Controller and Auditor-General
Tumuaki o te Mana Arotake

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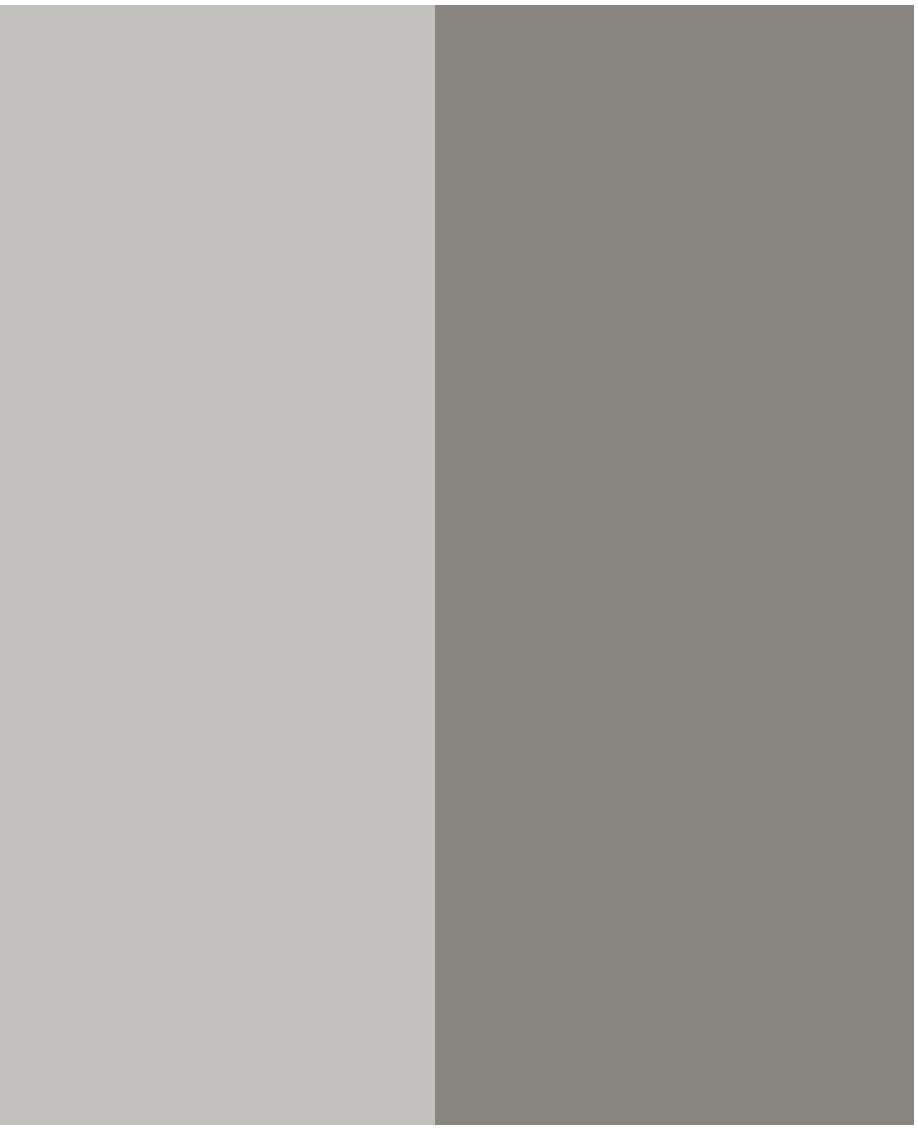
Managing freshwater quality: Challenges and opportunities



Managing freshwater quality: Challenges and opportunities

Presented to the House of Representatives under section 20 of the Public Audit Act 2001.

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E ngā mana, e ngā reo, e ngā karangarangatanga maha o te motu, tēnā koutou.

The quality of water in our groundwater, lakes, rivers, and streams is important to New Zealanders' well-being and national identity. We all expect freshwater to be managed sustainably for current and future generations.

In 2011, we published a report on how effectively Waikato Regional Council, Taranaki Regional Council, Horizons Regional Council, and Environment Southland (the four regional councils) managed the effects of land use on freshwater quality in their regions. We found that the effectiveness of the four regional councils' approaches was variable. In this report, we assess the progress they have made since 2011.

Improvements since our 2011 report and challenges

Regional councils are working in a difficult environment, with a range of stakeholders and often competing interests. Despite these challenges, the four regional councils have made improvements in aspects of their water management that support planning and targeting interventions to protect and improve freshwater quality. Some of the improvements made include:

- better sharing of information about freshwater quality with the community, particularly through the Land, Air, Water Aotearoa website;
- working more collaboratively with their communities, bringing more consensus to decision-making, and better understanding the many points of view and aspirations for freshwater;
- improved approaches to consenting, compliance monitoring, and enforcement, including procedural improvements to reduce the risk of elected members influencing enforcement decisions; and
- investment in non-regulatory programmes to support and promote the use of more sustainable land-use practices that are widely accepted as improving freshwater quality.

However, the four regional councils could further improve how they share information about freshwater quality, strengthen relationships with iwi and hapū, and commit to using a full range of tools for compliance, monitoring, and enforcement.

Analysis conducted for us by National Institute of Water and Atmospheric Research Limited (NIWA) has confirmed that the four councils all have robust freshwater quality monitoring programmes.

Improved national-level reporting is needed

I am concerned that there is not enough information about freshwater at a national level to prioritise efforts on a national basis. Decision-makers do not have the information they need to prepare a national approach or long-term strategy to this significant environmental issue.

A detailed national-level picture of freshwater quality is central to understanding the significance of factors affecting freshwater quality and the degree to which those factors are significant to particular regions. This picture would inform the prioritisation of action to address challenges and aid effective national-level planning and decision-making to support the work of regional councils in managing freshwater quality.

The shortcomings in national-level reporting are caused in part by complexities in using regional council data to form a national picture. There are also significant gaps in knowledge about the effects of poor freshwater quality, including the effects of pollution on te ao Māori and human health. These issues need to be addressed.

Work has been under way for some time to improve how information about freshwater is reported and used, but leadership is needed for meaningful progress to be made. I urge the Ministry for the Environment and Statistics New Zealand to take this leadership role, working with regional councils and others to make the improvements that are needed.

I consider that the recommendations and messages in this report are relevant to all regional councils and unitary authorities. I ask that all councils use them as appropriate to support improvements in their approaches to freshwater quality management. I also encourage all groups involved in freshwater quality management to continue to build on their collaborative efforts to sustainably improve freshwater quality.

I thank the staff of Waikato Regional Council, Taranaki Regional Council, Horizons Regional Council, and Environment Southland for their co-operation. I also thank the stakeholder representatives who took the time to provide their insights and staff from the Ministry for the Environment and NIWA for their technical assistance and contributions to this report.

Nāku noa, nā John

John Ryan
Controller and Auditor-General

11 September 2019

Our recommendations

We recommend that:

1. The Ministry for the Environment and Statistics New Zealand lead work with regional councils and relevant land and freshwater management agencies to support better informed and co-ordinated management of freshwater by preparing a consistent approach to monitoring, analysis, and reporting of freshwater quality state and trend information.
2. Waikato Regional Council, Taranaki Regional Council, Horizons Regional Council, and Environment Southland consider how they might use the analysis conducted by National Institute of Water and Atmospheric Research Limited to improve their monitoring of freshwater quality.
3. Waikato Regional Council, Taranaki Regional Council, Horizons Regional Council, and Environment Southland support and inform wider community discussion of freshwater quality issues by ensuring that the information they make available to their communities is clear, complete, up to date, consistent, accessible, and readily understandable.
4. Waikato Regional Council, Taranaki Regional Council, and Horizons Regional Council strengthen relationships with iwi and hapū, especially those yet to complete Treaty settlement processes, by formally seeking their aspirations for involvement in strategic decision-making and identifying how those aspirations can be met.
5. Waikato Regional Council, Taranaki Regional Council, Horizons Regional Council, and Environment Southland use a full range of appropriate compliance, monitoring, and enforcement tools to effectively identify and act on material non-compliance with the Resource Management Act 1991 or resource consent conditions.

1 Introduction

1.1 In this Part, we set out:

- the scope of our audit;
- what we did not cover;
- how we carried out our audit; and
- the structure of our report.

1.2 This report describes how well Waikato Regional Council, Taranaki Regional Council, Horizons Regional Council, and Environment Southland (the four regional councils) manage freshwater quality in their regions.

1.3 We audited the four regional councils in 2011 and published a report.[1] In that report, we described the four regional councils' approaches to managing the effects of land use on freshwater quality. Overall, the effectiveness of these approaches varied.

1.4 In our 2011 report, we made recommendations to all regional councils and unitary authorities. These included that they:

- review methods for reporting freshwater quality monitoring results;
- have specific, measurable, achievable, relevant, and time-bound objectives in their regional plans and long-term plans;
- be able to demonstrate that they effectively co-ordinate efforts with stakeholders to improve freshwater quality; and
- review their delegations and procedures for prosecuting non-compliance, to ensure that any decision about prosecution is free from actual or perceived political bias.

1.5 Since our 2011 report, the National Policy Statement for Freshwater Management (the National Policy Statement) and its amendments have superseded some of the issues we raised. Therefore, this report is not a straightforward review of how the four regional councils have responded to our 2011 recommendations. It provides our updated view on how well the four regional councils:

- set objectives for freshwater quality;
- gather and use freshwater quality information; and
- ensure effective compliance with the Resource Management Act 1991, relevant provisions of their regional plans, and resource consents.

1.6 We describe where the four regional councils are succeeding and identify issues, potential risks, and opportunities for improvement.

1 Office of the Auditor-General (2011), *Managing freshwater quality: Challenges for regional councils*, Wellington.

Scope of our audit

1.7 Our audit focused on how well the four regional councils manage freshwater quality.

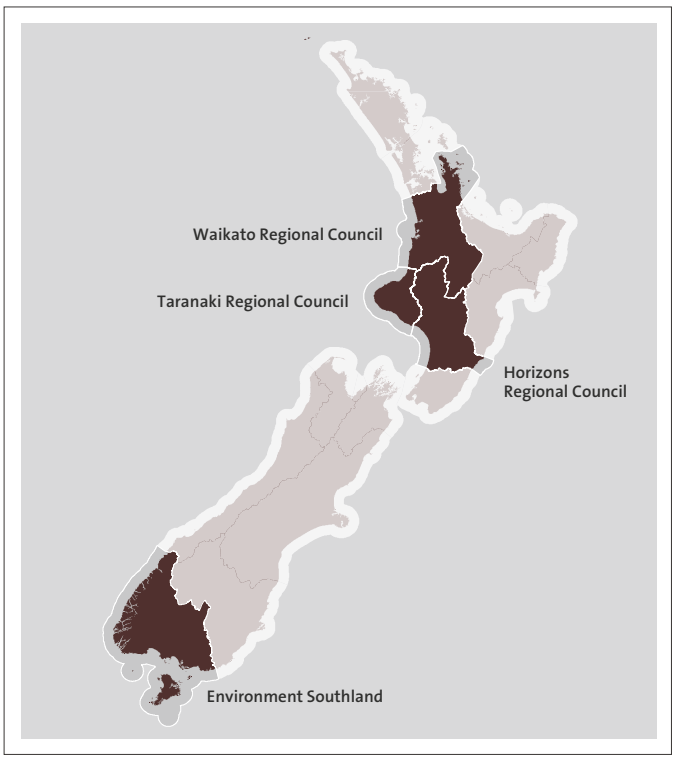
1.8 We selected the four regional councils based on:

- the extent and significance of surface water resources in their regions; and
- freshwater quality trends and pressures in their regions.

1.9 Together, the four regional councils' regions cover nearly one-third of the country's total land area (see Figure 1). The Waikato region includes the country's longest river (the Waikato River) and largest lake (Lake Taupo). The Taranaki region has more than 300 short but fast-flowing streams and rivers. Horizons Regional Council's region includes the Whanganui, Rangitikei, and Manawatū river systems. The wet climate in the Southland region has meant that significant artificial drainage has needed to be installed on pastoral land.

Figure 1
The four regional councils' regions

A map of New Zealand that shows the location of the four regional councils' regions. The map shows that the four regions together cover nearly one-third of the country's total land area.



Source: Land & Water New Zealand.

1.10 As we noted in 2011, the four regional councils have their own unique contexts and challenges. They have different topography, landscapes, soils, and river gradients. The historical quality of their freshwater, the degree to which land use has intensified, and the funding available to manage freshwater quality also varies.

1.11 Communities' desires guide the actions regional councils take to respond to freshwater quality concerns. The approaches taken to maintaining and improving freshwater quality in one region might not be enough or needed in another region.

1.12 We looked at how the four regional councils manage the effects of diffuse pollution (for example, animal effluent) from intensified land use (such as intensive dairy farming), which is a major cause of freshwater quality degradation.[2]

1.13 We also considered how well the four regional councils work with district and city councils in their regions to manage urban discharges, such as from wastewater treatment plants.

1.14 This report presents an opportunity for all regional councils and unitary authorities to consider their success, challenges, and potential for improvement in the matters we looked at.

What we did not cover

1.15 Because there are many different aspects to managing freshwater quality, we have needed to limit the scope of our audit. In particular, we do not consider drinking water, irrigation, freshwater clean-up funds, or stormwater. We have reported on these aspects of freshwater in their own dedicated reports.[3]

1.16 We have also been careful not to duplicate the work of other organisations, such as the Parliamentary Commissioner for the Environment. We had suitable technical experts to help us consider information about the states and trends of freshwater quality in the four regions and to provide a view on how fit for purpose each council's approach to monitoring freshwater quality was.

1.17 Similarly, we did not look at how the four regional councils have implemented the National Policy Statement. That has been the focus of considerable work at the Ministry for the Environment (the Ministry).

1.18 We make no comment about whether freshwater quality has improved or declined in the four regions since 2011. The science of freshwater quality is complex. Some factors that can result in declining or improving trends in

2 Gluckman, P (2017), *New Zealand's fresh waters: Values, state, trends and human impacts*, Wellington, at www.pmcsa.org.nz; Parliamentary Commissioner for the Environment (2016), *The state of New Zealand's environment: Commentary by the Parliamentary Commissioner for the Environment on Environment Aotearoa 2015*, at www.pce.parliament.nz.

3 These reports are available at www.oag.govt.nz.

freshwater quality can take many years, even decades, to have an effect. This time frame and the magnitude of effects varies within and between regions depending on local conditions of climate, topography, and geology.

1.19 The current states and trends of freshwater in the four regions are the result of cumulative actions over an extended period of time rather than the four councils' work since 2011.

How we carried out our audit

1.20 To carry out our audit, we reviewed documents such as regional plans and policy statements, compliance policies and reports, water-related policies, annual reports, state of the environment reports, and council minutes. We also asked the four regional councils to complete a self-assessment of their performance against matters we focused on in our audit.

1.21 After we received the self-assessments, we reviewed additional documents and interviewed council staff and elected members about their roles in managing freshwater quality policy and operations.

1.22 We also spoke with representatives from hapū, iwi, territorial authorities, the farming sector, and environmental groups about their experiences working with their regional councils on freshwater quality management issues.

1.23 We met and worked with staff from the Ministry, who provided us with data about the current freshwater quality in the four regions and information about the medium-term and longer-term trends.

1.24 We commissioned National Institute of Water and Atmospheric Research Limited (NIWA) to provide an assessment the effectiveness of the four regional councils' freshwater monitoring networks and approaches.

1.25 We met with staff from Statistics New Zealand, the Office of the Parliamentary Commissioner for the Environment, and the Ministry for Primary Industries. Staff from these organisations gave us their perspective on the context for the work that regional councils do.

1.26 We looked at data that the four regional councils recorded and supplied, including data on compliance monitoring results, enforcement tool use, and progress reporting on non-regulatory initiatives.

Structure of the report

1.27 In Part 2, we provide an introduction to freshwater quality management. We describe the causes of freshwater degradation and how freshwater quality is managed.

1.28 In Part 3, we discuss the incomplete national picture of freshwater quality, how this affects our current understanding of challenges to protecting and improving freshwater quality, and the action needed to address this problem.

1.29 In Part 4, we discuss the four regional councils' freshwater quality monitoring activities and NIWA's analysis of their monitoring networks. We also discuss the effectiveness of the four regional councils' efforts to incorporate mātauranga Māori and citizen science initiatives into their monitoring programmes.

1.30 In Part 5, we discuss how the four regional councils use freshwater quality monitoring information to inform how they manage freshwater quality.

1.31 In Part 6, we discuss how the four regional councils provide information on freshwater quality to their communities.

1.32 In Part 7, we discuss how well the four regional councils consult with communities to seek their aspirations for freshwater quality. We describe the progress that the four regional councils have made in updating their regional plans and setting freshwater quality objectives that reflect those aspirations.

1.33 In Part 8, we discuss the four regional councils' working relationships with different parts of the community, including people whose land use affects freshwater quality and people who are wanting improvement.

1.34 In Part 9, we discuss how well the four regional councils work with resource consent applicants and land users to understand the Resource Management Act, plan rules, and resource consent conditions. We also discuss the effectiveness of programmes that monitor consent holders' compliance with these rules and conditions, and the effectiveness of the four regional councils' enforcement approaches when consent holders have not complied.

1.35 In Part 10, we discuss how well the four regional councils carry out non-regulatory initiatives, work with the farming industry to support positive environmental outcomes, and integrate their regulatory roles and non-regulatory initiatives.

2 Managing freshwater quality

2.1 In this Part, we discuss:

- the causes of poor freshwater quality; and
- how freshwater quality is managed.

Causes of poor freshwater quality

2.2 Historically, urbanisation, industrialisation, and pastoral farming, which included deforestation and large-scale drainage schemes to convert wetlands to pasture, have contributed to the decline in freshwater quality and in the health of marine ecosystems.[4]

2.3 Sources of pollution can be separated into two categories: "point source discharges" and "non-point source discharges". Point source discharges are discharged directly from the source into the waterway (such as through a pipe). Common examples include discharges from a sewage treatment plant or a milking shed.

2.4 Non-point discharges, or "diffuse pollution", is when nutrients, microbial contaminants, and sediment get washed off the land into water bodies when it rains or when contaminants leach into groundwater. Common examples include animal urine and faeces, fertiliser, sediments, and run-off from urban areas.[5]

2.5 In the last few decades, the level of pollution from point source discharges has greatly reduced. Today, diffuse pollution from urban and pastoral land is a leading cause of the decline in freshwater quality. Levels of diffuse pollutants, such as nitrogen, phosphorus, *Escherichia coli (E. coli)*, heavy metals, and sediment, are found in slightly higher concentrations in urban areas.

2.6 However, pastoral farming occupies a much larger fraction of New Zealand's land area than cities and towns. A much greater length of our waterways travel through pastoral areas.[6] The rapid intensification of dairy farming in the past two decades has had a major adverse effect on the quality of freshwater.[7]

2.7 Some land-use practices (such as the wide-ranging use of nitrogen fertilisers during the last 40 years) can take a long time to affect freshwater quality. For example, it can take decades or more for contaminants that enter groundwater to move through aquifers and back into rivers, springs, lakes, or estuaries. This results in a delay, or lag time, between land-use practices and their effects on freshwater quality.

4 Gluckman, P (2017), *New Zealand's fresh waters: Values, state, trends and human impacts*, Wellington, pages vi and ix, at www.pmcsa.org.nz.

5 For more information, see the Land, Air, Water Aotearoa website at www.lawa.org.nz.

6 Ministry for the Environment and Statistics New Zealand (2019), *New Zealand's environmental reporting series: Environment Aotearoa 2019*, at www.mfe.govt.nz.

7 Ministry for the Environment and Statistics New Zealand (2019), *New Zealand's environmental reporting series: Environment Aotearoa 2019*, at www.mfe.govt.nz.

2.8 Lag times vary between catchments and can be as many as 50 or even 100 years. This means that the current state of freshwater in some areas can be the result of land use that occurred many years ago. It also means that past practices will continue to affect freshwater quality and efforts to improve quality for decades to come.[8]

2.9 The current quality and trends of freshwater indicate that many water bodies continue to be at risk of degradation. Between 2008 and 2017, trends for nitrate, dissolved reactive phosphorus, *E. coli*, and turbidity were worsening at about half of pastoral sites, though improving for ammoniacal nitrogen. In urban areas, decreasing trends for *E. coli* are seen at most sites.[9]

How freshwater quality is managed

2.10 Regional councils, central government, territorial authorities, Crown research institutes, iwi and hapū, private industries, environmental groups, and the primary production sector all have major roles to play in managing the effects of land use on freshwater quality.

2.11 The Resource Management Act is the main legislation that controls how our environment is managed. The purpose of the Act is to promote sustainable management of natural and physical resources through integrating resources and controlling adverse effects of activities on the environment.

2.12 The Act includes restrictions on the use of land and the coastal marine area, taking or using water, and discharging contaminants into water, air, or land. There are also restrictions on certain uses of lake and river beds. Part 3 of the Act includes duties and restrictions on everyone, such as requiring everyone to avoid, remedy, or mitigate adverse effects on the environment.

2.13 The Act also establishes a hierarchy of policy statements and plans. Documents lower on that hierarchy give effect to documents higher up. In descending order, these documents include national policy statements, national environmental standards, national planning standards, regional policy statements, regional plans, and district plans.

2.14 The Minister for the Environment recommends preparing national policy statements and national environmental standards. A regional council must prepare and implement a regional policy statement to give effect to its responsibilities under the Act. This means that regional policy statements must give effect to the National Policy Statement.

8 Gluckman P (2017), *New Zealand's fresh waters: Values, state, trends and human impacts*, Wellington, page x, at www.pmcsa.org.nz.

9 Ministry for the Environment and Statistics New Zealand (2019), *New Zealand's environmental reporting series: Environment Aotearoa 2019,* at www.mfe.govt.nz.

2.15 Unique to the Waikato Regional Council is *Te Ture Whaimana o Te Awa o Waikato – Vision and Strategy for the Waikato River* (the Vision and Strategy) – see Figure 2. Enacted through the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010, the Vison and Strategy is the primary guiding document for managing the Waikato-Waipa catchment. The provisions of the Vision and Strategy prevail if there is any inconsistency between it and other planning documents, including a national policy statement. We discuss the Vision and Strategy further in Parts 4 and 7.

Figure 2
Te Ture Whaimana o Te Awa o Waikato – Vision and Strategy for the Waikato River

Tooku awa koiora me oona pikonga he kura tangihia o te maataamuri

"The river of life, each curve more beautiful than the last"

Our vision is for a future where a healthy Waikato River sustains abundant life and prosperous communities who, in turn, are all responsible for restoring and protecting the health and wellbeing of the Waikato River, and all it embraces, for generations to come.

2.16 The National Policy Statement requires regional councils to:

- set objectives and limits for freshwater quality and quantity, and ensure that land use and water are managed in an integrated way (see Part 7);[10]
- consult with their communities when setting objectives (see Part 8);
- include iwi and hapū in freshwater quality management and have their values reflected in decisions about the management of freshwater; and
- maintain or improve freshwater quality in a region.[11]

2.17 Under the Resource Management Act, regional council responsibilities include putting in place control functions over the use of land for the purpose of soil conservation, and maintaining and improving water quality and quantity and marine ecosystems. Regional councils fulfil their responsibilities in many ways, including by playing a lead role in enacting policies set by central government, producing regional policy statements and plans, monitoring the state and quality of natural resources, and regulating land-users' and other resource-users' behaviour. Regional councils also manage activities that can affect the beds of water bodies and surrounding ecosystems.

2.18 Regional councils carry out regulatory and non-regulatory work to manage freshwater quality. Regulatory work involves regional councils requiring land users to comply with the Resource Management Act, regional rules, and resource

10 "Limits" refers to the total amount of water that can be taken out of a freshwater management unit or the total amount of contaminants that can be discharged into it without affecting the desired outcome. As outlined earlier, this audit looked at quality aspects, rather than quantity.

11 Ministry for the Environment (2017), *National Policy Statement for Freshwater Management: Implementation review*, at www.mfe.govt.nz.

consent requirements. Non-regulatory work usually involves providing advice, education, and incentives to change land-use behaviour. Increasingly, regional councils share management responsibility with local iwi through shared leadership arrangements.

2.19 We discuss the four regional councils' approach to regulatory activities in Part 9 and their non-regulatory programmes in Part 10.

Groups involved in managing freshwater quality

Iwi and hapū

2.20 For regional councils, iwi and hapū are critically important partners for resource management, including managing freshwater quality. Regional councils have legislative obligations, increasingly coming from the Treaty settlement process, about actively involving iwi and hapū in local decision-making.

2.21 To be truly effective, the relationship between regional councils and iwi/hapū needs to be based on more than legislative requirements. Regional councils and iwi/hapū need to develop strong and collaborative relationships and ways of working together that are meaningful and effective for both.

Stakeholders

2.22 Regional councils work with many stakeholders in freshwater quality management, including:

- **Crown research institutes**. These include organisations such as NIWA, which researches and monitors freshwater quality in New Zealand.
- **Territorial authorities**. District and city councils hold major resource consents for wastewater treatment plants and make decisions under the Resource Management Act about the effects of land use and activities on the surface of rivers and lakes.[12]
- **The primary production sector (or farming sector)**. Since 2011, farming companies (such as Fonterra Co-operative Group) and dairy industry representative groups (such as DairyNZ Limited or Beef and Lamb NZ) have increased their commitment towards encouraging sustainable farming practices. Groups such as NZ Landcare Trust also work with farmers to improve sustainable land management. Many individual farmers have also invested in improving their environmental performance. The primary production sector has an important role in freshwater quality management, given how its activities have affected freshwater quality.
- **The New Zealand Fish and Game Council.** The New Zealand Fish and Game Council (Fish and Game) has a statutory function to advocate for the protection of freshwater habitats. It takes a strong stance on the need to protect

12 For more on the roles and responsibilities of councils under the Resource Management Act, see www.mfe.govt.nz.

freshwater quality and challenges activities or agencies that adversely affect the sports fishing habitat.

- **Environmental and conservation organisations**. These groups (including national bodies such as the Royal Forest and Bird Protection Society of New Zealand and locally focused groups) play an important role in highlighting freshwater degradation and calling for improvements. They are often involved in conservation initiatives and clean-up efforts.
- **Community groups and individuals** are becoming more involved in monitoring freshwater quality though citizen science and mātauranga Māori monitoring initiatives.

2.23 The mix of stakeholders varies from region to region. For example, the Waikato Regional Council considers the forestry and energy sectors as important stakeholders for managing freshwater quality within its region given their significant presence and use of freshwater resources.

The incomplete national picture of freshwater quality

3

3.1 In this Part, we discuss:

- the difficulties involved in considering freshwater states and trends;
- the work being done to provide a national picture of freshwater quality states and trends;
- the significant gaps that remain in our knowledge of freshwater quality states and trends; and
- how leadership is needed to make progress.

Summary of findings

3.2 A detailed national-level picture of freshwater quality is needed. This will allow for effective national-level planning and decision-making to support the work of regional councils in addressing challenges to improving and protecting freshwater quality.

3.3 Complexities in using data sourced from regional councils to build the national picture and gaps in our knowledge mean that the current national-level picture lacks the detail needed. These issues are well known and work to address them is ongoing, but leadership is needed for meaningful progress to be made.

Difficulties in considering freshwater quality states and trends

3.4 Before discussing what we found from our review of how the four regional councils manage freshwater quality, we want to highlight current problems affecting national-level reporting on freshwater quality. It is an important issue that needs to be addressed if collective efforts by central government, regional councils, and others to improve and protect freshwater quality are to be effective.

3.5 We were interested in how the four regional councils' regional freshwater quality states and trends compared and how their freshwater quality data helps form a national view of freshwater quality.

3.6 Dr Jan Wright, a former Parliamentary Commissioner for the Environment, has stated that the purpose of national-level reports on environmental states and trends should be an "aid to prioritising different environmental issues".[13] It is important to present a clear picture of "where different issues are significant and where they are not".[14]

3.7 We were unable to obtain a detailed national picture of freshwater quality states and trends. This is because currently available data lacks the consistency and breadth needed to build a detailed national picture.

13 Parliamentary Commissioner for the Environment (2016), *The state of New Zealand's environment: Commentary by the Parliamentary Commissioner for the Environment on Environment Aotearoa 2015*, at www.pce.parliament.nz.

14 Parliamentary Commissioner for the Environment (2016), *The state of New Zealand's environment: Commentary by the Parliamentary Commissioner for the Environment on Environment Aotearoa 2015*, at www.pce.parliament.nz.

3.8 National reporting of freshwater quality is based on data sourced from regional councils. However, building a national picture of freshwater quality states and trends from that data is complicated by two factors (see Figure 3). First, regional monitoring programmes have been designed in relative isolation to suit local management needs rather than national reporting needs.[15] Secondly, regional councils collect and analyse some data differently and the data can be non-comparable.[16]

Figure 3
The challenge of building a national picture of freshwater quality

National-level reports on freshwater quality are prepared by the Ministry for the Environment and Statistics New Zealand from monitoring data collected by regional councils. However, regional councils' monitoring networks are designed to support their work in managing freshwater quality only within their respective regions. They meet local rather than national needs.

Regional councils tend to monitor areas with known or suspected freshwater quality issues that require environmental management. A higher proportion of monitoring sites are located in pastoral areas and a lower proportion in areas of native land cover. This can mean that monitoring networks do not provide a representative view of freshwater quality within regions. It also means that, taken together, the monitoring networks do not provide a representative view of water quality across New Zealand.

Data consistency also affects national-level reporting. Regional councils measure the same range of variables (see Figure 4) but can use different methods and technologies to do so. In other words, although there is consistency in *what* regional councils measure, there are differences in *how* they measure those variables.

Data produced through different methods cannot always be combined easily to form a national picture. When data is produced through non-comparable methods, some data is omitted to ensure that national-level data is consistent. As a result, the national picture is incomplete and at a high level, and can produce a different picture of freshwater quality than the detailed regional views.

3.9 Hon Simon Upton, the current Parliamentary Commissioner for the Environment, has also commented on the coverage and quality of environmental data. Although his commentary on the *Our Land 2018* report was specific to knowledge of land, two of his observations are also pertinent to the state of knowledge about freshwater:

- There is a lack of effort and resources. Collecting environmental data – in particular, long-term monitoring data – can be time-consuming and costly, and "is often the first thing to be cut when resources are tight".[17]
- There is unclear or incomplete mandated responsibilities to collect information. Although New Zealand relies heavily on its natural wealth, management

15 Ministry for the Environment and Statistics New Zealand (2017), *New Zealand's environmental reporting series: Our fresh water 2017*, at www.mfe.govt.nz.

16 Ministry for the Environment and Statistics New Zealand (2017), *New Zealand's environmental reporting series: Our fresh water 2017*, at www.mfe.govt.nz.

17 Parliamentary Commissioner for the Environment (2018), *Commentary on Our Land 2018*, at www.pce.parliament.nz.

agencies are not obliged to systematically collect information on the state, trend, or functioning of the environment. Instead, agencies separately collect the information they need to carry out their own functions, and there is no "overarching requirement to collect information at the national-level".[18]

3.10 The four regional councils have been maintaining and investing in their monitoring networks. For example, Taranaki Regional Council doubled its budget for state of the environment monitoring between 2011/12 and 2017/18, while Horizons Regional Council significantly increased the number of monitoring sites.

3.11 However, as we discuss in Figure 3, councils' monitoring can be unrepresentative and non-comparable. Increased monitoring by councils will not necessarily produce the information needed to produce an improved national-level picture.

3.12 The National Policy Statement goes some way to requiring regional councils to collect the information needed to improve the national picture. As we discuss below, guidance on exactly what regional councils monitor and how they analyse and report the results could be strengthened.

Work to improve data to provide a national picture

3.13 A range of initiatives to improve the quality of national data are under way. The Environmental Reporting Act 2015 supports efforts to standardise regional council data quality.

3.14 Under that Act, the Government Statistician and the Secretary for the Environment are responsible for reporting five different environmental domains (air, atmosphere and climate, freshwater, land, and marine) and the cross-domain area of biodiversity. The Act requires the Ministry to publish one domain report every six months and an overarching report on New Zealand's environment every three years. The Parliamentary Commissioner for the Environment can also comment on any aspect of the reporting.

3.15 In 2016, Jan Wright commented on *Environment Aotearoa 2015*, the first complete state of the environment report prepared under the Environmental Reporting Act. She noted that one of the benefits of the new national environmental reporting system is that it will lead to more consistent monitoring and analysis by regional councils.

3.16 *Environment Aotearoa 2019* provides some evidence that progress is being made to address shortcomings in the quality of national data. The Ministry and Statistics New Zealand adopted methods for the trend assessments of freshwater quality for that report that are consistent with approaches used by regional councils.

18 Parliamentary Commissioner for the Environment (2018), *Commentary on Our Land 2018*, at www.pce.parliament.nz.

3.17 These methods meant that more of the data sourced from councils could be used and that trend assessments could be classified with greater certainty. In short, more data was able to be used to produce a clearer picture of freshwater quality throughout New Zealand.[19]

3.18 We saw evidence that the Ministry is carrying out work to ensure that consistent and representative data is available for future environmental reporting. For example, the Ministry is working with regional councils on the Environmental Monitoring and Reporting project to improve environmental reporting systems. The Ministry notes that this involves "exploring the standardisation of methods and sharing of data collection, management and exchange protocols to allow national scale interpretation of regional data".[20]

3.19 Regional councils have also been leading work to bring greater consistency to environmental monitoring. Recent work on the National Environmental Monitoring Standards (NEMS) programme is an example of regional councils' work to build consistency in the way environmental monitoring data is measured, processed, and archived on a national scale.

3.20 NEMS is largely the work of regional council staff, with support from NIWA and the Ministry. The documents produced prescribe technical standards, methods, and other requirements for monitoring environmental variables between regions. Specific aspects of these standards still need to be agreed, but it is expected that this work will support better consistency.

3.21 At the time of this report, the Ministry has committed to funding NEMS until the standards are prepared. This leaves the question of how the standards will be reviewed and updated. We commend regional councils for investing in the development of NEMS to date.

Significant gaps remain in our knowledge

3.22 *Environment Aotearoa 2019* makes clear that there remain significant gaps in knowledge about freshwater quality (and the environment as a whole).[21] For example, although it is clear that water quality is degraded in pastoral areas at the national level, there is a lack of information to identify "exactly where, when, and what specific activities and management practices ... have contributed to (or mitigated) water pollution" at the local level.[22]

19 Ministry for the Environment and Statistics New Zealand (2019), *New Zealand's environmental reporting series: Environment Aotearoa 2019,* at www.mfe.govt.nz.

20 See "Improving environmental reporting data" at www.mfe.govt.nz.

21 Ministry for the Environment and Statistics New Zealand (2019), *New Zealand's environmental reporting series: Environment Aotearoa 2019,* at www.mfe.govt.nz.

22 Ministry for the Environment and Statistics New Zealand (2019), *New Zealand's environmental reporting series: Environment Aotearoa 2019,* at www.mfe.govt.nz.

3.23 This problem is partly due to the lack of a national-scale database or map of farm-management practices. A better understanding of the flow of pollutants through catchments is also needed to allow better understanding of the effect of past and current land-use practices on current freshwater quality trends.[23]

3.24 Knowledge is also lacking about the effect of water pollution on te ao Māori – particularly, on how mātauranga Māori, tikanga Māori, kaitiakitanga, customary use, and mahinga kai are affected. There is poor information on the effects of water pollution on human health. This includes lack of data on emerging contaminants such as pesticides, pharmaceuticals, and nanoparticles.[24]

Leadership is needed to make progress

3.25 As *Environment Aotearoa 2019* states, the systemic challenges in the country's data collection and management system need a whole team to resolve.[25] Once resolved, New Zealanders will have a better idea of regional and national freshwater states and trends, the challenges in protecting and improving freshwater quality, and the actions needed to achieve this.

3.26 We saw positive signs of commitment from the four regional councils and the Ministry to making the kinds of improvements needed. However, this issue needs leadership for rapid progress to be made. We consider that the Ministry and Statistics New Zealand are well placed to take this leadership role.

3.27 Ministry leaders acknowledged to us that underlying data issues need to be addressed. They stated that the Ministry is aiming to take a stronger role in data science leadership.

3.28 Regional councils are also central to resolving these data issues. Any change to the way that freshwater quality attributes are measured and reported on presents risks for councils. As Horizons Regional Council staff explained, adopting nationally consistent methods could result in a loss of historic data if the adopted methods are incompatible with a council's current methods. Historic data is important in determining long-term relationships between factors such as nutrients, water flow and periphyton levels (see Figure 4). A loss of historic data puts such analysis at risk.

23 Ministry for the Environment and Statistics New Zealand (2019), *New Zealand's environmental reporting series: Environment Aotearoa 2019,* at www.mfe.govt.nz.

24 Ministry for the Environment and Statistics New Zealand (2019), *New Zealand's environmental reporting series: Environment Aotearoa 2019,* at www.mfe.govt.nz.

25 Ministry for the Environment and Statistics New Zealand (2019), *New Zealand's environmental reporting series: Environment Aotearoa 2019,* at www.mfe.govt.nz.

3.29 The Parliamentary Commissioner for the Environment has recommended that the Secretary for the Environment and the Government Statistician work with other relevant agencies to assess the underlying causes of the gaps in data and information, identify potential solutions, and make the results publicly available. We agree with those recommendations.

Recommendation 1

We recommend that the Ministry for the Environment and Statistics New Zealand lead work with regional councils and relevant land and freshwater management agencies to support better informed and co-ordinated management of freshwater by preparing a consistent approach to monitoring, analysis, and reporting of freshwater quality state and trend information.

4 Freshwater quality monitoring

4.1 In this Part, we discuss:

- the four regional councils' freshwater quality monitoring programmes;
- NIWA's analysis of those programmes; and
- how effectively the four regional councils incorporate mātauranga Māori and citizen science initiatives into their monitoring programmes.

Summary of findings

4.2 Each of the four regional councils have robust freshwater monitoring programmes. Some councils have a better understanding of freshwater quality in their regions than others. The four regional councils could make changes to produce a more representative picture of the state of freshwater in their regions.

4.3 The four regional councils were at various stages of incorporating mātauranga Māori into their monitoring programmes. This includes integrating cultural monitoring indicators into freshwater quality monitoring programmes.

Monitoring freshwater quality

4.4 Monitoring long-term trends in freshwater quality allows regional councils to understand what is happening to freshwater quality in different sites.

4.5 Monitoring freshwater quality supports a range of regional council activities. These include:

- reporting on the state of environment;
- monitoring the effectiveness of regional plans;
- monitoring compliance with resource consents and regional rules on resource use;
- informing resource consent processes; and
- helping determine nutrient thresholds to manage the effects on ecological health.

4.6 Collecting good information and using it well is essential to making well-informed, evidence-based policy decisions.

4.7 Regular monitoring is also needed to effectively implement the National Policy Statement. As discussed in Part 2, the National Policy Statement directs regional councils to set objectives for the state of freshwater in their regions and to set limits on resource use to meet these objectives. Knowledge of states and trends is necessary to appropriately manage freshwater quality (for freshwater quality to be maintained or improved). Figure 4 describes what regional councils measure and report on.

Figure 4
What regional councils measure and report on

The most common variables that regional councils and NIWA measure and report on include:

Bacteria – Faecal coliforms, *E. coli*, and enterococci indicate the presence of human or animal faeces and the associated risk of infectious disease for people swimming in or drinking the water, and for livestock from drinking the water.

Nutrients – Increased levels of various forms of nitrogen and phosphorus in water bodies can cause excessive plant growth rates, which can lead to blooms of algae and nuisance weeds. These can then reduce the recreational and aesthetic value of water bodies and affect fish and other aquatic animals.

Visual clarity – A river or lake with low clarity can indicate significant erosion in the catchment or algal growth in the water. Low clarity affects fish feeding and spawning habits, plants' growth rates, and recreational uses.

Macroinvertebrate Community Index (MCI) – This measures the composition of the invertebrate animals that live on the river beds. The MCI gives an overall indication of river health and water quality.

Periphyton – The algae that grow on the beds of rivers, streams, and lakes turn dissolved nutrients into nutritious food (periphyton biomass) for invertebrates, which are themselves food for fish and birds. Elevated levels of nutrients can cause periphyton blooms – long filamentous growths or thick mats that cover much of the streambed. Too much algal growth can be a nuisance for swimming, fishing, and kayaking and can adversely affect fish and insect life in rivers.

Analysis of monitoring networks

4.8 In 2011, we commissioned NIWA to provide an independent expert view of the four regional councils' freshwater quality networks. NIWA found that the four regional councils had "well-planned and operated networks for assessing the current state and long-term trends in physical and chemical quality of rivers, lakes, and groundwater".

4.9 In particular, "the distribution of sampling sites across each region was deemed representative", and the four regional councils were monitoring an appropriate range of variables, employed adequate quality assurance and quality control processes, and followed acceptable data storage procedures.

4.10 We asked NIWA to assess of the effectiveness of the freshwater quality monitoring networks and approaches so we could provide a view of how fit for purpose they are.

4.11 NIWA's analysis took into account substantial changes to freshwater quality management regulation and laws since 2011. The National Policy Statement for Freshwater Management is the most significant change. It establishes national objectives to be met for multiple freshwater attributes including physical, chemical, and biological properties of rivers and lakes. These attributes are to be

managed to ensure that regional water quality is maintained or improved within freshwater management units.

4.12 The Australian and New Zealand Environment Conservation Council updated its guidelines for fresh and marine water quality in 2018. The revised guidelines provide default values for finer spatial-scale ecoregions compared to the previous guidelines.

Monitoring networks overall

4.13 NIWA found that the four regional councils each have robust freshwater monitoring programmes that regularly sample a common subset of physio-chemical, microbiological, and biological variables in rivers, lakes, and groundwater. NIWA also suggested ways in which the four regional councils could improve the representativeness and "statistical power" of their networks.

River monitoring

4.14 The four regional councils monitor the attributes for river ecosystem and human health identified in the National Policy Statement. The four regional councils also sample most of the core variables recommended by the National Environmental Monitoring and Reporting working group for river monitoring.[26]

4.15 The four regional councils have also begun adapting their practices to new regulations. For example, Environment Southland and Taranaki Regional Council have introduced monthly periphyton sampling programmes to meet the new requirements under the National Policy Statement.[27] Waikato and Horizons Regional Councils have introduced more sites for monitoring recreational bathing. This reflects the increasing focus on freshwater swimmability.

Lake monitoring

4.16 The four regional councils measure all the lake attributes identified in the National Policy Statement, except for planktonic cyanobacteria.[28] Waikato Regional Council measured planktonic cyanobacteria in some of its lakes. Environment Southland has provided information showing that it has consistently monitored cyanobacteria at its lake-monitoring sites over the last two years. Taranaki Regional Council provided information showing that it monitors all of the lake attributes identified in the National Policy Statement and consistently measures all variables at each monitoring site.

26 Taranaki and Horizons Regional Councils are the only two to measure total suspended solids and river flow.

27 NIWA concluded that Horizons Regional Council had introduced monthly periphyton sampling to meet the requirements of the National Policy Statement. Horizons Regional Council staff advised us that monthly periphyton sampling began in 2007.

28 Cyanobacteria (commonly known as blue-green algae) are potentially toxic and can multiply and form blooms in rivers or lakes (where they are known as planktonic cyanobacteria). For more information, see www.lawa.org.nz.

Groundwater monitoring

4.17 The four regional councils sample a common subset of groundwater variables. NIWA advised that groundwater monitoring is currently spread across several different programmes within each region. It recommended combining the various programmes into one network (with the same set of variables at all sites) to improve consistency and enable power analyses to be conducted.[29]

Water quality sampling, analysis, and data storage

4.18 Each of the four regional councils follow established sample collection and analytical procedures for the majority of water quality variables measured in river, lake, and groundwaters. All data are stored in accessible database formats. However, there was some variance in methods.

Representativeness

4.19 All four regions have an over-representation of river monitoring networks in lowland and pastoral areas. It also found an under-representation of monitoring networks in upland sites (sites dominated by natural land cover, particularly indigenous forest).

4.20 NIWA suggested that the four regional councils could improve the representativeness of their monitoring networks by adding specific river-based monitoring sites to their networks.

Statistical power

4.21 Statistical power refers to the likelihood that a study will detect an effect when there is an effect to be detected. One of the factors affecting power analyses is the size of the sample being considered. In short, large samples offer greater test sensitivity than small samples.

4.22 NIWA assessed the statistical power of regional river monitoring networks as the ability to distinguish mean values of water quality variables within each class from relevant guideline values. It noted that, in many cases, there are less than two sites in a given class, which prevents power analysis from being conducted. It suggested that a useful first step to address this would be to add at least one or two sites in these classes to enable future analysis.

29 For a short description of power analysis, see paragraphs 4.21 and 4.22.

Recommendation 2

We recommend that Waikato Regional Council, Taranaki Regional Council, Horizons Regional Council, and Environment Southland consider how they might use the analysis conducted by National Institute of Water and Atmospheric Research Limited to improve their monitoring of freshwater quality.

Mātauranga Māori and citizen science in freshwater monitoring

4.23 We looked at how effectively the four regional councils incorporated mātauranga Māori and citizen science initiatives into their monitoring programmes. The 2017 amendments to the National Policy Statement require every regional council to prepare a monitoring plan that includes methods for monitoring whether the values identified under its policy requirements are being provided for. This includes mātauranga Māori values.

4.24 Mātauranga Māori can been defined as "the knowledge, comprehension, or understanding of everything visible and invisible existing in the universe" and is often used synonymously with wisdom.[30] Mātauranga Māori is an important part of freshwater quality management because it values the perspectives of Treaty partners and can lead to insights into the health of the ecosystem as a whole.

4.25 The most common way regional councils implemented mātauranga Māori in their monitoring programmes was by including cultural health monitoring indicators. These indicators can include water clarity and flow, the form of the riverbank, the presence of certain fish, insect and bird species, or the smell of the water.

4.26 At the time we visited them, the four regional councils had made variable progress in incorporating mātauranga Māori into their monitoring programmes. Councils were supportive and had taken the first steps towards implementing cultural health monitoring indicators or were actively looking at how to make those first steps.

4.27 Since we visited the councils, Waikato Regional Council has advanced a programme to incorporate mātauranga Māori perspectives into all the work the Council carries out. The desired outcome is that incorporating mātauranga Māori perspectives becomes the business-as-usual approach.

4.28 One of the potential benefits of the programme will be improvements to the Council's ability to align the Waikato Regional Policy Statement, the Waikato Regional Plan, the Vision and Strategy for the Waikato River, the National Policy Statement for Freshwater Management, and iwi environmental/management plans with mātauranga Māori. Implementing this programme is under way and scheduled to be completed by the end of 2020/21.

30 For more information, see www.landcareresearch.co.nz.

4.29 People in the wider community can also carry out freshwater monitoring. This is called citizen science and is more widely supported and advanced in the four regional councils than it was in 2011. Some councils have been providing stream health monitoring and assessment kits prepared by NIWA to iwi and community groups so that they can test freshwater quality.

4.30 We encourage the four regional councils to continue working closely with iwi and hapū to implement and use mātauranga Māori monitoring in their monitoring programmes.

Using freshwater quality information

5

5.1 In this Part, we discuss how the four regional councils use the monitoring information they collect. As Horizons Regional Council staff said, the value of freshwater quality information is in its application – what councils collect is of little value unless it is used to inform decision-making.

Summary of findings

5.2 The four regional councils are effectively using freshwater quality monitoring results to inform high-level region-wide freshwater management planning. They also use this information well to inform planning and interventions to address poor freshwater quality.

Taranaki Regional Council

5.3 Taranaki Regional Council uses the results of its freshwater quality monitoring programme to inform its policy direction. Since 2011, the Council has generally used monitoring results for assurance that its management approach is maintaining or improving freshwater quality.

5.4 For example, in 2018, the policy and planning committee discussed a report that showed that Macroinvertebrate Community Index (MCI) trends were generally improving. The committee used the report for assurance that the Council was meeting the *Fresh Water Plan* objectives to maintain or improve freshwater quality in the region.

5.5 Taranaki Regional Council's riparian management programme is an example of how the Council uses monitoring results to inform freshwater quality policy proposals. In September 2015, the policy and planning committee discussed the report *Review of the status of freshwater quality in Taranaki*.[31] The report concluded that "the water quality of Taranaki is already very good on a regional basis" and that, aside from dissolved reactive phosphorus measures, which might be a concern, physio-chemical measures were generally improving.

5.6 Because of the largely positive results, the report noted that the starting point for considering new policy measures would be to "maintain and further enhance [an] already good state of water quality" while maintaining value for money for the community.

5.7 When making recommendations for future policy direction, the report stated that, although riparian management and installing new effluent discharge systems carried a cost to farmers, they were "the most cost-effective and beneficial for the region to take into the next Regional Fresh Water Plan" and were appropriate "in the context of a drive for an appropriate level of enhancement to the waterways of Taranaki".

31 Taranaki Regional Council (2015), *Review of the status of freshwater quality in Taranaki*, at www.trc.govt.nz.

5.8 Taranaki Regional Council's Proposed Freshwater and Land Management Plan had not gone out for public consultation when we were preparing our report. The Council's website states that informal and targeted consultation on a draft plan highlighted several issues that needed further detailed work and consultation, such as setting limits, including cultural values, and protecting biodiversity and wetlands (see Part 7 for further discussion of the Council's work on its Proposed Freshwater and Land Management Plan).

5.9 The Council's website also states that the Council has "clearly signalled its direction of travel" on several issues and that "changes are already taking place". These include stating that:

- the Council's policy is that land-based treatment and disposal of dairy effluent is best practice and that, in most cases, farmers are required to follow that policy when renewing effluent consents; and
- the Council is confident its riparian management programme is being implemented effectively and that the project will be nearly complete by the end of the decade. The Proposed Freshwater and Land Management Plan includes a requirement for riparian planting and fencing to be completed on land used for intensive pastoral farming by 2020.[32]

5.10 We support how Taranaki Regional Council considers the results of its freshwater quality monitoring programme when preparing policy.

Waikato Regional Council

5.11 In our 2011 report, we noted that the Waikato Regional Council had implemented an innovative plan change to protect Lake Taupō after monitoring data identified declining freshwater quality in the lake. Regional Plan Variation 5 – Lake Taupō Catchment (RPV5) capped the amount of nitrogen entering Lake Taupō from urban and rural activities through rules controlling some farm and development practices and requiring consents for others.

5.12 We saw how Waikato Regional Council used monitoring data to inform the goals of the Healthy Rivers Wai Ora Plan Change 1 (Wai Ora Plan), which covers management of the Waikato-Waipa catchment, and the earlier, non-statutory Waipa Catchment Plan.

5.13 The goals and provisions of the Wai Ora Plan for improving freshwater quality were based on an understanding of declining water quality informed by monitoring data. The main methods for achieving these goals include requirements for stock exclusion, constraints on land-use change, establishing nitrogen reference points and farm environment plans for farming activities, and requiring point source resource consent decisions to consider water quality targets.

32 Taranaki Regional Council (2018), *Water and soil plan review*, at www.trc.govt.nz.

5.14 The Waipa Catchment Plan focuses on non-regulatory work to improve water quality. It takes an integrated catchment-based approach to identifying prioritised investment of on-ground works, and priority areas for working with landowners, iwi, and community groups.

5.15 Waikato Regional Council used monitoring data to inform the Wai Ora Plan process. The Council transparently shared how it used technical information, including freshwater quality monitoring data, to inform policy direction.

5.16 Technical Alliance, an independent advisory group of specialists, analysed, summarised, and presented information, including monitoring data, to a collaborative stakeholders group (the main group preparing the Wai Ora Plan – see Part 7). It also shared a broad range of technical reports on the Council's website. The Wai Ora Plan was notified in October 2016 and includes goals to lower nitrogen and phosphorus in the Waikato-Waipa catchment.

5.17 Waikato Regional Council also pointed out the immediate effect of having the policy framework as part of the plan process. In particular, the Council developed and implemented a land-use rule change that can require land owners to get a resource consent before changing the use of their land to a more intensive activity.

5.18 As we noted in our 2011 report, managing the effects of significant land-use intensification was an important challenge facing the Council. The land-use rule change came into effect when the plan was notified. Since then, there has been a significant reduction in the amount of land in the Waikato-Waipa catchment earmarked for intensification.

5.19 The Wai Ora Plan covers the catchments of the Waikato and Waipa Rivers. We encourage the Council to apply its approach more broadly as plans are prepared for the other catchments in its region.

Horizons Regional Council

5.20 Horizons Regional Council's regional plan (One Plan) demonstrates an understanding of variations in freshwater quality within and between catchments and the many factors that can contribute to poor water quality. The One Plan has a water management framework that sets targets for freshwater quality. The framework has requirements for maintaining and improving freshwater quality.

5.21 The One Plan also includes objectives for freshwater quality and policies for achieving these targets. It includes policies to manage land-use activities affecting freshwater quality and to regulate intensive farming activities, point source discharges to water and land, and human sewage discharges.

5.22 The policy regulating intensive farming includes nutrient allocation limits for nitrogen (see paragraph 9.17), requirements to prevent faecal contamination in freshwater, and measures to manage land at risk of erosion.

5.23 We saw examples of Horizons Regional Council using monitoring information to inform interventions. For example, the Council worked with the Lake Horowhenua Accord (the Accord) to restore water quality in Lake Horowhenua.

5.24 The Accord is a collaboration led by the Lake Trust (elected to represent the Muaūpoko beneficial owners of the lake), and involves other groups, including the Horowhenua Lake Domain Board, Horizons Regional Council, local district councils, and the Department of Conservation. Members of the Accord have produced an action plan to restore freshwater quality in Lake Horowhenua and supported the implementation of significant works to achieve the goals.

5.25 There has been significant freshwater quality monitoring that involves several groups. The monitoring has identified that sediment loss from the surrounding land catchment into the lake, and the phosphorus that attaches to it, undermines the lake's health. There is also clear evidence of toxicity problems in the lake related to cyanobacteria and ammonia, which arise from the seasonal growth of lake weed. These complex issues negatively affect the lake's aquatic life.

5.26 We saw evidence that knowledge of these issues, and an improved understanding of their causes, has largely informed Horizons Regional Council and the Accord's strategies and approaches to addressing them. Management actions have included purchasing machinery to harvest lake weed and building a sediment trap on the inlet of the Arawhata Stream.

5.27 Horizons Regional Council and other members of the Accord know that these measures alone will not be enough to improve the freshwater quality in Lake Horowhenua. They have committed to a long-term programme of work that builds on current measures. We expect the Council to continue to build on the progress it has made in this area.

Environment Southland

5.28 Environment Southland has drawn on freshwater quality monitoring information when preparing and consulting on its proposed *Water and Land Plan*. Since 2011, Environment Southland's investment in science has seen it increase its knowledge (through projects such as "Water and Land 2020 and beyond").

5.29 That knowledge has informed the planning process and will continue to inform its upcoming processes to set limits on the amount of water taken (limit-setting)

throughout the region. We support how Environment Southland is increasingly using the results of its freshwater quality monitoring programme when preparing policy.

5.30 We also saw evidence of Environment Southland prioritising efforts to improve waterway quality at a more local level. Environment Southland has completed a "stratification" project, which divides the region's waterways into smaller areas based on freshwater quality monitoring results, the issues these results signify, and the levels of contaminant load moving through those waterways.

5.31 This process has used models based on the freshwater monitoring data, which have identified several areas with high contaminant loads and waterways with multiple issues. Environment Southland intends to use the findings of this work when limit-setting.

6 Reporting freshwater quality information

6.1 In this Part, we discuss:

- regional states and trend information;
- how the four regional councils report freshwater quality information (including the level of quality assurance they provide) to their communities; and
- how the four regional councils communicate the costs of freshwater management to their communities.

Summary of findings

6.2 The four regional councils have made some improvements since our 2011 report, but further improvements are needed. Three of the four regional councils make broadly accessible information on the state of freshwater available to the public. However, they could improve this information. In particular, councils could be more proactive in releasing information.

6.3 The four regional councils generally have good records of regulatory and non-regulatory activity costs and reporting of these costs. They could do more to differentiate the costs of different environmental activities in that reporting so a more complete picture can inform community decision-making.

Regional states and trends information

6.4 Regional councils' public reporting of freshwater quality information allows their communities to understand the state of the environment. Understanding which water bodies are facing the greatest risk is critical to making decisions about what needs to be done to improve freshwater quality.

6.5 It is also important for regional councils to keep stakeholders well informed to promote trust and encourage a balanced debate. As part of this, regional councils need to communicate the level of quality assurance and peer review carried out on their freshwater quality information.

6.6 The Resource Management Act requires regional councils to monitor the state of the environment and the effectiveness and efficiency of policies, rules, or other methods in their policy statement or plans. Results of this monitoring must be compiled and made publicly available at least every five years. The Act does not clearly prescribe how regional councils should report on freshwater quality.

6.7 We looked at how the four regional councils publicly communicate states and trends information. This included:

- how recently the four regional councils have produced region-wide reports on freshwater quality;
- what those reports suggest about freshwater quality in the four regions; and

- the level of quality assurance and peer review that the four regional councils carry out on their information so they can be confident in what they are presenting.

6.8 We were also interested to see how the four regional councils inform their communities about freshwater quality more broadly. In particular, we wanted to know how they communicate their body of technical knowledge to a general or non-technical audience. As we noted in our 2011 report, this type of reporting is needed for readers to fully appreciate the implications of the information and to support action needed to protect and improve freshwater quality.

6.9 Before looking at each council, it is important to acknowledge that, since 2014, the four regional councils have increasingly shared their regional freshwater quality data on the Land, Air, Water Aotearoa website. The website displays water quality data collected by regional councils at more than 1100 sites throughout the country.

6.10 Although there are some limitations to the data collected and presented on the website (for example, regional councils' different monitoring methodologies and quality assurance practices), it is a step forward in sharing freshwater quality information with the public in a user-friendly and regional way.

Taranaki Regional Council

6.11 Taranaki Regional Council publishes an annual water quality report card and a *State of the environment report* every five years (the last one was published in 2015). Both the report card and the *State of the environment report* are easy to find on the Council's website.

6.12 In its *Healthy waterways report 2018*, Taranaki Regional Council notes that "all the toxicant measurements at 15 Taranaki sites" meet national standards set by the Ministry. Of those sites, 78% were rated "best", 20% "intermediate", 2% "acceptable", and 0% "unacceptable". The report also noted that river ecology trends are improving at 53% of 57 sites, showing no obvious trend at 45% of sites, and are deteriorating at 2% of sites.

6.13 Finally, the picture of physical and chemical trends at 11 sites is "largely stable". Of the 11 sites, 84% have no obvious trend and 16% show a deterioration. These freshwater quality trends are also presented in a basic report card.[33]

6.14 Taranaki Regional Council's *State of the environment report*, which is more in-depth and technical, was peer-reviewed by independent specialists. Specifically, the surface and groundwater chapters were reviewed by scientists at NIWA and PRIME Hydrogeology Limited respectively.

33 Taranaki Regional Council (2018), *Healthy waterways report 2018*, at www.trc.govt.nz.

Horizons Regional Council

6.15 Horizons Regional Council published *State of the environment* reports in 2005, 2013, and 2019. The reports are available on its website. The Council also commissioned environmental consultants (Land Water People Limited) to prepare a states and trends report for river quality in the Manawatū-Whanganui Region in November 2018. This is also available on the Council's website.

6.16 As well as its more in-depth reports, Horizons Regional Council published a two-page freshwater report in 2018 that summarised freshwater quality in the region. The two-page report noted that Horizons Regional Council had seen "measurable improvement in many of the Horizons Region's waterways" but that more needed to be done in some areas.

6.17 For river water quality, the most recent *State of the environment report* states that:

> ... [t]*en-year trends show predominately degrading trends for periphyton (chlorophyll a), macroinvertebrate community index, dissolved reactive phosphorus, clarity, and spot measurements of dissolved oxygen. Predominantly improving trends were detected for soluble inorganic nitrogen, ammoniacal nitrogen, and the number of exceedances of the E. coli criteria for swimmability.*

6.18 The report also provides a detailed region-wide picture of water quality states and trends through clear and understandable graphics.

6.19 The reports do not clearly state the level of peer review that the Council's publications receive. However, the report prepared by Land Water People Limited does provide the Council and its community with an independent view of the region's freshwater quality states and trends.

6.20 The Council also helps to produce reports about the states and trends of particular water bodies in its region. In 2017, the Council helped to produce a report card for Lake Horowhenua as part of the Lake Horowhenua Accord, a partnership with the Lake Horowhenua Trust and other parties to improve the health of the lake.

6.21 The Council is also part of the Manawatū River Leaders Accord through which iwi/hapū, local and central government, farming, and industry leaders and others work together to improve the health of the Manawatū River and its catchment. In 2018, the Accord produced a report on progress against its action plan that included a summary of states and tends information for the river and the region.

Environment Southland

6.22 Environment Southland published a report in April 2017 on the states and trends of freshwater quality in its region.

6.23 In 2015, Environmental Southland also produced a seven-page factsheet summarising water quality in the Southland region. The main message was: "Southland's water quality is a mixed bag. Some areas are good, but some are not. It's not all bad news, but there are key areas where improvements in water quality need to be made."[34]

6.24 The report also includes a map of the region that shows the location of freshwater monitoring sites. On the map, the monitoring sites are represented by a circle divided into quarters. Each quarter represents what Environment Southland is measuring – *E. coli*, nitrate toxicity, macroinvertebrates (fish food), and slime algae – and the colour of each quarter represents the quality level.

6.25 Environment Southland produced its 2017 report in-house. NIWA and Environmental Associates Limited, an environmental consultancy, reviewed the report's analytical methods. Environmental Associates Limited also provided a review of the analytical results, including confirmation that the results were able to be replicated.

Waikato Regional Council

6.26 Waikato Regional Council publishes data and trends on its website that covers nitrogen losses from farms, river biology, river water quality for contact recreation, river water quality for ecological health, sources of nutrients (nitrogen and phosphorus), and surface water availability. However, the Council does not bring together this technical information in a manner that provides a regional picture of freshwater water states and trends for a general or non-technical audience.

6.27 It does provide information about region-wide freshwater quality through one Waikato progress indicator (a way the Council measures the region's progress on 32 economic, environmental, and social matters to give a dashboard view of the region's health). The progress indicator for river water quality is brief. It states:

> *The average proportion of unsatisfactory river water samples for ecological water quality for the period 2013-2017 at over 100 monitoring sites throughout the Waikato region was largely unchanged from 2003-2007.*[35]

6.28 Furthermore, the proportion of unsatisfactory river water samples remained consistent from 2004 to 2015.

6.29 As the only easily accessible source of non-technical region-wide states and trends information, this is not enough. Waikato Regional Council produces a lot of detailed, peer-reviewed freshwater quality information about the catchments in its region.

34 Environment Southland (2015), *Water quality in Southland*, at www.es.govt.nz.

35 See Waikato Progress Indicators at www.waikatoregion.govt.nz.

6.30 We consider that the Council needs to do more to bring this technical information together and make it available in ways that convey its message to a general or non-technical audience. This will help to support and inform the wider community discussion and commitment to action needed to protect and improve freshwater quality.

Improving how freshwater quality information is shared

6.31 We expect regional councils to be transparent when sharing freshwater quality information and to be able to have open and honest conversations with their communities about the challenges they face in managing freshwater quality.

6.32 Since our 2011 report, the four regional councils have improved the ways they share freshwater quality information. There is room for further improvement. In particular, although Waikato Regional Council has shared a lot of technical information about specific catchments in its region, it could do more to produce regional freshwater quality states and trends reports to better inform the public about the health of the region's waterways as a whole.

6.33 Environmental groups we spoke to in the Southland region were concerned that Environment Southland was keeping important details from the community by staggering the release of scientific information. We raised this concern with senior leaders at Environment Southland.

6.34 They explained that Environment Southland has heavily invested in advancing its science programme and in communicating information from that programme to the community. They said that bringing together and releasing information in packages is the most effective way of sharing related information. This will provide the community with a fuller and more understandable scientific picture. They noted that Environment Southland would ensure that the community has ready access to information about freshwater quality as soon as it is ready to share.

6.35 Since we spoke with them, Environment Southland has completed its four-year Southland Science Programme. Research outputs from the programme are available through Environment Southland's website. This includes a database of technical reports and community-focused research overviews. It also includes videos and posters from a science symposium held to celebrate the conclusion of the programme.

6.36 Because the public debate about freshwater quality has become increasingly complex, staff in regional councils told us that they have, at times, felt under attack by the media and wider community. Some regional councils have reacted to criticism with increased openness and honesty about the challenges they face in managing freshwater quality.

6.37 However, some regional council staff and stakeholder representatives noted that regional councils have, at times, countered such criticism by increasing the emphasis on "good news" stories to balance out these perceived attacks.

6.38 We looked at the four regional councils' websites and press releases. We do not dispute the accuracy of what is reported but have concluded that reporting was, at times, weighted towards highlighting success stories rather than challenges. In our view, if releasing "good news" stories has been used to counter criticism, this has been counter-productive. Some stakeholders have viewed the positive messages with scepticism.

6.39 The four regional councils are attempting to keep the public well informed about freshwater quality developments. However, they could improve the way in which they ensure balance in the information reported. Balance is critical in building and maintaining trust with the community.

Recommendation 3

We recommend that the Waikato Regional Council, Taranaki Regional Council, Horizons Regional Council, and Environment Southland support and inform wider community discussion of freshwater quality issues by ensuring that the information they make available to their communities is clear, complete, up to date, consistent, accessible, and readily understandable.

Communicating the costs of freshwater quality management

6.40 Regional councils are accountable to their communities for how they use their powers and spend rate-payer funds. This includes being transparent about costs and having a clear understanding of the costs and benefits of different policy choices and consequent programmes of work.

6.41 Our report *Introducing our work programme – Water management* highlighted that this understanding is essential for making good decisions. We were interested in how well regional councils made the costs of freshwater quality management visible to the public.

6.42 The four regional councils generally record and report well on the costs that are specific to identifiable regulatory and non-regulatory activities. For example, Horizons Regional Council has evaluated the costs involved in the Manawatū River Clean-Up Fund, clearly reporting previously estimated costs for each project, actual costs, and reasons for variances between those figures. The Council's public reporting also clearly outlines proposed budgeted costs for 2017/18 freshwater quality management projects and initiatives.

6.43 For Waikato Regional Council, Taranaki Regional Council, and Environment Southland, the costs reported for freshwater quality work were likely to represent only part of the overall costs. This was largely because these councils generally aggregated the costs of staff time and tasks that are common to the different activities people work on into administrative headings.

6.44 Regional council staff were confident that separating this financial information was possible through further interrogation of financial data. In our view, Waikato Regional Council, Taranaki Regional Council, and Environment Southland could do more to differentiate the costs of different environmental activities and communicate these to their communities. Providing a more complete picture of the costs incurred will usefully inform future conversation with the community when evaluating priorities and making decisions.

Setting freshwater quality objectives

7

7.1 In this Part, we discuss:

- how regional councils set freshwater quality objectives under the National Policy Statement;
- the progress the four regional councils have made in setting those objectives;
- including the community in a collaborative process to set objectives; and
- how two of the four regional councils model the costs of improving freshwater quality.

Summary of findings

7.2 When we visited them, the four regional councils were at different stages of setting objectives. Horizons and Waikato Regional Councils had made the most progress. Taranaki Regional Council and Environment Southland were not as far advanced in setting their objectives.

7.3 Since we met with them, and despite the challenges facing councils in setting objectives, the four regional councils have made progress with their plans for setting freshwater objectives by 2025. These plans have been prepared in consultation with, and have been made available to, their communities.

7.4 Freshwater quality is a social issue and its improvement needs involvement from the community. It is essential that the four regional councils work effectively with all interest groups when setting objectives. There remain opportunities to deepen engagement and involve the community more in decision-making. This will strengthen regional councils' understanding of community values and aspirations, and enable them to reflect those aspects in the agreed objectives.

7.5 The four regional councils have improved how they consider economic and social factors to understand the full costs of improving freshwater quality. Waikato Regional Council and Environment Southland are leading the way in the use of modelling. This type of information can support meaningful conversations with communities about freshwater objectives and limit-setting.

How regional councils set freshwater quality objectives

7.6 Under the National Policy Statement, freshwater objectives are intended environmental outcomes for each "freshwater management unit" in a region. Freshwater management units are water bodies, parts of water bodies, or groups of water bodies that regional councils decide are the appropriate scale to manage under the National Policy Statement.

7.7 The National Policy Statement requires regional councils to set freshwater objectives and limits in their regional plans. This includes regional councils having a plan to maintain or improve the overall quality of freshwater in water bodies and groups they identify in their regions. The National Policy Statement also requires regional councils to prepare objectives by identifying water quality values for each freshwater management unit to guide the setting of freshwater objectives in regional plans.

7.8 Amendments introduced in 2014 included several compulsory national values for freshwater and a set of national bottom lines for freshwater quality attributes that are relevant to the national values, including total phosphorus, nitrate, and ammonia toxicity, dissolved oxygen, and a faecal indicator (*E. coli*). Further amendments in 2017 included introducing targets for swimmable lakes and rivers.

7.9 Although regional councils are required to implement the National Policy Statement in their policies and plans by 2025, they can extend the deadline to 2030 if they consider 2025 to be impractical.

7.10 We were interested in the progress that the four regional councils had made in setting objectives under the National Policy Statement and in updating regional plans to include limit-setting.

Variable progress with updating freshwater quality plans

7.11 The four regional councils have made variable progress towards implementing the National Policy Statement and updating regional plans to include limit-setting.

7.12 Horizons Regional Council has made the most progress in implementing the National Policy Statement through the One Plan. The One Plan became operative in December 2014 and aimed to integrate policy planning with regulatory and non-regulatory work to maintain and improve freshwater quality.

7.13 As noted in the Ministry's National Policy Statement implementation review, Horizons Regional Council largely considers the One Plan to have implemented the requirements of the 2014 National Policy Statement.

7.14 However, because the One Plan was drafted before the current National Policy Statement amendments were made, some parts of the plan "do not align neatly with the national policy and may require revision".[36] To resolve this, the Council put in place a plan change in April 2016 to more fully address the requirements.

7.15 However, the One Plan remains unable to fully comply because its specified nutrient allocation limits are unachievable (particularly its nitrogen leaching limits). This has led to difficulties in assessing resource consent applications for

36 Ministry for the Environment (2017), *National Policy Statement for Freshwater Management: Implementation review*, at www.mfe.govt.nz.

some existing and new intensive farming activities. We discuss the effects of Horizons Regional Council's consenting approach and outline its proposals for addressing them in Part 9.

7.16 Waikato Regional Council has proposed a plan that will maintain and improve freshwater quality for the Waikato-Waipa catchment. The plan was notified in October 2016, submissions on the plan have been received, and hearings are under way and scheduled for completion in September 2019.

7.17 In part, the Council chose this catchment first because the quality and completeness of the data best position stakeholders there to carry out the limit-setting process. The Vision and Strategy for the Waikato River (discussed in Part 2) was a large part of this consideration.

7.18 Waikato Regional Council collaborated with the community to prepare a plan that reflects community aspirations. Waikato Regional Council intends to review the plans for the remaining catchments by 2025.

7.19 Environment Southland's proposed Southland Water and Land Plan was notified in 2016. It aims to either improve freshwater quality or maintain it at its current level until freshwater objectives and limits for all freshwater management units are set. Submissions on the plan have been received, hearings held, and Environment Southland has decided the provisions of the plan. A new version of the proposed plan was publicly notified on 4 April 2018.

7.20 Environment Southland has emphasised the importance of understanding the states and trends of its freshwater resources and the full range of factors that can influence this. It has significantly invested in a comprehensive science program, which has set back the original schedule for limit-setting. However, Environment Southland has now committed to a revised schedule that will set and implement objectives and limits for all five of its freshwater management units by 2025.

7.21 Taranaki Regional Council had made less progress in implementing the National Policy Statement when we met with it. Stakeholders we spoke to said that it had not been transparent about progress. Since then, the Council has advanced its plans to implement the National Policy Statement through a Freshwater and Land Management Plan. These plans are clearly set out in a publicly available Progressive Implementation Plan for the National Policy Statement. This plan will see objectives and limits set and implemented for all freshwater management units by 2025.

7.22 In the meantime, other aspects of the National Policy Statement are being implemented through ongoing initiatives. These include setting and publishing

targets for swimmable rivers and lakes, and work to incorporate mātātauranga Māori into freshwater planning and monitoring for the Taranaki region.

7.23 Staff at the four regional councils cited challenges affecting their ability to set and implement new objectives in a more responsive manner. These include the Resource Management Act's considerable requirements, as well as recent changes in the regulatory environment.

7.24 Continued changes to the National Policy Statement are an example of this. Regional councils have welcomed the National Policy Statement because it addresses the lack of central government guidance for freshwater quality management.

7.25 However, changes to the National Policy Statement since 2011 (such as the freshwater values bottom lines introduced in 2014 and targets for swimmable lakes and rivers introduced in 2017) have caused uncertainty for regional councils struggling to keep up with, and put in place, those changes.

7.26 Council staff said that they needed to be empowered to facilitate and put in place community decisions that are most relevant to their regions. They felt that this did not preclude central government from providing more support for them to do so.

7.27 Council staff suggested that central government should bring regional council experts together to prepare a "toolbox" that provides different ways of implementing community decisions about freshwater quality. Overall, they expressed, and we agree, that regional council efforts to prepare their own approaches to the new requirements can be co-ordinated more efficiently.

7.28 Each regional council needs to respond to the particular challenges of its region (including geography, historical freshwater quality, and the relationships councils have with iwi/hapū and their stakeholders), and the progress that is made must be widely visible to the community.

7.29 We are satisfied that the four regional councils have made genuine and ongoing efforts to keep their communities informed of planning preparation, developments, and progress so that freshwater quality management decisions and expectations are transparent and well understood.

Including wider parts of the community in setting objectives

7.30 Under the Resource Management Act, regional councils must consult with their communities so that the objectives are influenced by community values. The Ministry's implementation guide for the National Policy Statement makes this requirement explicit. It suggests that regional councils collaborate with their communities or improve the way they consult.

7.31 Regional councils also have obligations under legislation (including the Resource Management Act, the Local Government Act 2002, and Treaty settlement legislation) that they need to consider when making management decisions about specific water bodies. Some Treaty settlements include co-management and co-governance arrangements between regional councils and iwi.

7.32 The International Association for Public Participation has developed a spectrum of participation. At one end, entities inform their communities about what they are doing. At the other, entities empower communities to make those decisions (see Figure 5).

Figure 5
Spectrum of public participation

The figure presents a spectrum of the different approaches an organisation can take when interacting with the public. At one end of the spectrum is "inform", which is a one-way approach where the organisation simply provides the public information. At the other end of the spectrum is "empower", which is an approach that places final decision-making in the hands of the public.

Increasing level of public impact →

	Inform	Consult	Involve	Collaborate	Empower
					
Goal	To provide balanced and objective information in a timely manner.	To obtain feedback on analysis, issues, alternatives, and decisions.	To work with the public to make sure that concerns and aspirations are considered and understood.	To partner with the public in each aspect of the decision-making.	To place final decision-making in the hands of the public.
Promise	"We will keep you informed."	"We will listen to you and acknowledge your concerns."	"We will work with you to ensure your concerns are directly reflected in the decisions made."	"We will look to you for advice and innovation and incorporate this in decisions as much as possible."	"We will implement what you decide."

Source: Adapted from the International Association for Public Participation (2014), *IAP2's public participation spectrum*.

7.33 The approaches the four regional councils chose for consulting with their communities about setting objectives varied. Council staff said that this was because of statutory requirements and the councils' views of what would best meet the needs of their different communities. We support more collaborative consultation approaches. However, just because some councils are less collaborative than others does not mean they are less effective.

7.34 Waikato Regional Council adopted an approach for the Wai Ora Plan process that was characterised by collaborative decision-making and "giving the pen" to the community. Collaborative processes are more empowering for communities than consultative ones. They are also the most resource- and time-intensive for council staff and stakeholder representatives. Waikato Regional Council's approach so far has resulted in its community understanding what is in the plan and what is needed to meet its freshwater objectives.

7.35 We saw efforts from Environment Southland to involve the community more. It recognised that learning from the community and getting its commitment is critical to improving freshwater quality.

7.36 Environment Southland's efforts to gather and understand community views more effectively included running workshops with stakeholders about the need to collaborate and how they could achieve that. Environment Southland also ran community engagement sessions where council staff could share knowledge and increase levels of engagement.

7.37 In 2018, Environment Southland, in partnership with Te Ao Marama Inc (the Ngai Tahu ki Murihiku natural resource management agency), adopted a collaborative approach to implementing the National Policy Statement. This includes an update to the Southland Water and Land Plan.

7.38 A panel made up of Southland community members (called the Regional Forum) is developing recommendations for an agreed programme to update the plan. The programme will also integrate on-the-ground action with the regulatory framework by including regulatory and non-regulatory methods to achieve the community's values and objectives for freshwater.

7.39 The programme will be reviewed and approved by a governance group comprising regional council and iwi representatives. The council will decide whether to adopt the approved programme.

7.40 Taranaki Regional Council's approach to community engagement is more consultative than collaborative. The Council keeps its community informed of developments through online reporting and print media, and has iwi representatives on its Planning Committee. However, council staff have generally retained control of drafting plans and policies.

7.41 Stakeholders we spoke to acknowledged the efforts of the Council to consult and discuss issues with them but felt that its approach limited their ability to have their views and concerns clearly reflected in draft plans and policies. They wanted the opportunity to be involved from the beginning instead of just giving feedback on a draft document.

7.42 Since we last saw the Council, it has sought to facilitate tangata whenua input into the plan review processes by establishing a "Wai Māori working group". The group is intended to have a particular focus on identifying cultural values, policy development by co-design, limit-setting, and establishing mātauranga Māori monitoring methods.

7.43 Stakeholders have mixed views on Horizons Regional Council's approach to consultation on the One Plan. The farming sector, in particular, felt that the Council's engagement with it was less effective than it should have been.

7.44 However, many stakeholders (including representatives from the farming sector) consider that Horizons Regional Council's approach has improved since then. Many now consider Horizons Regional Council their "go-to place" for advice and assistance with sustainable land-use practices. This will be important as the Council works through the challenges that implementing the One Plan has raised.

Lessons from Waikato Regional Council's approach to collaboration

7.45 In preparing Waikato's Wai Ora Plan for the Waikato-Waipa catchment, Waikato Regional Council invested heavily in a collaborative process with its community.

7.46 In 2013, Waikato Regional Council and the five river iwi, who share leadership and co-management responsibility for the Waikato River, began to form a collaborative stakeholder group. A project steering group (Te Rōpu Hautū) ran the process to form the group.

7.47 Through consultation with multiple stakeholders and the community, Te Rōpu Hautū identified the desired make-up of the collaborative stakeholder group. This included ensuring that the group reflected a balance of social, cultural, economic, and environmental interests (the four well-beings), demographic and geographical balance, and members with the right mix of skills, influence, and mandate.

7.48 The collaborative stakeholder group included delegates from a range of sectors, including dairy, horticulture, energy, environment, local government, and Māori interests. For Waikato Regional Council, this meant that those most affected by the changes were preparing the policy and providing input.

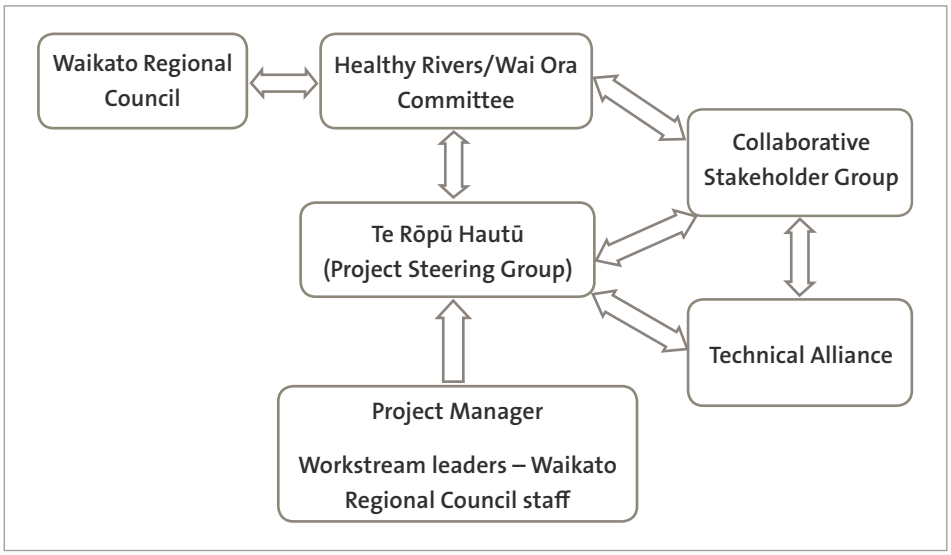
7.49 The collaborative stakeholder group and the joint steering group were supported by members of the Technical Alliance, who "analysed, summarised and presented environmental, social, cultural, and economic information about the rivers and the consequences of the different land management scenarios explored".

7.50 The Technical Alliance was supported by a seven-member Technical Leaders Group, which used specialists to fill knowledge gaps in fields such as science and economic modelling (see paragraphs 7.67-7.69 for more on the work of the Technical Leaders Group).

7.51 Figure 6 shows the relationships between the collaborative stakeholders group, Technical Alliance, and decision-makers.

Figure 6
The Healthy Rivers: Plan for Change / Wai Ora: He Rautaki Whakapaipai project structure

An organisational chart that shows the relationships between the different groups involved in preparing the Wai Ora Plan.



Source: Adapted from Waikato Regional Council (2014), *Terms of Reference – Collaborative Stakeholder Group*, page 10.

7.52 The independent chairperson carried out an evaluation that found widespread acknowledgment that the collaborative process had increased members' understanding of the complexity of issues facing other sectors. The evaluation suggested that this translated into "a willingness among some sectors to take more account of issues outside of their sector and to work more collaboratively

with other sectors". Furthermore, "there is no doubt among members that without the collaborative process, some important and innovative thinking would not have emerged".

7.53 We spoke to stakeholders involved in the collaborative stakeholders group and people supporting it. They had a good understanding of the views of different parts of the community and were inclined to compromise.

7.54 However, collaborative plan processes are not without drawbacks. Collaboration is resource intensive for councils and the stakeholder representatives, often taking much longer than traditional planning processes.

7.55 Representatives of the collaborative stakeholders group, Technical Alliance, Waikato Regional Council staff, and iwi informed us of some of the challenges and lessons that they learned throughout the process. Other regional councils might find them useful to consider.[37]

7.56 One lesson was that gathering and documenting technical inputs (such as scientific papers prepared for the collaborative stakeholder group) should have started earlier, when members were forming relationships and sharing their views. This would have made the process more efficient.

7.57 Waikato Regional Council staff and iwi leaders felt a level of discomfort in not controlling the drafting of the plan. For example, there was a view that council staff should have had greater involvement in writing the plan rules to ensure that they were workable and enforceable.

7.58 Waikato Regional Council leadership also acknowledged that, because the Council focused on working with the five river iwi that had Treaty settlements, it did not initially consult with another important iwi. This affected the work stream and highlights the need for regional councils to identify and involve all relevant parties at the outset.

7.59 Freshwater quality improvement is a social issue, which will need a response from the community as a whole. Decision-making processes that involve the community more collaboratively can help regional councils to understand the social nature of freshwater quality issues.

7.60 We encourage councils that are considering carrying out more collaborative processes to consider the challenges and lessons Waikato Regional Council learned throughout its collaboration process. In particular, councils need to involve all relevant parties and to carefully consider how staff and representatives of the community can best contribute to decision-making.

37 Many of these can also be found in the independent evaluation report commissioned by Waikato Regional Council: Kinnect Group (2017), *Healthy Rivers/Wai Ora Collaborative Stakeholder Group evaluation – Summative report*, at www.waikatoregion.govt.nz.

7.61 We encourage Taranaki and Horizons Regional Councils to consider the benefits of taking a more collaborative approach to setting and implementing freshwater quality objectives with their communities. A more inclusive approach is likely to increase support from the community and enable them to contribute more effectively.

Using modelling to set objectives

7.62 Knowing the costs of freshwater quality management programmes is more than simply accounting for the money spent on regulatory and non-regulatory programmes. The National Policy Statement requires regional councils to consider social, cultural, and economic implications when setting freshwater quality objectives.

7.63 Although the policy statement does not specifically require regional councils to do social and economic modelling, we see value in the way two of the four regional councils use these tools when setting objectives.

7.64 Environment Southland has a lead role in the Southland Economic Project, which includes looking at the economic effects of different limit-setting scenarios. A main part of the project considers the effects that managing nutrient loss has on farming profitability.

7.65 Environment Southland uses this information to model different limit-setting scenarios. It is also developing its understanding of how the economy influences community outcomes in the Southland region. It is committed to sharing this information with the community during the limit-setting process.

7.66 Environment Southland views freshwater quality as not just an environmental, economic, cultural, or scientific issue but as all these. Therefore, improving freshwater quality needs a response from the entire community.

7.67 Waikato Regional Council, through the Technical Leaders Group, engaged specialists from a wide variety of organisations to fill knowledge gaps and inform the work of the collaborative stakeholder group. This included completing an economic model that the collaborative stakeholder group used to shape its policy package for the Wai Ora Plan.

7.68 The model was designed to consider the potential social and economic costs of the changes or mitigations needed to deliver improved freshwater quality. The model was able to consider different levels of desired freshwater quality and predict costs at the farm, catchment, regional, and national levels.

7.69 The Technical Leaders Group commissioned and published documents explaining the model. These provided the social, cultural, economic, and environmental results of different scenarios, discussed the costs and levels of mitigations, and described what would happen if there was not a policy change.

7.70 Taranaki Regional Council has modelled the costs and benefits of various approaches to nutrient management as part of its Freshwater and Land Management Plan process. This includes economic, environmental, and administrative costs and benefits on farm.

7.71 Environment Southland, Waikato Regional Council, and Taranaki Regional Council are finding value in carrying out this work, which we consider to be good practice. In our view, there are opportunities for all regional councils and unitary authorities to share and learn from different experiences.

7.72 We encourage the four regional councils to continue to build on their understanding of the social and economic implications of freshwater quality management in their regions.

8 Working with stakeholders and partners

8.1 In this Part, we discuss regional councils':

- generally positive relationships with the farming sector;
- improving relationships with territorial authorities;
- strained relationships with environmental and conservation groups; and
- improving relationships with iwi and hapū.

Summary of findings

8.2 Since 2011, some improvements have been made in the four regional councils' ongoing relationships with stakeholders and iwi/hapū. Challenges still remain, particularly in the four regional councils' relationships with the Māori community and environmental groups. These need further commitment.

8.3 Overall, relationships with the farming sector are stronger than with other stakeholders. The strength of these relationships concerns some other stakeholders, who believe their own views get less attention.

8.4 The four regional councils' relationships with territorial authorities – city and district councils – are variable. Some territorial authority representatives said that regional councils should better understand territorial authorities' operational work, including their infrastructure and funding challenges. Territorial authorities consider that this would lead to more-effective working relationships.

8.5 Some of the four regional councils are working more effectively with iwi and hapū than others. All councils, even those with positive and robust relationships with iwi and hapū, can increase or improve their relationships. Councils should also properly include iwi and hapū yet to settle their Treaty claims with the Crown in decision-making.

8.6 Relationships with environmental groups are not all healthy, with some showing concerning signs of strain or fracture. Where unhealthy tensions exist, trust can be lost. Parties in unhealthy relationships need to re-establish trust and share views through honest and constructive dialogue.

Generally positive relationships with farmers

8.7 The farming sector can make a significant difference to freshwater quality. We expect regional councils to have healthy relationships with farmers so they can influence land-use practices.

8.8 The four regional councils all worked closely and had strong relationships with farmers. For example, Taranaki Regional Council has good relationships with individual farmers through ongoing interaction on its extensive and near-complete

riparian management programme. Taranaki Regional Council compliance staff and several farming stakeholders stated that having a strong compliance monitoring programme was no barrier to a robust and healthy relationship.

8.9 Day-to-day working relationships with farmers often centre on regulatory work and non-regulatory initiatives that help support more sustainable land-use practices and the effect on farming operations.

8.10 We discuss the relationships that the four regional councils have with representatives from the farming sector in Part 10.

Improving relationships with territorial authorities

8.11 Regional councils and territorial authorities need strong and productive relationships with each other so they can focus on better environmental outcomes.[38] Territorial authorities often hold major consents (such as for wastewater treatment plants) and are responsible for providing important services to the community. They are also in a position to influence positive environmental behaviours and land-use practices.

8.12 The four regional councils' relationships with territorial authorities varied. Regional councils have invested significant time and resources into working with territorial authorities to ensure positive outcomes for their regions.

8.13 The benefits of territorial authorities and regional councils working together is evident in the partnership between Horizons Regional Council and the district councils and others (through the Manawatū River Leaders Accord) to upgrade wastewater treatment plants in Woodville, Feilding, Kimbolton, Dannevirke, and Pahiatua. The Manawatū River Leaders Accord secured funding through the Fresh Start for Fresh Water Clean-up Fund for the upgrades.

8.14 A district council leader told us that Horizons Regional Council had also taken a pragmatic and future-focused approach to improving wastewater treatment issues that were affecting freshwater quality. Horizons staff helped pinpoint the areas that needed to improve and worked with the local district council on a long-term consent to enable an iterative approach to future-proof the affected treatment plant.

8.15 Waikato Regional Council considers that being an effective regulator includes maintaining effective and constructive relationships with the territorial authorities it regulates. A territorial authority leader that we spoke to supported this approach, noting that it had resulted in territorial authorities finding the best long-term solution to problems affecting freshwater quality. A senior

38 We did not audit any of the six unitary authorities, which are territorial authorities that also have the powers of a regional council. Our findings about relationships between regional councils and territorial authorities are not relevant to unitary authorities.

staff member for another territorial authority noted that the Council's consent enforcement staff were open to being approached about problems and finding solutions before the need for enforcement action.

8.16 Waikato Regional Council has partnered with territorial authorities to help protect and improve freshwater quality by integrating how they plan and manage water use. An example of this is the "Future Proof" initiative, which is intended to help manage population and economic growth in the Waikato-Hamilton-Waipa districts. This includes a Three Waters strategy that will co-ordinate management of water supply, wastewater, and stormwater to secure better freshwater quality outcomes for the Waikato River.

8.17 A perceived lack of understanding or professional affinity between groups can prevent effective working relationships. Some territorial authorities we spoke to questioned whether regional councils had a good enough understanding of the territorial authorities' operations and operating environment (such as the challenges territorial authorities face with ageing infrastructure, declining rural populations, and expanding urban centres).

8.18 Some territorial authority staff in the Taranaki region felt that Taranaki Regional Council's approach to compliance issues was too rigid. They felt that the Council could improve how it communicates compliance issues. They also felt that the Council lacked understanding of the challenges territorial authorities face in maintaining the services they deliver. These perceptions prevent a fully effective working relationship.

8.19 In the Southland region, territorial authority staff we spoke to acknowledged the genuine and ongoing effort by Environment Southland to improve its relationship with territorial authorities. This includes the 4-Waters initiative, where the regional council and territorial authorities collaborate on managing, upgrading, and consenting stormwater, wastewater, and potable water supplies and on managing the effects of these activities on freshwater quality.

8.20 This initiative and other efforts to build relationships have contributed to all parties building a better understanding of each other's operations and operating environment. However, territorial authority staff felt that Environment Southland's approach to compliance monitoring and enforcement was not fully informed by a clear understanding of a territorial authority's ability to control or limit the consequences of potential incidents.

8.21 Because regional councils regulate territorial authorities' use of resources, there will always be a level of tension in their relationship. However, that tension can be constructive. The territorial authority staff we spoke to acknowledged the need for

regional councils to be strong regulators, and we fully support regional councils taking a strong approach to every consent they regulate.

8.22 We encourage regional councils to continue efforts to work more effectively with territorial authorities to improve outcomes for freshwater quality.

Strained relationships with environmental and conservation groups

8.23 Environmental and conservation groups play an important role in highlighting freshwater issues and calling for improvements to be made. These groups, which include national bodies such as the Royal Forest and Bird Protection Society of New Zealand and locally focused groups, often initiate or become involved in conservation work and clean-up efforts to improve freshwater quality.

8.24 The four regional councils' relationships with environmental groups varied. In two of the four regional councils, the relationships were strained. Nevertheless, those regional councils have a responsibility to continue making efforts to work effectively with environmental groups.

8.25 The relationship between Horizons Regional Council and Fish and Game suffered because of issues with nutrient allocation during implementation of the One Plan. This led to the Environment Defence Society and Fish and Game bringing a case against the Council to the Environment Court in 2016. The Court issued declarations requiring Horizons Regional Council to address these and other issues. We encourage Horizons Regional Council to take a leadership role in bringing the two groups together and repairing the relationship.

8.26 Environmental groups we spoke to in the Southland region were concerned that some instances of material non-compliance were going undetected and that Environment Southland was not being fully transparent with all of the scientific information it held.

8.27 We spoke to Environment Southland about these concerns. Council staff were receptive to talking through these concerns with environmental groups and were considering how Environment Southland can be more open and timely in releasing scientific information. Since we spoke with them, Environment Southland has advised that it has established regular meetings to discuss compliance monitoring with environmental groups.

Improving relationships with iwi and hapū

8.28 Regional councils need to have strong and meaningful relationships with iwi and hapū given their deep cultural and traditional connections to water bodies and water. Effective relationships help regional councils better understand Māori values and aspirations for freshwater and reflect them in freshwater objectives. We expect regional councils to have strong and mutually beneficial relationships with iwi and hapū so that all parties can work towards common goals.

8.29 Legislation increasingly requires councils to involve iwi and hapū in the management of natural resources (such as freshwater). The Resource Management Act requires councils to protect Māori interests and allow for Māori involvement in resource management decision-making.

8.30 Section 6 of the Act requires regional councils (and others performing functions and exercising powers under the Act) to recognise and provide for "matters of national importance", including the relationship of Māori "with their ancestral lands, water, sites, waahi tapu, and other taonga" and the "protection of protected customary rights". The Act also allows for tangata whenua to participate in resource management and decision-making through Mana Whakahono ā Rohe arrangements.

8.31 The Local Government Act requires regional councils to provide Māori with the opportunity to contribute to decision-making. Treaty settlement legislation often promotes closer working relationships between iwi/hapū and regional councils. One way the Crown is meeting its obligations is by requiring (through settlement legislation) particular regional councils to work and partner with iwi in managing freshwater bodies.

8.32 The four regional councils had different approaches to working with iwi and hapū on freshwater quality management. It is important to acknowledge the different contexts that the councils work in. For example, some councils have multiple iwi and hapū relationships to consider, while others have only a few.

8.33 Some council relationships with iwi are shaped by co-governance and co-management arrangements that result from Treaty settlement negotiations. At the same time, those councils must work with iwi yet to complete their settlement negotiations. Some of these groups have capacity constraints that affect their ability to engage with councils on freshwater quality (and other) issues.

8.34 Waikato Regional Council works with several iwi at different stages of the Treaty settlement process. The Council has a clear focus on working with iwi and supporting co-management arrangements.

8.35 Its work has an internal and external focus. For example, it hired mātauranga Māori experts to build staff capacity in te ao Māori. The Council also co-hosted a conference for local hapū and iwi resource-management practitioners to increase the ways for the Council and iwi/hapū to work together.

8.36 Through these activities, the Council recognises the importance of understanding and incorporating the values of iwi and hapū into its organisation.

8.37 Waikato Regional Council formally partnered with Maniapoto Māori Trust Board, Raukawa Charitable Trust, Te Arawa River Iwi Trust, Tūwharetoa Māori Trust Board, and Waikato Raupatu River Iwi Trust to propose the Wai Ora Plan. People we spoke to said that these relationships are working well. However, representatives of iwi and hapū yet to settle Treaty claims had less positive feedback. We encourage Waikato Regional Council to continue to improve these relationships.

8.38 Horizons Regional Council also works with many iwi and hapū. Like other councils, Horizons Regional Council's relationships with iwi and hapū were variable. The Council works with iwi on freshwater quality management in a variety of ways. One way is by using accords. For example, for the Lake Horowhenua Accord, Horizons Regional Council, Horowhenua District Council, and the Department of Conservation worked with elected trustees representing Muaūpoko beneficial owners to carry out improvement activities.

8.39 Horizons Regional Council has also invested time and resources in a range of projects co-funded by the Crown through the Ministry for the Environment's Te Mana o te Wai programme. These projects were designed to assist iwi and hapū in playing a leading role in improving water quality water bodies and involved a mix of activities, including cultural health monitoring, stream fencing, riparian planting, and remediation of fish barriers.

8.40 The Tū Te Manawa project included installing information boards that help Manawatū River hapū to tell their stories and connections to the river. We would like to see Horizons Regional Council build on its positive experiences and further apply these good practices to wider iwi and hapū in the region.

8.41 Environment Southland has a strong collaborative relationship with Ngāi Tahu ki Murihiku on freshwater initiatives for many years. Environment Southland, Te Ao Marama Inc (which represents Ngā Rūnanga ki Murihiku for resource management and environmental issues), and territorial authorities signed a Charter of Understanding in 2016. It guides developing the relationship between local government and tangata whenua in the Southland region towards a shared goal of sustainable management of the region.

8.42 For the last four years, Environment Southland has joined with Te Ao Marama to fund a policy development role at Environment Southland. A representative of the rūnanga fills this role. The rūnanga representative was a critical part of the team drafting Environment Southland's Water and Land Plan proposal.

8.43 We heard positive feedback from the stakeholders we spoke to. For example, we were told that the rūnanga feel "right in the mix" at Environment Southland and is being supported to build capacity. Stakeholders we spoke to felt that Māori values are understood and largely incorporated into freshwater objectives and planning.

8.44 Taranaki Regional Council's work with iwi and hapū was less satisfactory. Council staff told us that their understanding of Māori values is, in part, informed through positive and ongoing day-to-day interactions with stakeholders. Iwi and hapū representatives told us that they respect council staff and appreciate that genuine effort is being made.

8.45 However, many people are frustrated at the one-way transactional nature of the relationship and at having little strategic input into the Council's decisions. They want to be actively involved in drafting regional plans at the beginning stages, rather than being asked for feedback at the end of an internal process. The Council's move to establish the Wai Māori working group (see paragraph 7.42) is an opportunity to address the concerns expressed by iwi and hapū representatives.

8.46 Because iwi and hapū have lacked opportunities to engage at the strategic decision-making level, they focus on working with Taranaki Regional Council on individual consents. This has been achieved through provisions of the Resource Management Act enabling iwi to be considered affected parties for a proposed activity. Affected parties are able to make submissions on a consent application.

8.47 Iwi and hapū representatives expressed frustration with the lack of information the Council shared about resource consent applications and said that this made them feel disenfranchised. They felt that the Council did not provide enough information to allow for meaningful comment. Iwi and hapū often resorted to sourcing information directly from the applicant. One representative noted this "just feels like [the Council] is ticking the box" by providing it to iwi.

8.48 Taranaki Regional Council has recently appointed six iwi representatives to its policy and planning committee and consents and regulatory committee. In our view, this is a positive development. This allows both parties to address iwi and hapū concerns about over-investment in individual consenting decisions by lifting their involvement to the strategic level. We encourage Taranaki Regional Council to help the iwi representatives contribute effectively in regional decision-making.

8.49 The Council is also having discussions with iwi authorities to establish Mana Whakahono a Rohe agreements. Any such agreements will make clear the ways in which iwi will participate in resource management and decision-making processes. These agreements could address the concerns and frustrations expressed to us by iwi representatives about a current lack of effective input.

8.50 The depth and strength of the relationships between the four regional councils and the iwi and hapū in their respective regions varied. This reflects, in part, the varying capacity of iwi and hapū to engage with councils.

8.51 However, in our view, there are clear opportunities to build further on these relationships to support more-effective involvement by iwi and hapū. As a first step, councils could do more to understand the aspirations of iwi for their involvement in strategic decision-making about freshwater quality.

Recommendation 4

We recommend that Waikato Regional Council, Taranaki Regional Council, and Horizons Regional Council strengthen relationships with iwi and hapū, especially those yet to complete Treaty settlement processes, by formally seeking their aspirations for involvement in strategic decision-making and identifying how those aspirations can be met.

9 Approaches to regulating land use

9.1 In this Part, we discuss:

- how the four regional councils communicate land-use regulations;
- how the four regional councils could improve their monitoring of compliance with legislative and resource consent requirements; and
- the four regional councils' approach to taking enforcement action for non-compliance.

9.2 We did a high-level review of the councils' consenting, compliance monitoring, and enforcement functions. We informed our review in different ways, including considering each council's policies, processes, and reporting. We also looked at the results of recent independent reviews, and how the councils had approached implementing improvements from recommendations.

9.3 We interviewed council consent and compliance staff, and sought the views of consent holders and stakeholders.

Summary of findings

9.4 Effective compliance monitoring and enforcement are important for freshwater quality management. The four regional councils varied in how effectively they carried out these duties. In particular, Horizons Regional Council needs to urgently resolve a specific and difficult challenge affecting its consenting processes.

9.5 The effectiveness of the four regional councils' regulatory consenting and compliance monitoring programmes was variable. Taranaki Regional Council has a strong regulatory approach. The other councils have been less effective in detecting non-compliance.

9.6 To support effective compliance, good information and effective support are needed. Three of the four regional councils helped land users understand the Resource Management Act, plan rules, and resource consent conditions.

9.7 Since 2011, the four regional councils have made significant procedural improvements to ensure that elected members are not involved in decision-making processes for prosecuting non-compliance. Despite these improvements, there are still opportunities for elected members to exert inappropriate influence. Councils must remain alert to this issue.

9.8 Regional councils lack the tools needed to tackle farm nutrient losses. As the Parliamentary Commissioner for the Environment has noted, the Government needs to take the lead on this issue for it to be satisfactorily resolved.

Communicating land-use regulations

9.9 The Resource Management Act has restrictions on how land and water can be used and what can be discharged to land and water. Regional councils give effect to their land-use functions and responsibilities through regional policy statements and regional plans.

9.10 Generally, councils include rules in their regional plans that classify activities into five different types. These types reflect the degree of control a council has over the activity. A "permitted" activity is an activity that can be carried out without a resource consent, provided it complies with the standards and terms of conditions in the regional plan. A "prohibited" activity means no resource consent can be granted for this activity. The other types of activities are "controlled", "restricted discretionary", "discretionary", and "non-complying". For these activities, a land user must have a resource consent.

9.11 These rules are different in different regions. For example, Environment Southland requires a land-use consent for all new dairy conversions and consents to discharge effluent. The Taranaki and Horizons Regional Councils require a resource consent for new dairy conversions seeking effluent discharge to land.

9.12 In the Waikato region, irrigation of dairy effluent to land (outside of Lake Taupō catchment) remains a permitted activity subject to conditions. A resource consent is required in the Waikato-Waipa catchment for dairy conversions from certain land uses (such as dry stock farming or forestry) for areas of more than 4.1 hectares.

9.13 Resource consents include conditions that land users must follow. These conditions are intended to reduce the adverse effects of land-use activity. Resource consents are an important regulatory tool for regional councils to manage the effects of land use on freshwater quality.

Advice to land users about how to comply with regulation

9.14 Generally, we were satisfied that three of the four regional councils provide good support and useful information to help users understand their obligations under the Resource Management Act, plan rules, and resource consents (including how to apply for resource consents). Taranaki Regional Council was particularly active. It worked with consent holders throughout the duration of their consents and ran forums to gather feedback.

9.15 Waikato Regional Council created a *Farmer's guide to permitted activities*. This sets out the conditions of the Waikato Regional Plan that apply to activities that can be carried out by farmers without a resource consent, including effluent discharge to land (outside of the Waikato-Waipa catchment). It also includes guidance for

farmers on the types of actions required to meet the conditions of the plan. The Council's website also contains substantial information about the effect of the Wai Ora Plan for landowners.

9.16 Environment Southland acknowledged that operating "between two plans" can cause uncertainty for consent holders and that it had to commit considerable effort to assure those concerned about the consent requirements.

9.17 Horizons Regional Council is having considerable difficulties that it is yet to fully work through. An Environment Court declaration in 2017 found that Horizons Regional Council continued to process and approve new and existing intensive land-use consents without being able to properly assess whether those consents would meet the Council's nutrient allocation limit rules.

9.18 The Council had not, to that point, required an Assessment of Environmental Effects (a written statement that describes how a land user's activities would affect the environment) to accompany those consent applications. The Environment Court declaration deemed the consenting approach and resulting approval decisions to be flawed.

9.19 Horizons Regional Council now has a large number of farms operating with consents that, although deemed valid, are open to legal challenge and scrutiny and that could be overturned. Although an Assessment of Environmental Effects is now required for intensive land-use consent applications, the current nutrient allocation limits are not considered implementable. There is no fully effective way for many new or outstanding intensive land-use applications to gain consent.

9.20 Horizons Regional Council has proposed Plan Change 2 to resolve the issue and to provide more certainty to its farming community. Plan Change 2 aims to ensure that nutrient limits are reset to achieve the original intent of the One Plan. It will reflect current science developments and enable the implementation of resource consent applications for intensive farming activities. Plan Change 2 was notified on 22 July 2019.

9.21 Horizons Regional Council is also proposing Plan Change 3, a more comprehensive plan that also focuses on the One Plan's nutrient management provisions. When this report was written, the Council was aiming to notify Plan Change 3 by the end of 2019.

9.22 The issues faced by Horizons Regional Council highlights the challenge regional councils have in quantifying nutrient losses from diffuse sources. The Parliamentary Commissioner for the Environment recently reported on this challenge.[39]

39 Parliamentary Commissioner for the Environment (2018), *Overseer and regulatory oversight: Models, uncertainty and cleaning up our waterways*, at www.pce.parliament.nz.

9.23 The Commissioner noted that regional councils are required to do something about farm nutrient losses that seriously compromise water quality. To achieve this, regional councils need a tool capable of quantifying nutrients lost from farms. The best tool currently available is not up to the task in its current form. Although the tool could be improved, what is really needed is a decision from the Government about whether the tool should be used to help manage water quality. The Commissioner called on the Government take the lead on this issue. We endorse this call for action.

Compliance monitoring can be improved

9.24 Regional councils are responsible for monitoring land-use activities to ensure that those activities meet the requirements of the Resource Management Act, regional plan rules, and individual resource consents. Compliance monitoring also includes responding to complaints from the community about incidents.

9.25 Effective compliance monitoring is an important part of managing freshwater quality because it supports better environmental outcomes. In particular, it:

- raises awareness among consent holders and land users about environmental management;
- helps regional councils detect environmentally adverse activities so they can take action to see that these effects are avoided, remedied, or mitigated;
- assures communities that the management framework they consulted on is upheld; and
- provides motivation for land users to follow the Resource Management Act, plan rules, and resource consents, helping to ensure that all land users follow the rules, not just those who voluntarily comply.

9.26 Regional councils can choose how to carry out their monitoring function. However, they have made a collective effort to bring consistency to compliance monitoring and enforcement approaches. As we noted in our 2011 report, they formed the Compliance and Enforcement Special Interest Group (CESIG), which brings together compliance and enforcement staff from across councils.

9.27 CESIG's work has included developing a Regional Sector Strategic Compliance Framework to help councils develop strategic compliance programmes and a range of interventions. CESIG also reviews and reports on individual councils' monitoring and enforcement programmes.

General overview of the four regional councils' approaches

9.28 Given the adverse effect that dairying can have on freshwater quality, this section is mainly concerned with how regional councils monitor dairy farms – in particular, dairy effluent discharges. The four regional councils varied in how effectively they did this.

9.29 Taranaki Regional Council and Environment Southland's risk-based approaches consider the scale and potential environmental effects of the activity being monitored. Both councils have comprehensive dairy compliance monitoring programmes and monitor all dairy farm consents annually. Taranaki Regional Council refers to this as its "every farm, every year" approach. Taranaki Regional Council includes how much contact staff have with consent holders in staff performance measures. This helps to ensure regular contact.

9.30 Horizons Regional Council has a risk-based approach to compliance monitoring that considers the location of activities and past performance. This means that, rather than monitoring all dairy farm consents each year, the Council prioritises inspecting sites that have higher environmental risks or where there are reasons for concern, including where there has been material non-compliance.

9.31 For 2016/17, Horizons Regional Council inspected effluent discharge resource consents at 543 out of 934 farms in its region. Of those, 59 farms (9%) were found to be non-compliant or significantly non-compliant.

9.32 Waikato Regional Council has a high percentage of dairy farms operating under permitted activity rules, which means that they can operate without a resource consent. Because the Council is unable to charge for monitoring where there is no resource consent, this presents a significant resourcing challenge in terms of costs and staff.

9.33 To direct its resources to where they are most needed, the Council uses a risk-based approach to prioritise and direct consent and permitted activity monitoring. Waikato Regional Council's 2017/18 Annual Report noted that the Council administers more than 10,000 resource consents at 4600 sites.

9.34 The Council monitored more than 1000 farms for compliance with dairy effluent rules. About 8% were found to be significantly non-compliant with consent conditions. The Council also monitored 46 dairy farms for compliance with resource consents for effluent discharge.

Best practice for monitoring dairy effluent compliance

9.35 The Ministry has produced best practice guidelines for compliance, monitoring, and enforcement under the Resource Management Act.[40] The guidelines, which draw on CESIG's strategic compliance framework, note "the frequency of monitoring should be determined based on the nature of an activity or consent type and by using a risk-based approach".

9.36 For example, an activity with minor effects on the environment might need only one-off monitoring, but activities of an ongoing nature such as the disposal of dairy effluent might need regular inspections.[41]

9.37 One way to monitor activity is to make unannounced visits to farms. The guidelines state that, under the Resource Management Act, an enforcement officer may enter a property "at any reasonable time" to inspect it. The Act does not require councils to give the land user notice before inspection.

9.38 The good practice guidelines explain that "unexpected inspections decrease the likelihood of consent holders hiding non-compliance, and help in establishing what is really happening on the site".[42] We consider that unannounced visits should be the default option for all councils.

9.39 Compliance monitoring and enforcement staff at the four regional councils can make unannounced visits to farms in certain situations. Some councils use the method more effectively than others.

9.40 We were satisfied with Taranaki Regional Council's approach. Its rigorous approach helps maintain the integrity of its overall environmental management model. It also shows that being a strong and effective environmental regulator does not preclude having healthy and co-operative relationships with land users.

9.41 Taranaki Regional Council's healthy relationships with farmers enables it to maintain a strong approach to compliance while working alongside them to implement its voluntary riparian management programme.

9.42 Environment Southland has improved its approach to compliance monitoring since our 2011 report, including having its risk-based monitoring programme in line with frameworks adopted by regional councils.

9.43 Some stakeholders told us that Environment Southland could further strengthen its approach. Some environmental groups have concerns about Environment

40 Ministry for the Environment (2018), *Best practice guidelines for compliance, monitoring and enforcement under the Resource Management Act 1991*, ME 1376.

41 Ministry for the Environment (2018), *Best practice guidelines for compliance, monitoring and enforcement under the Resource Management Act 1991*, ME 1376, page 45.

42 Ministry for the Environment (2018), *Best practice guidelines for compliance, monitoring and enforcement under the Resource Management Act 1991*, ME 1376, page 60.

Southland's ability to identify material non-compliance. Farmers that we spoke to did not want non-compliant land users to tarnish the efforts the wider farming sector has made in improving compliance.

9.44 Staff and management at Environment Southland are proud of the improvements made since 2011 and are confident in their ability to detect and address instances of non-compliance. They acknowledged that they can continue to improve their approach by learning from other councils.

9.45 In that regard, they noted that council staff are involved in CESIG and attend forums discussing challenges and opportunities. They also noted that a December 2018 report for CESIG concluded that Environment Southland's compliance, monitoring, and enforcement approaches were performing well.

9.46 We had concerns about the effectiveness of compliance monitoring at Waikato Regional Council and Horizons Regional Council.

9.47 Waikato Regional Council's compliance monitoring programme did not detect non-compliance as effectively as others. However, when we visited, the Council was working to improve its overall approach and preparing a new compliance strategy that it expects will provide more clarity for compliance staff.

9.48 Figure 7 highlights the importance of council staff being able to use a full range of appropriate compliance, monitoring, and enforcement tools.

Figure 7
The importance of being able to detect non-compliance

In 2014, Waikato Regional Council heard concerns from some farmers that its approach to monitoring farm dairy effluent rules (namely its use of helicopter monitoring) was causing unnecessary stress in the rural community.

A working group of farming industry representatives and elected members was formed and made seven recommendations. These recommendations resulted in several changes to the Council's compliance monitoring approach. In particular, the Council stopped using helicopters to monitor compliance and made appointments with farmers when it wished to do inspections in person.

Council staff put in place the new approach and reported back in 2016 and 2017 on non-compliance detection results. It found a decrease in the rates of non-compliance. However, this did not necessarily reflect increased compliance. A wider range of monitoring tools was made available to staff in a trialled approach, including unannounced visits to farms suspected of non-compliance or with a history of non-compliance.

After these tools were introduced, the number of significantly non-compliant sites increased. Council staff attributed this to their ability to conduct unannounced visits.

9.49 In 2018, Waikato Regional Council adopted a risk-based compliance strategy particular to dairy farms with inadequate effluent storage (less than seven days storage), which make up 19% of all dairy farms. The Council uses unannounced farm visits and aerial monitoring to detect instances of non-compliance.

9.50 This new approach has resulted in a significant number of cases of non-compliance being detected and significantly higher numbers of prosecutions being pursued. The Council has sought enforcement orders from the courts to ensure that adequate infrastructure is installed on those farms it seeks to prosecute.

9.51 It is important that non-compliance is appropriately identified and dealt with. In our view, regional council staff should be fully empowered to make unannounced calls if needed. Any risks to staff personal safety in what could be confronting situations would need to be managed.

9.52 We also had some concerns about the capacity of Horizons Regional Council to adequately cover all the farming operations in its region. The Council expects to add four full-time staff to its regulatory team to complement its risk-based monitoring approach. Horizons Regional Council is confident that this will allow it to better optimise that approach to ensure broader and more-effective coverage.

9.53 We were satisfied that the four regional councils regularly monitor their regulatory compliance programmes and approaches, commit to reviews and involvement with sector-wide compliance special interest groups, and are open to making improvements. We urge the four regional councils to continue these regular reviews and remain open to improvement, including learning from other regional councils and unitary authorities.

How the four regional councils take enforcement action

9.54 If a land user is not complying with the Resource Management Act or fails to comply with resource consent conditions, regional councils have a range of enforcement options (see Figure 8). Enforcement options include educating land users about compliance, informal warnings, abatement notices, infringement notices, and legal proceedings.

9.55 We were satisfied that the four regional councils used, or were increasingly using, these enforcement options to good effect. For example, Taranaki Regional Council has a strong approach to regulatory enforcement that includes warranting its compliance team and empowering it to issue abatement notices on-site.

Figure 8
Enforcement actions available to regional councils

Enforcement actions

Informal options include issuing a warning or educating the land user so as to encourage compliance in the future.

More formal enforcement options include:

- **Abatement notices** – Regional councils can direct a person to cease an activity that is adversely affecting the environment. Failure to comply can result in fines or imprisonment.
- **Infringement notices** – Council enforcement officers can issue infringement notices if they have reason to believe a person is committing an infringement offence.
- **Enforcement orders** – Enforcement orders are issued by the Environment Court, rather than regional councils. Anybody can apply for an enforcement order against anyone else. These orders can allow regional councils to recover clean-up costs from a polluter.
- **Prosecution** – Regional councils may consider criminal proceedings against an alleged offender if they have appropriate evidence. Because the standard of proof needed is high, prosecutions take a lot of resources. Penalties for a person can include restorative justice, a fine of up to $300,000, or a term of imprisonment for up to two years. A company can be fined up to $600,000.

9.56 During our audit, we noted that Horizons Regional Council had made significantly fewer prosecutions in the previous three years. When we asked Horizons Regional Council staff about this low number of prosecutions, they told us that there simply were not more prosecutions during that period but that they were preparing five more cases for prosecution. Those five cases have since been successfully concluded.

Recommendation 5

We recommend that Waikato Regional Council, Taranaki Regional Council, Horizons Regional Council, and Environment Southland use a full range of appropriate compliance, monitoring, and enforcement tools to effectively identify and act on material non-compliance with the Resource Management Act 1991 or resource consent conditions.

Political interference and compliance, monitoring, and enforcement decisions

9.57 Compliance, monitoring, and enforcement decisions need to be made impartially and without political interference. Any threat to the integrity of a council's compliance monitoring and enforcement programme cannot be tolerated.

9.58 In 2011, we were concerned that elected members at the four regional councils were involved in enforcement decision-making. We noted that, in central

government, enforcement decisions are made by staff rather than elected members so that they are independent of political influence.

9.59 We also noted that the Crown Law Office's *Prosecution guidelines* applied to all public prosecution activity. As such, we recommended that regional councils review their delegations and procedures for prosecuting, to ensure that any decision about prosecution would be free from actual or perceived political bias.

9.60 The four regional councils have made procedural improvements since our 2011 report. Elected members are no longer involved in enforcement decisions. Enforcement panels made up of compliance, monitoring, and enforcement staff now determine the best course of action.

9.61 Councils have the option of nominating staff who will answer any queries from elected members about constituent enquiries. At Environment Southland, this liaison person is a senior member of staff and acts to minimise the interaction that elected members have with compliance, monitoring, and enforcement staff.

9.62 We found no evidence of direct interference from elected members. However, in our view, regional councils must remain alert to this issue. No process can be completely effective, and elected members may still be able to exert inappropriate influence on compliance operations through interactions with staff.

9.63 Any attempt by elected members to inappropriately influence compliance staff or interfere with their processes, knowingly or not, is unacceptable. It compromises the integrity of monitoring activities and undermines the efforts of those who perform them.

9.64 Implementing effective processes to prevent inappropriate political influence or interference in compliance monitoring decisions has been a positive development. These need to be backed by an organisation-wide culture that does not tolerate interference and empowers staff to raise concerns if it occurs.

9.65 Some stakeholders and council staff expressed concerns and unease where elected members held or required consents for personal and business land use. Some perceived that those elected members had a conflict of interest when setting direction on regulatory and non-regulatory approaches, including approaches to compliance, monitoring, and enforcement.

9.66 To prevent undermining public trust and confidence in the elected member or the council, it is critical to declare a conflict of interest and effectively and transparently manage it. The conflict, or the perception of a conflict, needs to be dealt with so that the personal views or interests of the elected member do not unduly influence, or are not seen to unduly influence, the decisions and deliberations needed to meet their official responsibilities.

10 Approaches to non-regulatory initiatives

10.1 In this Part, we discuss:

- how the four regional councils carry out non-regulatory initiatives;
- how the four regional councils can work with the farming industry to support positive environmental outcomes while maintaining independence; and
- how well the four regional councils have integrated their regulatory roles and non-regulatory initiatives.

Summary of findings

10.2 All four regional councils are committed to using non-regulatory programmes to manage the effect of land use on freshwater quality.

10.3 Each of the four regional councils considered whether it can work effectively with farming industry groups where they have common objectives in promoting more sustainable land-use practices and behaviours. There are opportunities to work effectively with these groups in ways that still maintain a regional council's independence.

10.4 We were generally satisfied with the way the four regional councils integrated their regulatory and non-regulatory programmes.

Non-regulatory initiatives

10.5 Regional councils use a range of non-regulatory initiatives to help manage the effects of land use on freshwater quality. Non-regulatory initiatives include on-the-ground interventions such as riparian planting, hill country erosion control, wetland protection and enhancement, and invasive plant species control.

10.6 The four regional councils have made significant investments in on-the-ground interventions to improve, protect, and improve freshwater quality. These initiatives provide councils with opportunities to work with farmers, industry, territorial authorities, and their wider communities to achieve positive environmental outcomes.

10.7 Non-regulatory initiatives can also include software tools that aid in the farming activities that can affect freshwater quality. One example of this is a dairy effluent storage calculator developed by the Horizons Regional Council and Massey University. The calculator determines the effluent storage requirements of individual farms.

10.8 Regional councils can work with farmers to prepare plans that support more sustainable practices on their farms. These plans are prepared for their specific farming operations and are designed to educate farmers and help them follow good environmental management practices.

10.9 Farm environment plans can also include using "nutrient budget models". A nutrient budget model estimates the amount of nutrients (nitrogen and phosphorus) that are lost on a farm in any given year. The model takes into account variables such as soil type, how the land is used, rainfall, and fertilisers, and calculates nutrient inputs and outputs.[43] Nutrient budget models can encourage farmers to consider lost nutrients as a loss of resource for the farm and as a potential contributor to freshwater quality degradation.[44]

10.10 The four regional councils run programmes to work with farmers to promote land-use sustainability. Some of the current programmes are outlined below.

Taranaki Regional Council's riparian management programme

10.11 Riparian protection and restoration is a proven method for reducing stress on waterways because riparian strips can trap sediment and prevent nutrients from getting into water.[45] The Council has run and strongly promoted the programme since 1996.

10.12 As of June 2018, 99.5% of dairy farms in the region have riparian management plans. Plan-holders have fenced 85.7% of their stream banks and protected 71.7% of stream banks with riparian vegetation. The Council has provided 5.1 million plants to landowners under the scheme. The Council is aiming to nearly complete the riparian management programme by 2020.

10.13 A March 2018 report by NIWA found that "the landscape-scale riparian restoration programme" in the Taranaki has "had a beneficial effect on water quality and downstream aquatic invertebrate communities". The report noted a positive relationship between several invertebrate metrics, including MCI (see Part 4), and restoration activities. It also found an association between restoration and decreased *E. coli* (a measure of swimmability).

43 Gluckman, P (2017), *New Zealand's fresh waters: Values, state, trends and human impacts, Wellington*, at www.pmcsa.org.nz, page xxxiii.

44 Gluckman, P (2017), *New Zealand's fresh waters: Values, state, trends and human impacts, Wellington*, at www.pmcsa.org.nz, page xxxiii.

45 Gluckman, P (2017), *New Zealand's fresh waters: Values, state, trends and human impacts, Wellington*, at www.pmcsa.org.nz, p xiv; Parliamentary Commissioner for the Environment (2016), *The state of New Zealand's environment: Commentary by the Parliamentary Commissioner for the Environment on Environment Aotearoa 2015*, at www.pce.parliament.nz, page 54.

Horizons Regional Council's Sustainable Land Use Initiative

10.14 The Horizons region has a high percentage of hill country at risk of erosion. The Sustainable Land Use Initiative prepares "Whole Farm Plans" with farmers and takes a "mountains to sea" approach to keep hill country soils on the hills and out of waterways.

10.15 Horizons Regional Council has invested in a nursery to meet demand for its hill country erosion prevention efforts. Independent evaluation of the Initiative concluded that "there is a strong perception by farmers ... that it has made a major impact on environmental and economic sustainability".

10.16 Farmers and farming industry representatives we spoke to agreed that hill country programmes and separate support for riparian planting are both working well and are based on good relationships between farmers and the Council.

10.17 A February 2018 report by Land Water People Ltd found weak but statistically significant and positive associations between improving trends for water quality and the adoption of the Initiative. It also found significant associations between improving water quality and the Council's other initiatives, such as riparian planting and fencing.

Waikato Regional Council's sustainable agriculture advisors

10.18 Waikato Regional Council employed a team of sustainable agriculture advisors who work with farmers, researchers, and the agricultural industry to put in place solutions to ensure long-term sustainable farming. Their work includes facilitating events with farmers to encourage best environmental practice on farms. In 2016, an independent evaluation of the events found that they were effective in encouraging farmers to implement positive changes.

10.19 Waikato Regional Council's website has a page for farmers that includes links to freshwater quality events, publications, guides, manuals, and factsheets. It uses its website to promote guidance and assistance provided by the farming industry, such as DairyNZ's sustainable milk plans.

10.20 The Council has also worked with the farming industry to prepare a website that provides information and guidance on practices to improve nutrient management and reduce adverse effects on freshwater quality.

Environment Southland's Land Sustainability Officers

10.21 Environment Southland has a team of Land Sustainability Officers who work with urban and rural land users. They provide advice and education to farmers on more sustainable land management practices, including management of riparian areas, effluent, drainage, and intensive winter grazing.

10.22 The Land Sustainability Officers help farmers write and commit to farm environment plans (called "Focus Activity Farm Plans") and give advice about the direct economic benefits of more sustainable practices. Farmers and farming industry group representatives we spoke to praised the quality of the advice the officers gave.

10.23 We saw this work in action, including when we discussed the valued role they play in supporting farmer-led catchment groups looking to influence and support improved practices in their local community.

10.24 We are encouraged by the efforts that the four regional councils are making to work with farmers towards more sustainable land use. We urge all four councils to continue these efforts and look for opportunities to improve the programmes.

Supporting farming industry efforts while maintaining independence

10.25 It is important for regional councils to maintain their independence and ensure that their dealings with the farming industry are transparent. However, this should not preclude councils from supporting efforts by the farming industry to promote sustainable land use. There is room for regional councils to work with farming industry groups to find common ground on sustainable land-use practices while maintaining their independence.

10.26 Since 2011, many farming industry groups have increased their commitment to sustainable farming practices. Given the effect primary production has on freshwater quality, regional councils could usefully support industry-led efforts that improve the sustainability of farming practices.

10.27 How the regional councils worked with the dairy industry on industry-led sustainability programmes varied. The most difference was in the approaches of Taranaki Regional Council and Waikato Regional Council.

10.28 Taranaki Regional Council's focus is on working with farmers in the region day to day, including on its flagship riparian management programme. Individual farmers we spoke to were complimentary about how the Council works with them.

10.29 However, when we did our audit, we were concerned that Taranaki Regional Council was not taking advantage of opportunities to leverage environmental gains from industry-led sustainability programmes. Some farming representatives considered that the Council did not actively or visibly support farming industry efforts to increase land-use sustainability education and implementation.

10.30 We respect Taranaki Regional Council's right to protect its independence and integrity. Independence is a critical requirement for remaining an effective regulator. However, in our view, there were opportunities for Taranaki Regional Council to take advantage of industry-led investments and initiatives while maintaining its independence.

10.31 The Council has since taken advantage of some of these opportunities. Most notably, the Council has developed the "Land and Farm Hub" internet site. The site provides farmers with access to industry-developed best practice advice on topics such as nutrient management, effluent management, and the protection of waterways.

10.32 The site also provides access to council-recommended and industry-developed farm plans for the dairy, meat, and horticultural sectors, and links to industry-based help for completing the plans. We view this as a positive development.

10.33 Waikato Regional Council's approach includes taking advantage of farming industry-led work. For example, one of the main aspects of Waikato's Wai Ora proposal for the Waikato-Waipa catchment is to work closely with the primary production sector on Certified Industry Schemes. These schemes would see private sector organisations certified to monitor their members against the policy objectives of Wai Ora.

10.34 If viable, the Council would not need to do its own on-site compliance monitoring of certain farming activities, which an industry body would do instead. Waikato Regional Council proposes to audit every provider at least once a year and to investigate setting up an independent third-party assurance system for the monitoring.

10.35 Although we support regional councils finding new and more-effective ways of increasing land-use sustainability practices and achieving compliance with land-use rules and conditions, there are risks involved in implementing the Certified Industry Schemes. We expect Waikato Regional Council to understand and manage those risks.

10.36 For example, if the Certified Industry Schemes are adopted, Waikato Regional Council needs to ensure that the development and implementation of schemes is transparent to the wider community. Waikato Regional Council also needs to retain overall control of compliance monitoring in its region. To do this, Waikato

Regional Council will need effective audit oversight over the implementation and results of those programmes.

10.37 We encourage the four regional councils to work with other relevant parties, including farming industry groups, to identify, support, and align activities that lead to sustainable land-use practices and better freshwater outcomes.

10.38 We expect that, in doing so, councils will retain the appropriate level of independence necessary to ensure continued credibility as environmental regulators. We also expect that, in working together to find common ground, all parties mitigate the risk of farmers getting conflicting messages that could undermine the promotion of sustainable land-use practices.

Integrating regulatory and non-regulatory programmes

10.39 We were satisfied with how the four regional councils integrated their regulatory and non-regulatory programmes.

10.40 A well-integrated customer-centric approach is more efficient for the council and land users, ensuring that they receive a consistent message from the different interactions they have with council staff. The importance of these approaches being complementary is evident when considering the different roles regional councils play in full view of farmers.

10.41 In one role, they are a firm regulator and guardian of the rules and conditions that land users must follow. The other role is as a supportive educator that influences more sustainable land-use practices.

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