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:	**DairyNZ** *Submitter*
and:	**Canterbury Regional Council** *Local Authority*

Statement of evidence of **James Gregory Ryan** on behalf of DairyNZ

Dated: 12 October 2012

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STATEMENT OF EVIDENCE OF JAMES GREGORY RYAN

INTRODUCTION

1 My full name is James Gregory Ryan.

2 I hold a Master of Arts (First Class Honours) in Geography from the University of Canterbury which was conferred in 1996.

3 Since 2010, I have been employed by DairyNZ as the Regional Policy Manager. I am responsible for working with local government to help ensure that policies are developed that support the sustainability, profitability and competitiveness of dairy farming in New Zealand.

4 I represent DairyNZ on a range of industry groups including the Primary Sector Water Partnership which supports the sustainable use of freshwater resources in the primary sector.

5 In Canterbury I have been a member of the Policy Advisory Group established by Environment Canterbury to support the development and implementation of the Proposed Canterbury Land and Water Regional Plan. I have been involved in the Land Use and Water Quality project (LUWQ) that was used to inform development of the Proposed Hurunui and Waiau River Regional Plan (*the Proposed Plan*). As co-ordinator for dairy sector representatives, I am also closely involved in the freshwater limit setting process for the Selwyn Waihora catchment.

6 I have extensive policy and planning experience obtained both overseas and in New Zealand including at Environment Canterbury, Christchurch City Council and the former Auckland Regional Council.

7 I am an affiliate of the New Zealand Institute of Primary Industry Management.

8 I am a Project Management Professional and a member of the Project Management Institute.

9 I am familiar with the Proposed Plan to which these proceedings relate.

10 I am authorised by DairyNZ to provide this evidence on its behalf.

11 I am presenting this evidence on behalf of Fonterra and DairyNZ. Given the alignment of interests between Fonterra and DairyNZ in relation to the Proposed Plan the two organisations have elected to present a joint case before the Hearings Commissioners.

12 I am not offering evidence as an expert witness. However, given my work for DairyNZ and previous employers, I have relevant experience in policy and planning matters.

SCOPE OF EVIDENCE

13 My evidence will deal with the following:

13.1 DairyNZ's background interest in the Proposed Plan and its submissions;

13.2 The nature, scale and distribution of dairy farming in the Canterbury region and the Hurunui catchment;

13.3 Dairy industry sustainable farming initiatives;

13.4 Trends and changes anticipated based on those industry initiatives; and

13.5 How "audited self management" schemes ought to work.

SUMMARY OF EVIDENCE

14 The focus of DairyNZ's submission is on water quality, particularly as it relates to the Hurunui River catchment.

15 DairyNZ has made a significant contribution to the development of the Proposed Plan. We strongly support the collaborative process that has been adopted. Stakeholders have placed significant trust and confidence in agricultural industries and individual farmers to drive water quality improvements, with appropriate regulatory support. We are also supportive of the underlying approach to enable additional irrigation to support community outcomes.

16 My personal view is that the Canterbury community has done itself a significant service by adapting to the region's substantial freshwater management challenges, which are highly complex and involve diverse competing interests, in a pragmatic, integrated and collective way. I would hope that the collaborative approach to sustainable water management is taken up as a useful precedent in other parts of the country.

17 DairyNZ largely considers that the Proposed Plan reflects the collaborative desires and aspirations of the many stakeholders involved in the process to date.

18 Inevitably, a few issues were not resolved through the collaborative process, particularly around mechanisms to achieve appropriate nitrogen management and expectations of what existing farmers can do to create headroom for new development. DairyNZ therefore primarily seeks some refinements to the Proposed Plan relating to

these areas. Based on our technical advice, we consider there are alternative ways to manage nutrients effectively. This can be done in a way which allows the balanced outcomes sought by the community to be achieved, but without placing unrealistic pressure on existing farmers to reduce their current outputs.

19 More specifically, DairyNZ considers that the proposed limit for Dissolved Inorganic Nitrogen (*DIN*) for the catchment can be increased. This will enable growth to occur allowing the community's social and economic and environmental outcomes to be achieved.

20 DairyNZ considers, supported by its technical experts, that the following instream nutrient load limits for the Hurunui River at SH1 are sustainable water quality limits:

20.1 1,155 tonnes of dissolved inorganic nitrogen (*N*) (representing a 50% increase of current loads), or 963 tonnes if the N load is increased by 25% of the current loads), and

20.2 10.7 tonnes of dissolved reactive phosphorus (*P*).

21 We believe these limits enable approximately 32,000 hectares (or 18,600 hectares if the N load is allowed to increase by 25%) of additional land to be irrigated in the catchment that provides for the social, economic and environmental outcomes sought by the community.

22 While DairyNZ considers there are good technical reasons to support some improvements to the Proposed Plan, it remains committed to working with Environment Canterbury, the Hurunui Waiau Zone Committee and other stakeholders to support the implementation of the Canterbury Water Management Strategy.

23 DairyNZ will also continue to work closely with dairy farmers to drive adoption of sustainable farming practices.

DAIRYNZ'S INTEREST IN THE PROPOSED PLAN

24 DairyNZ is an industry organisation which represents New Zealand's dairy farmers. It is funded by a farmer levy on milk solids and through partnering with government investment. DairyNZ's purpose is to:

> *"secure and enhance the profitability, sustainability and competitiveness of New Zealand dairy farming. We deliver value to farmers through leadership, influencing, investing and partnering with other organisations and through our own strategic capability. Our work includes research and development to create practical on-farm tools, leading on-farm adoption of best practice farming, promoting careers in*

dairying and advocating for farmers with central and regional government[1]*.*

25 A key focus for the organisation is to carry out research to support good management practices across a wide range of areas that affect dairy farming businesses including animal welfare, staff management, stockmanship, feed management and nutrient management. DairyNZ has approximately 250 staff, of which 20 are based in Canterbury.

26 DairyNZ has an interest in the Proposed Plan as it will have a direct impact on dairy farmers in the Hurunui and Waiau catchments.

27 The Proposed Plan has evolved out of a lengthy collaborative process derived partly from the LUWQ project, which was established to develop a preferred approach for managing the cumulative effects of land use on water quality in Canterbury.

28 The LUWQ project was a collaborative project between Environment Canterbury, DairyNZ and other primary sector and non-governmental organisations. The primary objective of the LUWQ project was:

> *"To develop an approach to manage cumulative nutrient (N and P) loads while recognising the spin-off benefits for managing micro-organisms and sediments"*[2].

29 The LUWQ project was undertaken through a case study approach in the Hurunui catchment. This approach provided the opportunity to develop a common understanding of the resource management issues, to test possible management options with stakeholders and to evaluate various land use scenarios against a range of environmental (including water quality indicators), social and economic objectives. This was conducted through various consultation forums including a series of catchment workshops.

30 DairyNZ recognises that there is significant potential for increased farming activity in the Hurunui catchment including additional dairy farming. Further land use development is, however, dependent upon a complex range of issues being resolved including investment, infrastructure, farming practices, industry initiatives and policy and planning matters.

31 The dairy sector recognises the need for freshwater limits. As a result, DairyNZ invested significantly in the LUWQ project including staff resourcing and substantial funding for water quality science, farm systems research as well as the community engagement process. DairyNZ's motivation for investing in the LUWQ project

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1 DairyNZ 2012. DairyNZ Annual Report 2011/12

2 Environment Canterbury 2012. The preferred approach for managing the cumulative effects of land use on water quality in the Canterbury region (prepared under the direction and guidance of the LUWQ Governance Group)

was to ensure that a robust process was developed based upon science and community deliberation that could be used to inform limit setting processes throughout Canterbury. This process has subsequently been used by the Land and Water Forum to inform its recommendations to Government on limit setting. Additionally, other regional councils have taken an active interest in the project to guide them as they implement the National Policy Statement on Freshwater Management 2011.

32 DairyNZ views the LUWQ project as a success and remains firmly committed to working in partnership with Environment Canterbury, zone committees and other stakeholders to ensure that the lessons learnt from the process are shared and applied in other catchments.

33 One of the key insights from the project for DairyNZ was that in order to ensure balanced outcomes are achieved it is essential that trade-offs are accounted for in the limit setting process. In particular, in order to maximise community wellbeing decision-makers need to account for the social, cultural, economic and environmental consequences of setting freshwater limits before they are set in a statutory plan.

DairyNZ's submissions on the Proposed Plan

34 DairyNZ lodged a submission on the Proposed Plan on 2 December 2011, and made further submissions on 27 February 2012.

35 Generally, DairyNZ supports the overall approach of the Proposed Plan but has identified a small number of outstanding issues that need to be resolved in order to achieve the outcomes anticipated and to provide resource users with greater certainty. In particular, some existing farm businesses are concerned that increased land use development in the catchment could place pressure upon them to reduce their nutrient footprint to the extent that it could undermine their ongoing business viability. We note that regulatory certainty is essential if resource users are to have the confidence required to continue to invest in infrastructure upgrades and good management practices.

36 It is DairyNZ's view that a few outstanding issues have not been adequately resolved partly because of the pressure of time placed on Environment Canterbury to notify the Proposed Plan ahead of the moratoria for the Hurunui and Waiau rivers lapsing in October 2011. The fact that some of these issues were not resolved before the Proposed Plan was notified is not a criticism by DairyNZ of the collaborative process or those involved in the processes informing the Proposed Plan's development. The outstanding issues arise largely as a function of circumstances.

37 Furthermore, it needs to be acknowledged that the range of the issues identified by the LUWQ project presented all parties involved with some difficult challenges to resolve. In particular, the

complexities of managing the effects of land use on water quality are acknowledged in the LUWQ report[3], the Zone Implementation Programme, as well as the Proposed Plan.

38 One of the key outstanding issues that DairyNZ's submission identified was the need for the Proposed Plan to focus upon measureable objectives and the management of environmental effects rather than simply the management of nutrient loads. In DairyNZ's view, the Proposed Plan is overly focused on the management of nutrient loads, without sufficient understanding of how the community's broader wellbeing will be achieved including social and economic factors. For example, there remains significant uncertainty regarding how much new land can be irrigated in order to meet social and economic objectives while achieving environmental objectives. This issue is explored more fully by Dr McCall, Ms Hayward and Mr Butcher.

39 As a particular example of this, DairyNZ notes that the Proposed Plan sets a nutrient load limit for the Hurunui River at its current load.[4] Although there is scientific debate on the limit's relationship to water quality, my sense is that it was set as a pragmatic limit based on a key objective arising from the LUWQ project and the development of the Zone Implementation Programme that the existing instream values within the river should be maintained in their current condition or improved, which is broadly articulated as maintaining current water quality. For reasons explained by Ms Hayward, instream values can be maintained at the same time as increasing the nitrogen limit.

40 At the present time, the nutrient limit effectively means that the Hurunui catchment is fully allocated in relation to nutrient loads. Although DairyNZ notes that the Proposed Plan does allow for growth above the limits set by 20% prior to 2017.

41 Given the Hurunui catchment includes significant areas of potentially irrigable land, DairyNZ seeks that an alternative N limit be set which meets social and economic outcomes while maintaining environmental outcomes. This relies on appropriate measures being in place that are discussed further in the evidence of Ms Hayward, Mr Hide, Mr Willis and Dr McCall.

42 Furthermore, DairyNZ's submission identified the need to ensure adequate focus is placed on managing P, based on our understanding that it is the nutrient most limiting periphyton growth. The submission identified the need to re-evaluate the nitrogen load limit or accept that it is not realistic to irrigate as much land as anticipated by the Zone Implementation Programme.

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3 Ibid.

4 See Rule 10.2 and Schedule 1 of the Proposed Plan.

EXISTING DAIRY FARMING IN THE HURUNUI CATCHMENT

Characteristics of dairy farming in the Canterbury Region

43 Canterbury produces approximately 17% of the milk solids produced in New Zealand and 45% of the milk solids produced in the South Island[5]. Although dairying accounts for a very low proportion of total land use in the South Island, there has been significant growth of dairy farming in Canterbury over the last ten to twenty years.

44 Unlike some other regions with higher rainfall, dairy farming in Canterbury is reliant on irrigation. Subject to the availability of irrigated land, and the ability of farmers to manage to water quality limits, there remains significant growth potential for dairy farming in the region.

45 The Canterbury Region accounts for a higher level of dairy production per hectare compared with the rest of New Zealand. An average dairy farm in Canterbury produces 1,215 kg milk solids per hectare compared to the national average of 923 kg milk solids. This equates to an annual average of 372 kg milk solids production per cow compared to the national average of 334 kg milk solids production per cow[6].

46 These characteristics of dairy farming in Canterbury are partly a function of the region's dependence on irrigation that provides much more reliable supply of pasture unlike some rain-fed blocks in other parts of the country. In this respect, irrigation enables farmers to grow and utilise pasture efficiently and support relatively high levels of production. Additionally, the recent growth of dairy farming in the region has been associated with relatively high levels of uptake of technological innovations compared to some smaller more traditional family-owned dairy farms in other parts of the country.

47 However, the recent development of dairy farming in Canterbury is also associated with relatively high levels of debt. This concept of indebtedness has implications for the ability of farmers to service interest commitments and afford mitigations to create headroom for development. This issue is discussed further by Dr McCall.

Characteristics of farming in the Hurunui catchment

48 The Hurunui catchment comprises approximately 200,000 hectares.

49 Land use in the Hurunui catchment is dominated by sheep and beef farming (approximately 50% of the catchment) with dairy farming the third largest farm enterprise comprising approximately 15,000ha (including the dairy platform and support land for dairy grazing). The catchment includes a variety of other land uses including

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5 Livestock Improvement Corporation and DairyNZ 2011.

6 Ibid.

forestry, cropping and pig farming[7]. A map of the catchment showing its current land use is included in Appendix 1.

Characteristics of dairy farming in Hurunui catchment

50 The Hurunui District has the highest average production per herd (329,745 kg of milksolids) and the highest recorded production per cow (384 kg of milksolids) in the country, and accounts for approximately 8% of the milk solids produced in Canterbury[8].

51 As part of the development of a new initiative to improve nutrient management, DairyNZ has worked closely with Fonterra to trial the development of audited nutrient management which is described in more detail below. As a result, DairyNZ has obtained data from dairy farms in the Hurunui catchment that provides detailed information on farmers' current nutrient management practices. This information highlights that compared to the national average, dairy farmers in the Hurunui catchment tend to have comparatively low levels of nutrient loss and high levels of nitrogen conversion efficiency. Mr Hide and Dr McCall address these results in more detail.

52 In addition to their economic contribution, dairy farmers and their families make a significant contribution to the catchment's social wellbeing including through support for the local schools and community facilities. The growth of dairy farming in the district has also helped arrest rural depopulation, supported increased employment opportunities, helped ensure that local shops and services are sustained and supported community vitality[9].

53 Further details on dairy farming in the Hurunui catchment are addressed by the evidence of Mr Hide and Dr McCall.

Potential for further growth of dairying in the Hurunui catchment

54 The Proposed Plan recognises that, through additional irrigation, there is significant potential for increased agricultural output, including from dairy farming, in the Hurunui catchment.

55 Currently there is approximately 22,000ha of land irrigated in the catchment with the potential to irrigate a total of 54,000ha (another 32,000ha) providing adequate irrigation water is supplied and freshwater limits met.

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7 Environment Canterbury 2011. Nutrient Management in Hurunui: A Case Study in Identifying Options and Opportunities.

8 Livestock Improvement Corporation and DairyNZ; New Zealand Dairy Statistics 2010 – 2011; 2011.

9 Taylor N, McClintock W, & McCrostie H. 2003 Assessing the social impacts of irrigation - a framework based on New Zealand cases.

56 The LUWQ project assumed that with additional irrigation, dairying could increase significantly in the catchment and thereby support increased agricultural activity that would enhance the community's social and economic wellbeing.

57 Although dairy farming accounts for less than 5% of land in the catchment it accounts for approximately 50% of economic output. The social and economic significance of dairying to the Hurunui district is acknowledged in the Zone Implementation Programme (p 67 - 68):

> *"the area of the Hurunui Basin above State Highway 1 contributes more than $80 million to the District and more than $120 million to Canterbury. The economic contribution is primarily from dairying and from irrigated land. The above study indicated that irrigated land, which is 8% of the Hurunui Basin study area, produces 65-73% of the economic and employment contribution. Dairy land, at 4% of the study area, produces approximately half of the revenue, cash farm surplus and GDP. Dairy is associated with half of the direct and indirect employment.*
>
> *Dairying has a significantly wider economic impact than tourism. The dairy industry (including farming and manufacturing of dairy products) earns revenues per employee of more than $500,000 while tourism delivers revenue per employee of $77,000.*
>
> *Irrigated land use has changed in the last decade with conversion to dairying. In the Amuri Irrigation Company (AIC), which irrigates 20,000 hectares, less than 10% of the irrigated area was in dairy farms in 1990; now dairying is 60% of the irrigated area with an additional 25% of the area in dairy support.*
>
> *Provision of reliable water for irrigation is a key driver of economic development in the Zone. It is estimated that 30,000ha of new irrigation, as proposed by Hurunui Water Project, would increase GDP by at least $100 million (and significantly more if substantial dairy conversion occurs)."*

58 Therefore it is important that the Proposed Plan recognises the economic significance of dairying to the area, and its potential to further enhance the district's social and economic wellbeing. Mr Butcher and Dr McCall address these issues in more detail in their evidence.

CURRENT DAIRY SECTOR INITIATIVES

59 DairyNZ recognises that the dairy sector needs to continue to improve management of its environmental footprint. The dairy sector has substantially increased the level of investment it is making in a comprehensive range of programmes that will help achieve the social, economic, environmental and cultural outcomes anticipated by the Proposed Plan.

60 The dairy industry has recently been successful in obtaining significant government investment through the Primary Growth Partnership to further drive efficiency and sustainability gains in farm systems. When combined with funding provided through the farmer levy, DairyNZ is in a position to invest in programmes that will lead to improvements in nutrient management on Canterbury's dairy farms.

61 Although many of the initiatives that the dairy sector is investing in are being implemented across the country, DairyNZ has made a particular commitment to Environment Canterbury and the Hurunui Waiau Zone Committee to implement a number of specific actions in the Hurunui catchment. A number of these commitments, such as supporting the development of audited self management and the uptake of good nutrient management practices, are acknowledged in the Zone Implementation Programme. It is expected that these commitments will form part of a local partnership agreement that is overseen by the Hurunui Waiau Zone Committee.

62 A number of the key dairy sector sustainability initiatives are summarised below. In addition, Mr Hide discusses a range of Fonterra sustainability initiatives in his evidence.

Research

63 DairyNZ is involved in a range of research programmes including Pastoral 21 which is a collaborative venture between DairyNZ, Fonterra, Dairy Companies Association of New Zealand, Beef & Lamb and the Ministry of Science & Innovation. The aim of Pastoral 21 is to:

> *By 2016, deliver profitable, low-risk, new, simple, adoption-ready dairy production systems that increase production by 20% while reducing nutrient loss to the environment by 30%.*

64 A significant part of the research is being tested on dairy farms in Canterbury. As results from the initial season of reporting are still being analysed, it remains to be seen whether the project aim can be achieved across a range of farm types.

Sustainable Dairying: Water Accord

65 In 2003 Fonterra led development of the Dairying and Clean Streams Accord (*the Accord*). The Accord has played an important role in increasing farmer understanding of the importance of environmental issues in farm decision making and improving the industry's environmental performance. As many of the initiatives in the Accord have been delivered it is now being reviewed and a replacement developed. Mr Hide summarises some of the environmental improvements achieved under the current Accord in his evidence.

66 DairyNZ is currently leading development of a new Sustainable Dairying: Water Accord. This new accord will set a range of targets to manage the effects of dairying on water quality. This includes the establishment of good management practices expected of all dairy farmers in New Zealand, not just Fonterra suppliers. The new accord will identify expectations and commitments across a range of areas including nutrient management, effluent management, water use management, stock exclusion, riparian management and best practice standards for new conversions. In order to take account of increased community expectations of dairy sector's environmental performance, the new Accord has been developed in conjunction with a range of representatives from iwi, local government and environmental non-government organisations. The new Accord will be finalised by the end of 2012.

67 The new Accord will help to achieve the objectives of the Proposed Plan by continuing to build farmer awareness and understanding of good management practices such as stock exclusion and nutrient management. Though monitoring, evaluation and independent audit, the accord will help to identify opportunities for farmers to continue to make improvements in farming practices.

Nutrient management programme

68 Through the Primary Growth Partnership[10], the dairy sector (including DairyNZ, Fonterra and other partners) has entered an agreement with Government to invest $170 million to lead transformation within the dairy value chain through new investment in people, capability and knowledge. A key component of the programme involves reducing the environmental footprint of the industry whilst increasing efficiency as well as improving agricultural education to assist in achieving this. Part of this investment includes a comprehensive nutrient management programme that will help farmers to improve nutrient use efficiency and reduce nutrient losses including assisting them to meet regulatory requirements

[10] The Primary Growth Partnership is a government-industry initiative to invest in research and innovation to boost the economic growth and sustainability of New Zealand's primary, forestry and food sectors. The scheme focuses on boosting productivity through investment in innovation and delivering long term economic growth and sustainability across the primary sectors, from producer to consumer.

expected of them as a result of the development of freshwater limits.

69 A key component of the Hurunui Waiau Zone Implementation Programme 2011 (p40) is the need to:

> *"Urgently develop a plan for implementing improved nutrient management in Hurunui Basin. This plan must identify roles, responsibilities and timetable, including incentives for uptake and resourcing to facilitate and support the tributary and farmer-based approach. The direct involvement and leadership by community based land user groups will be critical to this approach being successful".*

70 In this respect, DairyNZ's nutrient management programme will play an important role in supporting delivery of the Zone Implementation Programme. Indeed, DairyNZ is recognised in the Zone Implementation Programme as a key player to support improved nutrient management in the Hurunui catchment.

Nutrient management indicators

71 As part of the nutrient management programme, regional nutrient management indicators have been developed to help farmers identify opportunities to become more productive and profitable through improvements in nutrient use efficiency. The programme also seeks to raise awareness amongst farmers of their farm's nutrient footprint and to identify opportunities to reduce nitrogen and phosphorus losses from their system.

72 This programme recognises and addresses the different stages needed in behavioural change processes, from raising awareness to education and tool provision that enable positive actions and choices. This work is actively supported by fertiliser companies and milk supply companies.

73 The indicator of nutrient use efficiency is:

73.1 Nitrogen conversion efficiency: an indication of a farm's efficiency at converting external nitrogen inputs such as supplementary feed and fertiliser into nitrogen in products such as milk and meat.

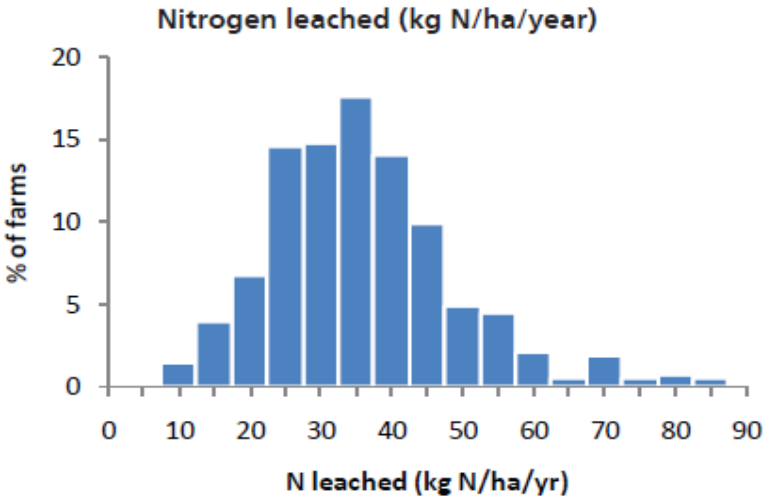
74 The indicators of nutrient loss are:

74.1 Nitrogen leaching (kgs N/per ha/year): an estimate of the nitrogen lost (leached) in drainage water below the plant's root system.

74.2 Phosphorus run-off (kg P/per ha/year): an estimate of the amount of phosphorus lost from the farm system via surface runoff.

75 Figure 1 shows nitrogen loss figures based on data from 426 dairy farms in Canterbury (derived using OVERSEER 5.4) for the 2010/11 season.

Figure 1 Canterbury dairy farms - distribution for nitrogen leaching 2010/11



76 The indicators are also being used to encourage farmers to seek information and professional advice on practices and actions that can influence how efficient they are at using nutrients and how they can reduce nutrient losses from their farm system.

77 The development of nutrient management indicators will help to achieve the objectives of the Proposed Plan by building farmer awareness, understanding and uptake of good nutrient management practices.

Audited Nutrient Management

78 Another key element of the nutrient management programme is the Audited Nutrient Management project. This project aims to create a set of protocols for the collection, analysis and audit of farm data that will enable milk supply companies to measure and monitor the efficiency with which nitrogen is utilised on dairy farms. A key feature of the project is that it provides farmers with actual results at year end (based on OVERSEER), as opposed to predictive nutrient budgets that have been predominantly used in the past.

79 The dairy sector recognises that, in many cases, management of P will be the critical factor for farmers to focus on to ensure environmental outcomes are achieved. Nevertheless, the Audited Nutrient Management project will help farmers to make more informed and effective management decisions around nitrogen use, as well as provide the industry with the ability to demonstrate achievements to the wider community. Dairy sector initiatives to

manage P are being delivered through a range of projects including the new accord, ongoing farmer education and milk supply company initiatives such as Supply Fonterra. This is discussed in more detail by Mr Hide.

80 The development of the Audited Nutrient Management project was based on a trial project in three catchments throughout New Zealand including Mangatainoka, Upper Waikato and the Hurunui. Part of the reasons the Hurunui catchment was selected to trial the development of Audited Nutrient Management project was to provide insights into the LUWQ project.

81 As a result, farmers in the Hurunui catchment are well placed to take advantage of the insights that the programme provides for farm decision-making. These insights include a better understanding of nitrogen management and options for reducing nitrogen losses such as improved fertiliser application and winter grazing practices.

82 The Audited Nutrient Management project provides:

82.1 Information to the farmer about their nitrogen use efficiency and/or losses, and how they compare with other, similar farming systems.

82.2 Improved input information to guide farmers in developing their nutrient management plans.

82.3 A tool to enable milk supply companies to apply a driver for change in behaviour around nitrogen management.

82.4 Ability for the industry to demonstrate increasing efficiency over time.

83 Milk supply companies may use the system to employ a range of tools to drive improved nutrient management practices, such as:

83.1 Support mechanisms to assist those with low nitrogen conversion efficiency and/or high leaching rates.

83.2 Incentives or rewards to those with high nitrogen conversion efficiency and/or low leaching rates.

83.3 Minimum standards that must be achieved as a condition of supply.

84 Fonterra have fully committed to supporting the Audited Nutrient Management project and it is now being implemented with all of its suppliers nationwide. A range of other milk supply companies are now also considering implementing the project. Mr Hide describes

the development of the Audited Nutrient Management in the Hurunui catchment in more detail.

Building industry capability in nutrient management

85 The other key element of the dairy sector's nutrient management programme is a joint dairy and fertiliser industry plan for building the capability of farmers and farm advisors to manage nutrients. The purpose of this initiative is to ensure that when dairy farmers are referred to nutrient management advisors, these advisors have met defined standards of minimum knowledge, training and certification.

86 This initiative will increase the number of capable advisors that can work with farmers to improve their nutrient use efficiency and reduce nutrient losses.

87 A scheme is also being developed to certify nutrient management advisors and audit their performance over time. This scheme will be completed at the end of 2012 and it will become the principle measure for nutrient management advisors with the certification requirement built into industry good practice through the Code of Practice for Nutrient Management.

88 By building industry capability in nutrient management, the programme will help to achieve the objectives of the Proposed Plan by increasing the number of capable nutrient management advisors.

Effluent management

89 The dairy industry is involved in a range of programmes to increase effluent management, including through the recent development of the Farm Dairy Effluent Design Code of Practice and Design Standards. The first round of companies, including a range of companies that provide services to farmers in the Hurunui catchment, has now passed through the associated effluent system design accreditation programme. This programme will help continue to improve standards with respect to effluent system design and management.

90 Other effluent management initiatives that DairyNZ has recently led include the development of an Institution of Professional Engineers New Zealand (IPENZ) practice note for the design of effluent storage ponds released in October 2011. Associated with this programme is a training course on the design and construction of effluent storage ponds which DairyNZ has developed in partnership with Infratrain. DairyNZ has also partnered with Massey University to develop a course on the design of effluent systems.

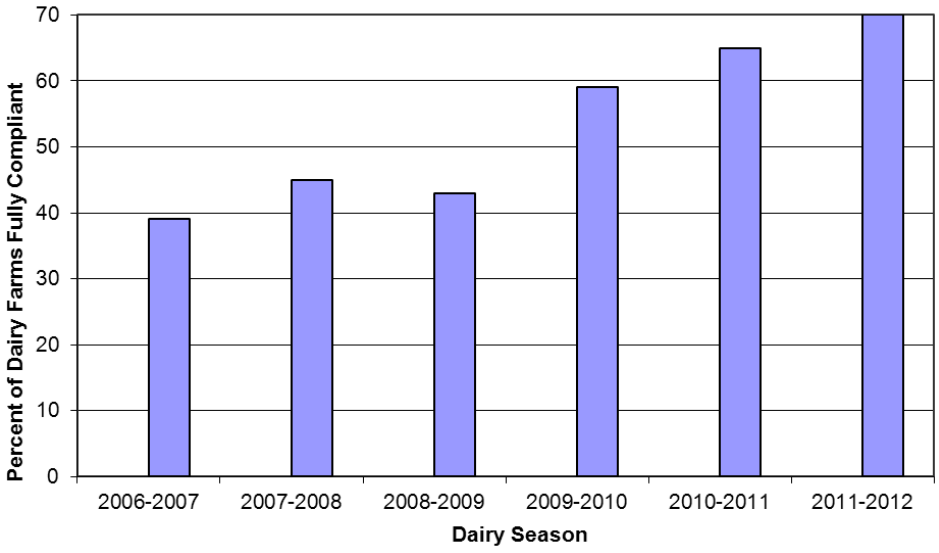
91 Milk supply companies are involved in a number of initiatives to improve effluent management. In his evidence, Mr Hide discusses

an ongoing effluent management programme carried out by Fonterra.

92 DairyNZ convenes the Canterbury Dairy Effluent Group which was formed in 2009 to help improve effluent compliance in the region. The group comprises representatives from Environment Canterbury, Synlait, Fonterra, AgITO, South Island Dairy Development Centre, Westland Milk, Federated Farmers and DairyNZ. The group has been involved in a range of successful initiatives including effluent management training, the development of educational resources for farmers, and a Dairy Effluent Expo attended by representatives from approximately one-third of the region's dairy farms.

93 The investment that the dairy sector is making in initiatives to improve effluent management has been matched by farmer investment in new infrastructure, training and technology. As a result, there continues to be recent significant improvements in effluent management and compliance across the region as highlighted in Figure 2. The increased investment and improved management by farmers has also helped ensure farmers optimise nutrient use[11].

Figure 2 Fully compliant dairy farms 2006-2011[12]



Sustainable Milk Plans

94 DairyNZ is developing a flagship environmental farm planning tool described as a Sustainable Milk Plan. These plans will help improve nutrient management and include targets and actions by creating a

[11] Environment Canterbury 2012, Canterbury Region Dairy Report 2011/12.

[12] Ibid.

farm specific, practical plan that helps landowners to focus on the actions that are essential to minimise their environmental footprint in the short to medium term. A Sustainable Milk Plan will help farmers to achieve regulatory and milk company requirements but may also exceed them.

95 A key difference between the Sustainable Milk Plans and other sustainability farm plans is that the Sustainable Milk Plans identifies specific "targets" that focus on key environmental outcomes and performance measures that take account of the sensitivity of the local environment. The plans can help farmers focus on practical actions that they can take to improve issues such as effluent management, nutrient management, soil health and waterway protection. Examples of actions that might be highlighted could be the need to improve planting or fencing around a waterway, an upgrade to effluent infrastructure and soil testing to help optimise Olsen P levels.

96 One of the advantages of the Sustainable Milk Plans is that through the process of their development, farmers' understanding of links between their farm business and environmental outcomes are increased. Additionally, through ongoing auditing and monitoring valuable information is provided on environmental performance, rates and barriers to change. In this manner, improvements can be made to help the development and implementation of plans.

97 These plans are currently being piloted in different catchments throughout New Zealand and will be available for application in the Hurunui catchment in 2013.

Supporting the uptake of good management practice

98 Research confirms that the most effective forum for farmers to learn is through communicating with other farmers[13]. Much of DairyNZ's focus centres on taking research and practical evidence out to groups of farmers through discussion groups. DairyNZ is involved in a wide variety of extension activities to support good environmental management. This includes providing advice to farmers on effluent management, nutrient efficiency and water management as well as programmes that enhance other aspects of successful farm management that can indirectly impact on environmental performance such as production performance that increases resource use efficiency, and staff management and training.

99 In the Hurunui catchment, DairyNZ regularly holds extension events with farmers to support the uptake of good management practice. DairyNZ has held approximately 20 events in the catchment in 2011/12. A variety of topics are addressed including effluent and

[13] Nuthall, P 2001. Managerial ability – a review of its basis and potential improvement using psychological concepts. Agricultural Economics 24, 247 – 262.

nutrient management, animal welfare, staff and financial management.

100 These extension initiatives compliment some of the work carried out by other agencies including milk supply companies, Environment Canterbury and the Zone Committee. In many cases, farmer events are held jointly with other sectors such as an irrigation efficiency event in North Canterbury in October 2012 organised by representatives from IrrigationNZ, Environment Canterbury, Fonterra, DairyNZ, Enterprise North Canterbury and the Foundation for Arable Research.

TRENDS AND CHANGES ANTICIPATED BASED ON INDUSTRY INITIATIVES

101 As highlighted in the previous section, the dairy sector recognises the need to continue to improve management of its environmental performance. As a result, the sector has substantially increased the level of investment and resourcing that it is making in a range of sustainability programmes. These programmes will continue to support improvements in nutrient management by dairy farmers in the Hurunui catchment. An example of the improvements that can be achieved by farmer actions is the Pahau Enhancement Group.

Pahau Enhancement Group

102 Situated in the Hurunui catchment, the Pahau Enhancement Group is an example of a successful farmer-led initiative to reduce the effects of land use upon water quality.

103 In 2005, Environment Canterbury identified concerns with the water quality of the Pahau River. Water quality data suggested that some farming practices and farm system designs were contributing to increased levels of nutrients and bacteria in the Pahau River. As a result, a number of local farmers formed the Pahau Enhancement Group which included representatives from the Amuri Irrigation Company and Environment Canterbury.

104 Each farm in the Pahau catchment voluntarily developed a management plan to identify actions that could be taken to manage the environmental risks of their farming operations. A key aspect of the approach was helping farmers understand the particular issues of concern (excessive periphyton growth and elevated bacterial levels affecting recreation in the Hurunui River) and focussing on key related water quality attributes (phosphorus and faecal bacteria concentrations). A range of actions were undertaken to improve water quality including fencing to prevent stock access to waterways, riparian planting, redirecting border-dyke wipe-off water into detention ponds and improving irrigation and effluent management. Progress against the actions was audited by an independent farm management consultant.

105 As a result of ongoing actions by farmers there has been a measureable decrease of concentrations of P and faecal bacteria in the Pahau River. As the stream feeds into the Hurunui River, the actions undertaken by the Pahau Enhancement Group have also had environmental benefits for the Hurunui River. Evidence of these improvements is discussed further by Ms Hayward.

106 As a result of farmer actions, water quality in the Pahau River has improved and in 2008 the Pahau Enhancement Group won the Canterbury Resource Management Award.

HOW "AUDITED SELF MANAGEMENT" SCHEMES OUGHT TO WORK

107 The use of audited self management as a tool to help manage some of the complex water management issues facing the Hurunui Waiau zone has largely evolved out of the collaborative process used by the LUWQ process and the Zone Committee in the development of the Zone Implementation Plan. The basis of audited self management is that industry and farmers take ownership for measuring and reporting on performance, which is then able to be independently audited.

108 During the LUWQ process, there was extensive discussion about the use of audited self-management as a means of meeting environmental outcomes. The LUWQ report concluded that:

> "*The implementation of audited self management is a key component of the managing to limits phase of the Preferred Approach…*
>
> *Audited self management is expected to be in widespread use (i.e. not regarded as discretionary) and may be implemented through industry-based quality assurance/certification schemes, irrigation company programmes or local catchment clubs"*[14].

109 The concept of audited self management was also adopted by the Zone Committee. The Zone Committee recognised the potential for audited self management to enable collective action at a catchment scale that could outweigh or maximise the benefits of individual farmer actions. One of the key recommendations of the Zone Implementation Programme is:

> *Implementation of sustainable best practice audited self-management programmes, particularly for water quality, led by community/land user based land care groups and industry*

[14] Environment Canterbury 2012. The preferred approach for managing the cumulative effects of land use on water quality in the Canterbury region.

is essential (and has commenced) and be backed up by a regulatory framework[15].

110 It is noteworthy that as the Zone Implementation Programme was being developed, a number of other influential groups concluded that audited self management offers enormous potential as a tool for solving complex water management issues, notably the Land and Water Forum[16] which recognised that:

> *"Audited self management schemes allow industry and regulators to put in place templates of good practice developed with wide stakeholder involvement, and assure themselves that outcomes are being met."*

111 A number of other agencies are also pursuing audited self management as a means of achieving water quality outcomes. For example, in the Hawkes Bay the regional council is supporting the use of audited self management as a means of managing the effects of land use from a new water storage scheme[17]. In Otago, the North Otago Irrigation Company brings together water scheme users under an audited self management approach, agreed with the regional council and local runanga, to actively manage the effects of land use upon water quality[18]. Additionally, the Ministry of Primary Industries, which is implementing the Government's Accelerated Irrigation Fund, requires that new irrigation schemes are contingent on a credible audited self management scheme to manage both water use and water quality impacts[19].

The Proposed Plan and Audited Self Management

112 The Proposed Plan recognises the potential for audited self management by having a rule that allows for a permitted activity status providing the landowner or occupier has:

112.1 an Industry Certification System; or

112.2 a Catchment Agreement; or

112.3 an Irrigation Scheme Management Plan; or

112.4 a Lifestyle Block Management Plan.

113 In his evidence Mr Willis addresses a number of details regarding how audited self management should work from a planning perspective.

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15 Hurunui Waiau Zone Implementation Programme 2011.
16 Land and Water Forum 2010. A Fresh Start for Freshwater.
17 Hawkes Bay Regional Council 2012. Nutrient Management Approaches for the Tukituki catchment 2012.
18 http://www.noic.co.nz/
19 http://www.mpi.govt.nz

DairyNZ views on audited self management

114 DairyNZ supports audited self management as a tool to achieve continuous improvement and assist farmers to attain goals including environmental objectives.

115 The concept of audited self management is not new to the dairy sector. Audited self management has been used as a tool to help address a range of outcomes including environmental objectives such as through the Accord and Supply Fonterra. In his evidence, Mr Hide discusses some of the successes of this approach. DairyNZ has developed Sustainable Milk Plans as a tool that can be integrated with audited self management by supporting farmers to focus on what actions are essential to minimise their environmental footprint in the short to medium term. One of the key features of these plans is that the actions and performance can be monitored and audited regularly.

RESPONSE TO SECTION 42A REPORTS

Hurunui Waiau Zone Committee

116 I agree with the statement of Mr Faulkner (Deputy Chair of the Hurunui Waiau Zone Committee) that "*water quality has been one of the most difficult and vexing issues*" facing the Hurunui Waiau zone. Despite their significant and commendable efforts, I note that water quality was one of the issues on which the Zone Committee failed to reach a consensus upon prior to notification of the Proposed Plan. The complexity and challenging nature of the water quality issues facing the zone was confirmed by my observations of the discussions that took place during my involvement in the LUWQ process.

Creating nutrient headroom

117 DairyNZ supports the use of audited self management to achieve the objectives of the Proposed Plan. We endorse the the key elements of audited self management as summarised by Mr Brown on behalf of Environment Canterbury who states that:

> *"The process of audited self management is an effective tool for ensuring improved on-farm nutrient management provided the process is set up from the beginning according to a strict set of key operating criteria".*

In particular, DairyNZ supports the need for objectives and clear performance targets that are independently audited being an integral part of an audited self management programme.

118 DairyNZ supports the development of audited self management schemes along the lines of those referred to by Mr Brown, including the North Otago Irrigation Company and the Morven Glenavy Ikawai Irrigation Company.

Historical background and process to develop the Proposed Hurunui and Waiau River Regional Plan

119 DairyNZ is strongly supportive of the collaborative process employed throughout the LUWQ project and the development of the Zone Implementation Programme. However, one of DairyNZ's concerns with the process was that it failed to fully account for some of the social, economic, environmental and cultural trade-offs. As a result, there remain a number of issues that the Proposed Plan needs to address.

120 This is highlighted, for example, by the recommendation in the Zone Implementation Programme, that:

> *"The water quality for Hurunui River at State Highway One should be at or about the same or better standard as present".*

121 In reality there was little understanding by participants in the collaborative processes of what that recommendation actually meant for some of the other Zone Committee goals, particularly the goal referred to by Mr Faulkner to deliver economic growth and healthy rural communities through an additional 60,000ha of irrigation.

122 This lack of understanding was partly a function of the belief that existing farmers could reduce nitrogen leaching by as much as 50% across all dairy farms. In his evidence, Dr McCall has highlighted that this is implausible. With the benefit of hindsight, the basis for the assumption that farmers could reduce nitrogen leaching by as much as 50% would have benefitted from greater scrutiny when the LUWQ project was being carried out.

123 DairyNZ's view is that freshwater limits should be set in full knowledge of the social, economic, environmental and cultural implications. For DairyNZ, this is the key lesson from the LUWQ project. This point was subsequently recognised in the LUWQ report[20] which states that:

> *"The process of establishing catchment nutrient load limits is designed to recognise the inevitability of conflict, particularly between economic and social values associated with land and water use and, environmental and cultural values. Therefore, at times there will be the need to make compromises on some aspects of values, level of value protection and/or risks to achieving those values. Making catchment limit recommendations with full transparency of these conflicts and compromises requires value judgements based on sound information. The process for making value judgements, and ultimately making recommendations on the catchment nutrient load limits, involves taking the technical information into a dedicated community discussion and decision making process."*

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20 Environment Canterbury 2012: The preferred approach for managing the cumulative effects of land use on water quality in the Canterbury region.

124 In this respect, I agree and support the comments made by Mr Parrish in his evidence where he reiterates the conclusions of the LUWQ case study that a solution for the Hurunui catchment must be based on[21]:

a. *Setting Load Limits in full knowledge of all the costs and benefits.*

b. *Fully considering all options to meet water quality objectives, not just managing land use development and nutrient loss. Inevitably other strategies, such as managing flow regimes and influencing water temperature through shading, will be important to meet periphyton objectives.*

c. *Taking an audited self-management and adaptive management approach that includes industry and land owners taking a high level of responsibility for on farm and sub catchment scale mitigation (tailored to individual properties) coupled with monitoring and commitment to change management practices and/or load targets if identified environmental outcomes are not being met*.

125 Additionally, Mr Parrish notes that the LUWQ project recommended that:

> *"Further steps be taken to confirm an agreed development scenario and nutrient limits for the tributaries. These steps should include a more fine grained analysis of costs and benefits and should include a further deliberation stage"*[22]*.*

126 DairyNZ supports this recommendation of the LUWQ project. However, it is DairyNZ's view that a more fine grained analysis of costs and benefits was either not carried out, or not done to a sufficient standard prior to the notification of the Proposed Plan. Consequently the trade-offs that need to be recognised and accounted for in the process leading to the development of the Proposed Plan were never fully addressed.

CONCLUSIONS

127 DairyNZ supports the approach used to develop the Proposed Plan.

128 However, in light of a deeper analysis of some of the complex issues underlying water management in the Hurunui catchment, DairyNZ seeks some refinements to the Proposed Plan that will enable the community's social, economic and environmental outcomes to be achieved.

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21 Environment Canterbury 2011. Nutrient Management in Hurunui: A Case Study in Identifying Options and Opportunities.

22 Ibid.

129 DairyNZ considers, supported by its technical experts, that the following instream nutrient load limits for the Hurunui River at SH1 are sustainable water quality limits:

129.1 1,155 tonnes of dissolved inorganic nitrogen (*N*) (representing a 50% increase of current loads), or 963 tonnes if the N load is increased by 25% of the current loads), and

129.2 10.7 tonnes of dissolved reactive phosphorus (*P*).

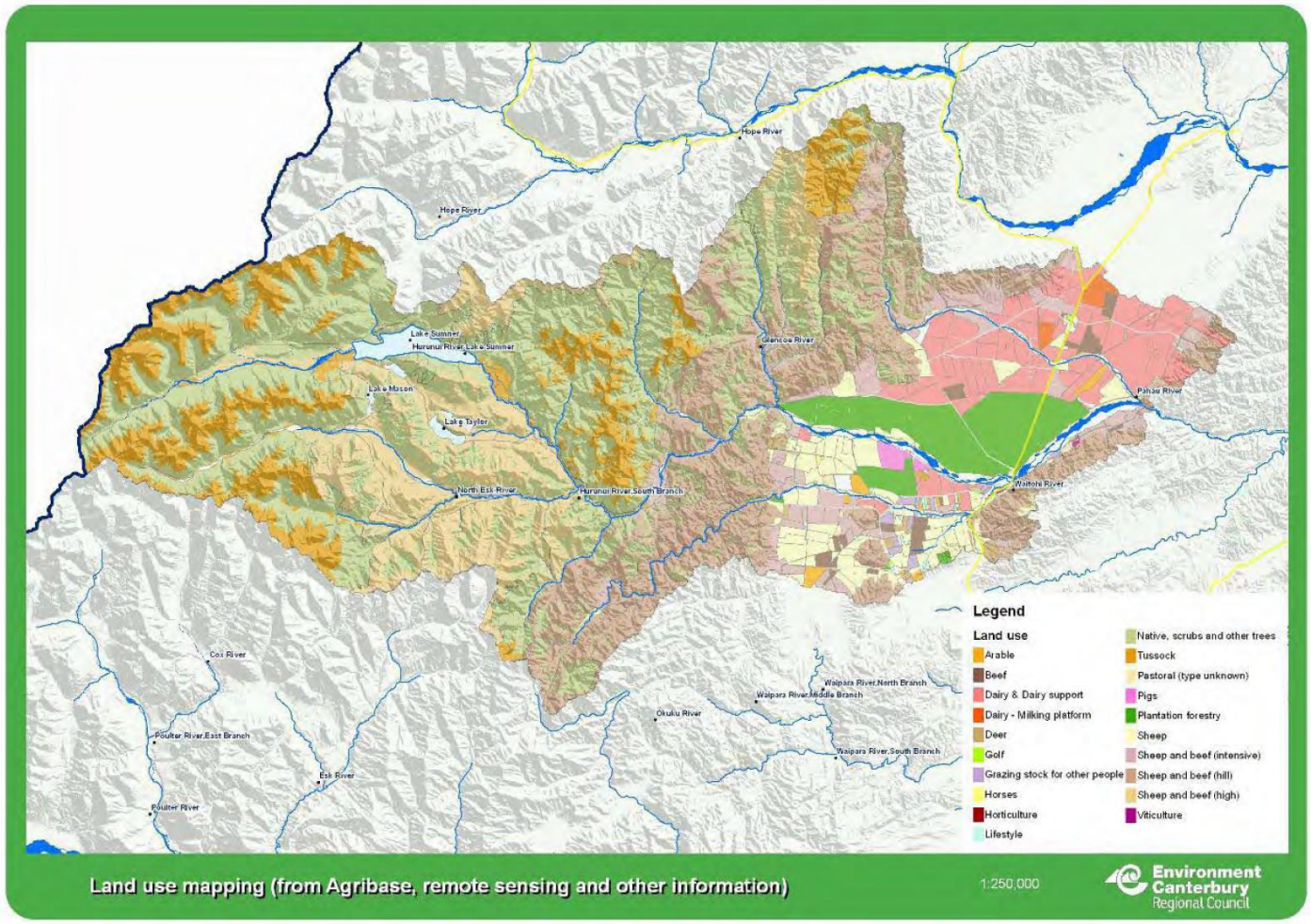
We believe these limits enable approximately 32,000 hectares (or 18,600 hectares if the N load is allowed to increase by 25%) of additional land to be irrigated in the catchment that provides for the social, economic and environmental outcomes sought by the community.

130 DairyNZ supports the development of audited self management schemes as an effective tool for improving environmental management and the objectives of the Proposed Plan.

131 Farmers have proved that when they have the opportunity to understand how their farming operations may be contributing to environmental issues they will take effective actions to avoid, remedy or mitigate the effects of their resource use. This has been demonstrated successfully in the Hurunui catchment through, for example, the actions of the Pahau Enhancement Group which has been particularly successful at reducing the level of P in the Pahau River, and as a result, improving the condition of the Hurunui River[23].

132 The dairy sector recognises that it has a significant role to play to ensure that the objectives of the Proposed Plan are achieved. The ambitious programme of initiatives that the dairy sector is implementing across the country will support achievement of the objectives of the Proposed Plan and the Zone Implementation Programme. DairyNZ is committed to working with the Environment Canterbury, the Hurunui Waiau Zone Committee and other stakeholders to support implementation of the Proposed Plan. In particular, DairyNZ is eager to progress the development of a local partnership agreement, as suggested by Environment Canterbury, to ensure the overall goals of the Proposed Plan are achieved.

[23] Familton 2007 Planning Report, Hurunui River and Tributaries: Environmental Flow and Water Allocation. U07/60



APPENDIX 1: LAND USE MAP OF THE HURUNUI CATCHMENT[24]

[24] Environment Canterbury 2012: The preferred approach for managing the cumulative effects of land use on water quality in the Canterbury region.

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