**Kaituna-Maketū & Pongakawa-Waitahanui Freshwater Futures Community Groups Workshop 8a (optional) Notes:**

1. **Opportunities & Barriers to Freshwater-Related Sustainable Economic Growth**
2. **Mitigation Options**

Pongakawa Hall
Thursday 25 October 2018, 9am – 12.30pm

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**Members present:** Brian Thomas, Darryl Jensen, Geoff Rice, Grant Rowe, Ian Schultz, Jane Nees, Kevin Marsh, Matthew Leighton, Peter Ellery, Warren Webber

**BOPRC staff and contractors**: Santiago Bermeo, Jo Watts, Sue Simpson, Lee Matheson (Perrin Ag Consultants, for second item only)

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**Opportunities & Barriers to Freshwater-Related Sustainable Economic Growth**

The Council has engaged Aqualinc Research to undertake an assessment of freshwater-related opportunities and barriers to sustainable economic growth throughout the region, as an action from the Regional Growth Study. This work is not directly related to our Plan Change 12 work, although the outputs will be of some relevance. The objective of this work is to answer the following questions:

- Is fresh water (quantity) a constraint to economic growth?
- What is the economic growth opportunity created from fresh water, including through more efficient allocation and use?
- Subject to the extent of any such constraints and opportunities, is there a need for irrigation infrastructure in the region, and if so where and for what purpose?
- Are there other opportunities and barriers to economic growth?

Aqualinc looked at the current status of water allocation (under Plan Change 9 interim allocation limits, which are likely to change under PC12) and a future scenario (Scenario C - the same one considered in the catchment model) in terms of land use and water demand.

It is acknowledged that our databases and freshwater accounts have a number of limitations which are in the process of being addressed; the analysis is based on the best information we have now. Members highlighted the extent of these limitations (e.g. extrapolating daily frost protection volumes to yearly values even though it is only used a few days per year, frost protection water coming from storage in some cases, etc.) and noted that the assessment may present quite an alarmist worst-case scenario.

The Council intends to put real-time accounting of surface and groundwater availability online shortly, as soon as some of these limitations have been addressed.

Despite the limitations noted above, the assessment found that generally there is:

- Headroom[1] for development from surface water in the Kaituna catchment, and from groundwater in the Pongakawa and Waitahanui catchments.
- Surface water is over-allocated[2] in the Waiari, Pongakawa and Waitahanui catchments, while groundwater (both shallow and deep aquifers) is over-allocated in the Kaituna and Waiari catchments.

According to Aqualinc's analysis, if allocations for irrigation are reduced to reasonable use rates, additional headroom for development can be created in the Kaituna catchment while groundwater over-allocation could be phased out. Likewise, most of the surface water over-allocation could be phased out, and additional groundwater headroom created, in the Pongakawa and Waitahanui catchments if irrigation allocations were reduced to reasonable use rates.

At least in theory, the projected "Scenario C" development could be fully provided for from available surface water in the Kaituna catchment while it could be fully provided for from available groundwater in the Pongakawa and Waitahanui catchments.

The environmental (water quality) impacts of this scenario were presented during workshop 8. Aqualinc also estimated the economic implications of this development (in catchment profit and employment).

[Following feedback received at the workshop, Aqualinc will be looking at frost protection reasonable use as well as irrigation reasonable use. This would increase the credibility and robustness of the analysis and hopefully address some of the main issues highlighted during the workshop. Because this may change the results and conclusions of the analysis, we will circulate revised results once that additional analysis has been completed].

*Discussion and questions*

We started filling out the following table, showing pros/opportunities, cons/barriers and information gaps related to the irrigation development suggested in Scenario C.

| Pros<br>Opportunities | Cons<br>Barriers | Information gaps |
|---|---|---|
| • Accounting for frost protection appropriately (e.g. commonly comes from storage ponds, during higher flows, during winter lower evaporation, only used for a few days a year, etc.)<br>• Accounting for water returned to the system SW vs. GW (e.g. dairy sheds, industrial processes). | • Environmental impacts (mitigation through consent conditions like wetland creation, financial contributions)<br>• Sediment load from kiwifruit development/re-contouring (mitigate through bunding, but highlighted issues with design of bunds), from forestry harvesting | • Consent database has big holes when using it for freshwater accounting (e.g. extrapolation of daily takes to one year). |

- Lack of road maintenance is a big source of sediment, also headwaters and big climatic events.
- It was noted that water permit transfers and water user groups are already possible ways to share water today, although proposed Plan Change 9 would restrict the former.

[1] When total allocation is less than the cumulative interim allocation limit.
[2] When total allocation is more than the cumulative interim allocation limit.

- The Government has recently announced changes to legislation to improve freshwater management including amendments to the RMA which will better enable regional councils to review existing consents, to more quickly implement water quality and quantity limits (such as reducing allocations to reasonable use prior to expiry to "unlock" some water).
- There are different models to estimate reasonable water use for irrigation. Although in general they would come up with similar estimates, occasionally and they don't. The BOPRC Consents Team uses SPASMO to estimate reasonable use, while Aqualinc have used Hydrus.
- It is noted that freshwater accounts will take into account large non-consumptive uses (e.g. consented industrial processes) but not other situations where some of the water abstracted may return to the environment (e.g. after irrigation, frost protection, dairy shed wash down).
- In the context of impacts from forestry harvesting, the National Environmental Standards for Plantation Forestry (NES-PF) was discussed. Additional information about the NES-PF can be found here.
- Do we have confidence in groundwater availability estimates? The council's assessment of groundwater availability is currently based on water balance calculations of recharge carried out by GNS Science. In simple terms, these calculations determine groundwater recharge based on the amount of rainfall in a surface water catchment, and the difference between that and the amount of evapotranspiration and surface water runoff. The assessments are designed to maintain base flow in streams and have been developed for many parts of the Bay of Plenty region where there is demand for groundwater. These water balance models are relatively simple calculations, rather than complex computer software based models that require more information and data.

  More complex 3-dimensional groundwater models using MODFLOW software are being developed for this WMA and an area that includes the Rangitāiki WMA. Confidence in groundwater modelling was discussed in the information sheet; Groundwater Model for Kaituna-Pongakawa-Waitahanui Water Management Area attached to Community Group 5 Pre-Workshop Briefing Notes and here.
- Deep aquifers in Pongakawa/Waitahanui, not there or not assessed? The GNS water balance assessment described above included two layers (deep and shallow) for the Kaituna catchment and Tauranga Harbour WMA, but only one layer for the Pongakawa/Waitahanui catchments. The more complex MODFLOW groundwater model described above will help decide whether a two-layer groundwater management approach is warranted for the Pongakawa and Waitahanui catchments.
- Aquifer level monitoring, where can they find this info? This is reported in the Natural Environment Regional Monitoring Network (NERMN) Groundwater Monitoring Report. The latest version is from 2013 but more recent data for some bores can be retrieved from the BOPRC website. A more recent NERMN report should be available soon.
- Depth of shallow vs deep groundwater? The depth of the deep aquifer depends on the location. Geological profiles and cross sections showing the depth of aquifers at different locations can be found on the GNS Science - Earth Beneath Our Feet - 3D Geological Models of NZ website. The Groundwater Monitoring Report above also shows the depth of

monitoring bores going into the WAI3 Ignimbrite Deep Aquifer and bores going into shallow aquifers.

- Water quality of deep vs. shallow aquifers? Groundwater chemistry can affect its suitability for particular uses and are influenced by a number of factors including the type of geological unit in which the water is found, proximity to the coast, depth, proximity to geothermal sources, etc. Unconfined aquifers, which tend to be shallower, can be more susceptible to contaminants from man-made sources (e.g. land use). Whether or not these aspects are an issue is determined by the water quality required for the use the water is being put to. Water from deep aquifers generally has more dissolved minerals. Information on groundwater quality can be found in the Natural Environment Regional Monitoring Network (NERMN) Groundwater Monitoring Report.

**Assessment of mitigation practices (Lee Matheson - Perrin Ag Consultants)**

(Please refer to the attached slides).

Santiago started with a few reminders of the earlier work the community groups have done on mitigation practices, and where these fit into the catchment model and the planning process. We are not worried about how these mitigations will be implemented at this point in time.

Lee shared the analysis undertaken (the full report was circulated earlier). Key points to note are that:

- N and P loss figures presented will not be used directly in the catchment model but are estimated only to determine the relative effectiveness of mitigation practices (which will be used in the catchment model).
- Noted that OVERSEER is not as good at estimating P losses as is at estimating N losses, but the relative change under mitigation is what is important in this case.
- Forestry financial figures are 28 year annualised values given that forestry doesn't have an annual revenue stream like the other land uses, and do not include any carbon credits.
- Not all mitigation practices apply to all farming systems (which is why the abatement curves are flat in some sections). The final report will specify which mitigation practices apply to which systems.
- We will shift the boundary between M1 and M2 for sheep & beef due to the higher costs of mitigation (relative to profit) for that land use.
- Noted the assessment was for "average" farms and orchards. Every farm and orchard is different, but it would not be practically possible to model every farm and orchard in the catchment separately. The extent of change required to achieve desired water quality objectives will determine the extent of any additional detail and granularity that we need in the analysis.
- This analysis focuses on agricultural land uses but we will also be considering if any additional restrictions are required for point sources (e.g. storm water, industries, etc., which generally already require discharge consents). [On that topic, central government has also recently announced a set of principles for urban water management. You can read more about it here].

- Lee mentioned a study by DairyNZ and AgFirst on the viability of covered stand-off pads. You can find it here.

Ahead of having full results from the coastal receiving environment/estuaries assessment, we will test the M1 bundle of mitigation practices and see how far that gets us. We need to wait for that coastal environment/estuaries assessment to fully determine how far beyond M1 we may need to go to achieve desired water quality objectives for the catchments and estuaries. That, and the complete results of the catchment model (which the group started considering during workshop 8), would allow us to identify any hot spots (in terms of parts of the catchment, specific land uses or other sources) and then to target solutions accordingly.

*General discussion*

Members asked how the recent *Essential Freshwater* blueprint from central government would change things. Central government's work programme is very ambitious in the timeframe available. However, at this point there are very few details that would allow us to assess the extent of the implications of any changes on our work in this Water Management Area. Some of the things proposed we are already intending to do anyway (e.g. manage sediment) while others may assist our task (e.g. expediting the process to set freshwater limits, increased powers to review consent conditions). The blueprint certainly provides a signal of the direction of travel of the current government. We will continue to keep a watching brief on central government initiatives and, where necessary, adjust our regional work programme to comply with those.

In relation to the central government announcements, members also asked about catchments at risk. The catchments identified by BOPRC and the rationale for them can be found in this paper (starting at page 121). Both the Maketū Estuary (Kaituna) and Waihī Estuary (Pongakawa) are identified as catchments at risk. The next step is for central government and regional councils to ensure that the criteria were applied consistently across the country (as it appears they have not been). At this point it is uncertain what measures central government would propose for these catchments.