

IN THE MATTER

of the Resource Management Act 1991

AND

IN THE MATTER

of a submission regarding the extractive industry noise controls in the Proposed Waikato District Plan.

**BRIEF OF EVIDENCE OF NEVIL IAN HEGLEY ON BEHALF OF
FULTON HOGAN LIMITED**

DATED: 8 September 2020

INTRODUCTION

1. My full name is Nevil Ian Hegley. I am the principal of Hegley Acoustic Consultants.
2. I am giving this evidence on behalf of Fulton Hogan Limited.
3. I have the following qualifications relevant to the evidence I shall give.
 - (a) I have specialised in acoustics for the last 40 years;
 - (b) I have an MSc from Southampton University where I undertook research in acoustics in 1975/76;
 - (c) I am a Member of the Institution of Professional Engineers New Zealand, the Institution of Civil Engineers London and the Acoustical Society of America;

- (d) I have been on the majority of the Standards sub-committees dealing with sound issues since 1977 and I was the Chairman of both of the sub-committees that approved the 1984 and 1999 versions of the Construction Noise Standard NZS6803;
 - (e) In 2010, I was awarded the Meritorious Award by Standards New Zealand for outstanding commitment to the development of New Zealand Acoustic Standards;
 - (f) I have been involved with the measurement and assessment of more than 75 quarries throughout the country; and
 - (g) I am familiar with the majority of quarries in the Waikato area and the surrounding environment although I have only addressed one of these quarries in this evidence.
4. I have read and agree to comply with the code of conduct for expert witnesses in the Environment Court 2014 Practice Note.

BACKGROUND

5. The Operative Waikato District Plan adopts the following rule for extractive industries:

25.19 Extractive industry noise

25.19.1

Any activity is permitted if extractive industry noise, measured at the notional boundary of any dwelling existing at 25 September 2004, or at any site in the Living Zone, does not exceed:

- (a) 55dBA (L_{10}) 7am to 7pm Monday to Friday;*
- (b) 55dBA (L_{10}) 7am to 6pm Saturday;*
- (c) 50dBA (L_{10}) 7pm to 10pm Monday to Friday;*
- (d) 50dBA (L_{10}) 7am to 6pm Sundays and Public Holidays;*
- (e) 45dBA (L_{10}) and 70dBA (L_{max}) at all other times including public holidays.*

6. The meaning of noise in the Operative District Plan is:

Means noise levels as measured in accordance with NZS6801:1999 Acoustics Measurement of Environmental Sound and assessed in accordance with NZS6802:1991 Assessment of Environmental Sound.

7. The Proposed District Plan assumes that quarry noise is treated the same as noise from any other Rural Zone activity. This effectively reduces the noise limit for quarries as currently applicable in the Operative District Plan by 5dB.
8. It is appreciated the assessment of the noise changes from L_{10} using NZS6801:1999 to L_{Aeq} using NZS6801:2008 so there is the potential argument that there is a 2 – 3dB difference in the two indices with the L_{Aeq} being less restrictive than L_{10} .
9. However, when adopting L_{Aeq} NZS6801:2008 Acoustics – Measurement of Environmental Sound states in clause 7.1.2 *"to demonstrate compliance, measurements should include or be appropriately adjusted to slightly positive propagation conditions, which are the upper limits of the meteorological window"*.
10. The 1991 and 1999 versions of NZS6801 adopt a neutral environmental window to measure and assess noise. The 1991 version of NZS6801 is adopted in some of the resource consent conditions for quarries in the Waikato area and the 1999 version is adopted in the Operative District Plan.
11. If assessing the noise using the earlier Standards (neutral sound propagation) then assessing the noise using the slightly positive propagation conditions required via the 2008 Standard (as adopted in the Proposed District Plan) the 2 – 3dB difference between L_{10} and L_{Aeq} at source breaks down as the distance from the noise source increases. Close to the noise source the L_{Aeq} is typically 2 – 3dB lower than the L_{10} value. However, due to the effects of positive meteorological conditions

as used in the assessment of L_{Aeq} compared to neutral conditions as used for L_{10} , this means the difference between L_{Aeq} and L_{10} reduces to 2.5dB at 100m, 0.8dB at 200m, zero at 300m and after that L_{Aeq} becomes more restrictive than L_{10} . These values will vary slightly for different sound spectrums but the concept that the L_{10} control can be interchanged for the L_{Aeq} control is reasonable. In fact, for quarries where the distances to the receiver are generally greater than 300m the L_{Aeq} is more stringent than the L_{10} limit.

12. It is therefore considered reasonable to assume that L_{10} and L_{Aeq} are interchangeable and reflect the same environmental noise effect despite L_{Aeq} being slightly more restrictive at the distances involved for quarries.

SECTION 42A REPORT

13. In response to the Fulton Hogan submission to retain the noise requirements of the Operative District Plan the Section 42A report states:

"I am cautious that the alternative limits represent a better balance of enablement and effect management than the general noise rules. They will have the result of actually increasing restrictions on peak noise, and will not materially increase the base average. As such the insertion of an additional rule appears to be inefficient and ineffective relative to simply retaining the general noise rule. These submitters are welcome to provide acoustic evidence that demonstrates the need for the proposed alternative limits and that demonstrates these limits to strike a better balance than the general rules."

14. It is not clear what is meant by *"I am cautious that the alternative limits represent a better balance of enablement and effect management than the general noise rules"*.
15. Quarries are unique, they must be located where the resource is located and without doubt quarries are one of the noisier industries. There are limited options to reduce the noise from quarries and once they are established there are limited options to further reduce the noise if they are to comply. These unique design parameters are acknowledged in the

Operative District Plan, as they are in many District Plans, with the implementation of appropriate noise limits and the control of future noise sensitive development near the quarries.

16. It is suggested in the Section 42A report "*They [presumably the L_{Aeq}] will have the result of actually increasing restrictions on peak noise and will not materially increase the base average*". As set out above, there will not be an increase in the noise received by neighbours. In fact, there will be a reduction in the noise for the neighbours around the quarries due to the distances between the noisy activities and the existing dwellings.
17. The Section 42A report states "*the insertion of an additional rule appears to be inefficient and ineffective relative to simply retaining the general noise rule*".
18. I believe that quarries do warrant a specific noise rule where the zone where they are located sets a level lower than quarries have been designed for or if new quarries are to be provided for. As set out above, quarries do not have the luxury to operate anywhere other than at the location of the resource.
19. The two basic aspects of the noise controls applicable for quarries are the noise level and the potential for new residential development coming to the area.
20. As set out in all of the noise Standards to date (and recommended by the World Health Organization) levels of up to 55/45dB L_{Aeq} for the day/night periods will ensure a reasonable noise environment for noise sensitive activities such as dwellings. Subject to the outcome of any submissions, the Waikato Proposed District Plan adopts a level 5dB lower than what is considered a reasonable level for the operation of existing quarries. This being the case it is reasonable to adopt a rule specifically for quarries. This is no different to having different rules for residential, industrial and commercial zones. It simply reflects the varying expectations for the

given activities and suggests efficiency rather than inefficiencies with noise rules.

21. The current quarry noise limits relate to any dwelling existing on 25 September 2004. A specific design criterion such as this is often adopted for quarries and has been adopted by the Environment Court that considers the unique nature of quarries. These controls vary from adopting noise control boundaries to limits relating to dwellings at a specific date. Without any such controls in place quarries run the risk of reverse sensitivity effects from long term development which have the potential for the quarry to be closed, or at the least severe limitations being imposed on the quarry.
22. It is noted that some of the quarries in the Waikato are already operating above 50dBA L_{10} although within the 55dBA L_{10} design requirements of the Operative District Plan.
23. As an example, the typical topography at quarry sites is relatively flat in the processing area with the quarry resource quickly rising behind the processing area and in most cases little surplus flat land available.
24. Should the design level be reduced by 5dB to 50dB L_{Aeq} as suggested in the Proposed District Plan the operation of the quarry would be significantly compromised. The significance of a 5dB reduction can be better understood when taking into account a reduction of 3dB is a halving of the noise sources (ie two loaders must be reduced to 1 loader) and a 5dB reduction is just under quarter the reduction of total noise sources (ie 4 loaders must be reduced to 1 loader assuming there are only four loaders generating noise on site).
25. To reduce the noise by 5dB L_{Aeq} , the options available are to use quieter plant on site, relocate the processing plant to increase the distance to the receiver location or provide additional screening of the plant. Reducing the plant numbers is not a practical option.

26. The quietest plant available is already being used on site to achieve compliance research plus field testing in an existing quarry has demonstrated it is not practical to further reduce the noise at source.
27. Due to the steep topography that typically extends beyond the processing plant it is impractical to move the processing plant further back into the site. It also takes a doubling of the distance between the noise source to the receiver to reduce the noise by 6dB and I am not aware of a quarry where this would be practical.
28. Screening of the processing area beyond using the stockpiles (which is already standard practice at quarry sites) is impractical, as most of the flat land available at quarry sites is normally already in use. Further, it is impractical to screen plant operating on an elevated quarry face and this is one of the controlling noise sources.
29. The above should satisfy the Section 42A report suggestion that the submitter "*demonstrates the need for the proposed alternative limits*".
30. It is noted that quarries such as Waingaro in Ngaruawahia have been through the rigorous of resource consent hearings and the 55dBA noise limit was found to be appropriate and reasonable in that decision. There are also a number of other quarries in the Waikato that are exposed to operational difficulties if a more stringent noise limit is adopted.
31. It is believed it is both reasonable and appropriate to retain the same basic limits of the existing noise rule for extractive industries with the only change being the L_{10} should be replaced with L_{Aeq} and the 2008 Standards should be adopted. These limits reflect the existing conditions and the fact a quarry has limited opportunity to control the noise beyond the original site establishment.

RECOMMENDATIONS

32. It is recommended, that subject to updating the noise rule to reflect the requirements of the 2008 Standards, the same rule that is applicable in the Operative District Plan should be retained in the Proposed District Plan. That is:

Extractive industry noise

(a) Any activity is permitted if extractive industry noise, measured at any point within the notional boundary of any dwelling existing at 25 September 2004, or at any site in the Living Zone, does not exceed:

- (a) 55dB L_{Aeq} 7:00am to 7:00pm Monday to Friday;
- (b) 55dB L_{Aeq} 7:00am to 6:00pm Saturday;
- (c) 50dB L_{Aeq} 7:00pm to 10:00pm Monday to Friday;
- (d) 50dB L_{Aeq} 7:00am to 6:00pm Sundays and Public Holidays;
- (e) 45dB L_{Aeq} and 70dB (L_{AFmax}) at all other times including public holidays.

(b) Noise levels must be measured in accordance with the requirements of New Zealand Standard NZS 6801:2008 "Acoustics - Measurement of Environmental Sound".

(c) Noise levels must be assessed in accordance with the requirements of New Zealand Standard NZS 6802:2008 "Acoustic - Environmental Noise".

CONCLUSIONS

33. The quarries in the Waikato District are currently operating within the noise limits of the Operative District Plan without any apparent adverse noise effects for the neighbours.
34. If the noise level for extractive industries is reduced by 5dB as currently suggested in the Proposed District Plan, it will have a significant adverse effect on the industry.
35. It is recommended the existing noise rule for extractive industries should be retained with the only change being to adopt L_{Aeq} and update the way the noise is measured and assessed in accordance with the requirements

of NZS6801:2008 Acoustics - Measurement of Environmental Sound and
NZS6802:2008 Acoustics – Environmental Noise.

36. This will not alter the level of noise for residents, as currently permitted by the Operative District Plan, or allow any increase in the level of noise from the extractive industries

Nevil Hegley

8 September 2020