

IN THE MATTER of the Resource Management Act
1991

AND

IN THE MATTER of the Proposed Canterbury Land
and Water Regional Plan

**STATEMENT OF EVIDENCE OF MATHEW CULLEN
FOR THE GROUP 1 HEARING**

1. INTRODUCTION

- 1.1 My full name is Mathew John Cullen. I hold a Bachelors of Resource Management from Lincoln University, which was conferred in 2003. I have also have attained a certificate of completion for both Sustainable Nutrient Management in New Zealand Agriculture and Advanced Sustainable Nutrient Management in New Zealand Agriculture from Massey University.
- 1.2 I have been employed by Fonterra Co-operative Group Limited (Fonterra), as a Sustainable Dairying Advisor since 2011, most recently as a Catchment Specialist since February 2012. As part of my role, I am responsible for working one-on-one with our supplier shareholders within the Te Waihora/Lake Ellesmere catchment to accelerate their adoption of good management practices. I also liaise with the dairy industry's wider stakeholders and partners within the catchment to ensure that they are aware of sustainability initiatives being undertaken by Fonterra within the catchment; as well as ensuring delivery of clear, consistent messages for farmers in terms of how these initiatives and regulatory requirements can be adopted.
- 1.3 Prior to my employment with Fonterra I was employed by Environment Canterbury for six months as the Team Leader of the Consents Monitoring team (Rural). I was responsible for the management of 6 Monitoring Officers in this team, which covered the Region from the Ashburton River to Kaikoura. This role involved the development of monitoring programmes within the

Canterbury Region to ensure compliance with conditions of resource consents (within the rural sector).

- 1.4 Before holding that position with Environment Canterbury, I worked for the London Borough of Southwark and the London Borough of Haringey (United Kingdom) as a Development Control Officer/Enforcement Officer in their respective Planning sections for a total of 4.5 years. These positions involved the processing of applications for planning permission and making subsequent recommendations to decision makers, as well as pursuing enforcement processes where developments contravened relevant legislation.
- 1.5 Prior to my employment in the United Kingdom, I was employed by Environment Canterbury as a Compliance Monitoring Officer for 3.5 years. This position involved both the processing of, and monitoring compliance with, resource consents within the rural sector.
- 1.6 I am familiar with the Proposed Canterbury Land and Water Plan (“the Plan”) and I am authorised by Fonterra to provide this evidence on its behalf as a Fonterra representative.
- 1.7 I am not offering evidence as an expert witness, although I do have considerable practical experience in water quality and related farm management matters given my work for Fonterra and for previous employers.

2. SCOPE OF EVIDENCE

- 2.1 My evidence for the Group 1 hearings will deal with the following:
 - (a) The importance of Fonterra’s interests to the Canterbury Region and nationally, particularly from the farm-side, and Fonterra’s interest in the Plan;
 - (b) Fonterra’s previous sustainability initiatives (the Dairying and Clean Streams Accord (“the Accord”)), current national sustainability initiatives (“Supply Fonterra”), Canterbury region’s sustainability initiatives which will support the Plan, and Fonterra’s collaborative approach towards on-farm change.

- 2.2 I also note that although my evidence is prepared primarily for the Group 1 hearings, some of the evidence contained in this statement will be relevant to matters addressed in the Group 2 hearings.

3. SUMMARY OF EVIDENCE

- 3.1 Fonterra and its shareholders are significant social and economic contributors to local communities, the wider Canterbury Region and New Zealand. Fonterra sees potential for further growth in milk supply in Canterbury and is committed to ensuring that this growth is undertaken in a sustainable manner.
- 3.2 Ten years ago, the dairy industry set some very ambitious and challenging targets in the Accord. These targets aimed to reduce dairy farming's effects on water quality. Not all targets specified by the Accord were achieved. However, the programmes, implemented both by Fonterra and industry-wide led to a step change in farming culture and traditional practices. The Accord resulted in significant improvements in on-farm sustainability, and has also provided a platform for further sustainability initiatives and continuing improvement.
- 3.3 Fonterra, together with Dairy New Zealand and AgITO¹, is committed to driving further improvements in environmental performance on farm. The recent launch of Supply Fonterra demonstrates this commitment. Supply Fonterra is designed to drive improvements to milk quality, sustainability and animal welfare across Fonterra's supplier base.
- 3.4 In terms of sustainability, Supply Fonterra currently has three modules that address effluent management, surface waterway management and nitrogen management. These programmes will support the preparation of Farm Environment Plans, and further uptake of industry good practice within the Canterbury Region.
- 3.5 These sustainability initiatives have been refined further within the Te Waihora/Lake Ellesmere catchment where Fonterra is focussed on accelerating the adoption of good management practices.

1. AgITO is one of New Zealand's largest industry training organisations supporting the agricultural industry.

- 3.6 Fonterra has been widely involved in a number of successful collaborative initiatives (working alongside both regulators and industry providers) within the Canterbury Region. Fonterra recognises that collaboration is a positive approach that often results in wide support by stakeholders.

4. ROLE OF DAIRY AND GROWTH OF DAIRYING

- 4.1 Fonterra's corporate structure is unusual – effectively it is owned by the individual farms who supply milk to it. Fonterra has approximately 10,500 supplier farms nationally, and produced close to 17 billion litres of milk in New Zealand in the 2011-2012 season.
- 4.2 Canterbury is a relatively new dairy area when compared to other parts of New Zealand. Whilst traditional dairying areas are well established in areas such as Kaikoura, Rangiora, Christchurch/Ellesmere and Clandeboye/Timaru, the majority of farm conversions in Canterbury have occurred in the past 20 years, with the advent of increased pastoral irrigation.
- 4.3 This has resulted in farms that generally have newer infrastructure and larger herds than the more traditional dairying areas in New Zealand. The average herd size in Canterbury for the 2010-2011 season was 774 compared to an average herd size of 393 cows nationally.²²
- 4.4 In my experience the benefits that reliable irrigation brings, and the largely flat topography of the area, have attracted farmers that are generally progressive thinking, and willing and able to adopt new technologies and farming techniques. These factors have contributed to the Canterbury area having some of the highest productivity statistics in New Zealand.² Mr Butcher discusses the growth of dairying and the related economic implications in more detail in his evidence.

5. FONTERRA'S INTEREST IN THE PROPOSED PLAN

- 5.1 Fonterra has an interest in the Plan because of its direct impact on Fonterra's existing shareholder suppliers in the Canterbury Region and the effect the Plan

2. Livestock Improvement Corporation and DairyNZ; New Zealand Dairy Statistics 2010-2011; 2011.

will have on Fonterra's ability to both maintain and grow milk supply in the future.

- 5.2 The wider Canterbury Region has experienced strong growth in milk supply in recent times and Fonterra recognises the potential for future growth from the Region. Fonterra is supportive of this growth occurring in a manner that balances the social, economic, cultural and environmental well beings of the community.

6. PREVIOUS SUSTAINABILITY INITIATIVES - DAIRYING AND CLEAN STREAMS ACCORD

- 6.1 The Accord was developed by Fonterra, in partnership with regional councils, Local Government New Zealand, the Ministry for the Environment and the Ministry of Agriculture. The Accord was signed in 2003 and promoted sustainable dairy farming in New Zealand by non-regulatory means.
- 6.2 At the time it was signed, the Accord consisted of a series of ambitious and challenging targets that would require the dairy industry to undertake significant changes on-farm, both in terms of installation of infrastructure as well as changes in management practice. These targets included:
- (a) 90% of dairy cattle being excluded from waterways³ by 2012;
 - (b) 90% of farm races include bridges where stock regularly cross a watercourse⁴ by 2012;
 - (c) 100% of farm dairy effluent discharges to comply with resource consents and regional plans immediately; and
 - (d) 100% of dairy farms to have systems in place manage nutrient inputs and outputs by 2007.

3. The Accord definition is a waterway that is wider than a stride, deeper than a redband gumboot and permanently flowing.

4. The Accord definition is where stock cross a watercourse more than twice a week averaged over a year.

6.3 The following table illustrates the progress made under the Accord:

Accord Target	Proportion of farmers compliant ⁵									% Change
	2003 - 2004 ⁶	2004 - 2005 ⁷	2005 - 2006 ⁸	2006 - 2007 ⁹	2007 - 2008 ¹⁰	2008 - 2009 ¹¹	2009 - 2010 ¹²	2010 - 2011 ¹³	2011 - 2012 ¹⁴	
<i>Cattle excluded from waterways</i>	67% ¹⁵	72% ¹⁶	75%	75%	78%	80%	85%	84%	87%	+20%
<i>Bridges/culverts where stock regularly cross a watercourse</i>	92%	93%	93%	93%	98%	98%	99%	99%	99%	+7%
<i>Farm dairy effluent discharge compliance</i>	Not reported	44% ¹⁷	67%	68% ¹⁸	60% ¹⁹	60% ²⁰	65% ²¹	69% ²²	73% ²³	+29%
<i>Nutrient budgets in place</i>	17% ²⁴	19% ²⁵	33%	97%	98%	99%	99%	99%	99%	+82%

6.4 As can be seen, it initially took a period of time for strategies (and funding) to be put in place by Fonterra in order to deliver the Accord's targets. Steps taken included:

(a) In 2005, three regional based environment specialists were employed by Fonterra to assist farmers to implement change. Fonterra and Dexcel

5. Nationally unless otherwise noted.
6. Fonterra, Ministry for the Environment, MAF, Local Government New Zealand: The Dairying and Clean Streams Accord: Snapshot of Progress – 2003/2004: 2004.
7. Fonterra, Ministry for the Environment, MAF, Local Government New Zealand: The Dairying and Clean Streams Accord: Snapshot of Progress – 2004/2005: 2006.
8. Fonterra, Ministry for the Environment, MAF, Local Government New Zealand: The Dairying and Clean Streams Accord: Snapshot of Progress – 2005/2006: 2006.
9. Fonterra, Ministry for the Environment, MAF, Local Government New Zealand: The Dairying and Clean Streams Accord: Snapshot of Progress – 2006/2007: 2007.
10. Fonterra, Ministry for the Environment, MAF, Local Government New Zealand: The Dairying and Clean Streams Accord: Snapshot of Progress – 2007/2008: 2008.
11. Fonterra, Ministry for the Environment, MAF, Local Government New Zealand: The Dairying and Clean Streams Accord: Snapshot of Progress – 2008/2009: 2009.
12. Fonterra, Ministry for the Environment, MAF, Local Government New Zealand: The Dairying and Clean Streams Accord: Snapshot of Progress – 2009/2010: 2010.
13. Fonterra, Ministry for the Environment, MAF, Local Government New Zealand: The Dairying and Clean Streams Accord: Snapshot of Progress – 2010/2011.
14. Fonterra, Ministry for the Environment, MAF, Local Government New Zealand; The Dairying and Clean Streams Accord: Snapshot of Progress – 2011/2012.
15. Canterbury was 73%.
16. Canterbury 78%.
17. Canterbury 52%.
18. Canterbury 40%.
19. Canterbury 46%.
20. Canterbury 43%.
21. Canterbury 59%.
22. Canterbury 65%.
23. Canterbury 70%.
24. Canterbury 27%.
25. Canterbury was 27%.

(now DairyNZ) also undertook a project to help increase farmers' understanding and implementation of nutrient management. This project included:

- (i) training of field staff in nutrient budgeting and management;
- (ii) production of technical support booklets for farmers; and
- (iii) conducting a nationwide series of field days aimed at increasing farmers' knowledge of the importance and benefits of implementing a nutrient management plan.

The success of these programmes is shown in the enormous increase in the number of farms having nutrient budgets in place reported at the end of 2006/2007 season (97% compared to only 33% the previous year).

- (b) Fonterra established the 'Every Farm Every Year Programme' for the 2010-2011 season. As part of this programme, independent assessors visited all 10,500 Fonterra-supplying farms, checking if effluent infrastructure was compliant, non-compliant or at risk of non-compliance. Fonterra also employed additional specialist staff to support farmers who required assistance in meeting these standards. As a result Fonterra's nine Sustainable Dairying Advisors:²⁶

- (i) received 2900 referrals (either identified by farm assessors as farms with compliance issues or self-referred);
- (ii) completed 2300 one-on-one visits with referred farmers;
- (iii) prepared 1360 effluent improvement plans, of which 720 were completed. The remaining farmers are continuing to implement their plans, but have not completed all actions. Some delays have occurred outside of a farmer's control (such as weather conditions and availability of contractors subsequent to the Christchurch earthquakes) and require extended timeframes;

26. The role of Sustainable Dairying Advisors is explained at paragraph 7.31 of my evidence.

- (iv) In Canterbury extended timeframes are also occasionally required due to the significant levels of investment in new effluent systems required for many farmers;
- (v) resolved 56 critical issues (within 24 hours of their identification).

- 6.5 As a result of this programme farm dairy effluent discharge compliance measured 69% at the end of the 2010/2011 season, up from 65% in the previous season. A similar improvement was experienced the following year (2011/2012) which ultimately recorded 73% of farms as compliant with effluent discharge requirements.
- 6.6 Whilst not all specified targets were achieved, the Accord has changed the face of dairying in New Zealand and made it more sustainable. Fonterra's programmes outlined below are intended to address these issues to ensure continuing change and improvement is made at a rate that is achievable by dairy farmers.

7. CURRENT FONTERRA SUSTAINABILITY INITIATIVES

- 7.1 Fonterra remains committed to being among the most sustainable food producers in the world. We accept that agriculture has a responsibility to minimise its impact on the environment. In accordance with this commitment, Fonterra has implemented a number of programmes to encourage and assist farms with sustainable production and nutrient management, which are relevant to how the water quality and growth objectives of the Plan will be achieved.

Successor to the Accord

- 7.2 The Accord came to its conclusion in 2012. As Mr Ryan has explained, DairyNZ is leading a discussion between Fonterra, the wider dairy sector and a wide range of interested parties on the form of an industry-wide successor to the Accord. It is expected that this will be released in mid-February 2013, and will seek to build on those initiatives within the Accord to continue the culture of continuous improvement. I am aware that the successor to the Accord will include a number of initiatives that will enhance the overall performance of dairy farming as it affects freshwater by addressing:

- (a) Riparian Management;
- (b) Nutrient Management;
- (c) Effluent Management; and
- (d) Water Efficiency.

- 7.3 The successor to the Accord is likely to include more robust targets around delivery of programmes, and subsequent reporting of progress rather than aspirational on-farm outcomes.
- 7.4 New dairy conversions (or farm divisions) must meet all requirements in the successor to the Accord prior to supplying milk to Fonterra. This has been a condition of supply since 2005.
- 7.5 Full details of those matters is not able to be made public yet. If this information becomes available before the hearing, I will provide it by way of a short supplementary statement of evidence.

Supply Fonterra

- 7.6 In July 2012 Supply Fonterra was launched. Supply Fonterra is a programme of on-farm initiatives that will help grow and maintain a sustainable milk supply. It is a package of on-farm continuous improvement initiatives to help Fonterra future-proof our dairying suppliers' practices.
- 7.7 At its heart, Supply Fonterra is a long-term change model. It leverages Fonterra's successful history in continuously improving our on-farm food safety performance, and more recently the positive results achieved through the "Every Farm Every Year" effluent management programme, discussed earlier.
- 7.8 The programme is founded on four key elements that we know from experience are required to drive change on farm:
 - (a) Minimum standards that must be achieved in order to supply milk;
 - (b) One-on-one advice and support to guide farmers towards best practice;

- (c) Practical education and resources for farmers, including support from our industry partners DairyNZ and AgITO; and
- (d) Recognition and reward for those who are at the cutting edge of sustainability, milk quality and animal welfare.

7.9 The Environment Programme for Supply Fonterra includes three modules: Effluent Management, Waterway Management and Nitrogen Management which are discussed below. There may be future modules of Supply Fonterra to address issues such as water efficiency, greenhouse gases, biodiversity and animal welfare.

7.10 All farmers who supply milk to Fonterra are required to participate in a Farm Dairy Assessment at least once per year. This assessment is a requirement of Fonterra's Risk Management Programme as required by the Animal Products Act (1999) which controls food safety in New Zealand. The Farm Dairy Assessment, which is undertaken by contracted service providers, is also utilised to assess compliance with minimum standards as part of Supply Fonterra programme.

Effluent Management

7.11 Formerly 'Every Farm Every Year', the effluent management component of the Environment Programme for Supply Fonterra involves an assessment by an independent contractor of every farm's effluent system to identify risks with the system. This is undertaken annually during the Farm Dairy Assessment. Where an issue is identified a Sustainable Dairying Advisor will meet with the farmer and formulate an agreed Environmental Improvement Plan (EIP). The EIP will be followed up with the supplier to ensure that the agreed actions are completed, and the minimum standard achieved.²⁷

27. The minimum standard for the Effluent Management Programme requires our suppliers to have systems in place that manage all effluent sources in a manner that complies with the relevant Regional Council resource consent or permitted activity rules, 365 days a year. Where this is not achieved, they work with a Sustainable Dairy Advisor to create an EIP that sets out the actions required to achieve the minimum standard.

- 7.12 Where a supplier fails to remedy the situation or work with the Sustainable Dairying Advisor to develop an EIP, the ultimate sanction is the non-collection of milk.
- 7.13 Since the launch of this programme in 2010, 2399 EIPs have been put in place with farmers and the actions completed in 1670 cases. These are actions that will increase the resilience of the effluent application systems and allow effluent to be better utilised for growing pasture, while reducing the risks of losses to the environment.
- 7.14 Whilst there are some 729 farms where agreed actions have not yet been completed, in most instances this is due to agreed timeframes which may be up to 12 months (e.g. a farmer may be required to install a new effluent storage pond before 1st August 2013). In addition, as with effluent improvement plans (para 6.4(b)(iii)) there are some exceptions where delays have occurred outside of a farmer's control (such as weather conditions and availability of contractors subsequent to the Christchurch earthquakes) and have been extended. In Canterbury, longer timeframes (up to 12 months) are often necessary because of the significant level of investment for many farmers in new effluent systems, which go significantly beyond the existing regulatory minimum standards (as specified by the NRRP) and that reflect good practice, but which may now not meet the rules required by the Plan.
- 7.15 The critical distinction between the annual compliance monitoring of effluent discharge consents by the Regional Council and Fonterra's annual Farm Dairy Assessment is that rather than assessing compliance with consent conditions on that particular day (which will often be influenced by weather/soil conditions on the day), Fonterra assesses farm dairy effluent systems on the basis of 'risk' of non-compliance. EIP's seek to achieve the best long term solutions for farmers (which often far exceed minimum standards). Accordingly, those 729 farms where agreed actions have not been completed, may not be failing to meet minimum standards.

Waterway Management

- 7.16 Waterway Management is a new programme for the 2012 season that is focussed on reducing the dairy industry's impacts on surface water quality, and

addresses some of the shortcomings of the Accord in terms of reporting and verification.

- 7.17 The minimum standards for this programme are:
- (a) The exclusion of stock from all waterways that are wider than 1 metre, deeper than 30cm and permanently contain water;
 - (b) All regular crossing points are required to have bridges or culverts; and
 - (c) Sediment and/or effluent is not to be discharged into any waterway where it is likely to result in a significant adverse effect on the environment.
- 7.18 The programme will also provide guidance and advice to suppliers about managing the risks from fodder crops and wintering practices, along with stock exclusion on run-off blocks.
- 7.19 The stock exclusion and crossing requirements will be assessed during the annual Farm Dairy Assessment. Working with the farmer, the assessor will use electronic mapping technology and aerial photographs to identify and classify the waterways on the farm and the level of stock exclusion that has been achieved. The assessor is required to carry out a full visual validation of waterway fencing within 200m of the dairy farm dairy. Stock exclusion and crossing information provided by farmers will be verified over time to ensure its accuracy.
- 7.20 Fonterra is mindful that this verification process must be robust and auditable, and is currently undertaking a series of pilots nationwide to determine the most effective method to verify that stock are excluded from waterways. Where a farmer does not comply with the minimum standards for stock exclusion, he or she will have until 1 December 2013 to comply, as long as there is an EIP in place.

Nitrogen Management

- 7.21 The Nitrogen Management programme is also new for 2012 and seeks to:
- (a) Model each supplier's nitrogen loss and efficiency at year end, using actual farm data, and in accordance with the industry developed protocol for the use of OVERSEER²⁸;
 - (b) Provide this information to farmers in an easy to understand format that shows how they are performing compared to their peers; and
 - (c) Provide an audited record of nitrogen loss that allows farmers to easily participate in audited self-management schemes or demonstrate compliance with regulatory requirements.
- 7.22 After the first season Fonterra will have a record of how each farm is performing in terms of nitrogen loss and nitrogen conversion efficiency. This will allow for the development of a support model for launch in the 2013-2014 season to assist farmers to reduce losses while increasing efficiency.

Collaborative Working within the Region

- 7.23 Fonterra has been actively involved with a number of highly-successful, collaborative sustainability initiatives within the Canterbury Region.
- 7.24 The Canterbury Dairy Effluent Group ("CDEG") was formed in 2009 to help improve the levels of discharge compliance within the Canterbury Region. CDEG is made up of key partners within the dairy industry and includes representatives from the Regional Council, DairyNZ, Federated Farmers, Fonterra, Synlait, Westland Milk, the South Island Dairying Development Centre and AgITO.
- 7.25 CDEG is effectively a 'clearing house' for effluent management issues within Canterbury. Partners share information to better inform and develop consistent key messages for the Region's dairy farmers, to demonstrate that both the dairy industry and the Regional Council are united in efforts to improve performance in effluent compliance.

28. The protocol will be discussed in more detail in my Group 2 evidence.

- 7.26 At the time of the inception of CDEG 46% of farmers had full compliance with Regional Council effluent consent conditions, 34% had minor non-compliance and 20% were significantly non-compliant (2007/2008 season).²⁹ Compliance figures have since improved with current results (for 2011-2012 season) showing 70% full compliance, 21% minor non-compliance and 9% significant non-compliance.
- 7.27 With the growing breadth of environmental initiatives (beyond effluent) within Canterbury, CDEG now also provides clear consistent information to farmers on stock exclusion from waterways and Zone Implementation Programmes.
- 7.28 Whilst there is clearly more work to do, this collaborative approach has proven to be very effective in delivering improvement in environmental performance on dairy farms. Fonterra recognises the importance of collaboration in the success of these environmental initiatives. Fonterra has involved Regional Councils across New Zealand during the development and delivery of the Supply Fonterra programme.
- 7.29 Fonterra has also undertaken extensive consultation and collaboration with the Regional Council and Ngai Tahu with respect to the Te Waihora/Lake Ellesmere catchment. Where possible, information has been shared (such as nitrogen benchmarking and stock exclusion from waterways) to avoid duplication with projects being undertaken as part of Whakaora Te Waihora (the Joint Restoration Plan), as well as ensuring that data collected by parties is consistent and comparable. The adoption of the dairy industry protocol (for use of OVERSEER) is a good example of this.
- 7.30 Fonterra has also been involved in the collaboration process that has been trialled in the Hurunui/Waiau catchment as part of the development of the Hurunui and Waiau River Regional Plan. Fonterra has supported this collaborative approach, and recognises that this as a positive process that has resulted in outcomes that are widely supported by stakeholders.

29. Environment Canterbury: The Canterbury Region dairy report for the 2008/2009 season. 2009.

Other Environmental Activities within the Canterbury Region

Sustainable Dairying Advisors and Area Managers

- 7.31 Fonterra has a team of four Sustainable Dairying Advisors based in the Canterbury Region. Their role is to work with our farmers one-on-one to deliver solutions and guidance that fulfil the requirements of the Supply Fonterra programmes.
- 7.32 Farmers are also supported in the Region by a team of four Area Managers who manage the relationship between Fonterra and its shareholders/suppliers. They offer support to farmers on a wide range of issues and are one of the key methods of delivering the 'why' messages to farmers in the sustainability area.

Te Waihora/Lake Ellesmere Catchment

- 7.33 Additional Sustainable Dairy Advisers have been allocated to support our suppliers within the Te Waihora/Lake Ellesmere Catchment in recognition of the Lake's particularly degraded state. Fonterra has decided to support the Cultural and Ecological Restoration Plan (Whakaora Te Waihora) which is supported by the co-governance agreement between Environment Canterbury and Ngai Tahu. As well as one-on-one farm visits, additional resources and communication is also being provided for the (approximately 200) suppliers who are located within this catchment. During the 2011/2012 season all farms located within the 'inner catchment' received one-on-one visits during which time benchmarking of effluent systems, nitrogen loss, surface waterway management, riparian management and on-farm biodiversity assessment was undertaken. EIPs were agreed where those minimum standards specified within the 'Supply Fonterra' modules were not being met. This intention of this additional focus on the Te Waihora/Lake Ellesmere catchment is to accelerate the adoption of good practice by our farmers located in this sensitive catchment.

Catchment Care

- 7.34 The Catchment Care initiative is a 3 year programme aimed at protecting and enhancing waterways in the communities in which our farmers operate. This has involved planting, fencing and weed removal at a number of sites in Canterbury.

Grass Roots Fund

- 7.35 Fonterra also offers support to the community through the Fonterra Grass Roots Fund. This fund allows for grants of up to \$5000 for projects in three focus areas: Bringing Communities Together, Caring for the Environment, and Making our Communities Safer. For example:
- (a) Te Ara Kakariki received funding in the October 2012 call period for a 'Canterbury Plantout'. This is a collaborative event that utilises volunteers to restore Canterbury's native biodiversity. The event involves the planting of 6000 native plants and education of participants on Canterbury projects and the importance of biodiversity, habitat, water quality and Te Waihora.
 - (b) Riparian Support Trust received funding in the October 2012 call period to utilise as part of the Salmon Breeding Program at McKinnons Creek. This involves both a Salmon rearing programme and riparian initiatives and projects on local creeks and rivers.

Current practices

- 7.36 In the following paragraphs, I set out my observations from field experience of the degree of uptake of what are currently commonly accepted good farming practices within the Canterbury Region.

Nutrient Budgets and Nutrient Management Plans

- 7.37 The use of nutrient budgets has increased significantly in recent years and they are now commonplace within the dairy industry.
- 7.38 A nutrient budget compares overall nutrient inputs to outputs in a farm system. It can help identify production or environmental issues arising from nutrient excesses or deficits. A nutrient budget can lead to a reduction in the fertiliser recommended as used as a part of a farming system and allows farmers to prioritise what nutrients are needed where. Nutrient budgets therefore assist with minimising nutrient loss from farming systems (including nitrogen and phosphorus).

- 7.39 In total 100% of farms in Canterbury had a copy of their nutrient budget available at their latest annual farm dairy and environment assessment (2011/2012 season).
- 7.40 A nutrient management plan defines the nutrient needs of agricultural systems as well as amounts, sources, placement and timing of nutrient applications to maximise nutrient uptake and minimise losses for optimal productivity, profitability and minimal environmental impact. A nutrient management plan is based on the information set out in the nutrient budget.
- 7.41 The major fertiliser companies are working to provide nutrient management plans to all dairy farmers over the coming years.

Stock Exclusion

- 7.42 Keeping stock out of waterways provides significant reductions in the losses of phosphorus, sediment, faecal contamination and, to a lesser extent, nitrogen.
- 7.43 The Accord requires that dairy cattle are excluded from streams, rivers, lakes and their banks. Fonterra's monitoring of compliance with the Accord targets in the 2011/2012 season indicated that 90% of suppliers with waterways had excluded stock from these waterways.
- 7.44 The Accord also requires that *"Farm races include bridges or culverts where stock regularly (more than twice a week) crosses a watercourse"*.
- 7.45 In terms of stock crossings, reporting in the Canterbury Region for the 2011/2012 season showed 99% of regular waterway crossings had bridges or culverts installed.

Improving Irrigation Efficiency

- 7.46 Border-dyke irrigation results in higher levels of drainage through the soil profile (when compared with well scheduled spray irrigation systems) which results in a higher risk of nitrogen leaching. Additionally, excess water that runs off the end of the borders (wipe-off water) is often discharged to surface water bodies.
- 7.47 In recent years there has been significant conversion of border-dyke systems to spray irrigation, driven largely by the efficiency gains that can be achieved. An

example of this is in the Hurunui Catchment, where approximately 92% of land used for dairying is now utilising spray irrigation³⁰. This is considered to be representative of similar changes to existing large scale irrigation schemes within the Region.

- 7.48 Efficient irrigation management through correct scheduling can also reduce excess losses which arise from over-watering.

Improved Effluent Management

- 7.49 Appropriate management of dairy shed effluent application minimises the potential losses of phosphorus, faecal contamination, sediment and nitrogen, while aiding pasture production.
- 7.50 This is achieved by applying effluent to soils at the correct rate and depth, and when soil moisture levels are suitable. It is also important to maintain separation distances to waterways and to utilise a large enough area to avoid over-application of nitrogen (in effluent) to the pasture.
- 7.51 68% of Canterbury's dairy farms have more than double the effluent application area required to maintain nitrogen levels below the limits imposed by their effluent consents, and this number has been increasing in recent years³¹.
- 7.52 Regionally effluent compliance rates have improved in recent years from 43% full compliance (with resource consent conditions) in the 2008/2009 season²⁹²⁹ to 70% in 2011/2012³¹³¹. Of most significance is the reduction in significant non-compliance from 19% in the 2008/2009 season to 9% in 2011/2012. These results have been achieved through a collaborative approach between the industry players and Environment Canterbury. Fonterra continues to support this approach to further improve compliance rates.
- 7.53 Farms who lack sufficient storage to allow for effluent irrigation to be deferred to periods where suitable soil moisture deficit exists do pose an increased risk of phosphorus, nitrogen and pathogen loss due to application of effluent to soils when moisture levels are elevated.

30. DairyNZ Audited Nutrient Management Project – 2010/2011 pilot study.

31. Environment Canterbury; The Canterbury Region Dairy Report 2011/2012 Season; 2012

- 7.54 There is potential to reduce these losses through investment in large effluent storage facilities. A number of farms in Canterbury have already completed this work and Fonterra is working with farmers, utilising tools such as the Massey University Dairy Effluent Storage Calculator to calculate site specific storage volumes (rather than utilising regulatory baselines specified by the current NRRP) to help them achieve this.

Dicyandiamide (DCD) nitrification inhibitors

- 7.55 The application of DCDs to pasture over the high risk months³² can reduce the losses of nitrogen from the soil profile. DCD's reduce nitrogen losses by slowing the process in the soil that converts ammonium into nitrate. While pasture plants can utilise nitrogen in both of these forms, ammonium is readily held in the soil while nitrogen is easily lost in drainage water.
- 7.56 Small amounts of DCD have recently been detected in testing of some New Zealand dairy products. Fertiliser companies Ravensdown and Ballance, have decided to voluntarily suspend sales and use of DCD treatment on farmland until further notice.

Trends and changes anticipated based on industry initiatives

- 7.57 As with any community, our farmers comprise a number of individuals with a variety of skills, capabilities and capacities for change. At one end of the spectrum there are farmers who are consistently ahead of their peers, whilst there are others who will always find change challenging.
- 7.58 Additionally, farmers operate within an infinitely variable set of constraints, which may be environmental, financial or simply related to the physical make-up of the farm. Dairy farming businesses are complex and the definition of good practice is continuously changing.
- 7.59 The initiatives that the industry invests in are aimed at assisting every farmer to be as close to best practice as they can be, while maintaining their profitability and productivity. This is not achieved by a one size fits all approach, and this is

32. The high risk months for nitrate leaching occur over the autumn and winter periods when drainage through the soil is generally higher and plant uptake of nitrogen from the soil is low.

illustrated by the structure and key elements of Supply Fonterra. In particular, Supply Fonterra is intentionally structured to drive improvements through the entire supply base. This approach allows for accelerated uptake of good practice that delivers change at an industry level, while catering for the needs of the individual within it.

8. CONCLUSIONS

- 8.1 Fonterra seeks to provide scope for continued dairying in the Region in a sustainable manner, maximising opportunities for the environment, economy and community of Canterbury in the years ahead. Dairying makes a significant social and economic contribution to local communities, the wider Canterbury Region and New Zealand.
- 8.2 The Accord has significantly changed the face of sustainable dairying in New Zealand. The Accord has initiated significant and continuing change and improvement on-farm and has provided a platform for the implementation of Fonterra's Supply Fonterra programme. The Supply Fonterra programme clearly specifies minimum standards for farmer to continuously improve on-farm environmental performance. This programme has been shown to be robust, auditable and includes consequences where targets are not achieved.
- 8.3 Fonterra's involvement in collaborative projects such as the Canterbury Dairy Effluent Group and stock exclusion and nitrogen benchmarking within the Te Waihora catchment have been effective in delivering improvement in environmental performance on dairy farms and has resulted in outcomes that are widely supported by stakeholders.
- 8.4 Reporting and observations in Canterbury show that industry based initiatives have resulted in a significant level of uptake of commonly accepted good farming practices in the Region. It is anticipated that through further initiatives such as the Supply Fonterra programme will continue to accelerate the uptake of good practice at an industry level, while catering for the needs of the individual within it.