

Memo

Environmental Health

To: Laura Galt – Hamilton City Council

From: Peter McGregor – Hamilton City Council **Date:** 27 November 2025

Subject: Ruakiwi Reservoir Requirement – Technical Specialist Report for Section 42A Reporting

Technical Area: Construction and operational noise and vibration

Version: Final

Purpose

1. This memorandum has been prepared to provide technical assessment under section 42A of the Resource Management Act 1991 (RMA), in respect of construction and operational noise and vibration in relation to the Ruakiwi Reservoir Alteration to Designation (the Requirement).

Introduction

2. My name is Peter McGregor. I am the Environmental Health Principal Advisor with Hamilton City Council. I hold a Bachelor of Science (Technology) from the University of Waikato in 1982. I hold the Royal Society of Health Diploma in Public Health (1984), a Royal Society of Health Diploma in Noise Control from the NZ Technical Correspondence Institute (1987) and a Certificate in Noise Measurement and Assessment from Southern Monitoring Services (2009).
3. I have been involved in the review of expert reports assessing construction and operational noise and vibration in support of applications for resource consent since 2010. This includes providing advice to processing planners for their notification and consenting decisions, including recommendations on conditions.

Code of Conduct

4. I have read the Environment Court Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023 and agree to comply with it. I confirm that the opinions expressed in this memorandum are within my area of expertise except where I state that I have relied on the advice of other persons. I have not omitted to consider materials or facts known to me that might alter or detract from the opinions I have expressed.

Scope

5. This memorandum covers the following:
 - a. The environmental effects of construction and operational noise and vibration of allowing the Requirement and whether any such adverse effects will be acceptable.

- b. Relevant matters raised, and relief sought, in submissions.
- c. Relevant statutory considerations
- d. Recommended amendments and/or additions to the Requiring Authority's proposed designation conditions.

Executive Summary

- 6. This memorandum provides a technical assessment under section 42A of the Resource Management Act (RMA), focusing on construction and operational noise and vibration aspects related to the Ruakiwi Reservoir Alteration to Designation (the Requirement). Following a review of pertinent documents, and analysis of specific issues raised in submissions, I conclude that the effects can be managed by appropriate designation conditions, including the new or modified conditions that I recommend below, or similar conditions, will have adverse effects on construction and operational noise and vibration that are generally no more than minor.
- 7. I have reviewed the submissions on construction and operational noise and vibration matters and recommended responses to them.

Documents considered

- 8. The following documents have been considered in the preparation of this assessment:
 - a. *Central City Reservoir - Ruakiwi: Notice of Requirement for an alteration to an existing designation, prepared by Bloxam Burnett & Olliver Ltd (BBO) for Hamilton City Council (HCC), August 2025 (Final).*
 - b. *HCC NEW WATER RESERVOIRS - ASSESSMENT OF ACOUSTIC EFFECTS (Marshall Day Acoustics, Rp 002 r01 20241335, 7 August 2025) (the MDA report).*
 - c. The Submissions listed in Table 1.

Table 1 Submissions that raise construction and operational noise and vibration matters

Number	Submitter
001	Ernestt Ross Needham
005	Glenda Morrissey

Site Visit

- 9. A site visit was not deemed necessary in order to make the conclusions as outlined in this memorandum.

Analysis

Introduction

10. Marshall Day Acoustics is a recognised acoustic consultancy providing advice on many different projects over the years. I have reviewed multiple acoustical reports provided by them in support of applications for resource consent by their clients. I find their assessments on noise emission and adverse effects associated with noise to be comprehensive and of sufficient detail to make informed decisions.
11. In my opinion, the MDA report provides a good analysis of the effects of the works on construction and operational noise and vibration matters.
12. I largely agree with and adopt that analysis for the purposes of this memorandum.

Environmental effects

Construction noise

13. Construction noise is subject to NZS6803:1999 as required by rule 25.8.3.2 of the Hamilton Operative Plan. This standard allows higher levels of noise for construction works on the basis that any adverse noise effects are temporary. Compliance with the time and duration-based noise limits in the standard means compliance with the rule and that any adverse effects are acceptable.
14. All construction works, except for those outlined in proposed condition 13, would be restricted to 7:00am to 6:30pm Monday to Friday (excluding public holidays). The applicable limit during this timeframe, based on the expected duration of works, is 70dB LAeq assessed over a 15-min measurement period at approx. 1m from building facades. Noise levels would vary significantly over each day and during the different stages of the overall construction schedule.
15. Predicted noise levels associated with anticipated construction activities over all construction stages are documented in section 4 – Construction Noise Assessment, of the MDA report. The prediction methodology uses information from the Reservoir Construction Method Statement (draft, v1 26 June 2025). The methodology also assumes a 2.4m high acoustically effective site hoarding is in place as shown in Figure 5 of the MDA report throughout the construction period. Predicted levels that are less than the 70dB limit are considered acceptable in terms of adverse effects. No other acoustic mitigation measures that may be applied are considered in the methodology at this stage.
16. Section 4 shows that most construction activities would comply with the 70dB limit. The activities that are predicted to exceed the limit at receivers R1 to R3 (as described in Table 1 of the MDA report) are-
 - Minor exceedances (71 to 73dB)-*
 - Woodchipper (except complies at R3)
 - Plate compactor
 - Significant exceedances (75 to 82dB)-*
 - Vibratory sheet piling (also predicted to exceed at R4)
 - Combined noise from discharge mains drilling

17. Vibratory sheet piling is the activity with the highest level of noise ranging between 78 and 80dB LAeq over the three receivers, with 82dB LAeq at the worst-case position. This activity would occur over 10-15 days early in the construction period during site enabling works. The site hoarding would be ineffective in mitigating noise from this activity due to the source height.
18. Combined noise from discharge mains drilling would range from 75 to 78dB LAeq over the three receivers. The duration of these works is not specified.
19. In addition to the above, noise from early morning concrete pours, which are anticipated to commence as early as 5:00am, are predicted to exceed the lower noise limits that apply at that time. These are 45dB LAeq between 5:00am and 6:30am and 55dB LAeq between 6:30am and 7:30am. The predicted levels over the three receivers range from 59 to 61dB LAeq. These levels significantly exceed the noise limits when occurring before 7:30am (but would comply with the 70dB limit that applies after 7:30am). It is anticipated that 4 early morning pours would occur (2 per floor and roof) would be required for each reservoir.
20. In summary, significant effects would be produced during vibratory sheet piling, discharge mains drilling and early morning concrete pours without additional specific mitigation measures for each activity.

Construction vibration

21. Predicted vibration levels from high-vibration sources/activities associated with piling and compaction are documented in Table 12 of the MDA report in relation to the closest receiver (which is 17 Ruakiwi Rd (R1) according to Table 1 in the report). All predicted levels are less than the limits in the German Standard DIN 4150-3:1999. The MDA report states that vibration levels would also be lower than the recommended amenity limit.
22. Therefore, it is considered that there would be no adverse effects from construction vibration at any of the receiver locations.

Operational noise and vibration

23. The MDA report in section 1.0 that MDA considered operational noise and vibration would be negligible and so this has not been assessed in the report.

Matters raised in submissions

Submission 1 – Ernestt Ross Needham – 1/17 Ruakiwi Rd

24. The submitter's concern is that construction noise would be in excess of already liberal construction noise levels and nothing has been provided to provide assurance that these effects would be mitigated in any meaningful way.
25. It is assumed the submitter is referring to the construction activities discussed in paragraphs 15 to 19 of the MDA report that would exceed the 70dB limit and for concrete pours the 45dB and 55dB limits. The predicted noise levels at the submitter's location from these activities are-
 - Wood chipper - 73dB
 - Vibratory sheet piling - 80dB
 - Discharge mains (combined noise) - 78dB
 - Early morning concrete pours (combined noise) - 61dB

26. As stated in paragraph 15, It is noted that the only acoustic mitigation considered in the MDA report when predicting noise levels is the 2.4m high site hoarding shown in Figure 5 of the report.
27. The proposed condition 14 would require a Construction Noise and Vibration Management Plan (CNVMP). Proposed condition 15 requires the CNVMP to be prepared by a suitably qualified and experienced person in construction noise.
28. Proposed condition 17 outlines the matters required to be addressed in the CNVMP, which includes adopting the best practicable option to minimise noise from the construction activities where noise would exceed the 70dB, and in the case of early morning concrete pours, 45dB and 55dB limits. This would include documenting and implementing additional mitigation measures that can be applied to these activities.
29. Some of these measures are indicated in the MDA report and include-
 - Alternative construction methodologies
 - Using smaller or different equipment with a lower sound power output where practicable
 - Locating mobile equipment beyond the minimum compliance distances where practicable
 - Localised screening around activities where practicable (in addition to the general site hoarding)
 - Communications with affected parties
 - Timing of activities to occur while affected parties are not at home
30. The implementation of additional mitigation measures, while not necessarily achieving compliance with the noise limits, would mitigate adverse noise effects as much as is practicable.
31. Further conditions prohibit the commencement of works until the CNVMP has been certified by the regulatory arm of Council and require that construction works be carried out in accordance with the CNVMP.
32. My view is that the submitter's concerns are adequately addressed through the current proposed conditions.
33. However, I recommend that the proposed condition 15 makes it clear that the suitably qualified and experienced person in construction noise is an acoustic consultant. This would provide a higher level of assurance to all stakeholders that the CNVMP would implement the best practicable option to mitigate noise as much as is practicable.

Submission 1 – Ernestt Ross Needham – 1/17 Ruakiwi Rd

34. The submitter states that vibration is another significant concern and that construction piling techniques will have both amenity impacts and potentially impinge on their home and compromise the structural integrity of their home and asks what monitoring and compensation would be put in place.
35. As stated in paragraphs 22 and 23, vibration levels associated with piling are predicted to comply with the required cosmetic and structural limits in the German DIN standard and to be under the recommended amenity limit.

36. If there remains a concern with vibration, then I recommend a condition be added that would require pre- and post-project building surveys of the submitter's property carried out by a suitably qualified and experienced building assessor.

Submission 5 – Glenda Morrissey – 4/17 Ruakiwi Rd

37. The submitters concern is that the construction phase, anticipated to extend up to 30 months, would generate considerable noise, vibration, and traffic disruption. These effects would negatively impact visitors, dog walkers, and nearby residents who value the tranquillity of the domain. The Assessment of Environmental Effects (AEE) underplays these issues by suggesting operational noise and vibration would be negligible. However, the potential for early morning concrete pours (as early as 5:00 a.m.) and heavy vehicle movements along Ruakiwi Road—within approximately 10 metres of residential dwellings—has not been appropriately addressed. These disruptions are likely to be more significant than stated.
38. Generally, the discussion in paragraphs 25 to 31 (noise) and paragraphs 35 and 36 (vibration) respond to this submitters concerns.
39. With reference to operational noise and vibration, section 1 of the MDA report states that this would be negligible.
40. My view is that the submitters concerns are adequately addressed through the current proposed conditions.

Statutory Considerations

41. I have reviewed the discussion in section 13 of the NoR on the provisions in the statutory documents relating to construction and operational noise and vibration that are listed below. I agree with the comments on those provisions. In my opinion, based on that analysis, the Requirement is consistent with those provisions.
- a. RMA – Section 5 – Purpose of RMA,
 - b. RMA – section 7 – Other matters –
 - i. maintenance and enhancement of the quality of the environment
 - c. Hamilton District Plan – objective 28.8.2.1 - Activities have minimal adverse noise and vibration effects on other activities and sites, consistent with the amenity values of the receiving environment.

Conclusions

42. In my opinion, from a construction and operational noise and vibration perspective, the proposed works for which designation is sought:
43. Can be managed by appropriate designation conditions, including the new or modified conditions that I recommend below, or similar conditions, will have adverse effects that are no more than minor and comply with the relevant statutory requirements addressed above.

Recommendations

Designation conditions

44. I recommend the following amendments and/or additions to the Requiring Authority's proposed designation conditions:
- a. Condition 13 be amended to clarify that no construction works can occur on Saturdays.
 - b. Condition 15 be amended to make it clear that the suitably qualified and experienced person in construction noise is an acoustic consultant.
 - c. Condition 17 be amended to include in the matters to be addressed in the CNVMP-
 - the activities listed in condition 13 that would be permitted to occur outside the stated timeframe
 - a requirement to carry out pre and post building condition surveys of the dwellings at 1/17 and 4/17 Ruakiwi Rd by a suitably qualified and experienced building assessor.