

Submission on Plan Change 7 to the Canterbury Land and Water Regional Plan

By **Southworth, V**

Submitter Identification number: **PC7-293**

Wishes to be heard: **Yes**

Would consider making a joint submission at the hearing: **Yes**

Submitted on: **11/09/2019**

This submission was submitted via Environment Canterbury's online submission portal. The Submissions portal generates pdf files of submissions (as attached). However, some of the information that appears in the pdf files is not consistent with information the submitter entered into the portal, specifically, where submitters have ticked:

- "I wish to be heard in support of my submission" ; and
- "If others make a similar submission I will consider presenting a joint case with them at a hearing".

Additionally, the submissions portal has generated submitter and submission point numbers that are not consistent with the numbering applied in the Summary of Decisions Requested. Submission points in the Summary of Decisions Requested (SODR) are numbered using the following format:

PC7 – Submitter ID #.Submission point #

The correct submitter identification number and submitter information is specified above. This will be the number referred to in the SODR.

Proposed Plan Change 7 to the Land and Water Regional Plan

Form 5 Submission on publically notified proposal for policy statement or plan, change or variation

Clause 6 of Schedule 1, Resource Management Act 1991

To Environment Canterbury - Tavisha Fernando
Date received 11/09/2019 3:18:28 PM
Submission #69

Address for service:

Southworth Vicky / 69
4 Denman Street Sumner Christchurch 8081
Phone: 02102970450
Email: vickysouthworth@gmail.com
Wishes to be heard? No
Is willing to present a joint case? No

Proposed Plan Change 7 has been developed to respond to emerging resource management issues, to give effect to relevant national direction, to implement recommendations from the Hinds Drains' Working Party, and to implement recommendations in the Waimakariri and Orari-Temuka-Opihi-Pareora (OTOP) Zone Implementation Programme Addenda (ZIPA).

- Could you gain an advantage in trade competition in making this submission?
 - No
- Are you directly affected by an effect of the subject matter of the submission that
 - (a) adversely affects the environment; and
 - (b) does not relate to trade competition or the effects of trade competition
 - Yes

Submission points

Point 69.1

Submission

The proposed reduction in nitrate losses beyond good management practice leaves the Christchurch deep aquifer at risk of increasing nitrate concentrations (NO₃ as N) to at least 3.8mg/L and potentially as high as 6mg/L in the future, representing a significant change. The current median is 0.3mg/L which likely reflects the aquifer with minimal nitrate input from human land use. Recent research raises concerns about the link between nitrate concentrations and increased cancer rates at concentrations much less than 3.9mg/L. The current drinking water standard of 11.6mg/L is based on an acute effect on toddlers and not on cancer risk. In light of new research, I would expect to see a report by a suitably qualified public health expert assessing the risk to the city's population. I have not found such a report in the supporting documents to PC7. The lack of this assessment means decisions have been made without a key piece of information. Various concentrations have been discussed in recent media reports (around 0.9mg/L) and this concentration with the ZIPA solution implemented could be reached in Christchurch aquifer west within 25 years based on the 95th percentile probability (R19/68, p.155, A9.3, CCC-West/ZIPA solution).

The Christchurch deep aquifer cannot be remediated in situ with technologies currently available such as managed aquifer recharge (Kreleger, A and Etheridge, Z. memo, 22/05/19, p.5). If concentrations are subsequently found to be at levels too high for safe drinking water supply costly treatment or an alternative supply is needed. It is estimated that connecting the city to a supply from the Waimakariri river would cost \$550 million (Harris S, July 2019, Waimakariri land and water solutions programme Options and Solutions Assessment Economic assessment, LWP, p.38, footnote). This potential cost to Christchurch residents has not informed the decision-making process (LWP, p.38). The current system requires the cost of treatment, when needed, to be met by impacted private well owner or water supplier, not the polluter. On this basis, it seems particularly important to consider the potential external costs of excess nitrates.

The risk level applied in developing the ZIPA proposed nitrate reductions included in PC7 does not reflect the level of uncertainty in the models, or recent research into nitrates in drinking water and human health, or the scale and irreversibility of the potential impacts. An 'indicative threshold' of 3.8mg/L based on protecting spring-fed rivers in the city, such as the Avon-Otakaro, has been selected for Christchurch's aquifer (Waimakariri Land and Water Solutions Programme Options and Solutions Assessment: Nitrate Management, Technical report R19/68, May 2019, p.62). This protects 90% of aquatic species and is a value applied to highly disturbed systems. Applying the Zone Implementation Plan Addendum Solution that has informed Table 8-8 in PC7, the groundwater modelling predicts concentrations in the aquifer will be at or below 3.8mg/L to only the 50% probability. On this basis there is as much likelihood that the concentration will exceed the target as fall below. Given the significance of impacting on a city's drinking water source, the uncertainties in the model (R19/68, p.44) and the difficulty and cost of rectifying a problem and the lengthy time lag before elevated concentrations decline again the 95th percentile probability would be more appropriate to use. The 95th percentile projections indicate that the peak nitrate concentration that could occur is around 6mg/L. On this basis the 3.8mg/L would be exceeded for around 150 years. Perhaps there is an assumption that because the most elevated concentrations occur in around 120 years it's acceptable, but passing on an issue of this magnitude in full knowledge is not compatible with the principles of the RMA, or Maori cultural values and should not be acceptable to our regional council.

If lower concentrations than 3.8mg/L are subsequently recommended to protect human health the long time periods allowed for nitrate reductions in PC7 will increase the risk that the Christchurch supply will have to be replaced with river water or treated for nitrates. This also has a cultural significance to Christchurch residents as one of very few cities globally that, until recently, supplied untreated water to the tap. Unlike chlorine, which can be a temporary addition while the supply network is secured, nitrate treatment, if needed, will be unavoidable and required for many decades or even centuries

due to the lag time from nitrate application at the surface to its arrival in the deep aquifer (R19/68, pp.155 -157).

The assumption that Chch rivers are all recharged significantly by the Waimakariri and are therefore less vulnerable to ecosystem health impacts with the input of nitrate-rich deeper groundwater is incorrect based on research from the Waterways Centre for Freshwater Research 'In the central and southern areas of Christchurch, the aquifers do not receive as much recharge from the Waimakariri River seepage as those to the north so are more vulnerable to variability in rainfall recharge of the unconfined aquifer.' (Barr, 2016. Fluctuations in the flow of artesian springs in Christchurch, Waterways Centre for Freshwater Management).

An assumption has been made that Christchurch aquifer's ecosystem can tolerate a concentration of 3.8mg/L (or higher) without significant effects. Tiny creatures called stygofauna are present in aquifers but their role in maintaining ecosystem health is not well understood. We do know that nutrient concentrations can result in fundamental changes to ecosystem health, such as reducing the range of fauna that can survive or thrive. It is very difficult to reinstate an ecosystem once a tipping point has been reached, as is seen with the Lake Ellesmere/Te Waihora and Lake Forsyth/Wairewa for example. A limit of 1mg/L nitrate is recommended to support high conservation values in surface water ecosystems and is advocated for by Maori stakeholders for surface water features with a high cultural value.

There has been a very significant imbalance in consultation between stakeholders in the Waimakariri District and those in Christchurch (See details of stakeholder engagement in Macdonald, M, 05/06/2019, Memo - Community Engagement for the Waimakariri Land and Water Solution Programme). This is also reflected in the absence of supporting evidence evaluating the potential impacts on Christchurch. A statutory period of notification is not a period of true consultation whereby stakeholders have an opportunity to influence decisions but is a process that lets us know about decisions that have already been made.

The Farmer Reference Group, as well as results from mitigation modelling undertaken by Dairy NZ, indicate that up to ~10% reduction in N losses can be achieved with a cost to profitability in the order of 0 – 10%. Additional infrastructure such as feedpads can achieve up to ~30% reduction in N losses beyond Good Management Practice (Harris S, 2019. Waimakariri land and water solutions programme Options and Solutions Assessment Economic assessment, LWP, p.21). The issue of nitrates was already recognised when the Canterbury Water Management Strategy was adopted in 2009. It is not clear why farmers have not already implemented measures to reduce nitrate losses given this awareness. To now allow a further 10 years to reduce by 15% does not look like serious recognition of the problem. The industry can reduce nitrate losses by 30% with current technologies. Composting barns offer the potential to improve welfare and manage nitrates. New technologies and changes through animal breeding or diets are also being researched and will offer further potential in the future.

There is an assumption that requiring improvements is a cost that agriculture cannot bear, but there is an economic risk to the agricultural sector of not making changes. Consumers are more aware and are challenging producers to demonstrate good environmental credentials. It is no longer enough to just say we are 'clean and green'. New Zealand's agricultural and tourism reputation stands to be damaged by producers not acting swiftly enough to reverse impacts that have been building over recent decades and are now need urgent attention.

Relief sought

Appoint a suitably qualified health expert to assess the potential risks associated with a range of nitrate concentrations.

Develop an economic impact assessment that accounts for potential costs to Christchurch's water supply, impacted businesses reliant on high-quality water and public health costs associated with increased cancer cases. The economic impact on the Waimakariri District seems to have carried more weight than the risk to human health, ecosystems, Christchurch's economy, cultural values, or future generations. The range of impacts on all stakeholders and scale of effects should be reviewed.

The potential to restore Christchurch's rivers to high-quality ecosystem health is potentially compromised for decades to centuries, other than with intervention such as diversion/augmentation of the river with low nitrate Waimakairi water. Further research is needed to confirm the initial findings by Barr (2016) but the analysis to date does not support the assumption that natural recharge from the Waimakariri is 'a significant proportion of the Avon River flows' (ECan, R19/68, p.61) and will therefore dilute the river water sufficiently to improve water quality in the surface flows.

A review of the potential risk to the aquifer ecosystem of persistently elevated nitrate concentrations to determine whether a concentration of 3.8mg/L or more is sustainable and doesn't unduly risk the long term function of the aquifer.

There should be a review of the severity and likelihood of potential impacts, the 3.8mg/L threshold selected for the Christchurch aquifer, and the appropriate level of conservatism in selecting the probability percentile to apply (50th, 95th or 99th) when interpreting the results of the groundwater modelling.

Compile the additional data/evidence required to consider all the potential effects of the nitrate loss proposals and conduct genuine stakeholder consultation with all affected communities and review the decisions that have led to the formation of Table 8-9.

If it is found that tighter limits are justified and nitrate losses, therefore, need to be cut more rapidly, restart discussions with Waimakariri landowners to identify potential solutions and the barriers to more rapid change. The potential for financial support, such as low-interest loans to enable investment in diversification or infrastructure to reduce nitrate losses whilst supporting the local economy could be investigated. On the ground support sharing success stories from the best performers in the farming community and helping more farmers to emulate best practice should also be considered. When unacceptable concentrations of nitrates were found to be impacting on Lake Taupo, for example, a plan was developed to protect the lake and the local tourism industry whilst also attempting to support the local landowners through a significant transition.

Section: Section 8 Waimakariri

Sub-section: 8.6 8.7 Allocation Limits and Water Quality L

Provision

Table 8-9: Nitrate Priority Area Staged Reductions in Nitrogen Loss for Farming Activities, Farming Enterprises and

Irrigation Schemes

From: [Vicky Southworth](#)
To: [Mailroom Mailbox](#)
Subject: Plan Change 7 to the LWRP Submission
Date: Thursday, 12 September 2019 3:27:02 PM

Please find attached a print out of my submission. I made it online and it seems to have been saved but the receipt says something went horribly wrong!

Please could you check and confirm that this submission has submitted properly.

Kind regards
Vicky Southworth

Sent from [Mail](#) for Windows 10

Submission - Proposed Plan Change 7 to the Land and Water Regional Plan

eplan.ecan.govt.nz/submissions

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Compile the additional data/evidence required to consider all the potential effects of the nitrate loss proposals and conduct genuine stakeholder consultation with all affected communities and review the decisions that have led to the formation of Table 8-8.

If it is found that tighter limits are justified and nitrate losses, therefore, need to be cut more rapidly, restart discussions with Waimakariri landowners to identify potential solutions and the barriers to more rapid change. The potential for financial support, such as low-interest loans to enable investment in diversification or infrastructure to reduce nitrate losses whilst supporting the local economy could be investigated. On the ground support sharing success stories from the best performers in the farming community and helping more farmers to emulate best practice should also be considered. When unacceptable concentrations of nitrates were found to be impacting on Lake Taupo, for

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