ENVIRONMENT COURT OF NEW ZEALAND
WELLINGTON REGISTRY

I MUA I TE KOOTI TAIAO O AOTEAROA
TE WHANGANUI-A-TARA

ENV-2023-WLG-000005

Under	the Resource Management Act 1991
In the matter of	the direct referral of applications for resource consent and notices of requirement under sections 87G and 198E of the Act for the Ōtaki to North of Levin Project
By	Waka Kotahi NZ Transport Agency

STATEMENT OF REBUTTAL EVIDENCE OF NICHOLAS JOHN KEENAN ON BEHALF OF WAKA KOTAHI NZ TRANSPORT AGENCY

Dated 10 October 2023

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INTRODUCTION

1. My full name is **Nicholas John Keenan.**

2. I prepared a statement of evidence (**Evidence**) regarding stormwater effects of the proposed Ōtaki to North of Levin Project (**Ō2NL Project** or **Project**), dated 4 July 2023.

3. My qualifications and experience are set out in my Evidence.

4. In this rebuttal evidence I use the same defined terms as in my Evidence.

5. I repeat the confirmation given in my Evidence that I have read the 'Code of Conduct' for expert witnesses and that my evidence has been prepared in compliance with that Code.

6. This rebuttal evidence responds to points made in evidence by:

   (a) Mr Stu Farrant, on behalf of Manawatū-Whanganui Regional Council (**Horizons**) and Greater Wellington Regional Council (**GWRC**) (together, the **Regional Councils**);

   (b) Mr Logan Brown, Horizons and GWRC expert on water quality and aquatic ecology;

   (c) Ms Justine Bennett, on behalf of Horowhenua District Council (**HDC**) and Kapiti Coast District Council (**KCDC**);

   (d) Mr Phil Jaggard, on behalf of Kāinga Ora; and

   (e) John Bent

7. I attended expert conferencing on 8 August 2023 with:

   (a) Mr Keith Hamill, Project water quality expert;

   (b) Mr Farrant;

   (c) Mr Brown;

   (d) Ms Bennett; and

   (e) Mr Phil Jaggard, on behalf of Kāinga Ora.

RESPONSE TO MR FARRANT

Stormwater design – absence of Regional Council review role

Concerns

8. General design intent, background references and wider Project context were discussed at expert conferencing but the expectation for a detailed design process that finished with final verification reviews and certification through Regional Council was not an issue discussed or recorded. However, I understand Mr Farrant's concern (statement of evidence 26/09/2023 paragraphs 10-26) is that Regional Councils will not have further and final opportunity to review the details of the proposed stormwater management designs closer to the end of the design phase, and then to formally certify the designs prior to construction phase. Mr Farrant seeks further Council consideration and verification be applied to ensure that the designs function as intended and are maintainable.

Responses

9. The design may be conceptual, but the information Regional Council can assess includes:

   (a) locations and orientations;

   (b) volumes and surface areas; and

   (c) components of the treatment train process.

10. These are shown in the Project drawings and are based on 3D landform modelling using LiDAR ground model data.

11. The concept design of each individual proposed stormwater management system will be developed through detailed design stage; with greater attention to water levels and pond shapes and integration with the whole-of-project design. The detailed design cannot be completed until earthworks landforms, landscaping and planting designs, shared user path alignments, stream diversion alignments, aesthetic and cultural items, etc. are similarly advanced as an integrated Project.

12. Condition RSW1 lists the design guidelines to be followed, which incorporate best practice for stormwater management systems. Professional designers can be expected to meet the guidelines in their final detailed designs. By

meeting these guidelines (in terms of water body volumes, plantings, embankment shapes and flowpaths) the designs will then achieve best practice stormwater treatment and in my opinion address the matters that Mr Farrant has added in Condition RWS1A.

13. The verification of the detailed design stage will be carried out by a Suitably Qualified Person (**SQP**) (a Chartered Engineer) independent of the design process in the form of a technical review. That engineer will sign off the plans. Waka Kotahi will have this verification prior to the construction phase to ensure the objectives of its Environmental Plan and Policy are met by the designs. P46 notes that: *As-built certification forms as set out in the NZTA (2010), Stormwater Treatment Standard for State Highway Infrastructure, should be used or replaced with agreed alternative.*

14. Given that Waka Kotahi is the road controlling authority and will be building and managing the operation of the 19 proposed stormwater treatment systems (i.e. not vesting the assets into Council ownership), it is reasonable for Waka Kotahi to obtain design verification through engagement of a SQP peer review. In my opinion it is entirely reasonable to rely on the independence and expertise of the Chartered Engineer. That engineer has professional (and contractual) obligations when verifying such plans. That verification can be provided to Council for information. I do not see any benefit from additional reviews or Council certification.

15. Further, Waka Kotahi, through its Contractor, will undergo commissioning and establishment procedures over each of the proposed stormwater management systems as part of the handover process and as part of quality control under contract conditions. This would provide a high level of conformity to best practice. Again, that could be provided to the Councils.

16. I have worked with Ms McLeod to amend the conditions. I consider that the conditions as proposed applies best practice and will ensure that the design functions as intended and is maintainable as sought by Mr Farrant.

Operations and Maintenance Plan – absence of Regional Council review role

Concerns

17. I understand Mr Farrant's concern (statement of evidence 26/09/2023 paragraphs 27-36) is that the proposed stormwater management systems will not be adequately supported with an operations and maintenance plan

(**OMP**) that gives opportunity for a long-term satisfactory performance, and that Council should be given the role of reviewing and certifying the OMP.

Responses

18. I agreed at conferencing that an OMP condition is required to provide certainty that the devices continue to operate and perform as designed. No parameters of what was required were contained in the conferencing agreement. I had envisaged a simple condition that required Waka Kotahi to provide an OMP to the Council for information. No provisions were included in the Mediation Version of the Draft conditions. Mr Farrant and Mr St. Clair have now proposed some conditions which go significantly beyond what I envisaged. My reasons for this are set out below.

19. An OMP will be initially developed by the Designer as part of the detailed safety in design process, and further, will be a requirement of the Contractor to complete as-built information and provide this to Waka Kotahi as owner and operator of the proposed stormwater management systems. As such, an OMP will be developed as part of the Project.

20. Condition RSW1 includes three key documents supporting a robust desktop OMP in detailed design stages: Waka Kotahi *P46 Stormwater Specification*; Waka Kotahi *Stormwater Treatment Standard for State Highway Infrastructure*, 2010; and Wellington Water, *Water Sensitive Design for Stormwater*, 2019.

    (a) Waka Kotahi *P46 Stormwater Specification*; Section 11: this provides the routine requirement for an OMP to be developed as part of new highway infrastructure assets including proposed stormwater management systems. It refers to accessibility and safety concerns with maintenance for swales and culverts as well as proposed stormwater treatment systems – and ensures working in the highway corridor is a part of the thinking in developing an OMP. P46 would form the safety framework around maintenance.

    (b) Waka Kotahi *Stormwater Treatment Standard for State Highway Infrastructure*, 2010; Appendix B1, B2, B3 and C provides construction inspection forms, as built documentation and certification, operations and maintenance forms (checklists). Appendix D also provides guidance on the procedures and paperwork for taking grab samples from stormwater treatment facilities. This document provides the

detailed checklists and procedures that would fulfil inspection and maintenance on site as part of a maintenance contract.

(c) Wellington Water, *Water Sensitive Design for Stormwater: Treatment Device Design Guideline*, 2019, Appendix A provides guidance on the activities and frequencies of routine maintenance and corrective maintenance in wetlands, swales and other features. This document would assist Waka Kotahi in preparing and financing a maintenance contract.

21. The three documents together form the basis for preparing an appropriate OMP, which is in Waka Kotahi's interest to understand and implement. The OMP will be further enhanced by Waka Kotahi's experience of OMP contracts throughout the country and from awareness of operating with safety in the road environment.

22. The rebuttal evidence of Mr Lonnie Dalzell goes further in explaining the reality of Waka Kotahi operations in the context of the region's state highway network.

23. At the conferencing, as recorded, all the experts agreed a condition would provide certainty that an OMP had been prepared. It was not to require an extensive review process as proposed by Mr Farrant (and in the proposed conditions RSW3-5). For the reasons set out above, I do not consider that a certification approach is warranted. Rather, there needs to be an OMP and once that has been prepared it should be provided to the Council for its information (for the reasons above and that the assets will remain operated and managed by Waka Kotahi).

24. I have worked with Ms McLeod to amend the conditions accordingly.

RESPONSE TO MR BROWN

Operations and Maintenance Plan – insufficient intended scope

Concerns

25. I understand Mr Brown's concern (statement of evidence 26/09/2023 paragraphs 41-50) is that the consent conditions do not contain an OMP and related monitoring of some of the proposed stormwater management systems, especially at locations where the catchments have a higher risk as a result of stormwater discharges.

Responses

26. I have addressed this issue of the OMP generally above.

27. In relation to the concern (statement of evidence 26/09/2023 Paragraph 44) about monitoring, some of the proposed stormwater management systems (including in a purely scientific manner of continuous water quality monitoring), as I noted in my Evidence, a visual monitoring regime that assesses form and function of the assets is appropriate. These observations and activities are described in RSW1 through references to Waka Kotahi Stormwater Treatment Standard for State Highway Infrastructure, 2010; and Wellington Water, Water Sensitive Design for Stormwater, 2019, (Section 2.5.4 and Appendix A) and described above. There are procedures for grab samples as needed as part of an OMP (NZTA 2010, Appendix D). I therefore consider that these concerns are appropriately addressed in condition RSW1.

P46 not appropriate for certainty of outcome

Concerns

28. I understand Mr Brown's concern (statement of evidence 26/09/2023 paragraphs 46-48) is that the OMP provisions in P46 focus on ensuring access to the devices so that maintenance can be undertaken, rather than describing the means of upholding stormwater treatment efficiency and performance in service.

Responses

29. This concern is addressed by including all references listed in RSW1 which complement each other in scope and requirements:

    (a) P46 represents the requirement as a stormwater upgrade specification in a state highway improvement project,

    (b) NZTA 2010 represents a Standard with supporting documentation for an activated OMP with a focus on safety and access, and

    (c) WSD 2019 provides activities and frequencies focussed on stormwater treatment device (or facility) efficiency of performance.

30. In my opinion Conditions RSW1, RSW2 and normal Waka Kotahi operations and maintenance processes appropriately address this concern.

75% contaminant reduction in TSS – performance target

Concerns

31. I understand Mr Brown's concern (statement of evidence 26/09/2023 paragraph 50) is that a certain level of performance should be added to an OMP to ensure treatment performance, namely, a target 75% reduction in total suspended solids (**TSS**) for stormwater treatment systems. Alternatively, he seeks a monitoring regime adopted aligning with the description in the s87F report (i.e. for seven stormwater management systems, continuous monitoring of inflows and outflows, capturing a range of contaminant concentrations, for at least one year of data - and possibly, this means permanently).

Responses

32. The 75% removal rate comes from Waka Kotahi *Stormwater Treatment Standard for State Highway Infrastructure*, 2010, Table 8-1 for a wet pond practice which, in turn, is referenced from "international literature". The table values are replicated throughout New Zealand stormwater practice guideline documents and give a means for valuing treatment train combinations of treatment practices.

33. The removal rate on any single storm event will vary depending on the size or duration or intensity of the rainfall, and the length of the dry period between storms to accumulate contaminants on the road and then to mobilise contaminants. Seasonal weather variations or daily traffic variations may become a factor. Therefore, a performance removal rate would be measured over a year or more of data. Any adjustments to a stormwater treatment system based on data would then take time to show any change.

34. I understand that there is technical complexity in continuous monitoring of key contaminants in a "before and after" situation at a stormwater management system such as a constructed wetland. A turbidity meter can be used as a proxy by calibrating a TSS-turbidity relationship, for example in a continuous stream environment, but I have not encountered this approach for stormwater management systems. Further complexity comes from monitoring the capture rates of other contaminants of interest such as dissolved metals and metal particulates. More usually, grab sampling during wet weather and analysis of bed sediments in ponds in dry weather is carried out from time to time.

35. The Waka Kotahi *Stormwater Treatment Standard for State Highway Infrastructure*, 2010 section 6.3.2 discusses effluent limits versus best practicable option (**BPO**) approach. Section 6.3.5 concludes that:

    (a) ”the BPO be used for stormwater management practice design although local consent discharge limits will have to be met when required”; and

    (b) “specific regions of the Country may have more stringent water quality sizing criteria than is presented here. In that event, the local criteria must be adhered to”.

36. In my opinion, continuous ongoing water quality monitoring and data collection to determine that a stormwater management system performs an acceptable removal rate is too complex (and likely costly) to be justified for the potential effects that may be managed. If monitoring was simple and cheap, and provided benefit to the environment by addressing adverse effects, then this would be a part of current best practice. But it is not.

37. In my opinion, a better approach to monitoring performance of stormwater management systems can be developed from observations of plant health, stability of the system, free-flowing water connections, capture of litter and heavy sediments in the forebay, and general appearance to an experienced maintenance contractor. This monitoring approach is captured through Condition RSW1. In my opinion, this is the BPO for minimising road contaminants passing into the receiving stormwater environment.

RESPONSE TO MS BENNETT

Stormwater design – conceptual design and absence of Regional Council review / certification role

Concerns

38. I understand Ms Bennett’s concerns (statement of evidence 26/09/2023 paragraphs 16-18) are that conditions do not provide the Regional Council with an involvement in the design review of later design stages prior to construction, in order to have design certainty and satisfaction.

Responses

39. I have addressed this matter in my response to Mr Farrant’s concerns, above.

Operations and Maintenance Plan – absence of Regional Council review role

Concerns

40. I understand Ms Bennett's concerns (statement of evidence 26/09/2023 paragraphs 20-23) are that the Regional Council is not involved in the OMP preparation review and final certification before implementation.

Responses

41. I have addressed this matter in my response to Mr Farrant's concerns, above.

RESPONSE TO MR JAGGARD

96, 98 Arapaepae Road – groundwater effects from stormwater disposal to soakage

Concerns

42. I understand Mr Jaggard's concern (statement of evidence 12/09/2023 sections 6-8) is that a proposed stormwater management system and soakage disposal field is proposed near to the properties and that, when operating, stormwater disposal to groundwater may increase the flood risk. This is a flooding concern.

Responses

43. Mr Jaggard's points are being addressed in other rebuttal evidence (Jack McConchie, Hydrogeology and Groundwater). I note there is a site investigation and data gathering stage, dependent upon property access, that needs to occur to support the final proposed stormwater management system. Mr Jaggard's concerns can be resolved and addressed by the future detailed design with the site-specific information available.

44. The stormwater management objective more generally is to mimic the existing stormwater regime in the area. Either existing geology already enables rainwater runoff to soak into groundwater then the proposed stormwater management will follow that as long as effects are minimised, or existing geology requires rainfall runoff to pass over the surface of the land and the proposed stormwater management will follow that as long as effects are minimised. Both options will be available to the Designer depending on the results of ground investigations.

RESPONSE TO SECTION 274 PARTY EVIDENCE – MR BENT

Floating litter in stormwater, prevention of transfer to the environment

Concerns

45. I understand Mr Bent's concern (statement of evidence 12/09/2023 sections 1-8) is that the stormwater management system design includes a specific measure where practicable and necessary – i.e. a submerged outlet pipe from the forebay to the treatment wetland – to reduce floating litter and plastics in the discharge to the receiving environment.

Responses

46. This design aspect will be considered as one way to contain litter and floating contaminants. There is no issue with that consideration. Justine Bennett recommends wording to RSW1(d) to keep the design options open to the Designer: "Stormwater treatment systems shall be designed and operated such that they avoid, as far as practicable, the discharge of litter to the receiving environment".

47. I support this wording and recommend the deletion of the previous wording. I have worked with Ms McLeod to alter the conditions accordingly.

Nicholas John Keenan

10 October 2023