Shopping list for Proposed Plan Change 9 Hearing
Friday 11 June 2021

Question	Author
1. Provide a flow diagram to show the consent pathway for activities of different scales e.g. farms with regards to water quantity. Permitted activities v. discretionary	Ellen Robotham, Planner, HBRC
2. Stock drinking water – where/how has this been accounted for in the model?	Dr Jeff Smith, Science Manager, HBRC
3. How are the municipal takes affected by PPC9?	Ellen Robotham, Planner, HBRC
4. Table 3 in Schedule 35, methodologies for determining SPZs, explanation of the table.	Anne Bradbury, Senior Policy Planner, HBRC
5. Is there a surrogate for chestnuts with regards to Irricalc?	Ellen Robotham with advice from Dr Channa Rajanayaka, Surface water and groundwater modeller, NIWA

1. Provide a flow diagram to show the consent pathway for activities of different scales e.g. farms with regards to water quantity, permitted activities vs discretionary

This is provided in a separate document.

2. Stock drinking water – where/how has this been accounted for in the model?

Being a permitted activity, records are not held for abstractions of stock drinking water and estimates have been made based on animal numbers and their drinking water requirements. The methodology is described in Appendix A of the Heretaunga Groundwater model development report (Rakowski & Knowling, 2018) and is summarised here.

Accounting For Stock Drinking Water

For groundwater models, abstraction for stock drinking was calculated for bores located within 100 m of farming properties. The 2015 AgriBase data set was used to determine the type of animals and stocking numbers for farms which intercepted the model boundary.

The number of stock were multiplied using estimates of Peak Daily Demand consumption rates for each animal type (Buchannan, 2011). Approximations were made for animals not provided in the list, based on known values for similar stock categories. The daily consumptions rates are shown in Table 1.

Table 1. Stock water peak daily consumption volumes (litres per head per day), used to estimate permitted abstractions

Description	rate (l/h/d)
Beef cattle numbers	55
Camelids (Alpacas and Llamas)	20
Dairy Cattle numbers	70
Deer numbers	12
Dogs	3
Donkeys	20
Ducks	0.3
Emus	3
Goats farmed	10
Horse numbers	70
Other Animals	10
Ostrich numbers	5
Pig numbers	35
Poultry birds	0.45
Sheep numbers	4.5

Based on this methodology, the groundwater abstraction for animal drinking water was estimated at a Peak Daily Demand of 1,404,692 L/day which equates to 512,712 m^3/yr.

The largest volumes were from Beef and Dairy farms which reflected not only the larger animal water requirements but also the larger farm size.

The annual groundwater volume for stock drinking represents less than 1% of the total 78 Mm^3/year annual average pumping from the Heretaunga aquifer system between 2005 and 2015 (Rakowski & Knowling, 2018). Therefore, errors in the estimation of abstraction for stock drinking were considered to be inconsequential to groundwater management scenarios that were modelled to inform PPC9.

While stock drinking was not included in the TANK SOURCE models of surface water flows, the impact on river flows from stock drinking were also considered to be negligible. For example, based on stock numbers in the Ngaruroro catchment and peak daily consumption from Table 1, 66 L/s is estimated to be used for stock drinking from the Ngaruroro River mainstem and tributaries (Buchanan, 2011).

At the time, this represented approximately 1% of consented surface water abstraction from the Ngaruroro River (Buchanan, 2011). Stock drinking water consumption is also less than 3% of the 2,400 L/s trigger flow in the Ngaruroro River at Fernhill, which is much less than generally accepted error with river flow gauging measurements. Therefore, the exclusion of stock water drinking from the SOURCE models was not considered to be an issue for water management scenarios that were modelled to inform PPC9.

References

Buchanan F. (2011) *Estimating Permitted Water Use in Hawke's Bay*. HBRC Technical Report number 4355.

Rakowski P. and Knowling M. (2018) *Heretaunga Aquifer Groundwater Model Development Report*. HBRC Technical Report number 4997.

3. How are the municipal takes affected by PPC9?

The following discussion of PPC9 provisions is based on the addendum version (19 May 2021).

PPC9 includes provisions specific to human health and domestic use, and it also includes provisions that are specific to municipal supplies. This is an important distinction to make because although municipal supplies do include uses for human health and domestic uses, municipal supplies also provide for a variety of social, cultural, recreational and economic uses (including a significant proportion of commercial and industrial uses). I also note that not all human health and domestic uses are provided for by municipal supplies (for example, marae and papakainga uses or rural domestic uses may be supplied by privately owned bores or private community supplies).

I consider that PPC9 includes a distinct allocation regime for municipal supplies and particularly the human health component of municipal supplies. Objectives for each water body (OBJ TANK 10-14) identify the values to be enabled which, among other things, include people's and communties' domestic water needs. OBJ TANK 16 identifies human health water needs and domestic supply, including municipal supply, as priority end uses. Through the policies, there are four key areas which are distinct:

1. Most significantly, municipal supplies can maintain their current allocated volumes which recognises the role of territorial authorities in planning for and investing in long-term urban development and growth.
2. A range of policies prioritise uses for human health.
3. Municipal uses are subject to 30 year, rather than 15 year consenting periods.
4. Transfers towards communities' health needs from other uses is enabled and favoured.

Use of municipal water is further directed by policy which requires good management practice in relation to the supply of and demand for water.

The following provisions provide that distinct regime.

OBJ TANK 10-14	Sets an objective for each catchment, that PPC9 enable water use that meets domestic needs of people and communities, for safe and secure supplies for municipal water use, and to meet water needs for social, and economic well-being.
OBJ TANK 16	Prioritises reasonable domestic needs (and stock drinking water and fire-fighting uses), followed by domestic supply, including marae, papakainga, and municipal uses as described in HPUDS2017 above other economic, cultural and social uses.
OBJ TANK 18	Identifies the various tools available and enabled through PPC9 to provide for current and foreseeable water needs of future generations and mauri and ecosystem health.
POL TANK 37(d)(ii) POL TANK 52(b)(ii)	Excludes municipal supply from being subject to an Actual and Reasonable use at re-allocation.
POL TANK 39	HDC and NCC as holders of consents to take water for municipal supplies will be relevant parties consulted when investigating and developing stream flow maintenance and habitat enhancement schemes.

	HDC and NCC are not excluded from requirements to contribute to schemes because their takes also have surface water depleting effects. The notified version of POL TANK 39(b) allowed contribution exceptions for the use of water for essential human health. However, such exceptions still have scope to be provided for through the investigation and development of schemes. This policy enables one of the tools that helps give effect to OBJ TANK 18.
POL TANK 47	Municipal supplies are excluded from demonstrating 80% efficiency. Efficiency of municipal uses is instead considered under POL TANK 50.
POL TANK 48	Prioritises and favours transfers towards water for community health needs and papakainga. This reference to community health needs rather than to municipal uses generically is intentional to ensure that human health is provided for as a priority above other social, cultural and economic uses in accordance with OBJ TANK 16. This policy is given effect to by RRMP Rules 62-62b.
POL TANK 49	Enables a longer consent duration to acknowledge the significant planning and investment required for municipal infrastructure in a way which is intended to align with grouped consent periods and enable consistent management of water .
POL TANK 50	This is the most significant policy for consideration of municipal supplies. It requires Council to meet water needs of future community growth within water limits and subject to good management practice. It recognises that an allocation limit preventing new water use was proposed by PPC9 but still enables takes for municipal and papakainga supplies to maintain their current allocated volumes so as to provide for urban growth. All other permit holders will be subject to an Actual and Reasonable assessment which in most cases will reduce their consented volume based on historic uses or existing levels of development. Linking municipal allocations to the growth projections included in HPUDS2017 (to 2045) is intended to reflect the need to manage growth within resource limits. From the evidence submitted by HDC and NCC, I understand that neither council has fully utilised their water allocations yet. Enabling HDC and NCC to retain their current allocations will provide them some room for growth in the short term but also acknowledges the need to phase-out and avoid over-allocation in the TANK catchment. PPC9 does not specify which uses HDC or NCC must prioritise within their allocated volumes. This enables HDC and NCC to identify where they see the growth priorities and manage accordingly within their allocated volumes. Whether that be for industrial or housing growth etc, is not directed by PPC9 (although will be influenced by strategies such as HPUDS). POL TANK 50 also requires the development and adoption of water demand and supply management plans. Municipal supplies are required to adopt good management practices for infrastructure management and efficiency, including meeting an Infrastructure Leakage Index of 4 or

	better. Through POL TANK 50(c) HBRC also commits to working collaboratively with HDC and NCC to give effect to National Policy Statements, including the NPSUD2020. This policy is given effect to by Rules TANK 9 and 10.
POL TANK 51	Reflects OBJ TANK 16 and prioritises human health when making water shortage directions. HDC and NCC are the only consent holders who are named to have representatives on the emergency water management group.
POL TANK 54-57	These policies enable some of the tools (high flow takes, damming and storage) that help give effect to OBJ TANK 18.

4. Table 3 in Schedule 35, methodologies for determining SPZs, explanation of the table.

Table 3 in Schedule 35 shows the methodologies that are used to determine Source Protection Zones. The table states the minimum requirements for the different population sizes. This table demonstrates that the numerical model provides greater certainty for larger populations.

Figure 2.1 in the Drinking Water Governance Group's summary presented on Tuesday 8 June 2021 contains the same technical explanation regarding the various models, but does not include reference to population size. It also confirms that the numerical model provides a higher level of accuracy.

For more information on the numerical model please see the evidence from Mr Pawel Rakowski, one of the council's experts that discussed the numerical method of SPZ delineation. Mr Rakowski's evidence can be found in Appendix 12 of the Section 42A Addendum Report.

5. Is there a surrogate for chestnuts with regards to Irricalc?

Currently, chestnuts are not included within the online IrriCalc tool available through Council's website.

However, it should be noted that IrriCalc or any other soil-water balance model can model any crop type. This requires crop coefficient time series for that crop (that can be taken from literature), soil-water reservoir depth (root zone), start and end date of irrigation, and irrigation management parameters.

Additional or specific crops could be modelled and then included in the online IrriCalc tool if the need is triggered through the consenting process.