

**BEFORE THE HEARING COMMISSIONERS
NAPIER**

IN THE MATTER

of the Resource Management Act 1991
(the Act)

AND

IN THE MATTER

of applications by Port of Napier Limited
to undertake wharf expansion,
associated capital and maintenance
dredging, disposal of dredged material
within the coastal marine area, and
occupation of the coastal marine area
for existing port activities and the
proposed new wharf

STATEMENT OF EVIDENCE OF CRAIG MICHAEL FITZGERALD

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INTRODUCTION

Qualifications and experience

1. My full name is Craig Michael Fitzgerald. I am an Associate with Marshall Day Acoustics (**MDA**), specialising in environmental noise and vibration assessments, building acoustics and underwater acoustics.
2. I have a Bachelor of Engineering (Mechanical) from the University of Auckland. I am a Chartered Engineer (CEng) registered with the Engineering Council (UK). I am a Member of the Acoustical Society of New Zealand and the Institute of Acoustics (UK).
3. I have worked in the field of acoustics in New Zealand and England for the past 12 years. I have experience in environmental acoustics for large infrastructure projects, including appearing as an expert witness for Council and Environment Court Hearings, and Environment Court mediation. I also have experience in architectural acoustics, and present an annual acoustics lecture to Building Science students at Victoria University.
4. Some of my recent marine project experience includes:
 - (a) Wharf extensions for Ports of Auckland and Port Otago
 - (b) Kennedy Point, Waikawa and Westhaven Marinas
 - (c) Americas Cup infrastructure and events consents (currently before the Environment Court).

Involvement in project

5. MDA first prepared a noise model for Port of Napier in 1994. Since 2012, I have assisted Port of Napier with noise assessments in the Napier Hill community, with monitoring, modelling and reporting, expanding the noise mitigation scheme, and participating in community engagement in relation to port noise matters.
6. MDA was engaged in 2016 to undertake an assessment of noise effects from the construction of Wharf 6. My colleague, Benjamin Lawrence, authored the construction noise

assessment included in the application documentation¹. I prepared the airborne noise model included in that document and reviewed the report. I authored the Future Noise Assessment report². I have visited the site and liaised with the relevant team members to ensure the assessment of effects addresses the proposed activities. I agree with the conclusions and recommendations therein.

Expert Witness Code of Conduct

7. I have been provided with a copy of the Code of Conduct for Expert Witnesses contained in the Environment Court's Practice Note dated 1 December 2014. I have read and agree to comply with that Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Purpose and scope of evidence

8. The new wharf is 350m long and 34m wide, oriented east / west at the northern edge of the existing container terminal.
9. The purpose of this evidence is to confirm the findings of the construction noise assessment. It addresses potential airborne noise and underwater noise from construction. Construction vibration is not addressed in detail because, as explained in the report, I have concluded that the levels will be negligible at locations of sensitive receivers due to separation distance.
10. Piling activities are predicted to generate the highest airborne and underwater noise levels, and therefore this activity is the focus of the noise assessment. The wharf is to be supported by a grid of 900mm and 1200mm diameter steel piles at approximately 6.5m centres. The piles would be installed using a hydraulic hammer resulting in an estimated 290 – 360 strikes per day.
11. My evidence covers the following matters:

¹ Rp 001 R06 2016446A BL Wharf 6 Construction Noise Assessment, dated 28 April 2017, Appendix J in Volume 3 to the Application documentation.

² Rp 004 R06 2015784A CMF Port of Napier Wharf 6 Future Port Noise Maps 2026, dated 20 September 2017, Appendix K in Volume 3 to the Application documentation.

- (a) Construction Noise (Airborne);
- (b) Construction Noise (Underwater);
- (c) Future Port Operations
- (d) Comments on the Council Report;
- (e) Comments on submissions;
- (f) Conclusions.

Summary of conclusions

12. I consider that airborne and underwater noise effects associated with the construction of Wharf 6 will be appropriate provided the construction activities are undertaken within appropriate hours of the day and are managed through a suitable construction noise management plan (**CNMP**) as was proposed in the Draft Conditions included in the application documentation³.
13. I consider the conditions of consent would appropriately deal with any relevant effects. However, I recommend condition 13 in relation to Consent CL 180008C should be updated to align better with Hawke's Bay Regional Coastal Environment Plan Rule 176 d).

CONSTRUCTION NOISE (AIRBORNE)

14. The proposed Wharf is located within the Coastal Marine Area, but both the City of Napier District Plan and the Hawke's Bay Regional Coastal Plan apply in terms of noise generated from port activities. Both plans require that noise arising from construction, maintenance and demolition work must comply with New Zealand Standard NZS 6803: 1999 "Acoustics - Construction Noise".
15. The construction duration exceeds 20 weeks, therefore the standard long-term construction noise limits are 70 dB L_{Aeq} and 85 dB L_{AFmax} , 0730 to 1800 hours, Monday to Saturday. Lower noise limits apply during morning and evening shoulder periods, while the night-time noise limits generally preclude noisy construction activities entirely.
16. The existing receiving noise environment on Napier Hill is generally controlled by port operations. The annual average

³ See the AEE, section 25.2.

24-hour noise level at the Bluff Hill Noise Monitoring Terminal on the corner of Seascape and Karaka Roads is 56 dB L_{Aeq} .

17. I predict piling works will achieve compliance with the daytime construction noise limits of 70 dB L_{Aeq} and 85 dB L_{AFmax} , with the closest dwellings receiving noise levels in the order of 55 dB L_{Aeq} and 65 – 70 dB L_{AFmax} . This is similar to the noise levels typically received from more proximate container terminal activities.
18. While noise from the impact piling would likely be noticeable at the nearest dwellings due to its character, I consider that the predicted noise levels would be appropriate on the basis that the levels readily comply with the noise limits, works would be of limited duration and undertaken within appropriate hours of the day. I have recommended the implementation of a CNMP to minimise the effects of airborne noise and underwater noise (discussed below).

CONSTRUCTION NOISE (UNDERWATER)

19. Section 16 'Duty to Avoid Unreasonable Noise' of the RMA requires adoption of the best practicable option to ensure underwater noise emissions do not exceed a reasonable level.
20. Neither the City of Napier District Plan nor the Hawke's Bay Regional Coastal Plan have further guidance on underwater noise⁴.
21. The ambient underwater noise level at three measurement locations was found to be generally typical of a coastal harbour environment, with wave noise, vessel movements and port activity being the principal noise sources.
22. I note that subsequent to the underwater survey for Napier Port, a suspect performance anomaly of the hydrophone used was identified. The hydrophone manufacturer reviewed the sensitivity of the hydrophones to examine the calibration and integrity of the equipment used for this and other surveys. The manufacturer concluded that the equipment was operating within the approved tolerances except for "a *minor deviation in receiving sensitivity in the band 2-4 kHz*".

⁴ While not directly applicable, the Auckland Unitary Plan (**AUP**) requires assessment of underwater noise effects on marine mammals from impact and vibratory piling methods, and it is now regarded as good practice to investigate this as part of a noise assessment when coastal structures are proposed

This potentially elevates the reported levels above by no more than 1 decibel. This is not a significant change to the reported levels and not material to the assessment, conclusions and management measures proposed.

23. Cawthron Institute identified four species of marine mammals known to visit the wider area on a regular basis:
 - (a) Common dolphins and Orca are mid-frequency cetaceans (**mf**) for the purposes of underwater noise sensitivity;
 - (b) Southern Right Whale are low-frequency cetaceans (**lf**) for the purposes of underwater noise sensitivity.
 - (c) New Zealand Fur Seal are otariid pinnipeds (**ow**) for the purposes of underwater noise sensitivity.
24. I have relied on the National Oceanic and Atmospheric Administration: 'Technical Guidance for Assessing the Effects on Anthropogenic Sound on Marine Mammal Hearing' (**NOAA**). The NOAA guidelines identify the received levels above which individual marine mammals are predicted to experience changes in hearing sensitivity. These changes are either temporary (**Temporary Threshold Shift or TTS**), or permanent (**Permanent Threshold Shift or PTS**). Auditory threshold shifts can be caused from peak exposure (high-level impulsive events such as pile strikes) or from cumulative exposure (lower noise levels over an extended period such as from vibro-piling or multiple pile strikes).
25. NOAA also provides interim guidance for behavioural impacts, which are variable in nature and scale.
26. My colleague predicted noise from underwater piling noise using the 'dBSea' computer prediction model which enables spatial visualisation of the zones of influence. Since the assessment report was prepared, the TTS criteria are now more commonly used for management zones. This change does not materially change the assessment, its conclusions or the management measures proposed.
27. I recommend the following procedure to manage the potential effects of underwater noise on marine mammals and divers:
 - (a) Underwater noise monitoring of the first occurrence of impact and vibratory piling methods to allow verification of the TTS zone

- (b) Visual monitoring 30 minutes prior to commencing piling operations to ensure there are no marine mammals within the TTS zone
- (c) Use of a wooden (preferable) or plastic dolly for impact driven piles, 'soft starts' (gradually increasing the piling intensity) and minimising duty cycle
- (d) Visual monitoring during piling and implement low power or shut down procedures if a marine mammal is identified within the TTS zone

These requirements should be built into the CNMP and can be cross-referenced in the intended Marine Wildlife Management Plan.

FUTURE PORT OPERATIONS

- 28. I have updated the Port of Napier noise model to represent both current (2016) and future (2026) operations with Wharf 6 and forecast growth. I consider that the noise model provides an accurate representation of current and future port noise emissions during peak operating periods.
- 29. In summary:
 - (a) The future (2026) noise contours I prepared are generally the same shape as the current (2016) noise contours, but 1 – 2 decibels louder. I note that the subsequent 2017 and 2018 review periods are similar to the 2016 period, so the current contours remain representative.
 - (b) Port of Napier future operations are predicted to remain compliant with Napier District Plan noise rule 28.15.1 part (a).

RESPONSE TO MATTERS RAISED IN SECTION 42A REPORT

- 30. I have reviewed the aspects of Hawke's Bay Regional Council's section 42A report which are relevant to noise and vibration. It summarises my findings and raises no further issues or concerns subject to the following proposed conditions of consent.
- 31. I wish to comment on the draft noise conditions included in the report, which relate to Consent CL 180008C:
 - (a) Condition 13: *"Noise resulting from construction activity shall not exceed the New Zealand*

Construction Noise Standard NZS 6803 (1999)". This proposed condition generally aligns with the existing requirements of both the City of Napier District Plan Rule 57.14 and Hawke's Bay Regional Coastal Plan Rule 176 d). However, the Standard includes more than just noise limits. Therefore, I recommend the wording is updated to better reproduce the wording in Hawke's Bay Regional Coastal Environment Plan Rule 176 d). "*Construction noise must not exceed the limits recommended in, and measured and assessed in accordance with, New Zealand Standard NZS6803:1999 'Acoustics: Construction Noise'*".

- (b) Condition 18: Requires the preparation of a CNMP. I agree with this proposed condition.

RESPONSE TO MATTERS RAISED IN SUBMISSIONS

32. I have reviewed the submissions and I am not aware of any concerns relevant to construction noise. However, Seascope Environment Society Inc. (submission 14) and a number of similar suggestions from individual submitters, include general concerns about noise from port operations and the qualification thresholds for the noise mitigation scheme. I have attended Port Noise Liaison Committee meetings to inform these concerns, but they are not directly relevant to this project. However, I note that the Noise Mitigation Scheme design noise level is the current incident façade noise level plus 3 decibels (safety factor to accommodate design tolerance and the potential future port growth identified).

CONCLUSIONS AND RECOMMENDATIONS

33. I consider that airborne and underwater noise effects associated with the construction of Wharf 6 will be appropriate provided it is undertaken within appropriate hours of the day and are managed through a suitable CNMP.
34. The predicted future (2026) noise contours are generally the same shape as the current (2016) noise contours, but 1 – 2 decibels louder. Nonetheless, future operations are predicted to remain compliant with Napier District Plan noise rule 28.15.1 part (a).

35. I consider the conditions of consent would appropriately deal with any relevant effects. However, I recommend condition 13 should be updated to align with the wording of Hawke's Bay Regional Coastal Environment Plan Rule 176 d).

Craig Michael Fitzgerald

6 August 2018