Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Canterbury Region Dairy Report 2014-2015 Season

Facilitating sustainable development in the Canterbury region

Citations of this document should be in the form:
Burns, M J. 2015. Canterbury Region Dairy Report 2014–2015 Season.
Environment Canterbury Report No. R15/140

PO Box 345
Christchurch
Phone (03) 353 9007

75 Church Street
PO Box 550
Timaru
Phone (03) 687 7800
Fax (03) 687 7808

Website: www.ecan.govt.nz
Customer Services Phone 0800 324 636

Report No. R15/140
ISBN 978-1-927299-14-2 Hard copy
ISBN 978-1-927299-15-9 Web Copy

Author: Melanie Burns
October 2015

EXECUTIVE SUMMARY

The dairy industry is important to both the Canterbury and national economies. The 2014-2015 season which this report covers was a very challenging one for farmers with reduced payouts and drought conditions.

Dairying has been growing in Canterbury. We now have 1149 farms compared with 632 10 years ago. The average dairy herd size in Canterbury is larger than elsewhere in New Zealand (912 compared with the national average of 413). The increase in dairying is part of a more widespread increase in farming intensification.

Environment Canterbury's role is to make sure this intensification does not unduly impact on water quality throughout the region. The Canterbury Water Management Strategy and the regulatory and non-regulatory actions that flow from it deal with the issues arising from land use intensification in a number of ways.

Several of the targets in the Canterbury Water Management Strategy focus directly or indirectly on the impacts of changing land use. Setting environmental limits is one of these. The Land & Water Regional Plan, which provides the framework for delivery of the community's aspirations for water management, focuses on limiting nutrient outputs from different farming activities.

In this context, our monitoring of dairy farms has become much more than just assessing compliance with consent conditions. It is an essential part of implementing the Canterbury Water Management Strategy. We are increasingly working alongside farmers and the industry to help improve environmental performance on farm while at the same time maintaining or improving profitability.

Environment Canterbury has an obligation to monitor compliance with dairy effluent discharge consents. We looked to meet this obligation while at the same time working with farmers dealing with the season's many challenges.

Last year saw less serious non-compliance with resource consent conditions than the previous year, with higher rates of minor non-compliance.

A change of approach has been implemented. We moved away from monitoring every dairy farm in the region at least once a year towards a more targeted regime based on risk criteria.

During the 2014-2015 year 976 of 1149 dairy farms were actively monitored at least once -85% of all farms. Because the farms that were not monitored were assessed as being lower risk (higher end of performance), year-on-year results are no longer directly comparable, with the level of compliance being understated and non-compliance overstated.

The rate of compliance in respect to farms that were monitored declined compared with last season (64%; 72.5% in 2013-2014). However, the rate of significant non-compliance or enforcement action was lower (6.5%; 8.5% in 2013-2014).

There was an increase in the number of abatement notices compared with previous years, but the number of incidents warranting infringement notices decreased and there were no serious incidents that resulted in charges being laid in court (prosecutions) this year.

An analysis of compliance by Canterbury Water Management Strategy zone showed the highest levels of compliance were in Christchurch-West Melton (100%), Kaikōura (87%), Ashburton (75%) and Hurunui-Waiau (73%). The lowest were in Upper Waitaki (one out of four farms compliant - 25%), Orari–Opihi–Pareora (47.75% compliant) and Lower Waitaki (54.25% compliant).

Compliance monitoring site inspections identified several common issues. Exceedance of application depth and/or ponding of dairy effluent were among the most common reasons for non-compliance, although the levels of these non-compliances were lower than in previous seasons.

Some of the other main non-compliances were exceeding the undiluted volumes of dairy effluent, overflow from storage ponds, and storage ponds not meeting requirements. Discharge of dairy effluent within buffer zones was found to a lesser extent than in previous seasons and there was only one instance of a direct discharge to water.

Resource Management Officers also recognised many good practices on dairy farms during the monitoring season. Many farm owners or managers went beyond their consented conditions to improve their environmental performance. Environment Canterbury appreciates the ongoing efforts and co-operation of these farmers.

Where there was significant non-compliance or enforcement action, follow-up site inspections were conducted. Most dairy farms were compliant with the conditions of their resource consent or improved their performance at that follow-up inspection. Those that did not will be a priority for monitoring in the 2015–2016 season.

Environment Canterbury will continue with this targeted regime in the 2015-2016 season as well as continuing to work with farmers and the dairy industry to take initiatives and improve compliance throughout Canterbury.

Farm environment planning will be a crucial aspect of this work. Environment Canterbury is gearing up to get closer to the farm gate in all its activities relating to land use and environmental protection.

Table of Contents

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION

1.1 History of dairy farming in New Zealand

Farming has had a long and successful history in New Zealand. It is embedded in our culture and psyche and is a well-celebrated part of what makes us unique. Private property law instils a rights-based view of our land which is held strongly by all. Farmers are no exception; many have had family ties to the land for generations and full freedom to farm how they wish, including the common intention to look after and improve the land for future generations. However, the nature of farming has changed: what were once small blocks with small numbers of stock have become larger farms with more stock, and fewer farmers are working on them. Table 1 shows these trends.

Table 1: National statistics on dairy farms, 1981–1982 and 2013–2014

	Herds	Total cows	Total effective hectares	Average herd size	Average effective hectares	Average cows per hectare
1981–1982	15,821	2,060,898	996,732	130	63	2.07
2013–2014	11,927	4,922,806	1,716,464	413	144	2.87

See also http://www.lic.co.nz/user/file/DAIRY%20STATISTICS%202013-2014-WEB.pdf

The New Zealand community is becoming more interested in the impacts of farms on the environment. As farm size, production and intensity increase so too do potential impacts on the environment. Our soil and water are deeply interconnected, so the impact of farming is felt a long way from its boundary. In giving effect to the Resource Management Act 1991, the aim is to develop, alongside sustainable development, a culture of responsibility that reflects the physical and generational interconnectedness of our environment and that influences our farming culture.

1.2 Canterbury cow numbers and herd size

Dairying has been growing in Canterbury, we now have 1149 farms compared with 632 ten years ago. The total number of cows has increased since 2005 by 182% to a total of 1,047,935. Table 2 presents a comparative analysis of the 2004–2005 and 2014–2015 seasons as a snapshot of how cow numbers have changed over this period.

Since 2004–2005 the average size of a Canterbury dairy herd has increased by 55% to 912 cows per herd and the median has increased by 48% to 800. The average dairy herd size in Canterbury is larger than elsewhere in New Zealand (912 cows per head, compared with the national average of 413). The number of herds with 1001–2000 cows has increased by 518% from 56 to 346, the greatest increase of all the ranges of herd size (Table 3). The increase in dairying is part of a more widespread increase in intensification of farming. Table 4 summarises the spread of farms in terms of their herd size over each of the Canterbury Water Management Strategy zones. Figure 1 and Figure 2 illustrate the change in geographical spread of the farms between 2004–2005 and 2014–15.

Table 2: Change in number of cows and herd size in Canterbury, 2004–2005 and 2014–2015

Season	Number of farms	Total number of cows	Average herd size	Median herd size	Largest herd	Smallest herd
2004–2005	632	371,686	588	540	3100	50
2014–2015	1149	1,047,935	912	800	3680	80
Percentage change	**82%**	**182%**	**55%**	**48%**	**19%**	**60%**

Table 3: Change in herd size from 2004–2005 to 2014–2015

Season	Herd size					
	0–300	301–600	601–1000	1001–2000	2001–3000	3001+
2004–2005	141	245	183	56	6	1
2014–2015	72	256	459	346	14	2
Percentage change	**–49%**	**5%**	**150%**	**518%**	**133%**	**100%**

Table 4: Cow herd size by Canterbury Water Management Strategy zone, 2014–2015

Zone	Herd size					
	0–300	300–600	600–1000	1000–2000	2000+	Total
Ashburton	6	71	161	141	5	384
Banks Peninsula	5	-	-	-	-	5
Christchurch–West Melton	1	-	-	-	-	-
Hurunui–Waiau	-	18	43	33	2	96
Kaikoura	6	10	7	-	-	23
Lower Waitaki – South Coastal Canterbury	1	39	57	44	2	143
Orari–Opihi–Pareora	13	47	74	35	2	171
Selwyn–Waihora	20	46	86	64	3	219
Upper Waitaki	-	-	-	4	-	4
Waimakariri	20	25	31	25	2	103
Total	**72**	**256**	**459**	**346**	**16**	**1149**

Figure 1:
Representation of farms and herd size, 2004–2005 (relative change in land use, not absolute land use).

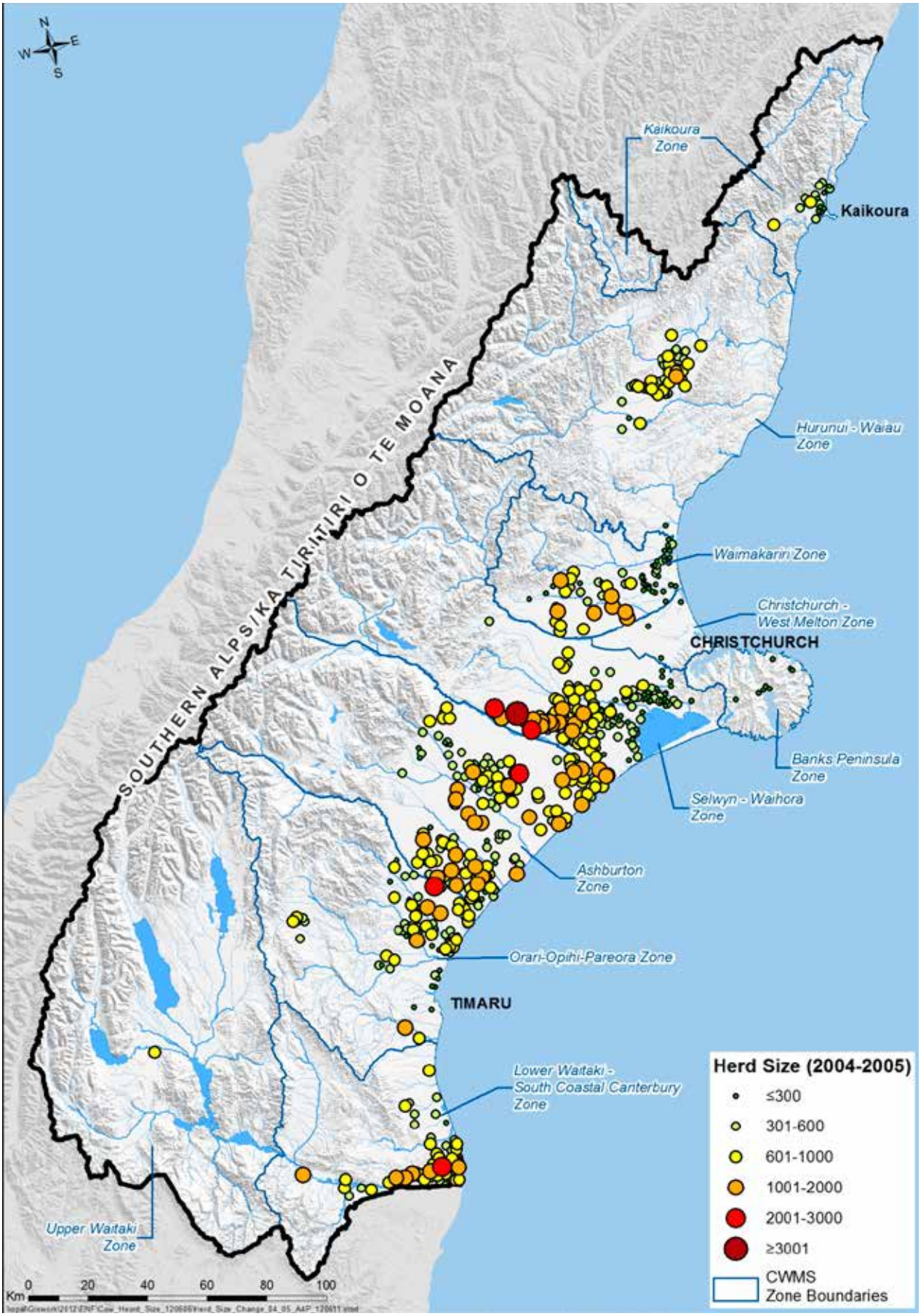
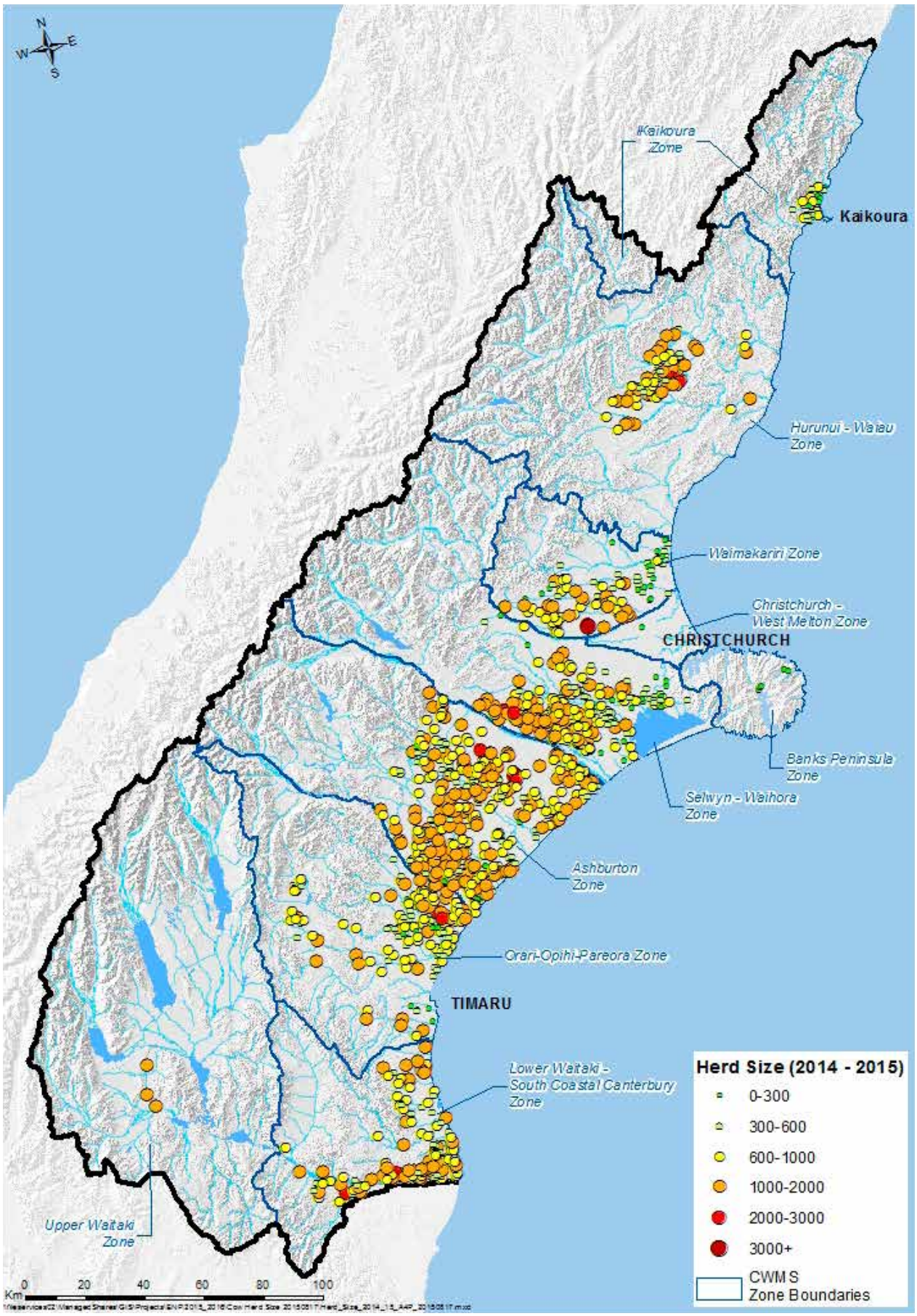


Figure 2:
Representation of farms and herd size, 2014–2015 (relative change in land use, not absolute land use).



1.3 Environment Canterbury's responsibilities

The purposes of New Zealand's regional and local authorities are determined by legislation and central government policy, and also by the needs, preferences, priorities and expectations of the communities we serve. Environment Canterbury works closely with communities, mana whenua, businesses, industry sectors and groups, taking a regional view of the management of natural resources – air, water, land and our region's unique biodiversity. We also have responsibility for a diverse range of other functions.

Environment Canterbury's work and activities are organised into seven portfolios. Within each of the seven portfolios is a range of work programmes, as outlined in the Long Term Plan, http://ecan.govt.nz/publications/Plans/ltp-2015-25-a.pdf

The monitoring of dairy effluent discharges forms part of the work in two portfolios:

1. Canterbury Water Management Strategy
2. Planning, consents and compliance

Environment Canterbury monitors dairy effluent discharges to satisfy its obligations under the Resource Management Act, and to ensure that the discharge of farm dairy effluent is managed in a way that does not unduly impact on water quality and contributes to the achievement of priorities in the Canterbury Water Management Strategy and achieve the broad environmental and economic development outcomes sought by the community, Ngāi Tahu, sectors and groups.

The consent conditions for individual dairy effluent discharge and storage consents are designed to ensure environmental effects remain less than minor. Non-compliance with dairy effluent consent conditions has potential for significant adverse environmental effects (Appendix 1) and must be dealt with appropriately. The seriousness of the actual and/or potential adverse effect, the conduct of the resource user and significance to the community are some of the factors that will determine what action is taken.

Regulation of dairy effluent is only a small piece in the larger puzzle of improving water quality. The Canterbury Water Management Strategy is the framework to deliver this.

1.4 The role of the Canterbury Water Management Strategy

The Canterbury Water Management Strategy marks a large shift in the way water issues are dealt with. It provides a shared vision developed over years of community discussions, led by Environment Canterbury, Ngāi Tahu and district and city councils.

It's about bringing to life a long-term vision to ensure we have clean, fresh water now and for generations to come - because we can all agree, water is our common ground.

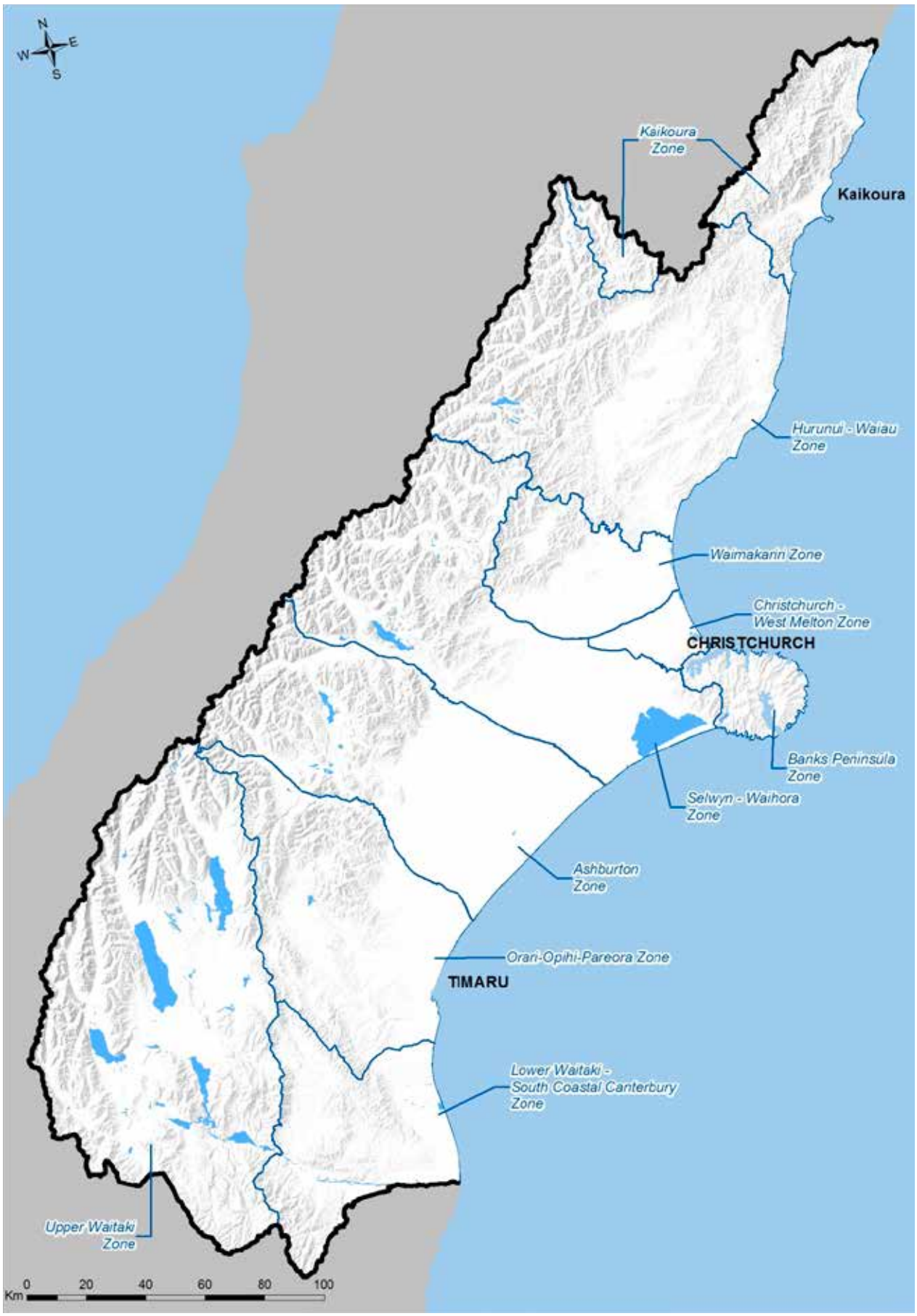
The Strategy puts finding solutions to local water issues into the community's hands. Canterbury is covered by 10 zones (Figure 3) each of which has a committee responsible for bringing local people together. The committees have regular meetings and workshops to develop effective water management solutions that deliver economic, social, cultural and environmental outcomes in collaboration with the local community.

Committees are guided by the targets agreed to in the Strategy. They make recommendations for the best way to manage water in their area. Committees have a set of immediate goals as well as milestones to meet by 2015, 2020 and 2040.

The focus is on delivering a balanced set of quantified targets in these areas: drinking water, irrigated land, energy security and efficiency, ecosystem health/biodiversity, water use efficiency, kaitiakitanga, regional and national economic growth, natural character of braided rivers, and recreational and amenity opportunities.

The Land & Water Regional Plan provides the statutory framework for delivering on the Canterbury Water Management Strategy. The monitoring of dairy farms has become much more than assessing compliance with consent conditions, it is an essential part of implementing the strategy.

Figure 3:
Map of the Canterbury Water Management Strategy zones.



1.5 Farmers and Environment Canterbury

Environment Canterbury recognises the significant economic benefits provided by dairy farming, while also being responsible for managing the environmental effects of these activities. Potentially positive changes from dairy farming include more riparian and native plantings, fencing of waterways and improved soil organic matter under irrigated pasture. Potential negative effects are nutrient losses to water or to the atmosphere from collection, storage and re-application of nutrients - referred to as "dairy effluent".

Dairy effluent is generally a 1:10 dilution of untreated cattle faeces and urine with water and a minor component of spillage of contaminants and detergents or washing additives from shed wash-down. In some circumstances (such as for indoor systems, or systems with feed pads and mechanical separation), this ratio may be different. When managed well, dairy effluent is a valuable on-farm resource. It provides economic benefit to dairy farmers because it contains nitrogen, phosphorus and potassium, and promotes improved pasture production. When not managed well, dairy effluent can become a pollutant. The most significant contaminants in liquid dairy effluent are faecal contaminants (bacteria and viruses), ammonia, oxygen demand, and nutrients (nitrogen and phosphorus).

Consent conditions aim to ensure that the environmental effects of dairy effluent are no more than minor. Compliance with consent conditions demonstrates an effective effluent management system, which also has the potential for significant economic benefit because on-farm generated nutrients reduce the need for off-farm fertiliser inputs.

Farmers have a direct and personal interest in making sure the quality of groundwater is protected, because most household water on farm is provided from the farm itself and clean water is necessary for production. Many farmers also wish to use rivers and streams for recreation.

Positive relationships between Environment Canterbury and farmers is fundamental to gaining compliance with consent conditions and developing a culture of good management practice. During compliance monitoring site inspections and in response to enquiries by consent holders, Resource Management Officers give advice on good management practices relating to dairy effluent storage and discharge. Resource Management Officers are also able to highlight current or future rule changes, meaning farmers can start allowing for these. They can also inform farmers when new rules come into effect.

Environment Canterbury provides support and education to the community through its Implementation and Extension section. Land Management Advisors work in partnership with the dairy industry on a number of rural initiatives, including farm environment plans designed to identify and support good management practices. Education and engagement on water quality issues are also achieved through catchment group initiatives.

1.6 Industry representatives

Industry bodies such as DairyNZ and milk processing companies are a key source of good management practice advice. A number of initiatives are in place at either national level (for example, Sustainable Dairying: Water Accord) or at company level (such as Synlait's Lead with Pride). These are outlined in more detail in Section 6.3. Resource Management Officers and industry bodies should align their advice so that farmers receive consistent messages.

The Canterbury Dairy Effluent Group was formed in October 2008 to implement initiatives aimed at improving awareness of dairy effluent management and compliance with resource consent requirements, as well as making sure messages from all parties were consistent. In 2014 the group broadened its scope to become the Canterbury Dairy Environment Group with the additional requirements of the Land & Water Regional Plan and sub-regional variations to it. The group includes representatives from Environment Canterbury, DairyNZ, Federated Farmers, South Island Dairying Development Centre, Fonterra, Synlait Milk, Westland Milk Products, Oceania Dairies and the Primary Industry Training Organisation. For more details refer to Section 6.3.

1.7 Tangata whenua and Environment Canterbury

For Ngāi Tahu, water is a taonga (treasure) and has an inherent value that must be recognised and provided for. Taonga refers to the values associated with the water itself and the resources living in it, as well as other life and resources sustained by water.

Each water body has its own mauri (life force) and mana. The exercise of kaitiakitanga is the active protection of and responsibility for natural and physical resources by tangata whenua.

Values associated with specific waterbodies include:

- A role in unique tribal creation stories
- A role in historical accounts
- Proximity to wāhi tapu settlement or other historical sites in or adjacent to specific waterbodies
- Use as access routes or transport courses
- Value as traditional sources of mahinga kai and other cultural materials
- Continued capacity for future generations to access, use and protect the resource.

The Local Government Act 2002 and Resource Management Act 1991 give regional councils specific obligations regarding kaitiakitanga, the principles of the Treaty of Waitangi and the relationship that Māori, their culture and their traditions have with their ancestral lands, water, sites, wāhi tapu and other taonga. To give effect to these obligations, Environment Canterbury must continue to develop its partnership with all 10 Papatipu Rūnanga in Canterbury and with Te Rūnanga o Ngāi Tahu, the iwi authority. A strong relationship with Ngāi Tahu is essential for achieving sustainable management of Canterbury's natural resources.

As part of this engagement, Environment Canterbury has made a commitment with Ngāi Tahu to engage as partners in a constructive and progressive relationship. This commitment is supported by Tuia, which translates as "Working together, arm in arm". It is the joint work programme of Environment Canterbury and Ngāi Tahu which aims to achieve sustainable environmental outcomes, perpetuating and supporting customary practices, and providing for development and effective iwi participation. This commitment is based on the recognition that the relationship Ngāi Tahu has with ancestral lands in Canterbury is inevitably affected by the powers and functions of Environment Canterbury.

Rūnanga representatives are partners together with local government in the Canterbury Water Management Strategy through their positions on the Regional Committee and the 10 zone committees. The Canterbury Water Management Strategy includes a series of kaitiakitanga targets, as well as biodiversity and ecosystem targets that help deliver tangata whenua values.

Tangata whenua have concerns about the direct and indirect impact of dairy discharges on waterways. They have high expectation that, at the very least, current consent conditions are being met. Ensuring compliance in this area will go a long way towards restoring the relationship Ngāi Tahu has with its taonga and strengthening the partnerships between the iwi, Environment Canterbury and the wider community.

2 SCOPE OF THIS REPORT

This report covers the level of consent compliance for the discharge to land of dairy effluent collected in the milking process in Canterbury in the 2014–2015 dairy season. It does not detail compliance with land use consents to store dairy effluent, farming land use consents, or the relevant farming rules in the Land & Water Regional Plan. However, when a site visit is undertaken, the dairy effluent disposal system as a whole is inspected due to the integrated nature of storage and discharge (see Section 3.2) and other areas with potential to result in effluent discharges to water, and discharge of contaminants to air and to land (such as offal pits and stock in waterways) are monitored against the relevant rule in the plan. Resource Management Officers also respond to complaints about such activities received through Environment Canterbury's Pollution Hotline (see Section 5.5).

3 MONITORING METHODS

In previous monitoring years we have undertaken (as part of the Sustainable Dairying: Water Accord) to monitor every farm every year. The dairy industry has become more focussed on self-regulation and we want to recognise improvements in compliance and incentivise farmers to go beyond compliance into good management practices. Therefore, as we signalled in last year's Annual Dairy Report we changed the way we monitored dairy effluent consents across the region. All farms were prioritised based on the risk criteria below. By focussing our monitoring effort on farms that are high risk or have poor performance we hope to move these farms into compliance.

During 2014–2015 there were 1149 dairy farms in Canterbury, 976 of which were monitored for compliance with the conditions of their relevant resource consents. The monitoring of resource consents can be broken down into three parts: preparation for site inspections, compliance monitoring site inspection, and post site inspection.

3.1 Preparation for site inspections

All dairy farms were graded according to risk based on these criteria:

1. Scale of activity and mechanism of damage
   - Number of cows per hectare
   - Storage (type, volume, number of milking days/rainfall adjustments etc.)
   - Type of irrigation (manually operated, centre pivot, programmable etc.)
   - Age of system and maintenance requirements and systems
   - Failsafe mechanisms (alarms, shut-off backstop etc.)
2. Sensitivity of receiving environment
   - Distance to surface water
   - Depth to ground water
   - Soil type (tight or porous)
   - Location to sensitive areas (community drinking water supplies, recreation activities, areas of cultural significance)
   - The nutrient management zone (Red, Lake, Orange, Green, Light Blue or Hurunui-Waiau)
   - Other (eg artificial drainage, tile drains)
3. Management structure and processes
   - Operating at good management practice and have a farm environment plan
   - Staff training systems
   - Farm/dairy effluent management plans in place/followed
   - Knowledge of consent requirements
   - Internal audits/quality systems
4. Compliance history – whether there were any previous instances of significant non-compliance or enforcement action.

All high and medium risk farms were monitored at least once during the 2014-15 dairy season. Some high risk farms were monitored more than once even if they were compliant on their first site visit.

The farms were divided into geographical blocks to enable Resource Management Officers to visit a group of consents in the same area, thus improving efficiency and reducing compliance monitoring costs (Appendix 2) to resource consent holders. Some low risk farms were also monitored when numbers were needed to make a full day of site visits. Low risk farms will be monitored every two years.

Dairy farms were then assigned to Resource Management Officers to conduct compliance monitoring site inspections. Before each site visit, the Resource Management Officer reviewed the farm's compliance history. This review covered details of any previous non-compliance, information on the dairy effluent disposal area, sensitive areas on the property, the management plan, seepage reports, pond certification, backflow prevention certificate and storage consent where applicable.

3.2 Compliance monitoring site inspections

All inspections were carried out without warning, although a phone call was made up to 30 minutes before entering the property to meet a senior person on site, such as the farm manager or consent holder. When no-one was present, a notice of inspection was left in a prominent position with the Resource Management Officer's contact details and the reason for the visit. Resource Management Officers then contacted the consent holder to discuss the findings of the site visit and gain necessary information.

Some dairy farms hold two resource consents, one to store dairy effluent and the other to apply it to land. In these cases, both resource consents were monitored during the same inspection. Dairy farms with previous significant non-compliance issues had compliance monitoring site inspections earlier in the dairy season.

The inspection of the dairy effluent disposal system included, but was not limited to:

- Inspection of the dairy yard and associated channels to make sure dairy effluent was not being washed into unlined areas or surface water bodies
- Inspection of the dairy effluent storage system for evidence of sump overflows (recent and historical)
- A clear demonstration that the effluent pond was adequately sealed. It is common for a resource consent to require the consent holder to obtain a registered engineer's report as proof that the pond is adequately sealed
- Inspection of the dairy effluent disposal area to assess the dairy effluent application rate (by walking through the dairy effluent disposal area) and make sure the discharge is in the consented area
- Inspection for any dairy effluent ponding on the soil surface

- Inspection to ensure that the appropriate buffer distances were being maintained between bores, boundaries, soak holes and waterways
- Inspection of the dairy effluent pipeline for any obvious breaks or leaks
- Storage and spreading of solids.

Resource consent compliance was assessed by the Resource Management Officer while on site and each resource consent condition was graded according to the level of compliance.

The main compliance grades are:

- Complies – All conditions have been complied with and no action is required
- Non-compliance, no further action - Non-compliance is considered administrative, minor or technical in nature. There are no or very minor actual or potential adverse effects
- Non-compliance, action required – The non-compliance is considered minor with actual or potential minor adverse effects. This non-compliance should be addressed because it could lead to continuing or repeat non-compliance
- Significant non-compliance – The non-compliance is considered to have significant actual or potential adverse effects. The consent holder will be requested to respond within a given timeframe (depending on actual or potential environmental effect), confirm action to be taken to address the non-compliance and a date by which the action should be taken
- Not monitored or unable to be assessed
- Enforcement action – enforcement action has been taken against the consent holder.

Appendix 4 shows standard grades used by Resource Management Officers when non-compliance is encountered. When non-compliance with resource consent conditions is identified during a compliance monitoring site inspection, Resource Management Officers report this to the person in charge of the site where possible. Resource Management Officers then give verbal instructions to remedy the situation.

Figures 4–7 are examples of grades from Complies to Enforcement action in relation to ponding.

Figure 4: No ponding – Complies

Figure 5: Ponding – Non-compliance, action required

Figure 6: Ponding – Significant non-compliance

Figure 7: Ponding – Enforcement action

For some non-compliances, enforcement action may be taken to:

- Avoid, mitigate or remedy adverse effects
- Achieve compliance
- Deter and compensate/penalise.

Table 5: Options for enforcement action

Non-compliance	Probable response
Significant non-compliance where there is no history of similar breaches	• Formal warning or • Abatement and/or infringement notices in severe cases and • Re-inspection to ensure compliance achieved
Repeated significant non-compliance	• Abatement and infringement notices or • Prosecution and • Re-inspections with repeated infringement notices until compliance is achieved
Persistent significant non-compliance or enforcement action taken (where multiple infringement notices have not resulted in compliance being achieved)	• Prosecution and • Continued increased monitoring frequency in coming seasons until a history of compliance is established
Discharge that results in a direct discharge to a surface water body or to groundwater (via a soak hole)	• Prosecution and • Continued increased monitoring frequency in coming seasons until a history of compliance is established

All enforcement action is undertaken in accordance with Environment Canterbury's Compliance Monitoring and Enforcement Guidelines 2010[1]. This guideline is designed to ensure that the use of enforcement tools is transparent and that people are treated in a consistent and equitable manner.

The appropriate enforcement tool will be used, taking account of:

a. The seriousness, imminence and/or reversibility of adverse environmental effects; for example:

- The magnitude of the actual adverse effect
- The nature of the receiving environment
- Irreversibility and/or duration of effects
- Potential effects

b. Past and present conduct of the resource user; for example:

- Deliberateness
- History of the situation/alleged offender
- Avoidability
- Commitment to ensure compliance
- Documented warning/requests
- Remediation/mitigation
- Remorse demonstrated

c. The significance to the community; for example:

- Prevalence of the offence
- The need for deterrence
- Upholding the integrity of the law
- Public expectation of prosecution
- Sense of injury or upset (victim impact)
- Complaints
- Considerations of fairness and balance

d. Legal availability of particular enforcement tools

e. Failure or ineffectiveness of compliance promotion measures

f. Implications for the application of the Resource Management Act

g. The cost effectiveness of the approach.

The enforcement methods most commonly used are abatement notices (requiring an action to be undertaken or an activity to cease), infringement notices (a punitive fine for breach of the Resource Management Act) and prosecutions.

3.3 Post site inspection

Following all compliance monitoring site inspections, a compliance monitoring report was produced and sent to the consent holder. The report outlined the dairy farm's compliance with the conditions of its resource consent and summarised any issues encountered during the compliance monitoring site inspection. It also detailed any remedial actions required and the timeframe within which they were to be completed. If there was a significant non-compliance, a copy of the compliance monitoring report was sent to the milk supply company and a follow-up visit was made to the farm.

Where non-compliance was identified, one or more enforcement options were used, ranging from a formal warning in the compliance monitoring report to an abatement notice and/or an infringement notice fine. All enforcement action was taken in accordance with Environment Canterbury's Compliance Monitoring and Enforcement Guidelines 2010[2].

1 A copy of this guideline is available from Environment Canterbury on request.

2 See http://ecan.govt.nz/publications/General/compliance-monitoring-enforcement-guidelines-000510.pdf

3.4 Follow-up site inspection

If a consent was graded significantly non-compliant, enforcement action; or if there was concern about the potential for non-compliance, a follow-up site inspection was conducted during the season. If the follow-up identified repeated or new significant non-compliances, further site inspections were undertaken until they were resolved.

The purpose of follow-up site inspections is to assess corrective actions taken by resource consent holders and/or farm managers. The follow-up inspections were undertaken with the milk supply companies if possible.

Another compliance monitoring report was produced after the follow-up site inspection.

3.5 Challenges to effective monitoring

There are some issues that can undermine the effectiveness of monitoring and compliance, and could skew monitoring results. These issues and their implications are detailed below.

3.5.1 Ability to monitor consent conditions

The consented area of land in which effluent is spread is an important factor in determining the maximum number of cows consented on the farm because this relates directly to the nitrogen loading in the soil. It is very difficult to ascertain whether the effluent is spread evenly within the designated area. If it is not, some areas may have greater nitrogen loading, leading to an adverse environmental effect and undermining the requirement of the condition.

Timing is very important in assessing consent compliance. Some farmers discharge effluent infrequently due to storage availability and/or weather conditions. Because it monitors without warning, Environment Canterbury may not be able to assess compliance with some conditions. During this season, only 8 farms (0.75%; see Table 29 in Section 5.4.2) could not be assessed against the condition of their consent that related to the discharge of effluent not exceeding the water-holding capacity of the soil or resulting in ponding on the surface.

4 DATA ANALYSIS

For the purpose of this report, two methods were used to interpret the results of Environment Canterbury's 2014–2015 dairy season compliance monitoring programme: consent-based and condition-based compliance. There were 976 consents and over 14,000 consent conditions monitored in the 2014-2015 season.

Consent-based compliance
The overall compliance grade is derived from the consent condition with the worst compliance grade. For example, where one condition is graded non-compliance action required and another significant non-compliance, the overall compliance grade will be significant non-compliance. Overall consent-based compliance statistics are provided in Table 6 in Section 5.1.1.

Condition-based compliance
Condition-based compliance statistics show the total number of conditions monitored on all dairy effluent consents in the Canterbury region over the 2014–2015 season and identify the compliance grade for each condition. These statistics are provided in Table 7 in Section 5.1.2.

Rationale for this dual analysis
Considered in isolation, neither of the above methods of displaying the compliance statistics gives an accurate picture of the level of compliance. For example, a farm graded minor non-compliance on one condition and complies on all other conditions will have a lower overall compliance figure. On the other hand, with the total condition-based compliance figure alone, it is not possible to know whether farms are failing to comply with a couple of conditions, or most of their conditions.

5 RESULTS

This section includes a summary of the initial results, good management practices, common non-compliance issues, enforcement action and follow-up inspections. Initial results refer to the first inspection of the season for all farms. Follow-up inspections were carried out when non-compliance was identified.

There were 1149 farms authorised to discharge dairy effluent during the 2014–2015 season and 976 of these were monitored. There were 173 farms that were not monitored as they were considered low risk.

5.1 Regional statistics

5.1.1 Overall consent compliance statistics for initial visit

Of the 976 farms that were monitored, 64% (627) complied with all of the conditions of their resource consents. Minor non-compliance[3] was recorded at 29% (282) and significant non-compliance or enforcement action at 6.5% (63 farms) (Table 6). See Sections 5.6 and 5.7 for information on the action taken in response to the significant non-compliances or enforcement action.

Although compliance has decreased by 8.5% and minor non-compliance has increased by 10% when compared to 2013-2014, direct comparisons at a regional level cannot be made due to the change in monitoring. By focussing our monitoring effort on farms that have had a previous history of significant non-compliance or are high risk, and not monitoring 173 farms that were considered low risk, we are potentially skewing the data by understating compliance and overstating non-compliance. However, significant non-compliance or enforcement action decreased by 2% when compared to 2013-2014 despite the change in monitoring programme which is a great result.

Table 6: Initial site inspection resource consent-based compliance results for region, 2014–2015

Dairy farm inspections	Total	
Number of dairy farms	1149	
Number of dairy farms monitored	976	
Number of dairy farms not monitored	173	
Compliance grades	**Number**	**Percent**
Complies	627	64%
Unable to determine compliance	4	0.5%
Non-compliance, no action required	48	5%
Non-compliance, action required	234	24%
Overall minor non-compliance	**282**	**29%**
Significant non-compliance	54	5.5%
Enforcement action	9	1%
Overall significant non-compliance and enforcement action	**63**	**6.5%**

3 *This is the combined total for non-compliance, no action required and non-compliance, action required*

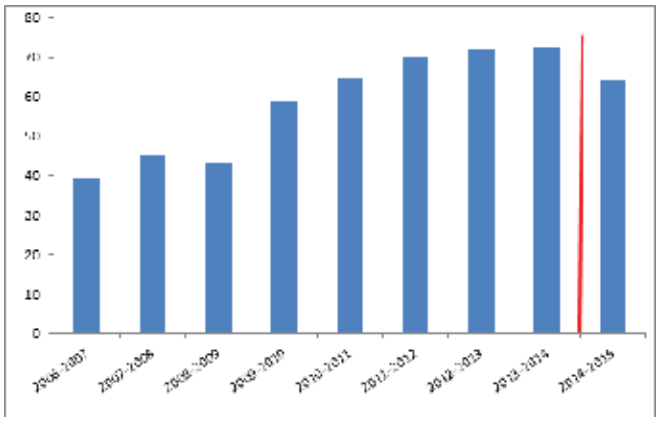


Figure 8: Fully compliant dairy farms from 2006–2007 to 2014–2015 (the red line indicates change in monitoring)

5.1.2 Monitored statistics for all conditions for region

In total, 71.5% of all conditions were compliant during the initial compliance monitoring site inspections (Table 7). This has decreased from 76% in 2013–2014. The number of conditions not able to be monitored has increased from 21% in 2013–2014 to 24.5% this season. Conditions not monitored include those that were not operational at the time of the visit or for which compliance could not be determined.

These results illustrate that although the overall level of consent compliance decreased, the percentage of conditions that comply was comparable with the previous season despite the change in monitoring.

Table 7: Initial site inspection condition-based compliance results for region, 2014–2015

Regional resource consent conditions	Complies	Non-compliance, no action required	Non-compliance, action required	Significant non-compliance	Enforcement action	Conditions not monitored or not operational
14,365	10,280 (71.5%)	343 (2.2%)	121 (0.75%)	80 (0.6%)	12 (0.1%)	3525 (24.5%)
		Minor Non-compliance 468 (3.3%)				

5.2 Results by Canterbury Water Management Strategy zone

The results have been analysed separately by Canterbury Water Management Strategy zones. In zones with only a small number of farms, the level of compliance can vary substantially between monitoring years due to the number of farms. Between zones there could be several reasons for variance in the level of compliance and scale of non-compliance, including differences in soil type, depth to groundwater, annual rainfall, and terrain and farm management. The size of the farm and the number of years in operation (and therefore age of effluent system, amount of storage and consent conditions) vary significantly between zones. This section presents an analysis of the results by zone. non-compliance, action required and non-compliance, no action have been combined into minor non-compliance. Figure 9 shows the geographical spread of significant non-compliance and enforcement action taken across the region.

5.2.1 Ashburton

In the Ashburton Zone, 72% of farms complied with all of the conditions of their resource consents (Table 8). This is slightly down from the previous season when 81.3% farms were compliant, but it is still above the regional average 64% (Table 6). This is because 25% of consents that were considered low risk were not monitored which means the results are not directly comparable.

The percentage of conditions monitored compliant (74.15%) decreased slightly from the 2013–2014 season (77.5%) and the percentage of conditions not monitored (22.68%) increased slightly compared with 2013–2014 (20.5%). Both are about the same as the regional average (Table 7).

The proportion of conditions monitored as compliant has not changed significantly despite the change in monitoring programme. This means a few farms in the region have been non-compliant, with only a few conditions contributing to the reduction in overall consent compliance.

Table 8: Initial site inspection consent-based compliance for Ashburton Zone, 2014–2015

Total resource consents	Consents monitored	% of consents monitored	Complies	Minor non-compliance	Significant non-compliance	Enforcement action
384 (33.5% of the region)	287	75%	207 (72%)	66 (23%)	13 (4.5%)	1 (0.5%)

Table 9: Initial site inspection condition-based compliance for Ashburton Zone, 2014–2015

Total conditions monitored	Complies	Minor non-compliance	Significant non-compliance	Enforcement action	Conditions not monitored	Conditions not monitored
4231	3140 (74.15%)	112 (2.65%)	18 (0.5%)	1 (0.02%)	960 (22.68%)	1083 (20.5%)

5.2.2 Banks Peninsula

The Banks Peninsula Zone has only 5 dairy farms, all of which were monitored this season. Two were compliant, two were minor non-compliant and one had enforcement action taken (Table 10). The farms that were minor non-compliant were non-compliant with one of the consent conditions. However, the farm that had enforcement action taken was significantly non-compliant with three conditions of the consent. Compliance in this zone has dropped significantly compared with the 2013-2014 season when all farms were compliant.

Table 10: Initial site inspection consent-based compliance for Banks Peninsula Zone, 2014–2015

Total resource consents	Consents monitored	% of consents monitored	Complies	Minor non-compliance	Significant non-compliance	Enforcement action
5 (0.5% of the region)	5	100%	2 (40%)	2 (40%)	-	1 (20%)

Table 11: Initial site inspection condition-based compliance for Banks Peninsula Zone, 2014–2015

Total conditions monitored	Complies	Minor non-compliance	Significant non-compliance	Enforcement action	Conditions not monitored	Conditions not monitored
60	32 (53.5%)	2 (3.25%)	2 (3.25%)	1 (1.5%)	23 (38.5%)	8 (13%)

5.2.3 Christchurch–West Melton

The Christchurch–West Melton Zone had one operational dairy farm this season. The farm was compliant. Two conditions could not be monitored.

Table 12: Initial site inspection consent-based compliance for Christchurch-West Melton 2014–2015

Total resource consents	Consents monitored	% of consents monitored	Complies	Minor non-compliance	Significant non-compliance	Enforcement action
1 (0.1% of the region)	1	100%	1 (100%)	–	–	–

Table 13: Initial site inspection condition-based compliance for Christchurch-West Melton Zone, 2014-2015

Total conditions monitored	Complies	Minor non-compliance	Significant non-compliance	Enforcement action	Conditions not monitored	Conditions not monitored
11	9 (82%)	-	-	-	2 (18%)	121 (9%)

5.2.4 Hurunui–Waiau

In the Hurunui–Waiau Zone, 73% of the farms were compliant with all of the conditions of their resource consents (Table 14). This is a significant decrease compared with the 2013–2014 season when 84% were compliant. However, it is above the regional average of 64%.

The proportion of conditions monitored compliant (81.75%) (Table 13) decreased slightly from the 2013–2014 season (89%) and is higher than the regional average of 71.5% (Table 7).

These results indicate that although the overall rate of consent compliance decreased, the proportion of consent conditions monitored compliant decreased only slightly. This means there may have been a few farms that were only non-compliant with a small number of conditions that lowered the overall compliance rate.

The proportion of farms that were monitored was 87.5%. Twelve farms were not monitored because they were considered low risk. Even if these had been monitored as compliant the overall rate of compliance would still be significantly lower than last year. Therefore the change in the monitoring programme has not significantly affected the results in this zone.

Table 14: Initial site inspection consent-based compliance for Hurunui–Waiau Zone, 2014–2015

Total resource consents	Consents monitored	% of consents monitored	Complies	Minor non-compliance	Significant non-compliance	Unable to determine compliance	Enforcement action
96 (8.25% of the region)	85	88.5%	62 (73%)	19 (22%)	4 (5%)	-	-

Table 15: Initial site inspection condition-based compliance for Hurunui–Waiau Zone, 2014–2015

Total conditions monitored	Complies	Minor non-compliance	Significant non-compliance	Enforcement action	Conditions not monitored	Conditions not monitored
1250	1021 (81.75%)	33 (2.5%)	9 (0.75%)	–	187 (15%)	26 (8.9%)

5.2.5 Kaikōura

In the Kaikōura Zone, 87% of farms were compliant with all the conditions of their consents (Table 16). This is above the regional average of 64% and a slight increase from 2013–2014 when 83% of farms were compliant. The proportion of conditions monitored compliant (85%) was higher than the regional average of 71.5% (Table 7).

The results show a good level of compliance in this zone and although only 70% of consents were monitored, this did not appear to affect the level of compliance.

Table 16: Initial site inspection consent-based compliance for Kaikōura Zone, 2014–2015

Total resource consents	Consents monitored	% of consents monitored	Complies	Minor non-compliance	Significant non-compliance	Enforcement action
23 (2% of the region)	15	65%	13 (87%)	1 (6.5%)	1 (6.5%)	–

Table 17: Initial site inspection condition-based compliance for Kaikōura Zone, 2014–2015

Total conditions monitored	Complies	Minor non-compliance	Significant non-compliance	Enforcement action	Conditions not monitored	Conditions not monitored
181	154 (85%)	3 (1.5%)	1 (0.5%)	–	23 (13%)	1083 (20.5%)

5.2.6 Lower Waitaki – South Coastal Canterbury

The proportion of farms that were compliant with all the conditions of their resource consents was 54.25% (Table 18), a decrease from the 2013-14 season when 68% were compliant and also below the regional average (64%).

The proportion of conditions monitored compliant (63.75%) also decreased compared with 2013-2014 (70%) and was significantly below the regional average (71.5%) (Table 7).

The results show a decline in the rate of compliance across this zone regardless of the change to the monitoring programme. Fourteen farms were not monitored because they were considered low risk. Even if they had been monitored compliant, the overall rate of compliance would still be significantly lower than last year.

A large proportion of farms in this zone were non-compliant with one or more of their consent conditions.

Table 18: Initial site inspection consent-based compliance for Lower Waitaki Zone, 2014–2015

Total resource consents	Consents monitored	% of consents monitored	Complies	Minor non-compliance	Significant non-compliance	Unable to determine compliance	Enforcement action
143 (12.5% of the region)	129	90%	70 (54.25%)	45 (35%)	12 (9.25%)	1 (0.75%)	1 (0.75%)

Table 19: Initial site inspection condition-based compliance for Lower Waitaki Zone, 2014–2015

Total conditions monitored	Complies	Minor non-compliance	Significant non-compliance	Enforcement action	Conditions not monitored	Conditions not monitored
1950	1243 (63.75%)	75 (3.85%)	16 (0.85%)	1 (0.05%)	615 (31.5%)	26 (8.9%)

5.2.7 Orari–Opihi–Pareora

In the Orari-Opihi-Pareora zone, 47.75% of farms were compliant with all of the conditions of their resource consents (Table 20). This is a significant decrease from 2013–2014 (79%) and well below the regional average of 64%. The proportion of significant non-compliance and enforcement action was around the same as the regional average. The proportion of minor non-compliance increased substantially to 46.25% from 10% in 2013-2014. The percentage of conditions monitored compliant (71.75%) (Table 18) was the same as last year (71.6%) and the regional average (71.5%) (Table 7).

The results show a dramatic decrease in the rate of compliance in this zone, regardless of the change in the monitoring programme. Eighteen farms were not monitored because they were considered low risk. Even if they had been monitored compliant, the overall rate of compliance would still be significantly lower than last year and the regional average. The decrease in compliance is the result of a number of consents being minor non-compliant with a few consent conditions.

Table 20: Initial site inspection consent-based compliance for Orari-Opihi-Pareora Zone, 2014–2015

Total resource consents	Consents monitored	% of consents monitored	Complies	Minor non-compliance	Significant non-compliance	Unable to determine compliance	Enforcement action
171 (14.75% of the region)	153	89%	73 (47.75%)	71 (46.25%)	6 (4%)	2 (1.5%)	1 (0.5%)

Table 21: Initial site inspection condition-based compliance for Orari–Opihi–Pareora Zone, 2014–2015

Total conditions monitored	Complies	Minor non-compliance	Significant non-compliance	Enforcement action	Conditions not monitored	Conditions not monitored
2216	1586 (71.75%)	114 (5%)	7 (0.35%)	3 (0.15%)	506 (22.75%)	612 (26.3%)

5.2.8 Selwyn–Waihora

In the Selwyn–Waihora Zone, 68.25% of farms were compliant with all the conditions of their resource consents (Table 22). This is a significant increase in the level of compliance compared with 2013–2014 (54%) and is above the regional average of 64%. The proportion of conditions monitored compliant (68.3%) slightly decreased from 2013–2014 (71.25%), and was slightly lower than the regional average.

All consents apart from one were monitored in this zone because they were all considered medium to high risk.

Table 22: Initial site inspection consent-based compliance for Selwyn–Waihora Zone, 2014–2015

Total resource consents	Consents monitored	% of total consents monitored	Complies	Minor non-compliance	Significant non-compliance	Enforcement action
219 (19% of the region)	218	99.5%	149 (68.25%)	52 (24%)	14 (6.5%)	3 (1.25%)

Table 23: Initial site inspection condition-based compliance for Selwyn–Waihora Zone, 2014–2015

Total conditions monitored	Complies	Minor non-compliance	Significant non-compliance	Enforcement action	Conditions not monitored	Conditions not monitored
3166	2162 (68.30%)	79 (2.5%)	18 (0.55%)	3 (0.1%)	904 (28.55%)	715 (23.5%)

5.2.9 Upper Waitaki

The Upper Waitaki Zone has only a small number of dairy farms. Three dairy farms (75%) were compliant with all of the conditions of their resource consent (Table 22) and the other farm was significantly non-compliant with only one consent condition (Table 23).

Table 24: Initial site inspection consent-based compliance for Upper Waitaki Zone, 2014–2015

Total resource consents	Consents monitored	% of total zone consents monitored	Complies	Minor non-compliance	Significant non-compliance	Enforcement action
4 (0.4% of the region)	4	100%	1 (25%)	2 (50%)	1(25%)	–

Table 25: Initial site inspection condition-based compliance for Upper Waitaki Zone, 2014-2015

Total conditions monitored	Complies	Minor non-compliance	Significant non-compliance	Enforcement action	Conditions not monitored	Conditions not monitored
139	86 (61.75%)	11 (8%)	2 (1.5%)	–	40 (28.75%)	26 (29.5%)

5.2.10 Waimakariri

In the Waimakariri Zone, the proportion of farms that were compliant with all of the conditions of their resource consents was 62% (Table 26) which is a slight improvement from 2013–2014 (60%), but still below the regional average of 64%. The percentage of conditions monitored compliant decreased (73%) (Table 27) compared with 2013-14 (81.25%) but was above the regional average (71.5%) (Table 7). The results show a slight improvement in full compliance despite only 77% of the medium and high risk farms having been monitored.

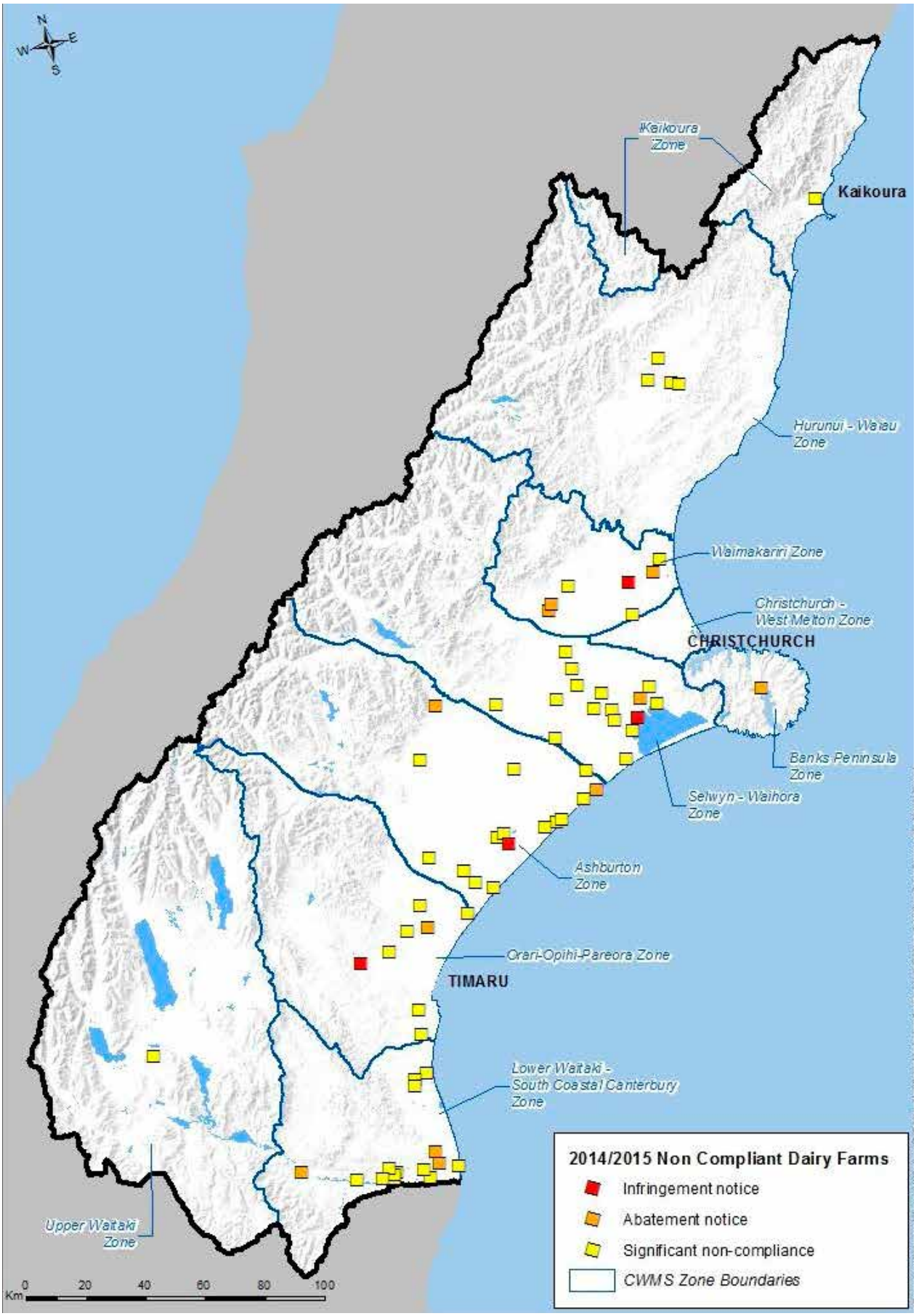
Table 26: Initial site inspection consent-based compliance for Waimakariri Zone, 2014–2015

Total resource consents	Consents monitored	% of total consents monitored	Complies	Minor non-compliance	Significant non-compliance	Unable to determine compliance	Enforcement action
103 (9% of the region)	79	77%	49 (62%)	24 (30.5%)	3 (3.75%)	1 (1.25%)	2 (2.5%)

Table 27: Initial site inspection condition-based compliance for Waimakariri Zone, 2014–2015

Total conditions monitored	Complies	Minor non-compliance	Significant non-compliance	Enforcement action	Conditions not monitored	Conditions not monitored
1161	847 (73%)	39 (3.25%)	7 (0.75%)	3 (0.25%)	265 (22.75%)	26 (8.9%)

Figure 9:
Geographical spread of non-compliance



5.3 Good on-farm practices

Actions employed on farm to improve dairy effluent compliance, as noted by Resource Management Officers during compliance visits, included the following.

5.3.1 In the shed

- Uncontaminated stormwater (shed roof) was diverted from the dairy effluent land application system where possible.
- The yard was wetted down before milking and scrapers were used before hosing down to reduce the volume of wash-down water required.
- All concreted areas were sufficiently bunded to contain dairy effluent.

5.3.2 Sumps and storage systems

- The storage and effluent system was designed according to the dairy effluent design code of practice.
- All channels, sumps, pipes and storage facilities were sealed and well maintained.
- Storage was agitated where required to reduce sediment and odour.
- The stone trap was cleaned out regularly, solids were placed on a concrete pad to dry and any liquid was able to run back into the stone trap. Alternatively, the material was spread to land while complying with the buffer distances between waterways, bores and soak holes.
- Adequate storage capacity was available to allow dairy effluent land application to be deferred when soil moisture levels were too high to irrigate.
- Storage facilities were maintained with sufficient freeboard to make sure storage was available when required.
- A safety ladder was in place for storage ponds.

5.3.3 Dairy effluent land application

- Dairy effluent irrigators were set up correctly and applied dairy effluent at the lowest rate possible, taking into consideration soil type, topography and soil moisture, to ensure that ponding, dairy effluent runoff and pasture damage did not occur, and to maximise the nutrient benefits of the effluent for pasture growth.
- The pump size was adequate relative to the land application system.
- There was adequate screening of solids.
- The irrigator was checked regularly to make sure it was operating correctly, there was no ponding and it would not come to the end of a run while discharging.
- Effluent was applied whenever conditions were suitable and on-site storage was used only when the conditions were unfavourable.
- Where a travelling irrigator was used, the hose was laid out properly to minimise drag on the irrigator.
- Sensitive areas such as bores, waterways and soak holes were identified and the appropriate buffer distances were maintained.
- High-risk areas such as compacted soil, pugging, low spots, ruts, water troughs and un-vegetated areas were mapped and avoided.
- Effluent was measured routinely to make sure the application rate and depth did not exceed the maximum limits specified by the resource consent.
- The land application area was sufficient to maintain nitrogen application rates from effluent below 200 kg/ha/year and effluent was applied evenly over this area. The area may need to be larger to keep potassium levels within the optimum range.
- Failsafe technologies were used to turn off irrigators remotely.
- GPS was used to track travelling irrigators to show where and when effluent had been applied.
- GPS variable rate irrigation was used.
- Soil moisture sensors were utilised.
- Farmers invested in new technology to enable them to manage their farms better.

5.3.4 Management

- An effluent management plan was developed and implemented. It was displayed in a prominent place in the dairy shed, together with a copy of the resource consent.
- Staff responsibilities were clearly defined and they were adequately trained in systems operation.
- Effluent storage and land application equipment was maintained regularly, as recommended by the manufacturer, and a maintenance record was kept.
- Contingency measures were put in place in the event of equipment failure, such as a spare pump and contact details for a vacuum tanker operator.
- A pre-season check was undertaken to make sure the effluent disposal system was adequate for the coming season's herd size and that all consent requirements were being complied with and a record of this check was kept.
- Where effluent was injected into irrigation water connected to a groundwater or surface water source, an approved backflow preventer was put in place to avoid backflow.
- The effluent management plan included a means of disposal of effluent outside the irrigation season.
- Staff were inducted on the management plan and resource consent conditions regardless of their role and responsibility.
- Farm managers took ownership and had a sense of pride in making sure their effluent system was managed efficiently and was compliant at all times.

5.3.5 Further information

For detailed information on best practice management techniques for dairy effluent disposal, refer to A Guide to Managing Farm Dairy Effluent – Canterbury. The guide is available from Environment Canterbury Customer Services (0800 EC INFO) or from www.dairynz.co.nz

5.4 Common non-compliance issues

Some of the common non-compliances resulted from the issues set out below. Appendix 4 presents how non-compliance was graded in a standardised guideline used in previous dairy seasons for assessing and responding to non-compliance issues.

5.4.1 Causes of significant non-compliance

Of the 560 consent conditions graded non-compliant in the 2014–2015 season (Table 7), 81 were significantly non-compliant and 11 were graded enforcement action. See Section 5.6 for details of enforcement action. An analysis of the causes of these significant non-compliance and enforcement action is shown in Table 28.

Table 28: Causes of significant consent condition non-compliance

Cause of non-compliance	Number of conditions (percentage)
Ponding, application depth and water-holding capacity	47 (51%)
Storage overflow	9 (9.75%)
Undiluted dairy effluent volume exceeded	8 (8.75%)
Discharged outside the area	7 (7.75%)
Discharge outside buffer zone distances	6 (6.5%)
Backflow prevention not compliant	4 (4.5%)
Storage pond not meeting requirements	4 (4.5%)
Not operating in accordance with management plan	3 (3.25%)
Effluent management plan not completed and/ or not stored in the shed	2 (2%)
Discharge directly to surface water	1 (1%)
Nitrogen loading rate exceeded	1 (1%)
Total	**92**

The 92 significant non-compliances occurred on 63 farms (Table 7). The number of conditions that are either significantly non-compliant or had enforcement action decreased compared with the 2013–2014 dairy season, when there were 129 significant non-compliances on 96 farms.

Some consents have conditions relating to both ponding of effluent and the application depth or water-holding capacity of the soil. In these cases an incidence of significant ponding could result in both conditions being graded significantly non-compliant. For the purposes of analysing ponding, the two types of conditions have been grouped together. In the cases of non-compliance with record keeping (such as not providing an effluent plan or not placing it on the dairy shed wall), these conditions are graded significantly non-compliant only when the issue has not been resolved for at least the second consecutive season and therefore it is considered serious.

5.4.2 Dairy effluent ponding

Most dairy farms in Canterbury use spray irrigation to apply dairy effluent to land. As in previous seasons, the main problem with this method is over-application of effluent, causing ponding on the soil surface (see Figures 5–7 in Section 3.2).

Ponding can be caused by a single factor or a combination of factors including soil type, inadequate irrigator set-up (such as being set at a low speed, cracked hoses, the anchor peg not secured or not in gear), poorly maintained application equipment (with issues such as worn irrigator nozzles and flat tyres), equipment failure (including pipe breakages or pump failure), lack of active management of the system and failure to shift the irrigator regularly, lack of training on using the equipment properly and adjusting the irrigator speed, staff inattention, unforeseeable failure, and/or insufficient effluent storage capacity which results in application of dairy effluent when soil moisture levels are already high.

Of the farms that were visited, 64% (627) had no ponding; 29% (279) had minor ponding, 5.25% (53) had significant ponding and 1% (9) had ponding that led to enforcement action (Figure 10 and Table 29). This is an improvement on the 2013-2014 season, when 51% farms had no ponding. As noted in Section 3.5.1, a significant barrier to effective monitoring is timing. If effluent has not been applied on the day of the visit, it is very difficult to ascertain the quality of the application and compliance with the ponding condition. There were 8 farms (0.75%) that could not be assessed on this condition (Figure 10) which is a large improvement on 2013-2014 season when 33% of farms could not be assessed.

Figure 10:
Ponding grade for dairy effluent, 2014–2015

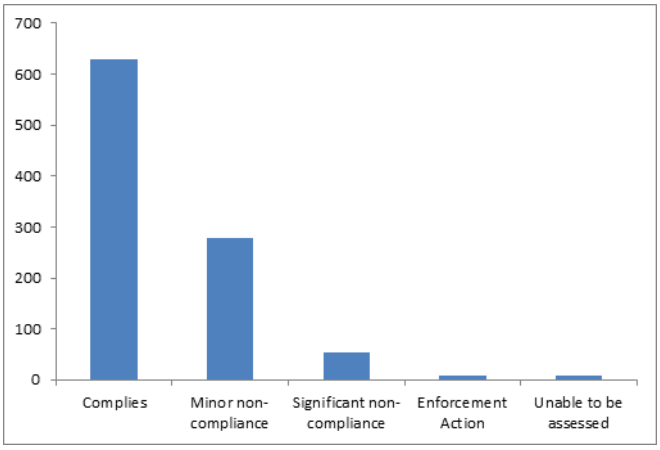


Table 29: Ponding grade according to zone, 2014–2015

Zone	Complies	Minor non-compliance	Significant non-compliance	Enforcement action	Unable to be assessed	Total
Ashburton	207	66	13	1	-	287
Banks Peninsula	2	2	-	1	-	5
Christchurch–West Melton	1	-	-	-	-	1
Hurunui–Waiau	59	18	3	-	5	85
Kaikōura	13	1	1	-	-	15
Lower Waitaki – South Coastal Canterbury	70	44	13	1	1	129
Orari–Opihi–Pareora	75	71	5	1	1	153
Selwyn–Waihora	149	52	14	3	-	218
Upper Waitaki	1	2	1	-	-	4
Waimakariri	50	23	3	2	1	79
Total	**627 (64%)**	**279 (29%)**	**53 (5.25%)**	**9 (1%)**	**8 (0.75%)**	**976**

5.4.3 Undiluted dairy effluent limits

Dairy effluent resource consents specify a limit on the daily volume that can be spread, related to either herd size or total volume. Any volume of dairy effluent discharged in excess of resource consent limits is non-compliant.

In a number of cases, non-compliance occurred because the size of the herd increased but the consent holder did not apply to change the resource consent. In some of these instances, the dairy effluent infrastructure could not cope with the increased volume of effluent, which led to further non-compliance.

A total of 8 farms (8.7%) (Table 26) exceeded the maximum undiluted dairy effluent limits specified on their dairy effluent disposal resource consent. By way of comparison, 7.75% of farms in the 2013-14 season, 2.8% in 2012–2013, 1.5% in 2011–2012 and 1.3% in 2010–2011 exceeded the undiluted effluent volumes. Farms discharging more than their undiluted dairy effluent limits are required to apply to change the conditions of their resource consent.

5.4.4 Management plans and consent documents

Most resource consents require an effluent management plan (EMP) and copies of the consent to be in a prominent place in the dairy shed to make sure all operational staff are aware of what they need to comply with and how to do it. Because a resource consent is specific to a farm, operational staff need to know the specific conditions for their particular farm. With a copy of the consent available in the dairy shed, a staff member can check the consent conditions if they are not sure what is acceptable. The EMP includes information on how to comply with the consent conditions; a maintenance program for the effluent irrigator, stone traps and any other equipment relating to the effluent management; records for the location of effluent and solids spreading, and contact details of contractors and staff to call if things go wrong. This information should be readily accessible in the dairy shed as a constant reminder, particularly if key staff are not available when issues arise.

During the 2014–2015 dairy season only three farms did not operate in accordance with their EMP and two farms did not have such a plan. However, on some farms where employees were questioned about the requirements of the consent conditions, they did not know anything about them even though this information was on the wall. Although compliance has improved compared with the 2013–2014 season, there is still plenty to be done.

Farm environment plans are required for all farms that do not meet the permitted activity rules for nutrient management in the Canterbury Land & Water Regional Plan. If a farm has a farm environment plan, a separate EMP may not be needed because management of effluent is one of the objectives in the farm environment plan. All farm employees should be familiar with the effluent management part of the farm environment plan.

5.4.5 Nitrogen loading

Dairy effluent contains nitrogen. Over-application can increase the risks of nitrate-nitrogen leaching through the soil profile, causing contamination of groundwater and loss of nutrients. In the past, in order to limit the loss of nitrate-nitrogen to groundwater, there has been an application limit of 200 kilograms of nitrogen from dairy effluent per hectare per year, when considered in conjunction with urinary nitrate loss from grazing cows. This is a limit based on 100 cows per approximately 3.25 hectares. However, the Land & Water Regional Plan rules are focused on outputs rather than inputs and nitrogen loss rates are required to be calculated using OVERSEER®. This will result in a much wider assessment of nutrient loading risks associated with all inputs across a property rather than just dairy effluent. However, compliance with the cow numbers and loading rate specified on the effluent discharge consents is still expected because it remains the most likely source of nutrient loss below the root zone.

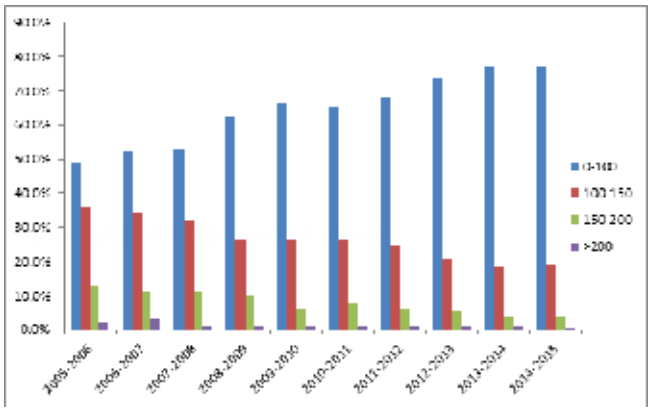
There is a high level of compliance with this requirement, with less than 1% of farms applying effluent at a rate over 200 kilograms per hectare. This season 77% of farms applied effluent at a rate less than 100 kilograms of nitrogen per hectare per year. Table 30 illustrates the nitrogen loading of dairy farms inspected this season.

Table 30: Initial inspection of dairy effluent disposal nitrogen application rates, 2014–2015

Application rate	Total number of farms
0–99 kg/ha/yr	754
100–149 kg/ha/yr	183
150–199 kg/ha/yr	36
200+ kg/ha/yr	5

Where the nitrogen loading limit was exceeded, it can be reduced either by milking fewer cows or increasing the available dairy effluent disposal area. Farmers should calculate their actual nitrogen loss rate using OVERSEER® to make sure that they are farming within their nitrogen baseline (1 July 2009 - 30 June 2013).

Figure 11:
Nitrogen application rates, 2005–2006 to 2014–2015



Nitrogen loading rates on effluent discharge areas have remained steady over the last three seasons. For an improvement in nutrient loss through runoff into surface waterways or by leaching into groundwater, nitrogen loading rates need to reduce further. The nutrient management rules in the Land & Water Regional Plan and the requirement to move towards good management practice will help achieve this.

5.4.6 Buffer zone discharges

Dairy effluent cannot be applied within 20 metres of any surface water body, bore or soak hole to reduce the risk of runoff. This consent condition was found to be significantly non-compliant on 6 occasions in the 2014-15 season. This is an increase from 2013–2014, when there were 3 occurrences.

All other instances of non-compliance with this condition were graded minor non-compliance and generally were just inside the 20-metre buffer zone. Compliance monitoring reports reflected this result and directed consent holders and farm managers to make sure the discharge was at least 20 metres from waterways, bores and soak holes.

5.4.7 Discharges directly to water

A discharge of dairy effluent directly into water can have significant adverse environmental effects. During the 2014–2015 season there was only one discharge directly to water. There were two incidences in 2013-2014, and one in each of 2012–2013, 2011–2012 and 2010–2011.

5.5 Complaints from the community

Most non-compliances with consent conditions are picked up during a site inspection. The other avenue to identify non-compliance is via complaints made to Environment Canterbury's Pollution Hotline. During the 2014–2015 season, 260 calls to the Pollution Hotline related to alleged incidents on dairy farms. Of these 260 complaints, 88 were substantiated. There were 161 complaints that could not be substantiated because there was not enough evidence. Evidence may be lacking because it is not always possible to visit the site while the alleged incident is occurring and therefore Environment Canterbury staff either cannot identify the cause of the incident or find little remaining evidence when they do visit. The other 8 complaints are still open for investigation.

Of the 260 complaints received through the Pollution Hotline, 60 were related to the discharge of effluent to land or to water. The rest of the complaints were related to stock in waterways (122), to the smell emanating from offal pits (4) and to the smell caused by the discharge of effluent (74). From the 88 substantiated complaints, 6 received an abatement notice, 6 received both abatement and infringement notices, 4 were given a warning, and 21 related to resource consent conditions and were dealt with by Resource Management Officers carrying out site inspections. There were 57 complaints where no action was taken as the issue was resolved or it did not warrant taking further enforcement action.

5.6 Enforcement action taken

Enforcement action taken by Environment Canterbury over the past seven dairy seasons is shown in Table 31. More abatement notices were issued this season than last, whereas there was a reduction in infringement notices. No charges were laid for prosecutions this season.

Table 31: Summary of enforcement action, 2008–2009 to 2014–2015

Method	2008–2009	2009–2010	2010–2011	2011–2012	2012–2013	2013–2014	2014-2015
Abatement notices	64	21	15	13	9	6	16
Infringement notices	43	28	5	19	11	13	5
Prosecutions – charges laid	2	4	2	2	4	0	0
Prosecutions – awaiting court result	1	0	0	0	1	1	0
Prosecution	1	2	3	4	3	3	1

5.6.1 Abatement notices

There were 16 abatement notices issued this season resulting from significant non-compliances, as detailed in Table 32.

Table 32: Reason for abatement notices, 2014–2015

Activity	Total
Ponding	12
Unconsented dairy effluent discharge to water	4
Total	**16**

5.6.2 Infringement notices

There were 5 infringement notices issued this season which related to 4 incidences of significant non-compliance.

Table 33: Details of infringement notices, 2014–2015

Incident	Description	Location
1	Ponding of effluent	Ashburton
2	Ponding of effluent	Ashburton
3	Contravention of an abatement notice, unauthorised discharge of effluent on to land	Selwyn-Waihora
4	Contravention of an abatement notice, unauthorised discharge of effluent on to land	Waimakariri
5	Ponding of effluent	Orari–Opihi–Pareora

5.6.3 Court case

The court case heard in 2014–2015 related to charges laid in the 2012 season. Table 34 summarises the result; for further details, see Appendix 5.

Table 34: Results of court case heard this season

Incident	Offence date	Defendant	Description of incident	Fine
1	04/09/2012 15/10/2012	Barry Foster (relates to prosecution 2013-2014, Barren Holdings)	Discharge of effluent to groundwater	Community service 100 hours – agreement before sentencing and taken into account on sentencing. Completed vegetation work at McLeans Island forest which Judge Dwyer valued at $40,000

5.7 Follow-up inspection results

When a consent condition is graded significant non-compliant or enforcement action is taken, follow-up inspections are carried out to make sure the matter has been resolved. Some consents have follow-up inspections even if they were compliant on the first inspection due to the risk of non-complying.

A total of 170 follow-up inspections were undertaken in respect of 138 resource consents. There were 25 consents that had two or more follow-up inspections during the season.

Of the resource consents assessed as requiring a follow-up site inspection, 57% were assessed as compliant at the final follow-up inspection (Table 35). Another 34% showed improvement so were re-graded non-compliant, action required or no action required between the first and final follow-up inspections. Another 5% were recorded “no change”, meaning the issue was being worked on but either it was not yet resolved or Environment Canterbury was waiting on an application for variation to authorise the non-compliance (such as increase in cow numbers or building a new storage pond). There were 5 consents (4%) where the overall compliance grade was lower. These consents were fully compliant at the first inspection but because the farms were considered high risk, they received an extra site inspection during which they were found significantly non-compliant. There was no further follow-up site inspection due to the end of the milking season, but these will be high priority for the start of the 2015-2016 season.

Table 35: Follow-up overall consent grade for significant non-compliances, 2014–2015

Follow-up grade	Number of consents (percentage)
Fully compliant	78 (57%)
Improved	48 (34%)
No change	7 (5%)
Worsened	5 (4%)

5.8 Dairy effluent: storage and rainfall

5.8.1 Dairy effluent storage

This report does not detail compliance with land use consents or the permitted activity rule under the Land & Water Regional Plan to store dairy effluent. However, when a site visit is undertaken, the dairy effluent disposal system as a whole is inspected due to the integrated nature of storage and discharge (see Section 3.2).

The Land & Water Regional Plan make the storage of dairy effluent a permitted activity, subject to conditions. Storage facilities that do not meet these conditions will require resource consent.

Environment Canterbury, the dairy industry and major companies support the development of increased effluent storage. To this end, the Canterbury Dairy Environment Group is committed to helping the dairy farming community through educational and advisory initiatives. Improved storage will provide greater flexibility in managing effluent discharge systems and lessen environmental risk.

The greater the volume of storage, the lower the risk of a sump overflow and ponding from effluent discharge. Dairy industry best practice recommends the effluent storage calculator facilitated throughout New Zealand by DairyNZ's environmental extension specialists and via local milk supply environmental staff. This tool calculates the storage capacity required for a particular farm based on characteristics such as soil type, rainfall and application system to ensure effluent is not applied when ponding would happen due to high soil moisture.

5.8.2 Effects of rainfall on dairy effluent disposal

The average rainfall in Canterbury during the 2014–2015 dairy season was 379 millimetres (Environment Canterbury data). Data from three rainfall stations were used to calculate this average - Waiau at Lowry Hills (North Canterbury), Selwyn at Ridgens Road (Mid Canterbury) and Broadgully Creek at Morven (South Canterbury). Rainfall for the 2014–2015 season was about 50%-60% of the long-term average for each of these sites.

Rainfall totals in other parts of the region are likely to be different from those measured at these stations. However, this rainfall data does provide an opportunity to assess consent compliance trends. Years of relatively low rainfall offer the benefit of increased absorption of effluent into the ground, whereas higher than average rainfall can have a negative impact on effective effluent management. These conditions make it important to have adequate storage in order to improve environmental outcomes. Adequate storage would provide more flexibility in the timing of discharging effluent in the event of prolonged wet weather or mechanical failure because the risk of a pond overflow is reduced. The need to discharge effluent on to land that is already saturated is also reduced.

The below average rainfall during the 2014-2015 season may have contributed to the continued improvement in the level of compliance with the ponding of effluent condition. Other factors that contribute to this improvement are the amount of storage available, effective effluent management, efforts by dairy farmers and initiatives of the dairy industry.

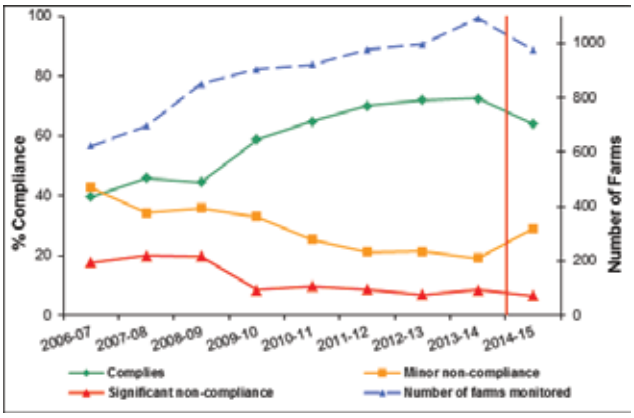
5.9 Comparison with previous monitoring seasons

5.9.1 Monitoring compliance

Due to a change in monitoring programme the results for the 2014-2015 season are not directly comparable with previous years.

However, regardless of the change to the monitoring programme the level of significant non-compliance and enforcement action has continued to decrease and is currently at the lowest level (6.5% or 63 farms) since we started tracking in 2006-2007. Also this is the second consecutive year in which there were no serious incidents resulting in charges being laid in court (prosecutions). Considering we targeted high and medium risk farms and those with a history of significant non-compliance, this is a great result.

Figure 12:
Dairy effluent compliance levels, 2006–2007 to 2014–2015 (the red line indicates change in monitoring programme)



5.10 Factors constraining or promoting compliance

Environment Canterbury has identified the following factors, ranging from cultural to economic, as barriers to compliance.

- This year we experienced drought conditions, which made it difficult for farmers to irrigate their pastures with many needing to buy in feed.
- Cash flow is seasonal and volatile with milk income changing by as much as 40% in a year. This year there were very low milk solid payouts. This has an impact on financial planning and resources available to commit to infrastructure upgrades that would help bring consent holders into line with consent conditions.
- Conversions may lack adequate capital investment to ensure that the effluent system is in line with consent conditions and/or good practice.

- The consent holder may not have an active role in managing the dairying operation and may not have the right processes in place. In many of these situations, on-farm management does not have the sense of ownership required to promote compliance.
- The farm may be owned by a large company with shareholders demanding improved returns but there is limited incentive to invest in infrastructure which is not seen to increase production or returns.
- The dairy industry is transitional in nature; farm managers and sharemilkers move frequently, with a resulting loss of institutional knowledge and training.
- There may not be a culture around compliance and good management practice.
- Effluent may be seen as waste rather than an asset.
- Where there is no contingency planning for potential system failures, the risk of non-compliance increases.
- There may be language and literacy barriers.

The following factors promote consistent compliance:

- Staff having completed agricultural training courses.
- There is a culture of compliance led by owners and management. Older systems that are well managed are generally capable of complying.
- Farmers recognise that effluent is a valuable fertiliser and not a waste product.
- Staff take pride in their work.
- There is appropriate support for professional development of employees.
- Farmers have a connection with the land they are farming.
- There is good contingency management where the potential risks to compliance, such as the physical characteristics of the farm and the effluent treatment system, are identified and strategies are implemented to avoid them or, if they are unavoidable, to resolve and mitigate them promptly.

This information helps improve understanding of the reasons for non-compliance so its causes, rather than just its results, can be targeted.

6 INITIATIVES AND ACTIVITIES

Environment Canterbury and the dairy industry have developed a series of initiatives to improve consent compliance and manage environmental effects.

6.1 Environment Canterbury initiatives and activities

6.1.1 Involvement in national audit of compliance monitoring

National reporting on the Sustainable Dairying: Water Accord highlighted how reporting of compliance rates in farm dairy effluent rules varied between regions. Compliance and regulatory managers from around the country developed a set of standardised compliance reporting grades, consistent with those shown in this report, with set criteria outlining what constitutes minor non-compliance and significant non-compliance.

These criteria and grades have been used from the 2007–2008 season. Environment Canterbury was one of the six regional councils that developed an audit process in December 2008 to check the effectiveness of the new grading system. The national dairy audit is held every two years. Last year the fifth audit of the 14 regional councils and unitary authorities undertaking dairy effluent inspections was conducted. Environment Canterbury was found to be following the guidelines consistently. Regions may have different rules; for example, some regional councils allow discharge of treated effluent direct to waterways, which is prohibited in Canterbury.

6.1.2 Enhancing relationship with farmers

Environment Canterbury's work in assessing compliance over several seasons has clarified the common issues dairy farmers face in complying with resource consent conditions, as well as the typical obstacles to achieving full compliance (see Section 5.10). This information has shaped the way Resource Management Officers conduct site visits and how they engage with farmers and consent holders.

Environment Canterbury considers that working well with farmers is crucial to continuing to improve compliance and promoting good management practices. Resource Monitoring Officers will continue to foster this relationship by making sure they engage with farmers in a constructive and fair way, and provide relevant and up-to-date information and support on areas of compliance and good management practices.

6.1.3 Involvement in Canterbury Dairy Environment Group

Possibly the most important of Environment Canterbury's initiatives has been its involvement in the Canterbury Dairy Environment Group. This joint task force was set up with industry to implement initiatives aimed at improving awareness of dairy effluent management and compliance with resource consent requirements (see Section 6.2).

Environment Canterbury has supported and actively been involved in these initiatives, providing technical support

and regional dairying data where appropriate. In addition, Environment Canterbury, in conjunction with the industry, reviewed all new consent conditions on farm dairy effluent consents to make sure they are fit for purpose. As a result, its standard conditions have become easier to monitor and more appropriate for the activity.

6.2 Joint initiatives

The 2007–2008 Dairy Report was discussed at length with the dairy industry towards formulating initiatives to improve compliance levels. This meeting was held in conjunction with representatives of Fish & Game and Forest & Bird, in recognition that all stakeholders have a strong interest in achieving a sustainable dairy sector that can deliver on key environmental outcomes.

During the 2008-2009 season, the Canterbury Dairy Effluent Group was set up with representatives from DairyNZ, Federated Farmers, Synlait, Fonterra, South Island Dairying Development Centre and Environment Canterbury. It has since been extended to include the Primary ITO, Westland Milk Products and Oceania Dairy Limited.

The group has progressively implemented initiatives aimed at improving awareness of dairy effluent management and compliance with resource consent requirements. These initiatives include making sure consent conditions are fit for purpose and taking a multi-layered approach to developing best-practice effluent-management systems, ranging from providing tertiary training to development of construction guidelines.

In 2014 the group broadened its scope to become the Canterbury Dairy Environment Group with the additional requirements of the Land & Water Regional Plan, and subsequent variations / plan changes. The new scope includes key messaging that addresses implementation issues, compliance monitoring, and support to farmers and professionals in nutrient consents, stock exclusion, farm environment plans and effluent.

The group also continued to implement its action plan for effluent management throughout the 2014–2015 season. The key outcomes from the formation of this group are that:

- Farmers are more active in making sure they comply with the conditions of their resource consents
- Farmers are more aware that Environment Canterbury and the dairy industry are united in their efforts to improve performance in this area
- Farmers have better information on what Environment Canterbury will be checking during compliance visits
- Environment Canterbury and industry review consent conditions to make sure they are fit for purpose.

Environment Canterbury's work in assessing compliance over several seasons has clarified the common issues dairy farmers are facing with respect to complying with their resource consent conditions, together with the typical obstacles to achieving compliance. The taskforce has adopted an industry-wide approach to developing practical solutions to the issues and overcoming the obstacles. As a result, the industry and Environment Canterbury have established clear and consistent messages about the nature of the issues and the options available to resolve them. In turn, with both industry representatives and Environment Canterbury officers giving consistent and practical advice, farmers understand clearly what is required. The industry has also committed additional resources to help farmers implement appropriate solutions on site.

This year the group has provided advice for some adverse weather events including flooding and saturated soil in winter and spring 2014, and drought conditions in summer 2014-2015. There is an ongoing effort to make sure the group is up to date with the changing nature of the current regulatory environment and to ensure its members are communicating consistent messages to farmers. A focus for the group is on promoting good effluent management and referring farmers to the right professionals and best information to help with their effluent system design and assessments, staff training, consenting and management requirements.

This group was also used as a reference group for development of draft effluent odour management rules for the Environment Canterbury Air Regional Plan. A focus for these discussions was to make sure the rules were practical and could be interpreted easily by farmers. We also sought to ensure that where consenting or management plans were required, these could be aligned with obligations under the Land & Water Regional Plan.

Some key areas of work in the 2015-2016 season will include land use consenting progress, communicating good management practices and farm environment plans and auditing.

6.3 Dairy industry initiatives

The dairy industry has been active on a number of fronts in its efforts to reduce the environmental effects of dairy farming.

6.3.1 DairyNZ

DairyNZ, a levy-funded industry organisation, is involved in developing best practice for the management of farm dairy effluent. Part of its work involves building capability within the effluent industry throughout New Zealand by developing a code of practice and design standards for farm dairy effluent systems, developing training courses for the service industry and establishing an accreditation program for the service industry. It has also developed a number of programs over the last four years to help farmers manage their effluent:

- Farm Dairy Effluent Design Code of Practice and Design Standards were released in February 2011 to guide designers through developing an effluent system that is fit for purpose. The standards provide a set of criteria against which to measure the adequacy of effluent systems. The code guides designers through a thorough process for developing an effluent system. The design standards and code of practice were reviewed and Version 2 was released in May 2013. A third review was undertaken in middle 2015 with Version 3 due to be released. Only very minor changes have been made in the two reviews.
- DairyNZ has helped develop Massey University's course, "Farm Dairy Effluent: System Design and Management". This three-day course takes attendees through the different aspects of land application of effluent following the code of practice and standards. Over 200 attendees from throughout New Zealand have passed this course. For more information, go to www.massey.ac.nz/~flrc/FDE.html
- DairyNZ helped develop the 2012 NZWETA course, "Farm Dairy Effluent: Pond Design and Construction". This course outlines the design and construction methodology in building an effluent pond. Over 190 people have passed this course, as a result of which they gain a certificate in pond design and construction and are listed on the NZWETA website. For more information go to www.nzweta.org.nz/dairy-effluent-pond
- DairyNZ also helped develop the New Zealand Milking and Pumping Trade Association course, "Farm Dairy Effluent Hydraulic Design". This three-day course focuses on selecting the right pumps for your effluent system. Over 90 participants have passed this course. For more information go to www.nzmpta.co.nz/courses
- DairyNZ established the dairy effluent system design accreditation program administered by Irrigation New Zealand. Companies taking part in this voluntary program are required to submit two full designs of effluent systems, which an expert panel assesses against the code of practice. If the panel approves the designs, the company is accredited for two years for effluent system design, so companies are essentially assessed for their competency. Currently 20 companies are accredited and more are going through the assessment process. For more information, go to www.effluentaccreditation.co.nz
- The Institution of Professional Engineers New Zealand (IPENZ)[1] has produced three documents on farm dairy effluent infrastructure. The first is "Practice Note 21 on Farm Dairy Effluent Pond Design and Construction", which is the industry best practice guide other councils are referencing. Version 1, released in October 2011, was followed by Version 2 in March 2013. This contained

three extra chapters covering clay liners, synthetic liner selection, and design and construction of tanks on peat. The second IPENZ document is "Practice Note 27, Dairy Farm Infrastructure", released in September 2013. It covers legislation, solid separation, underpasses, concrete structures and feed pads. The third practice note covers dairy housing and includes an effluent management chapter. It was released in September 2015.

- To estimate storage requirements, dairy farms throughout New Zealand are moving to use the Dairy Effluent Storage Calculator (DESC). Both accredited companies and those attending the effluent training courses will be skilled in its use. DairyNZ has released a guide, "How to use the Dairy Effluent Storage Calculator", which takes operators through the program step by step and includes scenarios to test skill level. This guide can be ordered from DairyNZ. The calculator has seen a couple of changes in the last year and has been updated with the latest climate and weather data. Download it from www.massey.ac.nz/~flrc/FDE.html
- Over the last four years DairyNZ has developed many resources to inform farmers and the industry, such as spreading calculators, a staff guide to operating effluent system, irrigator runsheets and an effluent management plan poster. These are all summarised in the DairyNZ effluent resources pamphlet. It has also produced technical documents for the effluent service sector as described above. To order or download these resources, go to www.dairynz.co.nz
- DairyNZ has developed an on-farm effluent Warrant of Fitness (WoF) assessment program. This consists of a WoF assessor training course and certification system to produce Certified WoF Assessors who will assess an effluent system following a consistent methodology outlined in a standard operating procedure. This program was launched in March 2014 and currently has 20 assessors throughout the country. For more information, go to www.effluentwof.co.nz
- The "App for Crap", developed and released in the last year, is a mobile spreading calculator for application of effluent. Download it from www.dairynz.co.nz
- A new resource around the planning, design and management of stand-off pads has been developed to help farmers choose from the options available. It covers design and construction, effluent management, animal health and welfare, and case studies.

6.3.2 Sustainable Dairying: Water Accord

The Sustainable Dairying: Water Accord is a set of national good management practice benchmarks aimed at lifting environmental performance on dairy farms throughout New Zealand. It replaced the Clean Streams Accord, which ended in 2012.

The Accord is an agreement between DairyNZ and dairy companies, with the support of and input from many industry stakeholders including Federated Farmers. The Accord's commitments include implementation of targeted riparian planting plans, management of effluent, introduction of comprehensive standards for new dairy farms and use of measures to improve water efficiency and nutrient use on New Zealand dairy farms.

To view the full document go to: www.dairynz.co.nz/page/page id/2145866853?resourceId=790

6.3.3 Fonterra

"Supply Fonterra" is Fonterra's farmer support program. It aims to ensure Fonterra farmers are well informed and positioned to adopt best-practice measures around environmental sustainability, food safety and animal welfare. The program has a set of minimum standards, provides one-on-one farmer support and advice, and recognises those who are leading the way.

Effluent management was the first initiative launched by Supply Fonterra at the start of the 2010–2011 season. It involves an assessment of the effluent system on every farm each year during its annual farm dairy and environmental inspection. The assessor identifies any risks related to the infrastructure and management of the effluent system that may result in the system failing to comply with Environment Canterbury's requirements and/or having an adverse environmental impact.

If a risk is identified, a Fonterra Sustainable Dairying advisor visits the farm and works with the farmer to prepare an environmental improvement plan, which sets out the required actions and timeframes within which they must be achieved. Fonterra's Sustainable Dairying Team also follows up with farmers identified by Environment Canterbury as having major or significant effluent disposal compliance issues.

Fonterra also works with its farmers to exclude stock from all farm waterways that contain water permanently, and to install bridges or culverts at regular stock-crossing points. Waterways have been mapped on every Fonterra farm; currently 96% nationwide are stock excluded with permanent fences, while in Canterbury the proportion is 98%. On farms where there is work to be done, the Sustainable Dairying team helps farmers develop an environmental improvement plan.

Supply Fonterra's Nitrogen Management Program uses the OVERSEER® model to measure and model nitrogen conversion efficiency and nitrogen loss on all farms supplying Fonterra. Farm performance is benchmarked and reported to farmers at the end of the dairy season. Sustainable Dairying advisors provide support to improve nitrogen conversion efficiency and reduce nitrogen loss risk.

Supply Fonterra's Water Use Program seeks to identify key risk areas where water use constraints may be imposed and implements a robust process to mitigate water use risks.

6.3.4 Synlait

For the 2014–2015 season, the following programs were implemented or already in place as part of the supply agreements:

- Where there is repeated non-compliance, the supplier will develop a work program in consultation with Synlait. If after two years the program is not followed and/or there is still non-compliance, the supply contract may be terminated.
- A financial penalty applies to any supplier who is served an infringement and/or subject to a successful prosecution.

- An on-farm training program, which may include effluent training days for all staff if required, is available for suppliers.
- Synlait carries out on-farm assessments every year to determine compliance with the following terms of supply:
- Completed the Farm Enviro Walk
- Compliance with the Sustainable Dairying: Water Accord
- Reporting and monitoring requirements under the Synlait Farm Dairy Quality Manual.

Synlait intends to continue with the same initiatives in the next dairy season, aligning them with the Lead with Pride program and the Sustainable Dairying: Water Accord. Currently 16 Synlait suppliers are certified under the Lead with Pride program and a further 20 are working towards certification.

6.3.5 Westland Milk Products

Westland Milk Products carries out annual assessments on all suppliers' farms under its newly developed Farming Excellence Program (FarmEx). Among other things, FarmEx ensures that supplying shareholders (suppliers) comply with the Resource Management Act 1991, Animal Welfare Act 1999, NZCP1 and Environment Canterbury rules. This is binding on all suppliers and forms part of the terms and conditions of supply to Westland Milk Products.

FarmEx requires suppliers to implement appropriate management practices so they can comply with environmental, animal welfare and farm presentation guidelines and standards.

All 2014-15 Westland Milk Products suppliers' farms within Environment Canterbury boundaries were assessed against FarmEx standards. Action plans are developed with suppliers who are required to make improvements.

Suppliers are also encouraged to carry out a self-assessment using the DairyNZ Farm Enviro Walk to make sure staff are fully trained to be aware of their responsibilities.

The following environmental management checks are part of the annual farm dairy inspection and FarmEx visits:

- Stock are excluded from waterways
- Effluent management plans are displayed in the farm diary
- Effluent records are kept
- Staff are trained in the correct operation of effluent systems
- Stand-off pads' or feed pads' size complies with industry guidelines, effluent is captured and the site is more than 50 metres from a waterway

- Silage stacks – no evidence of leachate to waterways
- Nutrient budgets are up to date
- Disposal methods of rubbish, dead stock, silage wrap and chemical containers – recycling is actively encouraged by Westland Milk Products.

In an attempt to minimise duplication, information collated during FarmEx assessments can be used to help suppliers drawing up farm environment/Sustainable Milk plans.

6.3.6 Oceania Dairies Limited

Oceania Dairy Limited (ODL) started collecting and processing milk in August 2014. As a new company, it has only recently joined the Sustainable Dairying: Water Accord. In its agreements with suppliers, ODL requires that their obligations to the regional council are met.

Oceania carries out on-farm assessments annually to assess compliance with company requirements for:

* Restricted stock access to waterways
* Race crossings of waterways are via culverts or bridges
* Nutrient budgets
* Compliance with resource consents.

In the coming season ODL will be working with its suppliers to ensure the above requirements continue to be met on existing and new farms and that there is alignment with the Sustainable Dairying: Water Accord.

ODL promotes use of the DairyNZ Farm Enviro Walk.

6.3.7 South Island Dairying Development Centre

The South Island Dairying Development Centre (SIDDC) is an industry partnership between Lincoln University, DairyNZ, Ravensdown, LIC, Plant & Food, AgResearch and South Island Dairy Event (SIDE). The partners harness their complementary capabilities to advance South Island dairying. SIDDC operates the Lincoln University Dairy Farm on behalf of Lincoln University. The farm is run as a commercial demonstration farm, focused on maximising sustainable profit across the whole farm business. Its profitability is in the top 1%–2% of dairy farms.

SIDDC and Environment Canterbury regularly interact across a number of areas. For example, both are extensively involved in the local zone committee where the farm data collected at Lincoln University Dairy Farm contributes to regional analysis.

SIDDC regularly hosts industry and community visitors to Lincoln University Dairy Farm, where the practices associated with operating a sustainable farm are discussed and portrayed. Visitors include students from the Waterways Centre for Freshwater Management (University of Canterbury and Lincoln University).

SIDDC runs the Lincoln University Dairy Farm focus days. Each week it publishes farm walk notes online, detailing the results and management decisions made.

6.3.8 Primary Industry Training Organisation

The Primary Industry Training Organisation is one of New Zealand's largest industry training organisations and has been training people in agriculture since the 1970s. It educates more than 15,000 people every year through New Zealand Qualifications Authority (NZQA) qualifications in primary industry. Specifically in relation to dairy farming and managing effluent, Primary ITO is currently running two training programs that help meet the Canterbury Dairy Environment Group's objectives: Effluent Management Planning (EMP) and Dealing with Dairy Farm Effluent (DWDE).

EMP is aimed at the decision makers on farm: supervisors, sharemilkers, managers and owners. The objective of this course is to give farmers the tools to evaluate their current effluent system and make informed decisions about planned improvements to the system and related management practices. One of the topics covered is permitted activities under the Resource Management Act and the roles of regional and local councils. This topic covers off all of the Canterbury Dairy Environment Group's objectives and is taught by a qualified tutor from AsureQuality.

DWDE is aimed at the whole farm. The aim is to make sure everyone on the farm team is aware of their responsibilities in keeping the farm effluent system efficient and effective. As well as empowering the team with the skills and knowledge to avoid potential problems, this course covers off a general understanding of what is required to meet legal and regulatory requirements.

Primary ITO's objectives are to ensure that all its farmers have developed an effluent management plan that maximises the use of effluent for pasture growth and minimises risk. Since the start of last year Primary ITO has run 15 EMP and 22 DWDE courses in the Canterbury area, with 342 participants who now have a clear understanding of what they must do to comply with resource consent conditions administered by Environment Canterbury. The intention is to keep running these courses and to improve their uptake by connecting with all farmers in the region.

7 2015–2016 DAIRY SEASON STRATEGY

7.1 Dairy monitoring strategy for 2015–2016

Last year we changed the way we monitored dairy effluent consents across the region. Instead of monitoring every farm every year we prioritised farms based on risk and visited all high and medium risk farms. High-risk farms include those in environmentally challenged locations, farms with poor infrastructure, those with poor management and farms with a history of non-compliance.

This new monitoring regime allowed us to focus our monitoring effort on high and medium risk farms and those that have had significant non-compliances or enforcement action. We also monitored a proportion of low-risk farms. For the 2015-2016 season we intend to continue with this monitoring regime.

Criteria for grading risk of dairy farms
All dairy farms will be graded according to risk based on these criteria:

1. Scale of activity and mechanism of damage
   - Number of cows per hectare
   - Storage (type, volume, number of milking days/ rainfall adjustments etc)
   - Type of irrigation (manually operated, centre pivot, programmable etc)
   - Age of system and maintenance requirements and systems
   - Failsafe mechanisms (alarms, shut-off backstop etc)
2. Sensitivity of receiving environment
   - Distance to surface water
   - Depth to ground water
   - Soil type (tight or porous)
   - Location to sensitive areas (community drinking water supplies, recreation activities, areas of cultural significance)
   - Other (eg tile drains)
3. Management structure and processes
   - Operating at good management practice
   - Staff training systems
   - Farm/dairy effluent management plans in place/ followed
   - Knowledge of consent requirements
   - Internal audits/quality systems
4. Compliance history

Priority for monitoring in the 2015-2016 season

1. All farms significantly non-compliant at the end of last season
2. All high-risk farms
3. All medium-risk farms
4. All follow-up visits for significant non-compliances from steps 1, 2, and 3
5. Any farms identified by a Canterbury Water Management Zone Committee as a priority for monitoring
6. Low-risk farms that were not monitored last year
7. Any further follow-up site inspections for outstanding significant non-compliances
8. Any high-risk farms that were compliant but might still need a follow-up visit.

7.2 Compliance monitoring response

Environment Canterbury will continue to support industry initiatives to educate and help dairy farmers to distribute effluent appropriately. It will also work closely with dairy industry representatives to address individual cases of significant non-compliance.

The Monitoring and Compliance section has changed the way it grades non-compliance with the conditions of resource consents to better communicate to farmers what is required of them and align with the national protocols for compliance grades.

Minor non-compliance is now split into non-compliance that requires action from the consent holder and non-compliance that requires no action (technical non-compliance). For the more serious grades, there is no longer major non-compliance, only significant non-compliance. All other grades remain the same. Where non-compliance is not rectified by the end of the dairy season and this non-compliance is repeated in the 2015–2016 season, prosecution is more likely to be the most appropriate enforcement option (see Section 5.6).

In all cases of significant non-compliance, the farmer's milk company is alerted. This allows direct input from environmental specialists. The approaches that Environment Canterbury will take to address the different levels of non-compliance are detailed below.

7.2.1 Non-compliance, no action required

This is a non-compliance that has no adverse effect or only minor actual or potential adverse effect, and no action by the consent holder is required. Non-compliance is considered administrative, minor or technical in nature.

7.2.2 Non-compliance, action required

In this case, the non-compliance is considered minor with actual or potential adverse effect. Action by the consent holder is required and there will be follow-up by a Resource Monitoring Officer. This non-compliance should be addressed as it could lead to ongoing or repeat non-compliance. Although they are minor, these breaches can often be an indicator of actions that, in time, may lead to a more

significant breach of resource consent conditions. Addressing these non-compliances is therefore important because consent holders can then reduce the risk of a significant non-compliance in future seasons. For this reason, Environment Canterbury will be providing clear guidance to farmers on what is required to rectify non-compliances and, where appropriate, we will undertake more follow-up inspections to make sure they are rectified.

7.2.3 Significant non-compliance

These non-compliances are considered to have significant actual or potential adverse effects. Farms that are assessed as having significant issues of non-compliance will be monitored more frequently until there is confidence that they can maintain an appropriate level of compliance. Where compliance is not achieved, the enforcement tools available to Environment Canterbury will continue to be used in the 2015–2016 season. Environment Canterbury will take enforcement action against non-complying farm employees, owners, companies and directors. Abatement notices will continue to be issued where it is appropriate to do so. Environment Canterbury will issue infringement notices for breaches of abatement notices.

Environment Canterbury will also take prosecutions in extreme cases of non-compliance. One example of extreme non-compliance is direct discharges to water, and prosecutions in other circumstances are also possible.

7.3 Natural Resources Regional Plan and Land & Water Regional Plan

The Land & Water Regional Plan (LWRP) contains rules that affect dairy farming activities in Canterbury.

The LWRP was notified on 11 August 2012 and was made partly operative on 1 September 2015.

The purpose of the LWRP is to identify resource management outcomes or goals, and put in place methods for managing land and water resources in Canterbury, to achieve the purposes of the Resource Management Act 1991. Nutrient management is a major component of the plan, which includes rules to manage nutrient loads.

For the LWRP and NRRP, go to www.ecan.govt.nz/lwrp

ACKNOWLEDGEMENTS

Management Team

Kim Drummond

Marty Mortiaux

Richard Purdon

Resource Management Officers

Aliesha Esker

Erin Baylis

Julia Russell

Justine Mowe

Katherine Hill

Maki Norman

Marco Cataloni

Michael Edmondson

Rachel Blackburn

Robin Hubbard

Ruth Sarson

Samuel Fuchs

Sylvia McAslan

Reporting Team

Rini Hidajat

Jackie Jones

Frances Jones

Other Environment Canterbury staff

Nicola Bassi

David Perenara-O'Connell

Manaia Cunningham

Alison Bower

Adam Martin

Adrian Patchett

Angus McLeod

Debbie Scott

External contributors

Tony Watson

Tony Fransen

Theresa Wilson

Libby Sutherland

Michael Hide

Jeremy Burgess

Ron Pellow

Kevin Scannell

Shane Lodge

APPENDICES

Appendix 1: Detail of environmental effects

Nature of the risk

A risk of dairy farming is the potential for dairy effluent to contaminate surface water or groundwater or both. The level of this risk can be identified with reference to the:

- Scale of the activity
- Affected environment and its sensitivity
- Mechanism of damage (how toxic, persistent and intense the pollutant is)
- Probability of the contamination occurring, which can be gauged by assessing:
  - Compliance history
  - Quality of the effluent system in use (for example, a good management practice effluent system will be of lesser risk than one of poor reliability).

As far as possible, the potential risk to the environment is mitigated by regular monitoring of the consent conditions. Risk can be further mitigated by increased identification of high-risk factors, corresponding targeted monitoring and education. Other risk factors are less easily discerned, such as farm management culture. Compliance with consent conditions is key, which to a significant extent is dictated by farming culture.

Pathway to contamination

Dairy effluent can contaminate surface water because of the general principle that water flows to the lowest point. There is a variety of pathways such as surface runoff, subsurface flow and preferential flow[4]. Contamination could happen when there is ponding or discharge within a buffer zone or discharge directly to surface water.

Dairy effluent contamination of groundwater is most common when there is a high water table with a close interaction with contaminated surface water or saturated soil strata, enabling the dissolving of nutrients and elements to groundwater and through preferential flow.

Groundwater in Canterbury feeds a significant number of spring-fed lowland waterways and lakes with high cultural and ecological values. Contamination of groundwater by dairy effluent has the potential to affect the quality of these ecosystems.

Effect of contamination

Dairy effluent contamination of water

In the case of dairy effluent accessing flowing water, the effect of the discharge of the major constituents of treated or untreated dairy effluent is:

- Biochemical oxygen demand (BOD5) – consumption (reduction) of the oxygen content of waters so minimum oxygen concentrations are exceeded downstream and stream life is suffocated (killed or repelled)
- Ammonia concentrations have three modes of action: they are highly toxic to aquatic life and can kill fish and other biota by damaging gills and skin; they consume oxygen during conversion to nitrate, depleting the water of oxygen; and they stimulate excessive growths of aquatic plants and algae
- Nutrients (nitrogen and phosphorus) stimulate excessive growths of aquatic plants and algae, causing eutrophication which seriously affects aquatic fauna and flora
- Faecal contaminants – common indicator bacteria (E coli) indicate the likely presence of pathogenic protozoa, bacteria and viruses from dairy sources, which impart a high risk of infection to people and animals consuming or in contact with dairy effluent and receiving water.

In addition to the contaminants listed above, direct discharge of irrigated dairy effluent will include large amounts of partially digested organic solids (partially digested cattle feedstuffs) that will deposit on land in a way that generates longer-acting sources of these contaminants. It will also deposit in waterways in a manner that smothers stream bed habitats and generates reductions in water clarity, and/or generates scum on the surface.

Other novel contaminants in dairy effluent may include a range of detergents used in dairy plant operations, medications such as wormers, antibiotics, bloat remedies and nutritional supplements, and hormonal compounds (estrogenic substances). These are generally in low concentrations and are readily absorbed into soils, but can become problems to water users and ecological communities if dairy effluent enters natural waters.

The risk of a direct discharge occurring is mitigated by monitoring compliance with the conditions around buffer zones for discharging effluent near surface water.

Discharge to land resulting in ponding

When dairy effluent is over-applied and allowed to cause ponding in paddocks, soil moisture levels are elevated and a moist, nutrient-rich environment is created which may allow anoxic (deprived of oxygen) conditions to occur. Pasture production and ability to utilise effluent are reduced and soil saturation may result in effluent moving below the root zone where it can potentially reach and contaminate groundwater.

Extreme ponding (to a depth of 100 millimetres) can generate a range of adverse effects from organic solids, BOD5, ammonia, nutrients and faecal contaminants. Soil in paddocks with extreme

4 Preferential flow is essentially when any flow, e.g. of water or dairy effluent, bypasses the typical soil structure when draining. Examples of what would enable preferential flow are soil cracks that may occur as a result of freeze-thaw processes and wetting and drying cycles, soak holes and bore holes. Soil is a great way to decontaminate effluent. Preferential flow undermines this capacity and increases the risk of surface and groundwater contamination.

ponding may rapidly become anoxic from the high BOD5 content and will become an anaerobic environment. Anaerobic soil is very different from normal aerated soil environments, because their chemistry and ability to retain nutrients are lost. Within a ponded (anoxic) paddock, the effects are:

- Soil-retained phosphorus becomes fully soluble in anoxic conditions and could leach into shallow groundwater and surface runoff
- Soil nitrogen (as nitrate) is reduced to the highly soluble and toxic ammonia form and leaches to shallow groundwater and surface runoff
- Soil carbon is mobilised as dissolved carbon and is lost in groundwater and surface water runoff
- Soil sulphur (added as fertiliser) is reduced from oxidised sulphate to the leachable toxic form of hydrogen sulphide (rotten egg smell)
- Soil-bound metals (iron, manganese, zinc, copper etc) are made highly soluble.

These all constitute loss of valuable soil constituents; they comprise toxic compounds from the effluent and toxic compounds generated in the soil that will exert adverse effects as they leach to subsequent (groundwater and surface water) environments. In addition, the anoxia will have sickened or killed off pasture grasses, which will also have hindered the subsequent rate of re-aeration and recovery of aerobic soil conditions. These effects will occur for a number of days to weeks as the soils and overlying organic material dry and pasture growth is recovered or re-established. The impact from extreme ponding can be felt for up to several weeks.

Level of adverse effect

The level of the effect can be determined by the proximity of the event to a sensitive catchment and drinking water supply (people and stock) and by whether it is an isolated incident or cumulative event[5].

A cumulative event that is close to a sensitive catchment or drinking water supply would generally have a greater adverse impact on the environment. This may take the form of increasing the potential for anoxic paddocks that degrade the soil as well as its capacity to manage future events, developing preferential flow from wetting and drying cycles, poisoning people or stock, or undermining the capacity of ecosystems to sustain life. The likelihood of such effects is increases through the presence of the various risk factors.

Appendix 2: Funding of compliance monitoring

Environment Canterbury policy is to fund the cost of carrying out many of its functions under the Resource Management Act, including consent monitoring, by way of user-pays charges to consent holders. Section 36(1) (c) of the Act allows the regional council to fix these charges. In the 2014–2015 season, holders of resource consents were charged an hourly rate of $97.75 including GST for the monitoring of their resource consent conditions and any subsequent follow-up on non-compliances (except when a decision was made to take punitive action). Environment Canterbury has must ensure that all charges are actual and reasonable and, therefore, where possible the cost to the consent holder is kept to a minimum. These charges are set out in the Environment Canterbury Annual Plan 2014–2015[6].

5 A cumulative effect can be generated when there is a history of non-compliance on a farm or when there is a pattern of non-compliance within the area over a number of dairy farms. A cumulative effect may be more likely from sump overflow because it tends to be in the same place.

6 The Annual Plan is available at: http://ecan.govt.nz/publications/Pages/annual-plan-2014-15.aspx

Appendix 3: National guidelines for compliance monitoring

The table below lists the criteria for assigning a grade of significant non-compliance, and examples of situations that would meet each of the criteria.

Criteria	Examples
Unauthorised discharges that have entered water (groundwater or surface water)	• Overflowing ponds or sumps into surface water • Overland flow/runoff into surface water • Irrigating over surface water • Race, feed pad or stand-off pad runoff into surface water • Discharges in breach of consent or plan rule conditions and where adverse effects are visible, measureable or likely, such as: – section 107 considerations eg change in colour or clarity after mixing – Exceeding ammonia limits – Exceeding suspended solid limits – Exceeding BOD5 limits – Exceeding faecal limits Exceeding groundwater nitrogen concentration limits
Unauthorised discharges that may enter water (groundwater and surface water)	• Significant surface ponding • Irrigating when soil conditions are too wet • Discharge without using an irrigator (eg pipe end discharge) • Sludge dumping • Discharges in breach of consent or plan rule conditions, and where adverse effects are visible and/or measureable and/or likely, such as: – Exceeding nutrient application rates – Exceeding effluent application depths/rates
Breach of abatement notice	• Any breach of an abatement notice
Objectionable effects of odour	• Serious adverse effects of odour have occurred
System shortcomings (where required by a rule in a plan or a resource consent)	• Serious lack of contingency storage or back-up plan
Multiple minor non-compliances with cumulative effects	• Lack of standby equipment
	• Multiple minor discharges into a sensitive environment

Appendix 4: Standard compliance grades for the 2014–2015 season

Non-compliance issue	Typical grade	Typical causes	Resolution advice	Likely Environment Canterbury follow-up
Minor ponding identified	Non-compliance action required	• Travelling irrigator speed setting too low • Failure to shift travelling irrigator • Travelling irrigator malfunction • Hose breakages • Poor equipment maintenance • Storage facility overflows	Reduce rate of application. Assess system for faults. If fault found, repair	Advice given in compliance monitoring report (CMR). Possible re-inspection
Significant ponding identified	Significant non-compliance			Advice given in CMR. Farm to be re-inspected. Possible infringement and/or abatement notices issued
Nitrogen overload	Non-compliance, action required or significant non-compliance depending on severity	Insufficient disposal area used for number of cows milked	Conversation needed with the farmer regarding the farm's nitrogen loss rates as calculated through OVERSEER®. If the change in cow numbers results in nitrogen loss rates being above the baseline nitrogen rate (2009-2013), then depending on the nutrient allocation zone this could be a prohibited activity or it may require a farm environment plan and land use consent. If a farmer gets this consent, there may be grounds to vary the discharge consent to remove this consent condition	Discussion with consent holder with comments in the CMR. A timeframe will be set for a follow- up to see the farm environment plan has been completed and land use consent sought
Undiluted effluent exceeded	Non-compliance, action required or significant non-compliance depending on severity	Failure to apply for a change in consent conditions when increasing herd size	Application to be made to change the consent condition. This will require an assessment to ensure that the environmental effects of the increase are nil or minor. It may also trigger the nutrient management rules in the Land & Water Regional Plan. When assessing the application for change of consent condition, the consent planner on the discharge consent will be able to inform the farmer	Advice given in CMR that undiluted effluent volume has been exceeded. An application to change the relevant condition of the resource consent, or a new consent, must be made before a specified date
Effluent discharge to water (including where effluent is running off into surface water or groundwater)	Enforcement Action	• Effluent application rate on disposal area too high, resulting in runoff to surface water or soak hole • Storage facility overflow • Pipe breakage	Cease discharge immediately	Enforcement action will be taken; likely prosecution
Effluent disposal within buffer distance around a watercourse, groundwater bore or soak hole	Significant non-compliance or possible enforcement action	Failure to identify location of waterway, bore or soak hole when setting up travelling irrigator	Move irrigator to outside the restricted area	Advice given in CMR. Likely to be re-inspected. Enforcement action, such as an abatement notice, may be taken
Failure to provide evidence that effluent storage facility is sealed	Non-compliance, action required	Failure to provide evidence that effluent storage facility is sealed	Take one of the following actions: • Provide documentation showing that the storage facility is appropriately lined • Test the storage facility to show it is sealed to the required standard • Have the storage facility lined and provide evidence that this has been completed	Advice given in CMR that evidence needs to be provided. Continued non-compliance may result in enforcement action
Failure to install adequate backflow prevention where effluent is being injected into irrigation water	Significant non-compliance	Failure to identify the requirement on the resource consent for a backflow prevention device to be installed	Install an appropriate backflow prevention mechanism recognised as acceptable by Environment Canterbury	Advice provided in CMR that an appropriate backflow prevention system is to be fitted to the bore. Failure to have a system fitted within a specified time may result in enforcement action

Appendix 5: Details of court case

Discharge of dairy effluent to ground/surface water

Incident occurred during the 2012-13 dairy season on 4 September and 15 October 2012
Charges were laid during the 2013-14 dairy season
Sentenced during the 2014-15 dairy season on 19 November 2014

Barry Henry Grant Foster, director, carried out vegetation clearance work before sentencing instead of a fine (valued at $40,000) and was sentenced to 100 hours' community work to be arranged with Environment Canterbury and costs of $3226. (Barren Holdings (2003) Pty Ltd and Hilltop Land Co Ltd were charged for the same offence; this was reported in the 2013-2014 Dairy Report.)

In response to a complaint Environment Canterbury compliance monitoring officers visited Barren Holdings Ltd on 4 September 2012 and observed dairy effluent overflowing to land due to a blocked stone trap. Effluent from the K-lines had accumulated in a boggy area in the paddock and discharged via a natural channel into Happy Jack Creek. A second complaint was received on 15 October 2012. Officers were informed by the sharemilker that effluent had discharged into Happy Jack Creek due to a split in the effluent pipe where it crosses the creek.

In sentencing Judge Dwyer said: "Although your liability is a vicarious one it must also be noted that you were the sole director of Barren Holdings and the person responsible to ensure that the company operated its effluent discharge process in accordance with the resource consent which it held. In other words your liability arises from your own failures as well as failures of the company itself.

"The farm presents a challenging irrigation environment, heavy clay soil, limited effluent storage capacity and a number of streams running through it. Not only the terrain would not have come as a surprise to anybody but weather events are to be expected and must be anticipated in terms of planning and usage of effluent disposal systems.

"Happy Jack Creek flows into the Selwyn River and eventually into Te Waihora/Lake Ellesmere. The health of Canterbury's lowland waterways is recognised as an issue of importance to the community and as such, discharges of contaminants to surface water are considered a serious and significant breach of the Resource Management Act. It is also well accepted within the dairy industry that the discharge of effluent directly to water is poor practice and unacceptable."

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Everything is connected

Facilitating sustainable development in the Canterbury region

www.ecan.govt.nz

Report No. R15/140
ISBN 978-1-927299-14-2 Hard copy
ISBN 978-1-927299-15-9 Web Copy

Environment Canterbury offices

Christchurch
PO Box 345
Christchurch 8013
P: 03 365 3828
F: 03 365 3194

Timaru
75 Church Street
PO Box 550
Timaru 7940
P: 03 687 7800
F: 03 687 7808