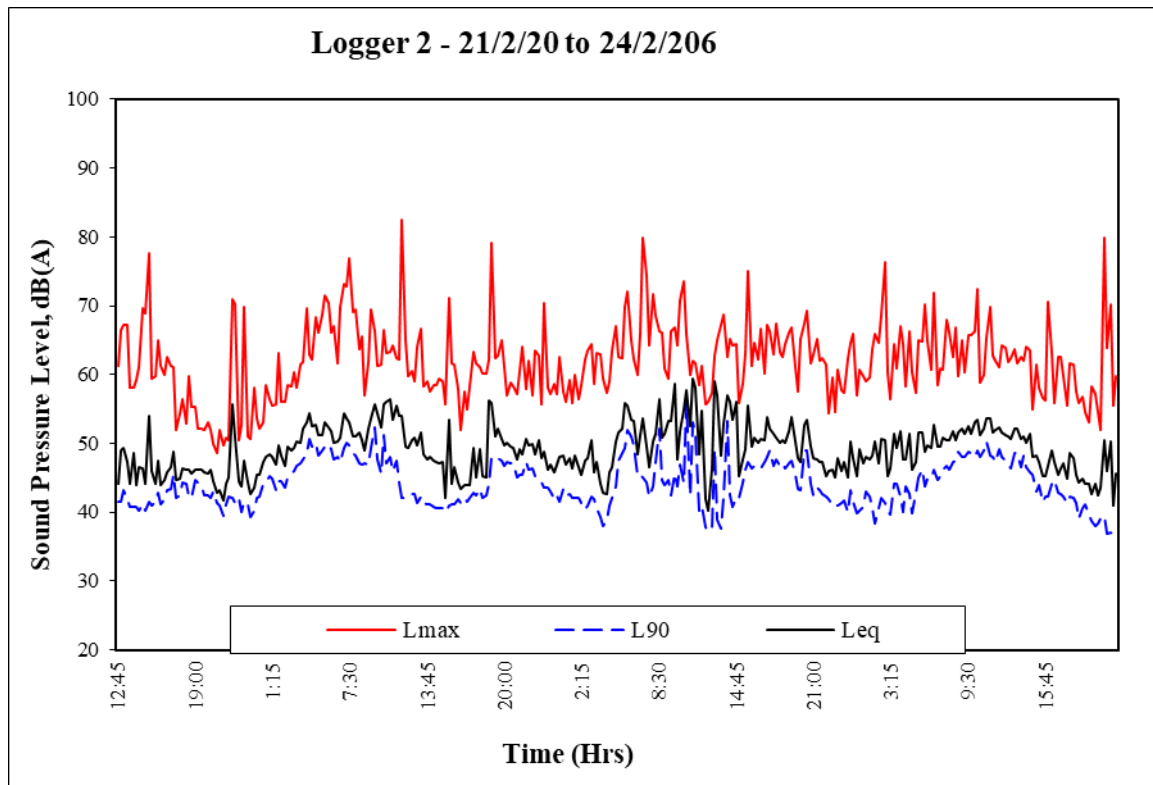
**Ross Hodge**

Acoustical Consultant

APPENDIX A  
NOISE LOGGER CHARTS









26 November 2019

Ref: 161308/8734

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: NOVEMBER 2019 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended and unattended noise monitoring conducted for the Ardglen Quarry (AQ) between Friday 15<sup>th</sup> and 22<sup>nd</sup> November, 2019. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

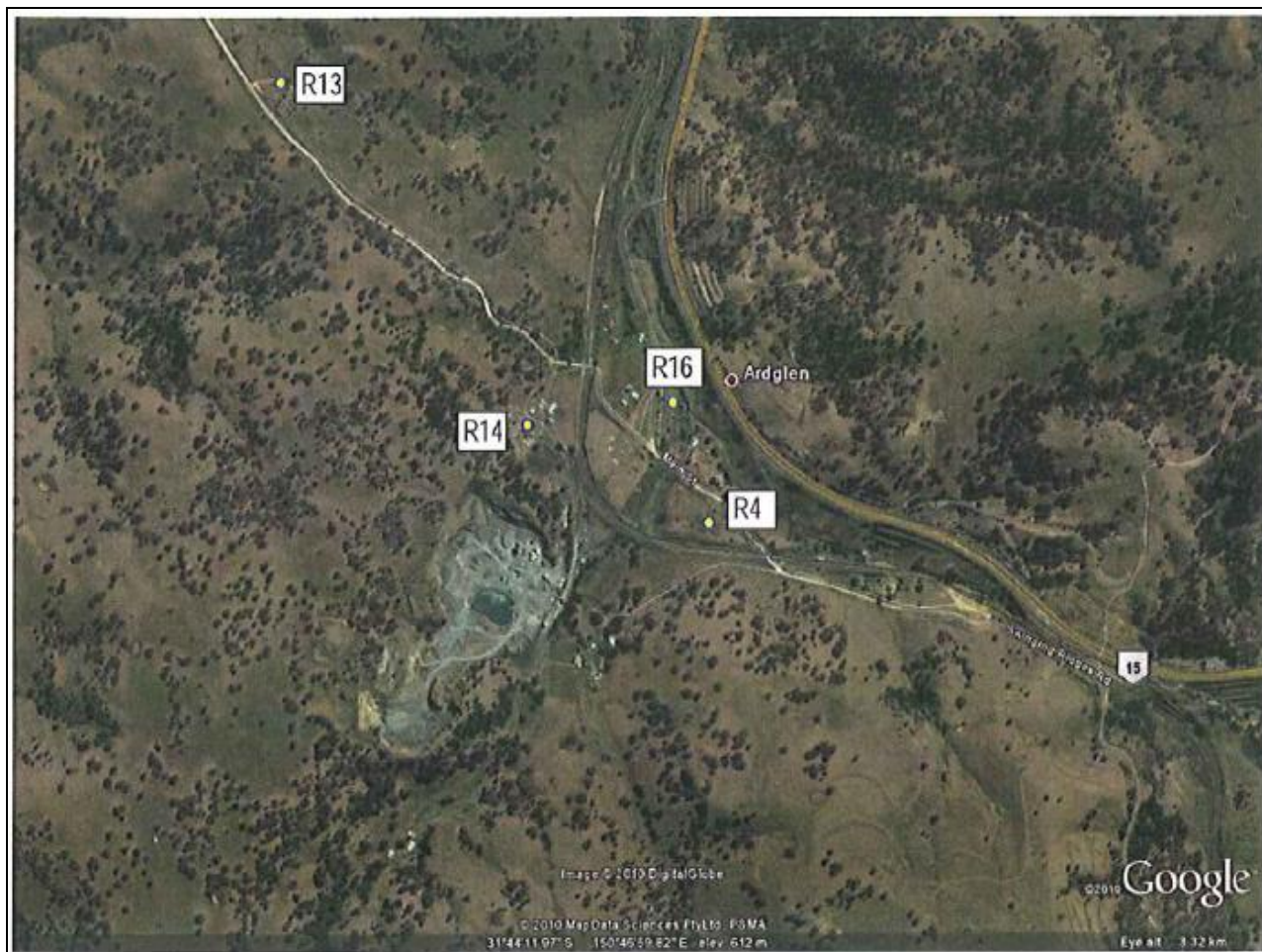
*Notes:*

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## **NOISE MONITORING LOCATIONS**

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2.5m above ground level. The weather throughout the survey was warm with relatively clear skies. The wind speed was generally around 2.0 to 3.0 m/s from the north to north west.

The quarry operates on an ad hoc basis as and when demand dictates. Throughout the current monitoring period the quarry was not operating.



## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “*Evaluator*” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

TABLE 2 Ardglen Quarry Noise Monitoring Results – 22 <sup>nd</sup> November 2019 (Day)				
Location	Time	dB(A), Leq	Wind speed/ direction	Identified Noise Sources
4. Thompson	10:49 am	48	2.0 m/s N	Traffic (48), birds (35), <b>AQ inaudible</b>
13. McGhie	11:35 am	40	3.0 m/s NW	Traffic (40), birds (25), <b>AQ inaudible</b>
14. Purtell	11:10 am	43	2.5 m/s NW	Traffic (43), <b>AQ inaudible</b>
16. Bojba	10:30 am	50	2.0 m/s N	Traffic (50), <b>AQ inaudible</b>

The results in Table 2 show that under the operating conditions at the time the noise emissions from AQ were inaudible and, therefore, compliant with the relevant noise criteria at all monitoring locations.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of seven days, part of which coincides with the quarterly attended noise monitoring.

To measure the acoustic environment Rion NL-42 sound level meters, set up as environmental noise loggers, were located as shown in Figure 2 from 15<sup>th</sup> to 22<sup>nd</sup> November, 2019. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix I**.

TABLE 3 Measured Logger Noise Levels dB(A) - 15 <sup>th</sup> to 22 <sup>nd</sup> , November 2019						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
Logger 1	48	36	50	37	50	37
Logger 2	56	41	45	36	43	36



**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R 14. This is adjacent to the attended noise monitoring location for this residence. Logger 2 was in an open paddock north of the house.

The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

**SPECTRUM ACOUSTICS PTY LIMITED**

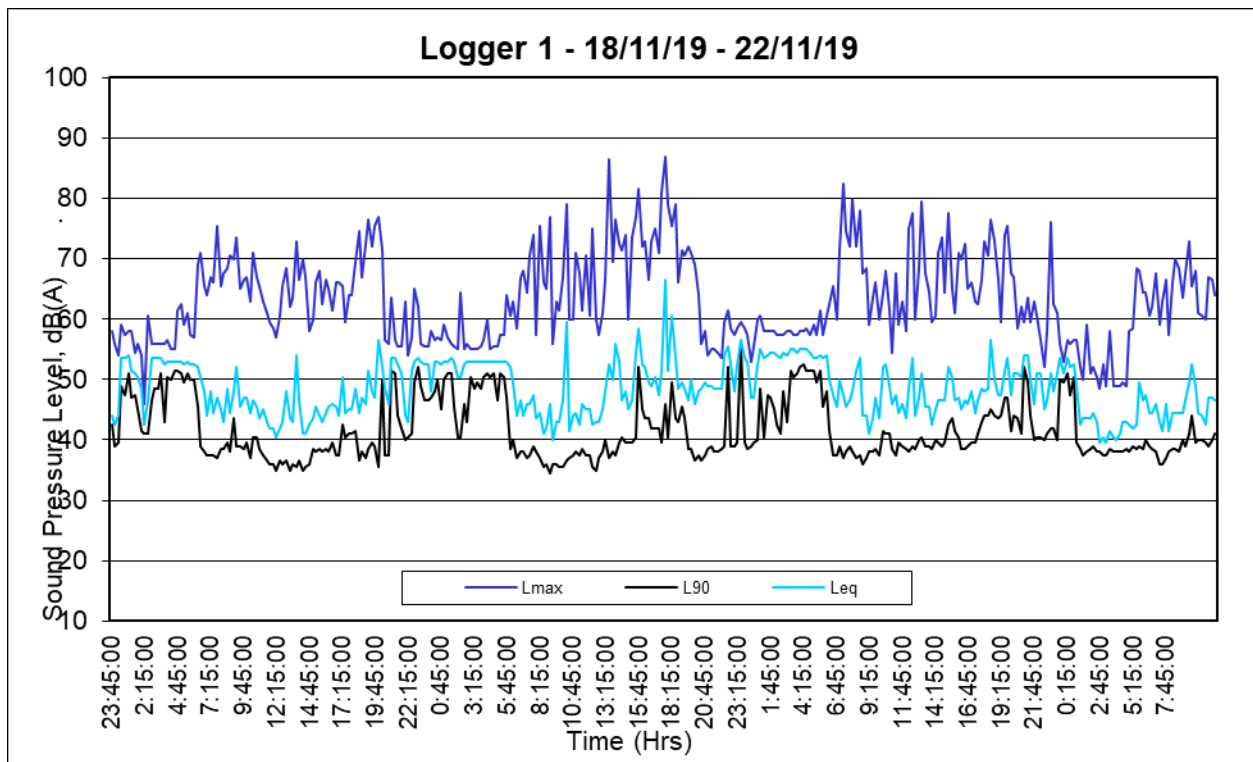
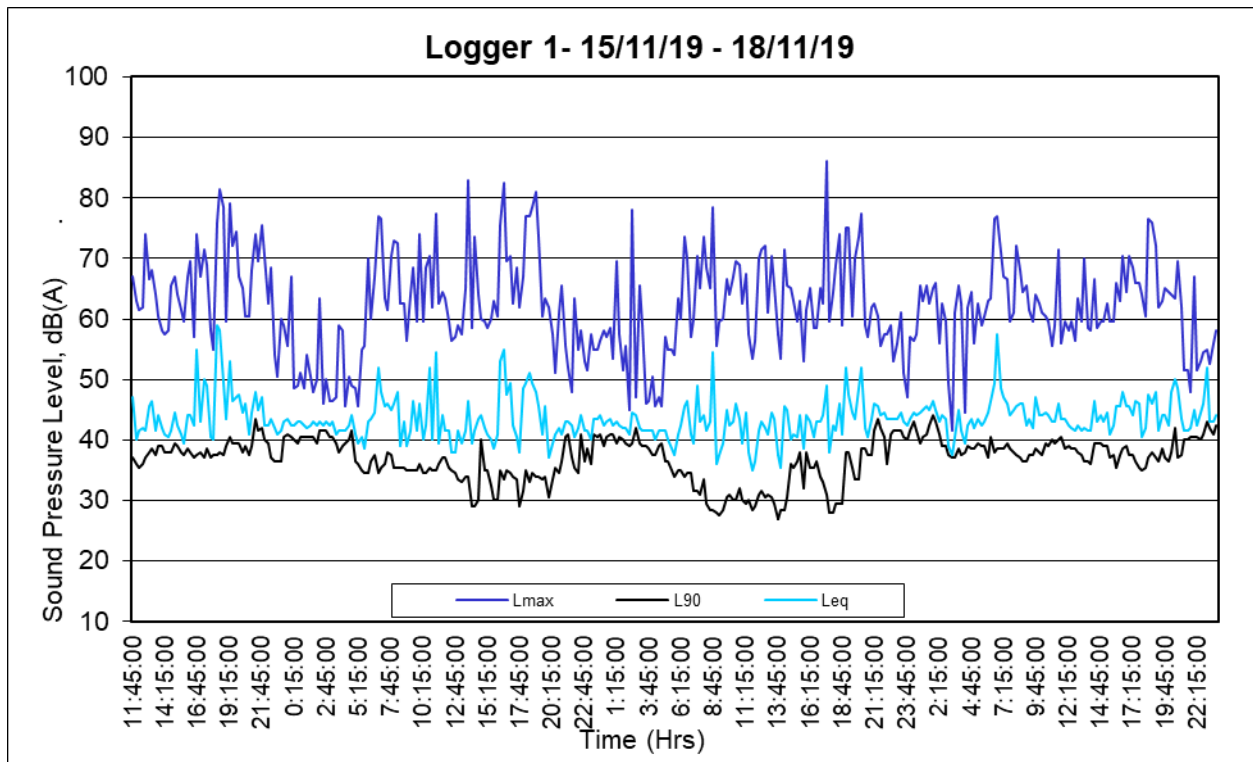
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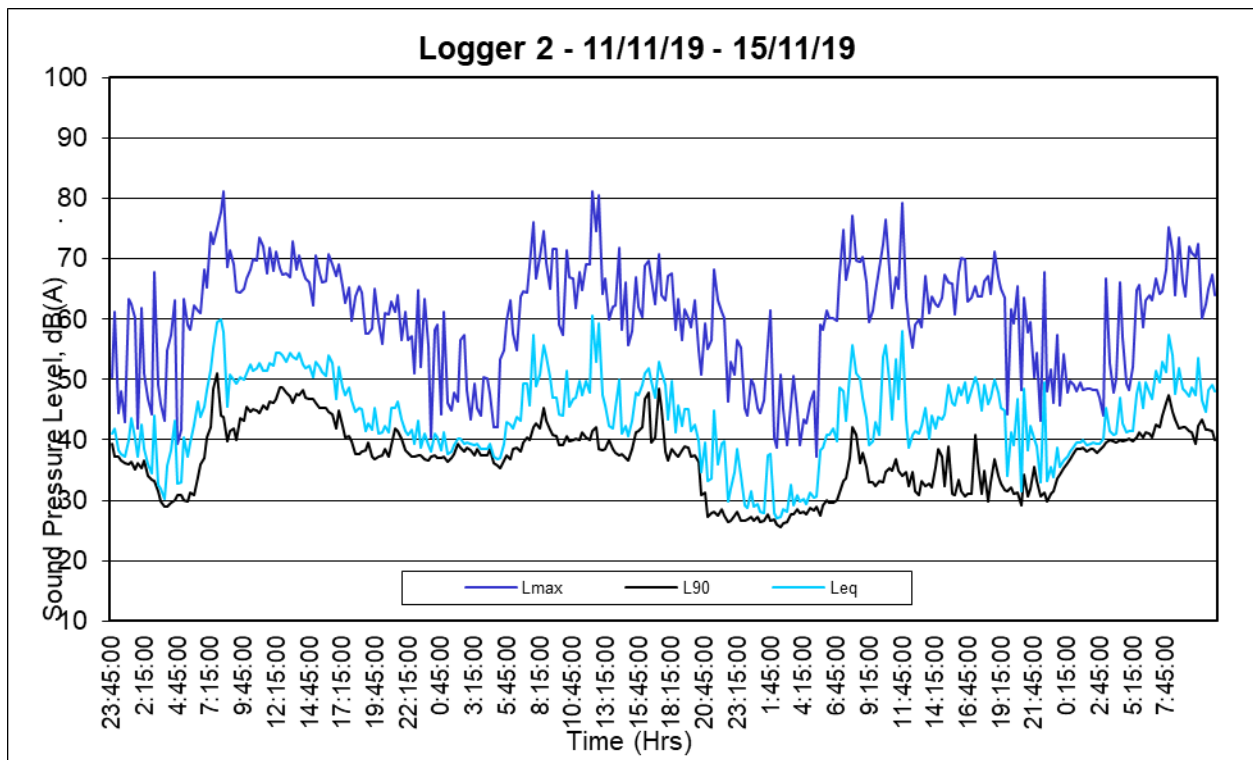
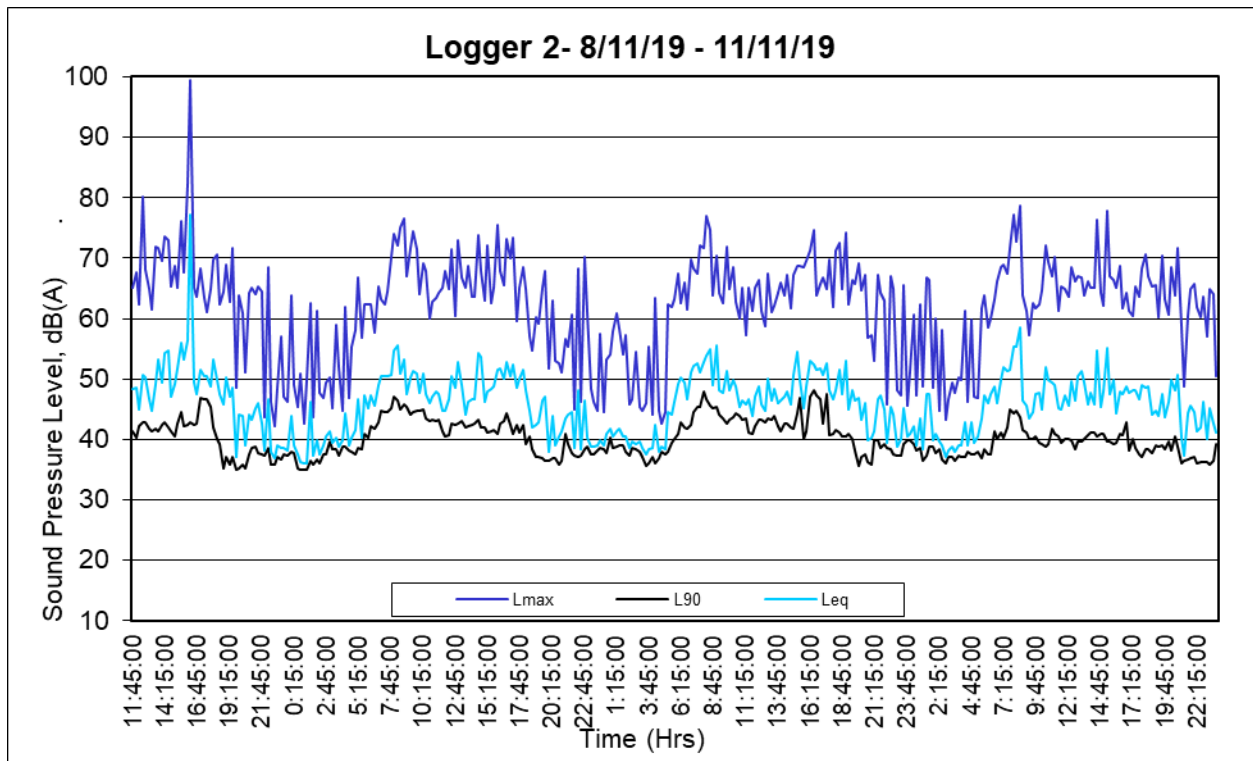


**Ross Hodge**

Acoustical Consultant

APPENDIX A  
NOISE LOGGER CHARTS









16 September 2019

Ref: 161308/8348

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: AUGUST 2019 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended noise monitoring conducted for the Ardglenn Quarry (AQ) between Friday 23<sup>rd</sup> and 30<sup>th</sup> August 2019. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

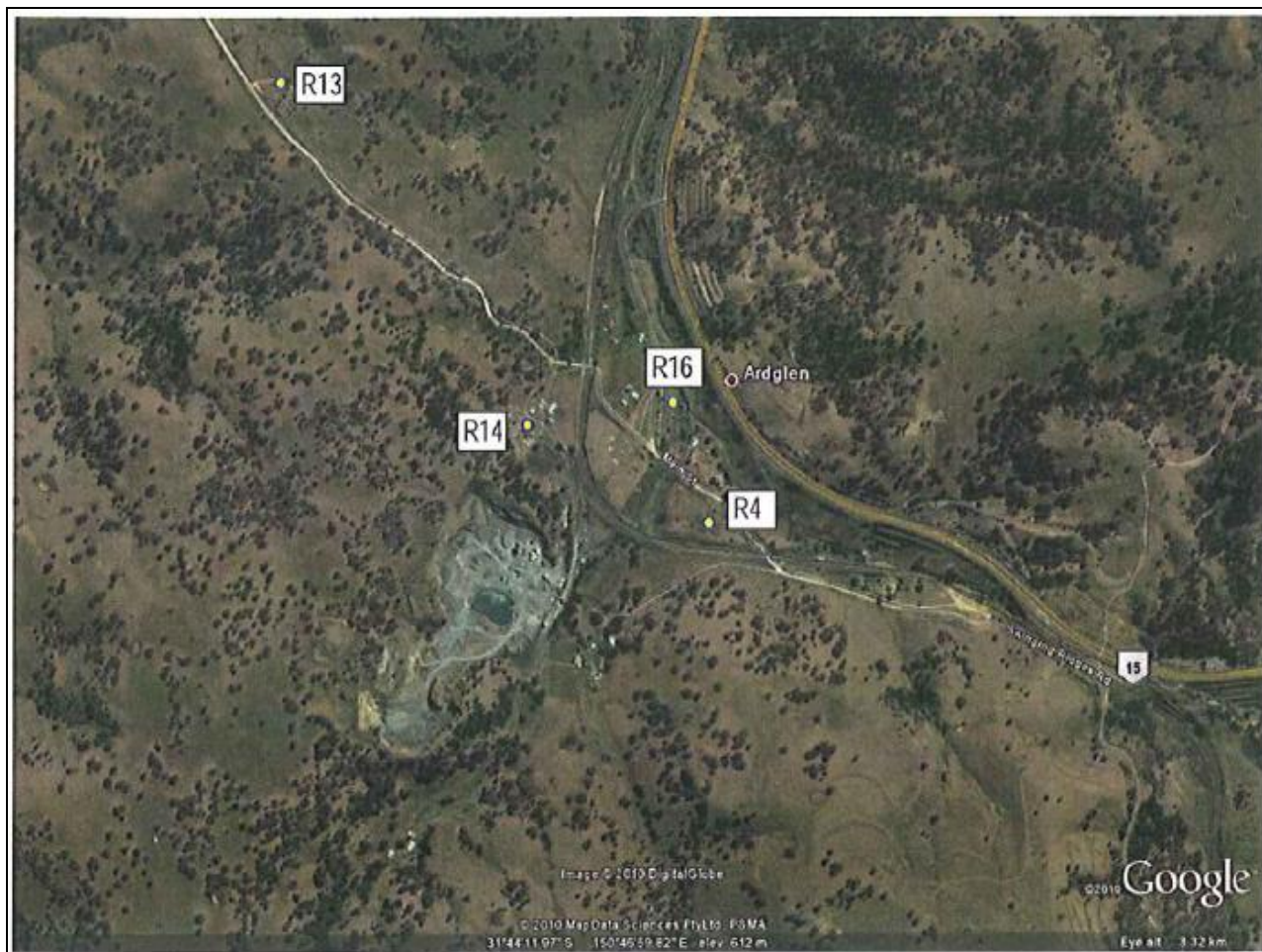
*Notes:*

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## **NOISE MONITORING LOCATIONS**

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2.5m above ground level. The weather throughout the survey was cool with relatively clear skies. The wind speed was generally around 2.5 to 3 m/s from the south.

The quarry operates on an ad hoc basis as and when demand dictates. Throughout the current monitoring period the quarry was not operating.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “Evaluator” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

<b>TABLE 2</b> <b>Ardglen Quarry Noise Monitoring Results –</b> <b>30<sup>th</sup> August 2019 (Day)</b>				
Location	Time	dB(A) <sub>Leq</sub>	Wind speed/ direction	Identified Noise Sources
4. Thompson	1:15 pm	43	2.5 m/s SE	Traffic (43), birds (30), <b>AQ inaudible</b>
13. McGhie	1:40 pm	55	2.7 m/s SE	Trains (54), traffic (47), birds (30), <b>AQ inaudible</b>
14. Purtell	2:01 pm	44	2.8 m/s SE	Traffic (44), <b>AQ (inaudible)</b>
16. Bojba	12:46 pm	54	2.0 m/s SE	Traffic (54), <b>AQ inaudible</b>

The results in Table 2 show that under the operating conditions at the time the noise emissions from AQ were inaudible and, therefore, compliant with the relevant noise criteria at all monitoring locations.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of seven days, part of which coincides with the quarterly attended noise monitoring.

To measure the acoustic environment Rion NL-42 sound level meters, set up as environmental noise loggers, were located as shown in Figure 2 from 23<sup>rd</sup> to 30<sup>th</sup> August, 2019. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix I**.

<b>TABLE 3</b> <b>Measured Logger Noise Levels dB(A)</b> <b>23<sup>rd</sup> to 30<sup>th</sup> May, 2019</b>						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
Logger 1	54	37	54	30	55	31
Logger 2	50	31	49	36	49	31





**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R 14. This is adjacent to the attended noise monitoring location for this residence. Logger 2 was in an open paddock north of the house.

The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

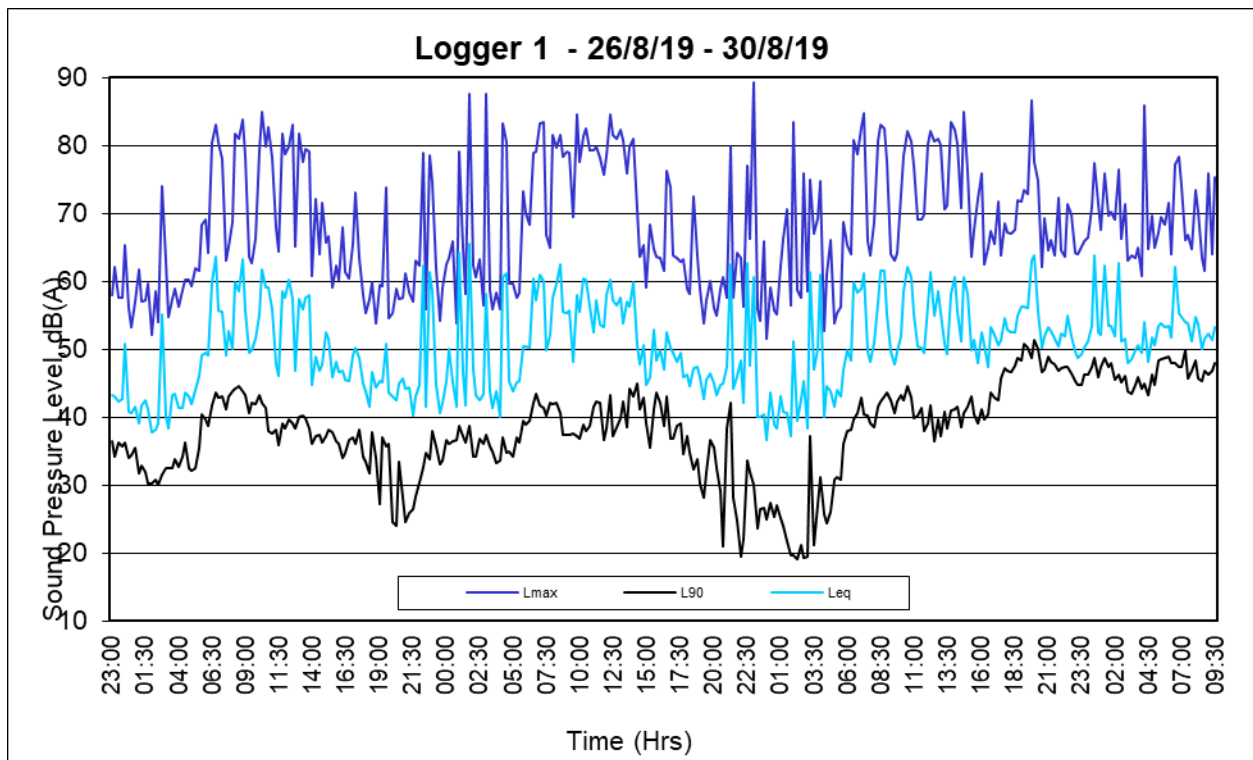
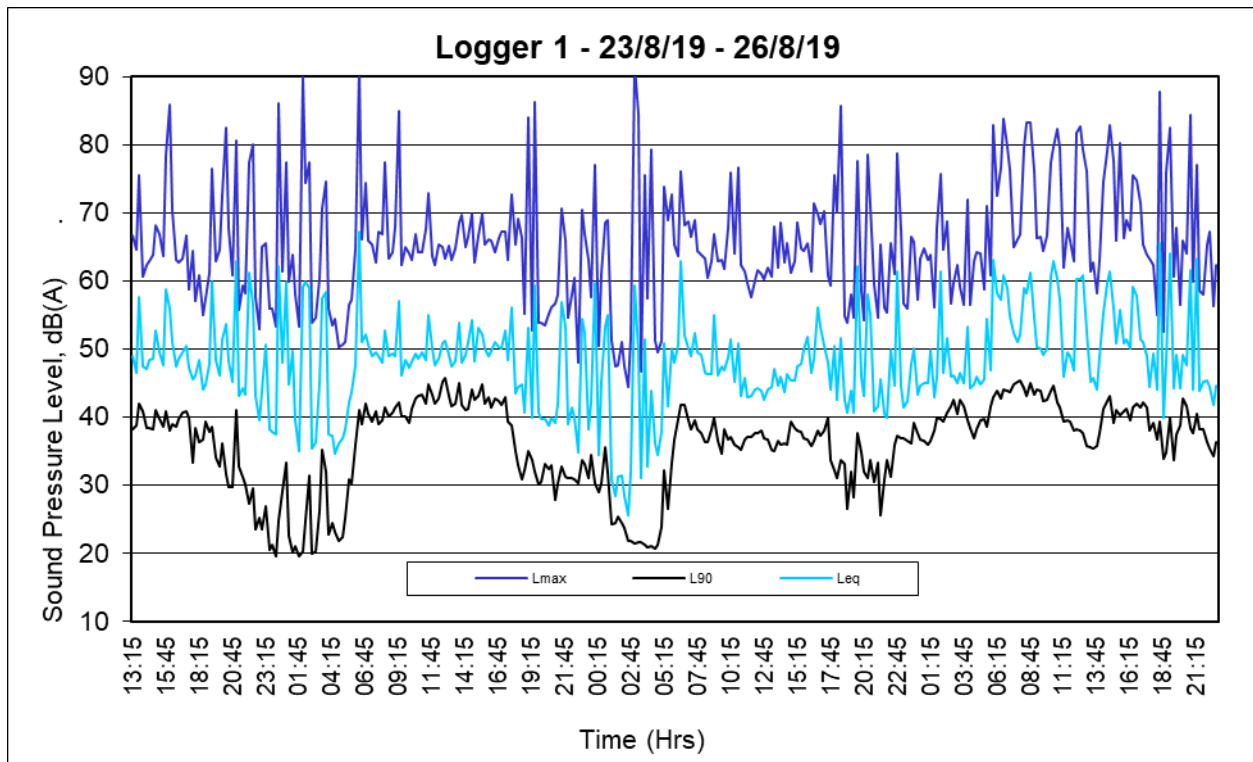
**SPECTRUM ACOUSTICS PTY LIMITED**

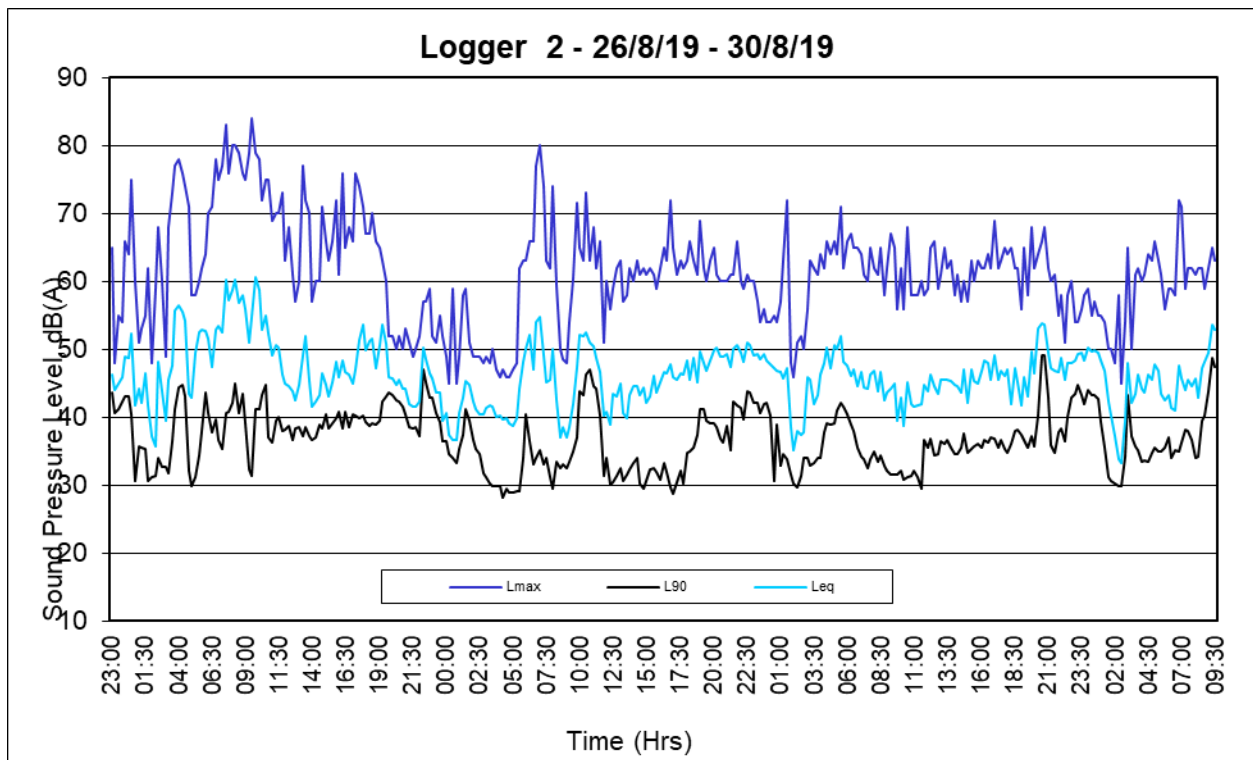
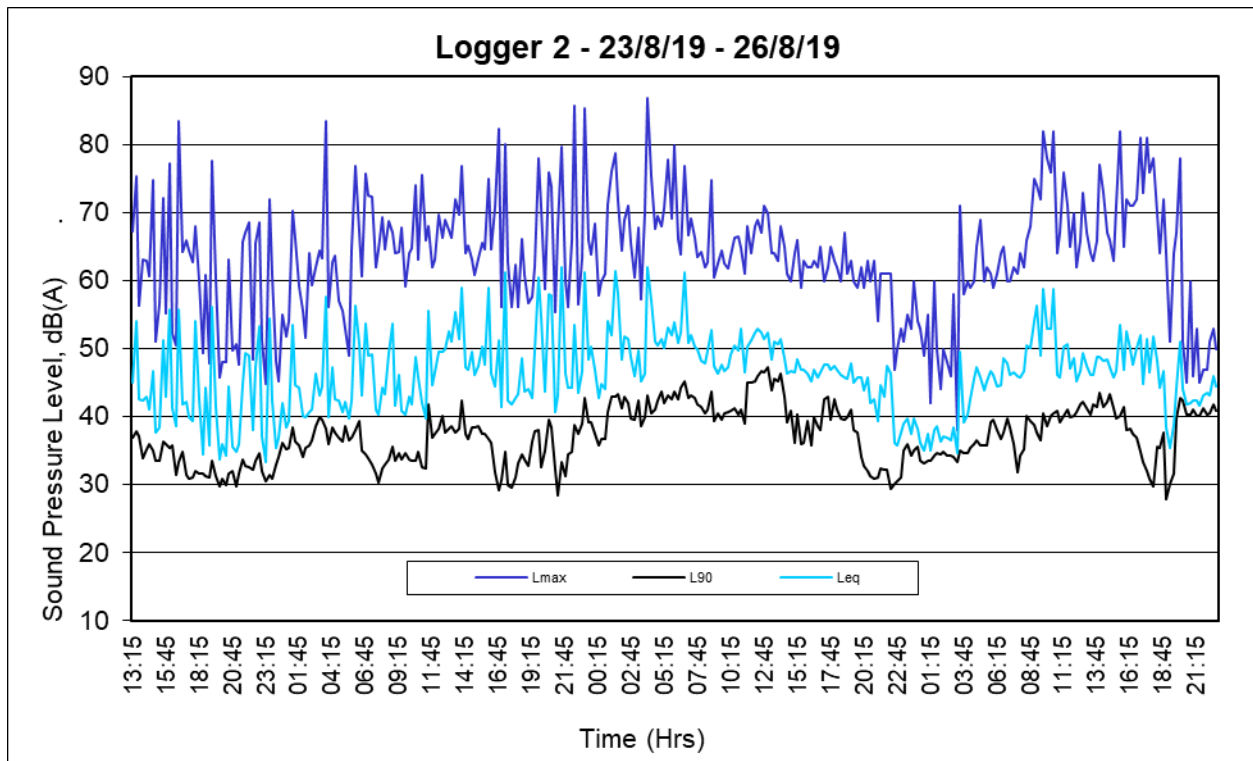
Author:

**Ross Hodge**

Acoustical Consultant

APPENDIX A  
NOISE LOGGER CHARTS







5 June 2019

Ref: 161308/8348

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: MAY 2019 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended noise monitoring conducted for the Ardglenn Quarry (AQ) between Wednesday 8<sup>th</sup> and 15<sup>th</sup> May 2019. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45



However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

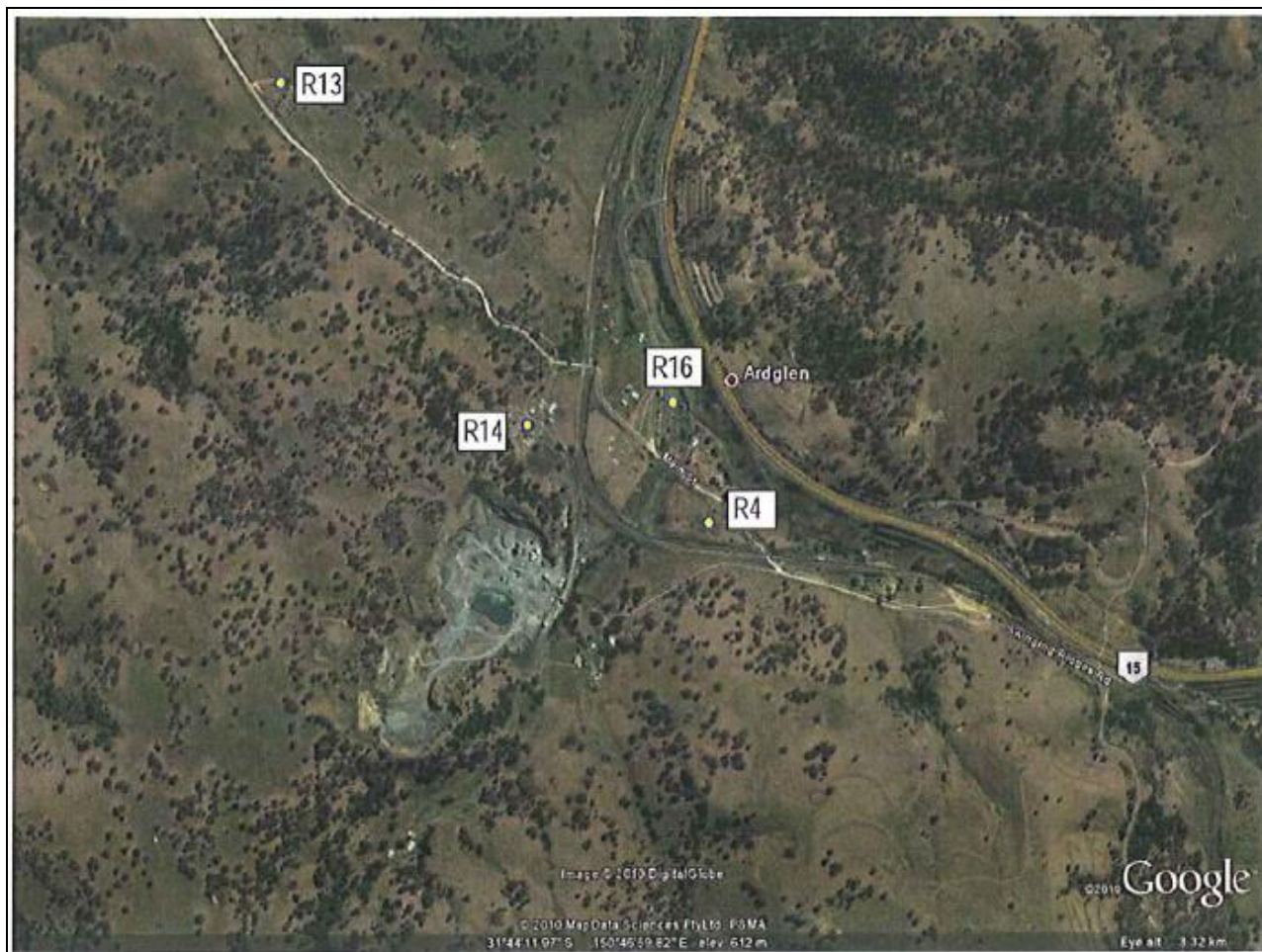
*Notes:*

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## **NOISE MONITORING LOCATIONS**

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2.5m above ground level. The weather throughout the survey was cool with relatively clear skies. The wind speed was generally around 2.5 to 3 m/s from the south.

Throughout the monitoring period the quarry was operating. Plant items working at the quarry are detailed below;

- 980 Caterpillar Loader;
- 27 loaded trucks departing site (throughout the entire day);
- One 20 Kva generator powering the office complex;
- Watercart operating on site; and
- Ancillary light vehicles.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “*Evaluator*” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

<b>TABLE 2</b> <b>Ardglen Quarry Noise Monitoring Results –</b> <b>15<sup>th</sup> May 2019 (Day)</b>				
<b>Location</b>	<b>Time</b>	<b>dB(A),L<sub>eq</sub></b>	<b>Wind speed/ direction</b>	<b>Identified Noise Sources</b>
4. Thompson	1:45 pm	50	2.5 m/s SE	Traffic (50), wind in trees (35), birds (20), <b>AQ inaudible</b>
13. McGhie	2:06 pm	45	2.7 m/s SE	Birds (44), traffic (36), <b>AQ inaudible</b>
14. Purtell	2:30 pm	48	2.8 m/s SE	Wind in trees (44), traffic (44), birds (40), <b>AQ<sup>1</sup> (25)</b>
16. Bojba	1:25 pm	57	2.0 m/s SE	Traffic (57), birds (44), <b>AQ inaudible</b>

1 see text re noise sources from quarry

Throughout the noise monitoring survey trucks were entering and leaving the quarry. The noise from the trucks is considered a site noise whilst the vehicles are on quarry site roads. Once the vehicles pass onto public roads the noise is assessed separately, against RMS road traffic noise criteria.

The noise from the trucks on site was audible and measureable at Location 14.

At location 14 the noise from one truck leaving and one truck entering the quarry was measureable during the 15 minute survey, with the relevant noise contribution calculated based on log addition of the magnitude and duration of the noise for each. The calculated contribution as an Leq (15 min) noise level from the trucks whilst on site is that shown in Table 2.

The results in Table 2 show that under the operating conditions at the time the noise emissions from AQ were inaudible and, therefore, compliant with the relevant noise criteria at all monitoring locations.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of seven days, part of which coincides with the quarterly attended noise monitoring.



To measure the acoustic environment Rion NL-42 sound level meters, set up as environmental noise loggers, were located as shown in Figure 2 from 8<sup>th</sup> to 15<sup>th</sup> May, 2019. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix I**.

<b>TABLE 3</b> <b>Measured Logger Noise Levels dB(A)</b> <b>8<sup>th</sup> to 15<sup>th</sup> May, 2019</b>						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
Logger 1	50	36	45	35	43	33
Logger 2						



**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R 14. This is adjacent to the attended noise monitoring location for this residence. Logger 2 was in an open paddock north of the house.

The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.



We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

**SPECTRUM ACOUSTICS PTY LIMITED**

Author:



**Ross Hodge**

Acoustical Consultant

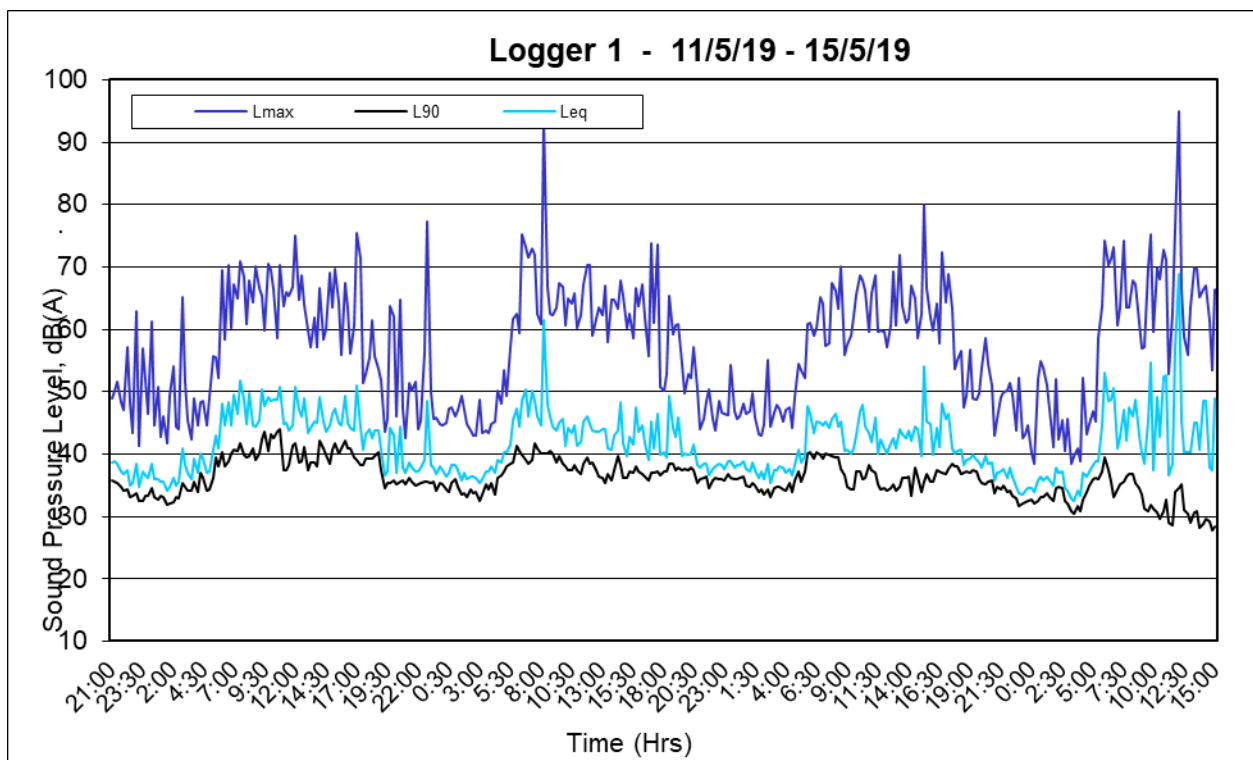
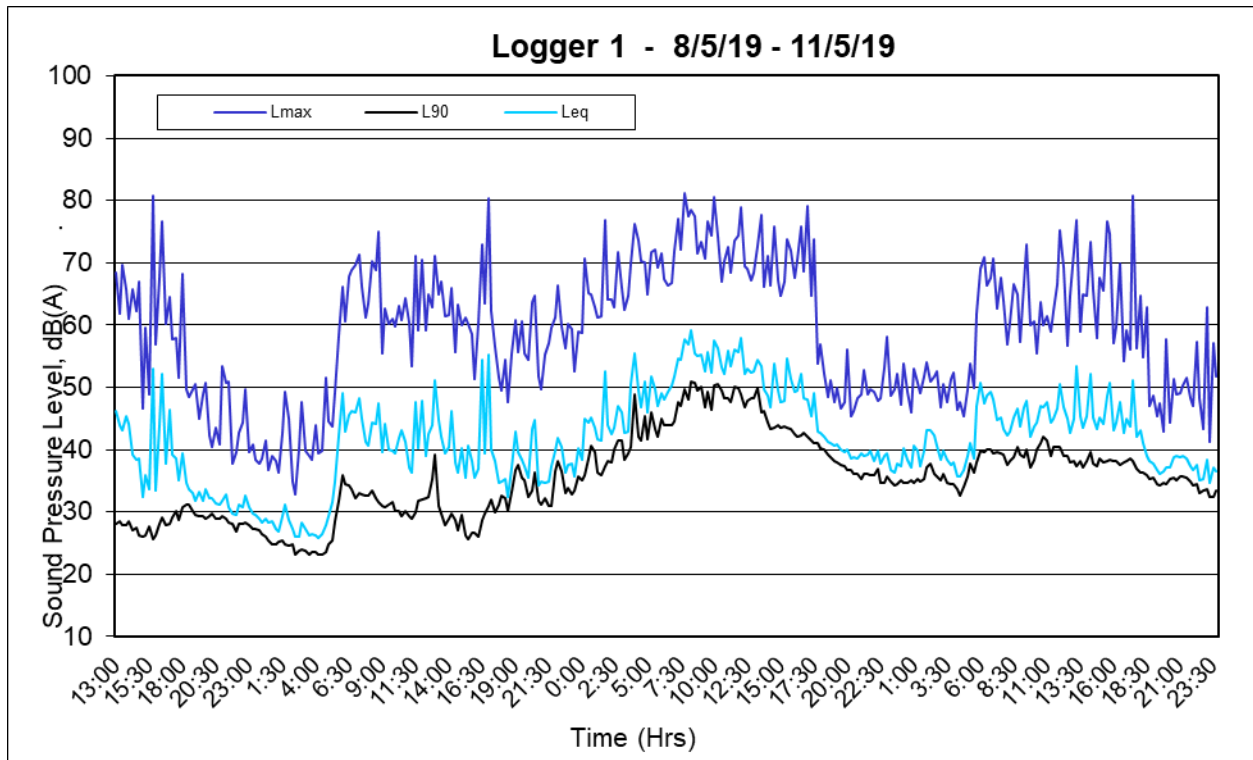
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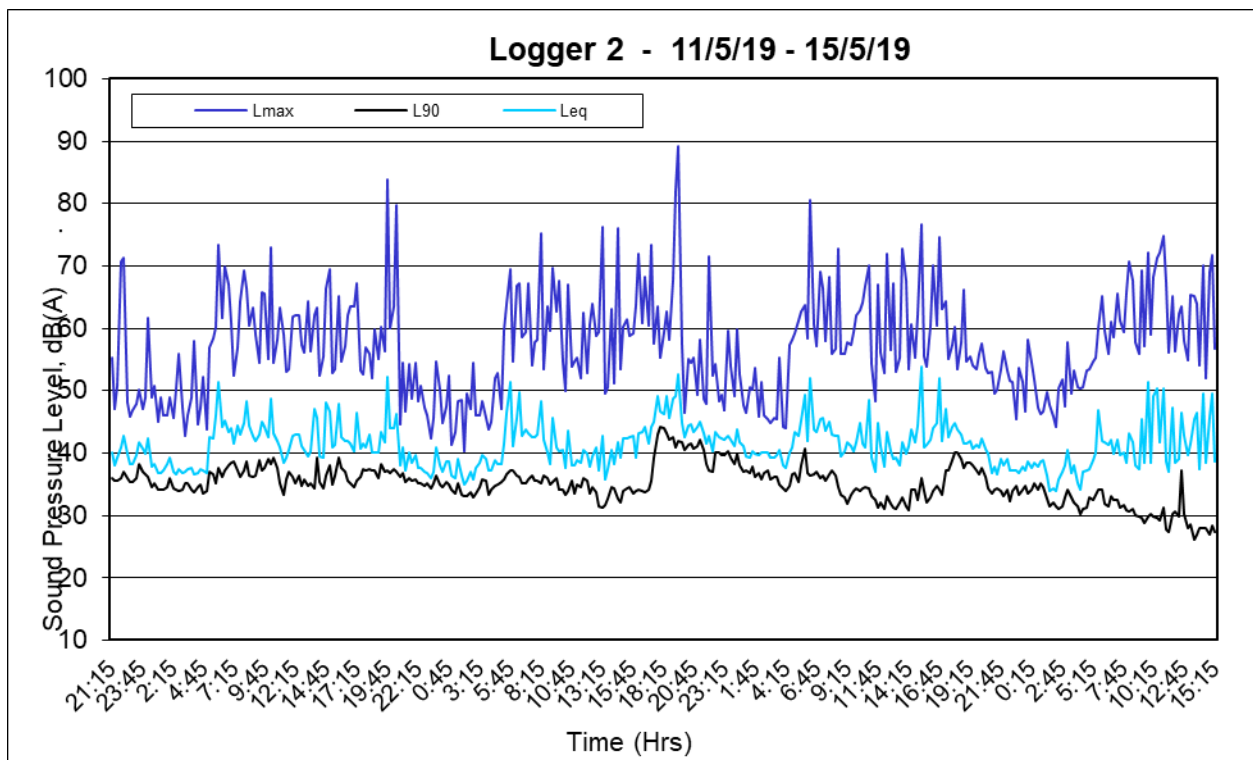
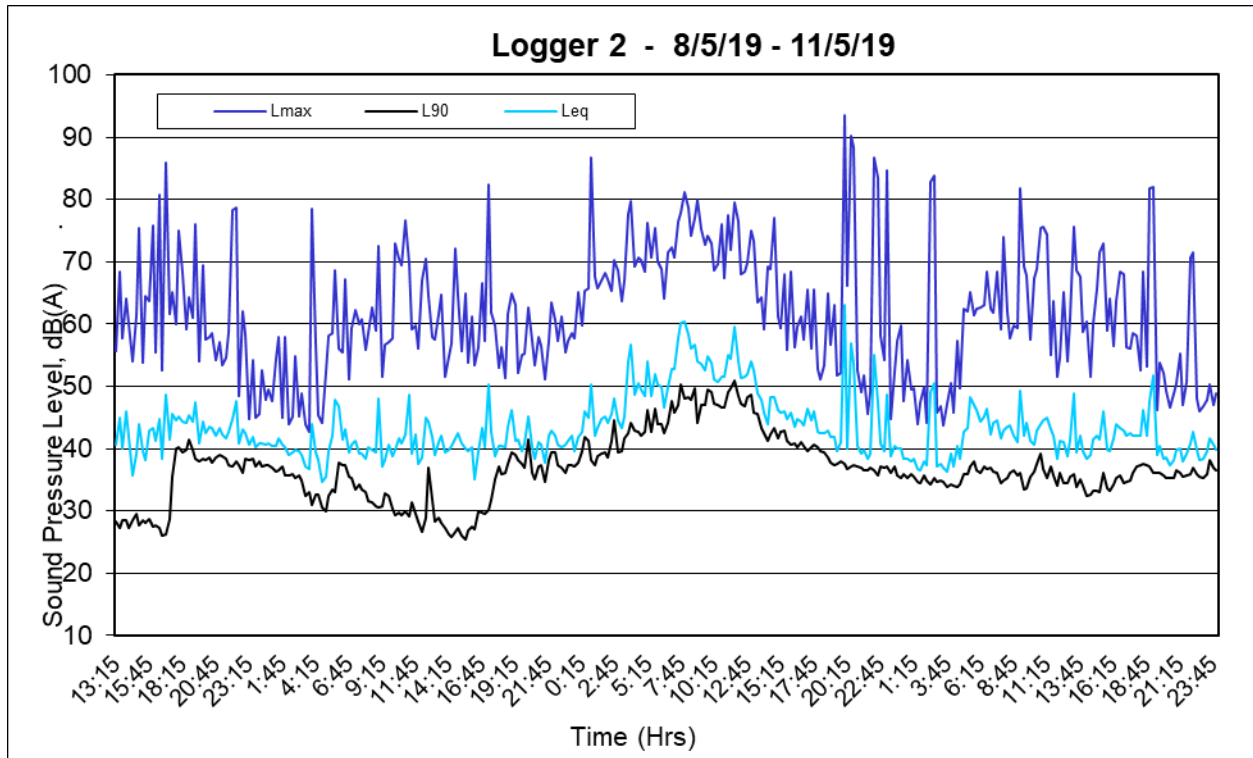


**Neil Pennington**

Acoustical Consultant

APPENDIX A  
NOISE LOGGER CHARTS







13 February 2019

Ref: 161308/8281

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: FEBRUARY 2019 NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended noise monitoring conducted for the Ardglenn Quarry (AQ) between Tuesday 5<sup>th</sup> and 12<sup>th</sup> February 2019. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45



However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

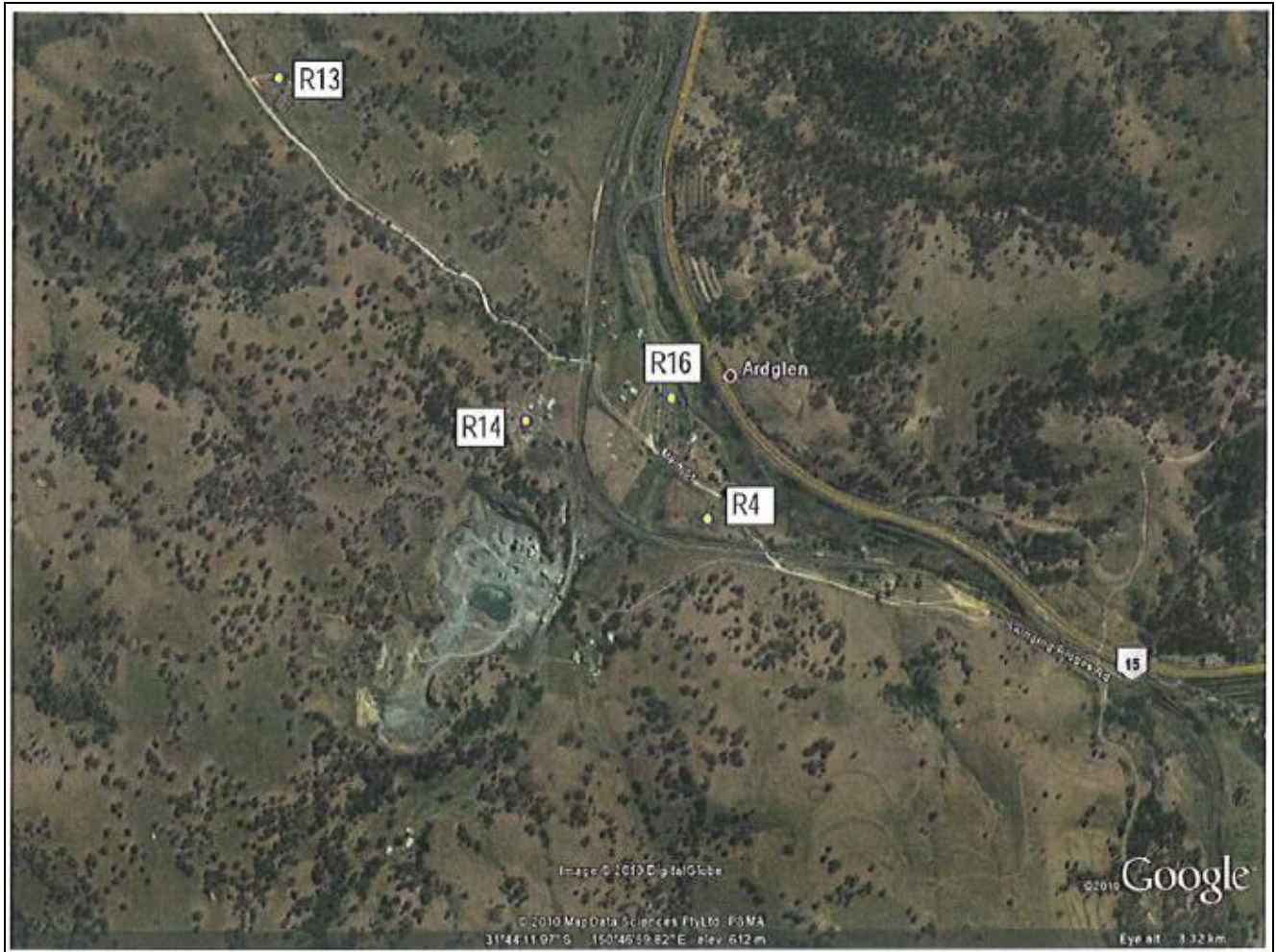
*Notes:*

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## **NOISE MONITORING LOCATIONS**

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with Brüel & Kjær Type 2260 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instruments was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2.5m above ground level. The weather throughout the survey was mild with relatively clear skies with 3 to 4 octas cloud cover. The wind speed was variable throughout at 2.5 to 4 m/s generally from the south.

Throughout the monitoring period the quarry was operating. Plant items working at the quarry are detailed below;

- Generator at Office;
- 980 Loader; and
- Five truck and dogs entering and leaving with loads.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “*Evaluator*” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

<b>TABLE 3</b> <b>Ardglen Quarry Noise Monitoring Results –</b> <b>12<sup>th</sup> February 2019 (Day)</b>				
<b>Location</b>	<b>Time</b>	<b>dB(A),<sub>Leq</sub></b>	<b>Wind speed/ direction</b>	<b>Identified Noise Sources</b>
4. Thompson	9: 05 am	55	1.5 m/s NE	Traffic (55), birds (30), <b>AQ<sup>1</sup> barely audible</b>
13. McGhie	10:05 am	40	2.5 m/s NW	Birds (39), traffic (32), <b>AQ inaudible</b>
14. Purtell	9:40 am	46	1.5 m/s N	Traffic (45), birds (37), <b>AQ<sup>1</sup> (30)</b>
16. Bojba	8:45 am	54	1.0 m/s NE	Traffic (54), birds (40), <b>AQ inaudible</b>

1 see text re noise sources from quarry

The results in Table 2 show that under the operating conditions at the time the noise emissions from AQ were compliant with the relevant noise criteria at all monitoring locations.

Throughout the noise monitoring survey trucks were entering and leaving the quarry. The noise from the trucks is considered a site noise whilst the vehicles are on quarry site roads. Once the vehicles pass onto public roads the noise is assessed separately, against RMS road traffic noise criteria.

The noise from the trucks whilst on site was audible at Locations 4 and 14.

At Location 4 the truck noise from the vicinity of the site was audible on occasion but not measureable in the acoustic environment dominated by noise from traffic on the highway.

At location 14 the noise from two trucks leaving and one truck entering the quarry was measureable during the 15 minute survey, with the relevant noise contribution calculated based on log addition of the magnitude and duration of the noise for each. The calculated contribution as an Leq (15 min) noise level from the trucks whilst on site is that shown in Table 3.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.



## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of seven days, part of which coincides with the quarterly attended noise monitoring. To measure the acoustic environment Rion NL-42 sound level meters, set up as environmental noise loggers, were located as shown in Figure 2 from 5<sup>th</sup> to 12<sup>th</sup> February, 2019. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix I**.

<b>TABLE 3</b> <b>Measured Logger Noise Levels dB(A)</b> <b>5<sup>th</sup> to 12<sup>th</sup> February, 2019</b>						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
Logger 1	54	36	53	34	54	24
Logger 2	55	39	52	36	43	29



**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R 14. This is adjacent to the attended noise monitoring location for this residence. Logger 2 was in an open paddock north of the house.



The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

**SPECTRUM ACOUSTICS PTY LIMITED**

Author:



**Ross Hodge**

Acoustical Consultant

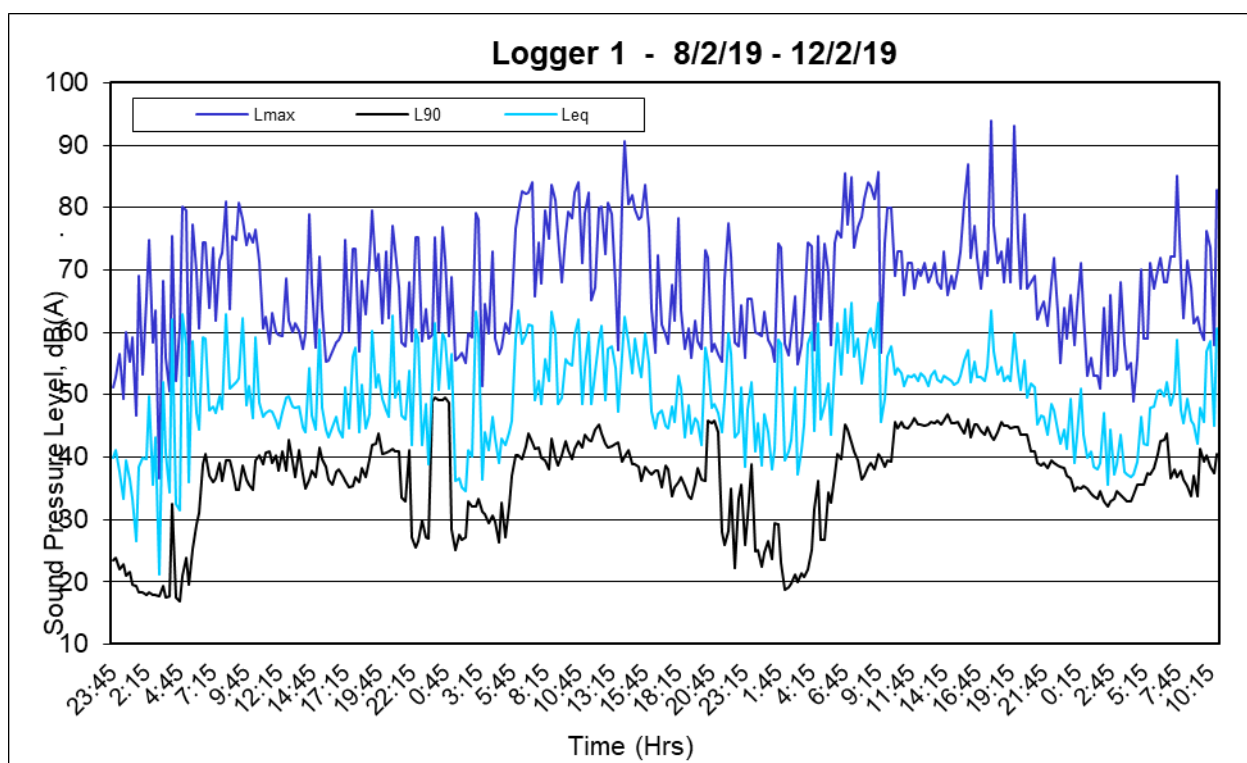
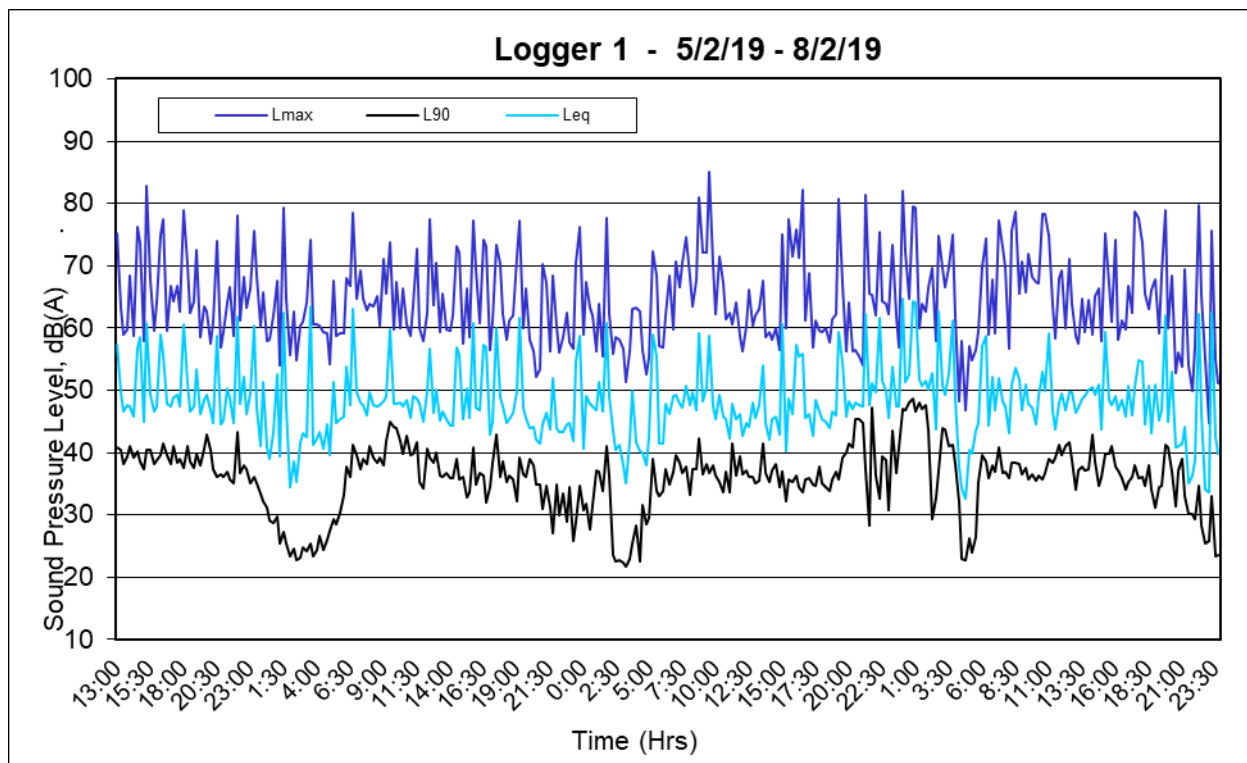
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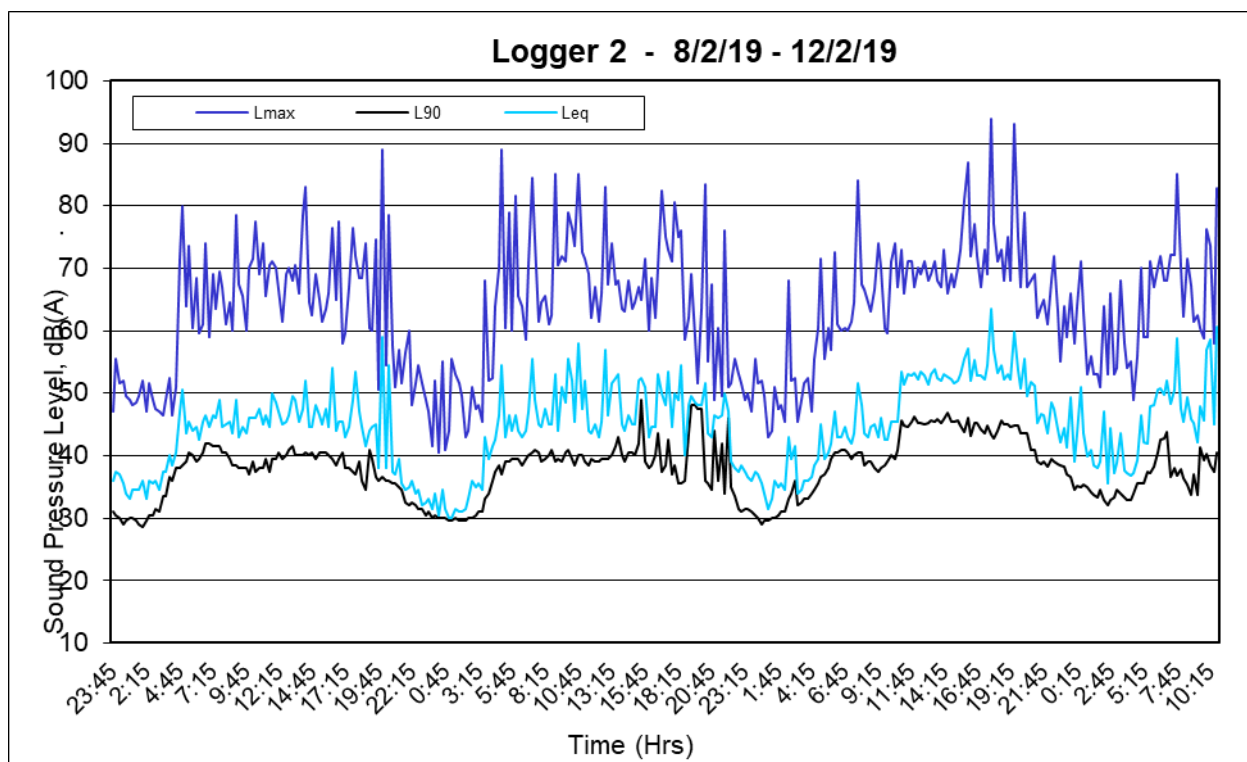
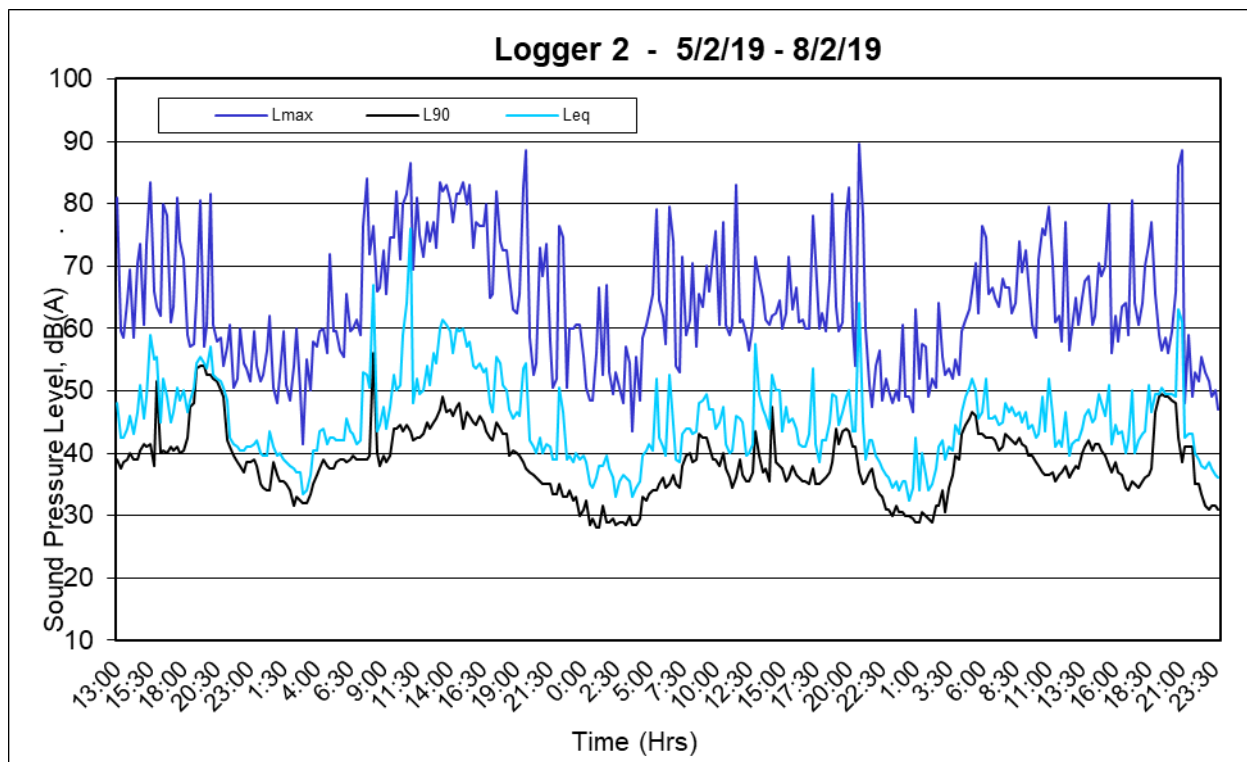


**Neil Pennington**

Acoustical Consultant

APPENDIX A  
NOISE LOGGER CHARTS







23 November 2018

Ref: 161308/8162

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: NOVEMBER 2018 ATTENDED NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended noise monitoring conducted for the Ardglenn Quarry (AQ) on Friday 16<sup>th</sup> November 2018. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45



However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

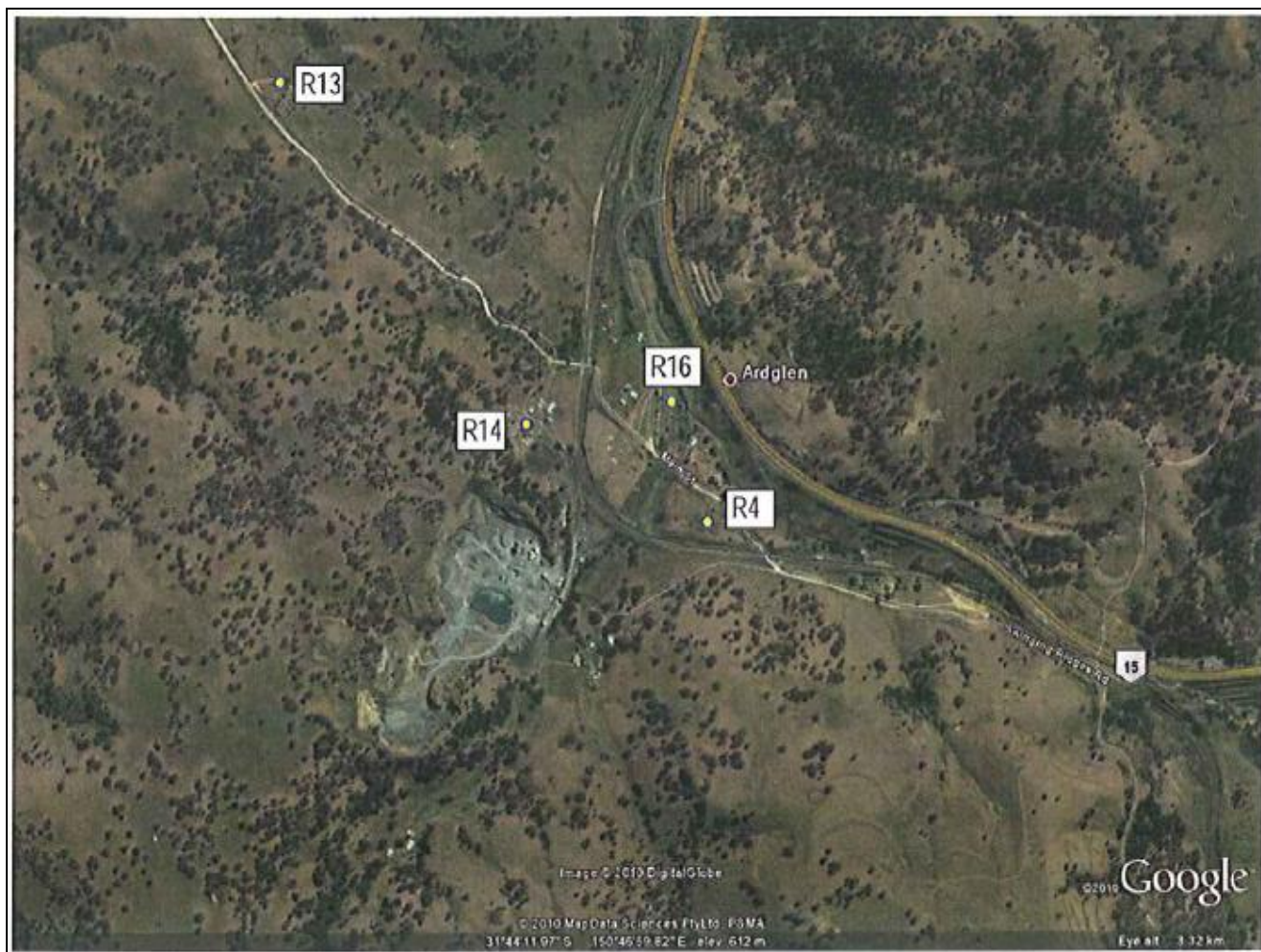
*Notes:*

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## **NOISE MONITORING LOCATIONS**

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with Brüel & Kjær Type 2260 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instruments was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2.5m above ground level. The weather throughout the survey was mild with relatively clear skies with 3 to 4 octas cloud cover. The wind speed was variable throughout at 2.5 to 4 m/s generally from the south.

Throughout the monitoring period the quarry was operating at typical capacity. Plant items working at the quarry are detailed below;

- D10 dozer;
- 980 Loader; and
- Watercart intermittently.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “*Evaluator*” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

<b>TABLE 3</b> <b>Ardglen Quarry Noise Monitoring Results –</b> <b>16 November 2018 (Day)</b>				
Location	Time	dB(A), Leq	Wind speed/ direction	Identified Noise Sources
4. Thompson	2:40 pm	42	2.5 m/s S	Traffic (41), birds (34), <b>AQ inaudible</b>
13. McGhie	3:30 pm	40	4 m/s S	Traffic (37), birds (37), <b>AQ inaudible</b>
14. Purtell	3:10 pm	45	2.5 m/s S	Traffic (43), birds (42), <b>AQ inaudible</b>
16. Bojba	2:00 pm	44	2.5 m/s S	Traffic (44), birds (36), <b>AQ inaudible</b>

The results in Table 2 show that under the operating conditions at the time the noise emissions from AQ were compliant with the relevant noise criteria at all monitoring locations.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of seven days, part of which coincides with the quarterly attended noise monitoring. To measure the acoustic environment Rion NL-42 sound level meters, set up as environmental noise loggers, were located as shown in Figure 2 from 9<sup>th</sup> to 16<sup>th</sup> August, 2018. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix I**.

<b>TABLE 3</b> <b>Measured Logger Noise Levels dB(A)</b> <b>9<sup>th</sup> to 16<sup>th</sup> November, 2018</b>						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
Logger 1	56	44	53	39	49	32
Logger 2	55	34	51	34	50	30





**Figure 2 – Unattended Noise Monitoring Locations**

The logger locations were chosen to be representative of the acoustic environment of the closest residences to the quarry and for security reasons.

Logger 1 was located on the fence at location R 14. This is adjacent to the attended noise monitoring location for this residence. Logger 2 was in an open paddock north of the house.

The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

**SPECTRUM ACOUSTICS PTY LIMITED**

Author:

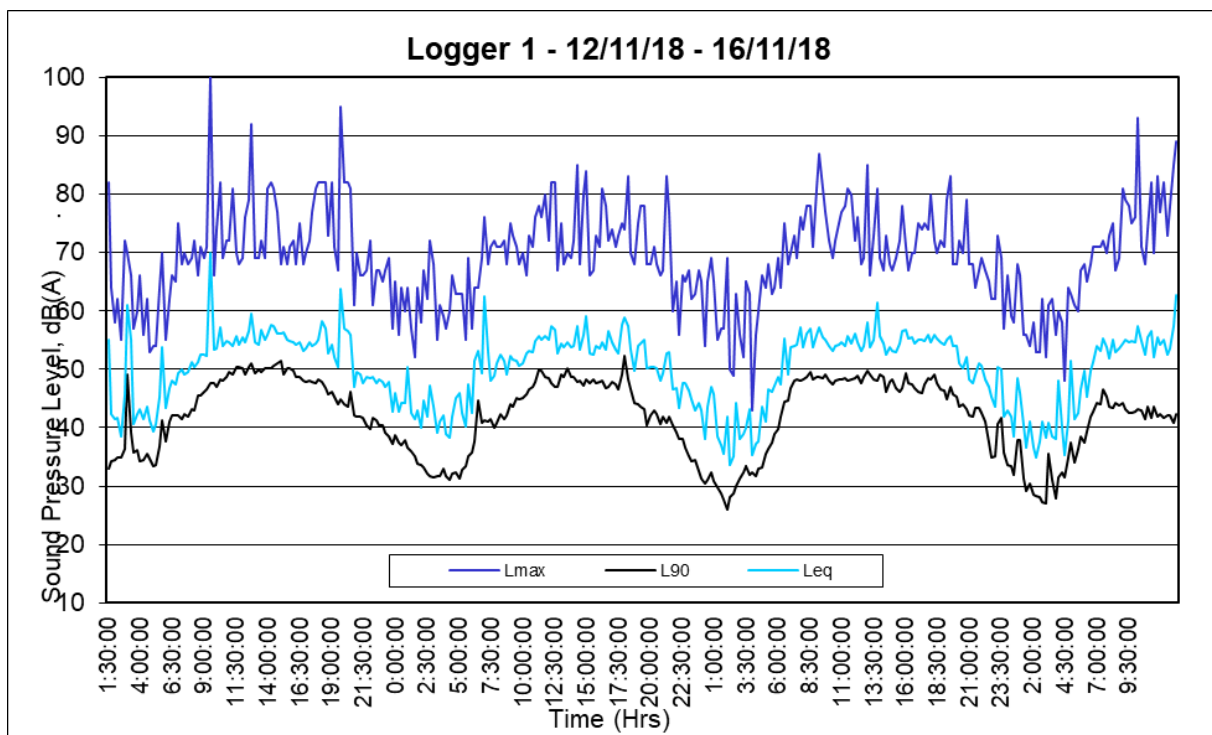
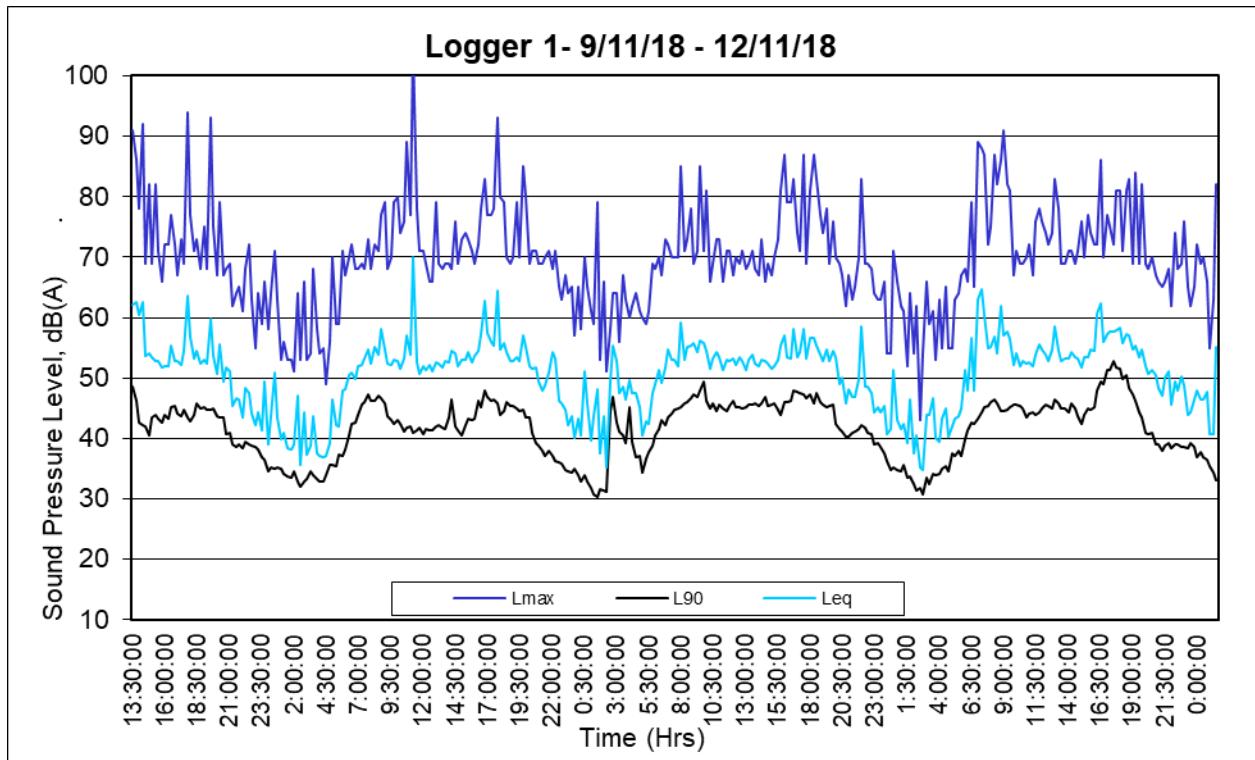
**Ross Hodge**  
Acoustical Consultant

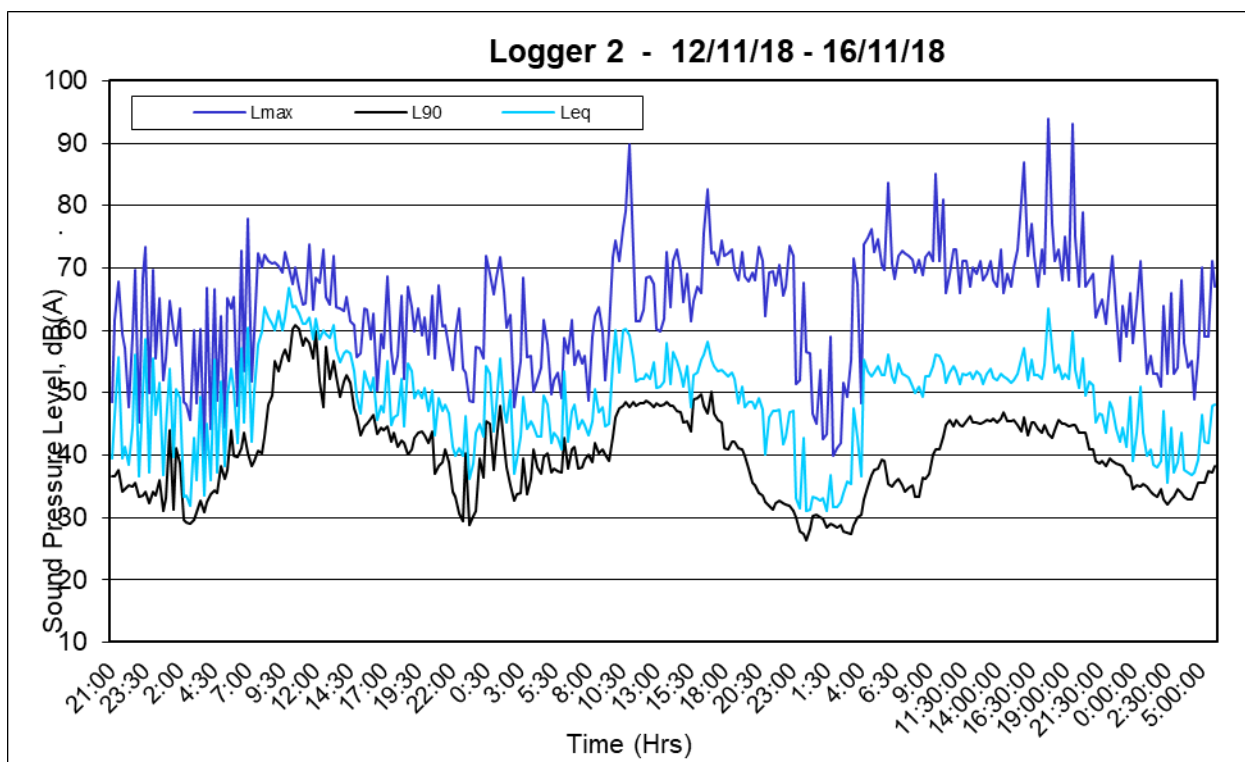
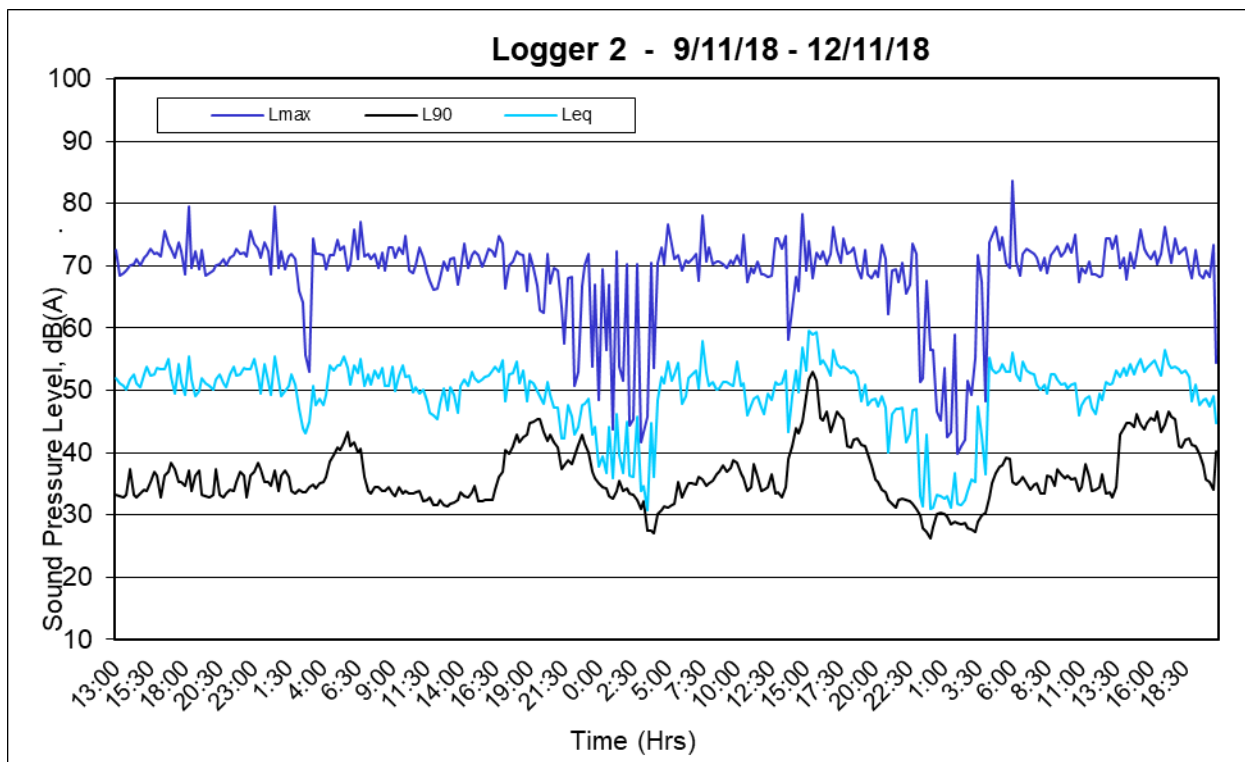
Review:

**Neil Pennington**  
Acoustical Consultant



APPENDIX A  
NOISE LOGGER CHARTS







21 August 2018

Ref: 161308/8012

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: AUGUST 2018 ATTENDED NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended noise monitoring conducted for the Ardglenn Quarry (AQ) on Thursday 16<sup>th</sup> August 2018. The monitoring was carried out to measure noise emissions from the operations of the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

*Notes:*

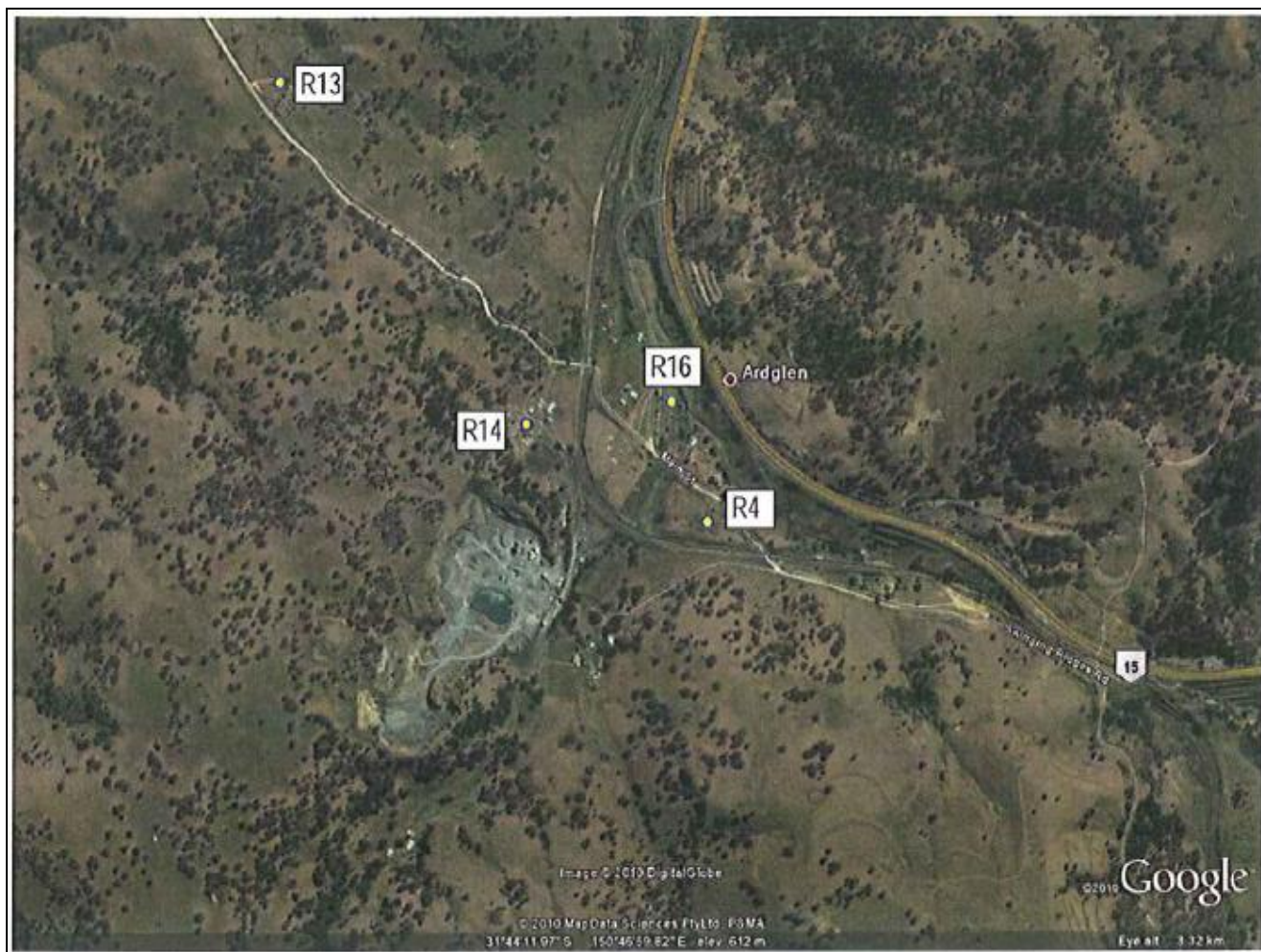
- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## **NOISE MONITORING LOCATIONS**

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying **Figure 1**:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba





**Figure 1 – Attended Noise Monitoring Locations**

## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with Brüel & Kjær Type 2260 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters”. Calibration of the instruments was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2.5m above ground level. The weather throughout the survey was mild with relatively clear skies at 1 to 2 octas cloud cover. The wind speed was variable throughout at 1 to 2.5 m/s generally from the north west.

Throughout the monitoring period the quarry was operating at typical capacity.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “*Evaluator*” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results, shown in **Table 2**, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

<b>Table 2</b> <b>Ardglen Quarry Noise Monitoring Results – 16 August 2018 (Day)</b>				
Location	Time	dB(A), Leq	Wind speed/ direction	Identified Noise Sources
4. Thompson	4:17 pm	48	2 m/s NNW	Traffic (47), birds (25), <b>AQ barely audible</b>
13. McGhie	4:55 pm	41	2.5 m/s NW	Birds (39), traffic (36), <b>AQ inaudible</b>
14. Purtell	4:35 pm	52	1 m/s NW	Traffic (52), birds (40), <b>AQ barely audible</b>
16. Bojba	4:00 pm	52	1 m/s NW	Traffic (52), birds (40), <b>AQ inaudible</b>

The results in Table 2 show that under the operating conditions at the time the noise emissions from AQ were compliant with the relevant noise criteria at all monitoring locations.

The results of the noise monitoring programme have shown that AQ is operating within approved noise limits. No actions are recommended with respect to noise management at the Quarry.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of seven days, part of which coincides with the quarterly attended noise monitoring. To measure the acoustic environment Rion NL-42 sound level meters, set up as environmental noise loggers, were located at the locations shown in Figure 2 from 9<sup>th</sup> to 16<sup>th</sup> August, 2018. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix I**.

<b>TABLE 3</b> <b>MEASURED LOGGER NOISE LEVELS dB(A)</b> <b>9<sup>th</sup> to 16<sup>th</sup> August, 2018</b>						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
Logger 1	57	42	54	37	54	34
Logger 2	58	40	53	38	51	38





**Figure 2 – Unattended Noise Monitoring Locations**

The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

**SPECTRUM ACOUSTICS PTY LIMITED**

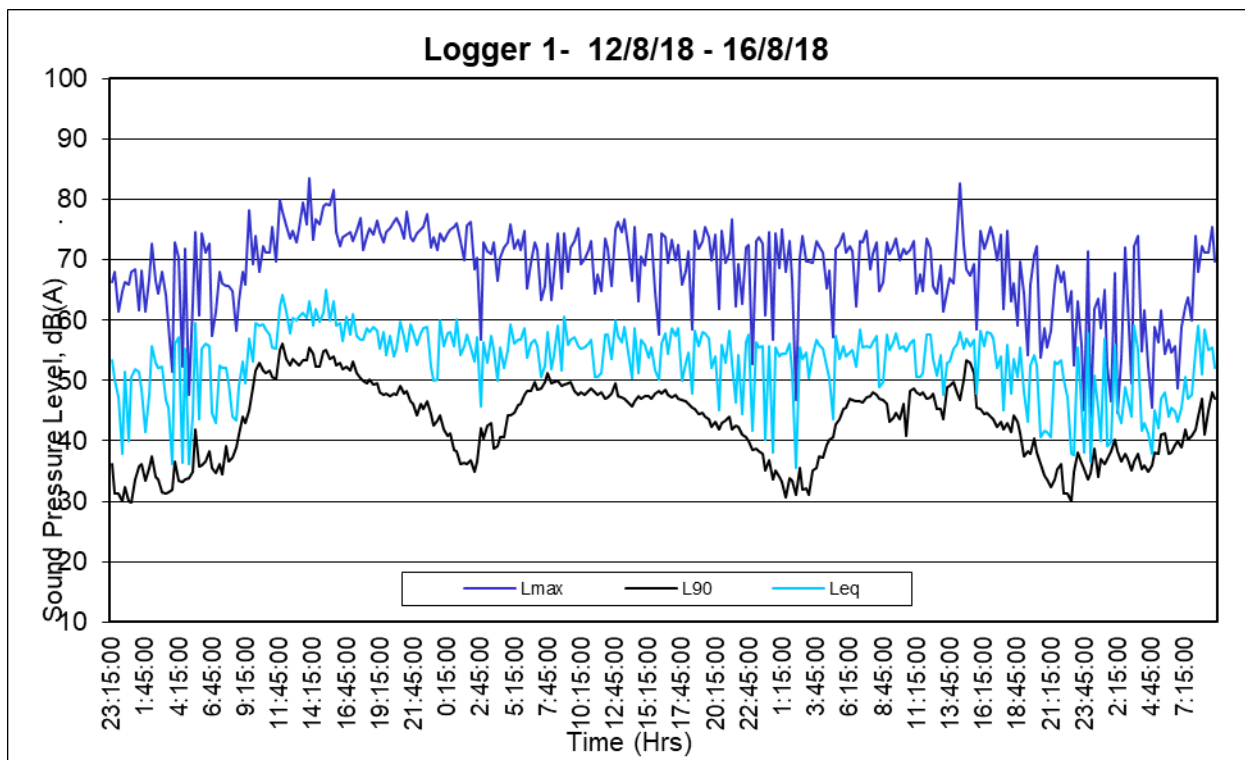
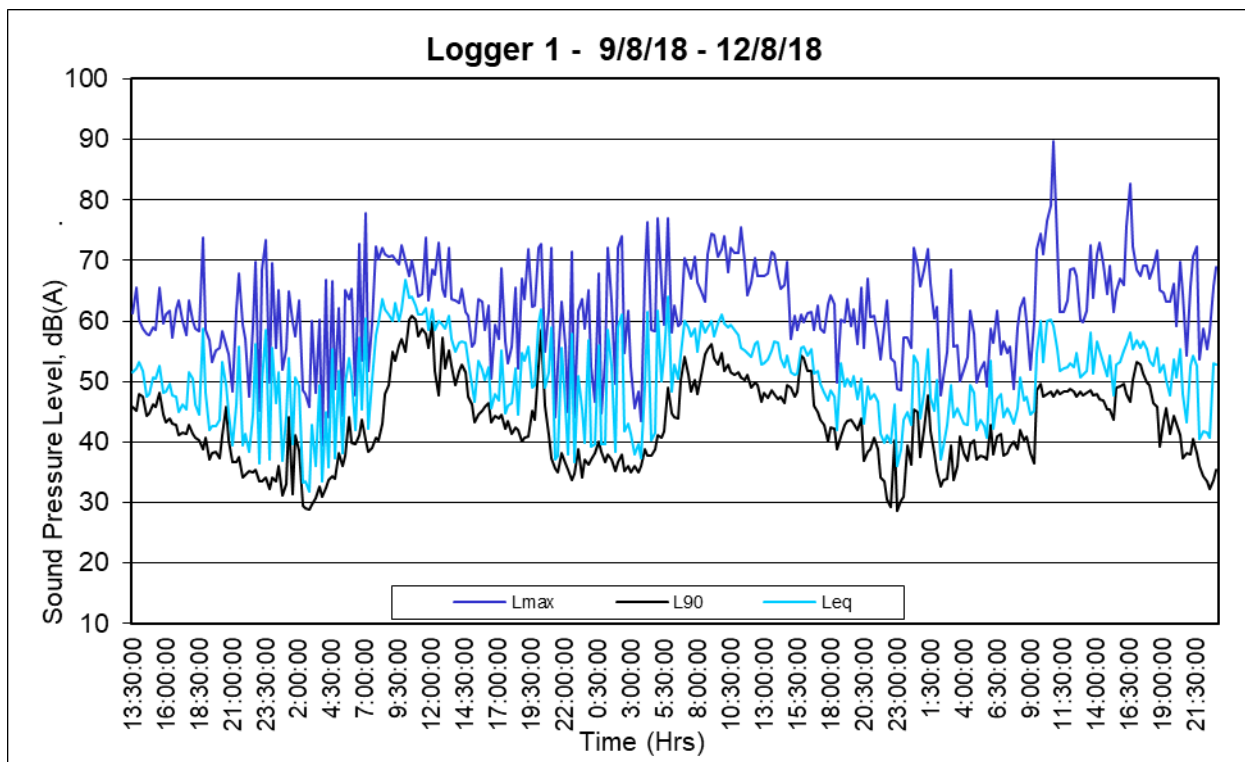
Author:

**Ross Hodge**  
Acoustical Consultant

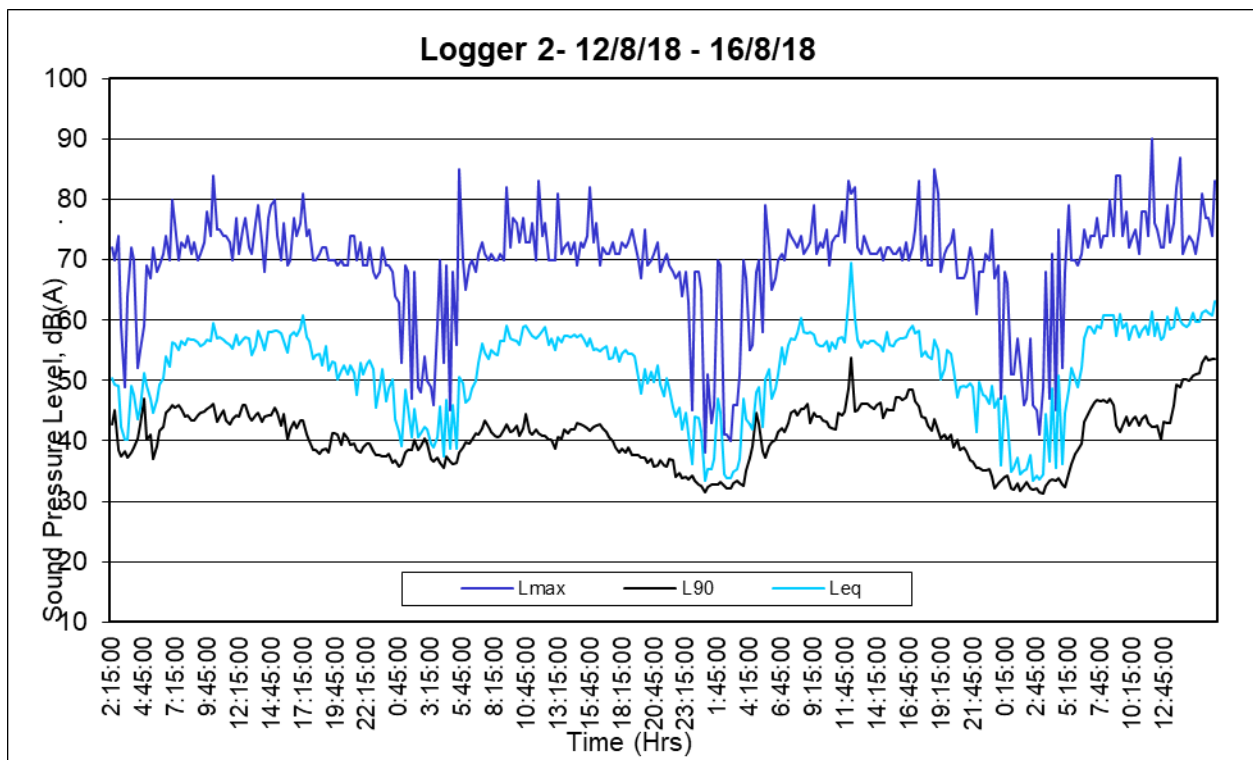
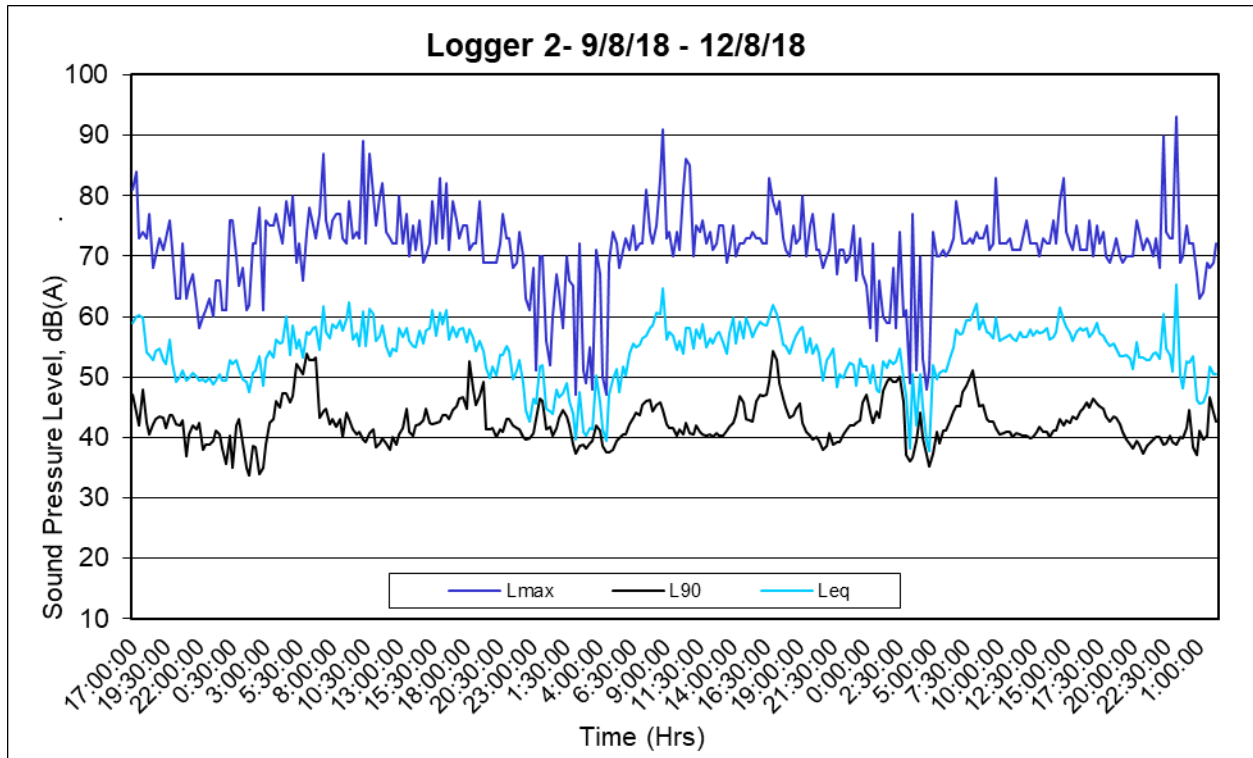
Review:

**Neil Pennington**  
Acoustical Consultant

APPENDIX A  
NOISE LOGGER CHARTS









21 December 2017

Ref: 161308/7547

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: DECEMBER 2017 ATTENDED NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended noise monitoring conducted for the Ardglenn Quarry (AQ) on Thursday 14<sup>th</sup> December 2017. The monitoring was carried out specifically to measure noise emissions during train loading at the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

Table 1 Noise Impact Assessment Criteria				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

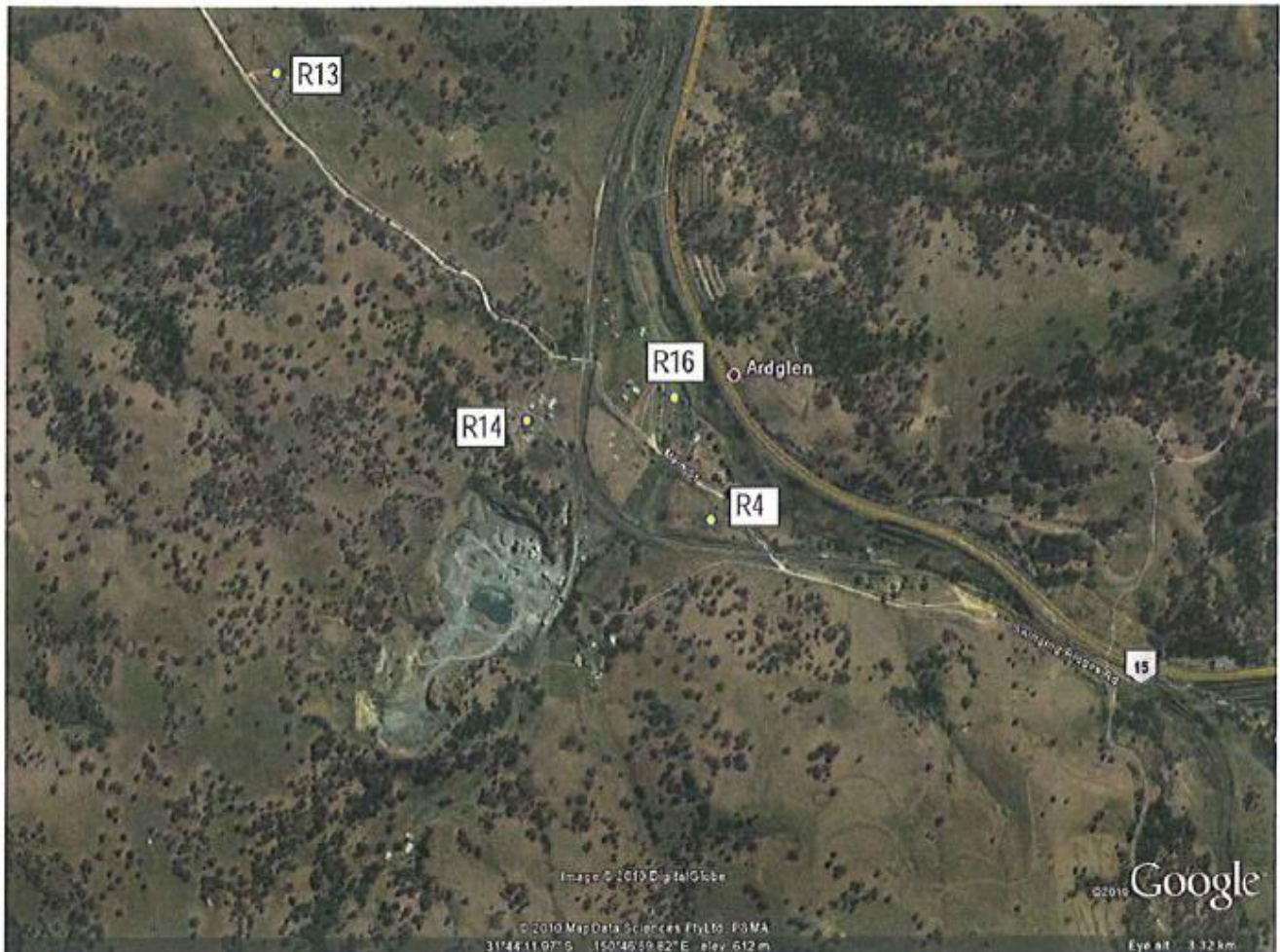
*Notes:*

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## **NOISE MONITORING LOCATIONS**

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying figure:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with Brüel & Kjær Type 2260 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instruments was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2m above ground level. The weather throughout the survey was hot with relatively clear skies at 2 octas cloud cover. The wind speed was variable throughout at 1 to 2.5 m/s from the north north west.

Throughout the monitoring period the quarry was not operating.



## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “Evaluator” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results shown in **Table 2**, below, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

Table 2 Ardglen Quarry Noise Monitoring Results – 14 December 2017 (Day)				
Location	Time	dB(A), Leq	Wind speed/ direction	Identified Noise Sources
4. Thompson	11:40 am	48	1 m/s NNW	Traffic (47), birds (36), train (33), <b>AQ inaudible</b>
13. McGhie	12:45 pm	36	2 m/s NNW	Insects (34), traffic (32), birds (25), <b>AQ inaudible</b>
14. Purtell	12:00 pm	38	2.5 m/s NNW	Traffic (37), birds & insects (30), <b>AQ inaudible</b>
16. Bojba	11:15 am	40	1 m/s NNW	Traffic (40), birds (31), <b>AQ inaudible</b>

As the quarry was not working at the time of the monitoring there were no noise emissions and there is no requirement for any further analysis of the data.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of seven days, part of which coincides with the quarterly attended noise monitoring. To measure the acoustic environment Rion NL-42 sound level meters, set up as environmental noise loggers, were located on the quarry fence line in the vicinity of R14 and to the west of the fence at R16 from 14<sup>th</sup> to 20<sup>th</sup> December, 2017. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix I**.

TABLE 3 MEASURED LOGGER NOISE LEVELS dB(A) 14 <sup>th</sup> to 20 <sup>th</sup> December, 2017						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
R14	53	43	53	44	52	34
R16	52	41	46	37	50	31

The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

**SPECTRUM ACOUSTICS PTY LIMITED**

Author:



**Ross Hodge**

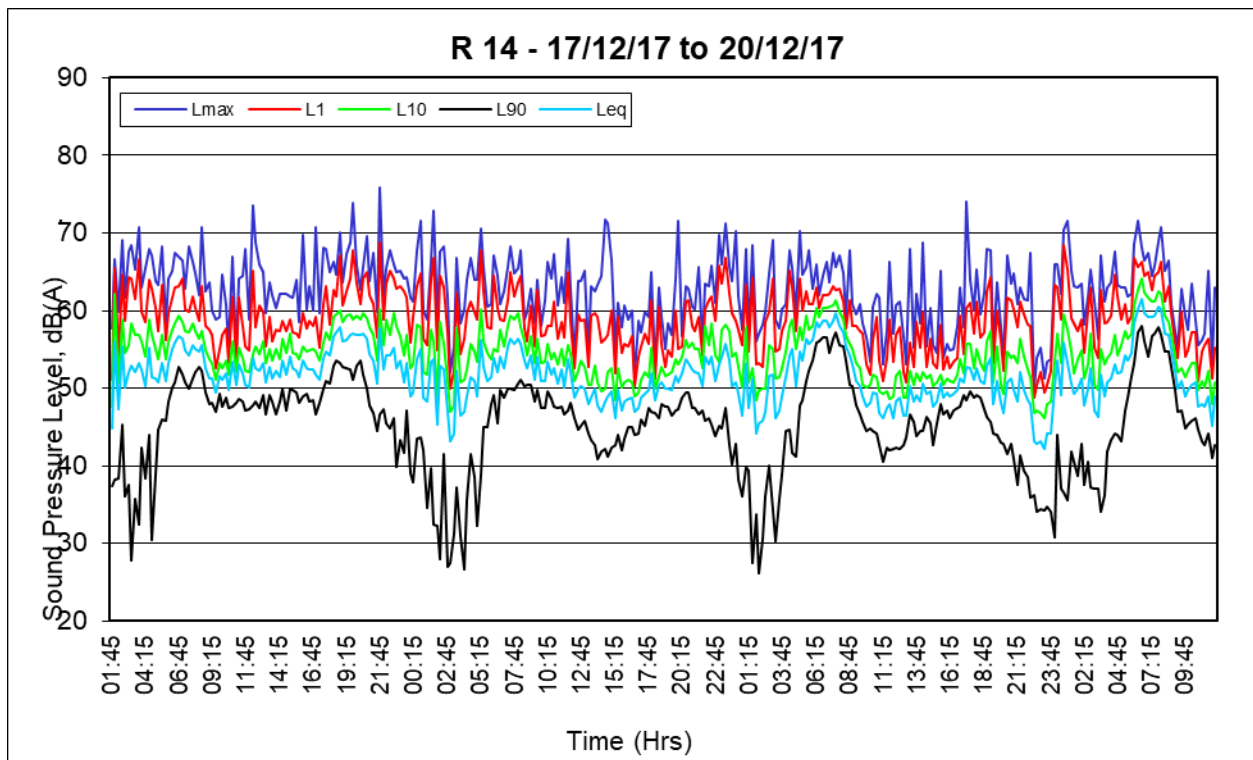
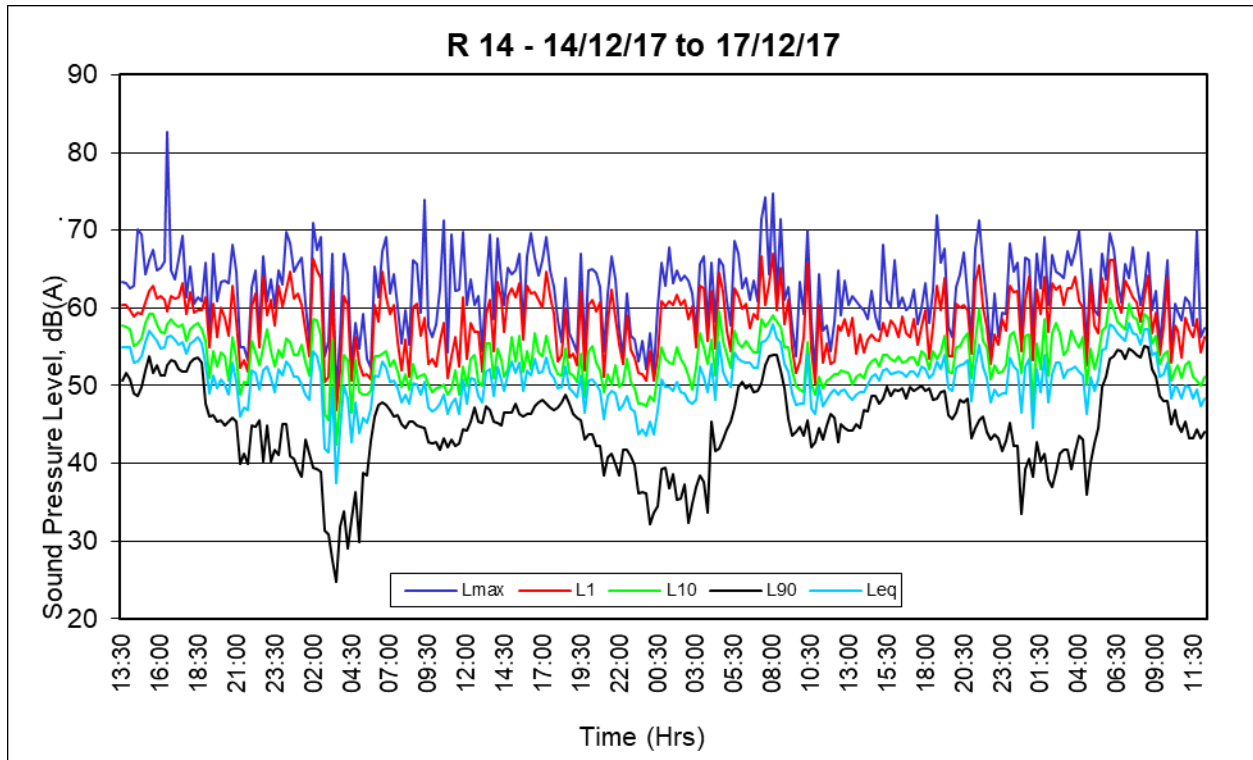
Acoustical Consultant

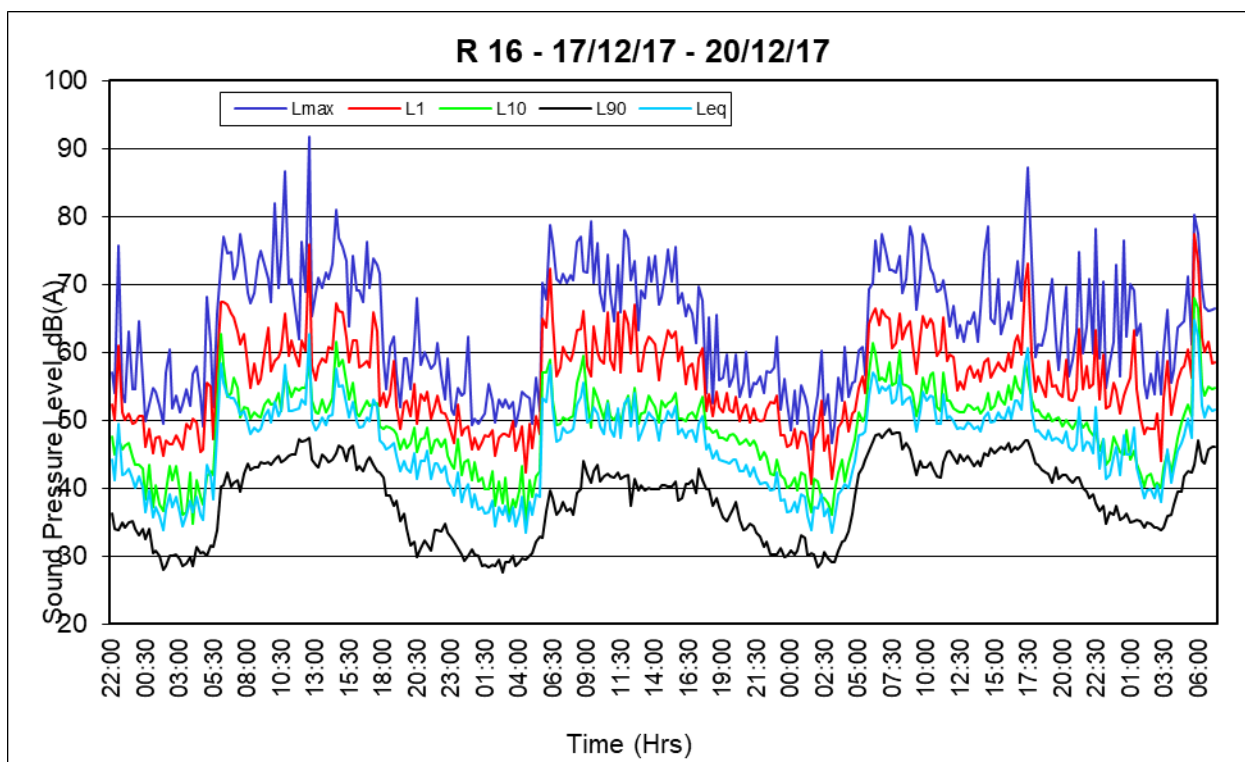
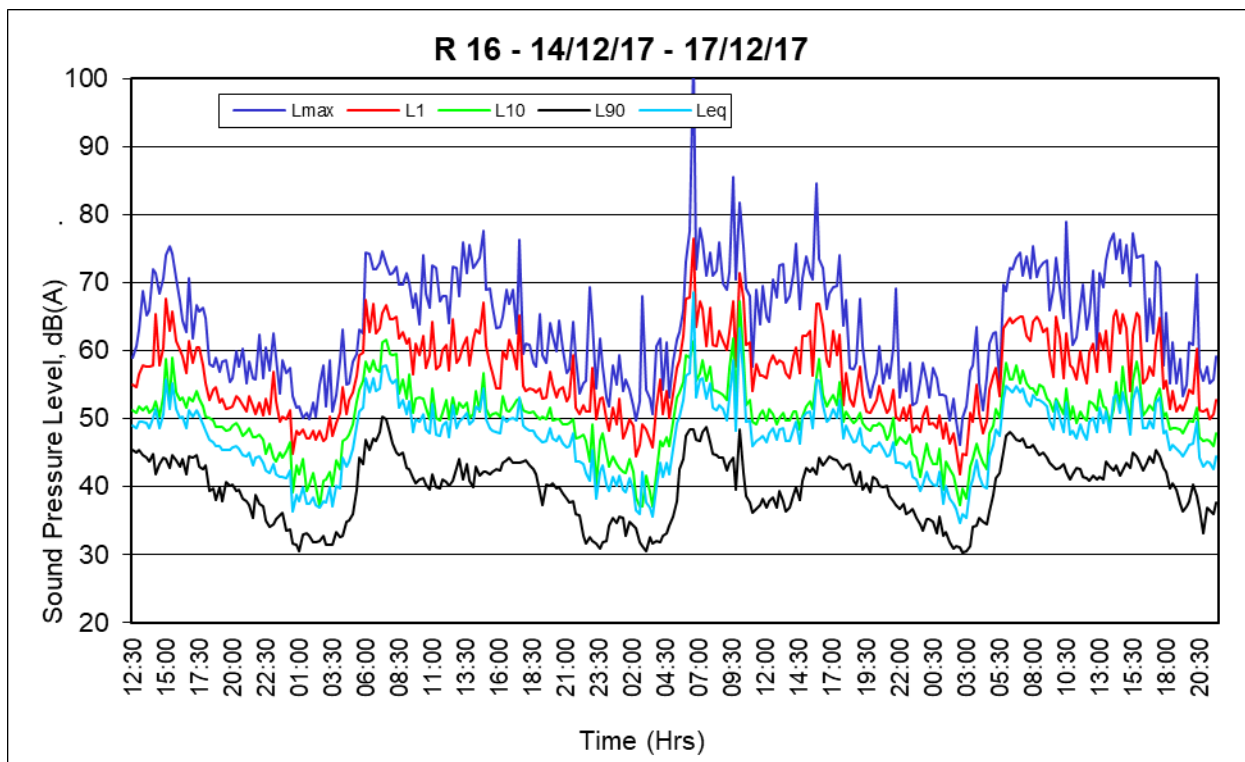
Review:



**Neil Pennington**

Acoustical Consultant









23 September 2016

Ref: 161308/6713

Daracon Quarries Pty Ltd  
PO Box 299  
WALLSEND NSW 2287

## RE: AUGUST 2016 ATTENDED NOISE MONITORING RESULTS – ARDGLEN QUARRY

This letter report presents the results of attended noise monitoring conducted for the Ardglenn Quarry (AQ) on Thursday 18<sup>th</sup> August 2016. The monitoring was carried out specifically to measure noise emissions during train loading at the quarry. Noise monitoring was carried out in accordance with the conditions of the AQ Noise Monitoring Plan (NMP) as detailed below.

### NOISE CRITERIA

*The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in **Table 1** at any residence on privately-owned land, or more than 25% of any privately owned land.*

<b>Table 1</b> <b>Noise Impact Assessment Criteria</b>				
Land	Day Leq (15 min)	Evening Leq (15 min)	Night	
			Leq (15 min)	L1 (1 min)
1 Burraston	35	35	35	45
3 Rose	35	35	35	45
4 C M Thompson	44	35	35	45
5 M Taylor	45	35	35	45
6 S Thompson	45	35	35	45
9 Bates	37	35	35	45
10 Avery	38	35	35	45
11 Shipman	37	35	35	45
12 Hall	36	35	35	45
13 McGhie	35	35	35	45
14 Purtell	36	35	35	45
15 J Taylor	43	35	35	45
16 Bojba	40	35	35	45
All other privately owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and the DECCW, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated agreement. The Proponent may also exceed the L1 (1 min) and Leq (15 min) noise impact criteria during out of hours rail loading activities provided they are conducted in accordance with Section 3, Condition 41 of the Project Approval (which is reproduced below).

41. The Proponent may only load a maximum of 2 trains outside the rail loading and distribution hours listed in Table 1 (of the Project Approval, being Monday to Sunday 7:00am to 10:00pm) in any 12 month period, unless agreed in writing by the Director General.

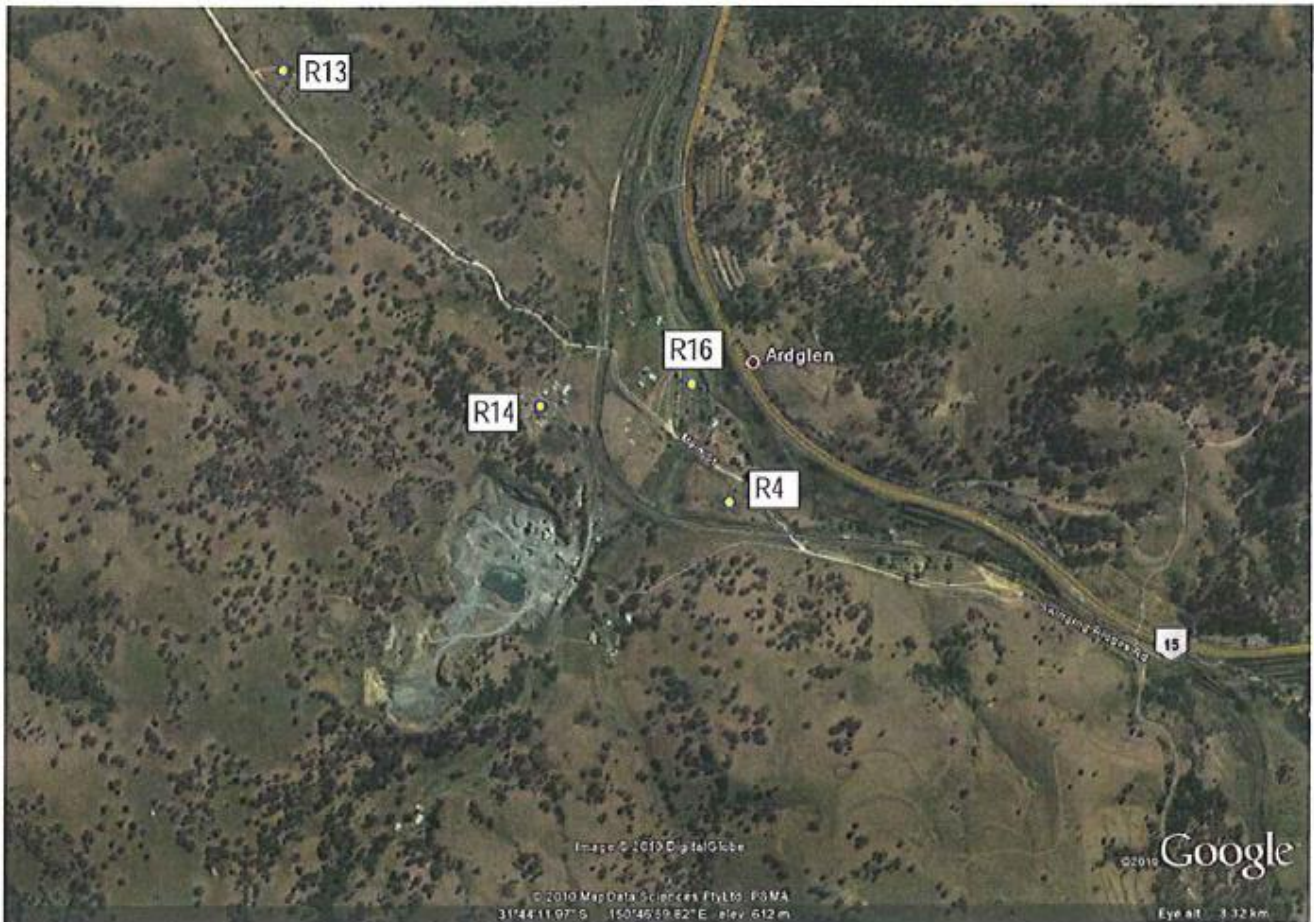
*Notes:*

- For information on the numbering and identification of properties used in this approval see Figure 2 on Page 14 of this Noise Monitoring Program).
- To determine compliance with the LAeq (15 minute) noise limits, noise from the project is to be measured at the most affected point on or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the L1 (1 minute) noise limits, noise from the project is to be measured 1m from the dwelling facade. Where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
  - wind speeds of up to 3 m/s at 10 metres above ground level; or
  - Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

## **NOISE MONITORING LOCATIONS**

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying figure:

Location 4: C M Thompson  
Location 13: McGhie  
Location 14: Purtell  
Location 16: Bojba



## ATTENDED NOISE MEASUREMENTS

Noise emission levels were measured with Brüel & Kjær Type 2260 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instruments was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2m above ground level. The weather throughout the survey was generally warm with relatively clear skies at 2 octas cloud cover. Wind speed was approximately 1m/s from the south east.

Throughout the monitoring period the quarry was not operating.

## RESULTS OF ATTENDED MONITORING

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær “*Evaluator*” software. The software enables the contributions of the quarry and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for AQ during the day is based on an Leq noise level. The results shown in **Table 2**, below, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

Table 2 Ardglen Quarry Noise Monitoring Results – 18 August 2016 (Day)				
Location	Time	dB(A), Leq	Wind speed/ direction	Identified Noise Sources
4. Thompson	10:07 am	42	1 m/s SE	Traffic (40), birds (35), <b>AQ inaudible</b>
13. McGhie	10:25 am	38	1 m/s SE	Traffic (35), birds (35), <b>AQ inaudible</b>
14. Purtell	10:05 am	41	1 m/s SE	Traffic (39), birds (38), <b>AQ inaudible</b>
16. Bojba	10:24 am	44	1 m/s SE	Traffic (44), <b>AQ inaudible</b>

As the quarry was not working at the time of the monitoring there were no noise emissions and there is no requirement for any further analysis of the data.

## UNATTENDED NOISE MEASUREMENTS

The NMP requires that unattended noise logging be undertaken over a period of seven days, part of which coincides with the quarterly attended noise monitoring. To measure the acoustic environment Rion NL-42 sound level meters, set up as environmental noise loggers, were located on a fence line in the vicinity of R14 and to the west of the fence at R16 from 18<sup>th</sup> to 25<sup>th</sup> August, 2016. **Table 3** shows a summary of the relevant measured data from the loggers which is also shown graphically in **Appendix I**.

TABLE 3 MEASURED LOGGER NOISE LEVELS dB(A) 18 <sup>th</sup> to 25 <sup>th</sup> August, 2016						
Logger Location	Day (7am to 6pm)		Evening (6pm to 10 pm)		Night (10pm to 7am)	
	Leq	L90	Leq	L90	Leq	L90
R14	53	33	48	36	46	31
R16	50	37	46	34	50	29

The unattended noise loggers measure the total noise level in the environment but the data cannot discriminate between various noise sources. As such, the data is presented here with no further analysis.



We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

**SPECTRUM ACOUSTICS PTY LIMITED**

Author:



**Ross Hodge**

Acoustical Consultant

Review:



**Neil Pennington**

Acoustical Consultant

