

Before Hearing Commissioners at Christchurch

under: the Resource Management Act 1991

in the matter of: Submissions on the Proposed Hurunui and Waiau River
Regional Plan

between: **Fonterra Co-operative Group Limited**
Submitter

and: **Dairy NZ**
Submitter

and: **Canterbury Regional Council**
Local Authority

Statement of evidence of **Gerard Matthew Willis** (planning) for Fonterra
Co-operative Group Limited and Dairy NZ

Dated: 12 October 2012

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STATEMENT OF EVIDENCE OF GERARD MATTHEW WILLIS

INTRODUCTION

- 1 My full name is Gerard Matthew Willis.
- 2 I am a director of Enfocus Ltd, a resource management consultancy based in Auckland. I have practiced as a planner and resource management specialist for the past 23 years.
- 3 I hold a Bachelor of Regional Planning (Hons) degree from Massey University and am a full member of the NZ Planning Institute.
- 4 My previous experience includes working in policy and regulatory planning roles in local government both in New Zealand and in the United Kingdom. Shortly after the enactment of the Resource Management Act 1991 (*RMA*) I joined the Ministry for the Environment (*MfE*) as a regional environmental analyst advising local authorities on the preparation of "first generation" district and regional plans.
- 5 Over the period 1995 to 1999, I was environment adviser to the Minister for the Environment. In that role I had close involvement in issues across the environmental portfolio including, in particular, energy and climate change, freshwater management and amendments to the RMA.
- 6 Since 2001, I have been a planning and resource management consultant, establishing my own practise in 2002. In that capacity I have acted for a number of district and regional councils, public and private companies and government agencies. The scope of consulting commissions has been broad ranging. Of note, over recent years, I have advised three different regional councils on the development of regional policy statements and/or regional plans.
- 7 I have also been involved in reform of freshwater management at the national level having been previously engaged by MfE under the Sustainable Water Programme of Action to advise on alternatives to first-in-first served allocation regimes and on barriers to tradeable permits. In 2010 I was engaged by MfE to assist in the New Start for Freshwater Programme with specific involvement in water governance issues.
- 8 I have read the Environment Court's Code of Conduct for Expert Witnesses, and I agree to comply with it. My qualifications as an expert are set out above. I confirm that the issues addressed in this brief of evidence are within my area of expertise, except where I state I am relying on what I have been told by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

- 9 I am familiar with the Proposed Hurunui and Waiau River Regional Plan (*the Proposed Plan*) to which these proceedings relate.

SCOPE OF EVIDENCE

- 10 This planning evidence relates to provisions of the Proposed Plan that seek to manage the cumulative effects of land use on water quality – specifically Objectives 5.1 and 5.2, Policies 5.1-5.4, Rules 10.1-11.2 and associated provisions of Part 5 and Schedule 1. In that regard my evidence will deal with the following:
- 10.1 Relevant planning instruments;
 - 10.2 The general *planning approach* proposed in the Proposed Plan as it relates to water quality;
 - 10.3 The principal *planning issues* and questions arising from evidence of current water quality and causes and on-going threats;
 - 10.4 An evaluation of the proposed water quality provisions against matters relevant under Section 32 of the Act;
 - 10.5 My *recommended regime* for addressing residual risks and unknowns; and
 - 10.6 A review of some *detailed issues* with the wording of the provisions relating to water quality.

SUMMARY OF EVIDENCE

- 11 This evidence only addresses the water quality aspects of the Proposed Plan.
- 12 There appears to be little dispute about the water quality outcomes of the Proposed Plan, whether expressed in narrative or numeric terms. The one issue may relate to the nitrate toxicity limit but that is a matter of technical detail as I discuss later.
- 13 It is also apparent that there is little dispute about the desirability of enabling water use and land use intensification in the catchments of the Hurunui and Waiau Rivers.
- 14 What does appear to be in dispute is what planning provisions will deliver the dual objectives of land use change and water quality protection in an effective and efficient manner.
- 15 In my opinion, the Proposed Plan is consistent with the National Policy Statement on Freshwater Management (*NPSFM*).
- 16 I also consider the Proposed Plan gives effect to the Proposed Canterbury Regional Policy Statement (*RPS*). The one issue that

requires careful consideration is whether the Proposed Plan gives effect to the RPS policy to take a precautionary approach to managing discharges when the effects are unknown or uncertain.

- 17 The key planning issues are whether the current nutrient load settings proposed:
- 17.1 Will enable the land use change desired; and
- 17.2 Are necessary to deliver the agreed water quality outcomes.
- 18 With regard to the first question it is apparent from the evidence of Dr McCall and Ms Hayward that the loads in Schedule will not enable the extent of land use change that appears to have been expected from the Hurunui-Waiau Zone Implementation Plan (*ZIP*).
- 19 That leaves the second question. It is clear to me that the phosphorus (*P*) limit is important if the periphyton objective is to be met. However, whether the N limit needs to be retained at the level as proposed is another matter. My analysis of the technical evidence on this issue is that the experts agree that the Lower Hurunui is "P limited" (i.e. periphyton growth is limited by a shortage of P relative to nitrate (*N*)) but they also agree that managing only P would involve greater risk to the achievement of objectives than managing both N and P. So the question is how much risk, is that risk worth taking and how can that risk be managed?
- 20 My broad scale assessment of risk included in this evidence (based on the evidence available to me) is that the risk to water quality objectives is low. Conversely, the benefits potentially foregone by not taking the risk are high some \$600 million region wide based on the foregoing of 30,000 ha (assuming that land use change can occur within the P load limit).
- 21 On that basis, I propose to increase the N load limit from the lower Hurunui as specified in Schedule 1. However, mindful of the need to manage risk (especially in light of the RPS policy on precaution as noted above) I propose that only half of that additional N load suggested as being potentially appropriate by Ms Hayward be available in 2017 with the remainder not available until 2022. That allows for an adaptive management approach to be taken as a means of management of unforeseen risks.
- 22 The additional load I propose (as stage 1) is 25% above that now recommended by the Hurunui Waiau Zone Committee, and supported by Ms White, based on the latest monitoring data.
- 23 In addition, I propose a number of other changes to the planning provisions including the following:
- 23.1 Inclusion of numeric objectives to support the narrative

objectives already in the Proposed Plan;

- 23.2 Refinement of the nitrate toxicity limit to reflect the latest technical advice;
- 23.3 Greater clarity and specification of the obligations of a ASM scheme and scheme membership, including ensuring that existing farmers are only encouraged to reduce outputs to levels which are technically efficient (a concept explained by Dr McCall);
- 23.4 Recognition of farms that establish post 2011 but pre 2017 (which were not recognised in the Proposed Plan); and
- 23.5 Refinement of the calculation of the load such that a 6 year rolling average approach is adopted.

THE PLANNING FRAMEWORK

Part 2 of the Act

- 24 The purpose of a regional plan is to assist a council to carry out its functions in order to achieve the purpose of the RMA. In that regard, sections 5 (2) (a)-(c) of the RMA are relevant.
- 25 In terms of Section 6 (Matters of National Importance), the Proposed Plan (taking into account its functional scope) needs to recognise and provide for, among other things:
 - (a) the preservation of the natural character ofwetlands, lakes and rivers
 - (e) the relationship of Maori and their culture and traditions with their ancestral lands, water ...
- 26 In accordance with Section 7, the Proposed Plan must have particular regard to all matters (a)-(j) as specified – all of which will be relevant to the issue of water quality management in the Hurunui.
- 27 Of course, section 6 and 7 matters need to be weighed in the overall judgement required by Section 5 of the Act (i.e. the reconciliation of the obligation to *enable* resource use with the obligation to safeguard environmental values).
- 28 In many respects the Proposed Plan and the collaborative process of its development have resolved this matter by clearly seeking an outcome that enables both water use and land use change, *and* protection of freshwater environmental values at specified levels. The Proposed Plan embodies a strategy that is designed to deliver on those twin objectives.

29 Unusually therefore, I see this process (in planning terms) as being less about ensuring the overall judgement is appropriately balanced and more about whether the provisions proposed will achieve that desired balance (and the outcomes specified) in an effective and efficient manner. That is, subject to meeting obligations to give effect to the NPSFM (see below) the major planning issue relates to whether the plan passes the tests imposed by Section 32 of the RMA.

30 I will return to that matter in my planning assessment of the Proposed Plan and my alternative proposals.

National Policy Statement on Freshwater Management

31 The Section 67 (3) of the RMA requires a council to “give effect” to the NPSFM. Policy E1(b) of the NPSFM requires the regional council “to implement the policy as promptly as is reasonable in the circumstances, and so it is fully completed by no later than 31 December 2030”.

32 Policy E1(c) provides councils the opportunity to implement a programme of defined time-bound stages to fully implement the NPSFM by 31 December 2030 if it is impractical for it to complete implementation by 31 December 2014. If a council does this it must formally adopt the staged programme by 12 November 2012

33 The NPSFM took effect on 1 July 2011, three months *before* the Proposed Plan was notified. On that basis my planning understanding is that, in terms of water quality, the Proposed Plan must:

33.1 Establish *freshwater objectives* and set *freshwater limits* for all bodies of freshwater (freshwater limits must reflect local and national values – values that include benefits and interests in both use and protection), NPSFM Policy A1(a);

33.2 Specify targets and implement methods to assist water bodies to *meet targets* where objectives are not met, NPSFM Policy A2;

33.3 Establish methods to *avoid over-allocation* (allocated beyond a limit or used to a point where freshwater objective is no longer met), NPSRM Policy A1(b).

34 In my opinion, the Proposed Plan meets the obligations of paragraph 33.1 to set freshwater objectives (insofar as water quality is concerned). The intended environmental outcomes are specified in Objective 5.1. There is a residual debate about whether the objectives should be set narratively (as in Objective 5.1) or numerically (as proposed by some other submitters). I discuss those two options later in this evidence but I suggest that either option would give effect to the NPSFM.

- 35 Similarly, I consider that the Proposed Plan meets the obligations of paragraph 33.1 to set freshwater limits insofar as the mainstems of the Hurunui, Waiau and Jed rivers is concerned in the form of Policies 5.3 and 5.4. It will also give effect to the NPSFM in respect of the tributaries provided the “agreed community outcomes” referred to in Objective 5.2 are in place before 31 December 2030 (as per Policy 5.4). As noted above a council will need to formally adopt a staged programme for the setting of these outcomes.
- 36 My understanding is that, by and large, the freshwater outcomes in Objective 5.1 are currently being met and therefore there is no need for the Proposed Plan to establish targets (a target being a limit that must be met at a defined time in the future). In that sense the Proposed Plan also gives effect to the obligations of NPSFM Policy A2. However, even if I am wrong on that point, the Proposed Plan does provide for limits to take effect at prescribed future dates for the mainstems in the form of Policy 5.3 and promises to do so for tributaries in Policy 5.4. Provided that the Canterbury Regional Council’s (*Council*) policy is fully implemented by 2030 the Proposed Plan will be compliant with NPSFM Policy A2.
- 37 The obligation to avoid over-allocation (as per paragraph 33.3 above) will be met by the cumulative effect of Rules 10 and 11 and through the discretion the RMA provides in section 87A (4) (a) for the Council to decline discretionary activity applications.
- 38 Therefore, in my opinion, the *framework* of the provisions of the Proposed Plan gives effect to NPSFM. Whether the specific provisions will be effective in providing for the freshwater values and whether all provisions are necessary in their current form are different issues that I address under the heading of “Section 32” (see page 17).
- 39 I consider it also appropriate to note that the freshwater objectives have clearly been established taking account of a range of national and local freshwater values as anticipated by the Preamble to the NPSFM. I note here only that, in my opinion, the value properly recognised by the Hurunui-Waiau Zone Committee and the Council of water for irrigation enabling land use change and increased agricultural production may not be appropriately reflected in the setting of the water quality limits as anticipated by the NPSFM. I return to that point later in this evidence.
- New Zealand Coastal Policy Statement (NZCPS)**
- 40 The NZCPS (2010) will also be relevant to the extent that the water bodies of the Hurunui, Waiau and Jed rivers lie within the *coastal environment*. I understand that the Canterbury Regional Coastal Plan (2010) (*RCP*) does not currently map the coastal environment but it will of course include the estuarine zones of these three rivers.

- 41 The most relevant provision of the NZCPS 2010 is Policy 21 which requires the Council to give priority to improving the quality of water in the coastal environment where it has deteriorated:

... so that it is having a significant adverse effect on ecosystems, natural habitats, or water based recreational activities, or is restricting existing uses such as aquaculture shellfish gathering and cultural activities...

- 42 In accordance, with NZCPS Policy 21 the Council is to do this by:

- 42.1 Identifying such areas of coastal water and water bodies and including them in plans;
- 42.2 Including provisions in plans to address improving water quality in the identified areas;
- 42.3 Where practicable, restoring water quality to at least a state that can support the activities quoted above, ecosystems and natural habitats;
- 42.4 Requiring stock exclusion from the water bodies; and
- 42.5 Engaging with tangata whenua to identify the coastal water in which they have a particular interest.

- 43 I am not aware of detailed technical evidence on freshwater quality in the coastal environment for the Hurunui and Waiau zone. I do note that Ms Shirley Hayward concludes that "*the receiving environments of the Hurunui River do not appear to change in their relative sensitivity to nutrients*". I also note that other plans, notably the RCP and the Natural Resources Management Plan (NRRP), may be more appropriate vehicles to define deteriorated water bodies in the coastal environment. Those plans address a fuller range of values and risks. Conversely, the Proposed Plan is limited in scope in terms of geography and capture of activities (it extends only to the taking and use of surface and groundwater and the discharge of water for non-consumptive uses as well as the control of land under section 9(2) of the RMA).

Canterbury Water Management Strategy

- 44 The Canterbury Water Management Strategy (CWMS) first published in December 2009 with targets updated in July 2010.

- 45 Its vision is:

To enable present and future generations to gain the greatest social, economic, recreational and cultural benefits from our water resources within an environmentally sustainable framework.

- 46 Amongst other things it provides the spatial framework for freshwater management (*water management zones* of which the Hurunui-Waiaru is one). Importantly, it recognises that there is capacity for further catchment/land use development but that this requires existing users and new users to improve the way they use water (CWMS, p.7).
- 47 The CWMS also prioritises water into:
- 47.1 First order priorities: environment, customary use, community supplies and stock water; and
- 47.2 Second order priorities: irrigation, renewable electricity generation, recreation and amenity.
- 48 It also establishes the following principles (reproduced here in summary only):
- 48.1 Primary principles: sustainable management, regional approach, and tangata whenua; and
- 48.2 Supporting principles: natural character, indigenous biodiversity, access, quality drinking water, recreational opportunities, and community and commercial use.
- 49 The CWMS focuses on delivering "*a balanced set of quantified outcome targets by specified dates*". These are developed through Zone Committees developing ZIPs that (amongst other things) inform the development of statutory plans under the RMA.
- 50 The Vision and Principles of the CWMS are included in full in Schedule 1 of the *Environment Canterbury (Temporary Commissioners and Improved Water Management) Act 2010*. Under Section 63 of that Act:
- In considering any proposed regional policy statement or plan, ECan must have particular regard to the vision and principles of the CWMS in addition to the matters relevant under the RMA to its decisions made under clause 10(1) of Schedule 1 of that Act*
- Regional Policy Statement**
- 51 There are two regional policy statements (RPSs) relevant to the Proposed Plan:
- 51.1 The Operative RPS 1998; and
- 51.2 The Proposed RPS 2011 (Decisions Version dated July 2012).
- 52 In accordance with the *Environment Canterbury (Temporary Commissioners and Improved Water Management) Act 2010*, the proposed RPS is subject only to appeal to the High Court on points of law. I understand that four such appeals were lodged (and not

yet determined) but that none relate directly to provisions on water quality.

- 53 Section 67 (3) of the RMA states that a regional plan must “give effect” to an operative RPS. While section 66 (2) of the RMA states that in preparing a proposed plan the Council shall “have regard to” a proposed RPS. Given the fact that the relevant provisions of the RPS are beyond appeal, however, I would consider it good planning practice to place considerable weight on the Proposed RPS.
- 54 A number of provisions of the Proposed RPS are relevant to the content of the Proposed Plan. Ms White identifies the relevant provisions in her appendix 4.
- 55 In summary, Objective 7.2.1 seeks sustainable management of freshwater which it defines (to paraphrase) as being about enabling people to provide for their economic and social well-being through using water provided various environmental imperatives are not compromised.
- 56 Objectives 7.2.2, 7.2.XX and 7.2.3 are also relevant and seek (respectively):
- 56.1 Development of water resources to occur in parallel with maintenance of water quality where it is already high and improvement in water quality where it is degraded;
 - 56.2 Overall quality of freshwater maintained or improved and life-supporting capacity safe-guarded; and
 - 56.3 Integrated management of freshwater resources including by considering the effects of land uses and intensification on water quality.
- 57 These objectives are to be implemented by Policies 7.3.1, 7.3.6, 7.3.7, 7.3.9 and 7.3.12 as follows.
- 57.1 Policy 7.3.1 requires preservation of *natural character values* of freshwater where those values are in a high state of natural character, maintenance where they are modified and improved where they are degraded to unacceptable levels.
 - 57.2 Policy 7.3.6 requires the establishment of *minimum water quality standards* for freshwater that are appropriate to each water body (with consideration given to life-supporting capacity; drinking, stockwater, customary and recreational uses; and other current or reasonably foreseeable values or uses).
 - 57.3 Policy 7.3.7 requires the avoidance, remedy or mitigation of *adverse effects of changes in land use* on the quality of freshwater (by identifying catchments at risk from increases

in the applications of nutrients or other changes and by controlling land uses to ensure water quality standards are maintained or improved).

- 57.4 Policy 7.3.9 requires the integrated management of fresh water bodies, their surroundings and land uses, through the development and implementation of integrated solutions to water management which provide comprehensive solutions to water issues in the catchment, including addressing all the matters set out in Appendix 3.
- 57.5 Policy 7.3.12 requires a precautionary approach to the allocation of water for abstraction, the damming or diversion of water, or the intensification of land uses or discharge of contaminants, in circumstances where the effects of these activities on fresh water bodies, singularly or cumulatively, are unknown or uncertain.
- 58 The provisions of the Proposed RPS are consistent with the intent of both the NPSFM and the CWMS as previously outlined. In my opinion the Proposed Plan is consistent with these Proposed RPS provisions for the reasons set out throughout this evidence. In particular I address the issue of unknowns and uncertainties from paragraph 127.

Canterbury Water and Land Regional Plan

- 59 It is also worth noting the broader regional plan context within which the Proposed Plan fits. The Council has recently notified the Canterbury Land and Water Regional Plan (*LWRP*). That plan operates at two levels:
- 59.1 There is a region-wide section, that contains the objectives, policies and rules that apply across the region;
- 59.2 There are ten sub-regional sections that contain (or will contain) policies and rules specific to the catchment of each sub-regional area. The Hurunui-Waiiau is one such sub-regional area (section 7 of the *LWRP*).
- 60 The policies and rules in the sub-regional sections apply instead of, or in addition to, policies or rules in the region-wide section. In the Hurunui-Waiiau case, Section 7 of the *LWRP* states that the objectives, policies and rules of the *LWRP* do not apply to the matters controlled by the Proposed Plan.
- 61 In that sense the Proposed Plan, while a stand alone plan, will effectively form a section of the *LWRP*.
- 62 Importantly Section 7 of the *LWRP* (the "place holder" for the Proposed Plan provisions) does note that:

The Hurunui-Waiau Zone Committee has developed a vision for the Zone that accommodates the values that underpin the CWMS. In order for the Zone Committee's vision to be realised, the following three outcomes were recognised as needing to be achieved:

- *A thriving natural environment, safeguarded by protecting important ecosystems and biodiversity and by implementing appropriate environmental flow regimes.*
- *Healthy water ways that provide abundant mahinga kai and recreational opportunities, with the health of hapua on the major rivers reflecting effective and responsible economic and natural resource management of the land and rivers that flow into them so that the mauri of the rivers is maintained and enhanced.*
- *A prospering zone, economically and socially, built largely on the basis of environmentally sustainable irrigated food and fibre production and tourism, with irrigation water supplied through an innovative combination of run-of-river takes and off mainstem- river storage, and managed by sustainable best practice audited self management programmes.*

Hurunui – Waiau Zone Implementation Programme and Land Use Water Quality project (LUWQ project)

- 63 The final relevant planning document is the Hurunui-Waiau ZIP. As noted above, ZIPs are being prepared under the CWMS to develop and recommend actions and approaches to implement the CWMS in particular water management zones.
- 64 The full recommendations made in the Hurunui-Waiau ZIP in respect of water quality outcomes are as follows:

Water quality outcomes for mainstem of Hurunui and Waiau Rivers:

- *Achieve in most years periphyton limits as identified in NRRP (that is, four years in every five);*
- *Safe for contact recreation;*
- *Maintain or enhance the mauri of the river;*
- *Toxin producing cyanobacteria shall not render the river unsuitable for recreation or animal drinking water;*
- *Nutrients (particularly nitrate and phosphorous) will decrease over time at a sufficient rate and to a level such that additional irrigation development can occur without compromising water quality outcomes for the river (i.e. reduce current loads to create "headroom" for new irrigation development).*

Water quality outcomes for tributaries of major rivers:

- *As above for mainstems, and;*
- *Achieve ecosystem health outcomes agreed for the particular tributary through a collaborative community based process.*

- 65 In terms of nutrient loads to the Hurunui River the Hurunui-Waiau ZIP recommends the following.

The goal for water quality in the Hurunui River at the SH1 bridge will be at or about the same or better standard as present, in terms of nitrate and phosphorus loads.

The Hurunui and Waiau River Plan will include targets for nitrate (N) and phosphorous (P) limits for the Hurunui River (mainstem) at Mandamus, State Highway 1 and the river mouth.

These limits must be implemented and applied in a way that results in the wide uptake of best practices without diminishing the viability of current land users.

This will require flexibility in the timing of their implementation where consequences arise that unreasonably impact on the wellbeing of the Hurunui community. This is not a get out of jail card for farmers but recognition of the need to provide reasonable time for change to occur in a manner that does not destroy existing economic value.

The load limits will be reviewed in five years.

- 66 It is also important to record that the Hurunui-Waiau ZIP also addresses water take issues comprehensively and specifically provides for water takes that would facilitate irrigation development (and hence land use change and intensification). The water quality and quantity recommendations are inter-related. The ZIP itself states that the recommendations are a package and cannot be cherry picked (Hurunui- Waiau ZIP, page 7).

- 67 There is no specific statutory obligation to take into account a ZIP in the preparation of a regional plan but part of the purpose of a ZIP is to inform the Regional Plan making process by including recommendations that have broad community support. In my view consideration should be given to the ZIP but that consideration should not be uncritical. In accordance with section 66(1) of the RMA provisions based on the ZIPs recommendations must still pass the Section 32 test.

UNDERSTANDING OF THE MANAGEMENT APPROACH

- 68 In accordance with the above 'unique-to-Canterbury' water planning policy framework, one of the distinguishing features of the Proposed Plan is the integration of *resource development* and *environment protection* objectives. That is, it has explicitly attempted to accommodate both growth and protection aspirations and identify and provide for "win win" outcomes wherever possible. That has not been the typical approach of regional plan development (which have historically tended to be agnostic on resource development opportunities). I support this new approach to water (and associated resource) planning. It offers the opportunity to provide greater certainty for resource users and communities and avoid future

decision making at the resource consent stage that is often uncertain and conflict-ridden.

- 69 The approach embedded within the Proposed Plan is consistent with the CWMS's sustainable resource use approach as discussed above. It is given effect to by the plan setting limits in such a way as to provide for land use change and intensification (enabling economic and social betterment) within limits set to safeguard the community's environmental, recreational and cultural values.
- 70 The Proposed Plan acknowledges (appropriately in my view) that:
- 70.1 Economic growth of North Canterbury is highly dependent on agriculture and horticulture activities, and that irrigation can enable these activities to produce more and therefore increase the gross domestic product of North Canterbury (Issue 1);
 - 70.2 *"If managed carefully additional abstraction and subsequent expansion of irrigated land area can be undertaken in a way which maintains and improves environmental, cultural and recreational values while providing the maximum benefit to water users"* (page 2); and
 - 70.3 Up to 100,000 ha in the Hurunui and Waiau Zone could be irrigated if reliable water could be sourced (page 2).
 - 70.4 Increasing the quantum of irrigated land in the Hurunui, Waiau and Jed catchments and adjacent catchments such as the Waipara is a key economic driver for North Canterbury.
- 71 Accordingly, the Proposed Plan sets up an objective, policy and rule framework to ensure that additional water can be abstracted to promote local and regional economic development while addressing the issues around sustaining environmental and cultural values. This includes provision for B Block and C Block water, which the Plan notes has been calculated as being sufficient (along with unused A Block water) to fully irrigate all potentially irrigable areas of the zone. Similarly, Map 3 shows areas of the Hurunui and Waiau catchments that have been identified as being suitable for development of water storage infrastructure (identified as "infrastructure development areas"). In short, the Proposed Plan expressly anticipates and provides for irrigation development to facilitate land use intensification (see, in particular, Objectives 3 and 6 and related provisions).
- 72 At the same time, the Proposed Plan seeks to manage the impacts of land use change enabled by irrigation. The basic approach, as contained in Policy 5.3 and Rules 10.1 to 11.2, is as follows:

- 72.1 To set nutrient limits on the mainstem of the Hurunui River at the 2005-2010 level (i.e. set an allocation limit for nitrogen and phosphorous at current levels).
- 72.2 To provide an adjustment period of 5 years to enable industry groupings to secure reductions in N and P losses from existing farms to free up "head room" for growth post 2017 (but allow for some land use change/intensification in the interim).
- 72.3 Post 2017 only allow for change in land use that results in an increase in N or P loss if there is "head room" below the 2005-2010 limit/cap.
- 72.4 To place incentives and responsibility for securing N and P reductions both pre and post 2017 on industry groups.

KEY ISSUES

Accuracy of nutrient policy settings for delivery of wider plan outcomes

- 73 A primary planning issue here is whether the basic approach to managing the potential effects on water quality posed by increased nutrients (outlined in paragraphs 72.1 to 72.4) realistically allows for the other aim of enabling irrigation development and land use change to capture economic and social benefit.
- 74 Imposing maximum nutrient loads through Policy 5.3 and Rules 10.1-11.2 of the Proposed Plan will curtail the ability for change in land use following irrigation development. From my reading of the Proposed Plan it is not clear to me whether the extent of that curtailment has been modelled and factored into the Proposed Plan such that the irrigation development and nutrient management approaches are integrated and aligned to achieve the objectives. I am aware, however, that the technical report Monaghan et al¹ suggested that existing dairy farmers could reduce N loss by 50% and that modelling presented to the Zone Committee as part of the LUWQ project indicated this would translate to approximately 25,000 ha of conversion to irrigated dairy use.
- 75 I further understand that the irrigation scheme resource consent application of the Hurunui Water project (as recently lodged with the Council) would provide for about 58,000 ha of irrigated land about half of which is proposed to be in the Hurunui-Waiau zone.
- 76 Evidence of Dr McCall, however, is that reductions are likely to be significantly less than the 50% suggested in the technical report of Monaghan et al. In fact Dr McCall suggests that 17% is a realistic reduction in N loss that can be expected from existing farms.

¹ Monaghan, R., Campbell, J., Thompson, B. and Glass, C. (2010). Modelling Assessments of N and P losses from Pastoral Farms in the Hurunui Case Study Area. AgResearch and DairyNZ. Presentation to LUWQ.

- 77 Ms Hayward states that a 17% reduction in N loss from existing farms would create "headroom" for around about 3,000 to 6,000 ha of dairy conversion.
- 78 It is not clear to me at the time of writing this evidence whether it would be viable to develop an irrigation scheme for 3,000 to 6,000 ha. That is for other submitters to determine. I merely observe that in planning terms, if the N load limits do not allow for conversion of a critical mass of land justifying the development of an irrigation scheme, then it may be that no scheme is developed. The conversion of further land to more intensive use is then reliant on much smaller irrigation schemes and/or use of spare capacity in existing irrigation schemes. This may mean that one of the key aims of the Proposed Plan will not be realised.
- 79 In other words, there is a careful balance of values and interests to be accommodated in the Proposed Plan. Unusually though, this may not be achieved by simple compromise at the margin. By that I mean "a little bit more" load allowance may not be sufficient to enable land use change that is dependent of irrigation schemes being developed. As I understand it, there is likely to be a critical threshold to be met before significant land use change aim can delivered.
- 80 On the basis of the evidence of Dr McCall and Ms Hayward, and Mr Norton for the Council, it is my understanding that the level of additional dairying that will be possible under currently proposed N loss settings will be well below the known potential irrigable land (and anticipated dairy convertible area) and well short of the design specifications of the proposed Hurunui Water Project Scheme (for example).
- 81 As proposed, the Proposed Plan is therefore likely to deliver one of three possible outcome scenarios:
- 81.1 Irrigation scheme(s) are not built because the critical mass of land able to be used for dairy is not available due to the N load limit; or
- 81.2 Irrigation scheme(s) are built on the assumption that sufficient headroom will be available – but that assumption proves to be false, effectively stranding the irrigation asset; or
- 81.3 Irrigation scheme(s) are built and land use change is enabled, however this occurs only because of pressure on existing farmers to adopt very high cost measures to reduce N loss (including potentially reducing stocking rates and production).
- 82 In my opinion, none of the above scenarios would represent good resource management practice and would be inconsistent with the

intent of the Hurunui-Waiau ZIP and the collaboratively agreed optimal catchment outcome.

Policy 5.3 and the Nitrogen Load Limit

83 The question then arises as to whether the Proposed Plan can be amended to enable a fourth scenario whereby the irrigation scheme is built, land use change enabled and Objective 5.1 continues to be met (which I agree must be achieved so as to give effect to the RPS).

84 That question requires an assessment of the technical evidence on the appropriateness of the nutrient limits. In particular, whether both N and P need to be limited to the extent proposed to achieve, in particular, the objectives of controlling “*periphyton growth that would adversely affect recreational, cultural and amenity values*” (Objective 5.1(c)) and ensuring “*aquatic species are protected from chronic nitrate toxicity effects*” (Objective 5.1(d)).

85 From the technical reports I have reviewed I note the following finding from a study of the middle Hurunui River catchment:

Analysis of the SIN/DRP ratios indicates that periphyton growth in the upper part of the middle catchment (SH7) is likely to be predominantly phosphorus-limited, but temporary switches to nitrogen-limited conditions cannot be excluded. Primarily due to nitrogen enrichment, the lower Hurunui River reaches appear to be phosphorus-limited. As a consequence, it is recommended that management emphasis be placed on reducing the DRP inputs to the system to reduce the occurrence of excessive periphyton growth.²

86 It is important to record the Dr Ausseil went on to point out that controlling just one nutrient has risk attached and that it is common for experts to recommend controlling both nutrients to manage that risk.³ Nevertheless, Dr Ausseil’s work shows (as I understand it) that periphyton growth in the Hurunui River at least is currently limited by an absence of phosphorus relative to nitrogen meaning that if phosphorous levels remain the same an increase in N load is unlikely to result in an increase in periphyton. Conversely if P levels increase we can expect periphyton cover to increase (whether or not N increases). Ms Hayward’s evidence confirms that the lower Hurunui is indeed P limited, rather than N limited.

87 This point seems to have been accepted by the Zone Committee. In the ZIP it notes:⁴

² Ausseil, O. (2010). Hurunui River – Influence of the Middle Reaches on Water Quality of the Lower Hurunui River (2005-2008). Environment Canterbury report No. R08/55.

³ I note here that Dr Norton made similar comments at Section 4 of his Section 42A report.

⁴ Page 35.

There has been a steady trend of increasing nitrate concentrations in the lower Hurunui River over the past 20 years and a pattern of increasing phosphorous concentrations up to around 2001 after which phosphorous concentrations reduced again. Correspondingly, the cover of filamentous algae (periphyton) was relatively high during summers of 2001- 2005 but has since decreased.

- 88 It is clearly beyond my expertise to comment on the validity of the findings of Dr Ausseil or to assess the risk (in the very technical sense) associated with focusing management control on P and relaxing control somewhat of N.
- 89 My understanding is that strictly managing one nutrient (as opposed to both) is a matter of some debate amongst experts but that the issue is really one of *risk management*. I take this to mean that managing just the limiting nutrient is an option but one that has risks. Before adopting such an approach those risks need to be carefully assessed.
- 90 I base the following planning analysis on the technical evidence of Ms Hayward. She suggests that the risks of increasing N load beyond the 2005-2010 level are low (but still need to be managed).
- 91 That being the case, Objective 5.2 could be achieved while providing for some level of land use change that involves increasing N load (provided the P load remains unchanged).

SECTION 32 EVALUATION

- 92 In my opinion, the management of N and or just P should be considered in the context of a Section 32 evaluation. That is, Policy 5.3 (b) (and associated rules) needs to be demonstrated as appropriate having regard to effectiveness and efficiency and costs and benefits as well as the risk of acting or not acting.
- 93 Effectiveness is measured as a function of the ability to achieve the objective. Efficiency is a measure of the net cost of the policy that will achieve the objective relative to alternatives.

Objectives 5.1 and 5.2

- 94 Before addressing Policy 5.3 and the nutrient limits, it is necessary to consider the water quality objectives of the Proposed Plan.
- 95 Objective 5.1 is a narrative freshwater outcome. Section 32 requires an evaluation of whether this is most appropriate way to achieve the purpose of the Act.
- 96 Several submitters including the Hurunui Waiau Zone Committee and Fish and Game propose to replace Policies 5.1 to 5.4 with policies that set out the numeric objectives that underpin the narrative objectives of Objective 5.1 and 5.2.

- 97 I do not support that proposal as I consider existing Policies 5.1 to 5.4 as drafted to be useful and appropriate policies (with some amendment⁵). I do, however accept the point that including the numeric objectives in the Proposed Plan can avoid debate during the implementation of the Proposed Plan. In that sense they would be appropriate ways of achieving the purpose of the Act.
- 98 For that reason, I propose including the provisions proposed by both the Hurunui Waiau Zone Committee and Fish and Game (with some amendment). I have done so in **Appendix 1**.

Policy 5.3

- 99 My opinion is that the case has not been made that controlling N at the levels proposed is an *effective* way to achieve the periphyton outcome (Objective 5.1 (c)). As discussed above, controlling the P load seems to be the critical response in that regard. Controlling N from land use will be effective in meeting the outcome of chronic nitrate toxicity effects (Objectives 5.1 (d) and 5.2). However on the basis of Ms Hayward's evidence the appropriate load to achieve that objective would seem to be well below the current load limit proposed in Schedule 1.
- 100 Of greater relevance is the question of policy *efficiency*. My review of the Council's Section 32 report (from page 52) indicates that the cost evaluation considered only the cost of changing farm practices/on-farm investment. The report does not appear to consider the cost of setting the N limit at the 2005-2010 level in terms of the foregone economic benefit associated with land use change. In my opinion, the Section 32 report therefore takes a very partial view and cannot be said to demonstrate efficiency (one way or the other).
- 101 Reference is made in the Section 32 report to the report "*Developing a Preferred Approach for Managing Cumulative Effects of Land Uses on Freshwater Quality*" (April 2011). That report (which I was subsequently asked by the Council and DairyNZ to edit) was divided into two separate reports for publishing by Environment Canterbury. The report that focused on the results of the Hurunui Case study were published as "*Nutrient Management in Hurunui: A Case Study in Identifying Options and Opportunities*"⁶. That report does include some assessment of the social and economic costs of different development scenarios (including a no irrigation/no change scenario). It clearly shows significant benefits at the farm level (in terms of cash farm surplus) and at the regional

⁵ I accept here the point made by Ms White in her Section 42A report that there is a circularity created by Policy 5.3 as, by definition, a land use consent is only required when the limits referred to in the policy cannot be met. Having regard to that policy in a consent context is therefore potentially problematic. While I do not think that problem is fatal to achieving the objectives of the plan I have suggested changes to the wording that ensure the policy focuses on providing a trigger for permitted activities rather than being determinative in the resource consent context.

⁶ Environment Canterbury, Report No. R11/114, ISBN 978-1-927195-43-7

level (in terms of contribution to regional GDP) from extensive irrigation and land use change. It also shows increased benefits in terms of population growth.⁷

- 102 In his evidence Mr Butcher suggests that dairying could generate \$39 million in output and 100 jobs per 1000 hectares (as opposed to \$4.3 million and 15 jobs from dryland sheep farming).
- 103 Mr Butcher further reports in his evidence that the total economic impact that might be expected from enabling 30,000ha of land to be converted to irrigated use could be up to \$600 million for the region and \$210 million for Hurunui District itself (based on a mixed use scenario). In employment terms, the number of new jobs could be 2400 for the region and 600 for the district.

The risk of acting or not acting

- 104 Counter-balancing the economic benefits to be gained from a planning regime that enables land use change, are the environmental costs, or in this case the risk of a greater extent/density of, more frequent, or longer duration periphyton growth.
- 105 This is important in the context of the requirement in Section 32 to consider the risk of acting or not acting when there is incomplete information.
- 106 Risk is, of course, generally defined as the product of the *probability* of something happening and *consequence* should it occur.
- 107 There is always incomplete information in natural resource management. We do not have a complete understanding of periphyton or of the effects of land use change. However, what we do know in this case, is that the lower Hurunui is P limited.
- 108 Table 1 below attempts to describe the risk associated with changing Policy 5.3 to increase the N load. It is based largely on the technical evidence of Ms Hayward.

⁷ See Figures 10 and 11, page 20 of the report.

Table 1- Risk Assessment

	Risk of agal blooms in receiving environment	Risk of periphyton growth in the river due to failure to control P	Risk associated with seasonal switch of limiting nutrient
Information availability	Poor	Good	Good
Probability	Low - due to well mixed and frequently flushed hapua zone and the high energy nature of the coastal receiving environment.	Low to moderate depending on the emphasis that new and existing land owners put on minimising P losses. <ul style="list-style-type: none"> • Critically the plan does provide a mechanism to halt land use change if the P levels rise above the Schedule 1 values; • good existing knowledge about P loss mechanisms, and measures that are needed to minimise P loss from farms; • additional controls can be implemented if failure occurs with short response times instream. 	Low - existing data does not indicate seasonal switches.
Consequence	Moderate - could affect mahinga kai, ecological and recreational/aesthetic values if algal blooms did start regularly developing.	High-Low-moderate - dependent on the extent of the inability to control P. (Short term effects that respond rapidly to management intervention.)	Low - Periphyton increase over short durations and infrequently.

109 Based on Table 1, the risk of periphyton growth is, according to the technical evidence available to me, generally low.

110 In Section 32 terms, in the face of incomplete information:

110.1 The risk of acting to maintain the N load in the Hurunui at 2005-2010 levels, even where P is known to be the nutrient limiting periphyton growth, is that there will be very limited ability for land use change and a possibility (as I understand it) that large scale irrigation (of the type provided for elsewhere in the Proposed Plan) may not be feasible.

110.2 The risk of not acting to maintain N load at 2005-2010 levels is that there is risk of increased periphyton growth but as suggested above that risk may be assessed (overall) as low.

111 On that basis I do not believe that Policy 5.3 (b) passes a reasonable Section 32 test and that a strong planning case exists for amendment to Policy 5.3 to modify the N load limit.

Consistency with the Hurunui-Waiiau Zone ZIP

112 That leaves the question of whether it is appropriate to make a decision that is not entirely consistent with the ZIP. On that issue I make just two points:

112.1 While there should be planning reluctance to depart from the recommendations developed through a collaborative multi-stakeholder process, I understand that the ZIP has no particular status under the RMA or under the Environment Canterbury (Temporary Commissioners and Improved Water Management) Act 2010; and

112.2 It is not clear to me that in preparing and agreeing the ZIP the Zone Committee was presented with information that enabled it to develop a view about the merits of an approach that focused on limiting P to current levels while relaxing somewhat the N load limit. My understanding is that while it considered a range of development scenarios the effects of these were modelled with the assumption that both N and P would increase commensurate with the areas being developed. Had the process modelled a "P constant, N increased" scenario it may well have reached a different conclusion.

113 I also note that the Hurunui Waiiau Zone Committee submission suggests an increase in N load from 693 to 770 tonnes (i.e. 11%) N per year and an increase in P load from 10.3 to 10.5 tonnes per year.

The appropriate alternative N load

114 If 693 tonnes of dissolved inorganic nitrogen (*DIN*) in the lower Hurunui mainstream is an unnecessarily conservative load, the question is what is a more appropriate load?

115 Clearly the load needs to be set at a level that protects against nitrate toxicity. In my opinion there is also a reasonable argument that the DIN load should not be set at such a level as to take all pressure off land users to minimise N loss and there remains an incentive for N to be used efficiently.

116 Ms Hayward's evidence suggests an increase from a concentration of 0.4 mg/L to between 0.5 to 0.6 mg/L (i.e. a 25% and 50% increase) is possible without risk of breaching nitrate toxicity trigger

values. I understand that this would equate to an increase in the area able to be converted to dairy, taking into account headroom created by a 17% reduction in N loss from existing farms, of 18,000 ha or 32,000 ha respectively.

- 117 To my mind the question of the appropriate load limit needs to be addressed in the context of risk mitigation and hence I express my planning view from paragraph 137 of this evidence.

Nitrate toxicity

- 118 I understand from the evidence of Ms Hayward that there has been an update of recommended nitrate toxicity thresholds by Dr Hickey, one of the two authors of the work on which the nitrate toxicity threshold of the Proposed Plan is based.
- 119 The net result of that work is that Dr Hickey has refined the recommended nitrate toxicity limits earlier recommended in Hickey and Martin (2009).
- 120 From a planning perspective, a key issue is the status of both the 2009 work (commissioned by Environment Canterbury) and the latest work by Dr Hickey.
- 121 My understanding is that neither piece of work has any "official" status. That is, they are not national standards or national guidelines. Although I understand the 2009 work has been used extensively throughout New Zealand (due to dissatisfaction with the 2002 ANZECC guideline values).
- 122 The 2000 ANZECC guideline includes a methodology and framework for setting and applying nitrate toxicity thresholds.⁸ This was used by Hickey and Martin for their 2009 advice to Environment Canterbury and has been used by Dr Hickey in his latest revision. As Ms Hayward noted, Dr Hickey's latest recommended threshold is based on a larger data set of toxicology study results than that available in 2009.
- 123 Many technical thresholds are subject to constant refinement based on improved information and methodology. As a result, and in the absence of specific legal status being accorded, it is always difficult (in planning terms) to know what technical advice to adopt.
- 124 As a matter of principle however, one needs to consider the source of the advice, the methodology used to develop it, the degree of peer review, and purpose for which the advice was prepared and context in which it will be used. On that basis, it seems to me that, based on the advice of Ms Hayward, Dr Hickey's latest toxicity threshold values are highly credible and should be the ones adopted in the Proposed Plan.

⁸ It also includes a toxicity limit (amended in 2002). I understand that limit is substantially higher than that proposed for the Hurunui Waiau.

- 125 It is important to record that Dr Hickey has proposed the toxicity threshold values based on the ANZECC methodological guideline. Similarly, the framework for how they ought be applied remains the same as previously applied. Ms Hayward continues to support use of the 99% level of species protection in the Hurunui main stem and 95% for the tributaries (as specified in the Proposed Plan). In my opinion, it would not be appropriate to argue for a lower level of protection given the extensive collaborative process used to derive these thresholds. However it is, in my opinion, appropriate to use the value to deliver that level of protection that is developed using the best, most recent, data.
- 126 I have reflected that opinion in my proposal for extended Objectives 5.1 and 5.2 (see **Attachment 1**).

RESIDUAL RISKS AND UNKNOWNNS

- 127 I think it is important to record that notwithstanding the risk assessment of Table 1 there may be relationships and consequences we do not have good knowledge of and accordingly, potential for unanticipated effects associated with increasing the N load in the Hurunui.
- 128 As acknowledged in the risk assessment, there is also risk that P is not controlled as required by Policy 5.3 of the Proposed Plan. That to me is the most obvious and most serious risk. However, as noted in Table 1, it seems to me that the risk is adequately managed post 2017 by a rule requiring the catchment P load to be complied with for land use change to be permitted. The real risk occurs over the pre 2017 period during which time land use change is allowed (in the absence of any rule to the contrary).
- 129 I am also aware through the Section 42A Report prepared by Mr Norton that reduced flows may lead to increased nutrient concentrations. Although that should not alter the ratio of N to P, I understand it would increase the P load and therefore increase risk of periphyton. As I understand it, while it is not an argument for not increasing the N load, it is an argument for ensuring tight control of P (and ideally achieving P reduction).
- 130 The other critical risk in this debate is the risk that there will not be the reductions in N from existing farmers that have been forecast.
- 131 In my opinion, it would be appropriate to factor in all these risks in the overall planning provisions if the N load is to be increased.
- 132 Three aspects of the planning regime could be refined to acknowledge and manage the risk:
- 132.1 The regime that applies to dissolved reactive phosphorus (*DRP*) pre-2017;

132.2 The approach to making available the DIN load so as to allow for an adaptive management to be taken;

132.3 The requirements associated with a system, agreement or plan as described in Schedule 2 of the Proposed Plan ("the Audited Self Management (ASM)" mechanism).

Managing risk of increased P in the pre 2017 period

- 133 There appears to me to be two approaches that could be taken to mitigate the risk of increased P loss pre 2017.
- 134 The first is to rely on the fact that there can be little land use change in the catchment without irrigation schemes being developed and that it will take a number of years before such schemes are in place enabling land use change. That fact coupled with the on-going work of Fonterra and DairyNZ to improve on farm environmental practices (as discussed in the evidence of Mr Hide and Mr Ryan for Fonterra and Dairy NZ respectively) means that the risk might be considered relatively low. Furthermore, there is evidence that community initiatives such as the Pahau Enhancement Group can work very effectively to reduce P loss. The regulatory "trick" is to create incentives to encourage these types of initiatives. In my opinion the Proposed Plan does that well.
- 135 An alternative planning approach to manage this risk would be to introduce an additional rule requiring (as of the date of decision of the Commissioners) that land use change only remains permitted provided the Schedule 1 P limit is not breached.
- 136 My preference is to take the first of these options for the reasons outlined in paragraph 134 and detailed further from paragraph 161. In particular, I note the point made by Ms White in her planning evidence (paragraph 482 b) that the water take and use rules provide a safeguard against water take and use development that would result in nutrient loads being exceeded. However, I accept that the second of these options needs to be kept "live" if evidence shows the assumption I have made about the ability for large-scale land use change without being subject to a water take consent under Rule 2.3 is incorrect.

Adaptive management approach

- 137 It is common in policy processes that deal with risk and uncertainty (but where an outcome is strongly desired) to adopt an *adaptive management* approach.
- 138 In the current context, and mindful of RPS Policy 7.3.12 which requires a precautionary approach, that might mean providing for an increased N load in stages allowing for the effects of each stage to be monitored and results confirmed as acceptable before releasing the next load.

139 That is, although the probability of adverse water quality outcomes from increasing N load limit is assessed as low, residual risk may be appropriately managed by releasing additional N load capacity in stages.

140 That would be an approach I would favour if the increase in N load is to be significant as proposed by Ms Hayward. On that basis I suggest that the N load may be increased 25% from that recommended by Ms White in her Section 42A report⁹, for the 2017-2022 period, to 963 tonnes. Provision should then be made to increase the load to 1155 tonnes (making a total increase of a further 25%) in 2022 if the periphyton outcomes are, as expected.

141 For the sake of administrative efficiency I propose that the Proposed Plan provide for the increase at 2022 and, if necessary, the values specified within Schedule 1 of the Plan be withdrawn by a plan change (using the First Schedule process) if monitoring finds that to be necessary to ensure the narrative and numeric objectives of the Proposed Plan can be achieved.

Clarity over a qualifying industry certification scheme etc

142 In the following section I use the term audited self-management scheme (*ASM*) to refer to the system, agreement or plan referred to in Rules 10.1 and 10.2 and Schedule 2 of the Proposed Plan.

143 I support the use of ASM schemes in the Proposed Plan. In my opinion, such schemes can provide an administratively efficient means of exercising control over the performance of multiple resources users who have some collective interest. Such schemes should be effective where:

143.1 There is some governing body with the ability to control and, if necessary, sanction scheme participants to ensure collective goals are achieved; and

143.2 There is some incentive on the governing body to establish and achieve goals.

144 At the outset, it is important to distinguish between two types of ASM. First, there are industry schemes that provide a goal and a range of services (extension, decision-making tools, advice etc) to industry participants in the interests of the industry as a whole. The Dairying and Clean Stream Accord is a good example. Many (but not all) of the programmes referred to by Mr Ryan and Mr Hide fall into that category. These tend to have collective goals but not necessarily consistent standards for individual participants. Accountability for scheme performance tends to rest with the governing body.

⁹ In the discussion Ms White appears to accept the submission of the Zone Committee that the N load should be increase at State Highway 1 to 770 tonnes. However, that change does not appear in Ms Whites amendment verison of the Plan Provisions in Appendix 2.

- 145 Second, are ASM schemes that involve property-specific obligations tailored to individual circumstances but which aim to achieve an outcome in the collective interest. These are distinguished from the first category of ASM by a greater level of individual accountability (for example, Supply Fonterra as discussed in Mr Hide's evidence). In other words, accountability for performance can be sheeted home to individual participants.
- 146 In my opinion, it is this second type of ASM scheme that is appropriate in the context of water quality management in Hurunui. The first type will of course be critical in providing the tools and support to make the more individualised ASM scheme work effectively. In essence that means that every farm should be subject to a farm plan that seeks to achieve good management practice taking into account the opportunities and limitations available to that particular property. I agree with the evidence of Dr McCall that such plans should be strongly focused on efficient use of nutrients and not simply on a standard list of required mitigations (beyond the very obvious ubiquitous measures such as stock exclusion).
- 147 I also agree with Dr McCall that there should be an expectation for existing dairy farms to operate such that they are, as he describes, "technically efficient" in terms of N loss. That will free up headroom for land use change. By the same token I consider it would make little sense for existing farmers to be forced into a position of going beyond the point of technical efficiency so as to allow other farms to establish at the cost of existing farmers. In my opinion that would not constitute sound resource management (as it would lead to underutilisation of existing investment) and would be inequitable.
- 148 For those reasons I support greater specification in Schedule 2 of the design and nature of ASM schemes. I have reviewed the suggested text of the Hurunui Waiau Zone Committee and concur that the suggested wording is preferable to that contained in the Proposed Plan.
- 149 I note also that Ms White appears to have accepted the Zone Committee wording with some amendment.
- 150 In my opinion it would be appropriate to use Schedule 2 as proposed by Ms White with the exception that reference be made to the schemes setting objectives that do not require N reductions from existing farms to free up headroom for new entrants beyond that point that represents the economic optima.
- 151 In that regard I propose the following amendment to section 1 c. of Appendix 2:

A statement of the outcomes sought in relation to minimising and mitigating the environmental effects of existing landuses on water quality within the Programme area, ensuring

existing landuses are encouraged to reduce nutrient waste and increase efficiency but not requiring them to reduce nutrient loads to unsustainable levels so as to create additional headroom for changes of use.

- 152 I also suggest some minor amendments as follows:
- 152.1 References to "whole farms" plans should be changed to "farm environment plans" to distinguish between plans that address farm business and production decisions;
- 152.2 Reference to best management practice be changed to good management practice (recognising that not everyone can be "best" and what is best will vary depending on circumstances); and
- 152.3 Greater emphasis and priority be placed on measures to minimise P loss to address the risks discussed earlier.

SPECIFIC ISSUES OF DETAIL

- 153 In addition to the primary planning issues outlined above there are a number of secondary planning issues requiring consideration and resolution. These are described below and including in my redraft of the Proposed Plan provided as **Attachment 1**.

Objective 5.1 - Measurability and clarity

- 154 As noted from paragraph 94, I consider that the measurability and clarity of Objective 5.1 could be improved by incorporating changes sought by both the Hurunui Waiau Zone Committee and Fish and Game.
- 155 The other issue with Objective 5.1 (as drafted) is that it implies that the outcomes (a) to (e) can be achieved through the management of nutrient concentrations. My understanding is that outcomes (a) to (e) are determined by a range of factors and not simply nutrient levels (including, for example, flow, flow variability, and sediment load, structures in and on the beds of rivers and lakes, and a wide range of other potential contaminants (e.g. microbial, metals and toxicants). Achievement of the outcomes listed is dependent on the integrated management of a range of risks.
- 156 As currently worded, Objective 5.1 rather unhelpfully perpetuates the erroneous view that water quality is solely determined by nutrients associated with land use. This issue can be easily resolved by amending the start of the objective to read as follows (or words to like effect):

Concentrations of nutrients entering the mainstems of the Hurunui, Waiau and Jed rivers are managed to (insofar as nutrient limitation can):

Objective 5.2 - Outcomes from community processes

- 157 I understand that the processes (such as the LUWQ) undertaken to date have not yet concluded setting nutrient limits for the tributaries of the Hurunui, Waiau and Jed rivers (and that, in accordance with Policy 5.4 nutrient limits will be progressively set for tributaries over time).
- 158 Accordingly, in contrast to Objective 5.1 (which deals with mainstem outcomes) Objective 5.2 (which addresses tributaries) does not include a comprehensive list of outcomes but instead records that nutrients concentrations in the tributaries are to be managed to meet "agreed community outcomes" (with bottom-lines set in terms of chronic toxicity and suitability for human consumption).
- 159 While I support that approach, I believe that there would be value in providing greater specificity about how the "agreed community outcomes" will be derived. In my opinion, that would improve transparency and public confidence in the plan.
- 160 That greater specificity could be achieved through a specification of a non-regulatory method. However the general scheme of the Proposed Plan does not include specification of such methods hence I propose instead the addition of the following footnote:

** Agreed community outcomes will be determined using a process that allows for a tributary by tributary assessment of values such that communities can make informed choices based on an understanding of the costs and benefits of nutrient limit options.*

Appropriateness of existing farms being permitted until 1 January 2017

- 161 Rule 10.1 provides for land uses existing as at 1 October 2011 to be permitted post 1 January 2017 provided they are within an audited self-management (ASM) scheme. No rule applies to land use prior to 1 January 2017 hence land use and land use change prior to that date is not regulated (by this rule).
- 162 In the context of the management framework proposed, that is, in my opinion, an appropriate approach. I say that for the following reasons:
- 162.1 Industries will need time to establish and fine tune appropriate ASM schemes.
- 162.2 Farmers/land managers need time to adjust to new expectations and to achieve the nutrient loss reductions that will enable further land use change.
- 162.3 Land use change/intensification will be controlled in a *de facto* sense through limits on water takes. (Rule 1.1 of Part 3 of the Proposed Plan limits permitted takes to a maximum of

100m³/day¹⁰ and Rule 2.3 makes other takes that enable land use change through irrigation a restricted discretionary activity with the matters of discretion including whether the nutrient limits in Schedule 1 will be exceeded).

162.4 The incentive created by the threshold that applies at 1 January 2017 means that industry groups will be motivated to manage existing farmers' N loss down over the 2012-2017 period to enable future growth.

162.5 The dairy industry does have a range of proven programmes and initiatives that will promote and in some cases require adoption of good management practices irrespective of what the Proposed Plan does or does not include.

Status of farms that establish post 2011 but prior to 2017

- 163 My understanding is that no existing use rights apply to land uses that become subject to a regional plan rule under Section 9(2) of the RMA. Hence once a rule regulating land uses is introduced by way of a regional plan, existing land use activities will need to be granted consent (or comply with the conditions of a PA rule, if such a rule applies) in order to continue to operate lawfully.
- 164 As currently worded, land uses established after 1 October 2011 are not captured by Rule 10.1 (as that rule only applies to land uses existing as at 1 October 2011). They do not appear to be captured by Rule 10.2 either since the "change" referred to must be post 1 January 2017. The same applies with Rules 11.1 and 11.2. In other words, the Plan seems to omit to address that class of farm that establishes after 1 October 2011 but before 1 January 2017. This means that post 1 January 2017 these farms will be unauthorised and their status unclear. It would appear that they would fall to be discretionary activities under section 87B of the RMA. In my opinion, that would be too onerous a category for an activity that established lawfully within just a few years of the rule taking effect.
- 165 The issue can be easily solved by simply deleting the words "as at 1 October 2011" from Rules 10.1 and 11.1 and prefixing the rule with the words "From 1 January 2017". The effect of this will be that when the rule takes effect in 2017 all land uses/farms existing at that time will either be permitted (subject to being part of an ASM scheme) or discretionary. That seems to be the intent of the regime in any event.¹¹

¹⁰ Although in practice the permitted allowance will often be significantly less than that.

¹¹ An alternative remedy would be to amend Rules 10.2 and 11.2 to clarify that the change in land use includes any change that occurs from 1 October 2011.

Load calculation

- 166 Post 2017 the key issue in the planning framework is whether the limit specified at the applicable downstream monitoring site is less than the Schedule 1 limit. The Schedule 1 limit is a load limit (tonnes/year) of DIN. I understand that this is measured by "back casting" from the in-stream DIN concentration (taking into account flow) to provide a tonnes per year number. It therefore is not a direct measure of the N being lost from land (which is subject to attenuation and lags etc) although there is a clear relationship between the two.
- 167 The definition of "Nitrogen Phosphate load" indicates that the load will be calculated on a yearly basis. Given the indirect relationship between N lost from diffuse sources and DIN, that seems to me an inappropriate approach to take. I note that the issue is discussed in Ms White's Section 42A report and I agree with her proposed solution. That is, "Nitrogen and Phosphorous load" should be redefined to focus on a 6 year rolling average rather than a single year measurement.

Consent status – Land use change pre 2017

- 168 At paragraph 546 of her Section 42A Report Ms White provides a wording change option that would essentially regulate changes to land use from the date the Proposed Plan is made operative rather than from 1 January 2017 as per the Proposed Plan. Ms White does not make a specific recommendation as to whether this formulation should be adopted.
- 169 The amendment would mean a land use change was only a permitted activity if:
- 169.1 There was capacity within the load limit (post 2017); and
- 169.2 The activity was part of an ASM scheme.
- 170 Given that there are currently no ASM schemes of the type now envisaged, the rule would effectively make any change in land use a discretionary activity.
- 171 If water was required for the use, consent would be required under two separate rules of the Plan.
- 172 I have addressed the issue of managing the P risk pre 2017 from paragraph 133. While those comments were directed specifically at P, they are relevant to both nutrients. In my opinion, whether there is a need to manage the risk of land use change pre 2017 through rules in the Proposed Plan depends largely on the likelihood of land use change occurring that does not fall to be regulated under the water take and use rules (because it is not reliant on new water). If that is a real risk then the proposal of Ms White does have some merit.

- 173 However, if the Hearing Panel did go down that path, in my opinion, it would be unreasonable to include the requirement for the land use to be subject to an ASM when no such scheme exists at this point.¹² It should be sufficient for the activity to fit within a load limit and I would suggest that this apply from the date the activity establishes, not 2017 as Ms White has suggested. Consistent with Policy 5.3 (b) the cap that should apply to changes of land use pre 2017 should be 120% of the load limit.
- 174 It seems to me that this is, again, an issue of risk management. I am not in a position to assess the risk of significant unregulated land use change pre 2017 and hence I do not offer a firm view on whether such an amendment is appropriate.

Consent status post 2017

- 175 Ms White supports an amendment to Rules 11.1 and 11.2 and the insertion of a new Rule 12.1. The effect of these amendments is to change the consent status post 2017 from discretionary to restricted discretionary activity (*RDA*) for both existing and new land uses that result in an increase of N or P. However there would be cap on the land use change that would qualify as RDA (125% of the load limit for N and 110 of the load limit for P). Rule 12.1 would make land use change that did not meet the RDA rule non-complying.
- 176 In my opinion, the result of the amendments proposed by Ms White (which reflect the views of a number of submitters that the discretionary category should be capped) is to create a reasonable expectation of acceptable N and P loss that is not dissimilar to that that would be delivered under the regime I have proposed. Albeit, under my proposal more change would occur through the permitted activity route (subject to ASM requirements) whereas under Ms White's proposal more change would need to go through the RDA consenting route (allowing binding conditions on nutrient loss performance and on-farm practice).
- 177 To my mind the two proposals are not additive (you could not adopt my permitted regime and Ms White's RDA/non complying regime). That would be too permissive. I do accept, however, that the regime put forward by Ms White is a feasible planning alternative to my own (in principle). It should have a similar development outcome albeit with greater consenting cost. For all the reasons set out in this evidence I prefer the regime I propose in Attachment 1 but I accept that Ms White's regime also has some merit (although there are some matters of detail that would require careful consideration).

¹² Any activity that establishes pre 2017 will, from 1 January 2017, need to comply with an ASM scheme in any event

CONCLUSIONS

- 178 The Proposed Hurunui Waiau River Regional Plan takes a novel approach to managing water resources. It is an approach that I fundamentally support given the helpful way it addresses the thorny issue of balancing Part 2 interests identified through the collaborative process of the Zone Committee and associated processes.
- 179 While there is little dispute about the water quality objectives of the Proposed Plan and the desire to create social and economic opportunities through land use change in the catchments of the Hurunui and Waiau Rivers, there are, in my opinion, changes that need to be made to ensure that these dual objectives can be delivered in an efficient and effective manner.
- 180 Much of the debate centres on how best to manage risk faced with some uncertainty.
- 181 My planning preference is to retain the planning framework as proposed, while making some changes to the allowable N load. Various aspects of the plan can and should be tightened to ensure N remains efficiently used and P is very carefully managed to minimise any increase in the lower Hurunui.
- 182 My proposed solution is to (a) adopt an adaptive management approach by releasing N load allowance in two tranches; and (b) increase obligations for those participating in ASM schemes around P management. I also note some amendments to rules would be possible if certain risks are found to be significant.
- 183 I acknowledge the planning proposal of Ms White and accept that they, with some amendment, may also be an appropriate response to risk, subject to some refinement.

ATTACHMENT 1

Provisions Proposed to be Amended

Objective 5.1

Concentrations of nutrients entering the mainstems of the Hurunui, Waiau and Jed rivers are managed to (insofar as nutrient limitation can):

- a) maintain and enhance the mauri of the waterbodies;
- b) protect naturally occurring biota including riverbed nesting birds, native fish, trout, and their associated feed supplies and habitat;
- c) control periphyton growth that would adversely affect recreational, cultural and amenity values;
- d) ensure aquatic species are protected from chronic nitrate toxicity effects; and,
- e) ensure concentrations of nitrogen do not result in water being unsuitable for human consumption

Objective 5.1a

Water quality in the mainstem of the Hurunui River complies with the following:

- a) Periphyton biomass of the mainstem of the lower Hurunui River (below Pahau River Confluence) do not exceed 120 mg/m² and 20% cover of filamentous algae in 4 years out of 5
- b) Nitrate nitrogen concentrations do not exceed the chronic nitrate toxicity threshold for 99% level of protection (annual median do not exceed 1.1mg/l and the annual 95% percentile do not exceed 2.0 mg/L)
- c) Average annual dissolved reactive phosphorus concentrations do not exceed the annual average (0.0044 mg P/L)

Objective 5.2

Concentrations of nutrient entering tributaries to the Hurunui, Waiau and Jed rivers are managed to meet agreed community outcomes¹ while ensuring they do not give rise to:

- a) chronic nitrate toxicity effects on sensitive aquatic species; and,
- b) water being unsuitable for human consumption.

¹ *Agreed community outcomes will be determined using a process that allows for a tributary by tributary assessment of values such that communities can make informed choices based on an understanding of the costs and benefits of nutrient limit options.*

Objective 5.2b

Water quality in the Pahau River, Waitohi River, Dry Stream and Waikari River tributaries of the Hurunui River complies with the following:

- a) Periphyton biomass do not exceed 200 mg/m² and 30% filamentous cover 4 out of 5 years.
- b) Nitrate nitrogen concentrations at the confluence with Hurunui River do not exceed the chronic nitrate toxicity threshold for 95% level of protection (annual median do not exceed 2.3 mg/l and the annual 95% percentile do not exceed 3.6 mg/L).

Policies 5.1 and 5.2 – No change proposed

Policy 5.3

To protect existing values, uses and the Mauri of the Hurunui River and its tributaries while also providing for future development in the catchment by **ensuring applying thresholds on diffuse nutrient discharging land use as permitted activities based on maintaining annual nutrient loads (as set out in Schedule 1) as follows. At the:**

- a) Mandamus flow recorder, ~~for the 2005-2010 levels of both Dissolved Inorganic Nitrogen and Dissolved Reactive Phosphorous, are maintained at 2005-2010 levels.~~
 - (i) **the 2005-2011** Dissolved Reactive Phosphorus level, is ~~maintained at 2005-2010 levels~~
 - (ii) **Prior to 2017, the 2005-2011** Dissolved Inorganic Nitrogen ~~prior to 2017 plus , does not increase more than 20% above 2005-2010 levels; and~~
 - (iii) **In the period 2017-2022,** the 2005-2010 Dissolved Inorganic Nitrogen ~~post 2017, is improved to 2005-2010 level plus 25%.~~
 - (iv) **Post 2022 the 2005-2011 Dissolved Inorganic Nitrogen plus 50%.**
- b) Statement Highway 1 flow recorder:

Policy 5.4 – No change

Rule 10.1

From 1 January 2017 aAny existing land use ~~as at 1 October 2011~~ in the Nutrient Management Area shown on Map 4, is a permitted activity provided that on or before 1 January 2017, one of the following is being implemented by the landowner or occupier:

- i An industry Certification System; or
- ii A Catchment Agreement; or
- iii An Irrigation Scheme Management Plan; or
- iv A Lifestyle Block Management Plan

Rule 11.1

From 1 January 2017 aAny existing land use ~~as at 1 October 2011~~ in the Nutrient Management Area shown on Map 4, which does not comply with Rule 10.1 is a discretionary activity.

Schedule 1: Catchment Nutrient Load Limits

Catchment	Monitoring site location	Nutrient Load Limits	
		Dissolved Inorganic Nitrogen (tonnes/year)	Dissolved Reactive Phosphorous (tonnes/year)
Hurunui Catchment	Mandamus flow recorder	40	3.6
	State Highway One flow recorder (2017-2022)	693 963	10.27
	State Highway One flow recorder (2022-)	1555	10.7

Definitions

Nitrogen and Phosphate load	The current year's level, in tonnes per year, of dissolved inorganic nitrogen and/or dissolved reactive phosphorus averaged over the last 6 years.
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Note: I also propose to include the changes to Schedule 2 of the proposed Plan as included in Ms Whites redline version wither the minor changes I propose in paragraph 150.