

November 7, 2020

To: Environment Canterbury  
Subject: Plan Change 7 to the Canterbury Land and Water Regional Plan  
From: Sandra Stewart, 239 Gardiners Road, Springbank, RD1 Rangiora 7471

## Summary

This is an update on my September 11, 2019 submission outlining my support – actually much more than support – my complete embrace of the September 3, 2020 National Policy Statement - Freshwater and the National Environmental Standards which now must be given legal effect to in this proposed plan change. So it is essential in my view for the proposed 2029 consent review of minimum flows/allocations for the northern Waimakariri River tributaries to be advanced with urgency, as I requested in my September 2019 submission, in order to achieve the fundamental and guiding principle of Te Mana o Te Wai in the essential freshwater package.

The health and wellbeing of the significantly degraded receiving waters of the Kaiapoi River and its tributaries – the Cam River and brooks, Ohoka Stream, Cust Main Drain (Cust River) and Silverstream ( upper Kaiapoi) River – is now the fundamental priority in this plan change.

Second comes the provision of safe drinking water for people and stock and third the economic uses of this water – irrigation abstraction as an example.

While the nutrient and sediment reduction measures outlined in the proposed plan change will go some way to halting further degradation of these river systems over the decades and generations to come, the plan change's proposed time frames of 60-90-125 years-plus will not achieve the reversal of past damage within a generation of 25 years – as required by the NPS/NES.

The sole mechanism to halt further degradation and improve water quality **within five years**, as the essential freshwater package requires, is to immediately ensure more water remains in these streams and rivers once the plan change becomes operative by a consent review of minimum flows and allocations across all northern Waimakariri River tributaries. And as a consequence it is clear land-use change will be an essential requirement.

I concede that tackling pollution by dilution is not a long-term solution.

But in this case it is the only mechanism that will stop further degradation of the northern Waimakariri's rivers and streams and achieve immediate measurable ecological and environmental improvement within these waterways within the short-term of five years.

Such a consent review is also the fundamental first step, in my view, to reversing the extensive past damage to bring these waterways and ecosystems back to good health within a generation of 25 years.

## **Freshwater streams and rivers**

What I now want to do is document some of the LAWA data illustrating the extent of degradation of these river systems and give you some insight into the community impact to reinforce the need for an urgent consent review of minimum flows and abstraction allocations.

Since I lodged my submission in September 2019 there has been no improvement in the water quality, ecological health or cultural use in the Kaiapoi River or its tributaries.

The Land and Water Aotearoa (LAWA) 2020 report documents the degraded state of the northern Waimakariri tributaries and the mainly deteriorating water quality trends.

The inconsistent hotchpotch patchwork reporting of water quality and ecological parameters on the LAWA site makes gaining a comprehensive picture of stream health across the northern Waimakariri streams and rivers challenging with the most recent results – December 2019 – almost 12 months old.

I'm giving a snapshot of LAWA sampling here to illustrate the state of the Kaiapoi River and its four tributaries:

**The Cam River** both at Bramleys Road and upstream at Marsh Road rates in the worst 25 per cent nationally for bacterial contamination – the upstream reach more contaminated with its five-year median at 1173n/100ml. Its total oxidised nitrogen at both sites is in the worst 50% of rivers nationally and its ecology is rated at C on the National Objectives Framework at Bramleys Road, its MCI at 96 rated as 'fair'.

**The Cust River** – it's called the 'Cust Main Drain' – at Skewbridge is rated in the worst 50% for faecal bacteria and rated in the D NOF band. Its total oxidised nitrogen at 4.2g/m<sup>3</sup> is in the worst 25% of rivers and degrading with its MCI at 96.6 again only 'fair'. Similarly for the Cust River at Tippings Road – where it is called the Cust River - well upstream.

**The Silverstream (upper Kaiapoi)** at Harpers Road is in the worst 50% for faecal bacteria, according to its five-year median, with its hugely problematic total oxidised nitrogen contamination at 8.65g/m<sup>3</sup> in the worst 25% and well exceeding the old NPS 'bottom-line' – let alone any new NPS.

On January 15, 2015 the TON was at 10.5g/m<sup>3</sup> and the latest reading on December 9, 2019 was 9.6g/m<sup>3</sup>.

Ironically its clarity at 5.735m (black disc) puts the stream in the best 25% nationally but its MCI rates its ecology at only 'fair' at 95.6.

Further downstream at Heywards Road LAWA gives no water quality data for the Silverstream only measuring its ecology as 'fair' with an MCI of 92 and rating the stream as C with a degrading trend.

Even further downstream and closer to the Kaiapoi town centre at Island Road, the Silverstream has a bacterial rating in the worst 25% of rivers nationally, and a NOF rating of D.

High nitrates blight this site also with TON of 5.1g/m<sup>3</sup> in the worst 25% of rivers. On September 1, 2014 the TON was 6.4g/m<sup>3</sup>, the latest monitoring on December 9, 2019 was 5.9g/m<sup>3</sup>.

Frustratingly when this stream enters the Kaiapoi River proper at the three-streams confluence there are no further water quality or ecological measurements, save for the long-standing recreational water quality monitoring at the Cure Boating Club ramp over summer.

This PC 7 designated swimming site, where kids jump off the Williams Street bridge on hot summer days – see Page 5 photo Kaiapoi & Woodend Voice story – has a long-standing 'unsuitable for swimming' notice – a 'special status reflecting a history of poor or highly variable water quality delivering a moderate to high risk of illness to swimmers'. (LAWA)

In the last three years the site has peaked at 2420 e.coli/100ml with a lowest reading of 344.

ECan reports to the ZIPA discussion back in 2017-18 measure this stretch of the Kaiapoi River with a nitrate level around 7mg/l-plus which exceeds the 6.9mg/l bottom line.

**The Ohoka Stream**, the fourth significant tributary of the Kaiapoi River, upstream at Bradleys Road only has its ecology measured on the LAWA site with an MCI at 85.5 rated 'fair' and rated D on the NOF, although with an improving trend – no water quality measures are posted by LAWA.

Further downstream at Island Road on the outskirts of Kaiapoi the bacteria in the Ohoka Stream is measured in the worst 25% of rivers and degrading. Nitrate is again an issue with TON at 4.1g/m<sup>3</sup> but very likely improving in trend. Its highest reading over the last decade was 5.1g/m<sup>3</sup> on June 5, 2012.

This quick overview of the Kaiapoi River and its tributaries illustrates the sad and degraded state of these northern Waimakariri tributaries with all tributaries flowing into the Kaiapoi River, the 'jewel in the crown' of the Best Rivertown in New Zealand – Kaiapoi Town Centre plan.

I now want to draw your attention to some particular 'community' examples of the degraded nature of these waterways apart from the LAWA data.

I include for your information copies of the Kaiapoi & Woodend Voice, a special environmental election newspaper I produced as an information and promotional tool for my Kaiapoi-Woodend ward councillor local body election campaign in September 2019 – a very successful campaign I might add! In my campaign I gave voice to the rivers outlining their degraded nature, the threats to Waimakariri drinking water supplies and the particular threats from rising nitrate contamination of groundwater to the thousands of Waimakariri residents on their own private well drinking supplies.

I draw the hearing panel's attention to two stories in particular "Low flows doom the Kaiapoi River" – Page 5 and "Is your water safe to drink? – Page 3, which expand on and background my September 2019 submission.

The low-flows story tracks the demise of the multi-million dollar 50-year old chinook salmon hatchery on the Silverstream River at Clarkville which has been forced to relocate much of its \$41million salmon-rearing business because of low river flows, high temperatures, low dissolved oxygen and increasingly high nitrate levels in the Silverstream where its business is based.

Flows as low as 100 litres a second were recorded just downstream from the hatchery meaning adult salmon released from the hatchery couldn't get downstream and nor could released fish make it back up the Silverstream to the hatchery.

The present minimum flow on this Kaiapoi River tributary is 600 litres a second but the flow is gauged many kilometres downstream. A question, apart from the water quality itself, is the appropriateness of the downstream site for gauging?

The Waimakariri water zone committee has had a regular monthly deputation from Kaiapoi resident Michael Bate for the past five years complaining about the 'death' of the Kaiapoi River – the disappearance of aquatic life, weed beds, shrimps and invertebrates and virtually all the fish in the lower tidal reaches. Bate, who has grown into an outraged environmental activist, has his own handwritten notebook of his fish catches from the Kaiapoi River which he's finished from childhood – a record going back almost 60 years.

"I've caught thousands of fish there," he told the Kaiapoi Advocate community newspaper back in August 7, 2015. "There were billions of shrimps in the weed beds."

Bate and other Kaiapoi fishers initially pointed the finger at ECan and Waimakariri District Council's aquatic weed spraying programme since 2012-13 when the weed, macroinvertebrate and fishery decline struck the Kaiapoi River. But the reason for the weed die off and demise of the freshwater fishery has since been found to be more likely the result of increased and persistent saltwater intrusion flowing far higher up-river than previously thought – not that any studies had been done by ECan until the fishers' complaints got traction

around 2015 after I wrote stories in the Kaiapoi Advocate community newspaper, which I produced for the decade up to 2018.

See ECan's principal water quality scientist Adrian Meredith's Assessment of the state of a tidal waterway – the Lower Kaiapoi River, March 2018 (Report No. R18/7 (978-1-98-852080-3(web)).

A too-low flow set by ECan at the Waimakariri River Old Highway Bridge (minimum flow 41 cumecs) is without doubt the main reason for the salt intrusion far higher up the Kaiapoi River and the death of the freshwater fishery. But as I've submitted earlier the Kaiapoi River also has high nitrate levels over the old 6.9mg/l 'bottom line', high faecal bacteria counts, massive sediment loads and regular algal blooms.

Page 6-8 of Meredith's report describes the large number of big adult fresh water mussels ( kakahi) he discovered at the Cam/ Kaiapoi rivers confluence in the middle of the Kaiapoi township – 50 mussels were collected in 25 minutes by one person! They were all older adult mussels – no small or young size classes were present – so the large population of this unique native freshwater shellfish has not been successfully reproducing in recent years with the large numbers of dead shells in the riverbed indicating a dying and disappearing population.

The samples Meredith brought to the Kaiapoi-Tuahiwi community board to report his findings were 50-60 years old perhaps, he said back in 2018.

I found the demise of this large population of native shellfish particularly poignant. Not only because no-one knew they were there in the first place in the middle of the Kaiapoi town centre but nothing has been done since then to help this unique and dwindling native shellfish population to survive.

So the Kaiapoi community, Ngai Tuahuriri runanga and the river itself will likely lose another of its taonga residents.

Like with many other northern tributaries ECan has scant/ if any monitoring data for fish and invertebrate health. I thoroughly support the monitoring and reporting regimes and action plans outlined in the new NPS/NES.

These are a couple of examples, along with the demise of the Silverstream salmon hatchery, where the mauri of this river system which has served the Kaiapoi and wider Waimakariri community so well for more than 150 years has been diminished and degraded.

And if you aren't fully aware the Southbrook, a Cam River tributary, was the discharge point for more than 60 years for the sewage effluent from Rangiora, polluting the Cam with sediment, faecal bacteria and nutrients that the too-low flow in the Cam remains unable to shift still since 2006 when the \$32million

Waimakariri District's eastern sewage treatment scheme with its ocean outfall into Pegasus Bay was commissioned.

In a past life the Kaiapoi River was the dumping point for Kaiapoi Woollen Mills effluent plus various eras of freezing works' discharges.

**The State of the Takiwa 2012**, an inaugural cultural health assessment undertaken by Mahaanui Kurataiao for Ngai Tahu and Waimakariri District Council in July-August 2012 found all 44 sites tested from the source to the sea along the Ruataniwha/Cam River and its tributaries were polluted and were deemed unfit for gathering mahinga kai, primarily due to pollution from neighbouring land uses.

This river system, which runs through Tuahiwi, the centre of Ngai Tuahuriri settlement on Maori Reserve 873 is a highly significant area for Ngai Tahu. The recommendations from this cultural health assessment, now almost 10 years old, have not been implemented in any comprehensive or planned manner.

They include regular monitoring, progressive elimination of pollutants throughout the catchment, investigation of where faecal contamination both animal and human is entering the waterways, protection fencing and enhancement of springs and restoration of riparian planting with appropriate native species with buffer zones of 10 to 30 metres depending on adjacent land use. The goal of course is restoration of water quality and the health of the stream to a point where mahinga kai thrives again and can be safely gathered. The study I'm told is not worth repeating because nothing much has changed in the past eight years.

I also chaired the now defunct Cam River enhancement subcommittee, now part of the new land and water committee at Waimakariri District Council, which I also chair. The Cam River enhancement subcommittee administered and allocated a fund, set up by the Environment Court back in 2001 as a consent condition for Waimakariri's new eastern district sewage treatment plant. The court directed the Waimakariri council to put the money, funded by ratepayers at \$25,000 a year for five years, into restoration and rehabilitation of the degraded habitat in the Cam River following the decades of sewage effluent discharge. The monies, now totalling over \$200,000, while allocated still remain largely unspent –ironically awaiting the granting of the Waimakariri Maintenance and Minor Works consent from ECan.

**So I embrace with open arms the NPS-FW and NES requirement to give primacy to the mana of the Kaiapoi River and its tributaries – these waterways been good and generous servants to the town and district development for well over a century and it is time now to stop the usury and abuse, honour that contribution and give priority to their recovery, restoration and on-going well-being.**

As I've said earlier the only way I see able to deliver measurable environmental improvement in the next five years is to increase the minimum flows throughout the catchment and reduce abstraction allocations, especially for irrigation which is at its peak in summer when the rivers and streams are particularly vulnerable.

I am pleased to report however that by the end of January 2021, ECan's principal water quality scientist Adrian Meredith, told the Waimakariri water zone committee at its meeting on November 2 that the regional council will be installing state-of-the art continuous nitrate, salinity, nutrient, clarity, temperature, dissolved oxygen and pH recording equipment on the Mandeville Bridge piers in the middle of Kaiapoi plus be taking monthly grab samples for phytoplankton species, phosphorus and carbon.

This is a first for this river and will be in addition to the summer sampling for faecal bacteria at the Cure Boating Club launch ramp. This is certainly progress and within 12 months ECan should have enough data to benchmark the issues in this river.

And I quote Meredith: "Many of the problems in the Kaiapoi are because it's a nutrient sensitive receiving environment. We cannot ignore it anymore."

Sadly up until this point and even with years of publicity around the fishers' concerns, ECan has been tardy to take action on this river. The monitoring gear is a first and the type of equipment a first for New Zealand, Meredith said.

**I also wanted to raise some questions** about the setting of minimum flows themselves and the use of a percentage of the seven-day mean annual low flow – 7 day MALF - for determining the flow needs for ecological habitat in a waterway and how that sits with the fundamental and governing principle of the NPS/NES of Te Mana o Te Wai.

My contention is that working out the seven-day mean annual low flow for any waterway, then determining say 95 per cent – or 90% - of that flow and accepting that as the minimum the stream can be abstracted down to is a fundamentally flawed approach given the new over-arching principle of Te Mana o Te Wai in the new NPS/NES.

These degraded waterways need the full 100% of the flow required for their biggest inhabitants to grow and thrive - not a discounted percentage of that flow.

Such an approach immediately puts the survival of the aquatic life in the waterway under pressure when other parameters like temperature, nutrient and bacterial contamination are also at their peak.

Plus when the waterway is already degraded through high sedimentation, heavy nutrient contamination, it needs the buffer of much more flow and stricter allocation limits to heal itself, recover and preserve habitat for the aquatic weed, macroinvertebrate and fish life within it.

It defies logic to think that a degraded waterway can restore to health and well-being by continually being abstracted to flatline at its minimum flow or some percentage below that!

How does this approach fit with the primacy of Te Mana o Te Wai? It doesn't in my view!

So I request that the full 100% of the 7 day MALF be the starting point for setting new 'minimum' flows and that at least another 50% - 100% of that flow be directed to remain in the waterway at all times before any abstraction can occur.

I do concede that my buffer of 50-100% extra is somewhat a stab in the dark as I don't have the expertise to recommend what should be a "healing" buffer flow to permit a degraded waterway to recover its mauri and well-being.

But I submit the concept for your consideration in requiring an extra buffer flow in all these degraded northern Waimakariri waterways **before** any surface or stream-depleting abstraction can occur.

I also note there is no reference to cultural values in the use of the 7 day MALF as a benchmarking tool.

So I support the active involvement of Ngai Tuahuriri/ Ngai Tahu experts in preparation of plans and policy statements – and clearly any 'minimum' flows and allocations for abstraction - and the new compulsory value for mahinga kai. The cultural assessment on the Ruataniwha/Cam undertaken in the State of the Takiwa report 2012 is an excellent starting point to re-set the flows which should remain in any waterway to enable its recovery to health.

I also support action plans benchmarking and monitoring all 22 attributes of freshwater health for every one of the northern Waimakariri waterways.

## **Drinking water**

I expressed my concerns in my September 2019 submission about the implications of groundwater nitrate contamination both for the Waimakariri District Council's 16 community drinking water supplies and the thousands of private wells supplying drinking water to Waimakariri's four-hectare 'lifestyle' and bigger farm blocks.

My concern was initially based on the extra cost to ratepayers in monitoring community supplies which breach the half Maximum Allowable Value (MAV) of 5.65 mg/l nitrate which the proposed plan change 7 nitrate reductions were based on.



I note now the NPS/NES sets a maximum nitrate value of 2.4mg/l both in surface freshwater streams and rivers and groundwater supplying drinking water.

I certainly support this lower limit and am also in favour of the Christchurch City Council/ Vicki Buck even lower limit of 1mg/l nitrate in the aquifers supplying the city and Waimakariri's main towns.

Both Kaiapoi/ Rangiora and Christchurch supply wells draw from the same deep aquifers, which are projected to be affected by the nitrate contamination 'in-the-post' flowing to the coast and under the Waimakariri River from intensive farming in the west of Waimakariri District.

Modelling projections show significant long-term increases in nitrate concentrations in the Kaiapoi (and hence Rangiora) town water supply wells, going up to 5.4mg/l under current pathways median scenario (page 67 of the Etheridge nitrate options and solutions assessment report.)

I find this level unacceptable in an aquifer renowned for its pristine nature.

Why should an aquifer system, the towns of Kaiapoi and Rangiora and the whole Waimakariri district – and Christchurch City – be expected to 'wear' these contaminated flows in their drinking water from farming practices on less than 200 farms upstream in the west of Waimakariri intensified inappropriately on free-draining gravels?

I am particularly concerned with the reported link with the incidence of bowel cancer and drinking water with nitrate levels over 1mg/l, as reported in the Danish study and also replicated in the 2019 United States study.

The concern I have in Waimakariri is that there is another 900 or so subdivided four-hectare lots ready for building consents **in addition** to the 2640 lots included in ECan's current state reports on which the plan change nitrate reduction targets were based.

The vast bulk of those 900 yet-to-be-built on 4ha block homes will be sinking their own private water supply wells, many into shallow (up to 50-metres deep) groundwater.

**After more than 10 years of PC7 proposed reductions** some 940 shallow wells will still be drawing water over 5.65mg/l nitrate with 250 wells drawing water over 11.3mg/l nitrate, according to ECan's May 2019 nitrate management options and solutions assessment.

**And even after 50 years of the progressive nitrate reductions** proposed in the plan change, some 740 private wells will still have a nitrate level which exceeds 5.65mg/l with a further 170 over 11.3mg/l.

This tally does not include the further 900 already subdivided blocks sitting in the wings waiting to be built on.

Nor does it include the hundreds, if not thousands, of property owners still able to subdivide Waimakariri rural land between now and when the Waimakariri proposed district plan becomes operative.

The plan, which may include changes to existing rural zones, is expected to be notified early in 2021 and may take a further two years-plus before becoming operative.

Clearly this is a potential health crisis just waiting to happen.

And I do not accept that the solution for these potential new Waimakariri residents is just to cough up with several thousands of dollars to install reverse osmosis nitrate treatment and its ongoing annual operating costs.

Under the ECan Act, now expired, the regional council had a legal obligation to ensure a drinking water supply, if potable without treatment, retained that level of potability without treatment.

The Waimakariri aquifers, supplying these thousands of 'lifestyle' block owners with their drinking water, has not retained their water quality due to the intensity of farming practices upstream.

See Page 3 story Kaiapoi & Woodend Voice, "Is your water safe to drink?"

Nor will the water supplying the 900 already-subdivided lots yet to be built on. And neither will the water supplying the potentially hundreds - perhaps thousands - more blocks able to be subdivided before the draft district plan becomes operative and any changes to rural subdivision rules within the new plan apply.

I am well aware that all a rural block owner requires to gain building consent utilising a private well is one potable supply well test.

And that's where the district council's legal responsibility ends at present.

If the nitrate level spikes in the initially potable well water over the next few months, years or decades after the new house is built - as the ECan science tells us it will with the amount of nitrate already in-the-post in the groundwater flowing to the coast - then the responsibility to fix lies with the property owner.

This is a totally unacceptable stance to take in my view.

Both the district and regional council have a duty of care to these residents, particularly as the science right now indicates it is only a matter of time - potentially a very short time - before the nitrate in-the-post contaminates these private wells.

In addition there's the documented link between drinking water exceeding 1mg/l nitrate and the development of bowel cancer which indicates New Zealand's drinking water standards may need urgent review on safe nitrate levels.

I don't have a solution to advance to what I consider is an impending health crisis but I am outlining the problem I see in the hope this issue can be flagged in any plan change rules.

The question being if the nitrate target is 2.4mg/l or 1mg/l under this plan change/ NPS/NES who pays for the treatment of well water to comply with that limit – given the predicted time frames exceeding 100 years for compliance in some areas?

And what is the nature of warnings, subdivision or development restrictions or bans which could and should, in my view, accompany subdivision consent applications in this Waimakariri nitrate priority red zone and downstream?

Many thanks for the opportunity to speak on my submission.

Sandra Stewart