

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 to the Waikato
Regional Plan

**SUPPLEMENTARY EVIDENCE - RESPONDING TO HEARINGS PANEL QUESTIONS TO
COUNCIL**

Bryce Cooper

DATED 11 March 2019

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INTRODUCTION

1. My name is Bryce Cooper. I have already provided evidence dated 15 February 2019 for this Hearing. I have the qualifications and experience set out in paragraphs 2 and 3 of my previous evidence. I confirm that I remain bound by the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2014.

PURPOSE

2. The purpose of this supplementary evidence is to provide responses to the following questions from the Hearings Panel to Council dated 19 February 2019:

QUESTION 1: Interpreting and Implementing the Vision and Strategy

QUESTION 2: Science and economic modelling underpinning the provisions of PC1

QUESTION 1: Interpreting and Implementing the Vision and Strategy

3. The Panel has asked the following question:

PC1 is required to "give effect" to the Vision and Strategy. The Vision and Strategy contains, amongst other things, the vision, together with a number of objectives and strategies. The Panel foresees that submitters may argue that different elements of the Vision and Strategy suggest different responses. For example, the provisions focussing on restoration and protection of the health and wellbeing of the Waikato River might be seen by some submitters to conflict with sustaining prosperous communities and protecting of the economic relationships some communities have with the River. Given the legal obligation to give effect to it, does the Council consider that some elements of the Vision and Strategy take precedence?

If so, what is the basis for that view, and which elements are prioritised. If the Council considers there is no internal priority, how does the Council suggest the Panel resolve areas of perceived conflict?

Second, Objective k of the Vision and Strategy focuses on water quality being such that it is safe for people to swim in the Waikato River over its entire length. A number of submitters suggest that the achievement of that objective needs to take into account river conditions, e.g. excluding consideration of times when the river is in flood and unsuitable for swimming on that account. How does Council interpret that objective in this regard? The challenge of restoring water is a complicated and complex issue.

Currently, our main tool is the Resource Management Act 1991 (RMA). The RMA deals with water quality in a structured policy framework that does not fully recognise the depth of complexity in responding to water quality improvements.

RESPONSE

4. My response relates to the swimmability issues referred to above.
5. The anticipated future state of the Rivers in Proposed Plan Change 1 is described in Objective 1 ('the long-term restoration and protection of water quality'), and is also described as Scenario 1 in the Proposed Plan Change 1 Section 32 evaluation report.
6. Scenario 1 was considered to be the most aspirational from a water quality viewpoint. The Collaborative Stakeholder Group (**CSG**) and Waikato and Waipā River Iwi also viewed the scenario as closest to that of the 'protect and restore' requirements of Te Ture Whaimana o Te Awa o Waikato (the Vision and Strategy) for the Waikato River. The Scenario 1 description includes the narrative that to achieve this scenario the rivers in the Waikato and Waipā river catchments would be swimmable in all seasons with respect to the relevant attributes, E. coli and visual clarity.
7. The swimmability target was developed by the CSG in consultation with River Iwi partners as a key outcome of the plan change. River Iwi prepared a written outcome statement and principles for implementing the Vision and Strategy: <http://waikatoregion.govt.nz/assets/WRC/Council/Policy-and-Plans/HR/S32/D/3483800.pdf>.
On page 3 of the document it is stated that "Swimmable includes in all seasons across a range of flows, with the understanding that different standards might apply at flood flows".
8. The E. coli attribute was adopted following recommendations from the Technical Leadership Group (**TLG**). It was recommended that the attribute be adopted as per the NPS-FM (2014). The NPS-FM (2014) document does not mention adjusting the data to account for flow or seasonality. In the 2017 amendments to the NPS-FM there is guidance added to the E. coli attribute table that clarifies this point. It says: "Attribute state should be determined by using a minimum of 60 samples over a maximum of 5 years, collected on a regular basis regardless of weather and flow conditions". A further note says: "The predicted average infection risk is the overall average infection to

swimmers based on a random exposure on a random day, ignoring any possibility of not swimming during high flows or when a surveillance advisory is in place”.

9. Consistent with the NPS-FM the CSG interpreted Objective k of the Vision and Strategy as meaning that the Waikato River should be swimmable along its entire length (i.e. including tributaries) “in all seasons across a range of flows...”.
10. The NPS-FM (2014) minimum acceptable state for swimming is an E.coli concentration of 540/100ml expressed as a 95th percentile statistic of the samples collected over a 5-year period. That is, 5% of the time E.coli concentrations can be any value above that statistic and the risk of infection from swimming at those times is elevated. This specifically recognises, and allows for, high contamination events (which may be high flows) when a site is graded under the NPS-FM (2014) for its general *long-term* suitability for swimming. When a *single sample* at a designated bathing beach exceeds this value, the 2003 MfE/MoH guidelines specify the need to initiate daily sampling until the concentration falls below the threshold, investigate the cause(s), erect warning signs, and inform the public of the health risk through the media (<http://www.mfe.govt.nz/sites/default/files/microbiological-quality-jun03.pdf>).

QUESTION 2: Science and economic modelling underpinning the provisions of PC1

11. The Panel has asked the following question:
While Dr Cooper (in his evidence) has provided a general description on the process, given the importance of the numerical targets in Table 3.11.1 – Short and Long term numerical water quality targets for the Waikato and Waipa River catchments, the Panel requests that the Council outline how the input from the Technical Leaders Group (TLG) has ‘informed’ or ‘resulted in’ each of the 80 year targets in Table 3.11.1.

Specifically, what was the process the Collaborative Stakeholder Group (CSG) undertook to determine that each of the numerical targets was consistent with the values the CSG had identified, cross referencing the specific technical input the CSG received on each parameter?

RESPONSE

12. To understand the current state of waterways in relation to attribute levels the TLG provided information to the CSG on the water quality current state data for each of the attributes (2010 -2014, except E.coli 2009-2014) and the associated National Objectives Framework (**NOF**) band for each contaminant’s current state for each monitoring site.

These were presented in the form of colour coded sheets (A, B, C and D bands and <MAS Minimum Acceptable State for E.coli) for all site-by-contaminant pairs. These were provided together with colour-coded states for each scenario modelled.

(a) Current State Data:

<http://waikatoregion.govt.nz/assets/WRC/Council/Policy-and-Plans/HR/S32/C/Current-state-data-2010-2014.xlsx>

(b) Current State and Scenario 1 colour coded bands

<http://waikatoregion.govt.nz/assets/WRC/Council/Policy-and-Plans/HR/S32/C/3597165.pdf>

13. Using the attributes recommended by the TLG¹ (TLG 2015, Scarsbrook 2016), the CSG deliberated over a series of meetings to define desired water quality bands for each FMU. The CSG provided instructions to the TLG on a range of 'future state' scenarios (Scenarios 1, 2, 3, 4) representing aspirational and less aspirational attribute bands to be achieved in each part of the Rivers. The CSG's instructions were of the form such as "stay within the current state band where it was already high (A or B), or (as was more frequently the case) move water quality up a band where current state was low (i.e. C or D bands, or worse than Minimum Acceptable State). (Refer to Table 7, page 29 Overview of the Collaborative Stakeholder Group's Recommendations March 2016) <http://waikatoregion.govt.nz/assets/WRC/Council/Policy-and-Plans/HR/Restoring-and-protecting-our-water-Overview-of-Collaborative-Stakeholder-Groups-recommendations2.pdf>
14. These four 'future state' scenarios were modelled by the TLG in the first round of modelling (HRWO Scenario modelling). The results were presented to the CSG² and reported in Doole, Elliott and MacDonald 2015³. From the first round of scenario modelling results the CSG selected Scenario 1 as their preferred Scenario for 80 years. The CSG considered that Scenario 1 best gave effect to the Vision and Strategy. The CSG considered whether to opt for a lesser level of 'restore and protect' (Scenario 2), that represented only raising water quality to minimum standards for 'swimmable' and 'safe to take food from', rather than raising the water quality up one band even in places where it already met minimum standards. CSG's position was to remain with the

¹ <http://waikatoregion.govt.nz/assets/PageFiles/28959/12/192%20-%203414280.pdf>
<https://waikatoregion.govt.nz/services/publications/technical-reports/2018-technical-reports/tr201866/>

² http://waikatoregion.govt.nz/assets/PageFiles/28959/15/273%20-%203498179%20-%20Scenario%20modelling-%20the%20first%20set%20-%20Graeme%20Doole,%20TLG%20-%20CSG15_.pdf

³ <https://waikatoregion.govt.nz/assets/WRC/Services/publications/technical-reports/HRWO-trs/TR201856.pdf>

'improve everywhere' approach as they felt this best reflected what they had heard from River iwi about the Vision and Strategy/ Te Ture Whaimana.

15. Once the first set of modelling results came back to the CSG, there was an opportunity to identify appropriate scenarios for Round 2 modelling. The CSG remained committed to achieving the water quality defined in Scenario 1, but requested the TLG model the steps of 10%, 25%, 50% and 75% of the way from the current situation to achievement of Scenario 1.
16. The TLG also modelled an 1863 scenario to ascertain what water quality might have been like in 1863, and modelled a baseline scenario (business as usual (BAU)) (Doole 2016⁴). In light of the modelling results from the 1863 scenario modelling (Doole, Hudson and Elliot 2016⁵) the TLG recommended that the chlorophyll bands be more aligned with the phosphorus bands for the Upper Waikato (i.e. a 'B' band for chlorophyll unless the site is already an 'A'). The CSG made adjustments to the chlorophyll bands in the Upper Waikato accordingly.
17. The integrated assessment (Wedderburn and Coffin 2016^{6/7}) was undertaken by the TLG to assist the CSG's consideration of the broader implications of choosing certain limits and policies. This includes the range of values and uses of the Rivers, and the wider social, economic and cultural considerations valued by the community.
18. When setting desired bands, the instruction from CSG did not depend on where a monitoring site value currently sat within a band (i.e. was it at the top (lowest concentration) or bottom (highest concentration) of the band range). "Up a band" could be a large change or a small change depending upon where the site currently sat within the band. The CSG understood that their instructions "up a band" did not allow for just an improvement within a band.
19. The 80-year targets are either the current state where already within the desired band (i.e. water quality to be maintained and not decline), or the threshold between bands i.e. the highest concentration allowed within the band to be achieved.

⁴ <https://waikatoregion.govt.nz/services/publications/technical-reports/2018-technical-reports/tr201849/>

⁵ <https://waikatoregion.govt.nz/services/publications/technical-reports/2018-technical-reports/tr201854/>

⁶ <https://waikatoregion.govt.nz/assets/WRC/Services/publications/technical-reports/HRWO-trs/TR201840.pdf>

⁷ <https://waikatoregion.govt.nz/services/publications/technical-reports/2018-technical-reports/tr201841/>

20. I note that in all the above when referring to concentrations and highest, lowest etc these relate to N, P and E.coli, which have to decrease in concentration. The reverse applies to clarity, which has to increase.

Bryce Cooper

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