Waipaoa Catchment Planning Advisory Group – Hui 9

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Title of report: Water Quantity – Minimum Flows and Allocation Blocks – Scenarios for Analysis

Report no: 1

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Purpose of this report

This report discusses the options for minimum flows and allocation blocks for the Waipaoa Catchment Plan. It builds on the scenarios and feedback from Hui 8 and seeks further feedback and amendment by the group.

The report also provides the opportunity for a "check in" on the appropriateness of the environmental outcomes we developed now that water quantity issues are further considered.

Outcomes sought

- Members of the Advisory Group input into the development of minimum flow and allocation block scenarios for further analysis and testing.
- Members expertise and knowledge helps build the collective understanding of issues relating to water quantity

Getting ready for the hui

Please consider the questions in this report ahead of the next hui. This will aid the discussion at the hui.

Contents

1. Introduction

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.

This report for Hui 9, summarises the feedback from the discussion around timeframes and priorities and brings back the possible scenarios for setting minimum flows and allocation blocks for further discussion.

This report also provides information on the draft Environmental Outcomes for the Tūranga Flats FMU and identifies the relationship with these and the water quantity scenarios.

2. Scene setting – the National Objective Framework

This work is part of the second stage of implementing the National Objectives Framework (NOF).

Stage 1: Identifying aspirations and goals for freshwater

- Identifying freshwater values
- Defining Freshwater Management Units
- Setting environmental outcomes
- Identifying a Long-Term Vision

Stage 2: Identifying how and when to achieve those goals

- Understanding attributes and baseline states
- Setting targets and timeframes
- Setting limits, methods and actions **– we are here**
- Monitoring

3. Key Discussion Points from Hui 8

Hui 8 focussed on 3 key areas:

- Timeframes and priorities for water availability
- Pace and methods of implementation for any new allocation and minimum flow framework
- Discussion of scenarios for water quantity improvement in the Waipaoa River, Te Arai River and groundwater systems

The notes from the workshop are attached as **Appendix One.** Staff have reviewed these and have identified key takeaways from the workshop:

Timeframes

- The issue is urgent, but the impact of changing allocation is severe. Therefore, we need to both take immediate action, but also provide a pathway for long term improvement. Harder tasks need longer timeframes.

Priorities

- There is a high risk of irreversible harm to the Makauri Aquifer, so addressing saline intrusion and decline of the aquifer is a high priority.
- We need to make progress towards improving ecological values in the Waipaoa and Te Arai Rivers, but also recognise that a problem, decades in the making, will also be decades in the solving.
- Storage is a key part of the solution to better water quantity management, so the framework needs to strongly promote this.

Transition

- Need to provide clear timeframes – longer timeframes are needed for larger cuts
- Saline intrusion in the Makauri Aquifer is an urgent issue so needs some immediate action
- Incremental reductions are the preferred approach to provide for time for growers to develop storage solutions and innovate

4. Possible Policy Direction for Discussion

Based on the workshop feedback, staff have developed a possible policy direction for feedback from the Advisory Group. We have developed short and longer-term priorities/actions:

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. For example, a requirement for 5% reduction in abstraction rate when the river reaches 2,000l/s and further percentage reductions as the river level drops.
- 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.
- Substantial reductions in 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.
- Maintain current allocations in other water sources (Te Hapara Sands, Matokitoki Aquifer, Waipaoa Gravels, Shallow Fluvial Aquifer). 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.

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.
- Set a target minimum flow in the Waipaoa Surface Water Quantity Zone of 2,550 l/s (MALF) by 2050.
- Introduce 5 yearly reductions in Makauri Aquifer allocations to achieve 15% reduction by 2045 unless this is offset by Managed Aquifer Recharge.

Questions for the Advisory Group

- ❖ Have we correctly identified the key short and medium-long term directions on water quantity? What changes would you make?
- ❖ Are we missing anything critical around priorities?

5. Environmental outcomes and how they relate to water quantity scenarios

Using the feedback we received in our earlier Advisory Group hui, the following draft environmental outcomes were developed for the Waipaoa Catchment and Turanga Flats Freshwater Management Unit.

Waipaoa Catchment

Value	DRAFT Environmental Outcome Statement	Water Quantity Scenarios
Ecosystem Health	Land is managed well so that water quality, and quantity, river, stream and wetland flows, support the naturally occurring range of native wildlife including tuaiwi - kore/invertebrates, rākau/plants, ika/fish and manu/birds. Key marker species such as kanae, kōtare, koura, kākahi, pekapeka and tuna are abundant in their natural habitats.	This outcome is likely to be supported most by increasing minimum flows in the Waipaoa Surface Water Quantity Zone so that they are greater than MALF (2550 l/s).
Threatened Species	The populations of threatened species increase in the rivers, streams, wetlands and riparian areas of the catchment. Habitat improvements enable threatened species to expand their range, with weeds and pests managed. Ki uta ki tai fish passage is uninterrupted so that threatened species can maintain all parts of their life cycle. Riparian areas are sufficient in	This outcome is likely to be supported most by increasing minimum flows in the Waipaoa Surface Water Quantity Zone so that they are greater than MALF (2,550l/s) – however any increase above 2,000l/s is likely to significantly improve the situation for smaller tuna in the river.

	width and in good health to support breeding populations. The freshwaters remain a national stronghold for longfin eel (tuna).	
Mahinga Kai	Mahinga kai and rongoa practices are accessible, safe to consume and available for whānau and marae events year – round, supporting communities in the places where they historically occurred.	This outcome is likely to be supported most by increasing minimum flows in the Waipaoa Surface Water Quantity Zone so that they are greater than MALF (2550 l/s).
Human Contact – Swimming	Swimming is safe and healthy and accessible during the November to April swimming season at identified swimming spots.	All scenarios would provide for this environmental outcome.
Animal Drinking Water	The water sources within the catchment are an important part of a healthy drinking supply for stock. The use of dams and water reticulation means less direct stock access to waterways.	All scenarios would provide for this environmental outcome.
Mauri	Mauri of the wai is protected, acknowledged, and cared for. Customary practices can be observed.	This outcome is likely to be supported most by increasing minimum flows in the Waipaoa Surface Water Quantity Zone so that they are greater than MALF (2550 l/s).

Turanga Flats FMU Specific Environmental Outcomes		
Irrigation/Food Production	There is efficient use and reuse of water and water storage for irrigation, including through use of aquifers, allowing the Tūranga Flats to retain their high levels of food production. Good practice management of soil health, runoff and nutrients means the freshwater impacts of food production are reduced.	This outcome is likely to be supported most by the Status Quo and scenarios with lower minimum flows in the Waipaoa Surface Water Quantity Zone.
Drinking Water Supply	The Waipaoa River provides an important part of a healthy drinking water supply for Gisborne City and communities across the Tūranga Flats.	This outcome is likely to be supported most by the Status Quo and scenarios with lower minimum flows in the Waipaoa Surface Water Quantity Zone.
Natural form and character	Flood protection is maintained within the FMU. Alongside this the number and extent of wetlands and their connection to waterways is increased with riparian corridors developed around tributary streams.	All scenarios would provide for this environmental outcome.
Fishing	The Waipaoa River and its tributaries support fish populations for fishing.	This outcome is likely to be supported most by increasing minimum flows in the Waipaoa River.

Aquifer recharge	Aquifers are actively managed to improve water quality and support water storage for irrigation. This includes use of managed recharge as well as reductions in allocation. Saline intrusion is stabilised, and the aquifers are resilient to sea level rise.	This outcome is likely to be supported most by the Status Quo and scenarios with lower minimum flows in the Waipaoa Surface Water Quantity Zone.

As can be seen from the table there is a strong tension in the environmental outcomes – scenarios that increase minimum flows in the Waipaoa River are more likely to support environmental outcomes around ecosystem, species and cultural values, whereas scenarios that retain lower minimum flows in the Waipaoa River better support environmental outcomes around food production, drinking water supply and aquifer recharge. Environmental outcomes around swimming and animal drinking water are largely neutral as regards the water quantity scenarios.

Question for the Advisory Group

- Given what you understand about water quantity issues, would you amend any of these environmental outcome statements for the Turanga Flats FMU or do you think these environmental outcomes are still appropriate?

6. Scenarios for Evaluation

In hui 8 we introduced some draft minimum flow and allocation scenarios for the first time. Now that Advisory Group Members have had time to "mull over" these scenarios, further feedback is sought.

The scenarios outlined in Hui 8, but as amended by the feedback we received at the hui, are included in the information below. The intention is that these scenarios will be used to inform the quadruple bottom line evaluation.

6.1. Scenarios for River flows

Table 1: Minimum flow scenarios and irrigation reliability for the Waipaoa River

Scenario	Water take limit (l/s)	Description	% of time cutoffs in place (2003-2022)	Historical flow record (2003-2023) (20 years)		
				Number of hydrological years flow has fallen below this limit	Duration in days of low flows per hydrological year (excluding years with no cutoff limits in place)	Average duration in days per hydrological year of low flows (including years with no cutoff limits in place)
1	**1,300**	Status quo – A Block	0.1	3	2-4	0.4
2	**1,733**	Table 2, Option 3, with 433 l/s cap (NIWA, 2023)	1.7	7	5-33	6
3	**2,000**	80% of Mean Annual Low Flow is 2040 l/s; this has been rounded	3.2	8	1-61	11
4	**2,550**	Mean Annual Low Flow (NIWA, 2023)	6.7	12	3-105	23
5	**3,000**	High instream values (NIWA, 2023)	9.3	15	3-114	32
6	**4,000**	Option 1 (high instream values), with 1000 l/s cap (equivalent to B Block) (NIWA, 2023)	16.6	18	1-144	57

This table is provisional, and the flow data is based on hydrological years (from 1 July to 30 June).

Table 2: Minimum flow scenarios and irrigation reliability for the Te Arai River

Scenario	Water take limit (l/s)	Description	% of time cutoffs in place (1984-2022)	Historical flow record (1984-2023) (39 years)		
				Number of hydrological years flow has fallen below this limit	Range of days cutoffs in place (excludes years with no cutoff limits in place)	Average duration (days) of cutoffs per hydrological year (includes years with no cutoff limits in place)
1	**60**	Status quo (A Block) – observed MALF	7	29	1-107	24
2	**100**	Options 3 & 2 (with 20 l/s cap) (NIWA, 2023)	15	37	2-152	54
3	**150**	High instream values (NIWA, 2023)	22	39	3-180	81
4	**220**	Status quo (B Block)	30	39	4-206	108

This table is provisional, and the flow data is based on hydrological years (from 1 July to 30 June).

6.2. Scenarios for Aquifers

	Impacts on actual use	Impacts on saline intrusion	Impacts on water levels /river flows
Scenario 1: 5% reduction in allocation every 5 years – all aquifers	Cuts in actual use from 2095	Further saline intrusion from west - may make the aquifer unusable before actual use cuts commence	3m drop in groundwater levels Makauri Aquifer, reduction in Waipaoa River minimum flows
Scenario 2: Allocation cut to Actual Use 2030, 5% cut in actual use every 5 years to 2045	15% cut in actual use achieved by 2045	Saline intrusion continues but slows from 2030	Groundwater levels continue to reduce but at a slower rate from 2030
Scenario 3: Allocation cut to Actual use 2030, Managed Aquifer Recharge used to offset need for 15% cut – in place by 2035	No requirement to cut actual use as this is offset by MAR	Saline intrusion stabilises from 2035. Depending on number of MAR wells and location, could reverse intrusion trend	Groundwater levels continue to reduce to 2035. Depending on number of MAR wells could reverse groundwater level decline.

7. Next Steps

Feedback from this Advisory Group hui will help the freshwater planning team update the scenarios for further investigation and evaluation. There are two key areas where this evaluation will take place.

Firstly, the Council is assembling a technical expert panel who we will be liaising with and asking their expert technical opinion of the scenarios and the implications of them.

Secondly a quadruple bottom line (Environmental, Social, Environmental and Economic) analysis is intended to be undertaken of the scenarios, with the outcome of the analysis to be brought back to a future Advisory Group meeting for further discussion.

In the Regional Freshwater Plan Advisory Group there is work being undertaken looking at water demand through a regional water assessment, and allocation options. Once that work has progressed then this will be brought through to look at how this might work within the Waipaoa Catchment.

8. Appendix 1 – Hui 8 Workshop Notes

Session 1 – Timeframes and Priorities

1. What timeframes should we be planning for?
2. Should we prioritise improving minimum surface water flows ahead of groundwater levels or vice versa?
3. Should we prioritise Te Arai River over the Waipaoa River in terms of improving flows?
4. What priority should we place on the smaller aquifers (e.g. Te Hapara Sands, Waipaoa Gravels) compared with the Makauri Aquifer?

Timeframes

Group 1

- Should we be looking at different timeframes for different water sources
    - i.e. groundwater/Te Arai River
    - i.e. Saline intrusion
- Could we look at different timeframes for different species eg. Focus on tuna initially + expand more species/ecosystem health over time.
- Would there be value in targeting specific times of year for improved flows to help species?
- Need to take into account temperatures in the rivers when thinking about flows.
- Can we have some info coming to next FWAG on the ecological values
    - eDNA results - what is there?

Group 2

- Depends on scale of change?
    - Harder the task, longer the timeframe
- Requires needs for significant asset investment (dams, pipes, etc.)
- Soil types affect negative impact on lack of water supply
- Above 1400 L/s regular storage investment
- Social implications of forcing amalgamation of 'mum & dad' orchards

Min flows	Timeframe
1700 ls	10 years min
2000 ls 2500ls 300 ls	10 years plus ↑ (Need to be linked to unsustainable hill country management!!!; 100 year plan)

Group 3

Allocation Timeframes

- Issue is urgent
- Severe effect
- Businesses build around use
    - Need to quantify
        - drives timeline
    - Depends on scenario
- Health of waterways important, not just economy

    - Integration between people and awa. Important to look at health of whole catchment. Quality + Quantity connected
- Te Mana o te Wai - Are we interested in the health of awa?
- DH
    - will take a long time to come right
    - Problem is bigger than we think. Ecosystem ruined
- Need to signal need to look at bigger picture. Need a plan - signal in plan to address all of the issues.
- Safe drinking water is a priority.
- Set a 50-year vision. Think about what we can achieve in that time

Priorities

Group 1

- Prioritising low hanging fruit and certainty on outcomes
- Better understanding what we don't know
- Need to consider impacts on changes of rain flow on Te Arai vs. the Waipaoa river in relation to the drinking water supply
- Would be good to understand impact of Cedenco vs irrigation in economic model
- Saline intrusion/groundwater risk is quite high
    - irreversible damage
- Should prioritise groundwater recovery
    - recognizing that if do that would also improve flows in the rivers
    - baseflow + also transfer consents from surface water to groundwater if a MAR was undertaken
- Need to monitor the rivers to ensure we get benefits from any increase in minimum flows
    - eg. Te Arai
- Need to ask the question for rivers of what are the benefits we can get given the constraints such as sediment, flood scheme
- Need to be more specific about the ecological values/ecosystems that we want for the Waipaoa river – do we continue the focus on tuna as a priority species?
- No agreement, should prioritise better health rivers eg. Te Arai over Waipaoa in terms of short-term improvements.
- Need to recognise Waipaoa river is being run hard
    - min flow is 50% of MALF.
- But want some confidence that improvement in environmental outcomes will actually occur
- Think permitted takes on Te Hapara sands are a minor issue
- Priority should be on Makauri aquifier
- Need to recognise Te Hapara is currently ok
    - but focus on retaining water quality/canary for climate change as water levels are currently good.
- Recognise temperature can be a barrier to fish passage.

Group 2

Question 2

- We need better science, but can we get it?
- Prioritise MAR over surface water as seen as a viable solution to more water ⬆️
- Corporate solution/ business to provide & supply irrigation water
    - Business will attract investment
- Need to make a decision!
- Research & Development (R&D) + investment requirements

Question 3

- Bush intake required by 2026

    - no min take at moment
- No/why do we have to prioritise?

Question 4

- 80/20
- Put investment in to maximise returns.
- Salination considerations (project risk)
- Need to start MAR now. What are the risks?
    - Have prioritised monitoring heavy at start, reducing over time if conditions met etc.
- Community has "trust issues" (Public perceptions)
    - education & awareness
    - public will never be happy (social media)

Group 3

- Mātauranga important
- Regenerative farming
    - need to restore whole ecosystem
- Mana whenua + community have a role to protect water sources & staged approach – preferred
- Where to focus efforts
    - storage critical to reducing low flows
    - Very long-term thing
- River used to be deeper. Lived right on river. Like that for generation. '48 flood shifted us out. Used to bring whales right up river. Flood works used to be up river.
- Timeframes need to reflect scale of change that has occurred over time.
- Te Arai is a small source already from a user perspective.
- What is the benefit to Te Arai river?
- Makauri aquifer as a matter of priority
    - recharge doesn't solve mindset

Session 2 – Transition

1. What pace might any transition take?
2. Is it better to take an incremental approach or, for example, give users 10 years and then a big cut?
3. Should the surface water and/or groundwater allocation regimes place any priority on supporting high flow harvesting and storage?

Group 1

- In terms of groundwater need to understand the point of irreversible damage + what level of damage we are prepared to accept
- Pro-rata reductions don't work
    - people who don't have full use of allocation will benefit over those who are tight.

Priority for high flow harvesting/storage

- Problem of MAR – community input for benefit of one sector
    - Back to reciprocity what are users giving back to wider community
- Need more focus on irrigation efficiency/water use best practice

Group 2

Question 1

- Anything scalable (eg. Groundwater recharge) can be incremental reductions
- Where significant investment requirements need long lead-in timeframes

- Need to look at new/additional water to get water security

Question 3
- Frame-work "use it or lose it" approach needs fixing
- This is difficult!

Group 3
- Clear timeframes – longer timeframe, larger cut.
- Urgent issue so needs some immediate action
- Quantity/quality relationship – low flows vs winter
- MAR – prioritise for managing low flows
    - Can be achieved in a relatively short-term basis
        - support long-term minimum flow changes
    - Recharge greater than is required for abstraction to achieve long term groundwater level increases
- Do we need to look at different crops or land uses that are better suited. Support a long-term transition.

Session 3 – Scenarios

1. Are there missing scenarios or alternatives you would suggest?
2. How could we consider both supply and demand side measures within the scenarios

Waipaoa River/Te Arai River
- Can't see the benefits of moving beyond a 1300l/s
- Climate change will see these low flows increase + reliability drop.

Scenario alternative (Same for both Waipaoa & Te Arai)
- More from binary (on/off) water take to a staged/tailored approach. Take more during high flows & less in low flows. This "may" incentivise storage and investment

Groundwater
- This group didn't had enough time to discuss scenarios