BEFORE A HEARING PANEL
CONSTITUTED BY NELSON CITY COUNCIL

IN THE MATTER of the Resource Management Act 1991

IN THE MATTER of an application by CCKV Maitahi/Mahitahi Development Co LP and Bayview Nelson Limited for a change to the Nelson Resource Management Plan (Private Plan Change 28)

EVIDENCE OF ROGER YOUNG FOR FRIENDS OF THE MAITAI
27 JUNE 2022

QUALIFICATIONS AND EXPERIENCE

1. My full name is Roger Graeme Young.

2. I hold a PhD (University of Otago, 1998) and BSc (Hons) (University of Otago 1992).

3. I am a freshwater ecologist and have been employed in this role at the Cawthron Institute for the last 24 years. My responsibilities include management of Cawthron's Freshwater Ecosystems Group.

4. My work involves a mix of government-funded research on river ecosystems, and commercial projects assisting a range of clients with freshwater management issues. My work has included studies on new tools for river health assessment, minimum flow and water allocation assessments, factors affecting fish abundance, relationships between human pressure indicators and river ecosystem integrity, water quality sampling and data analysis, integrated catchment management, synergies between western scientific and cultural indicators of river health, and tools for rehabilitating river ecosystems.

5. I have written 68 scientific papers and more than 90 reports relating to this work.

6. I have provided a variety of advice to the Nelson City Council on freshwater monitoring and management over many years and have contributed to the development of the draft Whakamahere Whakatū Nelson Plan.

7. Andrew Spittal and Neil Donaldson (Maitahi) hosted Tom Kennedy (Friends of the Maitai) and me on a tour of the area influenced by the Proposed Private Plan Change in early May 2022.

8. I participated in various expert witness conferencing sessions alongside experts assisting the Applicants and other parties. The sessions I attended focussed on water quality, water sensitive design, erosion and sediment control and ecology (both terrestrial and aquatic).

EXPERT WITNESS CODE OF CONDUCT

9. I have read the Code of Conduct for Expert Witnesses set out in the Environment Court Practice Note 2014 and I agree to comply with it. I confirm that the opinions I express in this evidence are within my expertise and represent my true and complete professional opinions. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

SCOPE OF EVIDENCE

10. I have been asked by Friends of the Maitai to prepare evidence on water quality and aquatic ecology issues associated with the proposed private plan change request sought for the Maitahi Bayview development.

11. In particular, my evidence provides information on:

    (a) the existing environment in the Maitai Catchment, Nelson Haven and Tasman Bay

    (b) issues typically encountered in urban waterways

    (c) potential effects associated with the proposed development

    (d) my assessment of the adequacy of the information provided by the Applicants

THE EXISTING ENVIRONMENT

12. The majority of the proposed Maitahi Bayview development is located within the Maitai River catchment, via the Kaka Valley Stream, although some of the development area will drain into small streams along the ocean side of the Atawhai hills.

13. The Maitai River is highly valued by the Nelson community and supports a variety of aquatic life. However, a detailed review of water quality, hydrology and ecological information from the Maitai River catchment (Crowe et al. 2004) identified some specific concerns, including:

    (a) decreased water clarity and increased fine sediment inputs in the lower parts of the river compared with the upper reaches

(b) warm water temperatures in the lower river, occasionally exceeding levels that will cause mortality of sensitive fish and other aquatic life

(c) downstream increases in nitrate nitrogen in the river, and associated proliferations of periphyton biomass, including regular blooms of toxic cyanobacteria in the lower reaches

(d) concentrations of faecal indicator bacteria, typically low in the upper reaches of the river, but occasionally reaching levels of concern for recreation in the lower river

(e) downstream declines in stream health, as measured by macroinvertebrate community composition, with high quality (e.g., mayfly-dominated) assemblages usually present in the upper reaches and poorer quality assemblages (e.g., those dominated by snails and midge larvae) in the lower reaches

(f) the Maitai River was a notable local trout fishery in the past. The trout were reputed to be mostly small and very abundant. However, since the 1980s, the trout fishery appears to have deteriorated substantially, particularly in the main stem upstream of The Brook confluence.

(g) thirteen species of native freshwater fish have been recorded in the Maitai River Catchment, but these sampling records focus on the presence/absence of species and reveal very little about their abundance. The available information is not able to detect any changes in abundance or distribution over time.

14. Water quality and stream health appears to be poor in the small streams along the Atawhai hills that are monitored, with high concentrations of faecal bacteria and nutrients and the macroinvertebrate communities present in these streams are indicative of poor ecological health (Crowe 2002; www.lawa.org.nz).

15. The Maitai River and small Atawhai streams drain into Nelson Haven and eventually Tasman Bay. These coastal areas are highly valued for their aesthetic appeal, rich biodiversity, shellfish collection, aquaculture, swimming, fishing, boating and scientific appeal. Key threats to the Nelson Haven are elevated muddiness caused by sediment runoff from urban and rural catchment areas, and localised sediment toxicity and eutrophication (nutrient over-enrichment) at urban stream mouths

entering the Haven (Stevens & Robertson 2017). These threats are also relevant to Tasman Bay.

16. In summary, the proposed development drains into highly valued and sensitive waterways that are already experiencing the effects of sedimentation, contaminants and warm water temperatures. Any development needs to be done with extreme care to avoid exacerbating these stressors.

TYPICAL ISSUES ASSOCIATED WITH THE HEALTH OF URBAN STREAMS

17. Throughout the world, urban streams are often associated with what's been described as an 'urban-stream syndrome' with symptoms typically including an unnaturally variable flow regime (bigger floods and extreme low flows), high concentrations of nutrients and contaminants, elevated water temperatures, altered channel morphology, and a reduced diversity of aquatic life (Walsh et al. 2005).

18. Urban streams are increasingly being affected by newer or previously unknown types of stress, such as those resulting from waste materials such as plastics and chemicals, including pharmaceuticals and narcotics (Richardson & Soloviev 2021).

19. This international pattern is consistent with what is seen in New Zealand, and Nelson, with streams draining urban areas typically having issues with sediment, nutrients, pathogens and other contaminants, such as heavy metals. Macroinvertebrate communities in these urban waterways are typically indicative of poor ecosystem health (MFE 2020; www.lawa.org.nz).

20. In summary, urban development has a consistent set of effects globally on waterways draining these urban areas. Considerable mitigation efforts and careful management will be required to avoid the symptoms of urban stream syndrome becoming apparent in the Kaka Stream and other waterways influenced by the development.

POTENTIAL EFFECTS ASSOCIATED WITH THE PROPOSED DEVELOPMENT

21. The Ecology report (Tonkin & Taylor 2021) and particularly the Environmental Review (Morphum Environmental Ltd 2021) provide a good summary of the potential ecological effects of the proposed Maitahi Bayview development.

22. In my opinion these potential effects include:

    (a) *Erosion and sediment input to waterways* - soil disturbance, erosion and sediment input to downstream waterways is likely to occur during vegetation clearance and site preparation, road development, Kaka Stream realignment, floodplain lowering, section development and house construction. Sediment is a major factor affecting stream and estuary health as inputs of fine sediment to waterways smother in-stream habitat, reduce food quality for aquatic organisms and reduce water clarity. Erosion and sediment input to sensitive downstream waterways would be expected to continue after the development and construction activities were completed, but to a lesser extent.

    (b) *Runoff of urban contaminants and input to waterways* - stormwater inputs to waterways of contaminants other than sediment can also have detrimental effects on aquatic life in downstream waterways and cause human health risks for people contacting the water. These contaminants include toxic chemicals such as heavy metals and polycyclic aromatic hydrocarbons, as well as nutrients and faecal bacteria. These are typically sourced from road runoff and roofs. There is also the chance of wastewater spills and leaks occurring, especially during storm events and if there are accidental cross-links between the stormwater and wastewater systems. Stormwater running off roofs and paved urban areas during summer can also be very warm, causing mortality of sensitive aquatic life.

    (c) *Change to flow regime* - the increase in impervious area (house roofs, roads, driveways), and the loss of vegetation and wetland

areas resulting from the development are likely to cause bigger floods and more severe droughts.

(d) *Loss of stream habitat* - piping and burial of intermittent channels and tributaries of Kaka Stream, along with straightening of streams will potentially reduce the length and quality of aquatic habitat. The proposed realignment of the lower Kaka Stream appears to shorten its current flow path.

(e) *Degradation of habitat quality* - any loss of riparian vegetation alongside Kaka Stream and its tributaries will result in less shading, higher stream temperatures and reductions in the supply of organic matter (food) to these stream ecosystems.

ADEQUACY OF INFORMATION PROVIDED

23. The plan change application indicates that the applicants are aware of the potential detrimental effects of the proposed development and aim to ensure that the Maitahi Bayview development is compliant with the National Policy Statement for Freshwater Management (NPS-FM 2020) and the Nelson Resource Management Plan and follows principles of Te Mana o te Wai. However, there is considerable uncertainty about how well these requirements can be met.

24. I understand that there is a two-stage process (Plan Change request followed by specific resource consent applications) before any development can proceed. I also recognise that detailed specifications and assessments of effects will be required during the resource consent process, but I consider that sufficient information is needed now at the Plan Change stage to determine whether the size and scope of proposed mitigation tools can be implemented and if they will be sufficient to address the potential effects. At this stage, the likely effectiveness of the proposed mitigation efforts is unclear (Ahiablame et al. 2012).

ESPLANADE RESERVE IS NOT A SILVER BULLET

25. Schedule X.7 of the application requires that an esplanade reserve with a minimum total width of 40 m shall be vested in stages as subdivision progresses. A 40 m reserve may be sufficient to shade the stream if there

is appropriate tall riparian vegetation planted in this reserve, but an area wider than 40 m with thick grasses or wetland vegetation would potentially be required to filter sediment runoff from some of the steep slopes alongside Kaka Stream.

26. Ideally, there should be at least a 20 m buffer on each side of the stream, although I recognise the benefits of providing some flexibility in providing a minimum of 40 m total width to reflect natural topography and geological features alongside the Kaka Stream channel, as highlighted in the Ecology JWS.

27. I am concerned that this esplanade reserve (also called the blue-green spine) is considered a 'silver bullet' that will address most of the concerns associated with the development, as well as provide a walking/cycling track. I think this is unrealistic. In my opinion it is not appropriate to locate the proposed stormwater treatment wetlands within the esplanade reserve. Additional areas would need to be set aside for this purpose.

SCHEDULE X.9 – BEST PRACTICE PRINCIPLES

28. Schedule X.9 of the application lists a series of best practice principles that shall be used to avoid or reduce the effects of the development on ecological values in Kaka Stream and downstream waterways. I agree with the aims of these high-level principles, although as noted in the Ecology JWS I consider that X.9 should also:

    (a) Apply to the entirety of the Structure Plan area
    (b) Refer to the mandatory fish passage requirements of the NPS-FM and NES-F
    (c) Avoid impervious surfaces and structures within 5 m of Kaka Stream
    (d) Avoid or minimise adverse effects of urbanisation and stream loss
    (e) Include ecological principles / provisions for terrestrial ecology to ensure areas that provide important connectivity or buffering functions, and significant indigenous vegetation and significant habitats for indigenous fauna
    (f) Allow for an alternative to the realignment of Kaka Stream as an enhancement opportunity

(g) Include erosion and sediment control management and vegetation clearance

(h) Ensure there is a link to Stormwater Management Plans.

VEGETATION REMOVAL

29. Vegetation removal from steep areas within the proposed development area has already been completed in large parts of the area covered by the Plan Change and was being conducted on very steep slopes while I was being shown around the site. I understand that no consent conditions have been breached as part of this vegetation clearance (Andrew Spittal, pers comm.) but I have observed erosion and sediment movement above Walters Bluff over the last 12 months after vegetation clearance of the steep slopes.

REALIGNMENT OF THE LOWER REACHES OF KAKA STREAM

30. The proposed realignment of the lower reaches of Kaka Stream is described as an ecological enhancement activity, but it is also integrated with requirements to accommodate peak flows and protect the proposed adjacent development areas from potential flooding.

31. The lower reach of Kaka Stream is heavily modified and provides low quality habitat to stream life currently. As discussed in the Ecology JWS, ecological enhancement of Kaka Stream may be achieved without needing to realign the lower reaches of the waterway.

ADDITIONAL INFORMATION PROVIDED BY THE APPLICANT

32. The Structure Plan provided with the Plan change application included very little detail, so it was impossible to determine the location of roading and housing, where earthworks will occur, the likely scale of issues like erosion and sediment export, where the biggest risk areas were likely to be located, and if proposed mitigation options like wetlands and stormwater retention ponds were large enough or in the right location to address the risks.

33. A more detailed Structure Plan has been developed in response to concerns raised at the expert witness conferencing. I also understand that

plans relating to sediment/erosion management and stormwater management are also being developed.

34. At the time of writing this evidence I have not been able to thoroughly review these draft plans. I will review these documents prior to the hearing. I am particularly interested to see if there are monitoring requirements included (both pre- and post-development), any water quality or other standards that need to be met, and if the consequences of any breaches to such limits/standards are listed.

Roger Graeme Young

27th June 2022

References

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