

Rangitāiki Freshwater Futures Community Group

Workshop 9 Notes: Groundwater Quantity

Galatea Hall, 50A Mangamate Road, Galatea

Wednesday, 20 March 2019 commencing at 9:00am

- Members present:** Larry Wetting (Co-Chair), Bridget Robson (stand-in for Alamoti Te Pou), Cathy Brown, Christina Bunny, Colin Maunder, Jose Miki (replacing Earl Rewi), Kerry Snowdon, Linda Conning, Matt Gow (left 1.25pm), Tom Lynch
- Invited participant:** Maramena Vercoe (Chair Rangitāiki River Forum), Pouwhare Rewi (guest of RRF Chair), Rob van Duivenboden (guest of Christina Bunny)
- Apologies:** Alan Law, Alamoti Te Pou, Cllr Bill Clark, Craig Rowe, George Johnstone, James Doherty, John Gibson, Matt Osborne, Nicholas Woodley, Nick Doney, Steve Brightwell, Te Waiti Rangiwai
- BOPRC staff present:** Kerry Gosling (Facilitator), Stephanie Macdonald (support facilitator), Andrew Millar (Senior Planner – Water Policy), Nicki Green (Principal Advisor), Michelle Lee (Planner), Nancy Willems (Team Leader Eastern Catchments), Raoul Fernandes (Team Leader Water Quantity Science)
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Related documents previously circulated:

- 1 [Workshop briefing note](https://atlas.boprc.govt.nz/api/v1/edms/document/A3164462/content). Workshop 9: Groundwater quantity. (https://atlas.boprc.govt.nz/api/v1/edms/document/A3164462/content)
- 2 [Workshop Fact Sheet](https://www.boprc.govt.nz/media/796400/2018-03-28-rangitaiki-groundwater-limits_info-sheet.pdf): Introduction to Groundwater Environmental Level Setting (updated Feb 2019). (https://www.boprc.govt.nz/media/796400/2018-03-28-rangitaiki-groundwater-limits_info-sheet.pdf)

These papers and the [workshop presentation](https://atlas.boprc.govt.nz/api/v1/edms/document/A3164462/content) are available on council's website. (https://atlas.boprc.govt.nz/api/v1/edms/document/A3164462/content)

1 Welcome/Purpose

The purpose of the workshop was to focus on groundwater quantity management with a view to confirming the group's values and objectives, clarifying issues, and exploring options for addressing the issues.

2 National and Regional Update

Potential changes to the National Policy Statement for Freshwater Management (NPSFM) were noted. There is uncertainty about the scope and content as the Government is still working on the policy changes. Public consultation is likely to be in July 2019.

Parts of Plan Change 9 (region-wide water quantity) are subject to Environment Court appeals. Those matters can be noted but cannot be debated in the workshop.

A poll on future workshops dates will be sent out shortly. The future workshops will be on water quality and surface water quantity.

The council team will engage with the public on PC12 work once key issues and policy options have been clarified.

Key points raised in discussion:

- First public engagement on options is currently scheduled to start in June/July, but might be delayed due to potential NPSFM changes. It was suggested public engagement take place outside of spring which is a busy time for farmers.
- The effect of notified proposed plan changes on resource consents decisions was discussed. Objectives, policies and rules in proposed Plan Change 9 have legal effect. The previous objectives, policies and rules still continue to apply as well. While there are two sets of rules the most onerous rule applies. The relative weight given to the old and the new objectives and policies that conflict depends on how much the new ones are still subject to challenge.
- Staff will make efforts to meet with iwi in addition to public engagement. It was noted that iwi often need longer engagement period so they have time for discussion and decisions within their rohe.
- Concern was expressed that while some sectors of the community were aware of and understand the Plan Change 9 requirements, other sectors were not, such as lifestyle block owners.

3 Rangitāiki Groundwater (Slides 13-23)

Staff explained groundwater resources in Rangitāiki. Some of this information was briefly presented at workshop 7.

Key points:

- Interaction between groundwater and surface water was explained. Streams can receive groundwater through the stream bed (forming stream base–flow) from shallow unconfined aquifers, or lose water through the stream bed. It depends on the difference in water levels between the stream and groundwater. The water moves from high level to low level.
- Taking groundwater affects groundwater levels.
- The interface between groundwater and saline water at the coast is constantly changing in response to natural changes in water levels. The interface is not a discrete boundary. It is a gradient from fresh water to saline water at the coast. Taking groundwater at the coast can affect the location of the saline boundary.
- Various geological layers underlie the Mid-Upper and Lower Rangitāiki. For the purposes of calculating groundwater availability for use, they are currently grouped together into one unit vertically below the ground. In the future, they may be separated into some different hydrogeological units each with specified groundwater availability.
- It is estimated that groundwater takes approximately 250-300 years to move completely through the Matahina Formation geological layer and approximately 30-50 years to move through the sediments in the Rangitāiki Plains.
- Recharge areas in the Lower Rangitāiki are through the Matahina Formation in the south and the various sediments on the Rangitāiki Plains.

4 Groundwater Values, Uses and Objectives (Slides 24 – 28)

Staff asked members to consider the identified values and uses, and to think about any others to add to the list.

Key suggestions and points raised in discussion:

- Suggested Te Mana o te Wai (TMotW) should be considered as a value in place of “mauri” as TMotW is all encompassing. Staff noted work needs to be done on what we mean by TMotW as this has not been applied in policy before.
- Suggested water bottling should be identified as a separate use type with its own criteria to evaluate whether it is appropriate or not. Existing provisions on efficiency don't easily relate to it.
- Suggested contaminant/nutrient discharges were also a potential effect of groundwater. Water use and discharges, including non-point source discharges should be considered holistically at the same time, i.e., council should also consider effects of using the water to intensify land use and contaminant loss risk.
- Natural groundwater quality such as high iron concentration can affect suitability of water for some types of uses.
- Suggested that differences in annual recharge rates be recognised. Staff noted that average annual recharge across many years is used because it reflects differences in annual recharge in different years and groundwater systems respond more slowly than streams.
- Management objectives need to be achievable and reflect natural differences across the catchment e.g. different geology.
- Social and economic implications also need to be considered when setting policy limits, a cost and benefit assessment would also have to be carried out.

5 Availability and Current Allocation (Slides 29-40)

Staff presented information on current location and availability of groundwater within the Rangitāiki water management area. Groundwater management zones currently used were explained. These are used for setting groundwater available for use and accounting for the amount of water allocated.

A question was asked about water metering requirements – see Appendix 1 for a full reply.

Current allocation status is shown in slides 37 and 38.

Key points presented:

- Plan Change 9 as notified referred to council's report, *Assessment of water availability and estimates of current allocation levels, October 2016* which included the management zones. The report explained the approach/method, but it was not part of the notified plan change document. The plan change hearing decision includes *Schedule 15 – Method for estimating surface water and groundwater allocation status*. Schedule 15 includes the groundwater zone approach/method.
- There are different methods to determine groundwater/surface water interaction. The degree of interaction depends on a range of factors. These include: volume taken, duration of take, distance from connected water bodies, aquifer characteristics, stream bed characteristics, hydraulic boundaries (e.g. faults). Applicants should contact a hydrogeologist to determine the interaction effects of a particular proposal.
- Groundwater allocation zones are different geographic areas, not separate aquifers. Residual recharge calculations are calculated separately for each zone, which assumes groundwater does not move between zones. This is a simplification as groundwater can move between zones. The approach can result in residual recharge calculations of less than zero in a zone. In the lower Rangitāiki there are three such zones. This suggests more water is leaving the zone as base-flow than is going into the management zone as recharge. The

method is conservative as it effectively creates a groundwater take exclusion zone.

- Recharge calculations are based on historical long term climate data such as rainfall where available and modelled climate data where it is not available.
- An allocation of 35% of residual recharge is generally very conservative compared to other regions in New Zealand. Comparisons are difficult as they don't use the residual recharge method, the proportion of recharge allocated varies from location to location and there may be different issues e.g. there is less connection between groundwater and surface water bodies. Allocation limits in some parts of the Auckland region would be about five times greater.
- A conservative approach has been adopted to protect connected surface water bodies because we have limited information/modelling. More data is being collected to enable the development of a 3-dimensional groundwater model to better represent the groundwater system. Initial model development has commenced. Results are 5 year away. Management options have to be based on the information we currently have.
- Consented take volumes presented do not include: permitted takes, stock/domestic use and unauthorised use.
- Where groundwater and surface water bodies are connected taking groundwater will have some effect of surface water bodies, but less effect than taking the surface water directly. Even though slide 38 shows that groundwater is available in the Mid-Upper WMA, granting new consents to take groundwater above Matahina is constrained if the groundwater is connected to surface water. This is because it could affect people's ability to exercise existing surface water consents. New groundwater consents applications would have to assess the potential groundwater/surface water interaction effects of the proposal.
- A question was asked about unconsented water users identified by council. Work on managing these is continuing. **Staff note:** *Approx. 130 unauthorised water uses identified: 70 meet permitted activity conditions and don't require consent; 25 have applied for consents and are being processed; 10 applications are expected shortly once bore tests are completed; and, 25 are subject to ongoing compliance.*

6 Future Demand

Staff reminded members that possible future land use scenarios were discussed with them during workshop 7. After workshop 7 some group members also participated in a workshop on potential future water demand. Further work has since been done to calculate water use by management zone. It was emphasised that these are broad estimates to get a general sense of whether water demand and supply are likely to be issues for the catchment in the future (slides 43 and 45).

Key points from discussion:

- Irrigation enables land use development and can change the rate of development.
- Estimated water demand was based on: the potential future land use scenarios previously developed in conjunction with council land managers, industry, CNI and the community group; the change in development area (hectares); and, estimated annual water requirement per hectare for the type of development/use.

7 Management Issues (Slide 48)

Members were asked to identify any other issues/concerns in terms of managing groundwater quantity.

Key suggestions and points from discussion:

- Suggested there should be some consideration of climate change on groundwater recharge.
- Suggested there should be work done to improve the understanding of connection between groundwater and surface water bodies to limit cost and improve certainty for consent applicants.
- Suggested water use and consequent effect of discharges should be considered together. It was confirmed these considerations are part of the Plan Change 12 process and policy options for both can be considered together. We have just focused on groundwater quantity today.
- Suggested there should be consideration of efficient water use and education on good management practices for new growers. *Staff noted efficient water use is considered in water allocation as part of the consent process. For some development types, such as various crop water requirements, council has tools to assist assessment. Mitigation measures and good practice related to management of contaminant discharge discussed at previous workshops has been the subject of ongoing work. It will be incorporated into water quality discussions at an upcoming workshop.*

8 Options (Slides 49-58)

In three to five years improved information and 3-dimensional groundwater modelling will be available. Results will provide greater certainty for decision making. Potential options for improving groundwater management now were presented. The Group were asked to provide feedback on the four options, and to suggest additional options.

Raw notes from group members are included in Appendix 2.

Key points from the discussion were:

Improved Information and Monitoring

- Suggested more resources should be applied to help improve the knowledge base for decision making. How and where we monitor should be considered so issues are identified and responded to quickly. Iwi and the community could help with monitoring data collection. *Staff advised monitoring bore locations are based on geology, resource use, and where data is required to inform modelling. Five monitoring bores were installed in Upper Rangitāiki, three in Galatea and a further one is to be soon to be drilled on the Rangitāiki Plains. A number of other privately owned bores are monitored by council.*
- Suggested Te Mana o te Wai should be included in monitoring programmes. *Staff noted Te Mana o te Wai was recently introduced into the NPSFM and we will need to work through how to implement it. The government is expected to provide further direction on Te Mana o te Wai. It incorporates the values of tangata whenua and the wider community in relation to each water body. While the concept of Te Mana o te Wai is expressed in te reo Māori, it applies to freshwater management for and on behalf of the whole community.*
- Council proposes to employ a Maturanga Māori specialist.

Make More Water Available

- Suggested storage options could be considered. A number of irrigation scheme feasibility studies have been undertaken in the past. **Staff Note:** *The Galatea Murupara scheme study (2006) found it was not viable to take run-of-stream flow. The Plains Community scheme study (2013) found it had a lack of interest; and the Upper Rangitāiki Irrigation / Flood Control scheme study (2017) showed it was not considered viable for flood control. It also has issues with project viability, finance and technical certainty.*
- The recent [Aqualinc Research study](https://www.boprc.govt.nz/media/796356/fresh-water-constraints-to-economic-development-final-hires.pdf) (December 2018) on freshwater-related opportunities and barriers for economic growth is available on council's website. (<https://www.boprc.govt.nz/media/796356/fresh-water-constraints-to-economic-development-final-hires.pdf>)
- A key conclusion of the report is the foreseeable freshwater demand across the region can be met (without storage), provided consents are based on reasonable use, with some localised exceptions.
- A group member suggested considering viable land uses that don't require water, but suggested this is an option for land owners/managers rather than a policy option.

Option 1 – Increase Allocation Limits

Description:

- The more groundwater that is allowed to be taken, the more likely it is there will be an effect on connected surface water bodies and/or coastal freshwater discharge. Very little data is available to inform us of the degree of increased risk if we allocate more.

Discussion:

- Suggested that actual water use needs to be determined to assess what effect it is currently having on the groundwater resource. Some consent holders may not be using all water they are allocated. Some users don't require a consent (e.g. stock, domestic and permitted uses). There may also be unauthorised water use. More water use information would help reduce uncertainty related to the current environmental effects. *Staff noted more information will become available over time such as number of permitted use takes. A plan change decision can be made based on the available information. The level of risk of having incomplete information needs to be taken into account in the decision.*
- Why do some management zones have zero allocation if limits are increased from to 75% of residual recharge? *Staff noted some management zones assessed in the water balance model have no residual recharge. So allocation limits expressed as some percentage of residual recharge will always result in zero allocation regardless of the percentage adopted.*

Option 2 – Amend Management Zones

Description:

- Using the water balance model approach, relatively small management zones and large base-flow results in zero or very little allocation in some Lower Rangitāiki zones. Calculation of allocation with separate zones is described in section 5 above. Groundwater can move between zones. There is the possibility of combining some zones. This would re-distribute the same volume of water over a wider area. This could mean water is available in areas where there is currently considered to be none. However, it reduces the 'blanket'

protection of spring flow/base-flow in the zone and instead would require assessment of effects to be made in individual consent applications.

Discussion:

- Suggested there was a risk that a single consent could take all the available water.
- Suggested the combining approach could result in a practical outcome for the region.

Option 3 – Efficiency Gains

Description:

- Groundwater availability is based on annual volume.
- There are limited ways that consents without annual allocation may be able to be reviewed to improve efficient allocation. Central government is looking at the potential for other ways existing groundwater consents can be reviewed.

Discussion:

- Suggest there be seasonal volumes / use is constrained to specific dates. Groundwater consents usually have a maximum daily or maximum weekly allocation limit as well as annual allocations. Annual consented volumes reflect seasonal water use. They don't allow use at the maximum daily/weekly rate for the full period of the year.

Option 4 – Share Water

Description:

- Sharing water in fully allocated resources improves allocation efficiency.

Discussion:

- Suggest surrender or transfer of consents that are not used.

Members would like council to understand that currently landowners are under a lot of stress, and recognise the social and economic consequences of changes.

9 What's next?

Staff summarised the next steps and note their intention to hold another workshop on surface water quality in May/June.

Staff will summarise the issues and options with a view to talking to the wider community. Whilst the draft plan change is still scheduled for late in the year, councillors have advised that nothing will be notified until central government makes their direction clear. There is also a council election in October this year which may affect the schedule.

Further conversations will be held with iwi. Staff will prepare discussion documents for public engagement that will be useful to members.

Workshop ended at 2.25pm.

Appendix 1 – Clarification on reporting water use by telemetry

We undertook to provide you with information on the requirement to report water use by telemetry and clarify whether it was with 12 months of the Plan Change 9 becoming operative. Telemetry is automated communications process by which measurements are collected on one location (site the water is taken) and transmitted to receiving equipment in another location (council) for monitoring.

The 12-month period relates to registration of the Permitted Activity to take water and fit a meter, if one was required by the Permitted Activity. The 12-month period has not started yet because there are appeals to that rule, so Plan Change 9 is not operative. The 12-month period does not relate directly to the requirement to report water use by telemetry.

The [Region-wide Water Quantity - Proposed Plan Change 9 hearing committee decision document](https://cdn.boprc.govt.nz/media/785544/2018-09-27-master-document-for-notification-full-track-change-clean-copy-pdf-version.pdf) can be found on the on council's website. (<https://cdn.boprc.govt.nz/media/785544/2018-09-27-master-document-for-notification-full-track-change-clean-copy-pdf-version.pdf>)

Water metering, reporting and accounting is covered in policy WQ P24 on pages 18 -19 of the PC9 hearing committee decision document. WQ P24 is copied below. Under WQ P24 all consumptive consented takes require a meter. Permitted activity takes require a meter where in conjunction with a take allowed by s.14(3)(b) of the Resource Management Act (water for animal drinking and domestic needs) the total volume of water taken from the property exceeds the permitted activity take volume. The policy requires a minimum requirement of monthly reporting in a council approved electronic format. Under clause WQ P24(c) more frequent reporting can be required. The policy does not specifically require water use reporting by telemetry. To date the council has not specified the electronic reporting format must be telemetry. However, if daily reporting is required rather than monthly, then telemetry would be a much more practical. Council is currently working with DairyNZ to trial automated reporting systems that are similar to telemetry, but much more cost effective. If this trial is successful it is expected that most water users will adopt this system because of the low cost and time saving.

Plan Change 9 Policy WQ P24

Water metering, reporting and accounting

WQ P24 Require the installation of a water measuring device (water meter) for consumptive water takes, and electronic reporting as follows:

- (a) All takes authorised by a water permit and, for takes authorised as a permitted activity, where the total amount of water (permitted takes plus takes allowed by RMA s14(3)(b)) exceeds the permitted activity limit for that property.
- (b) The minimum metering requirement for all water permits, and for permitted activities that require metering shall be a daily recording of the volume taken (in cubic metres) and monthly reporting in a council approved electronic format.
- (c) If considered necessary to meet the objectives of this plan, require more frequent reporting. This may include, but is not restricted to, the following circumstances:
 - (i) The maximum allowed rate of take exceeds 5l/s;
 - (ii) The stream or aquifer is over allocated;
 - (iii) The water permit was granted as secondary allocation or for flood harvesting; or
 - (iv) The resource use is under restriction.

Advice notes:

1. *Horizons Regional Council Technical Report December 2007 "Reasonable Stock Water Requirements Guidelines for Resource Consent Applications" (available at:*

<https://www.boprc.govt.nz/media/470831/reasonable-stock-water-requirements-guidelines-horizons.pdf>) provides a means of assessing stock drinking water requirements.

2. Dairy shed water requirements (milk cooling and wash down) shall be assessed according to Schedule 7.
3. Properties taking water under section 14(3)(b) of the Act from multiple locations on a property must include all water taken from all locations when determining whether metering is required, but only need to meter and report water that is used as a permitted activity.

APPENDIX 2: OPTIONS ACTIVITY

OPTION 1: INCREASE ALLOCATION LIMITS

- Pros

Opens land use options up
No adverse effects in upper/mid Rangitāiki
- In between

35% to 75% is proportional to term of consent. Clear short term consents may allow >35% to be granted and ability for council to clawback volume
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- Cons

Uncertainty on model(s) <ul style="list-style-type: none"> • ground versus surface • climate (risk↑)
Too much uncertainty as to effects – can't clawback once granted
Don't know about effect of climate change/ land use change on water yield in catchment
Amending allocation limit needs to be done cautiously
Knowledge on water resource is not sufficient to amend in my view
- Questions

Is it better to be conservative now and amend when we have the information we need?
Permitted take is not understood
- Recommendations

CDo a water cycle analysis associated with take, so that the amount that comes back into the system is counted, and where it returns / surface → shallow → deep \ evapotranspiration
Live within our means
Wait until better groundwater information and reassess – precautionary approach
Factor in climate change
Must monitor water take

OPTION 2: AMEND MANAGEMENT ZONES

- Pros

Could use a natural capital approach to allocated and re-zone
<ul style="list-style-type: none"> • Be conservative – 35% • Can collect data then make decision
Uncertainty <ul style="list-style-type: none"> • science • surface versus ground → dams • climate • knowledge on groundwater
Local landowner disadvantaged?
- Cons

Seems unsure whether these are appropriate management areas at this stage

Note: These notes from the 20 March 2019 workshop are provided without prejudice. As part of the process, the content records key discussions points, which do not form the group's recommendation to Council, except where it is explicitly stated so.

Management zones need to be in place for a clear purpose based on clear information. These changes suggest that the zones are arbitrary.

Need to ensure whole zone percentage is not allocated to one applicant e.g. water bottling or supersized dairy farms

- Recommendations

Constraints on total volume so that no one person gets the lot

Maximise social/economic/environmental values

Include rule that no applicant can take more than a % and/or volume available

Have consideration of providing water for different users in a catchment – avoid “capture” by landowner or sector

Need a clear link between management zone and the water resources within them

Rapidly move to 3D modelled zones for certainty

- Other

Make clear the assumptions re groundwater boundaries* so that all calculations are logical.

*Groundwater and surface water not aligned

OPTION 3: EFFICIENCY GAINS

- Pros

Should be step 1 on all options “Efficiency”

Efficiency assessment should be a compulsory first step

Could be just a number shift to justify current practice

As an outcome across the board to encourage efficient and un wasteful use

Reduce unnecessary water use

Help ensure water is not used unnecessarily

Review existing consents to impose seasonal limits and volumes

- Cons

Current annual allocation are not always done with efficiency due to limitations of water available (no more water weekly available)

Capital investment – not long enough consent

Different rules for ground versus surface leads to tension amongst users

Needs monitoring and accurate data to ensure gains are efficient

- Questions

Is this about changing practice and streamlining the whole system?

What is “efficient” use and what is this based on? Is this correct? If not, could direct in wrong direction

- Recommendations

Don’t know how much water is currently taken until all takes registered

Whatever the system we use, we urgently need to know what the water systems groundwater and surface water are and how they affect / or not each other

Make efficiency dollar gains explicit

Need to monitor water take

OPTION 4: SHARE WATER

- Pros

Relies on good relationships

Exchanging surface for groundwater takes at critical times is good
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- Cons

Historical – hard to predict water usage ahead of time
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Difficult to regulate and manage relationships
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- Questions

Spatial challenges

Money talks – water take shared between some farm ownership

Sharing water that the person hasn't paid for the water – should they expect dollars for something that isn't theirs?

- Recommendations

Bring your own cup!!

ADDITIONAL SUGGESTED OPTION 5A: LAND USE CHANGE USING LESS WATER

- Questions

What are these land use changes and what is encouraging this?

Science

- Options
- effects
- genetics – drought tolerant/desirable species

Is there a land use 'map' that can be used to determine land use options suitable for the different management zones?

- Cons

Need an incentive to change – tighter allocation might provide this

- Recommendations

Encourage DairyNZ to provide information on low water input farming

Encourage change to more water efficient crops (e.g. Lucerne)

ADDITIONAL SUGGESTED OPTION 5B: STORAGE

- Pro

Provides:

- Guaranteed minimum flows
- More water available – huge and many benefits
- Recreation
- Habitat
- Environmentally friendly
- Flood protection

If we are looking forward with a view to factoring climate change impacts this is an option that needs consideration seriously

- Con

Potential for adverse effects on biodiversity if policy and rule framework not tight i.e. no damming running water bodies

High flows are necessary hydrologic process. Also carry very high total suspended solids (TSS).
High costs high risk option

If storage is not encouraged at home level then dependence on surface water and groundwater increases consequences and environmental impact

- Questions

Financial case

Are there actually any suitable sites in catchment e.g. dry gullies?

Dam allocations – is land use better for community than electricity generation?

ADDITIONAL SUGGESTED OPTION 5C: SURRENDER UNUSED

- Pro

Good idea

- Cons

Need incentive – maybe reduction/waiving of consent fees

- Questions

What will encourage this? How will it be easy?