



14 September 2021

Ref: 8413/9388

**Metromix Pty Ltd**  
 150 Rhondda Road  
 Teralba NSW 2284

### AUGUST 2021 NOISE MONITORING RESULTS – TERALBA QUARRY

This letter report presents the results of attended noise monitoring conducted for the Metromix operated Teralba Quarry (TQ) commencing on Monday 16<sup>th</sup> and finishing on Wednesday 18<sup>th</sup> of August, 2021. Noise monitoring was carried out in accordance with the conditions of the TQ Noise Management Plan (NMP) as shown in extract on page 2 (referenced from EPL 536).

Although the project approval nominates noise criteria at nine locations, Metromix recognises that meaningful monitoring data will continue to be collected from the closest locations to the active operational areas. As a result of this, and as outlined within the approved NMP, for periods when operations are confined to areas south of Rhondda Road, noise monitoring will be undertaken at Locations EPL-A, B, D, E and H.

Further to this, location EPL-C and EPL-F have been omitted from the noise monitoring programme given they are not required as other monitoring locations are nearby and closer to quarry related noise sources. This has been recognised by the EPA by the removal of these locations from the monitoring locations detailed in EPL 536. **Table 1** lists the address and coordinates of each noise monitoring location, with the relevant monitoring locations that were monitored during the August 2020 period highlighted in **bold**. The locations are shown on the figure in **Appendix I**.

Table 1 Noise Monitoring Locations (from PA 10-0183)			
Location in EPL	Address	Easting	Northing
<b>EPL-A</b>	<b>Awaba Street, Teralba</b>	<b>369080</b>	<b>3651470</b>
<b>EPL-B<sup>1</sup></b>	<b>Rhondda Road, Teralba</b>	<b>369250</b>	<b>6351915</b>
EPL-C	Rhondda Road, Teralba <sup>2</sup>	369205	6352015
<b>EPL-D</b>	<b>Rhondda Road, Teralba</b>	<b>369150</b>	<b>6352135</b>
<b>EPL-E</b>	<b>Victoria Avenue, Teralba</b>	<b>369060</b>	<b>6352620</b>
EPL-F	Victoria Avenue, Teralba <sup>2</sup>	369130	6352945
<b>EPL-H</b>	<b>School Road, Wakefield</b>	<b>366210</b>	<b>6352520</b>

1. See text in relation to changes to monitoring location
2. Metromix has obtained permission for this monitoring location to be omitted.

It is noted that during the period when monitoring is undertaken at Location B, Metromix is required to provide a spotter to record the number of trucks departing from the Quarry and not the Teralba Business Park. Spectrum Acoustics personnel undertook identification of quarry trucks as part of the noise monitoring procedure.

As part of pre monitoring protocols Spectrum Acoustics notified, by letterbox drop, all landowners in the close vicinity of each site of the impending monitoring. The resident at Location B has previously told Metromix that they didn't want monitoring to be done near their residence so monitoring was undertaken at a point approximately 30m south (as shown in Appendix I).

The following presents noise related conditions of EPL 536 relevant to the compliance noise monitoring programme.

Condition	Requirement																																								
L5.2	<p>The licensee must ensure that noise generated by the activities within the premises do not exceed the following criteria measured by dB(A) at any residence or privately owned land.</p> <table border="1" data-bbox="331 846 1423 1238"> <thead> <tr> <th data-bbox="331 846 491 880">Location</th> <th data-bbox="491 846 794 925">Day Shoulder 6:00am - 7:00am</th> <th data-bbox="794 846 1034 925">Day 7:00am - 6:00pm</th> <th data-bbox="1034 846 1273 925">Evening 6:00pm – 10:00pm</th> <th data-bbox="1273 846 1423 925">Night 10:00pm – 6:00am</th> </tr> <tr> <td></td> <td data-bbox="635 925 794 958">L<sub>Aeq</sub> (15 minute)</td> <td data-bbox="834 925 994 958">L<sub>Aeq</sub> (15 minute)</td> <td data-bbox="1042 925 1201 958">L<sub>Aeq</sub> (15 minute)</td> <td data-bbox="1265 925 1423 958">L<sub>Aeq</sub> (15 minute)</td> </tr> </thead> <tbody> <tr> <td data-bbox="331 981 419 1014">EPL-A</td> <td data-bbox="675 981 707 1014">38</td> <td data-bbox="874 981 906 1014">38</td> <td data-bbox="1082 981 1114 1014">37</td> <td data-bbox="1305 958 1369 1014">L<sub>A1</sub>(1min) 35</td> </tr> <tr> <td data-bbox="331 1025 419 1059">EPL-B</td> <td data-bbox="675 1025 707 1059">42</td> <td data-bbox="874 1025 906 1059">46</td> <td data-bbox="1082 1025 1114 1059">36</td> <td data-bbox="1305 1014 1337 1048">45</td> </tr> <tr> <td data-bbox="331 1070 419 1104">EPL-C</td> <td data-bbox="675 1070 707 1104">42</td> <td data-bbox="874 1070 906 1104">42</td> <td data-bbox="1082 1070 1114 1104">35</td> <td data-bbox="1305 1048 1337 1081">45</td> </tr> <tr> <td data-bbox="331 1115 579 1149">EPL-D, EPL-E, EPL-H</td> <td data-bbox="675 1115 707 1149">35</td> <td data-bbox="874 1115 906 1149">35</td> <td data-bbox="1082 1115 1114 1149">35</td> <td data-bbox="1305 1081 1337 1115">45</td> </tr> <tr> <td data-bbox="331 1160 419 1193">EPL-F</td> <td data-bbox="675 1160 707 1193">37</td> <td data-bbox="874 1160 906 1193">38</td> <td data-bbox="1082 1160 1114 1193">38</td> <td data-bbox="1305 1115 1337 1149">35</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td data-bbox="1305 1149 1337 1182">45</td> </tr> </tbody> </table> <p data-bbox="347 1238 1417 1305">Note: The licensee may provide to the EPA written evidence of any agreement with a landholder which is subject to the above noise limits. The written evidence may be submitted with a licence variation to remove the landholder from the above table.</p>	Location	Day Shoulder 6:00am - 7:00am	Day 7:00am - 6:00pm	Evening 6:00pm – 10:00pm	Night 10:00pm – 6:00am		L <sub>Aeq</sub> (15 minute)	L <sub>Aeq</sub> (15 minute)	L <sub>Aeq</sub> (15 minute)	L <sub>Aeq</sub> (15 minute)	EPL-A	38	38	37	L <sub>A1</sub> (1min) 35	EPL-B	42	46	36	45	EPL-C	42	42	35	45	EPL-D, EPL-E, EPL-H	35	35	35	45	EPL-F	37	38	38	35					45
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L5.3	<p>For the purposes of Condition L5.2:</p> <ul style="list-style-type: none"> <li>a) Day-Shoulder is defined as the period between 6am to 7am Monday to Saturday.</li> <li>b) Day is defined as: <ul style="list-style-type: none"> <li>a. the period from 7am to 6pm Monday to Saturday; and</li> <li>b. the period from 8am to 6pm Sundays and Public Holidays.</li> </ul> </li> <li>c) Evening is defined as the period from 6pm to 10pm.</li> <li>d) Night is defined as: <ul style="list-style-type: none"> <li>a. the period from 10pm to 7am Monday to Saturday; and</li> <li>b. the period from 10pm to 8am Sundays and Public Holidays.</li> </ul> </li> </ul>																																								
L5.4	<p>The contributed noise level from the premises must not exceed the noise limits specified within EPL 536 at the most noise-affected point on or within the boundary of any residential premises to the north and/or south of the premises, except as expressly provided by this licence, or by the EPA in writing.</p>																																								
L5.5	<p>The noise limits set out in conditions L5.2 apply under all meteorological conditions except for anyone of the following:</p> <ul style="list-style-type: none"> <li>a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or</li> <li>b) Stability category F temperature inversion conditions and wind speeds greater the 2 metres/second at 10 metres above ground level; or</li> <li>c) Stability category G temperature inversion conditions.</li> </ul>																																								
L5.6	<p>For the purpose of condition L5.5:</p>																																								

	<p>a) the meteorological data to be used for determining meteorological conditions is the data recorded at the meteorological station identified in this licence as EPA Identification Point W1.</p> <p>b) Stability category temperature inversion conditions are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the <i>NSW industrial Noise Policy (EPA 2000)</i></p> <p>Note: The weather station must be designed, commissioned and operated in a manner to obtain the necessary parameters required under the above condition.</p>																
L5.7	<p>To determine compliance:</p> <ol style="list-style-type: none"> <li>1. With the <math>L_{Aeq(15\text{ min})}</math> noise limits in condition L5.2, the licensee must locate noise monitoring equipment;             <ol style="list-style-type: none"> <li>a) approximately on the boundary, where any dwelling is situated 30 metres or less from the property boundary that is closest to the premises; or,</li> <li>b) within 30 metres of a dwelling facade (but not closer than 3 metres) where any dwelling on the property is situated more than 30 metres from the property boundary that is closest to the premises; or where applicable</li> <li>c) within approximately 50 metres if the boundary of a national park or nature reserve.</li> </ol> </li> <li>2. With the <math>LA1(1\text{ minute})</math> noise limits in condition L5.2, the noise monitoring equipment must be located within 1 metre of a dwelling facade.</li> <li>3. With the noise limits in condition L5.2, the noise monitoring equipment must be located;             <ol style="list-style-type: none"> <li>a) at the most affected point at a location where there is no dwelling at the location, or</li> <li>b) at the most affected point within an area at a location prescribed by conditions L5.7 1(a) or L5.7 1(b).</li> </ol> </li> </ol>																
L5.8	<p>A non-compliance will still occur where noise generated from the premises in excess of the appropriate noise limit is measured:</p> <ol style="list-style-type: none"> <li>a) at a location other than an area prescribed by the conditions of this licence, and /or</li> <li>b) at a point other than the most affected point at a location.</li> </ol>																
L5.9	<p>For the purpose of determining the noise generated at the premises the licensee must use a Class 1 or Class 2 noise monitoring device as defined by AS IEC61672.1 and AS IEC61672.2-2004, or other noise monitoring equipment accepted by the EPA in writing.</p>																
L5.10	<p>For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.</p>																
L7.1	<p>The licensee must comply with the operating hours specified in Column 2, Column 3, and Column 4 of the table below:</p> <table border="1" data-bbox="331 1406 1305 1646"> <thead> <tr> <th>Day</th> <th>Loading and Dispatch of Quarry Trucks</th> <th>Extraction and Processing</th> <th>Receipt of Concrete</th> </tr> </thead> <tbody> <tr> <td>Monday - Friday</td> <td>4:00am Monday to midnight Friday</td> <td>7:00am to 7:00pm</td> <td>7:00am to 5:00pm</td> </tr> <tr> <td>Saturday</td> <td>Midnight Friday to 6:00pm Saturday</td> <td>7:00am to 2:00pm</td> <td>7:00am to 2:00pm</td> </tr> <tr> <td>Sundays and Public Holidays</td> <td>None</td> <td>none</td> <td>none</td> </tr> </tbody> </table> <p>Note: Maintenance activities may occur at any time provided they are inaudible at privately-owned residence.            *VENM = Virgin Excavated Natural Material            **ENM = Excavated Natural Material</p>	Day	Loading and Dispatch of Quarry Trucks	Extraction and Processing	Receipt of Concrete	Monday - Friday	4:00am Monday to midnight Friday	7:00am to 7:00pm	7:00am to 5:00pm	Saturday	Midnight Friday to 6:00pm Saturday	7:00am to 2:00pm	7:00am to 2:00pm	Sundays and Public Holidays	None	none	none
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Sundays and Public Holidays	None	none	none														

**M9 Noise monitoring**

M9.1 To assess compliance with the noise limits specified within this licence, the licensee must undertake operator attended noise monitoring at each specified noise monitoring point in accordance with the table below.

**POINT 12,13,15,16,18**

Assessment period	Minimum frequency in a reporting period	Minimum duration within assessment period	Minimum number of assessment period
Day	2 times a year	1.5 hours	3 consecutive operation days
Evening	2 times a year	30 minutes	3 consecutive operation days
Night	2 times a year	1 hour	3 consecutive operation days

M9.2 The licensee must undertake the operator attended noise monitoring at each one of or at one or more noise monitoring points that is representative of the worse-case location(s) listed in this licence.

**NOISE MEASUREMENTS**

Attended noise monitoring was conducted with Brüel & Kjær Type 2250 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 “Sound Level Meters” and have current NATA calibration. Field calibration of each instrument was carried out at the start and end of each monitoring period.

The noise monitoring was conducted in general accordance with the requirements of Section 9 of the NMP (Noise Monitoring Protocol and Evaluation of Compliance) as follows;

*“Metromix proposes to adopt a noise monitoring protocol that provides feedback on the effectiveness of the noise control measures and demonstrate compliance with the conditions within the Project Approval 10\_0183 and Environment Protection Licence 0536.*

*The approach to monitoring compliance is based substantially upon Metromix’s experience to date which has identified the on-site activities have not been the source of noise complaints or any recorded non-compliance. Hence, it is considered the monitoring program needs to reflect this fact.”*

A-weighted noise levels were measured over 15 minute monitoring periods with data acquired at 1 second statistical intervals and the meter set to “fast” response. Each 1 second measurement is accompanied by a third-octave band spectrum from 20 - 20k Hz which is required for analysing INP ‘modifying factors’. Time based field notes allow for determination of the relative contributions to the overall noise level of all significant noise sources.

The worst case 15 minute Leq noise level for each monitoring period is shown in the tables below. Where the noise from TQ was audible, Bruel & Kjaer “Evaluator” analysis software was used to quantify the contributions of the quarry and other significant noise sources to the overall level.

Quarry noise from TQ is shown in the tables in bold type. Where noise from TQ is listed as faintly audible, this means the noise levels from the quarry were at least 10 dB below the ambient level during the measurement and not measurable.

Noise levels were recorded for each of the L10, Leq, Lmax, L1, L90 and Lmin percentiles. All noise levels shown in the tables of results are in dB(A) Leq (15 min). Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. Meteorological data used in this report was obtained from the quarry-operated weather station at the site. The wind speeds and directions shown in the tables of results are the arithmetic average of the five minute measurement periods throughout the entire noise monitoring period at each site.

At the time of the noise monitoring survey there were limitations placed on the movement of people in the area due to the impacts of COVID 19. From an acoustic point of view this meant that there was less road and rail traffic than would typically be the case (relative to previous noise monitoring). There was also less contribution to the acoustic environment from noise from other industries in the area.

### Noise Compliance Assessment

The results of the noise measurements undertaken throughout the various time periods are provided in **Tables 2 to 16**. EPL 536 refers to the various time periods as follows:

- a) Day-Shoulder is defined as the period between 6am to 7am Monday to Saturday.
- b) Day is defined as:
  - (i) the period from 7am to 6pm Monday to Saturday; and
  - (ii) the period from 8am to 6pm Sundays and Public Holidays.
- c) Evening is defined as the period from 6pm to 10pm.
- d) Night is defined as:
  - (i) the period from 10pm to 7am Monday to Saturday; and
  - (ii) the period from 10pm to 8am Sundays and Public Holidays.

Table 2 Teralba Quarry Noise Monitoring Results – 16 August 2021 (Night)					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed (m/s) / direction	Identified Noise Sources (Leq (15 min))
A	5:35 am	47	35	0.6 / 359	Traffic (46), birds (40), industrial noise (36), <b>TQ (25)<sup>1</sup></b>
B	4:30 am	49	35	1.9 / 0	Traffic (48), frogs (42), rooster (37), trains (29), <b>TQ inaudible</b>
D	4:30 am	40	35	1.9 / 348	Traffic (40), <b>TQ inaudible</b>
E	5:35 am	50	35	2.2 / 325	Birds (50), traffic (33), <b>TQ inaudible</b>
H	5:00 am	48	35	2.3 / 310	Traffic (45), birds (45), <b>TQ inaudible</b>
Notes: 1. Trucks on access road.					

Table 3 Teralba Quarry Noise Monitoring Results – 16 August 2021 (Day Shoulder)					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed (m/s) / direction	Identified Noise Sources (Leq (15 min))
A	6:35 am	47	38	2.2 / 323	Birds (45), traffic (42), trains (34), industrial noise (31), <b>TQ (28)</b>
B	6:23 am	49	42	1.0 / 14	Traffic (47), industrial noise (43), <b>TQ (31)</b> <sup>1</sup>
D	6:45 am	54	35	2.2 / 354	Traffic (54), birds (42), <b>TQ inaudible</b>
E	6:35 am	52	35	3.3 / 331	Birds (52), traffic (35), <b>TQ inaudible</b>
H	6:01 am	45	35	0.5 / 316	Traffic (43), birds (40), <b>TQ inaudible</b>

Notes: 1. Trucks on access road.

Table 4 Teralba Quarry Noise Monitoring Results – 16 August 2021 (Day)					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed (m/s) / direction	Identified Noise Sources (Leq (15 min))
A	7:00 am	49	38	1.8 / 335	Birds (46), traffic (46), <b>TQ (33)</b> , industrial noise (31)
B	8:35 am	56	46	0.9 / 275	Traffic (53), birds (53), trains (37), industrial noise (35), <b>TQ (33)</b> <sup>1</sup>
D	7:00 am	51	35	2.1 / 322	Birds (50), traffic (42), <b>TQ (38)</b>
E	9:15 am	51	35	2.9 / 304	Birds (50), traffic (42), <b>TQ (38)</b>
H	4:29 pm	48	35	2.7 / 266	Birds (47), traffic (38), <b>TQ inaudible</b>

Notes: 1. Trucks on access road

Table 5 Teralba Quarry Noise Monitoring Results – 16 August 2021 (Evening)					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed (m/s) / direction	Identified Noise Sources (Leq (15 min))
A	8:31 pm	46	37	3.0 / 238	Trains (44), industrial noise (39), <b>TQ inaudible</b>
B	7:15 pm	49	36	2.0 / 236	Traffic (47), trains (42), <b>TQ inaudible</b>
D	6:41 pm	50	35	2.9 / 342	Traffic (50), birds (39), <b>TQ inaudible</b>
E	7:53 pm	38	35	2.7 / 271	Traffic (37), birds (30), <b>TQ inaudible</b>
H	6:01 pm	36	35	1.3 / 211	Birds (34), Traffic (31), <b>TQ inaudible</b>

Table 6 Teralba Quarry Noise Monitoring Results – 17 August 2021 (Night)					
Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed (m/s) / direction	Identified Noise Sources (Leq (15 min))
A	5:35 am	46	35	0.6 / 209	Birds (44), traffic (41), industrial noise (28), <b>TQ (22)</b>
B	4:30 am	57	35	1.2 / 248	Frogs (55), traffic (50), trains (47), rooster (42), <b>TQ inaudible</b>
D	4:30 am	36	35	1.1 / 270	Traffic (36), <b>TQ inaudible</b>
E	5:35 am	41	35	0.7 / 295	Birds (40), traffic (35), <b>TQ inaudible</b>
H	5:00 am	44	35	0.6 / 269	Traffic (41), birds (39), <b>TQ inaudible</b>



**Table 7**  
**Teralba Quarry Noise Monitoring Results – 17 August 2021 (Day Shoulder)**

Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed (m/s) / direction	Identified Noise Sources (Leq (15 min))
A	6:35 am	50	38	1.1 / 351	Birds (49), traffic (42), industrial noise (27), <b>TQ (30)</b>
B	6:23 am	46	42	0.8 / 326	Traffic (44), industrial noise (40), <b>TQ (26)</b> <sup>1</sup>
D	6:46 am	53	35	0.9 / 300	Traffic (51), birds (45), <b>TQ (38)</b>
E	6:35 am	45	35	0.6 / 318	Birds (42), trains (40), traffic (36), <b>TQ (25)</b>
H	6:01 am	45	35	1.1 / 315	Birds (42), traffic (41), <b>TQ inaudible</b>

Note: 1 Trucks on access road

**Table 8**  
**Teralba Quarry Noise Monitoring Results – 17 August 2021 (Day)**

Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed (m/s) / direction	Identified Noise Sources (Leq (15 min))
A	7:00 am	51	38	1.0 / 322	Traffic (50), birds (45), <b>TQ (31)</b> <sup>1</sup> , industrial noise (24)
B	8:35 am	59	46	2.3 / 340	Traffic (57), birds (54), industrial noise (43), <b>TQ inaudible</b>
D	7:00 am	51	35	0.5 / 312	Birds (48), traffic (46), <b>TQ (40)</b>
E	8:35 am	40	35	1.5 / 297	Birds (38), traffic (32), <b>TQ (28)</b>
H	4:30 pm	47	35	1.0 / 62	Birds (44), traffic (43), <b>TQ inaudible</b>

Note: 1 Trucks on access road

**Table 9**  
**Teralba Quarry Noise Monitoring Results – 17 August 2021 (Evening)**

Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed (m/s) / direction	Identified Noise Sources (Leq (15 min))
A	8:28 pm	42	37	0.4 / 218	Trains (41), Dog (33), <b>TQ barely audible</b>
B	7:10 pm	51	36	0.4 / 276	Traffic (48), birds (48), <b>TQ inaudible</b>
D	6:36 pm	52	35	0.5 / 320	Traffic (52), <b>TQ (37)</b>
E	7:47 pm	39	35	0.4 / 193	Traffic (36), birds (35), <b>TQ inaudible</b>
H	6:00 pm	42	35	0.1 / 306	Traffic (40), birds (38), <b>TQ inaudible</b>

**Table 10**  
**Teralba Quarry Noise Monitoring Results – 18 August 2021 (Night)**

Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed (m/s) / direction	Identified Noise Sources (Leq (15 min))
A	5:35 am	49	35	1.1 / 229	Insects (46), traffic (45), birds (36), <b>TQ inaudible</b>
B	4:30 am	58	35	0.6 / 172	Trains (57), insects (41), traffic (46), <b>TQ inaudible</b>
D	4:30 am	38	35	1.0 / 208	Traffic (38), birds (25), <b>TQ inaudible</b>
E	5:35 am	45	35	1.3 / 255	Birds (45), traffic (32), <b>TQ inaudible</b>
H	5:01 am	46	35	0.8 / 205	Traffic (44), birds (39), <b>TQ inaudible</b>

Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed (m/s) / direction	Identified Noise Sources (Leq (15 min))
A	6:35 am	52	38	0.6 / 208	Traffic (50), birds (48), industrial noise (28), <b>TQ inaudible</b>
B	6:43 am	47	42	1.5 / 257	Traffic (45), industry (42), train (36), <b>TQ inaudible</b>
D	6:24 am	51	35	0.6 / 208	Traffic (50), birds (40), <b>TQ (37)</b>
E	6:35 am	48	35	1.4 / 270	Birds (48), traffic (32), <b>TQ (28)</b>
H	6:00 am	48	35	1.9 / 240	Birds (46), traffic (44), <b>TQ inaudible</b>

Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed (m/s) / direction	Identified Noise Sources (Leq (15 min))
A	7:00 am	48	38	1.5 / 237	Birds (47), traffic (42), <b>TQ (27)</b>
B	8:35 am	51	46	2.4 / 263	Traffic (50), birds (43), <b>TQ (34)<sup>1</sup></b>
D	7:00 am	47	35	1.4 / 244	Birds (45), traffic (38), <b>TQ (38)</b> , other industry (30)
E	8:35 am	42	35	1.2 / 193	Birds (42), <b>TQ (32)</b> , traffic (39)
H	4:31 pm	44	35	0.3 / 116	Birds (42), traffic (28), <b>TQ inaudible</b>

Note: 1 Trucks on access road

Location	Start Time	Total noise dB(A) Leq	Criterion dB(A) Leq	Wind speed (m/s) / direction	Identified Noise Sources (Leq (15 min))
A	8:29 pm	48	37	1.1 / 344	Traffic (47), trains (41), <b>TQ inaudible</b>
B	7:13 pm	45	36	0.9 / 279	Traffic (43), trains (39), <b>TQ inaudible</b>
D	6:38 pm	50	35	0.4 / 44	Traffic (50), birds (36), <b>TQ (32)</b>
E	7:50 pm	39	35	0.4 / 304	Birds (37), traffic (32), <b>TQ inaudible</b>
H	6:01 pm	44	35	0.6 / 99	Traffic (42), birds (40), <b>TQ (&lt;20)</b>

The results shown in Tables 2 to 13 show that, under the operational and atmospheric conditions at the time of monitoring, noise emissions from TQ exceeded the relevant criterion at Location D throughout the survey and at Location E during the day on 16 August. Visual inspection of the quarry from Rhondda Road, at these times, identified significant extraction equipment operating at natural ground level, and haul trucks transporting material on a haul road, on the southern edge of the extraction area.

All of the measured transport noise was attributed to TQ. It is understood, however, that, during the entire monitoring period, a nearby coal mine was transporting fly ash, in trucks, along a haul road to the west of TQ. The road in use passes through sections of the TQ lease area. Noise from trucks using this haul road would be of similar character to the noise from transport activity in the quarry and it would not be possible to determine the relative contributions of each to the total received noise.

Monitoring location EPL-B is situated close to the corner of Rhondda Road and Railway Street. This monitoring location is included predominantly to measure quarry noise from emissions from trucks exiting the site along the private section of the access road (through the Teralba Business Park). From the monitoring location it



was possible to determine which trucks were associated with the quarry and a dedicated spotter was not required during this monitoring period.

When measuring noise at the EPL-B location, the noise emissions from the exiting quarry trucks (whilst on the private section of the access road) was measured and the worst case 15 minute Leq noise level calculated based on the time each truck was on the private road. The worst case calculated Leq level for the trucks is that shown for Location B in Tables 2 to 13.

At location EPL-D the acoustic environment is significantly influenced by noise from traffic on Rhondda Rd and birds. Noise from trains and other industries within the vicinity also contributed to the acoustic environment. Due to the intermittent scheduling of trains, noise from these could be isolated from the worst case 15 minute periods (in relation to quarry noise). Noise emissions from the batching plant which is located adjacent to TQ contributed to the received noise during some monitoring periods. Due to the relative proximity of the batch plant to the quarry it is not possible to determine the relative contributions of each to the received noise.

Data from those times where TQ operations were audible were analysed using the “*Evaluator*” software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions of “modifying factor corrections” in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from TQ must not exceed **45 dB(A) L1 (1 min)** within the night-time period i.e. between the hours of 10 pm and 7 am, in accordance with *Condition L4.1* of EPL 536. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the quarry. The compliance measurement locations are different for each of the operational and sleep disturbance noise. That is, the sleep disturbance criterion is typically applicable at 1m from the façade of a bedroom window.

To avoid undue disturbance to residents, the L1 (1 min) noise level from the operational measurements are used to show general compliance with the sleep disturbance criterion. That is, as the distance between the noise source and the operational noise monitoring location is significantly greater than the distance between the operational noise monitoring location and the sleep disturbance monitoring location (i.e. 1m from the facade of the house) there will be little variation in L1 (1 min) levels between the two monitoring locations. It must be noted, however, that the sleep disturbance criterion is to be measured near a bedroom window. As the internal layout of each residence is not known, to consider a worst case, a bedroom window is assumed to be facing the operational noise monitoring location.

The results of the sleep disturbance measurements are shown in **Tables 14 to 16**.

Location	Time	dB(A), L <sub>1</sub> (1minute)	Wind speed (m/s) / direction	L <sub>A1</sub> source	Identified Quarry Sources (L <sub>1</sub> (1 min))
A	5:35 am	64	0.6 / 359	Traffic	n/a
B	4:30 am	67	1.9 / 0	Traffic	n/a
D	4:30 am	50	1.9 / 348	Traffic	n/a
E	5:35 am	58	2.2 / 325	Birds	n/a
H	5:00 am	57	2.3 / 310	Birds	n/a

Location	Time	dB(A), L <sub>1</sub> (1minute)	Wind speed (m/s) / direction	L <sub>A1</sub> source	Identified Quarry Sources (L <sub>1</sub> ( 1 min))
A	5:35 am	63	0.6 / 209	Traffic	n/a
B	4:30 am	65	1.2 / 248	Traffic	n/a
D	4:30 am	53	1.1 / 270	Traffic	n/a
E	5:35 am	54	0.7 / 295	Birds	n/a
H	5:00 am	54	0.6 / 269	Birds	n/a

Location	Time	dB(A), L <sub>1</sub> (1minute)	Wind speed (m/s) / direction	L <sub>A1</sub> source	Identified Quarry Sources (L <sub>1</sub> ( 1 min))
A	5:35 am	69	1.1 / 229	Traffic	n/a
B	4:30 am	80	0.6 / 172	Train	n/a
D	4:30 am	62	1.0 / 208	Train	n/a
E	5:35 am	55	1.3 / 255	Birds	n/a
H	5:01 am	56	0.8 / 205	Birds	n/a

As shown in Tables 14 to 16, during the night time measurement circuits the L1 (1 min) noise from TQ did not exceed 45 dB(A) at any monitoring location.

In summary the results of the noise monitoring programme have shown that the Teralba Quarry exceeded its noise limits at some locations during the survey, most likely due to heavy equipment operating at the highest point in the extraction area. The quarrying in this location was to be of relatively short duration and as, no actions are recommended with respect to noise management at Teralba Quarry.

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**

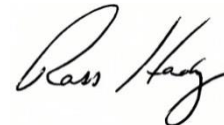
Author:



**Neil Pennington MAIP, MAAS**

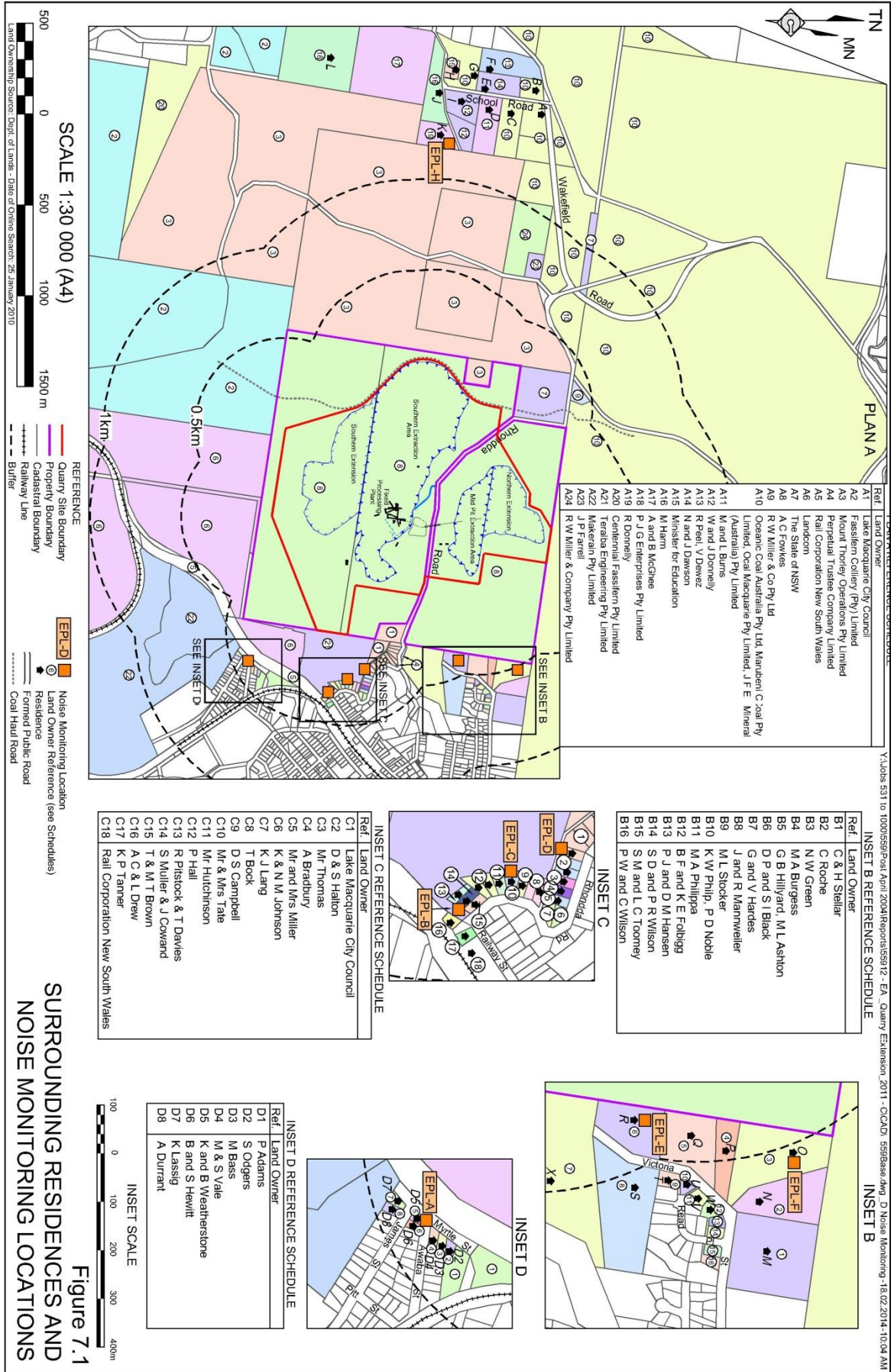
Acoustical Consultant

Review:



**Ross Hodge MAAS**

Acoustical Consultant







Location EPL – B Modified noise monitoring location