Water Conservation Order: Te Waikoropupū Springs and Associated Waterbodies

Submission Reference no: 652

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[redacted]

Submitter Type: Individual
Source: Web Form

Overall Notes:

Clause
What is/are your view/s on the application?
Position
Support
Notes

Clause
I/we seek the following recommendation from the Special Tribunal to the Minister for the Environment
Position
Grant the order
Notes

Clause
Would you like to present your views on this submission to the Special Tribunal at a public hearing?
Position
I/we do want to present my/our views at a public hearing
Notes

Clause
If others make a similiar submission, would you want to consider presenting a joint case with them at the hearing?
Position
No
Notes

I give full support to the following statements contained in the reports following:

Biodiversity of Te Waikoropupü Springs Assessment and vulnerabilities to reduced flows Prepared for Ngati Tama ki Te Waipounamu Trust August 2016 prepared by Graham Fenwick and Brian Smith
That
'sustaining Te Waikoropupü Springs and their high values depends on maintaining healthy, living ecosystems within the Takaka Valley aquifers. This may be best achieved via a conservative approach and by giving special attention to all human impacts (flow permanence, water velocity, dissolved oxygen, organic carbon, nitrate, etc.), individually and in combination, incremental and cumulative, to ensure the future of these ecosystem services and Te Waikoropupü's values.'

Increased water extraction for irrigation and other human uses from water sources (surface waters streams, rivers and aquifers) which supply the springs has several main effects:
1 reduces the normal flow to the springs.
2 Raises the temperature of waters. Essentially daily accumulated solar energy transferred to a smaller quantity of water raises its temperature.
3 Oxygen solubility in water reduces rapidly as water temperature rises, especially at over 20 degrees centigrade.
4 All life: plant, vertebrate and invertibrate requires oxygen and reduced dissolved oxgen in the water in tissues of living organisms, and higher than normal organism physiological temperatures can result in severe stress, failure to grow, physiological systems collapse and death, which can be sudden and rapid when critical temperatures are reached.
5 Greater concentration of pollutants dicharged from land from agricultural and horticultural production and human settlements and industry including pesticides, herbicides, sediments, fertilizers and animal excreta which can produce a more toxic environment for land and water ecosystems.

I refer you to the paper titled:
Sustainability of Te Waikoropupu Springs' aquifer ecosystems March 2015 prepared by Graham Fenwick Principal Scientist Biodiversity National Institute of Water & Atmospheric Research Ltd and draw your attention to the following:
from page 8
'We note that dissolved oxygen is replenished primarily via recharge water and that as recharge declines, so too do water levels (depths below ground)(i.e., hydraulic head decreases) and dissolved oxygen concentrations. In particular, dissolved oxygen appears to become a critical factor at low aquifer levels when the hydraulic gradient is reduced and the rate of water replacement (containing more dissolved oxygen) is slowed. Thus, managing, water levels to ensure near natural velocities/flows through the aquifer matrix, in tandem with managing organic carbon concentrations within groundwater, seems likely to sustain higher dissolved oxygen concentrations within most aquifers.'
from page 10
'The primary concern over nitrate in the environment is due to its toxicity to humans, farm and domestic stock, and to aquatic invertebrates. In all cases, nitrate binds to the oxygen-carrying blood pigments (haemoglobin in humans and mammals, haemocyanin in many invertebrates), preventing these pigments from transporting oxygen to body tissues (Camargo et al. 2005). Nitrates also are implicated as potential carcinogens for humans, adding to concern about drinking nitrate contaminated water. Thus, nitrate is a high priority for resource management, especially for managing freshwaters.'
and
'It recommended average long-term exposure concentrations of 1.0 mg NO3-N/L to protect high conservation value ecosystems (concentrations at which no effect was observed; termed Grading)

and threshold effect (termed Surveillance) concentrations of 1.5 mg NO3-N/L for managing seasonal (up to three months) maximum concentrations (Table 3). '

Ammonia based and urea fertilizers are frequently used in agriculture at high concentrations, for example to stimulate early spring pasture growth for dairying, the main land use from which surface water flow into the springs.
Fertilizer application rates need to be controlled and limited so that run off water containing fertilizers and breakdown products do not exceed limits which need to be set to protect ecosystems and natural wild biota.
I recommend that comprehensive and regularly taken water samples are taken at locations where runoff from agricultural land and other land used for human and industrial activities can be measuremented, and a shedule of graduated fines be developed and enforced to ensure compliance by land users, since private businesses and activities are otherwise transferring the destructive consequences of their activity to cause the degradation of the natural environment , to the detriment of wild flora and fauna, and human safety and quality of life.
As human and animal population numbers and concentrations increase in Golden Bay there is a clear need for increased environmental monitoring of water to detect toxic and pollutant wastes from humans, animals and fertilizers, sediments from landclearance and earthworks, runoff from suburbs and from herbicide and pesticide spraying including from roadsides.
From page 12
'there is scant information on toxicities, tolerances and sublethal effects for groundwater ecosystems, including biofilms, and specifically for New Zealand or WaiSAC stygofauna. For these reasons, refining these suggested limits will require significant time and other resources. '

In the paper titled
Application for a Water Conservation Order in respect of Te Waikoropupū springs and associated water bodies (including the aquifers, Takaka River, and tributaries) By Ngāti Tama Ki Te Waipounamu Trust and Andrew Yuill April 2017
on page 27
'78. Nitrate and total phosphorus concentrations in Te Waikoropupū have been increasing. They are many times greater than the concentrations measured in the Takaka River at Harwoods and the Waingaro at Hanging Rock (Table 3).'
on page 31
'90. Recent nitrate concentrations in Te Waikoropupū Springs are reported as “typically <0.4 mg/L-N” (median 0.36 mg/L). Historical data indicate significant increases since the 1970s. The aquifers and catchments should be managed to ensure that NO 3 -N concentrations in spring water do not exceed 0.4 mg NO 3 -N/L in order to protect the springs’ high conservation values.'
on page 34
'103. The data collected as a result of this community programme has shown up inconsistencies in the previous records and led to a better understanding of where the nitrate is coming from. it has shown there is an unidentified source of some 120 tonnes per year of nitrate-N in the catchment, accounting for about 70% of the nitrate seen in the Main Spring of Te Waikoropupū. 104. The programme has established beyond doubt that the nitrate-N level in Te Waikoropupū Main Spring is 0.4 mg/l, which is already at the limit that NIWA advised.'

Nitrogen, a necessary element for plant growth is highly mobile in soils and is rapidly leached. The current agricultural practise of crude application methods in Golden Bay by 'sowing' solid fertilizers in large single application quantities make for poor fertilizer utilization by pastures and leads to large losses of fertilizer into ground water into streams, rivers, aquifers and Waikoropupu Springs. This is not best practise as proven modern effective methods of optical scanning technology both on the field mounted fertilizer applicator and through aerial and satellite imaging can accurately determine detailed plant nutrient deficits on a square metre basis across an entire field, and correct

nutrient dosage applied on the spot almost to an individual plant level.
Primary production farmers can get more for less, and reduce the environmental impact of fertilizer wastage as in the following example-
From https://www.massey.ac.nz/~flrc/workshops/13/Manuscripts/Paper_Lawrence_2013.pdf
A PRECISION FERTILISER PLAN: REAL MEASUREMENTS, REAL COSTS, REAL RESULTS Hayden Lawrence Niaruo Dairies 871 Fraser Road, RD 13, Hawera, Taranaki
'Review The precision fertiliser program has delivered significant cost savings over the four year period, originally the fertiliser cost to the business was $279/ha, this has dropped to between $50 and $114 per ha, when considering the extra cost of soil sampling (nil to $34/ha) this equates to an annual saving of between $131 and $195/ha'
and
'Both pasture and milk production over the period of the program have increased, initially at the inception of the program production was 90,000kg MS and annual pasture production was 14.54T/ha, in four years this has increased to 124,000kgMS and 18.68T/ha using similar amounts of brought in supplements '
The above real example shows that since fertilzer cost per hectare is directly proportional to application rates per hectare that a **fertilizer reduction** of (279-50)/279*100=**82%** is possible at the same time as **increasing production** by (124-90)/124*100=**27%**
Reducing fertilizer use on dairy pastures could cause a massive reduction in nitrates in strams, rivers and aquifers that feed Waikoropupu Springs, without compromising primary production.

There are aesthetic, spiritual and survival reasons for preserving and improving the quality of the natural evironment in which we live and are totally dependant.
The beauty of the Waikoropupu Springs gives great joy to thousands of visitors each year and this needs to be preserved and enhanced for future generations.
There are direct threats to the springs from visitors, from trampling plants, and in the past people entering the water. There is potential for accidental or deliberate introduction of foreign exotic pests (eg. Exotic fish) and pollutants to both the terrestrial and aquatic environment. Adherence to good management policies and practices is necessary to preserve and enhance both the visitor experience and that of the natural environment in the Waikoropupu Springs, which are dependant on the good care of land and water in the wider catchment of the waters for Waikoropupu Springs.
Nigel Ritson