

PROPOSED WAIKATO REGIONAL PLAN CHANGE 1 WAIKATO AND WAIPĀ RIVER CATCHMENTS



Submission form on publicly notified – Proposed Waikato Regional Plan Change 1 – Waikato and Waipā River Catchments.

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FORM 5 Clause 6 of First Schedule, Resource Management Act 1991

SubFo m	PC12016	COVER SHEET	
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Entered		Initials	
File Ref		Sheet 1 of	

SUBMISSIONS CAN BE

Mailed to	Chief Executive, 401 Grey Street, Private Bag 3038, Waikato Mail Centre, Hamilton 3240
Delivered to	Waikato Regional Council, 401 Grey Street, Hamilton East, Hamilton
Faxed to	(07) 859 0998 <i>Please Note: if you fax your submission, please post or deliver a copy to one of the above addresses</i>
Emailed to	healthyivers@waikatoregion.govt.nz <i>Please Note: Submissions received by email must contain full contact details.</i>
Online at	www.waikatoregion.govt.nz/healthyivers

We need to receive your submission by 5pm, 8 March 2017.

YOUR NAME AND CONTACT DETAILS

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TRADE COMPETITION AND ADVERSE EFFECTS *(select appropriate)*

- I could / could not gain an advantage in trade competition through this submission.
- I am / am not directly affected by an effect of the subject matter of the submission that:
- adversely effects the environment, and
 - does not relate to the trade competition or the effects of trade competition.

Delete entire paragraph if you could not gain an advantage in trade competition through this submission.

PLEASE INDICATE BY TICKING THE RELEVANT BOX WHETHER YOU WISH TO BE HEARD IN SUPPORT OF YOUR SUBMISSION

- I wish to speak at the hearing in support of my submissions.
 I do not wish to speak at the hearing in support of my submissions.

JOINT SUBMISSIONS

- If others make a similar submission, please tick this box if you will consider presenting a joint case with them at the hearing.

IF YOU HAVE USED EXTRA SHEETS FOR THIS SUBMISSION PLEASE ATTACH THEM TO THIS FORM AND INDICATE BELOW

- Yes, I have attached extra sheets. No, I have not attached extra sheets.

SIGNATURE OF SUBMITTER

Signature: Robin Boom



Date: 08/03/17

Personal information is used for the administration of the submission process and will be made public. All information collected will be held by Waikato Regional Council, with submitters having the right to access and correct personal information.

PLEASE CHECK that you have provided all of the information requested and if you are having trouble filling out this form, phone Waikato Regional Council on 0800 800 401 for help.

THE SPECIFIC PROVISIONS OF PROPOSED PLAN CHANGE 1 THAT MY SUBMISSION RELATES TO

Please state the provision, map or page number e.g. Objective 4 or Rule 3.11.5.1 (Continue on separate sheet(s) if necessary).

Use of Nitrogen Reference Points as it relates to 3.11.3 Policy 1a, Policy 2C, Policy 3C (Pages 30 & 31)
Also 3.11.5.4 - 1, 5C (Page 42)
And as outlined in Schedule B (P 47) generally and specifically point f as far as grand-parenting goes.

I SUPPORT OR OPPOSE THE ABOVE PROVISION/S

(Select as appropriate and continue on separate sheet(s) if necessary)

- Support the above provisions
- Support the above provision with amendments
- Oppose the above provisions

MY SUBMISSION IS THAT

Tell us the reasons why you support or oppose or wish to have the specific provisions amended. (Please continue on separate sheet(s) if necessary).

I work as an independent agronomist advising on soil fertility on over 400 farms in the greater Waikato Region. I am currently a member of the following professional organisations:

New Zealand Society of Soil Science
New Zealand Grasslands Association
New Zealand Institute of Agriculture and Horticultural Science
The British Society of Soil Science
The Institute of Professional Soil Scientists
The Brookside Society of Professional Consultants

My approach to soil fertility is biological and I am largely against the use of nitrogen fertilisers, and consequently most of my clients are low N users and I tell them off if they use more than 100 kg/ha N a year. My clients will therefore be disadvantaged compared to most other farmers in their catchments if Nitrogen Reference Points (NRP) are being used for 'historical grand-parenting'. My clients will generally be at the low end of N leaching and many will have already lowered their NRP compared to what they were before employing my services. As an example a dairy farmer client on the Mamakus had been leaching 70 kg/ha N according to Overseer in 2012 before taking on my approach, and within two years had halved this level to 35 kg/ha N. As 2014 is one of the reference years, he will be disadvantaged from using my biological approach, and now has very little wriggle room to further from his NRP.

Also using the 2014/15 years a reference point when many farmers were coming off a high payout year, their stock numbers would be much higher than the following two years, and their nitrogen inputs (see attached article

I SEEK THE FOLLOWING DECISION BY COUNCIL

(Select as appropriate and continue on separate sheet(s) if necessary).

- Accept the above provision
- Accept the above provision with amendments as outlined
- Decline the above provision
- If not declined, then amend the above provision as outlined

NITROGEN REFERENCE POINTS

The use of Overseer to determine Nitrogen Reference Points (NRP) for environmental benchmarking has some merit in some situations, but by and large for application over the Waikato Region as a whole it is a flawed concept which should not be used in PC1. Overseer is an ever-improving model for determining how much nitrogen is leaving the rootzone, but it does not account for attenuation which can be as high as 0.9 (90%) on some soils, particularly heavier soils and peaty soils, whereas on lighter pumice type soils attenuation losses may account for 0.1-0.3 (10-30% of total N). In physics, according to Wikipedia, attenuation is defined as 'the gradual loss of intensity of any kind of flux through a medium'. As far as nitrogen losses into ground water go, attenuation is the unaccounted disappearance of nitrogen through natural chemical processes such as denitrification, ammonification, absorption by clay colloids etc, and because of attenuation the quantities of N leaching into the environment when the Overseer model is used is over-exaggerated.

Secondly the desire to use NRPs based on the 2014/15 or 2015/16 years was promoted by the dairy farmers and Rural Professional representatives on the CSG but was not favoured by the sheep and beef representative as a form of 'grand-parenting'. Using the 2014/15 year when dairy farming was just coming off its high milk payout year, and many dairy farms were stocked to their limit, and bringing in various off farm feeds such as palm kernel and cereal grains, as well as using high rates of artificial N, will have much higher N losses in that year compared to last year with a low payout, and cow numbers on average have since dropped on average by 10-15%, and little off farm feed has been brought in, and N applications are lower due to low milk payout. For the environment, the 2014/15 gives dairy farmers a get out of jail free card, as their current N loss levels will be lower than the 2014/15 year.

For sheep and beef farmers, and for more conservative dairy farmers who have not been overstocked and bringing on the farm lots of brought in feed supplements or used a lot of nitrogen, these good farmers are forever stuck at a lower bench-marked NRP. For sheep and beef farmers, there is no opportunity to develop their farms to the biological potential by increasing subdivision, and getting natural soil fertility close to biological optimum levels, whereas dairy farmers have been able to achieve this over the past two or three decades with much better profits. Also the science shows that using Overseer for hill country properties is fraught with inaccuracies. At last month's annual Fertiliser and Lime Research Centre Conference at Massey University, attendees were told of some work done by Massey University researchers Dr Ranvir Singh and David Horne in the Rangitikei catchment that what Overseer predicted was leaving the root zone, and what actually entered the waterways could be vastly different. As a rough guide they suggested that on heavy silt loam and peat soils, attenuation could account for as much as 80-90% of N lost from the Overseer model, on silt loams there was medium attenuation which may account for 50% of the total N, and on stony and coarse textured soils the amount of N lost by attenuation could be 10-30%.

A keynote speaker at the conference was Danish professor Brian Kronvang who informed us of what had been taking place in Denmark for the past 30 years, where farmers have been forced to limit their farming operations based on environmental modelling. What the models for N leaching had predicted and how much actual N was being measured by monitoring were often vastly different. He said farmers had always been against modelling and were much more in favour of monitoring actual levels found in the water. As the models and the monitored hard data were contradictory, the past couple of years the models have been abandoned in favour of monitoring the nutrient levels in waterways.

Another interesting paper presented by Victoria University researchers promoted the LUCI (Land Utilisation and Capability Indicator) approach. One site they looked at, the Massey University Tuapaki Farm, Overseer predicted 8 kg/ha N was lost, whereas the actual amount of N measured

was only 2.37 kg. The LUCI model was more accurate for both nitrogen and phosphorus losses compared to Overseer.

In my view, Overseer is an excellent model for predicting nutrient losses from the root zone, but that is all. Using Overseer for grand-parenting N losses, allowing bad polluters to continue being the worst polluters and penalising good farmers and restricting future development of under-developed farmland is inequitable and wrong. Setting catchment limits based on LUCI or some other Land Use Suitability/Capability model where every farmer and land-owner are on an equal footing makes more sense to me, and as the science improves and accumulation of hard data from monitoring grows, then adjustments and changes can be made along the way. If the Waikato Regional Council really wants to address pollution problems, it should target known hotspot catchments and identify the specific farms where the pollutants are actually entering the waterways rather than hamstringing everybody else who is not causing the pollution problems.

Another silliness relating to setting NRPs for the Waikato and Waipa River catchments and most of the water bodies in the region, is that these rivers are not N limiting, but rather they are P limiting as far as algal growth is concerned, and N is not the limiting factor, so lowering N levels entering these waterways is unlikely to have any beneficial affect on these waterways. Overseer is pretty useless in predicting phosphorus losses, but there is a very good indicator used overseas called the Phosphate Saturation Index which is based on Mehlich III phosphorus, iron and aluminium levels, which determines whether a soil is overloaded in phosphorus or not. I have been using the Mehlich II extraction for my clients for determining soil nutrient levels for the past 22 years and find this extraction method better than the industry standard Olsen P and MAF Quick Test methods. The Mehlich III method is probably the most internationally recognised test for acidic soils like what we have in the Waikato, and I believe should become the new standard test, particularly for phosphorus, as the Olsen P is less accurate on our acidic soils, and Phosphorus Saturation Indexes can be easily determined from this laboratory test data which all of the major laboratories in NZ can now perform.

Also in relation to using NRPs and making the highest polluters come down to the 75th percentile is still going to make these farmers worse polluters than all other farmers. Setting catchment limits where low polluters can increase stocking rates through land improvement or changing stock policies which give a better economic outcome, but where they are all on a level playing field. Everybody should come down to at least the 50% percentile figures, should NRPs be used, and this will allow low polluters to further develop their land should they want to.

I did mention that there probably is some value in using NRPs in some cases. This is on highly leachable soils such as pumice soils in the South Waikato region which are flat, where attenuation is known to be relatively low, and steps can be taken to get all farmers under a particular N loss benchmark – not based on grand-parenting, but getting all farmers in the catchment to drop to the same level or below. This is equitable for everyone as there are no double standards, and allows conservative farmers to continue farming in a soil-friendly/environmentally/animal friendly manner as they always have done.

I work as an independent agronomist advising on soil fertility issues on over 400 farms in the greater Waikato Region. My approach to soil fertility is a balanced biological approach adapted from Albrecht science in the USA where all 16 critical elements for plant production are assessed and applied. I am generally not a fan of Urea and my clients are generally low N users, and will therefore be disadvantaged compared to most farmers in their catchments who use just a NPK approach to soil fertility. As an example I have a dairy farmer client – Brett Martin – at Mamaku whose farm according to Overseer had been losing over 70 kg/ha N before taking on my approach, and within

two years this dropped by half, yet his farm production and profitability improved. My big focus is on getting good legume based pastures where nitrogen is fixed for free out of the atmosphere, and where farms run to their biological capacity based on optimum overall soil fertility levels. Local environmental conservationists in partnership with whanau/hapu and local businesses, are undertaking a project of 50 of my clients compared to 50 farmers using NPK programs to prove that what I have been doing on my clients farms in the region is an overall win-win for the environment, the financial concern of the farm and animal welfare.

ROBIN BOOM CPAg, Member of the Institute of Professional Soil Scientists

ADDITIONAL SHEET TO ASSIST IN MAKING A SUBMISSION

Section number of the Plan Change: 3.11.5.2 Point 3 & 4 (Page 40)

Do you support or oppose the provision?

Support

Oppose

Submission

Decision Sought

State in summary the nature of your submission and the reasons for it.

State clearly the decision and/or suggested changes you want Council to make on the provision.

This rule proposes stocking rates to be limited to 22 October 2016.

Change this rule to allowing farmland to be stocked to its biological optimum level, but limit the use of artificial nitrogen to 30 kg/ha and brought in feed to 10 kg/stock unit once these biological optimum levels have been achieved.

This will restrict under-performing farmland from achieving its biological productive potential.

At the New Zealand Grassland Association Hill Country symposium conference in Rotorua, noted soil scientist Dr Doug Edmeades presented a paper stating that if the government wants primary industry production to double by 2025, hill country properties on average could increase production by 30% just by getting basic soil fertility up to biological optimum levels. Limiting stock numbers on under-performing farms to 2016 levels means this potential can never be realised and the income potential for the country as a whole is limited.

Section number of the Plan Change: 3.11.5.2 (page 40) 3e

Do you support or oppose the provision?

Support

Oppose

Submission

Decision Sought

State in summary the nature of your submission and the reasons for it.

State clearly the decision and/or suggested changes you want Council to make on the provision.

Fencing any permanent water body to at least 3 metres is too large in some situations which will gobble up too much productive farmland. It will also risk weed species such as blackberry and gorse to become rampant resulting in toxic herbicides being sprayed directly onto waterways.

A one meter distance is more economic and is also sufficient to keep most sediment, pathogens, nitrogen and phosphorus from entering waterways. Once this ungrazed one meter buffer zone grows it should act as a sufficient physical filter to most of these contaminants and a three metre strip is likely to have little greater impact.

ADDITIONAL SHEET TO ASSIST IN MAKING A SUBMISSION

Section number of the Plan Change: 3 Part A Use Values - Primary Production (Page 25)

Do you support or oppose the provision?

Support

Oppose

Submission

State in summary the nature of your submission and the reasons for it.

I support the recognition of benefits which primary production has on the wealth, social and cultural wellbeing of the region and the importance of maintaining this.

Decision Sought

State clearly the decision and/or suggested changes you want Council to make on the provision.

The significant benefit of primary production to NZ Inc and maintaining this is made highest priority of PC1.

Section number of the Plan Change: Schedule C (Stock Exclusion) - page 50

Do you support or oppose the provision?

Support

Oppose

Submission

State in summary the nature of your submission and the reasons for it.

I do not support the fencing of all permanent waterways as there is a lot of countryside where this is impractical and uneconomic. The two main contaminants which stock exclusion is trying to address are sedimentation and microbial pathogens.

I have attached an article on Sedimentation and also some photos I took yesterday of a koi carp looking for worms and stirring up the stream on a farm I was at yesterday.

I have also attached an article in relation to phosphorus as that is another plan change I would like to see.

Decision Sought

State clearly the decision and/or suggested changes you want Council to make on the provision.

Rather than fencing off all permanent waterways, I suggest fencing off all waterways where the minimum flow is at least 3 litres/second, with the fencing of minor waterways being voluntary.

As there is not enough room in this submission form for me to comment about all of the changes related to phosphorus, I would like to see Regional Council ditch the use of Overseer for phosphorus and adopt using a Phosphorus Saturation Index as is used successfully overseas by some countries and states for assessing whether a soil is overloaded in phosphorus, and also encourage the use of the Mehlich III extraction method in determining the phosphate status of a farm which is a better measurement method than the industry standard Olsen P test.

SEDIMENTATION

Sediment is recognised as one of the four contaminants entering waterways and Regional Council is entrusted with the task of reducing the amount of sedimentation occurring. Livestock have been largely blamed for the high amount of sediment in some of our streams and rivers, and reducing the amount of livestock overall, plus fencing off waterways preventing animals from entering is a heralded solution. Interestingly sheep are still allowed to graze alongside waterways under Waikato Regional Council PC1 rules, as unlike other grazing animal species – cattle, horses, deer and pigs – sheep tend to avoid standing directly in water and certainly don't wallow in it like some other species do. Pigs and deer in particular like to wallow in muddy pools which is natural for them, so preventing them from doing what they enjoy doing is going against nature, yet feral deer and pigs will continue to wallow in streams coming out of native bush and forestry.

As for the effect livestock have on sedimentation, this too can be overstated. The Waipa River is a classic case in point. During normal river flows, the Waipa River upstream of Otorohanga is relatively clear of sediment, yet it has a huge catchment going out to the back of Benneydale, and few farms actually currently have this river fenced except for the dairy farms up the Otewa and River Roads. Yet venture down to Pirongia and the Waipa River becomes discoloured rapidly, which again has little to do with livestock, but is the result of bank subsidence. Further downstream where the river flow is not as swift, there is another cause of sedimentation and that is koi carp which eat into the banks in search of worms and other aquatic life.

It would seem that the intention of PC1 is to reduce the amount of livestock farms and convert pasture to forestry which is deemed to have low pollutant impact. This may be beneficial as far as reducing nitrogen loading is concerned, but in the case of forestry, particularly on steep hillsides, the amount of sedimentation at harvest is colossal, moreso than what traditional livestock farming will do over several decades. On flat land, the amount of sedimentation from forest harvesting is minimal, but so is sedimentation from livestock farming on flat land, and on easy slope land, having a wetland to capture sediment before it leaves a property can act as an effective filter on pastoral farms. So overall the change from livestock to plantation forestry provides no benefit as far as sedimentation goes, and possibly the reverse.

As for the lower Waikato, Whangamarino wetland and the shallow lakes and lower streams feeding into the lower Waikato, sedimentation is a huge problem, but again it is not from livestock farming, but largely due to the pest fish Koi carp. I have a client up the Mangapiko valley behind Te Kauwhata where this is glaringly obvious as there is also a small waterfall which koi carp cannot get up. The water above the waterfall is pristine clear, whereas below the waterfall the stream takes on a murky colour from koi carp eating into the banks. Koi carp and other fish species also contribute significantly to the amount of microbial pathogens in the water through their defecations.

If council and iwi are serious about sedimentation, there is a business opportunity to catch koi carp and turn them into fish meal for livestock, or export them to Asian markets where they are readily consumed, or turning them into fish fertiliser for applying back onto land. Such industries would need funding help to get established, but an industry based on harvesting koi carp will reduce sedimentation, provide useful fish protein meal and also provide employment opportunities in the Huntly-Te Kauwhata region which has higher unemployment than other regions around the Waikato. Once established with established market, then subsidising the industry can hopefully cease as the businesses will hopefully be self-funding from sales.

All dairy farmers now have any significant waterways fenced off and cattle cannot enter them. Having to fence off small drains which contain water all year round will add expense, but with cows,

just a single wire electric fence is all that is required and can be done relatively cheaply. In the case of beef cattle on hill country goes, my suggestion is that only waterways with a minimum flow of at least 3 litres/second should need fencing, as the sheer cost of fencing all waterways on many hill country farms is prohibitively expensive. As for pigs and deer farming, their numbers are very low, their overall impact is very minimal, and secondly pigs and deer enjoy wallows, and most of these are generally very slow flowing if at all, so I would like to see the exclusion of pigs deer, and horses removed from the PC1 agenda. Horses respect single wire fences like cattle, but deer and pigs do not. Deer fencing itself is also a lot more expensive to build than conventional seven wire fences, and even seven wire fencing for keeping pigs out of slow moving waterways is many times more expensive than single wire fences for cattle.

I would therefore like to see pigs and deer excluded from needing to be fenced off in PC1 change, a change in category for when a fence need to be erected to having a minimal flow of at least 3 litres/second, and for koi carp harvesting businesses to be subsidised to help clean up lower Waikato lakes and rivers/streams.

ROBIN BOOM CPAg, Member of the Institute of Professional Soil Scientists

PHOSPHORUS

Phosphorus (P) is recognised as one of the four contaminants in Waikato Regional Council PC1, and although much fuss has been made of nitrogen, in the Waikato Region the majority of waterways are more phosphorus limiting rather than nitrogen limiting as far as algal growth is concerned, and yet phosphorus hardly gets a mention. As a lot of the phosphorus entering waterways comes from particulate run-off, fencing off waterways and having wetland on farms areas will have a big impact on reducing this, but there are some other mitigation strategies which should be considered.

At the moment Regional Council is falsely relying on Overseer to determine if a farm is high risk as far as P losses into the environment goes. As Overseer is partly owned and funded by the two big fertiliser co-ops, these companies have an econometric model attached to Overseer which their reps can use which helps establish best options for fertilising their properties. My observation from using Overseer though is that it overestimates the amount of phosphorus which is needed to sustain or improve production, and underestimates potassium. I often find farmers, dairy farmers in particular, after entering their soil test data and other farm operational factors into Overseer, are advised to apply excessive amounts of phosphorus and not enough potassium. The reason for this is that Overseer estimates that where a farm has high Olsen P levels, to maintain the current level of production, high levels of P are needed for maintenance, and it doesn't factor into the equation whether the farm is already above the biological optimum levels or not. P is a recognised contaminant in waterways whereas K is not, and P is also the most expensive element to apply. When soil particles from high P farms do enter waterways, this becomes an environmental problem, whereas soil particles from low P farms do not cause as much pollution.

Another problem is the almost universal use of the Olsen P test to measure soil phosphorus levels. There are better soil tests for acidic soils like ours used internationally. The Olsen P test was developed for alkaline soils in the mid-West of America by Dr Olsen of Colorado State University back in the early 50's. More than 20 years ago I abandoned the Olsen P test in favour of the more modern Mehlich III phosphorus test which I believe is a much better predictor of determining a phosphate response, and is now the most common assay used on acidic soils worldwide and also the favoured method used in the international scientific literature.

Because the Mehlich III (M3) extractant is a multi-element test, it has been used in some countries and states for environmental monitoring for determining what is sometimes called the Phosphorus Saturation Index or Phosphorus Saturation Ratio. The scientific literature shows the PSR/PSI is determined by the equation $P/(Al + Fe)$ which is phosphorus divided by the total of aluminium and iron. On acidic soils, aluminium and iron are responsible for fixing water soluble phosphate fertilisers such as superphosphate, DAP, Triple Super, MAP and animal manures, into non soluble forms. Low water soluble phosphate fertilisers such as dicalcium phosphate, serpentine super and RPR fertilisers avoid or delay this fixation or locking up of the phosphorus and their direct application into waterways is therefore less environmentally damaging. The benefit of doing M3 soil assays is that one can quickly determine if the soil phosphorus levels are already beyond what the soil can hold and has the potential to be environmentally harmful. The international literature suggests the PSR or PSI threshold for causing environmental harm is as low as 0.1. This would mean that if the total iron and aluminium levels using the M3 extraction was 1000 ppm, then phosphorus should not exceed 100 ppm. Since this research has already been done overseas, it can easily be used and checked here as the scientific methodology is the same. All of the major soil testing labs in New Zealand have the technology to do Mehlich III tests. This will be a much more accurate way of determining whether a farm's phosphate status is likely to cause environmental harm compared to using the Olsen P values typed into the Overseer model.

Having a better, more modern phosphate test using the Mehlich III assay where iron and aluminium are also measured from which Phosphorus Saturation Indexes can be determined is I believe a much better tool for reducing phosphorus contamination of waterways. Also for farmers, because the Mehlich III test is a better predictor of a phosphate response, it means they will not be wasting their money applying phosphorus when it is not needed, but can apply it when it will give an economic production response.

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