

**BEFORE THE HEARING COMMISSIONERS  
AT HAMILTON**

**IN THE MATTER** of the Resource Management Act 1991  
(**"the Act"**)

**AND**

**IN THE MATTER** of the hearing of submissions on The  
Proposed Waikato Regional Plan Change 1 –  
Waikato and Waipa River Catchments

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**STATEMENT OF REBUTTAL EVIDENCE BY CHRISTOPHER MARTIN  
KEENAN  
FOR HORTICULTURE NEW ZEALAND**

**26 FEBRUARY 2019**

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## SUMMARY STATEMENT

1. This rebuttal evidence addresses the nature of proposed Table 3.11.1, the concept of sub catchment versus whole of catchment and comments by various submitters in relation to loads, concentrations, limits and targets.

## QUALIFICATIONS AND EXPERIENCE

2. My full name is Christopher Martin Keenan, my qualifications and experience are set out in my primary evidence.
3. In relation to this rebuttal statement of evidence I reiterate and confirm my compliance with the Code of Conduct for Expert Witnesses as set in my primary evidence.

## CONTEXT AND SCOPE OF REBUTTAL EVIDENCE

4. This evidence responds to the statements of evidence from Mathew Mccallum Clark, Gerard Matthew Willis, Craig Verdun Dupree, Dr Timothy Cox, Richard Parkes, Dr Jane Maree Chrystal, Dr Hannah Mueller, Adam Douglas Canning, Dr Glen Treweek, Dr Phillip Matthew Jordan, Dr Olivier Michel Nicolas Ausseil and Dr Kate McArthur.

## ISSUE

5. The issues addressed by these experts relate to the nature of Table 3.11.1 with reference to loads, limits, targets and the contribution of differing landuse activities to water quality in the Waikato and Waipa Rivers. The experts also discuss whether a subcatchment or catchment wide approach is more appropriate.
6. Mr Mccallum Clarke Refers to Table 3.11.1 in the following way in his statement:

*“18. Part B5 of the Block 1 s42A report addresses a range of matters relating to subcatchments, including mapping issues, prioritisation of the sub-catchments and most importantly the targets and limits in Table 3.11-1. Table 3.11-1 is detailed, but also of fundamental importance to both PC1 and for setting the future direction toward giving effect to the Vision and Strategy. While there are a very large number of submissions on these matters of detail, few are very specific, such that the issue of whether the changes requested by*

submitters are adequately clear is something that the Hearing Panel will need to carefully consider.”<sup>1</sup>

7. I agree that Table 3.11.1 is of fundamental importance. Horticulture New Zealand (HortNZ) sought amendments to Table 3.11.1. in submissions; and proposed amendments to the Objectives to refer to the new amendment sought as well as Table 3.11.1. For avoidance of doubt, the excerpt from the submission in relation to Table 3.11.1 is attached as Appendix A to the rebuttal evidence of Gillian Holmes.
8. In essence, HortNZ sought that Table 3.11.1 be amended to include both 10 and 80 year targets expressed in the form of unattenuated load limits for each of the contaminants by each subcatchment; to provide more guidance to the community seeking to implement Objectives 1 and 3 of the plan.
9. In my opinion it was important to provide these load limits to support collaborative action within subcatchments, in order to achieve the targets using the most cost-effective methods. They provide an opportunity for subcatchment management plans to be tested prior to implementation, to see whether a mix of proposed mitigations is likely to achieve the instream concentrations desired by Objective 1 and Objective 3.
10. In my view they are also more closely linked to the limits required by the NPS Freshwater. Mr Willis for Fonterra addresses this point in his evidence:

*“The term “limit” is defined broadly in the NPSFM to mean “the maximum amount of resource use available, which allows a freshwater objective to be met”. Despite that broad definition, limits are often interpreted incorrectly as being in-stream concentrations or, narrowly as loads of contaminants or discharge concentrations.*

*In my opinion, a limit is generally not an in stream concentration (that being the subject of a freshwater objective as discussed above) and can be as broad as, for example, a specified limit on the amount of cropping or the area of winter grazing or extent of required stock exclusion and a wide range of similar matters that limit that amount of land (or assimilative capacity) that can be used while achieving the freshwater objective. In PC1, in terms of N, limits include the NRP and (for dairy) the 75th percentile. That understanding is based on, and consistent with, the MfE Draft Guide to Limits under the National Policy Statement for Freshwater Management 2014 (as amended 2017)<sup>13</sup>.*

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<sup>1</sup> Overview Of S 42a Report By Matthew Mccallum-Clark, Primary Author para 18. Underlining added for emphasis.

Similarly, the NPSFM Implementation Guide (updated 2017), after noting the limits are often contaminant loads, states ...<sup>2</sup>

11. In my primary evidence) I have discussed the references within the section 42A report to changes proposed for Table 3.11.1. There is no support within the section 42a report for load limits to be added. I am of the opinion that the analysis included in the response is not appropriately detailed, particularly given the many expert statements that relate to Table 3.11.1; the number of alternative models; and methods that are suggested in the expert evidence and the differing conclusions of those experts.
12. In my view expert caucusing is required to assist the planners and the Commissioners to evaluate the differing relief sought. It would be particularly useful if the expert caucus could come to a view on whether the table can be amended in a way that more effectively supports the community to achieve the Objectives of the plan efficiently and effectively.
13. Gillian Holmes<sup>3</sup> notes the technical work on subcatchment load limits has been reviewed by NIWA and some adjustments were made. Some other experts<sup>4</sup> are seeking differing numeric values for loads or concentrations to be added to Table 3.11.1. Almost all these aspects refer not only to concentrations, but underline the importance of assessing the impact of the load as well.
14. The use of loads as limits at a subcatchment level supports both the concept of managing the river as a whole and the concept of managing subcatchments together as a community. The evidence of Mr Dupree notes:  
  
*“Water quality management at individual sub catchment vs catchment-scale a. I agree with the Officers assessment (S42a, para 142-143) that focussing on sub catchment management is not supported by the technical work, and in doing so runs the risk of not having an ‘eye of the prize’ (i.e. the whole river system).”*<sup>5</sup>
15. I agree that the concept of managing the river as a whole is extremely important to achieving Objectives 1 and 3 of proposed

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<sup>2</sup> Gerard Matthew Willis For Fonterra Co-Operative Group Ltd paras 7.8-10. Underlining added for emphasis.

<sup>3</sup> Eic Gillian Holmes for Horticulture New Zealand paras 35 – 38.

<sup>4</sup> EIC Timothy Cox for Beef and Lamb New Zealand; (para 120 Table 5); EIC Dr Phillip Jordan for Wairakei Pastoral EIC (paras 60-61), EIC Garret John Hall for Watercare (paras 5.13, 6.18, Figure 1), EIC Kathryn McArthur for Department of Conservation (para 104, 105,108,110 and Appendix 1), EIC Adam Douglas Canning for Fish and Game (para 3.35), EIC Dr Olivier Michel Nicolas Ausseil for Waikato and Waipa River Iwi (paras 59,60).

<sup>5</sup> EIC Craig Verdun Dupree For DairyNZ; para 3.5

PC1; and that action is required across the Waikato community to reduce discharges that effect water quality.

16. However, the community acting together as a group should not be excluded as an option and the subcatchment approach or a collective approach provides opportunities to work at a scale that is more relevant to individuals seeking to work in groups. Dr Treweek notes:

*“Building trust and community is critical to achieving long-term sustainable change. Harris (2017) found that “Farmers frequently look to a trusted leader in their rural community when looking to implement changes in their farming practices” ...”*<sup>6</sup>

17. Dr Treweek also provides useful examples of catchment management in a collective. The inclusion of subcatchment loads provides an opportunity for local communities to measure the success of subcatchment scale communities and in my view should be provided for in proposed PC1.

18. There is a critical difference of distinguishing between loads and concentrations. This is demonstrated by looking across the evidence. For instance, Dr Mueller of Beef and Lamb New Zealand notes:

*“Specifically, the approach does not distinguish between land use types or capability, or account for other downstream impacts on water quality such as phosphorus and sediment. N leaching generally is lowest from forestry land uses, followed by dry stock farming, mixed cropping, dairy farming, and vegetable cropping”*<sup>65, 77</sup>

19. Dr Chrystal notes *“Some farming activities pose a higher risk of contaminant losses to water than others. These include: (a) irrigation; (b) effluent storage, land application, and management; (c) cropping; (d) high stocking rates and densities; and (e) fertiliser use, including type, timing, and load.”*<sup>8</sup> I note the evidence produced by Jacobs for HortNZ does not support point a) of her statement.

20. Further; Richard Parkes notes *“Nitrogen (N) loss to water is proportionally much less of a concern for the drystock sector as that of other sectors, such as dairy, cropping, arable, or horticulture.”*<sup>9</sup>

21. But Dr Cox notes: *“Based on my own numerical modelling and analysis, I have presented evidence that supports the following*

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<sup>6</sup> EIC Dr Glen Treweek para 15. Underlining added for emphasis.

<sup>7</sup> EIC Dr Hannah Mueller For Beef & Lamb New Zealand para 63. Underlining added for emphasis.

<sup>8</sup> EIC Dr Jane Marie Chrystal For Beef & Lamb New Zealand Underlining added for emphasis.

<sup>9</sup> EIC Richard Parkes for Beef & Lamb New Zealand para paras 17, 36 and 97.

*arguments: (a) Diffuse loads from dairy lands represent the single largest source category of nitrogen in both the Waipa and larger Waikato River basins, comprising over half of the total load in both basins. This should be made fully transparent in all work going forward. (b) Diffuse phosphorus loads are more evenly distributed across source categories. Depending on the land use layer used, the largest contributor of phosphorus in the Waikato basin is either dry stock (NIWA land use) or dairy (Agribase land use). Diffuse loads from dry stock lands represent the single largest source category of phosphorus in the Waipa basin."<sup>10</sup>*

22. These experts are seemingly contradictory. However, in my view the difference arises from the scale being addressed by the evidence in question. So, it is important to identify not only the concentration on a per hectare basis to manage localised effects on water quality; but the total contribution also to the load of activities at a larger scale than the individual enterprise.

## **CONCLUSION**

23. The cumulative effects and scale of all landuse within the catchment need to be managed effectively if PC1 Objectives 1 and 3 are to be achieved.
24. It is still important to allow for collective approaches at the subcatchment or enterprise scale to encourage a focus on action in local communities. This will assist in managing cumulative effects of the catchment to achieve the PC1 Objectives.
25. Table 3.11.1 is critical to the Plan structure.
26. Inclusion of loads within Table 3.1.11 provide alternative approaches to managing collectively at the subcatchment or enterprise scale.
27. The experts have differing views on the numeric values that should be included in Table 3.11.1. Expert caucusing prior to hearings may help to focus some of the expert views for the Commissioners and planning witnesses to better evaluate the reasons for differences.

**Chris Keenan**  
**for Horticulture New Zealand**

**26<sup>th</sup> February 2019**

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<sup>10</sup> EIC Dr Timothy Cox For Beef & Lamb New Zealand; para 142.