Waipaoa Catchment Planning Advisory Group – Hui 11

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Title of report: Water Quantity in the Waipaoa Catchment – Summary and Update

Report no: 3

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Purpose of this report

This report provides a summary and update of work to date in developing the draft water quantity scenarios for the Waipaoa Catchment Plan. It also outlines the next steps to develop the water quantity scenarios and provisions.

Outcomes sought

Members of the Advisory Group understand the next steps in developing the water quantity scenarios and provisions for the Waipaoa Catchment Plan.

Members are reminded that the scenarios outlined in this report are for workshopping purposes and are not the limits that will appear in the proposed plan.

Contents

1. Introduction

Three Hui over 2024 have dealt with water quantity provisions for the Waipaoa Catchment Plan.

At Hui 7, staff introduced the current water quantity provisions for the Waipaoa Catchment, outlining the current Water Quantity Zones, approach to water quantity management and allocation limits.

At Hui 8, timeframes and priorities for water quantity improvements were discussed and some draft scenarios for these improvements were introduced.

At Hui 9, timeframes, priorities and scenarios were further discussed and the environmental outcomes from Hui 4 were reviewed in light of the water quantity issues.

The discussions and feedback provided have covered many topics and the purpose of this report is to consolidate that feedback and provide a summary. We are seeking the Advisory Group to confirm our understanding and provide some further clarification on specific topics. The summary below does not reflect all written feedback but attempts to recap the key messages.

2. What are the issues?

Waipaoa River Mean Annual Low Flow (MALF) is 2,550 l/s not 2,000 l/s	• Ecological impacts of a minimum flow of 1,300 l/s are much more severe than previously thought • Minimum flows will need to increase if we are to provide for ecological flows in the river • Increasing minimum flows will have a significant impact on water users • The monitoring site location for the Waipaoa River is above water takes, making our understanding of the impacts of water takes less clear. Work is currently underway to better understand whether the Matawhero monitoring site (below all water takes) could be part of the future minimum flow setting framework. • The relationship between water quantity and water quality – and the resultant health of the river is unclear.
Makauri Aquifer continues to decline and is now at risk of saline intrusion	• We need to ensure the plan strongly supports/enables alternative water supply including Managed Aquifer Recharge (MAR) • Cuts to allocation in the Makauri Aquifer of 15% of current actual use need to be made very quickly to avoid permanent adverse effects
Waipaoa Gravels and the Shallow Fluvial Aquifer are not as strongly linked to the river as previously thought	• The river and these aquifers have been treated as a single water source – with transfers occurring between them • Separating these aquifers out from the main river allocation could be complex

	• There may not be a strong environmental benefit to separating these aquifers from management with the river
Te Hapara Sands Aquifer appears to be relatively stable – but with sea level rise will have an increased risk of saline intrusion and climate change will likely reduce recharge rates	• Continuing to manage this aquifer as a separate water quantity zone seems reasonable • There is no capacity to increase use and because this aquifer is recharged by rainfall, and climate change projections are for 15% less rainfall by 2045, this will impact on recharge of the aquifer • There is potential that MAR could be a way of buffering the aquifer against saline intrusion and a supportive framework should provide for this
No minimum flow is set on the municipal supply take on Te Arai River – this is required by 2026	• Any requirement for a minimum flow on Te Arai is likely to increase demand for water for municipal supply from the Waipaoa River • Currently there is no planning link between the flows in the rivers and the demand management plan for the municipal supply

This report focuses on two of these key issues, the setting of minimum flows in the Waipaoa River and the allocation from the Makauri Aquifer.

3. Setting Minimum Flows on Waipaoa River

Understanding the Mean Annual Low Flow (MALF) of a river or stream is key to understanding what an appropriate minimum flow is. The 2015 Waipaoa Catchment Plan set the minimum flow for the Waipaoa River on the understanding that MALF was 2,000l/s and that the proposed minimum flow was 65% of MALF. A comprehensive review of the flow record undertaken in 2023 has identified that MALF is 2,550 l/s. This changes our understanding of the impacts on the Waipaoa River quite significantly as the minimum flow is 51% of MALF.

NIWA has provided some advice on minimum flows for the Waipaoa River from an ecological perspective. Alongside this, the impacts of changes to the minimum flow on water users has been considered to develop a set of options for evaluation. These are summarised in the table below:

Scenario	Relationship with MALF
Scenario 1: 1300 l/s	A block status quo – 51% of MALF
Scenario 2: 1600 l/s	63% of MALF
Scenario 3: 1733 l/s	68% of MALF
Scenario 4: 2000 l/s	78% of MALF
Scenario 5: 2550 l/s	MALF
Scenario 6: 3000 l/s	High ecological flow 118% of MALF
Scenario 7: 4000 l/s	B Block status quo 157% of MALF

Aside from the Status Quo, all scenarios would decrease the reliability of water takes from the river and increase the frequency of time when water could not be taken from the river for irrigation.

A key question when considering setting the minimum flow, is whether this will improve the environmental outcomes in the river.

How are other Councils dealing with this issue? What is good practice?

An analysis has been undertaken of how other regional councils have set minimum flows for rivers in their regions under the recent NPS-FM (2017 and 2020 versions). This is helpful for understanding what is standard and best practice across the sector and is set out in the table below.

Region	Minimum flows in relation to MALF	Comment / basis for minimum flow	Status / source
Northland	Small-large rivers: 80% Outstanding rivers: 100%	Regional habitat modelling using Environmental Flows Strategic Allocation Platform (EFSAP) (a NIWA toll)	Proposed plan
Auckland	Specific rivers: ~50-70%	Regional habitat modelling using Environmental Flows Strategic Allocation Platform (EFSAP) No large rivers in region.	Operative unitary plan
Bay of Plenty	Default small: 70% Default large: 60% Average river-specific minimum flow: 77%	Current policies in existing plan use 5-year return period low flow but moving towards using MALF in revised plan. River-specific minimum flows are based on Instream Flow Incremental Methodology (IFIM) studies and pre-determined habitat retention levels for various species.	Background report for policy development content (boprc.govt.nz)
Waikato	n/a	70-190% of 5-year return period low flow (Q_5).	Operative Regional Freshwater Plan
Hawkes Bay	Tukituki: 70-90% Ngaruroro: 50% Tutaekuri: 65%	Tukituki: 90% habitat protection (tuna/trout) Tutaekuri: 75% habitat protection (trout)	Tukituki – Plan Change 6 TANK – Plan change, appeals stage
Taranaki	Existing plan: 66% Scenarios for consultation (large streams): 50-110%	Scenarios are based on IFIM work and species habitat protection thresholds	Existing plan / scenarios for consultation
Manawatu-Whanganui	Whangaehu: 80% Rangitikei: ~80% Upper Manawatu: ~90%	Generally based on IFIM results, with minimum flow set to retain 80-90% of trout habitat. Where no IFIM undertaken, defaults apply (Whangaehu).	Operative One Plan
Wellington	Ruamahanga: ~70%	Historically set but recently assessed against habitat	Operative NRP

Region	Minimum flows in relation to MALF	Comment / basis for minimum flow	Status / source
	Waiohine: 85%	objectives of retaining 80-90% of habitat of key species.	
Marlborough	Wairau: 60% Rai: 80% Awatere: ~50%	Rai: based on 10-year return period 7-day flow (Q_{10}).	Operative plan
Tasman	Upper Takaka: 70% Waingaro: 80%		Recommended to FLAG (similar to GDC's FWAG)
West Coast	75% where total take >20% MALF, otherwise no minimum flow		Operative regional land and water plan
Otago	Manuherikia: 30% (existing); 75% (preferred scenario post-consultation) Lower Taieri: ~65%		Operative Regional Plan
Southland	n/a	Q95 (flow that is exceeded 95% of the time). This probably equates to around 90-100% MALF.	Appeals version of plan

As can be seen from the table above, the use of Instream Flow Incremental Method (IFIM) studies is a common method used across councils to inform minimum flow setting in rivers. The current 51% of MALF is also one of the lowest minimum flows set for Plans looked at across the country.

Further information needed for flow setting

The previous Waipaoa Catchment Plan set the minimum flow considering tuna/longfin eel as the priority species for flow setting, with the aim being to provide a moderate level of habitat for tuna.

The NIWA study used IFIM data collected for the Operative Plan, as the high river levels meant that new instream ecological studies could not be undertaken. It is planned to redo the ecological assessment work over the 2024/2025 summer so that further analysis of the ecological data can be undertaken. As the Waipaoa River has infilled significantly due to Cyclone Gabrielle this should provide more accurate information about the habitat available to inform decision making on minimum flows.

Work is also underway looking at the relationship between the flow monitoring sites at Kanakanaia (above most water takes) and at Matawhero (below most water takes) so that a better understanding of the effects of water abstraction on water levels in the river can be gained.

4. Groundwater Allocation in the Makauri Aquifer

The groundwater modelling undertaken has identified that the over allocation in the Makauri Aquifer is more severe than previously thought, and since the operative plan was developed problems with saline intrusion have arisen.

The Advisory Group considered 3 scenarios at the May and July meetings; however, advice from the groundwater modelling staff is that a fourth scenario needs to be considered to avoid irreversible adverse effects in case a Managed Aquifer Recharge (MAR) scheme is not progressed. These scenarios are set out in the table below:

Scenario	Impacts on Saline Intrusion	Impacts on water levels /river flows
Scenario 1 Status Quo – current Waipaoa Catchment Plan Maximum allocation 1.89 million m^3/year, reducing to 1,7million m^3/year by 2025.	Further saline intrusion from the west – will result in the aquifer becoming unusable as progressively more bores become saline.	3m drop in groundwater levels in Makauri Aquifer, reduction in Waipaoa River flows by 2045. This will impact some water users as they will need to drill deeper wells or alter their infrastructure to continue to access water from the aquifer.
Scenario 2 Cap at 2020-2021 use followed by 5 yearly 5% reductions Maximum allocation based on 2020-2021 year of 1,047,000m^3/annum, reducing by 5% every 5 years	Further saline intrusion from west - further wells may become unusable due to saline intrusion by 2045.	Aquifer levels continue to decline – though level of decline has not been modelled for this scenario. This will impact some water users as they will need to drill deeper wells or alter their infrastructure to continue to access water from the aquifer. May also result in reduced flows in Waipaoa River.
Scenario 3 – Cap at 2020-2021 use and include a MAR scheme (Similar to Model Scenario 5.1) Maximum allocation based on 2020-2021 year of 1,047,000m^3/annum, MAR put in place offsetting drawdown so no further cuts at 2035.	MAR prioritised to slow the rate of saline intrusion from the west. This scenario assumes 600,000m^3/year water is put into the aquifer with a MAR increasing over time to 720,000 m^3/year.	MAR prioritised to stabilise aquifer levels. This scenario assumes all MAR water is used to stabilise the aquifer.
Scenario 4 Sustainable Allocation. (Similar to Model Scenario 7.1) Maximum allocation is a 15% cut on 2018 levels to 720,000m^3/annum,	Rate of saline intrusion continues to increase (but not as bad as scenario 1 or 2). Further wells may become unusable due to saline intrusion by 2045	Groundwater would stay similar to current observed levels to 2050

followed by a further 15% cut at 2045		

As can be seen from the scenarios above there are no "good" options. It has been the strong view of members of the Advisory Group that MAR is the solution to the problem of declining levels and saline intrusion of the aquifer; however, without a MAR scheme in place, the Waipaoa Catchment Plan needs to outline the "Plan B" if MAR is not undertaken.

A key issue for the Advisory Group members to consider is what a manageable alternate pathway in the absence of MAR looks like.

5. Timeframes and approach to reductions

Because there are multiple water sources across the catchment where significant change is being looked at, the approach taken in terms of the timeframes for any change, and how they are paced in terms of scale of reductions is key.

In particular the question is whether we take a parallel approach to the speed of improvements in the rivers and groundwater sources, or whether we should prioritise some water sources over others.

A possible policy approach was considered by the Advisory Group at Hui 9. Feedback from the Advisory Group was that the priority and focus needs to be placed on addressing the problems in the Makauri Aquifer; however, Te Mana o Te Wai and the degrading health of the Waipaoa River means that some steps will need to be made to address issues in that river also. An updated possible policy approach incorporating that feedback and informed by further science input is included in Appendix 1.

Alongside the input from the Waipaoa Catchment Advisory Group, parallel work has been undertaken in the Regional Advisory Group looking at the overarching rules for water allocation, approach to reductions and how to provide for activities such community water supplies, the Gisborne municipal water supply and water storage within the regional framework. These are discussed in the companion report on this agenda. Because the Waipaoa Catchment is the main location where there are water takes at the moment, it is important that the two sets of provisions are well integrated.

6. Next Steps

There remain a range of unanswered science questions to support the water quantity topic, and some further work is planned, as well as a review by the Expert Panel. This will inform the development of draft provisions, which are expected to be available for the group to review and discuss mid-2025.

Appendix 1

Summary of previous meeting and scope

Short Term Priorities (next 5 years)

- Put in place a higher minimum flow on the Waipaoa River that encourages storage but still retains a high level of irrigation reliability.

- Introduce stepped reductions once flows drop in the river, rather than reducing the size of the allocation blocks.
- Support water user groups to manage the stepped reductions – allowing for the % reductions to be achieved across a geographic area/group of growers, rather than through the same % applied to each individual consent.
- Cut allocation in the Makauri Aquifer, so that the total allocation is no more than the 2020 water year total actual use.
- Specific allocation provisions within the B block for the Waipaoa River for Managed Aquifer Recharge (to ensure there is water available for this use) and above ground water storage.
- Introduce minimum flow for water supply intake at Te Arai River in 2026 as per operative Waipaoa Catchment Plan.
- Establish the outcomes required for a MAR Scheme and support the introduction of a MAR for the Makauri Aquifer.
- Maintain current allocations in the Waipaoa Gravels and Shallow Fluvial Aquifers. Retain the Waipaoa Gravels and Shallow Fluvial Aquifer in the Waipaoa River Water Quantity Zone.
- Undertake further science work around the effect of increasing minimum flows and the impact of this on ecological values in the Waipaoa River.
- Identify opportunities for wetland restoration and provide for this as an offsetting measure for water takes.
- Investigate surface storage options – including where these are combined with municipal supply.
- Develop a better understanding of naturalised river flow with a focus on surface water/groundwater interactions.
- Undertake further science work on the relationship between water quality and quantity and the best ways to improve ecological health outcomes in the Waipaoa River.

Medium - Long Term

- Increase minimum flow in the Waipaoa Surface Water Quantity Zone to meet a critical low flow of 1,733 l/s in 2035. Retain stepped reductions approach though the thresholds may change.
- Set a target minimum flow in the Waipaoa Surface Water Quantity Zone of 2,550 l/s (MALF) by 2050.
- 15% cut in Makauri Aquifer allocation followed by 5 yearly reductions in Makauri Aquifer allocations to 2045 unless this is offset by Managed Aquifer Recharge.
- Put in place a policy framework that provides for a mosaic of water options – reuse, storage at a range of scales from the individual to community scale.
- Provide a framework that allows for wastewater and stormwater reuse as future options in the catchment.