

Memorandum

To: Stuart Watson
Environmental Manager
Ruapehu District Council

From: Fiona Death
Science and Practice Manager
Aquanet Consulting Ltd

Date: 24th June 2021

Re: **Ohura Community Water Supply: Reasonable and Essential Water Use**

Water permit No. 101866 for the Ohura Water Treatment Plant is expiring on 14th November 2021. To support the application by Ruapehu District Council for a new consent, the following memo details Reasonable and Essential water use (and associated assumptions used in calculations) against provisions of One Plan Policy 5-12 and Policy 5-18 (copied below) for the Ohura Community Water Supply.

Policy 5-12: Reasonable and justifiable need for water[^]

*Subject to **Policy 5-18**, the amount of water[^] taken by resource users must be reasonable and justifiable for the intended use. In addition, the following specific measures for ensuring reasonable and justifiable use of water[^] must be taken into account when considering consent applications to take water[^] for irrigation, public water supply*, animal drinking water[^], dairy shed washdown or industrial use, and during reviews of consent conditions[^] for these activities.*

- a. *For irrigation, resource consent[^] applications must be required to meet a reasonable use test in relation to the maximum daily rate of abstraction, the irrigation return period and the seasonal or annual volume of the proposed take. When making decisions on the reasonableness of the rate and volume of take sought, the Regional Council must:*
 - i. *consider land[^] use, crop water[^] use requirements, on-site physical factors such as soil water[^]-holding capacity, and climatic factors such as rainfall variability and potential evapo-transpiration*
 - ii. *assess applications either on the basis of an irrigation application efficiency of 80% (even if the actual system being used has a lower application efficiency), or on the basis of a higher efficiency where an application is for an irrigation system with a higher efficiency*
 - iii. *link actual irrigation use to soil moisture measurements or daily soil moisture budgets in consent conditions[^].*
- b. *For domestic use, animal drinking water[^] and dairy shed washdown water[^], reasonable needs must be calculated as:*
 - i. *up to 300 litres per person per day for domestic needs*
 - ii. *up to 70 litres per animal per day for drinking water[^]*
 - iii. *up to 70 litres per animal per day for dairy shed washdown.*
- c. *For industrial uses, water[^] allocation must be calculated where possible in accordance with best management practices for water[^] efficiency for that particular industry.*
- d. *For public **water supplies***, the following must generally be considered to be reasonable:*
 - i. *an allocation of 300 litres per person per day for domestic needs, plus*

- ii. an allocation for commercial use equal to 20% of the total allocation for domestic needs, plus
 - iii. an allocation for industrial use calculated, where possible, in accordance with best management practices for water[^] efficiency for that particular industry, plus
 - iv. an allocation necessary for hospitals, other facilities providing medical treatment, marae, schools or other education facilities, New Zealand Defence Force facilities or correction facilities, plus
 - v. an allocation necessary for public amenity and recreational facilities such as gardens, parks, sports fields and swimming pools, plus
 - vi. an allocation necessary to cater for the reasonable needs of animals or agricultural uses that are supplied by the public **water supply*** system, plus
 - vii. an allocation necessary to cater for growth, where urban growth of the municipality is provided for in an operative district plan[^] for the area and is reasonably forecast, plus
 - viii. an allocation for leakage equal to 15% of the total of (i) to (vii) above.
- e. When making decisions on consent applications where the existing allocation for a public water supply* exceeds the allocation determined in accordance with (d)(i) to (d)(vi) above:
- i. consideration must be given to imposing a timeframe within which it is reasonably practicable for the existing allocation to be reduced to the determined amount, or
 - ii. if (i) is not imposed, an alternative allocation must be determined based on the particular social and economic circumstances of the community serviced by the **public water supply*** and the actual and potential effects[^] of the abstraction on the relevant **Schedule B** Values for the reach of river[^] or its bed[^] affected by the take.

Policy 5-18: Apportioning, restricting and suspending takes in times of minimum flow

When a river[^] is at or below its minimum flow, takes from it must be managed in the following manner:

- a. **Permitted takes** - Takes that are permitted by this Plan (surface water[^] and groundwater takes) or are for fire-fighting purposes must be allowed to continue regardless of river[^] flow.
- b. **Existing hydroelectricity generation takes** - must be allowed to continue subject only to any minimum flow restrictions specified in their consent conditions[^].
- c. **Supplementary takes** - must cease at a flow specified in their consent conditions[^] and that cessation flow must be higher than the **Schedule C** minimum flow such that the requirements of **Policy 5-17(b)(i)** are met.
- d. **Essential takes** - The following core water[^] allocation takes are deemed essential and must be managed in the manner described:
 - i. takes greater than permitted by this Plan (and therefore subject to resource consent[^]) that are required for reasonable domestic needs, reasonable needs of animals for drinking water[^], and reasonable dairy shed washdown water[^] must be allowed to continue regardless of river[^] flow, but must not exceed:
 - A. up to 250 litres per person per day for domestic needs
 - B. up to 70 litres per animal per day for drinking water[^]
 - C. up to 70 litres per animal per day for dairy shed washdown
 - ii. takes required to meet the reasonable needs of hospitals, other facilities providing medical treatment, marae, schools or other education facilities, New Zealand Defence Force facilities or correction facilities must be allowed to continue regardless of river[^] flow, but must be required to minimise the amount of water[^] taken to the extent reasonably practicable
 - iii. takes which were lawfully established at the time of Plan notification (31 May 2007) required for industries which, if their take were to cease, would significantly compromise a community's ability to provide for its social, economic or cultural wellbeing or for its health or safety (including the hygienic production and processing of perishable food), must be allowed to continue regardless of river[^] flow, but must be required to minimise the amount of water[^] taken to the extent reasonably practicable
 - iv. **public water supply*** takes must be restricted to a total public water[^] consumption calculated as follows:
 - A. an allocation of 250 litres per person per day for domestic needs, plus

- B. an allocation for commercial use equal to 20% of the total allocation for domestic needs, plus
 - C. an allocation which meets the reasonable needs of those facilities and industries listed under (d)(ii) and (d)(iii) where such facilities and industries are connected to the public **water supply*** system, plus
 - D. any allocation necessary to cater for the reasonable needs of animals that are supplied by the public **water supply*** system, plus
 - E. an allocation for leakage equal to 15% of the total of (A) to (D) above.
- e. Non-essential takes - Other core water[^] allocation takes, including irrigation takes but excluding the essential takes described under (d), must be managed in the following manner:
- i. water[^] takes must be required to cease when the river[^] is at or below its minimum flow, as set out in **Policy 5-15**
 - ii. water[^] takes must be allowed to recommence once the river[^] flow has risen above its minimum flow.
- f. Meaning of "core water[^] allocation take" - For the purposes of this policy, a core water[^] allocation take means a take that has been granted consent in accordance with a core allocation made under **Policy 5-15**, or in accordance with a previous core allocation regime.

Table 1 provides an assessment of water usage required for the Ohura Community water supply.

In assessing Reasonable and Essential water use, the following information has been used and/or assumptions made:

- The current Consent allows for abstraction of 360 m³/day at a maximum rate of 15m³/hr.
- Domestic use has been calculated based on a peak population of 320 residents,
- Assumes that peak population will grow to 347 by 2031, corresponding to an 8.4% growth.
- Animal drinking water has been calculated using Peak Daily Demand (PDD) from Steward and Rout (2007, Reasonable Stock Water Requirements, Guidelines for Resource Consent Applications. Technical report to support One Plan development):
[70 l/h/d for dairy cattle, 55 l/h/d for beef cattle, 4.5l/h/d for sheep, 5l/h/d for ewes with lambs, 12 l/h/d for deer, 70 l/h/d for horses, 35 l/h/d for pigs.]
Livestock numbers estimated in the catchment were obtained from a 2017 landuse survey.
- An allocation for filling the school pool has been calculated based on advice that the pool holds 375,000 L (375 m³) and on the basis that the pool is filled completely once annually (at the beginning of the summer season) and then topped up occasionally during the summer when in use.

If any of these assumptions are incorrect, or additional information is available, please advise and we can revise our calculations accordingly.

- **Efficient/Reasonable Use calculated to be: 278 m³/day.**
- **Essential Use calculated to be: 160 m³/day.**

Table 1: Assessment of water use against provisions of One Plan Policy 5-12 and Policy 5-18 for the Ohura Community Water Supply.

Use type	Town & Rural	Pol 5-12 (Efficient/Reasonable Use)		Pol 5-18(d) (Essential Use)	
		Provisions	Town & Rural (m ³ / day)	Provisions	Town & Rural (m ³ / day)
Domestic use	320 (peak population)	300 L per person/day	96 (based on peak population)	250 L per person/day	80 (based on peak population)
Commercial	Café's, B&B, etc	20% of domestic needs ⁽¹⁾	19.2	20% of domestic needs	16.0
Industrial use	-	Industry BMPs ⁽²⁾	-	Existing takes ⁽³⁾	-
Hospitals / Medical Facilities	-	Necessary allocation	-	Reasonable needs, but required to minimise amount of water taken to the extent reasonably practicable	-
Marae	-		-		-
Corrections facilities	-		-		-
Schools/Education facilities	Ohura Primary School		3.6		3.0
Swimming Pools	Ohura School pool ⁽⁴⁾		75	Not essential use	-
Gardens/parks/sports fields	Golf Club: - currently grazed with sheep - Not irrigated		-	Not essential use	-
Animal drinking water	1,080 animals	Stock drinking water was calculated using the PDD figures from Horizons ⁽⁵⁾	31.6	Stock drinking water was calculated using the PDD figures from Horizons ⁽⁵⁾	31.6
Agricultural uses	-	Irrigation	0.0	Not essential use	0.0
Woolshed	-		-	Not essential use	-
Dairy shed washdown	-	70 L per animal	-	70 L per animal	-
Projected Urban Growth to 2025: 8.4% population increase	No increase expected	Cater for Growth ⁽⁶⁾	16.3	Cater for Growth ⁽⁶⁾	8.3
Total without leakage			242		139
Leakage		15 % of the above	36.3	15 % of the above	20.8
Total including leakage			278		160

- (1) Pol 5-12(d)(ii): Allocation for commercial use equal to 20% of the total allocation for domestic needs
- (2) Pol 5-12(d)(iii): Allocation calculated where possible, in accordance with best management practices for water efficiency for that industry;
- (3) Pol 5-18(d)(iii): Takes which were lawfully established at the time of Plan notification (31 May 2007) required for industries which, if their take were to cease, would significantly compromise a community's ability to provide for its social, economic or cultural wellbeing or for its health or safety (including the hygienic production and processing of perishable food), must be allowed to continue regardless of river flow, but must be required to minimise the amount of water taken to the extent reasonably practicable.
- (4) Pol 5-12(d)(v): Allocation necessary for public amenity and recreational facilities such as gardens, parks, sports fields and swimming pools.
- (5) Animal drinking water: Using Peak Daily Demand (PDD) from Steward and Rout (2007, Reasonable Stock Water Requirements, Guidelines for Resource Consent Applications. Technical report to support One Plan development) 70 l/h/d for dairy cattle, 55 l/h/d for beef cattle, 4.5l/h/d for sheep, 5l/h/d for ewes with lambs, 12 l/h/d for deer, 70 l/h/d for horses, 35 l/h/d for pigs.
- (6) Pol 5-12(d)(vii): an allocation necessary to cater for growth, where urban growth of the municipality is provided for in an operative district plan for the area and is reasonably forecast.