

BEFORE THE HEARING PANEL

AT HAMILTON

IN THE MATTER

of the Resource
Management Act 1991

AND

IN THE MATTER

of the Proposed Waikato
Regional Plan Change 1
Waikato and Waipā River
Catchments

AND

IN THE MATTER

of Variation 1 to the
Proposed Waikato
Regional Plan Change 1
Waikato and Waipā River
Catchments

**REBUTTAL EVIDENCE OF DR HUGH ALLISTER ROBERSTON ON BEHALF
OF THE DIRECTOR-GENERAL OF CONSERVATION**

BLOCK 2

10 May 2019

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Submission number: 71759

INTRODUCTION

1. My name is Hugh Allister Roberston.
2. I hold the position of Principal Science Advisor-Freshwater in the Aquatic Unit, Department of Conservation. I have been in this role since October 2008.
3. I am presenting this rebuttal evidence for the Director-General of Conservation in relation to protecting and restoring the values of wetland ecosystems through addressing water quality pressures in the Waikato and Waipā catchments.

QUALIFICATIONS AND EXPERIENCE

4. My qualifications and experience are set out in my statement of evidence prepared for Block 1 dated 15 February 2019.

CODE OF CONDUCT FOR EXPERT WITNESSES

5. While this is not an Environment Court hearing, I have read the Environment Court “Code of conduct for expert witnesses”, and I agree to abide by it. I have prepared this Statement in accordance with that Code. I confirm that my evidence is within my area of expertise. I have not omitted to consider any material facts known to me that alter or detract from the opinions I express in this Statement. I have acknowledged the material used or relied on in forming my opinions and in the preparation of this Statement

SCOPE OF REBUTTAL EVIDENCE

6. This rebuttal evidence relates to the Block 2 Evidence in Chief of Mr Basheer and Mr Mayhew, in particular:
 - the opinion that all food schemes in the Waikato and Waipā catchments are low through systems that do not contribute a contaminant load as outlined in the evidence of Mr Basheer and Mr Mayhew for the Waikato Regional Council (as submitter).

- the associated amendments to PC1 proposed by Mr Mayhew that seek to exclude all flood protection and land drainage schemes from provisions to mitigate or offset adverse effects in Policy 11, and associated amendments to Policy 12 and Rule 3.5.10.2.

STATEMENT OF EVIDENCE OF GHASSAN BASHEER

7. The evidence of Mr Basheer describes the operation of flood protection and land drainage schemes in the Waikato and Waipā catchments, including the Lower Waikato Waipā Flood Control Scheme (LWWFCS).
8. It is stated in Mr Basheer's evidence that flood schemes are operated as 'flow-through' systems, specifically it is stated "*Their operation is one of flow-through which does not constitute the addition of contaminants into the receiving waterways*" (refer paragraph 29).
9. Further it is stated that "*The Lower Waikato Flood Control Gates are operated to regulate water levels within two significant water bodies for the purposes of flood storage. Their operation incorporates damming and diverting water under specified conditions as authorised by a suite of Consents and Environment Court Consent Orders. Again, the operation of the Gates do not constitute addition of contaminants into the receiving waters.*" (refer paragraph 30, emphasis added).
10. I **do not** agree with the statements in paragraph 29 and 30 of Mr Basheer's evidence. Empirical data provides clear evidence that the operation of the LWWFCS has added contaminants into the Whangamarino Wetland as a receiving water body.
11. Overall, I would characterise the LWWFCS as a 'diversion' scheme, not a flow-through scheme. That is, the scheme diverts water from Lake Waikare into Whangamarino Wetland, via the Pungarehu Canal into the Pungarehu Stream.
12. The substantial inflow of water from Lake Waikare into Whangamarino Wetland did not exist prior to the establishment of the LWWFCS. As outlined in Figure 1, prior to the LWWFCS there may have been some

limited overland flow to the north of Lake Waikare, but under normal flow conditions Lake Waikare discharged into the Waikato River (not Whangamarino Wetland). The predominant water sources for the Whangamarino Wetland were from its contributing sub-catchments (e.g. Whangamarino River) and some backflow from the Waikato River.

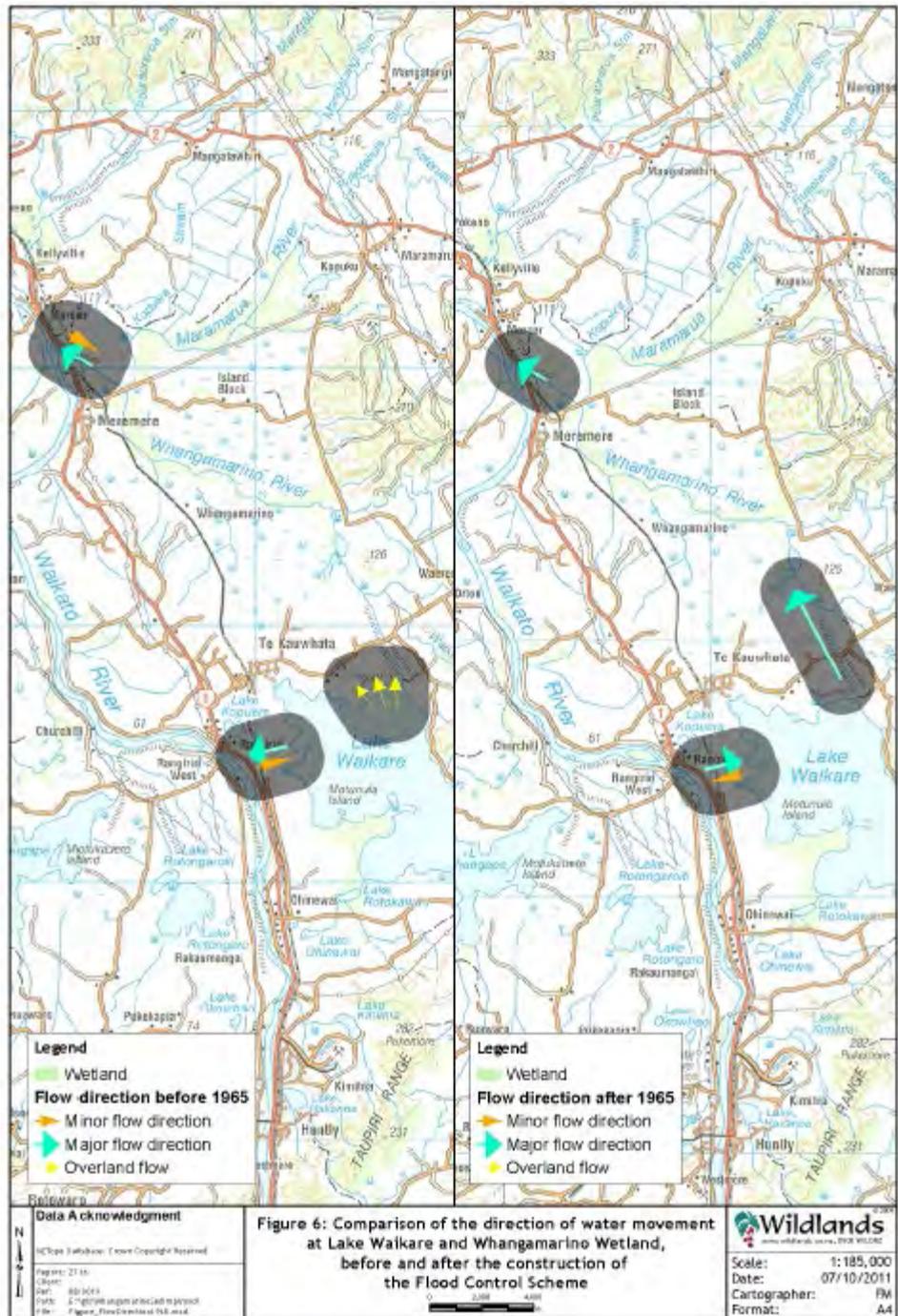


Figure 1. Change in the direction of water movement between Lake Waikare and Whangamarino Wetland after the construction of Lower Waikato Waipā Flood Control Scheme. Source: Reeves et al. 2012.

up to 40,000,000 m³ of water (per annum) have been diverted into Whangamarino Wetland (Reeves et al. 2011). In my opinion, it is inaccurate to suggest this constitutes a flow-through system, because the flow has been diverted into a different receiving water body to that which it would naturally flow to.

14. I also **do not** agree that the LWWFCS has not added any contaminants into Whangamarino Wetland as a receiving water body.
15. Research and monitoring data provide clear evidence that there has been a change in sedimentation rates in the wetland, and a change in sub-catchments contributing the main sediment load to Whangamarino Wetland, since the establishment of the LWWFCS.
16. NIWA have undertaken research on sedimentation rates in Whangamarino Wetland. The NIWA study (which utilised lead-210 decay rates for dating sediments and Caesium-137 as a reference marker for the mid-1950s), indicated there has been a distinct increase in sediment accumulation rates (SAR) over the past 50 years. At sites affected by LWWFCS inflows, the SAR in Whangamarino Wetland increased from ~2-3 mm/yr per year to 8-15 mm/yr (Reeve et al. 2010).
17. NIWA (Reeve et al. 2010) also identified the sub-catchments that have contributed the main sediment load to Whangamarino Wetland using compound-specific stable isotopes (CSSI). Figure 2 provides evidence that the Lake Waikare sub-catchment was not historically a contaminant source for Whangamarino Wetland. That is, Lake Waikare sediments are absent from the deeper sediment layers.
18. However, the more recent sediments (sediment layers near the surface) have a high proportion of sediment from Lake Waikare (Figure 2). This indicates that the diversion of water into Whangamarino due to the operation of the LWWFCS has added contaminants into the receiving waterbody. The change in sediment contaminant source is also consistent with the change in SAR (refer paragraph 16).

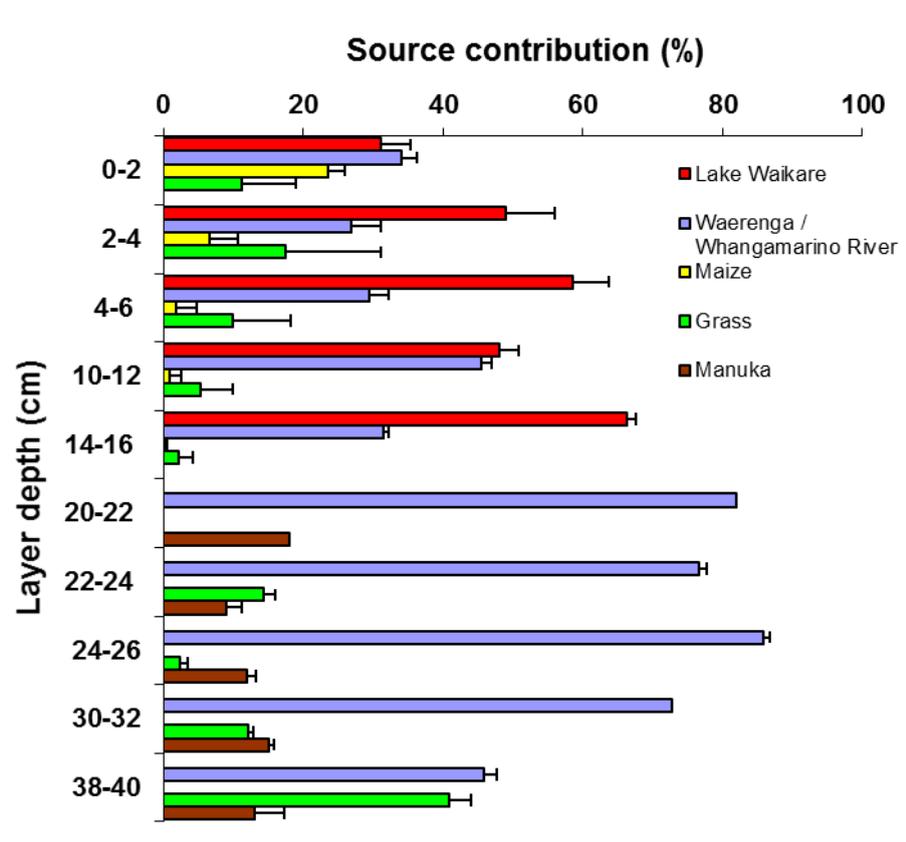


Figure 2. The proportion of soil contributed from different source catchments/land uses in Whangamarino Wetland at different depth layers. Source: Reeve et al. 2010.

19. As I described in my Block 1 evidence, recent monitoring of sediment concentrations and loads in the Pungarehu Canal has been undertaken by WRC and provides up to date estimates of the sediment load diverted from Lake Waikare to Whangamarino Wetland (PDP 2018). Based on 2017 data, the annual sediment load transported from Lake Waikare to Whangamarino Wetlands was in the order of 27,000 Tonnes. It is estimated the Lake Waikare source made up 67% of the total sediment load entering the wetland for that year, and ~16,000 Tonnes of sediment is retained (deposited) in the wetland (PDP 2018).

20. I also **do not** agree that except for limited operational measures that “there are no reasonably practical options for flood protection and land drainage to remove nitrogen, phosphorus, sediment and microbial pathogens once they have been generated and discharged to the drains and stream systems” (refer paragraph 43 of evidence of Mr Basheer).

21. In my opinion, there are feasible and practical measures to avoid or mitigate water quality effects associated with the operation of flood schemes. This includes the application of flocculants for treatment of sediment (and bound-P), construction of settlement basins and development of two stage-channels (incl. constructed wetlands) to treat contaminants that are being diverted into receiving waterbodies.
22. Application of these mitigation measures are particularly important when the flood or drainage scheme has contributed additional flow and contaminant load to a waterbody that did not exist prior to the scheme being established.

STATEMENT OF EVIDENCE OF IAN MAHYEW

23. The evidence of Mr Mayhew relies on the evidence of Mr Basheer. Mr Mayhew similarly suggests that '*...Scheme operations are 'flow-through' activities and do not add contaminants...*' (refer paragraph 35 of Mr Basheer's Block 2 EIC).
24. Further it is stated that '*...from the perspective of PPC1, which focuses on four contaminants being: nitrogen, phosphorous, sediment and microbial pathogens, flood protection and land drainage scheme discharges do not add to the contaminants that are already in the flow. Rather, they simply pass upstream flows through or over a control structure*' (refer paragraph 36).
25. I **do not** agree with the statements in paragraphs 35 and 36 of Mr Mayhew's evidence. As described above there is clear evidence that the operation of a flood scheme, such as the LWWFCS, can add a significant new load of contaminants into a receiving waterbody, particularly when the scheme connects to a waterbody that previously had limited or no hydrological connection.
26. In my opinion, where any flood or drainage schemes contributes additional catchment loads to receiving water bodies (i.e. diversion schemes) then it is critical that Policy 11, Policy 12 and Rule 3.5.10.2 incorporate provisions to avoid, mitigate and where appropriate offset adverse effects on receiving waterbodies.

27. I **do not** support the amendments to PC1 proposed by Mr Mayhew to Policy 11 (refer paragraph 45 of Mr Mayhew's Block 2 EIC), that seeks the exclusion of all flood and drainage schemes from provisions in Policy 11 that require adverse effects to be mitigated or offset.
28. I also **do not** support the associated amendments proposed by Mr Mayhew to Policy 12 and Rule 3.5.10.2.
29. If the proposed amendments of Mr Mayhew to PC1 are adopted a major driver of water quality degradation (the diversion of additional contaminant load into receiving waterbodies from flood and drainage schemes) will not be addressed. In my opinion, this would be inconsistent with the purpose of PC1 and the Vision and Strategy for the Waikato River.

REFERENCES

PDP (2018) Whangamarino wetland sediment monitoring report. Prepared for Waikato Regional Council. August 2018. 55pp

Reeve G, Gibbs M, Swales A (2010) Recent Sedimentation in the Whangamarino Wetland. NIWA client report HAM2010-080 to Department of Conservation. Project code DOC10202. 40 pp.

Reeves P, Hancock N, Mazzieri F (2012) Ecological impacts of the flood control scheme on Lake Waikare and the Whangamarino Wetland, and potential mitigation options. Prepared for the Department of Conservation and Waikato Regional Council. Wildland Consultants Contract Report No. 2766.



Dr Hugh Robertson

10 May 2019