

**In the matter** of the Resource Management Act 1991

**And**

**In the matter** of an application for Resource Consents by Road Metals Company Limited to extend quarry operations onto adjoining land and operate an aggregate processing activity.

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**STATEMENT OF EVIDENCE OF GARY MARK WALTON  
FOR ROAD METALS COMPANY LIMITED**

**15 March 2018**

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**Duncan Cotterill**

Solicitor acting: Ewan Chapman  
PO Box 5, Christchurch

Phone +64 3 379 2430  
Fax +64 3 379 7097  
ewan.chapman@duncancotterill.com

## QUALIFICATIONS AND EXPERIENCE

- 1 My full name is Gary Mark Walton.
- 2 I am a Consultant with the international acoustical consulting firm of Marshall Day Acoustics (MDA). I hold a Bachelor of Science with Honours in Audio and Music Technology from the University of the West of England in the United Kingdom. I am a member of the Institute of Acoustics (UK), for which requirements of membership are that I am active in the field of professional acoustics and have suitable qualifications and experience.
- 3 I have worked in the field of acoustics since 2011 in both the United Kingdom and in New Zealand. I have experience in environmental noise assessments, construction noise and vibration, and noise control in relation to both environmental noise and building acoustics.
- 4 Of specific relevance to this project, I have been involved in many similar projects around New Zealand, including for quarries and other comparable activities such as contractors' yards. Examples of such projects are:
  - 4.1 Road Metals' Rolleston Quarry Expansion (2014) and Monitoring;
  - 4.2 GBC Winstone's Yaldhurst Quarry Expansion (2014) and Variation (2015);
  - 4.3 Quarry and concrete batching plant assessments for Christchurch Ready Mix Concrete (various sites);
  - 4.4 Lincoln University Cleanfilling Operation (2014);
  - 4.5 SOL Shingle Conservators Road Quarry (2015);
  - 4.6 Oxford Gravel Pit, Waimakariri District Council (2015)
  - 4.7 Harewood Gravels Conservators Road Quarry (2015);
  - 4.8 Waterloo Business Park Quarry, Islington (2016); and
  - 4.9 Frew's Contracting Savills Road Quarry Monitoring (2017).

## CODE OF CONDUCT

- 5 While this is a Council Hearing, I acknowledge that I have read and am familiar with the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014, and agree to comply with it. I confirm that this evidence is within my area of expertise, except where I state that this evidence is given in reliance on another person's evidence. I have considered all material facts that are known to me that might alter or detract from the opinions I express in this evidence.

## SCOPE OF EVIDENCE

- 6 I authored the noise assessment report<sup>1</sup> (the **Noise Report**) that accompanied the resource consent application and undertook associated ambient noise surveys.
- 7 In preparing my evidence, I have reviewed the following:
- 7.1 Council Officer's Notification Report<sup>2</sup> (including acoustic peer review<sup>3</sup> comments);
  - 7.2 Council Officer's s42A Report<sup>4</sup> (including acoustic peer review<sup>5</sup> comments); and
  - 7.3 Submissions.
- 8 My evidence will not repeat details of the Noise Report or documents referred to above, but I will summarise a few key points and comment on issues raised in the s42A report and submissions where these relate to noise.
- 9 To assist with interpretation, a glossary of acoustical terminology used is provided as Appendix A to this document.

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<sup>1</sup> Marshall Day Acoustics report reference Rp 001 R01 20170504, dated 3 August 2017.

<sup>2</sup> Christchurch City Council s95 Report, Emma Chapman, 04/12/2017.

<sup>3</sup> Acoustic Engineering Services Memorandum AC17211-01-D1, William Reeve, 28/12/2017.

<sup>4</sup> Christchurch City Council s95 Report, Emma Chapman, 06/03/2018.

<sup>5</sup> Acoustic Engineering Services Memorandum AC17211-02-D2, William Reeve, 01/03/2018.

## EXECUTIVE SUMMARY

- 10 The Noise Report considered a range of assessment criteria and I found that the District Plan noise limits are appropriate to protect residential amenity in the area. The key limits are 50 dB  $L_{Aeq}$  at the notional boundary of dwellings and 55 dB  $L_{Aeq}$  at the boundary of the quarry site.
- 11 The existing ambient noise environment in the area is generally governed by traffic on public roads and noise levels at dwellings on Buchanans Road and Old West Coast Road are typically between 50 and 55 dB  $L_{Aeq}$ , depending on their proximity to roads.
- 12 There are no new noise generating activities associated with the proposed quarry expansion. Potential noise effects for the nearest residents arise from relocation of some existing noise generating activities closer to these dwellings; specifically, the extraction and internal haulage of aggregate.
- 13 Quarrying activity will not occur within 100 metres of any dwellings without the consent of residents. This is much greater than the minimum distance assessed in the Noise Report (approximately 25 metres). Consequently, noise levels will be lower than the worst-case levels discussed in the Noise Report.
- 14 Noise from Road Metals' activity will comfortably comply with the District Plan noise standards. In addition, noise levels will generally be below the existing levels of ambient noise.
- 15 Some short-term site preparation works will also occur, such as bund construction and topsoil stripping. These are assessed as construction noise, mainly due to their temporary nature, and resulting noise levels will comply with limits given in the construction noise standard, NZS 6803.
- 16 I have addressed several specific noise matters raised in submissions in addition to comments provided in Council's s42A report.
- 17 Some submitters have raised concerns regarding the predicted increase in noise level. While this is the case, activity levels will be below both the existing ambient noise levels and applicable noise standards.

- 18 Considering also that there will be no changes in the usage of public roads by quarry traffic, there will be no substantial change to the submitters' overall noise environment.
- 19 Regarding the s42A report, Council's acoustic peer reviewer agrees that "*noise effects will be minimal at all existing dwellings*". I agree with Council's recommended consent conditions regarding noise (Conditions 22 to 26).
- 20 Overall, I remain of the view that levels of noise generated by this activity and received at neighbouring dwellings will be acceptable. Although noise from quarrying may be audible at times in some conditions, I consider the scale of any adverse effects to be minimal.

## **UPDATES AND CLARIFICATIONS**

- 21 As noted in my response<sup>6</sup> to Christchurch City Council's (CCC) s92 information request, some locations were mislabelled in our noise assessment report. Although these make no difference to the conclusions of our assessment, I have reiterated these issues for clarity, summarised in Appendix B.
- 22 I also note that the Noise Report was not predicated on, and did not consider the effects of, the now proposed 100 metre exclusion zone (setback) from the dwelling at 622 Buchanans Road. I will discuss this in more detail below.

## **NOISE REPORT FINDINGS**

### ***Noise Assessment Standards***

- 23 The proposed operating hours are within the daytime noise period, as defined in the Christchurch District Plan – 07:00 to 22:00, seven days. As such I have only considered daytime noise criteria.
- 24 The critical noise standards that are applicable in the Christchurch District Plan are:

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<sup>6</sup> Marshall Day Acoustics memorandum reference Mm 001 20170504, dated 2 October 2017.

- 24.1 50 dB  $L_{Aeq}$  at any point within the notional boundary<sup>7</sup> of a rural zoned dwelling;
- 24.2 55 dB  $L_{Aeq}$  at the boundary of any site<sup>8</sup> within a rural zone; and
- 24.3 55 dB  $L_{Aeq}$  at the boundary of the Special Purpose (Cemetery) Zone.
- 25 As I discuss in the Noise Report, these limits are more stringent than some other common guidance. As such, I consider that compliance with these noise limits will ensure an acceptable level of daytime amenity.
- 26 More lenient noise limits are appropriate for temporary enabling works (e.g. bund construction) given their short presence in any given location. Such activities are typically considered as construction noise, and assessed<sup>9</sup> in accordance with New Zealand Standard NZS 6803:1999 "*Acoustics - Construction Noise*".
- 27 Acoustic Engineering Services (**AES**), in their peer review for CCC's s95 and s42 reports, agree that the limits are "*appropriate to ensure noise effects are acceptable at adjoining rural sites*".

### ***Existing Noise Environment***

- 28 The daytime noise environment at dwellings adjacent to the site is typified by road traffic (on SH73, Buchanans Road and Old West Coast Road), aircraft and animals.
- 29 Noise levels at dwellings are generally determined by their proximity to local roads. Broadly I would summarise the ambient noise levels as:
- 29.1 Between 50 and 55 dB  $L_{Aeq}$  (15 min) for dwellings or areas set back from roads; and
- 29.2 55 dB  $L_{Aeq}$  (15 min) or greater for dwellings close to roads, such as that at 622 Buchanans Road.

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<sup>7</sup> A line 20 metres from any wall of a residential unit or building occupied by a sensitive activity, or the site boundary where this is closer to the residential unit or sensitive activity.

<sup>8</sup> Excluding road reserves/designations, in which case the limit applies on the opposite side of the road reserve.

<sup>9</sup> This Standard is specified for Construction Activities in the Christchurch District Plan (Rule 6.1.6.1.1.P2)

- 30 My ambient noise measurements were obtained between 15:00 and 16:30 on a weekday. My analysis of traffic flow data (from CCC and NZTA) suggests that traffic volumes during this period are not dissimilar to those at other times of day and therefore I expect the measured noise levels to be representative of the daytime ambient noise environment.

### **Noise Generation**

- 31 Noise from within the proposed “RM4” expansion block during quarrying will be limited to extraction and haulage activities only. There will be no processing plant in this block, or adjacent expansion blocks (RM2 and RM3), as this will continue to occur at the main site, as currently consented.
- 32 In addition, there will be no changes to the number of vehicle movements currently associated with the quarry. No additional traffic will be generated on public roads<sup>10</sup>.
- 33 Internal haulage of extracted materials within the site, via either dump trucks or road trucks, will continue to occur in the same manner as currently consented, as outlined in detail in Mr Forbes’ evidence.
- 34 Although the activity will move closer to receivers around the RM4 block, as these are currently some distance from the quarry, I note that no dwelling is located closer to these proposed works than previously considered in the RM2/RM3 expansion scenarios.
- 35 My Noise Report provided predicted noise levels that were based on measurements of Road Metals’ existing operation at the time of the RM3 consent in 2014.
- 36 These measurements show that noise from extraction and internal haulage activities will remain below 50 dB L<sub>Aeq</sub> for all receivers behind the boundary bund.
- 37 Quarrying will not occur within 100 metres of any dwelling outside the application site that has not provided their consent. Noise levels from quarrying will therefore in reality be well below the most stringent 50 dB L<sub>Aeq</sub> noise limit, and typically in the range of 40 to 45 dB L<sub>Aeq</sub>.

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<sup>10</sup> Evidence of Lindsay Forbes, para 17.

- 38      Aside from the main operation, some noise will also be generated by “construction activities” – short-term site preparation and rehabilitation works.
- 39      Construction activities must only occur within the daytime to ensure they will fall below the recommended upper limits given in the construction noise standard, NZS 6803. On that basis these should only occur between 07:30 to 18:00, Monday to Saturday.
- 40      Construction noise will comply with the NZS 6803 limits, even for the worst-case example of bund construction occurring on the site boundary adjacent to a dwelling. AES agree with this assessment<sup>11</sup>, subject to this time restriction discussed above.

## **SUBMISSIONS**

- 41      Most of the submissions that identified noise as a concern only did so in a general sense and hence have been addressed indirectly through my preceding comments. However, two did raise specific noise matters and I will comment on these directly.

### ***Marcia & Gerard Martini, 76 Old West Coast Road***

- 42      Mr and Mrs Martini express concern on the effects of noise received in their outdoor areas, noting they also operate a B&B lodge, as well as noise received in the Yaldhurst Cemetery. They state that little traffic noise is heard in their outdoor area.
- 43      I have reviewed aerial imagery of their property and it appears that the outdoor living areas are set back from Old West Coast Road (by at least 50 metres) and mostly screened behind various structures.
- 44      I expect that these features (setbacks and screening) account for the fact that they do not seem to experience intrusive levels of noise from road traffic passing. However, these features will also provide similar screening for quarrying noise.
- 45      The Martini’s dwelling is located over 300 metres from proposed quarrying activity. At this distance I expect that noise received from activity within the RM4 block will comfortably be below 40 dB  $L_{Aeq}$  at this location. As a guide, 10 dB is a significant difference in noise level and is subjectively perceived as a halving of sound.

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<sup>11</sup> Para 11, pg. 2 of AES Memorandum (dated 28/12/2017) appended to s95 Decision



- 46 Furthermore, I reiterate that there will be no change in the level of road traffic noise because of this activity – at this dwelling or any other – as no additional traffic will be generated on public roads.
- 47 Regarding the Yaldhurst Cemetery, this already experiences a relatively high level of road traffic noise, in excess of 50 dB  $L_{Aeq}$ . The cemetery does not share a common boundary with the RM4 block, and even worst-case noise levels will be below 45 dB  $L_{Aeq}$ .
- 48 In addition, the RM4 block is further from the cemetery than the existing RM3 block. This suggests that the worst-case noise levels are likely to be lower than in the currently consented scenario.

***Derek & Jessica Vallance, 105 Old West Coast Rd***

- 49 Mr and Mrs Vallance raise a number of points around noise, principally relating to: truck movements; the calculation methodology; operational hours of the processing plant and potential noise level increase from the activity.
- 50 To clarify any confusion around truck numbers, I understand that there will be no changes to existing vehicle usage of public roads (as previously discussed) and that there will be no additional numbers of dump truck movements on internal haulage roads. Within the site, trucks will ferry material from the working face back to the main site at the same rate as presently.
- 51 However, the route of the trucks will move closer to dwellings around the RM4 site. As with the extraction activity, the potential noise effect is due to the change in location or proximity, rather than a fundamental change in the nature of the activity.
- 52 Taking the Vallance's dwelling as an example, the closest quarrying activity to them within the RM3 block is around 300 metres away. This will reduce to around 100 metres for RM4.
- 53 Despite this, noise from the activity will continue to remain below the existing ambient noise level. In terms of subjective response, the activity is likely to go from being:
- 53.1 Insignificant at 300 metres away (below 35 dB  $L_{Aeq}$ , or more than 15 dB below the existing background noise level); to

- 53.2 Just noticeable at 100 metres away (between 40 and 45 dB  $L_{Aeq}$ , or at least 5 dB below the existing background noise level), typically only audible during lulls in traffic.
- 54 Regarding the calculation methodology, the predictions are based on noise measurements of Road Metals actual equipment in situ, rather than relying on generic data and are also consistent with noise source data I have reviewed for other projects.
- 55 The measurements are representative of noise from extraction within a pit, where equipment is working at the face of the excavation. Ground level works, as identified in the Vallance's submission, would only consist of topsoil stripping, which would be assessed as a temporary construction activity and occurs infrequently.
- 56 Finally, I note that noise from the crusher will not increase as more aggregate is quarried, as per the Vallance's suggestion. The processing plant will continue to operate as at present and noise levels will not change.

## SECTION 42A REPORT COMMENTS

- 57 I have only minor comments to add in response to the Council Officers' report and these are mainly just to add clarification.
- 58 AES' peer review notes that *"when the quarry is at a stage where equipment is operating close to the boundary, noise from quarry equipment will be audible and distinct in character from passing traffic"*<sup>12</sup>.
- 59 I agree with this statement to an extent, but note that:
- 59.1 The proposed 100 metre setback from 622 Buchanans Road (where owners have not given consent) means that the noise levels will be lower than discussed in the report (as I have previously addressed);
- 59.2 Accordingly, quarrying noise levels of 40 to 45 dB  $L_{Aeq}$  are on par with the measured background noise level of around 45 dB  $L_{A90}$ ; and

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<sup>12</sup> Para 10, pg. 2 of AES s42A Memorandum (dated 01/03/2018).

- 59.3 While the character of the noise will differ slightly to general road traffic, the noise source is vehicle engines and therefore not out of character for the environment.
- 60 I agree with AES' recommendation to restrict site preparation works to after 07:30 to ensure compliance with the construction noise limits. While the majority of such work could take place without exceeding the noise limits for earlier time periods, this is the simplest way of ensuring compliance.
- 61 AES discuss cumulative noise from other activities within the wider Road Metals site. I confirm that these have been considered and notable noise sources, such as the fixed processing plant, are sufficiently far away that they will not generate any notable additional noise at dwellings around the RM4 site. Cumulative noise levels will remain comfortably below 50 dB L<sub>Aeq</sub> at all times.
- 62 I agree with Ms. Chapman's assessment<sup>13</sup> that a noise monitoring condition is unnecessary given the proposed 100 metre setback from the dwelling at 622 Buchanans Road that has not given affected persons' approval to the application.

## CONCLUSIONS

- 63 My assessment shows that the proposed quarry extension will comfortably comply with the District Plan's daytime noise standards of 50 dB L<sub>Aeq</sub> at dwellings and 55 dB L<sub>Aeq</sub> at the site boundary.
- 64 Noise levels from the activity will also be below the levels of existing traffic noise in the area, which typically exceed 50 dB L<sub>Aeq</sub> at local dwellings.
- 65 On this basis, I conclude that there will be minimal adverse noise effects as a result of this activity.



Gary Mark Walton

15 March 2018

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<sup>13</sup> Emma Chapman, s42A Report, paragraph 61.

## APPENDIX A

## GLOSSARY OF TERMINOLOGY

### Ambient

The ambient noise level is the noise level measured in the absence of the intrusive noise or the noise requiring control. Ambient noise levels are frequently measured to determine the situation prior to the addition of a new noise source.

### dB

#### Decibel

The unit of sound level.

Expressed as a logarithmic ratio of sound pressure  $P$  relative to a reference pressure of  $P_r=20 \mu\text{Pa}$  i.e.  $\text{dB} = 20 \times \log(P/P_r)$

### dBA

The unit of sound level which has its frequency characteristics modified by a filter (A-weighted) so as to more closely approximate the frequency bias of the human ear.

### $L_{A90}(t)$

The A-weighted noise level equalled or exceeded for 90% of the measurement period. This is commonly referred to as the background noise level.

The suffix "t" represents the time period to which the noise level relates, e.g. (8 h) would represent a period of 8 hours, (15 min) would represent a period of 15 minutes and (2200-0700) would represent a measurement time between 10 pm and 7 am.

### $L_{Aeq}(t)$

The equivalent continuous (time-averaged) A-weighted sound level. This is commonly referred to as the average noise level.

The suffix "t" represents the time period to which the noise level relates, e.g. (8 h) would represent a period of 8 hours, (15 min) would represent a period of 15 minutes and (2200-0700) would represent a measurement time between 10 pm and 7 am.

### $L_{Amax}$

The A-weighted maximum noise level. The highest noise level which occurs during the measurement period.

### Masking Noise

Intentional background noise that is not disturbing, but due to its presence causes other unwanted noises to be less intelligible, noticeable and distracting.

### Special Audible Characteristics

Distinctive characteristics of a sound which are likely to subjectively cause adverse community response at lower levels than a sound without such characteristics. Examples are tonality (e.g. a hum or a whine) and impulsiveness (e.g. bangs or thumps).

## **APPENDIX B            AMENDMENTS TO NOISE REPORT**

The following items were updated in our RFI response of 2 October 2017:

- Section 2.1 (pg. 3) describes the dwellings at 622 and 659 Buchanans Road as being *“between 40 and 70 metres from the site boundary”*. They are in fact this distance from the pit edge as assessed in our modelling, rather than the site boundary.
- Similarly, Section 4.2 (pg. 10) refers to the dwelling at 622 Buchanans Road as being *“around 40 metres from the site boundary”*. This should be 659 Buchanans Road and, as above, the distance is from the pit edge rather than the site boundary.
- Accordingly, the assessment position for the notional boundary of 659 Buchanans Road is 6.5 metres back from the site boundary.