Updated Evaluation Report: Proposed Southland Water and Land Plan

Prepared for the Environment Court

~~**under Section 32 of the Resource Management Act 1991**~~

~~3 June 2016~~ 19 October 2018

Contents

1 Introduction

1.1 Purpose and Scope

The Resource Management Act 1991 (RMA) requires regional councils, when proposing a regional plan, to prepare an evaluation report in accordance with section 32[1] of the Act. The purpose of this report is to set out the evaluation that Environment Southland (ES) has undertaken on the proposed Southland Water and Land Plan (pSWLP) to replace the current Southland Regional Water Plan (Water Plan), the Southland Regional Effluent Land Application Plan (RELAP) and the Transitional Regional Plan (TRP). This report is updated to align with the Council's decisions[2] on the pSWLP and the reasoning provided in the Decision Report[3].

The original Section 32 Report, much of which remains, was prepared by a number of staff and consultants to Southland Regional Council. It is not based on the opinion of a single person. That Section 32 Report was adopted by Council and notified, along with the proposed Plan. The updating and tracked changes in this version has similarly been prepared by a range of staff and consultants to Southland Regional Council, including planners and scientists. It also incorporates parts of the Section 42A Report developed for the hearing and the Hearing Panel's Decision Report.

Section 32 requires that the objectives of the pSWLP must be examined for their appropriateness in achieving the purpose of the RMA, and that the benefits and costs, and risks of new policies and rules need to be clearly identified and assessed. This report documents the analysis under section 32, so stakeholders and decision-makers can understand the rationale for policy choices.

The pSWLP is the next evolutionary step in the planning framework for Southland's land and fresh water management and is intended to align with the RMA framework of national, regional and local policy documents.

1.2 Contents

This report is comprised of the following components:

- Section 1 – an introduction to this report ~~the pSWLP and context for its development~~
- Section 2 – an overview of the planning context for the pSWLP
- Section 3 – an overview of background to the development of the pSWLP
- Section 4 – an overview of the current state, values and potential environmental effects of the issues facing Southland
- Sections 5-8 – the evaluation required by Section 32 of the Resource Management Act

[1] As the pSWLP was notified prior to the 2017 amendments coming into force, this report, and its updates, reflects the 2015 version of section 32 (full text is included in Appendix A).
[2] Ref – date and report from website
[3] Ref – from website

- ~~Section 6 – comments on the appendices and what they contain~~

1.3 Abbreviations

Within this report a number of abbreviations are used, as follows:

- "the Air Plan" means the Proposed Regional Air Plan
- "the Council" or "ES" means Environment Southland, which is the Southland Regional Council;
- "RMA" or "the Act" means the Resource Management Act 1991;
- ~~"the pRPS" means the Proposed Southland Regional Policy Statement 2012;~~
- "Q95" means the flow exceeded 95% of the time
- "FMU" refers to Freshwater Management Units
- "GMP" refers to Good Management Practices
- "Ha" means Hectares
- "Kg" means Kilograms
- "Kg/Ha/Yr" means kilograms per hectare per year
- "NES" means a National Environmental Standard
- "NPSFM" means the National Policy Statement for Freshwater Management 2014, as amended 2017
- "NZCPS" means the New Zealand Coastal Policy Statement 2010
- "OVERSEER®" means the Overseer Nutrient Budgets Model
- "RELAP" means the Southland Regional Effluent Land Application Plan
- "RCP" means the Regional Coastal Plan
- "RPS" means the Regional Policy Statement for Southland 2017
- "TRP" means the Transitional Regional Plan
- "Water Plan" means the Southland Regional Water Plan
- "pSWLP" or "this Plan" or "the Plan", means the Proposed Southland Water and Land Plan
- "WCO" means Water Conservation Order

2 An overview of the planning context for the Proposed Southland Water and Land Plan

2.1 Resource Management Act 1991

The purpose and principles of the RMA, and the functions of the Council, and purpose of regional plans are set out in the following sections.

The Council has been mindful of the responsibilities and obligations imposed by Parts 2-5, and Schedule 1 of the RMA in preparing the pSWLP, to ensure the RMA requirements have been met throughout.

2.1.1 Purposes and principles of the RMA (Part 2)

The pSWLP has been prepared in accordance with the provisions of Part 2 of the RMA under Part 2 (section 66(1)).

The purpose of the RMA is set out in Part 2, section 5 and states:

(1) The purpose of this Act is to promote the sustainable management of natural and physical resources.

(2) In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while:

(a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and

(b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and

(c) avoiding, remedying, or mitigating any adverse effects of activities on the environment.

The following matters of national importance under section 6 are intended to be addressed by the pSWLP provisions:

- the preservation of the natural character of wetlands and lakes and rivers and their margins, and the protection of them from inappropriate use, and development (section 6(a));
- the protection of outstanding natural features and landscapes from inappropriate use, and development (section 6(b));
- the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna (section 6(c));
- the maintenance and enhancement of public access to and along lakes, and rivers (section 6(d));
- the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga (section 6(e));
- the protection of historic heritage from inappropriate use, and development (section 6(f)): and
- the protection of protected customary rights (section 6(g)).

Further, the following other matters under section 7 are intended to be addressed by the pSWLP provisions:

- kaitiakitanga (section 7(a));
- the ethic of stewardship (section 7(aa));
- the efficient use and development of natural and physical resources (section 7(b));
- intrinsic values of ecosystems (section 7(d));
- maintenance and enhancement of the quality of the environment (section 7(f));
- any finite characteristics of natural and physical resources (section 7(g));
- the protection of the habitat of trout and salmon (section 7(h)); and
- the benefits to be derived from the use and development of renewable energy (section 7(j)).

Lastly, the pSWLP provisions are intended to take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi) under section 8 of the RMA.

~~In exercising its functions and powers under section 30 of the Act, Environment Southland has to recognise and provide for the following matters of national importance (section 6):~~

~~*(a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:*~~
~~*(b) the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:*~~
~~*(c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:*~~
~~*(d) the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:*~~
~~*(e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:*~~
~~*(f) the protection of historic heritage from inappropriate subdivision, use, and development:*~~
~~*(g) the protection of protected customary rights.*~~

~~Section 7 of the RMA sets out other matters that all persons exercising functions and powers under the Act are directed to have particular regard to:~~

~~*(a) kaitiakitanga:*~~
~~*(aa) the ethic of stewardship:*~~
~~*(b) the efficient use and development of natural and physical resources:*~~
~~*(ba) the efficiency of the end use of energy:*~~
~~*(c) the maintenance and enhancement of amenity values:*~~
~~*(d) intrinsic values of ecosystems:*~~
~~*(f) maintenance and enhancement of the quality of the environment:*~~
~~*(g) any finite characteristics of natural and physical resources:*~~
~~*(h) the protection of the habitat of trout and salmon:*~~
~~*(i) the effects of climate change:*~~
~~*(j) the benefits to be derived from the use and development of renewable energy.*~~

~~Environment Southland is also required under section 8 of the RMA to take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).~~

2.1.2 The functions of Environment Southland (Section 30)

Section 30 of the RMA sets out the functions of regional councils. It is extensive in nature, including a wide range of matters that relate to both land use and water. Those of relevance to the pSWLP include:

- establishing, implementing and reviewing objectives, policies, and methods to achieve integrated management of the natural and physical resources of the region (Section 30(1)(a));
- preparing objectives and policies in relation to ~~the~~ any actual or potential effects of the use, development or protection of land which are of regional significance (section 30(1)(b));
- controlling the use of land:
  - to maintain and enhance the quality of water in waterbodies (Section 30(1)(a)(c)(ii)),
  - to maintain the quantity of water in waterbodies (Section 30(1)(a)(c)(iii)),
  - to maintain and enhance ecosystems in water bodies,
  - for soil conservation (Section 30(1)(c)), and
  - for avoiding or mitigation natural hazards (Section 30(1)(c)(iv)); ~~to maintain the quality and quantity of water in waterbodies~~
- the investigation of land for the purposes of identifying and monitoring contaminated land (section 30(1)(ca);
- controlling the taking, using, damming, and diverting of water, and control of the quantity, level or flow in any waterbody (Section 30(1)(e));
- controlling the discharge of contaminants onto or into land or water and discharges of water into water (Section 30(1)(f));
- establishing rules to allocate the taking or use of water, and the capacity of water to assimilate discharges (Section 30(1)(fa)). This is subject to the restrictions set out in Section 30(4);
- in relation to any bed of a water body, the control of the introduction or planting of any plant in, on, or under that land, for the purpose of—
  - soil conservation (Section 30(1)(g)(i));
  - the maintenance and enhancement of the quality of water in that water body (Section 30(1)(g)(ii);
  - the maintenance of the quantity of water in that water body (Section 30(1)(g)(iii);
  - the avoidance or mitigation of natural hazards (Section 30(1)(g)(iv);
- establishing, implementing and reviewing plan provisions for maintaining indigenous biological diversity (Section 30(1)(ga)).~~;~~
- the strategic integration of infrastructure with land use through objectives, policies, and methods (section 30(1)(gb)).

2.1.3 Regional Plans

The purpose of a regional plan is to assist a regional council to carry out any of its functions in order to achieve the purpose of the RMA (Section 63(1)).

Sections 65 to 70 set out a number of technical and procedural matters to be followed in the preparation of a regional plan. Of particular note are the following:

- the preparation of a regional plan must be carried out in the manner set out in Schedule 1 (section 65(2) & (5));
- there are particular circumstances where the Council must consider the desirability of preparing a regional plan, including any use of land that has actual or potential adverse effects on water quality (section 65(3));
- when preparing a regional plan, the Council must have regard to management plans and strategies prepared under other Acts, and take into account any relevant planning document recognised by an iwi authority, to the extent that their content has a bearing on the resource management issues of the region (section 66(2)(c)(i) & (2A)(a));
- a regional plan must set out objectives, policies and rules (section 67(1)). There are a number of optional matters that may be included, including issues, explanations, reasons and environmental results expected;
- a regional plan must give effect to any national policy statement, the New Zealand Coastal Policy Statement and any regional policy statement (section 67(3));
- a regional plan must not be inconsistent with a Water Conservation Order, or another regional plan for the region (section67(4)).

Sections 68-70 contain specific requirements about the application of regional rules, including those relating to water quality and discharges.

2.2 Superior Planning Instruments

This section briefly describes the superior policy instruments the pSWLP must give effect to.

2.2.1 National Policy Statements

A regional plan must give effect to any national policy statement, including ~~and to~~ the New Zealand Coastal Policy Statement. There are currently five ~~four~~ national policy statements in force:

1. National Policy Statement for Freshwater Management (NPSFM);
2. National Policy Statement for Renewable Electricity Generation (NPS-REG);
3. New Zealand Coastal Policy Statement (NZCPS);
4. National Policy Statement on Electricity Transmission (NPS-ET); and
5. National Policy Statement for Urban Development (NPS–UDC).

The relevant parts of the NPSFM, NPS-REG and the NZCPS are set out below.

The NPS-ET and NPS-UDC are considered less relevant to the pSWLP, primarily because they relate more so to territorial authority functions.

The National Policy Statement for Freshwater Management 2014 (amended 2017)

~~The NPSFM provides direction to regional councils on managing both water quantity and quality. It requires the Council to recognise both the national significance of fresh water for all New Zealanders, and Te Mana o te Wai (the mana of the water). Specifically, in relation to water quality, it directs the council to:~~

- ~~safeguard fresh water's life supporting capacity, ecosystem processes, and indigenous species including their associated ecosystems;~~
- ~~manage freshwater bodies so people's health is safeguarded;~~
- ~~maintain or improve the overall quality of fresh water within the Southland region.~~
- ~~avoid the over allocation of inputs of contaminants, and phase out existing over allocation.~~
- ~~set freshwater objectives according to a specified process (the national objectives framework) to meet community and tāngata whenua values which include the compulsory values of ecosystem health and human health for recreation;~~
- ~~use a specified set of water quality measures (attributes) to set the freshwater objectives - and only set an objective below national bottom lines in specified circumstances;~~
- ~~set water quantity and quality limits to meet the freshwater objectives.~~

~~The NPSFM also directs that an integrated approach is taken to managing land use, fresh water and coastal water. It seeks to provide for the involvement of iwi and hapū in freshwater management, and to ensure that tāngata whenua values and interests are identified and reflected in its management. Further, the NPSFM requires ES to put in place measures, to tally water takes and sources of contaminants, and monitor achievement towards meeting freshwater objectives and limits. The NPSFM allows ES until 2025 (or 2030 if they have reason) to fully implement all its policies.~~

The National Policy Statement for Freshwater Management 2014 ('the NPSFM') was amended by Government in August 2017.

The preamble to the NPSFM identifies the importance of freshwater to economic, cultural and social well-being, and the need for national direction in the management of freshwater resources. Relevantly, it recognises catchment-level variation between different freshwater bodies, and different demands on the resource across regions, including managing land use and development activities that affect fresh water so that growth is achieved with a lower environmental footprint. The preamble also describes accounting for all freshwater takes and sources of relevant contaminants as vital. It contains specific references to 'national bottom lines' not being standards to aim for and describes a national target of 90% of specified rivers and lakes being safe for primary contact by 2040.

The NPSFM also introduces and requires consideration of the concept of Te Mana o te Wai. This notes that the health and well-being of our freshwater bodies is vital for the health and well-being of our land, our resources (including fisheries, flora and fauna) and our communities. Te Mana o te Wai incorporates the values of tangata whenua and the wider community in relation to each water body.

Council has recently issued an updated Progressive Implementation Programme, identifying its process to give effect to this NPS[4]. In the interim, the pSWLP gives effect to the NPSFM to the extent that it is required to do so. This means that the pSWLP gives effect to the Objectives, and some of the policies. The Progressive Implementation Programme identifies the timing and outlines the process to establish values, freshwater objectives, targets and limits, and identify and address any overallocation.

Objectives are contained in the NPSFM for Te Mana o te Wai (Objective AA1), water quality (Objectives A1 and A2), water quantity (B1 to B4), and for integrated management (Objective C1).

Objective AA1 is to consider and recognise Te Mana o te Wai in the management of fresh water. Policy AA1 directs the Council to consider and recognise Te Mana o te Wai in preparing the pSWLP.

Objective A1 is to safeguard the life-supporting capacity of freshwater and the health of people and communities in sustainably managing the use and development of land and discharges of contaminants. Objective A2 is maintaining or improving the overall quality of fresh water within a freshwater management unit (FMU) while protecting significant values of outstanding freshwater bodies and wetlands and improving the quality in waterbodies degraded by overallocation. Objective A3 is to improve the quality of water within a FMU so it is suitable for primary contact more often.

Objectives A4 and B5 are to enable communities to provide for their economic well-being, including productive economic opportunities, in sustainably managing freshwater quality, within limits. Policies A7 and B8 require the Council to consider how to enable communities to provide for their economic well-being, including productive economic opportunities, in sustainably managing freshwater quality, within limits, when giving effect to the NPSFM.

Objective B1 is to safeguard the life-supporting capacity, ecosystem processes and indigenous species of freshwater in sustainably managing the taking, using, damming and diverting of fresh water. Objective B2 is avoiding any further over-allocation of fresh water and phasing out existing over-allocation. Objective B3 is improving and maximising the efficient allocation and efficient use of water. Objective B4 is protecting significant values of wetlands and of outstanding freshwater bodies. Policy B3 directs the pSWLP to state criteria by which transfers of water permits are decided. Policy B4 directs that the pSWLP identify methods to encourage the efficient use of water.

Objective C1 is to improve integrated management of fresh water and use and development of land in whole catchments, including interactions between fresh water, land, associated ecosystems, and the coastal environment. Objective C1 is particularly relevant to Objective 1 of the Plan. To achieve that objective, Policy C1 directs the Council to manage freshwater, land use, and development in an integrated and sustainable way so as to avoid, remedy, or mitigate adverse effects, including cumulative effects.

Objective CA1 is a nationally consistent approach to establishing freshwater objectives for national values, and any other values, that recognise regional and local circumstances.

[4] See Appendix C

Policy CA1 is that all regional councils are to identify freshwater management units for all freshwater bodies in every region.

Objective CB1 titled 'Monitoring plans', and related policies CB1 to CB3, is to provide an approach to monitoring progress towards achieving freshwater objectives and values. Objective CC1 titled 'Accounting for freshwater takes and contaminants' is to improve information on those matters.

Part D of the NPSFM relates to tangata whenua roles and interests. Objective D1 states "To provide for the involvement of iwi and hapū, and to ensure that tangata whenua values and interests are identified and reflected in the management of fresh water and associated ecosystems, and decision-making regarding freshwater planning…" Policy D1 is for local authorities to take reasonable steps to involve iwi and hapū in the management of freshwater and ecosystems, to work with them to identify values and interests, and reflect them in management and decision-making.

~~The NPSFM is a first step to improve freshwater management at a national level to address the over-allocation of water in catchments for abstraction or discharges. ES is required to give effect to the NPSFM, an assessment against the relevant provisions of the NPSFM which demonstrates how the pSWLP addresses them is set out in each relevant section.~~

The New Zealand Coastal Policy Statement 2010

The New Zealand Coastal Policy Statement 2010 (NZCPS) sets out policies to achieve the purpose of the Act in relation to the coastal environment. This includes providing policy direction on national priorities for the preservation of the natural character, protection of the characteristics of the coastal environment of special value to ~~the~~ tangata whenua and activities involving the subdivision, use, or development of areas of the coastal environment. Given the physical geography of the Southland Region, which includes an extensive range of estuaries, coastal lagoons, and coastal wetlands, the NZCPS is highly relevant to this Plan.

The NZCPS recognises that activities inland can have a major impact on coastal water quality as a consequence of point and non-point sources of contamination, including stormwater and wastewater discharges. Unlike the NPSFM, the NZCPS does not provide for a pathway for the regional council to progressively implement the requirements of the NZCPS, therefore the proposed Plan must give effect to the NZCPS in full in the management of discharges to coastal water. The following provisions are considered to be the most relevant to the development of this plan:

Objective 1 seeks the maintenance of coastal water quality and the enhancement where it has deteriorated.

Objective 3 requires that the principles of the Treaty of Waitangi are taken into account, and the role of tangata whenua as kaitatiki is recognised. It also requires that tangata whenua involvement in the management of the coastal environment provided for. This is provided for in policy 2.

Objective 6 enables people and communities to provide for their social, economic, and cultural wellbeing and their health and safety, through subdivision, use, and development, while recognising that there are a range of values associated with the coastal environment that require protection.

Policy 2 provides direction on how the principles of the Treaty of Waitangi and kaitiakitanga are to be taken into account in relation to the coastal environment.

Policy 11 requires the regional plan to protect indigenous biodiversity in the coastal environment. It contains a comprehensive list of taxa, ecosystems, habitats and areas from which the adverse effects of activities must be avoided.

Policy 21 provides specific direction on improving water quality and it requires that where water quality that has deteriorated so that there are significant adverse effects on ecosystem health, recreation activities, or other existing uses of water, these areas are prioritised for improvement.

Policy 22 provides specific direction on managing land use and discharge activities that result in sedimentation.

Policy 23 provides specific direction in relation to the management of discharges that impact water quality in the coastal environment, including management of stormwater and wastewater discharges.

The provisions within the pSWLP and the processes established for Freshwater Management Units seek to manage the water quality and quantity of the upstream waterbodies, to give effect to the NZCPS. A detailed assessment of the relevant NZCPS policies can be found in the activity specific sections of this report.

The National Policy Statement for Renewable Electricity Generation 2011

The National Policy Statement for Renewable Electricity Generation 2011 (NPS-REG) sets out an objective and policies to enable the sustainable management of renewable electricity generation under the RMA. Of particular relevance to the pSWLP, it requires that the Council recognise and provide for the national significance of renewable electricity generation activities. Policy E2 relates to hydro-electricity resources and requires that regional plans include objectives, policies and methods to provide for the development, operation, maintenance, and upgrading of new and existing hydro-electricity generation activities to the extent applicable to the region. The NPS-REG has a qualification in its preamble, to the effect that it does not apply to the allocation and prioritisation of freshwater.

~~The objective and policies of the NPS-REG have been given effect through the Water Plan and have not been amended in the pSWLP.~~ The pSWLP is gives effect to ~~consistent with~~ the NPS-REG provisions.

2.2.2 Water Conservation Orders

Water Conservation Orders recognise the outstanding amenity or intrinsic values of water bodies and are the strongest form of protection of water under the RMA. A water

conservation order can prohibit or restrict a regional council issuing new water and discharge permits. Regional policy statements, regional plans and district plans must not be inconsistent with the provisions of a water conservation order (WCO). The WCOs that apply within the Southland region are:

- Water Conservation (Mataura River) Order 1997
- Water Conservation (Oreti River) Order 2008

The pSWLP is not inconsistent with these orders.

2.2.3 National Environmental Standards

National environmental standards (NES) are regulations issued under section 43 of the RMA which apply nationally and therefore provide a consistent approach and decision-making process throughout the country. A NES can prescribe standards, methods or other requirements for a range of matters referred to in the RMA. Each regional, city or district council must enforce the same standard as outlined in any NES. In some circumstances, councils can impose stricter standards, but cannot make a rule more lenient than a national environmental standard.

Several NESs are relevant to the pSWLP. However, others do not require material implementation through the pSWLP.

Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007
This NES sets requirements for protecting sources of human drinking water from becoming contaminated. With respect to the pSWLP, the regional council is required to be satisfied that a rule that permits a land use or discharge upstream of an abstraction point for a registered drinking-water supply will not result in the drinking water supplies being unsafe for human consumption following existing treatment (Regulation 10). Rules in a regional plan may be more stringent than required by the regulations (Regulation 13).

The pSWLP includes a range of drinking water protection zones (identified in Appendix J) and conditions that apply to permitted land uses and discharges to ensure that the Drinking Water NES is complied with.[5]

Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017
The Plantation Forestry NES provides a consistent set of regulations for plantation forestry activities. It covers eight core plantation forestry activities, allowing these to be carried out as permitted activities, subject to conditions to manage potential effects on the environment.[6] As this NES came into effect immediately after the pSWLP Decision was released, the Council considered that the most effective way of responding to this NES is to state that nothing in the pSWLP controls an aspect of plantation forestry activities that is specifically regulated by the Plantation Forestry NES, unless Regulation 6 applies (which allows rules in a regional plan to be more stringent than the regulations in certain circumstances).[7] Advice to this effect appears on page 44 of the pSWLP.

[5] S42A
[6] Sourced from the MPI website 17 August 2018
[7] Decision Report Pages 9-10

Resource Management (National Environmental Standards for Electricity Transmission Activities) Regulations 2009

This NES set out a national framework of permissions and consent requirements for activities on existing electricity transmission lines. Activities include the operation, maintenance and upgrading of existing lines. Regulation 4 specifies those activities the NES applies to, along with a range of activities that the NES does not apply to, including the construction or use of a bridge or culvert, the storage, use, disposal, or transportation of hazardous substances, the refuelling of a vehicle or equipment and earthworks to the extent that they are subject to a regional rule. Similar to the Plantation Forestry NES, on page 44 of the pSWLP there is a confirmation that the pSWLP does not apply to any activity specifically regulated by this NES.

Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011

Regulation 4 of this NES stipulates that this it applies to the functions of territorial authorities, and not regional councils. That said, the pSWLP minimises any overlap with the requirements of this NES by not independently managing earthworks on contaminated sites.

Resource Management (National Environmental Standards for Air Quality) Regulations 2004

This NES is not relevant, as the Southland Regional Council has an Air Plan, which addresses all matters in this NES.

Resource Management (National Environmental Standards for Telecommunication Facilities) Regulations 2016

Regulation 8 of this NES states that this regulation does not apply to anything done in the coastal marine area or in, on, under, or over the bed of a river or lake, but does apply to anything done over a river or lake (such as on a bridge). However, Regulations 52 and 54 state that the activity must be undertaken in accordance with any regional rules applying to an activity over a river or lake or to earthworks. Therefore, this NES does not require any particular implementation through the pSWLP.

Resource Management (Measurement and Reporting of Water Takes) Regulations 2010

The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 are not an NES. These regulations require the keeping of records of fresh water taken under a water permit and the provision of the records to Council annually, and (if required) evidence of verification of their accuracy. The regulations do not stipulate matters to be contained in regional plans and are while not directly relevant to the pSWLP, Rules in the pSWLP are partially aligned with this NES.[8]

~~There are currently five NES in force:~~

- ~~National Environmental Standards for Air Quality 2004~~
- ~~National Environmental Standards for Sources of Human Drinking Water 2007 (Drinking Water NES)~~
- ~~National Environmental Standards for Telecommunication Facilities 2008~~

[8] Decision Report Pages 9-10

- ~~National Environmental Standards for Electricity Transmission Activities 2009~~
- ~~National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2011 (Soil Contaminants NES)~~

~~The only two current NES of relevance to the pSWLP are the Drinking Water NES and the Soil Contaminants NES. Regulation 10 of the Drinking Water NES prevents regional councils from including permitted activity rules in a regional plan, under section 9, 13, 14, or 15 of the Act, upstream of an abstraction point, in certain circumstances.~~

~~The Council considers that the pSWLP is not inconsistent with the Drinking Water NES or the Soil Contaminants NES. In particular, the rules in the pSWLP are not considered to be more lenient than the standards in either of these NES.~~

2.2.4 Regional Planning Documents

~~Proposed~~ Southland Regional Policy Statement 2017~~2~~ (~~p~~RPS)

Under Section 67(3)(c) of the RMA, a regional plan must give effect to any regional policy statement.

~~The pRPS is still a proposed plan, but is substantially through the policy-making process, with appeals being resolved and a number of parts now 'beyond challenge'.~~

The Southland RPS was notified on 19 May 2012, decisions were issued on 6 June 2016 and the RPS made operative on 9 October 2017.

The ~~p~~RPS sets out a policy framework for the management of natural and physical resources in the Southland Region. It gives an overview of the significant resource management issues facing Southland, including issues of significance to tangata whenua, and includes objectives, policies and methods to resolve any identified issues, including a chapter specific to freshwater.

The purpose of the freshwater chapter is to address the resource management issues pertaining to freshwater for the Southland region. The chapter contains six objectives, which seek that the region's freshwater resources are sustainably managed in an integrated way. These objectives take into account a range of specified matters, including consideration of the effects of land uses and intensification on water quality, so that the region's water quality is maintained or improved. The objectives are implemented through 20 policies, with the ~~p~~RPS then setting out methods through which the policies are to be implemented.

Over time the expectations set out in NPSs change, and this has been particularly the case for the NPSFM. The initial drafting of the RPS occurred under the 2011 version, the notification version of the pRPS was prepared to give effect to the 2014 version of the NPSFM, and the 2017 amendments to the NPSFM came into effect after the RPS was made operative. The Minister for the Environment has recently stated that further changes to the NPSFM are forthcoming. Aside from the introduction of a new NPS (NPS-UDC), other NPSs have not changed during the preparation of the Southland RPS.

The RMA does not require, unless an NPS directs it, that an RPS be changed specifically to give effect to an NPS promulgated or amended after the RPS becomes operative. Therefore, in some respects, the RPS is not fully up-to-date with respect to the NPSFM (further discussed below).

In the case of a gap in the RPS or any conflict between the RPS and any current NPS, the NPS, as the superior document, provides the policy direction for the pSWLP to give effect to.

~~***Regional Policy Statement for Southland 1997 (RPS)***~~

~~The RPS will remain operative until the pRPS becomes operative. A brief analysis of how the Plan gives effects to the RPS follows.~~

~~Objective 5.2 of the RPS aligns closely with the direction provided in the NPSFM – i.e. water quality must be maintained as a minimum. The RPS 1997 is clear that attention must be paid to the effects of land use in order to maintain water quality, and the pSWLP is required to give effect to these provisions.~~

~~Policy 5.5 of the RPS is particularly directive and states:~~
~~Council must assess the effects of land use and development on ground and surface water quality (including non-point source discharges) and provide for any adverse effects to be avoided, remedied or mitigated when preparing a regional plan.~~

~~The proposed Plan is considered to give effect to the RPS.~~

Under section 67(4)(b) of the RMA, the pSWLP must not be inconsistent with any other regional plan for the region. These plans are summarised below.

Regional Coastal Plan (RCP)

The RCP covers the Coastal Marine Area and areas immediately landward of this within the Southland region. Chapter 7 of the RCP deals with Coastal Water Quality and includes objectives, policies and rules that seek to manage the discharge of contaminants and water within the Coastal Marine Area.

The RCP identifies that discharges of contaminants, directly or indirectly into the Coastal Marine Area, can adversely affect coastal water quality and its ecological values, the cultural relationship tangata whenua has with water, and the use of the water by the Southland community. In relation to coastal water quality, the RCP seeks to maintain the overall high existing water quality (Objective 7.2.2.1). The RCP recognises that discharges inland of the Coastal Marine area can adversely affect coastal water quality, and therefore Policy 7.3.2.1 promotes measures to manage the effects of these discharges on this area.

The pSWLP is not considered to be inconsistent with the RCP.

The ~~Proposed~~ Regional Air Plan ~~2014~~ 2016(Air Plan)

The ~~stage 1 revision of the~~ Air Plan was approved by Council on 30 September 2015 and became operative on 14 October 2016. This introduces new rules in response to the Government's health-inspired National Environmental Standards for Air Quality to address the region's air quality issues.

The Air Plan includes new rules for home heating, outdoor burning, the application of agrichemicals and fertilisers, and fire training. All other discharges to air (such as industrial and commercial discharges) will be reviewed in Stage 2 of the Air Plan Review.

The pSWLP is not considered to be inconsistent with the ~~proposed Regional~~ Air Plan.

2.2.5 Iwi Management Plans

Environment Southland is a signatory to a Charter of Understanding – He Huaraki mā Ngā Uri Whakatupu in place between the southern councils and Ngāi Tahu ki Murihiku. The Charter sets out the basis and conduct of the councils and rūnanga in the context of the RMA and the agreed common goal of "the sustainable management of the region's environment and for the social, cultural, economic and environmental well-being of the community, for now and into the future."

In addition, section 66(2A)(a) of the RMA requires regional councils to take into account any relevant planning document that is recognised by an iwi authority and that is lodged with the regional council. The relevant iwi management plans lodged with ES are:

- Te Rūnanga o Ngāi Tahu Freshwater Policy Statement (1999); and
- Ngāi Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan 2008 (Te Tangi a Tauria).

In preparing the pSWLP, ES has taken into account these documents. The key issues concerning water quality and the outcomes sought by Ngāi Tahu iwi and hapu are summarised in Table 1. In general, it is the iwi's desire that the region's freshwater resources are acknowledged as a taonga, the cultural values associated with freshwater are protected, and that degraded water bodies are restored. More effective management of discharges (including non-point source discharges) to water and their adverse effects on freshwater quality, ecosystems and cultural values are consistent themes through all of the iwi management plans. Among the measures proposed to manage non-point source discharges, are the use of best management practices, farm management plans, riparian planting and buffer zones, setting appropriate conditions on resource consents, and monitoring and reporting on the effectiveness of these measures. The following table outlines key issues concerning water quality and the outcomes sought by Ngai Tahu.

Table 2.2.5(a) – Key issues concerning water quality and the outcomes sought by Ngāi Tahu

Issues	Outcomes sought by Ngai Tahu

Kaitiakitanga	• Limited recognition of kaitiakitanga in resource management processes and decision making	• Recognise role of Ngāi Tahu as kaitiaki and engage with Ngāi Tahu in the spirit and intent of the Treaty of Waitangi (Te Tiriti o Waitangi) and the RMA.
Land use & infrastructure	• Discharge activities associated with land use and development, and effects on the mauri of water and soil resources.	• Protect Ngāi Tahu cultural values and associations from inappropriate subdivision, use and development. • Avoid discharges to water, and those discharges to land where, such discharges will have adverse effects on the mauri of the land. • Promote development of best practice guidelines to manage surface run off of contaminants.
Fresh water	• The impact on mahinga kai, taonga and other indigenous species as a result of poor water quality and insufficient water quality and quantity. • Discharges to water (point and non-point source) and the effects on surface and groundwater quality, cultural and intrinsic values of importance to tangata whenua. • Effects of land use on water resources, including rivers, streams, wetlands, groundwater, waipuna and riparian areas.	• Water resources are managed according to the philosophy and principle of Ki Uta Ki Tai, including the unimpeded passage of water from the mountains to the sea. • Restore, maintain and protect the mauri of freshwater and mahinga kai. • Avoid discharges (point and non-point source) to water and those discharges to land, where such discharges will have adverse effects on the mauri of the water. • Water quality is maintained, and where required, enhanced. • Protect, restore and enhance native riparian vegetation, to provide habitat for taonga species and a buffer against intensive land use.
Coastal environment	• Discharges to coastal waters and impacts on coastal water quality.	• Avoid the discharge of contaminants to coastal waters.
Soil	• Loss of soil qualities / effects on mauri of soils as a result of discharge to land activities. • Human induced soil erosion.	• Human induced soil erosion is avoided • The mauri and life supporting capacity of soils is safeguarded.

2.2.6 Ngāi Tahu Statutory Acknowledgement Areas

The Ngāi Tahu Claims Settlement Act 1998 gives effect to the Deed of Settlement signed by the Crown and Te Runanga o Ngāi Tahu on 21 November 1997 to achieve a final settlement of Ngāi Tahu's historical claims against the Crown.

Statutory Acknowledgements recognise Ngāi Tahu's mana in relation to a range of sites and areas in the South Island and provide for this to be reflected in the management of those areas. Statutory Acknowledgements impact upon RMA processes concerning these areas. There are several ~~areas~~ Statutory Acknowledgement Areas within Southland, which are mapped and listed within Appendix B of the pSWLP.

2.2.7 Sports Fish and Game Management Plans

Under section 66(2)(c)(i) of the RMA, the Council must have regard to any management plan or strategy prepared under another Act, to the extent that its content has a bearing on the resource management issues of the region.

The Conservation Act 1987 requires each Fish and Game Council to prepare any sports fish and game management plans that are necessary for the management of sports fish and game birds within its region of jurisdiction, for approval by the Minister of Conservation. The Southland Sports Fish and Game Management Plan establishes a framework which provides direction for Fish and Game and its staff to ensure the sustained use of sports fish and game bird resources for anglers and hunters. The Southland Sports Fish and Game Management Plan is the relevant management plan in relation to the pSWLP.

2.3 *Overall Plan Structure and FMU Sections*

The basic structure of a regional plan is set out in section 67 of the RMA. The pSWLP follows a simple and orthodox structure of having objectives, policies and rules. These provisions are supported by a number of appendices and a series of planning maps. The pSWLP is a departure from the existing Water Plan and RELAP Plan, in that the pSWLP has fewer of the optional components in section 67, and does not have explanations to objectives, polices or rules. The one optional component that the plan has is a statement of issues, in the introductory sections of the Plan.

The structure of the pSWLP has been developed to enable the addition of components resulting from the FMU processes that are about to commence. The FMU processes are in response to the requirements of the NPSFM, primarily Objective CA1 and Policies CA1 to CA4. As has been detailed above, the Council has identified the relevant FMUs, and has notified a staged implementation programme, in accordance with Policy E1 of the NPSFM. The most recent update of this programme is attached as Appendix C.

Policies 44 to 47 and Rule 2 of the pSWLP provide context for the development and incorporation of the FMU sections. Whether these FMU sections are standalone chapters, or integrated into the pSWLP polices and rules is yet to be determined. However, these policies and the rule establish the basic construct for developing FMU responses.

Policies 44 to 47 and Rule 2 are considered by Environment Southland to be effective and efficient, in that they provide certainty and clarity as to the process to be undertaken, and therefore reduce cost through the specification of a process to be followed consistently across the region. These policies have the specific support of Ngāi Tahu and align closely with the requirements of the NPSFM.

Environment Southland is satisfied that Policies 44 to 47 and Rule 2, along with the overall plan structure, are the most appropriate way to achieve the objectives of the pSWLP, and Environment Southland is satisfied that the structure of the pSWLP provides a considerable improvement in terms of clarity and certainty over the Water and RELAP Plan structures.

The pSWLP rules assign activity status across the full range from permitted to prohibited activities. The rules also address land use, discharge to land and discharge to water, and activities in the beds of lakes and rivers. Almost all permitted, controlled and restricted discretionary rules, and some discretionary activity rules, are subject to conditions that need to be met to maintain that activity status. For controlled and restricted discretionary activities, matters of control and restrictions on discretion are listed. There are no separate assessment matters.

Water take and water use rules	Rule 49 Abstraction, diversion and use of surface water Rule 50 Community water supply Rule 51 Minor diversions of water Rule 52 Water abstraction, damming, diversion and use from the Waiau catchment Rule 52A Manapōuri Hydro-electric Scheme Rule 54 Abstraction and use of groundwater
Land use rules	Rule 20 Farming Rule 25 Cultivation Rule 32A Reconstruction of effluent storage facilities Rule 32B Construction, maintenance and use of new agri effluent storage facilities Rule 32C Construction maintenance and use of non-agri effluent storage facilities Rule 32D Existing agri effluent storage facilities Rule 35A Feed pads/lots Rule 40 Silage storage Rule 46A Site investigations Rule 48 Cemeteries Rule 53 Bores and wells Rule 79 High country burning
Discharge rules	Rule 5 Discharge to surface waterbodies Rule 6 Discharge to surface waterbodies that do not meet water quality standards Rule 8 Discharge of surface water Rule 9 Discharge of agrichemicals onto or into surface water Rule 10 Discharge of agrichemicals to land Rule 11 Discharge of vertebrate pest control poisons Rule 12 Discharge of non-toxic dyes Rule 13 Discharge from subsurface drainage systems Rule 14 Discharge of fertiliser Rule 15 Discharge of stormwater Rule 16 Discharge of water from bores and wells for aquifer testing Rule 17 Dust suppressants

	Rule 18 Discharge of water from purging of instruments at water treatment plant and portable potable water treatment units Rule 18A discharge from emergency fire-fighting Rule 18B Discharges form emergency response training activities Rule 19 Discharge of water associated with water treatment processes Rule 26 Discharge from on-site wastewater systems Rule 27 Discharges from pit toilets Rule 28 Discharge of liquid from waterless composting toilets Rule 29 Discharges of aerobically composted human excreta Rule 30 Discharges from mobile pit toilets Rule 31 Dump stations Rule 33 Community sewerage schemes – to land Rule 33A Community sewerage schemes – to water Rule 34 Industrial and trade processes Rule 35 Discharge of agri effluent to land Rule 36 Horticulture wash-water Rule 37 Agricultural dips Rule 38 Animal and vegetative waste Rule 39 Other agri effluent disposal Rule 41 Silage leachate Rule 42 Cleanfill sites Rule 43 Farm landfills Rule 45 Landfills Rule 46 Land contaminated by hazardous substances Rule 47 Closed landfills
Bed of lakes and rivers and incidental discharges	Rule 55A General conditions for activities in river and lake beds Rule 55 Monitoring and sampling structures Rule 56 Boat rams, jetties, wharves and slipways Rule 57 Bridges Rule 58 Cables, wires and pipes Rule 59 Culverts Rule 59A On-farm sediment traps Rule 60 Dams and weirs Rule 61 erosion control structures Rule 62 Fords Rule 63 Moorings and signs Rule 63A Navigational aids Rule 64 Temporary canoe gate or ski lane markers Rule 65 Whitebait stands Rule 65A Maimai Rule 66 Maintenance of structure Rule 67 Alteration or extension of structure Rule 68 Demolition or removal of structures Rule 69 Structures not covered by, or not complying with, rules Rule 70 Stock exclusion Rule 71 Channel realignment, widening or deepening

	Rule 72 Dry cuts Rule 74 Wetlands Rule 75 Vegetation flood debris removal Rule 76 Vegetation planting Rule 77 Vehicles and machinery Rule 78 Weed and sediment removal for drainage maintenance
Region wide rules	Rules 1-4

2.4 Freshwater Management Units and Implementing the NPSFM

In addition to the Plan, Council and the Southland community have commenced ~~will commence~~ the catchment values, objectives, targets and limit setting under the Council's People, Water and Land programme. ~~component of the Water and Land 2020 & Beyond project later this year~~. ~~During catchment limit setting,~~ Council will work with the Southland community to give effect to the NPSFM through the development of values, freshwater objectives and corresponding targets and limits for freshwater quality and quantity within each of the Freshwater Management Units (FMUs)[9]. In accordance with the NPSFM Council has identified five FMUs based on Southland's surface water catchments. The FMUs identified for Southland are ~~(in order of process implementation)~~:

- Fiordland and islands;
- Aparima and Pourakino – Jacobs River Estuary;
- Mataura – Toetoes Harbour;
- Oreti and Waihopai – New River Estuary
- Waiau – Te Waewae Lagoon

~~The first FMU covers western Fiordland and the offshore islands, including Stewart Island/Rakiura and is predominantly national parks. The remaining four FMUs are based on Southland's four major river catchments and the coastal boundary is at the mouth of each estuary (i.e. it includes the estuary), while also considering the wider coastal environment. These FMUs are largely made up of developed land with primarily agricultural and forestry land uses (although 36% of the region's undeveloped land is within these "developed" FMUs).~~

Most objectives and policies of the pSWLP can be achieved by the current rules. Several objectives are aspirational and will take more than one planning cycle to achieve. It is anticipated that FMU processes will lead to, in addition to identification of values, freshwater objectives, limits and targets, a refinement of some policies, the addition of location specific policies and rules. In particular, it is expected that several appendices will be updated or replaced.

When Council commenced the development of the pSWLP in 2014, a series of workshops were held with Councillors, staff and representatives from Te Ao Mārama Inc. During the

[9] Under the NPSFM (2014), a "Freshwater Management Unit" is a "water body, multiple water bodies or any part of a water body determined by the regional council as the appropriate spatial scale for setting freshwater objectives and limits and for freshwater accounting and management purposes."

course of those workshops, Council developed the following key touchstones to guide the development of the Proposed Plan:

1. Maintain water quality;
2. Make improvements to water quality through good management practices; and
3. Make further improvements, where degraded, through the Freshwater Management Unit processes.

On this basis, the pSWLP does not generally seek to make improvements to water quality, other than through adoption of good management practices, nor does it seek to address overallocation. Council considers that, in advance of setting freshwater objectives, no waterbody in Southland is overallocated, in terms of the NPS-FM definition of overallocation, with the possible exception of the Cromel Stream.

In terms of Policy 16(1)(b)(ii), the wording of this part of the policy reflects the wording of Objective A2 of the NPSFM. While it refers to overallocation in terms of water quality, in advance of the FMU processes being undertaken, in practical terms, it is likely that only waterbodies with attributes that are clearly below national bottom lines may be able to be considered as overallocated ahead of freshwater objective setting.

3 An overview of the development of the pSWLP

The pSWLP was developed as ~~is~~ an important component of ~~the pSWLP is part of~~ the then ~~broader~~ Water and Land 2020 and Beyond project which was ~~has been~~ developed in partnership with Te Ao Marama (as representatives of Ngāi Tahu ki Murihiku) to address Southland's water quality and quantity issues and respond to the NPSFM. The Water and Land 2020 and Beyond project was revised and renamed the People, Water and Land Programme, in 2016. Developing the pSWLP has been a large project and there has been considerable supporting work involved. This section discusses the following sub-projects which have been crucial to the development of the Plan to date:

- Partnership with Ngāi Tahu
- Engagement and consultation
- Physiographic zones
- Freshwater management units and implementing the NPSFM
- Technical documents

3.1 Development of the pSWLP

The Plan is the culmination of a long period of community engagement. Part of the early engagement was the establishment of a Water and Land 2020 & Beyond Steering Group in late 2011 which included agricultural industry representatives, farmers, conservation representatives, territorial authorities, and iwi representatives. The Steering Group was established to assist Council staff with advancing focus activities in the first instance. Focus activities are agricultural activities which have the largest impact on water quality in Southland. The purpose of the group was to provide feedback and input into the process of developing Council's response to the focus activities, both in terms of identifying good management practices and a policy framework.

From late 2011 to 2014 the Steering Group provided advice to Environment Southland around five focus activities:

- Hill and high country development
- Nutrient management
- Intensive winter grazing
- Overland flow
- Riparian management

The Steering Group then became the Regional Forum in 2015 with a shift in focus to combining the proposed changes to the Water Plan into a single planning exercise. This culminated in the release of the consultation document *Towards a New Plan* and the Working Draft for Water and Land in July 2015 (the Working Draft). *Towards a New Plan* was distributed to all ratepayers across the region, with the Working Draft available online and hardcopies distributed on request.

Towards a New Plan explained Southland's water quality issues, outlining the impact of sediment, microbial contamination, nitrogen and phosphorus. It also provided information on physiographic zones and good management practices. The document posed 10 questions covering nine topics for the community to provide feedback on. Topics included:

- managing critical source areas;
- intensification;
- intensive winter grazing;
- cultivation on sloping land;
- stock access to waterways;
- tile drains;
- surface and groundwater takes;
- on-site household wastewater systems;
- indigenous biodiversity and wetlands.

The Working Draft was based on the existing Regional Water Plan 2010 with proposals outlining substantive changes to address the topics listed above.

A three-month feedback period followed during which nine public drop-in sessions were held throughout Southland as well as two online question and answer sessions via Facebook and several industry focus group meetings. The format for the drop-in sessions included a presentation, smaller workshop groups, and a question and answer session. The presentation canvassed water quality in Southland, physiographic zones and the provisions of the Working Draft. Feedback from the workshop groups was compiled and provided to Council for consideration. This non-statutory consultation, a joint initiative between Council and Te Ao Marama, sought to obtain wider community feedback on not only the proposed provisions but also the broader approach to managing freshwater in Southland. The feedback received from the drop-in sessions and the submissions was summarised, analysed, and incorporated into the pSWLP.

In the development of the Plan, representatives of Te Ao Marama have been integral members of the team of advisors to Council and at the governance level. Te Ao Marama and Council have held several joint workshops to discuss the proposed provisions.

3.2 Water and Land 2020 and Beyond (until 2016) and People, Water and Land Programme (since 2016)

Water and Land 2020 & Beyond included the following work streams:

- **Phase 1 – Focus Activities:** This phase seeks to move Southland towards operating at 'good management practice' level. It includes supporting farmers to write Farm Focus Activity Plans that provide farm-specific good management practice advice and recommendations for individual properties. The good management practice recommendations concentrate on nutrient management, winter grazing, and riparian management. The Farm Focus Activity Plans contain several colour aerial photo

maps detailing soil types, waterway locations and winter grazing paddocks along with factsheets and recommended actions for each farm.

- **Phase 2 – Water and Land Plan:** An intermediate step towards implementing the NPSFM, the Plan focuses on improving the management of land uses which can adversely affect water quality in order to maintain water quality while the longer catchment limit-setting process is undertaken across Southland between 2016 and 2025.
- **Phase 3 – Catchment limit setting:** As required by the NPSFM, from 2016 to 2025 this will involve setting limits for water quality and quantity in each catchment. Limits may include restricting the amount of contaminants that can be discharged into waterways and how much water can be removed.

Throughout these three phases, Council has and will continue to invest in a comprehensive research programme to better understand the science behind managing freshwater systems and the economic impacts of limit setting in Southland. Other research will look at community and cultural needs and values relating to freshwater and the impacts of limit setting on local communities. The science and economics programmes are described in the sections below.

This project was renamed and refocussed as the People, Water and Land Programme, in 2016, and has been developed and will be delivered as a partnership programme with Ngāi Tahu.

The People, Water and Land Programme puts the community at the heart of the work that Council is undertaking to achieve the requirements of the NPS-FM. The work streams have slightly evolved from the previous ones and are now:

1. Action on the Ground – building on the Focus Activity Plans and broadening the remit into wider, non-regulatory methods for freshwater improvements;
2. Value and Objectives – a community led process of defining the regional values and objectives which will form the basis for the limit-setting element of work stream three;
3. Establishing a Regional Forum – which will be made up of community representatives and tasked with making recommendations, on regulatory and non-regulatory methods, to Council, which will lead to the setting of Regional limits and targets.

More information about the People, Water and Land Programme is included in the Progressive Implementation Programme (Appendix C).

3.2.1 Southland Science Programme

A comprehensive science programme by Council to better understand Southland's river catchments. In particular, the programme will fill gaps in our knowledge of how Southland's waterways function and how the ecological communities respond to the pressures from different urban and rural land use. There are three sub-projects within the Science Programme: Land Use Inputs, Ecosystem Response, and Fluxes and Flows.

3.2.2 The Southland Economic Project

The Southland Economic Project ~~for Water and Land 2020 and Beyond~~ is a joint initiative to develop economic tools that can be used in "limit-setting" for water quality in Southland, under the ~~National Policy Statement for Freshwater Management 2014 (~~NPSFM~~)~~. The aim is that, through the use of these tools, Environment Southland will be able to provide information to the council and the community on the socio-economic impacts of different policy options throughout the Freshwater Management Unit processes.

The Project is a joint initiative between Environment Southland and a wide range of industry groups and government organisations, all with a strong interest and involvement in the region. They include (in no particular order): Beef and Lamb New Zealand, DairyNZ, the Department of Conservation, Te Ao Marama, Ministry for Primary Industries, the Southland Chamber of Commerce, Invercargill City Council, Gore District Council, Southland District Council, Deer Industry New Zealand and the Southland Deer Farmers Association (Southland Branch), Foundation for Arable Research, and Horticulture New Zealand.

The main tools being developed within the Southland Economic Project are:

- extensive datasets on the value to agricultural and municipal/industrial sectors in Southland of discharging by products;
- a dynamic Computable General Equilibrium (CGE) model of the regional economy (known as the Southland Economic Model for Freshwater).

The agricultural and municipal/industrial datasets will be used as inputs into the Southland Economic Model. The model recognises the interconnections between different sectors of the economy and it reflects the importance within the NPSFM and the RMA of understanding the impacts of different rates of change. It will be essential for building a good understanding of the economy's dependence on freshwater.

3.3 Partnership with Ngāi Tahu

3.3.1 Relationship with Ngāi Tahu and the Charter of Understanding

Ngāi Tahu, as mana whenua of Southland, regard water as a taonga, or treasure, of the people. Tangata whenua have a kaitiaki responsibility to ensure that this taonga is available for future generations in as good as, if not better, quality. Water has the spiritual qualities of mauri and wairua. The continued well-being of these qualities is dependent on the physical health of the water.

Through the NPSFM, the Crown has stated that "the involvement of iwi and hapū in the overall management of fresh water, are key to meeting obligations under the Treaty of Waitangi." Therefore, the NPSFM is regarded by Ngāi Tahu as a key mechanism in realising the Treaty of Waitangi.

In 1997, Council entered into a Charter of Understanding with Ngāi Tahu o Murihiku. The purpose of the Charter is to develop a relationship of mutual benefit between the local authorities within the Murihiku rohe and the mana whenua of Murihiku and Te Rūnanga

o Ngāi Tahu. Through Te Rōpu Taiao, Te Ao Marama assists councils in their relationship with matawaka living in te takiwa o Murihiku.

3.3.2 Te Mana o te Wai

The Government's NPSFM recognises the national significance of fresh water in New Zealand and introduces the concept of Te Mana o te Wai. Te Mana o te Wai can be thought of as the relationship between the health and mauri of water and the environment, and their ability to support each other, while sustaining health and mauri of the people. Te Mana o te Wai weaves together different values to create a picture of what tangata whenua and community aspirations are for their waterbodies.

The Plan forms part of the People, Water and Land Programme ~~Water and Land 2020 and Beyond partnership project~~, which is designed to utilise existing resources and sources of knowledge including the local territorial authorities, Papatipu Runanga, and the wider Southland community. Council has recognised the national significance of Te Mana o te Wai by incorporating the concept into the Plan. Te Mana o te Wai underpins the overarching policy direction of the Plan in a number of areas.

3.4 Physiographic Zones

Description of Physiographic Zone

Southland's physiographic zones have been developed to better understand the evolution of water across the region. By understanding where water comes from and the processes it undergoes as it moves through drainage networks, we can better understand the reasons for different water quality outcomes across Southland. Physiographic zones underpins an array of management approaches outlined in the Plan.

Scientists have divided Southland into nine physiographic zones. Each zone represents areas of the landscape with a common influence over water quality. Zones differ in the way sediment, microbes (e.g. *E.coli*) and nutrients, such as nitrogen and phosphorus, build up, attenuate and move through the soil, aquifers (areas of groundwater) and into rivers and streams. The physiographic zones are:

- Alpine
- Bedrock/Hill Country
- Central Plains
- Gleyed
- Lignite – Marine Terraces
- Old Mataura
- Oxidising
- Peat Wetlands
- Riverine

There are four main transport pathways via which contaminants travel to ground and surface water. These are:

- overland flow (surface run-off);
- artificial drainage (such as through tile drains and mole pipe drainage);
- deep drainage (including natural bypass flow);
- lateral drainage (movement of contaminants laterally through the soil zone).

The key transport pathways for contaminants are different for each physiographic zone, for example, in the Old Mataura zone, deep drainage of nitrogen is the key transport pathway, and in the Alpine zone overland flow is the key transport pathway. For some zones, there are areas within the zone that have an increased water quality risk when soils are wet, and these are called variants. There are two types of variants:

- overland flow or (o) variant
- artificial drainage or (a) variant

For example, deep drainage of nitrogen is the typical contaminant transport pathway in the Oxidising zone. However, in some parts of the zone, when soils are wet additional transport pathways occur such as overland flow on steeper slopes. These areas are within the (o) variant of the Oxidising Zone.

The physiographic zones with variants are listed below:

- Bedrock/Hill Country – (o) and (a) variants;
- Gleyed – (o) variant;
- Lignite-Marine Terraces – (o) and (a) variants;
- Oxidising – (o) and (a) variants;
- Riverine – (o) variant.

The transport pathways for each of the physiographic zones and their variants are presented in the Table below.

Table 3.4(a) physiographic zones and variants and key transport pathways

Physiographic zone	Key transport pathways (✓)		
	Overland flow[1]	Deep drainage (leaching to groundwater)[2]	Artificial Drainage[1]
Alpine	✓	-	-
Bedrock/Hill Country	✓(o)	-	✓(a)
Central Plains	-	✓	✓
Gleyed	✓(o)	-	✓
Lignite-Marine Terraces	✓(o)	-	✓(a)
Old Mataura	-	✓	-
Oxidising	✓(o)	✓	✓(a)
Peat Wetlands	-	✓*	✓

Riverine	✓(o)	✓	-

NOTE:

[1]Overland flow and artificial drainage transport nitrogen, phosphorus, microbes and sediment

[2]Deep drainage transports nitrogen, except in Peat Wetlands, see * below

*Deep drainage transports phosphorus rather than nitrogen, and lateral drainage of phosphorus and microbes through the soil is also a key pathway in the Peat Wetlands (mitigations are the same as for deep drainage)

✓(o) denotes that overland flow is only a key transport pathway in the parts of the steeper parts of the physiographic zone, referred to as the (o), or overland flow variant (refer to physiographic zones map)

✓(a) denotes that artificial drainage is only a key transport pathway in parts of the physiographic zone where there is artificial drainage, referred to as the (a), or artificial drainage variant (refer to physiographic zones map)

Alpine

The Alpine physiographic zone includes all land above 800 metres elevation and is mainly found in northern and western parts of Southland. This zone is characterised by steep slopes with thin soils or bare bedrock. Its high elevation results in high snowfall and rainfall, which provides large volumes of pristine water to downstream physiographic zones. Contaminant loss is limited due to low intensity of land use.

Central Plains

The Central Plains physiographic zone extends across flat to gently undulating terraces in the lower reaches of the Aparima and Oreti Catchments in Central Southland. Clay-rich soils in this zone exhibit shrink-swell characteristics, which means they swell and become waterlogged when wet and shrink and crack when dry. When soils are wet, contaminants move quickly through artificial drainage networks to surface waterways. When soils are dry, cracks allow water and contaminants to rapidly drain down through the soil to groundwater, bypassing the soil matrix.

Gleyed

The Gleyed physiographic zone extends across flat to gently undulating land across the plains of both northern and southern Southland. This zone is characterised by imperfectly to poorly drained soils that exhibit redoximorphic features such as mottling and gleying. Soils in this zone have some denitrification ability, which reduces build-up of soil nitrogen. However, artificial drains (mole-pipe) are extensively used in this zone due to soils being prone to waterlogging. The extensive network of artificial drainage rapidly transports contaminants to surface water, particularly during heavy rain. The zone also has an overland flow or (o) variant, which means that in parts of the zone, overland flow is also a key transport pathway for contaminants when soils are wet.

Bedrock/Hill Country

The Bedrock/Hill Country physiographic zone is the largest in the Southland Region, covering half the mapped area (approximately 1.6 million hectares). It is characterised by prominent landforms below 800 metres elevation where soils overlie bedrock or glacial till. This zone has high rainfall due to higher elevations, which results in a dense network of streams that comprise the headwaters of many lowland streams. This zone contains an overland flow or (o) variant, as well as an artificial drainage or (a) variant, which means that in some parts of the zone, overland flow is a key transport pathway, and in some parts

artificial drainage is the key contaminant transport pathway. This means that streams in developed areas of these variants are at risk of receiving contaminants from surface runoff and artificial drainage.

Lignite/Marine Terraces

The Lignite/Marine Terraces physiographic zone is distributed along Southland's south coast and in areas of Eastern and Western Southland where the underlying geology has elevated organic carbon (such as lignite or coal). The potential for nitrogen build-up in aquifers is limited by high denitrification potential. Like Bedrock/Hill Country, this zone contains an overland flow or (o) variant, as well as an artificial drainage or (a) variant.

Old Mataura

The Old Mataura physiographic zone is located on the older, high terraces in the Mataura catchment. Soils and aquifers in this zone have a high risk of nitrogen build-up due to low denitrification potential. The combination of flat land and well drained soils results in high rates of nitrogen leaching (deep drainage) to underlying aquifers. Groundwater in this zone discharges into springs, streams and aquifers in lower parts of the Mataura catchment, adding to their cumulative nutrient inputs.

Oxidising

The Oxidising physiographic zone is located on intermediate terraces along the margins of major river systems. Soils and aquifers in this zone have a high risk of nitrogen build-up due to low denitrification potential. The combination of flat land and well drained soils results in high rates of nitrogen leaching (deep drainage) to underlying aquifers. Like Bedrock/Hill Country and Lignite-Marine Terraces, this zone contains an overland flow or (o) variant, as well as an artificial drainage or (a) variant.

Peat Wetlands

The Peat Wetlands physiographic zone was once extensive across Southland. However, today it accounts for less than 2% of the total land area. This zone is characterised by high organic carbon content in soils and underlying geology, which exerts a strong influence over water quality. Soils in the zone are poorly drained, peaty and extremely acidic. This zone is also characterized by an elevated water table requiring extensive artificial drainage where land is developed. There is little nitrogen build-up in soils and aquifers due to high denitrification potential. However, limited mineral content results in elevated concentrations of soluble phosphorus in both soils and aquifers.

Riverine

The Riverine physiographic zone occurs along the margins of Southland's major river systems. This zone is characterised by large volumes of pristine water from alpine headwaters that is carried down major river systems to the coast. However, river water in this zone also contains soil water drainage from adjacent land. Soil water drains quickly through shallow, stony soils to underlying shallow aquifers, which are highly connected to rivers. Because this zone has large volumes of water flowing through it, there is little risk

of nitrogen build-up, however nitrogen loss from soil leaching (deep drainage) through aquifers can contribute significant nitrogen loads to downstream environments. Like the Gleyed zone, this zone has an overland flow or (o) variant.

Physiographic Zone Science

Overview

The Physiographics of Southland project was a project initiated by Environment Southland scientists to provide insight into spatial variation in water composition (which includes quality) across the region. Specifically, the goal was to understand 'how' and 'why' water quality varies spatially, despite often similar land use pressures.

In order to understand spatial variation in water quality, it is necessary to recognise: (i) the underlying processes that govern water quality outcomes, and; (ii) the inherent landscape features or 'environmental attributes' that govern spatial variation in these processes.

National and international research demonstrates that anthropogenic land use is often the primary contributor to poor water quality outcomes. However, it is also well established that different landform characteristics modify water composition and hence quality in different ways. The key processes responsible for spatial variation in water composition and quality outcomes may be classified into atmospheric, hydrological, and biogeochemical processes. The environmental attributes that govern variance in these key processes include the physical, chemical and biological features of an environment. Some examples of these are the soil hydrology, organic carbon content of aquifers and soils, and the geological composition of rocks and sediments. To explore one example further, soil hydrology is one of several key environmental attributes that vary in space due to natural geological, hydrological and soil forming factors. Variation in soil hydrological attributes influences water compositional and water quality outcomes through determining the pathway water takes and the interactions that occur whilst water is in the soil zone. Importantly, the same natural processes that modify water composition in areas of intensive land use also determine natural water compositional variation in pristine natural state environments.

In summary:

(i) different landscape attributes are responsible for variation in the natural processes governing water compositional and water quality outcomes;
(ii) variation in landscape attributes govern variation in the processes that govern water composition and quality, and;
(iii) these processes are ubiquitous to all areas of the planet and all manner of land uses. Identifying and mapping the natural attributes of the environment that govern spatial variance in water composition and quality is the basis of the physiographic approach.

In a number of the studies referenced here it was observed that landscape features accounted for more than two times the variability in water composition (including water quality) than land use alone. Therefore, the Physiographics of Southland science project sought to understand the natural environmental attributes that governs variance in shallow ground and surface water quality outcomes across the Southland region. This forms the basis for the development of a land use risk framework for targeting policy.

This section provides:

(i) an overview of the evolution of the Physiographics of Southland project;
(ii) an outline of the project outputs and where these can be sourced, and
(iii) a summary of the validation and peer review processes undertaken.

Evolution of the Physiographics of Southland Project

The Physiographics of Southland is a project that has been many years in the making. Much of the understanding as to how and why water quality varies spatially evolved over a number of years prior to the formal inception of the project in 2014.

The project makes use of a comprehensive dataset that has been collected through Environment Southland's monitoring programmes over approximately the last 25 years, with some data records going back more than 40 years. Included in that dataset are records from a number of long-term state of the environment monitoring programmes.

Prior to the formal inception of the project in 2014, much of the foundation research and questioning had been developing for a number of years using this dataset. During these years the general question remained the same – *why do hydrochemical*[10] *and water quality*[11] *signatures vary in space and time across Southland*?

Much of the hydrochemistry data available for Southland prior to 2012 was for groundwater. Looking at this data over a period of many years it became apparent that hydrochemical signatures vary across Southland. Patterns began to emerge as results from different investigations and observations were pieced together.

In 2012 it was recognised that more data was needed to fill gaps in Southland's hydrochemical signature puzzle (see Figure 1). A revised sampling programme for ground and surface waters was implemented in late 2012, which included an increased range of both sampling locations and measured parameters. Of significance was the increased focus on stable isotopes[12]. This work proved to be crucial to developing a much greater understanding of hydrochemical gradients such as water source, recharge mechanism[13] and redox[14] processes.

[10] Hydrochemical signatures refers to the chemical composition of water.
[11] Water quality refers to the condition of water relative to ecological or human requirements.
[12] Isotopes are different forms of the same element with different numbers of neutrons. For example carbon 12 is the most common form of carbon, and has six protons and six neutrons. Carbon 14 has the same number of protons (six) but has eight neutrons. Isotopes of a given element typically behave alike chemically.
[13] Recharge mechanism describes the primary method/pathway through which water enters a water body, such as a stream or aquifer.
[14] Redox (short for reduction–oxidation reaction) is a chemical reaction in which the oxidation states of atoms are changed. Any such reaction involves both a *reduction* process and a corresponding *oxidation* process.

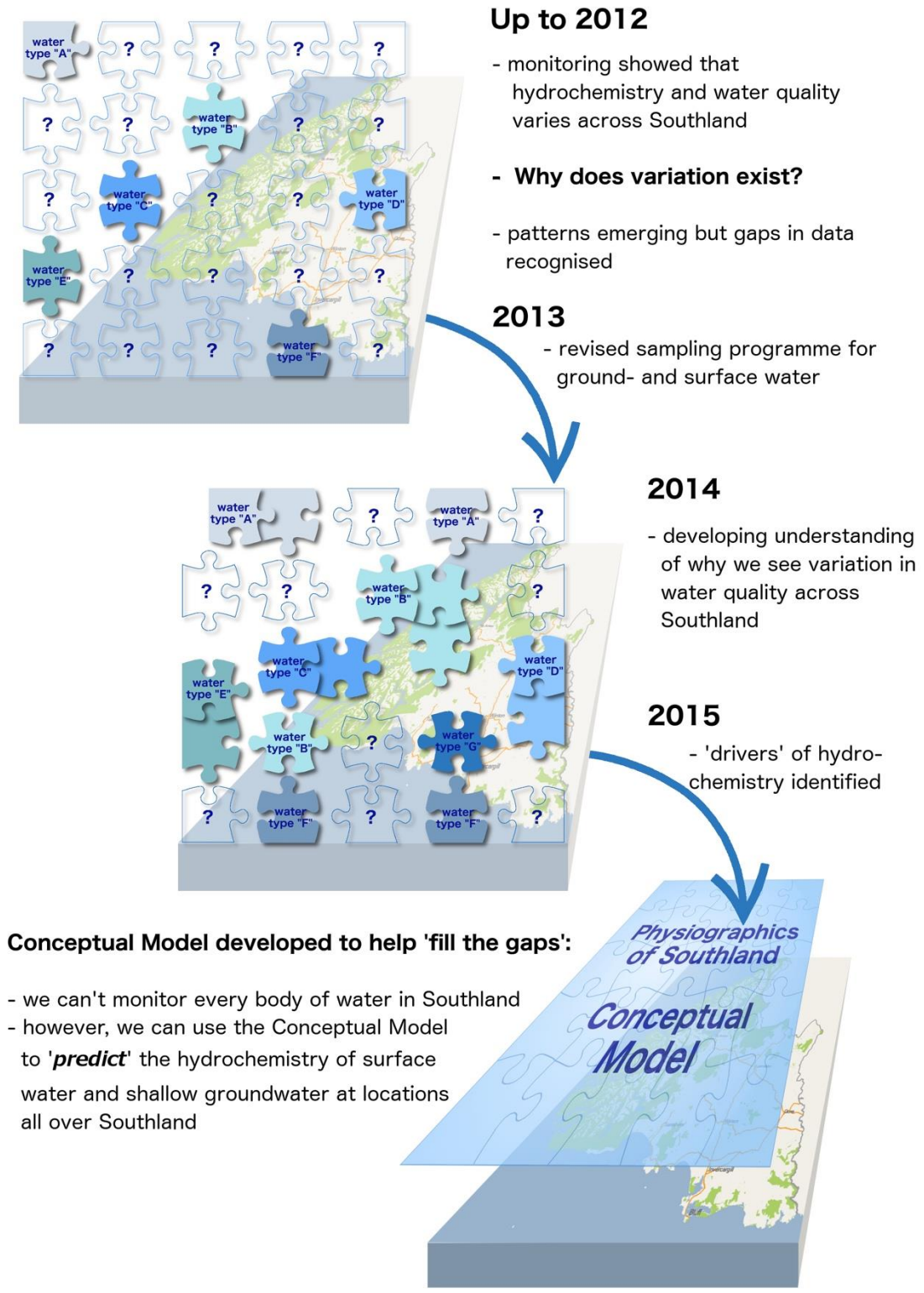

Figure 1: A 'monitoring and data' view of the evolution of the Conceptual Model, developed as Part 1 of the Physiographics of Southland project.

In 2014 a team of Environment Southland scientists commenced working with this dataset to produce the first physiographic zone maps using hydrochemistry to guide the mapping process (a bottom up approach).

In 2015 external consultant scientists advised the team to extend the project to include a rule based (or top down) approach using existing spatial frameworks[15] so that the mapping process could be easily repeatable and more transparent. Integrating both the bottom-up and top-down approach was an important basis for reducing the uncertainty in the work.

It is important to note that the identification of the key environmental attributes governing variance in Southland's water quality was informed by water composition (i.e., the physical, biological and chemical composition of precipitation, soil water, ground and surface water). In other words, within any given water sample information is retained as to the physical, chemical and biological evolution of the water – equivalent to a fingerprint. Using these finger prints it is possible to identify, extract and classify the important attributes of the landscape that control spatial variation in water composition. This is a critical distinction from some other works in which the attributes supposedly governing water composition are assigned without consideration of the evolutionary history contained within any given water sample.

Understanding variation in water signatures requires an integrated understanding of how environmental attributes control variation in the processes that determine water quality outcomes. For example, an assessment of water quality controls based purely on soil hydrology, although important, is not sufficient to understand how and why water quality varies in space. Only when all key attributes are combined can we reliably estimate spatial variance in water quality outcomes.

The scientific understanding of the underlying controls over water quality outcomes forms the basis for zonation of the landscape (physiographic zones) and subsequent land use risk assessment undertaken for the Plan. The 9 physiographic zones are therefore based on the conceptual knowledge of the controls over water quality outcomes.

From the conceptual scientific understanding of water quality controls, 9 physiographic zones and 8 sub-classes (referred to as variants) were developed. Each physiographic zone represents distinct combinations of biogeochemical and hydrological controls over potential water quality state, while the variants represent areas within each zone where variability in drainage mechanisms can modify water quality risk on a temporal basis.

After an extensive peer review process in late 2015 and early 2016 (outlined in Section 5.7), the Physiographics of Southland Part 1 and initial Part 2 science reports were published and made publicly available in June 2016, along with a scientific report prepared by AgResearch on the management practices and mitigation options for reducing contaminant losses from land to water for each physiographic zone. The original Part 2 reports were subsequently consolidated and merged into a single version 2 document, which was made publicly available in December 2016 along with the accompanying validation and testing report.

[15] Existing spatial frameworks include those for topography, geomorphology, hydrology, hydrogeology and soils.

Outputs

The size and complexity of the Physiographics of Southland project resulted in the body of work being divided into two separate science reports, a mitigations report, validation and testing report, technical sheets and an accompanying user guide, and factsheets (see Figure 2). All documents can be sourced from Environment Southland's website – www.es.govt.nz.

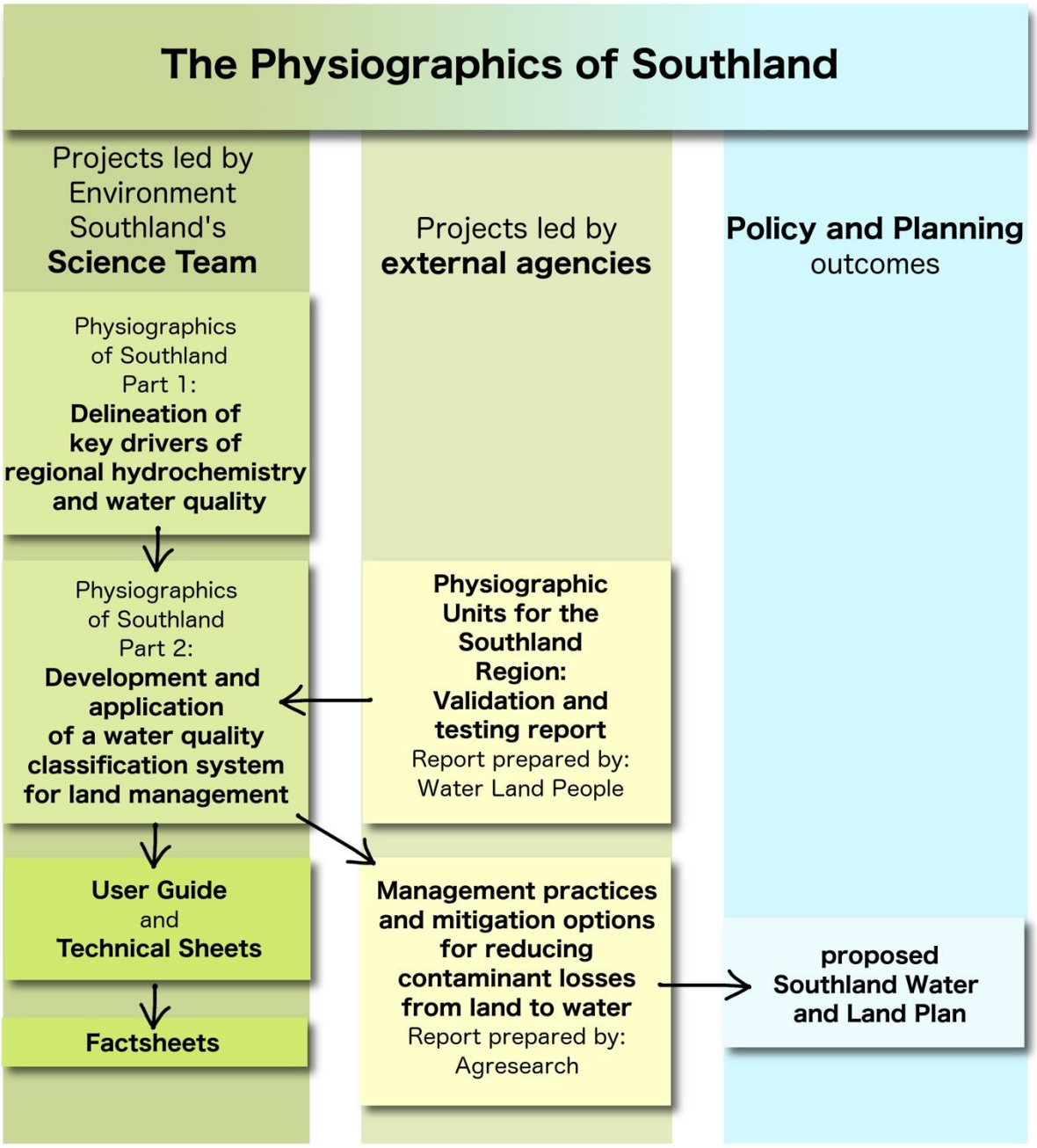

Figure 2: An outline of the projects led by Environment Southland's Science Team, those led by external agencies and how they feed into the proposed Southland Water and Land Plan.

Validation and Peer Review Processes

The validation and peer review processes for the Physiographics of the Southland project have been comprehensive and are outlined below.

Validation process

The validation and testing for the main science report (Part 1) by Dr Ton Snelder from Land Water People is included within the report itself. Empirical testing was undertaken which indicated a strong estimation capacity for surface water hydrochemistry, but was weaker for groundwater. Nonetheless, the patterns of hydrochemical response for groundwater were still consistent with the conceptual model[16]. Furthermore, given nearly half the base flow of the region's surface waters is from groundwater, the strong performance of the model for surface water indicates the characterisation of young, soil zone influenced groundwater across Southland is robust. The latter is particularly significant in terms of the value and effectiveness of this work in terms of accurately estimating ecosystem inputs to surface water bodies across the region.

Water covered in the Physiographics of Southland project includes surface water, soil water and shallow, hydraulically connected groundwater (see Figure 16). Deep or 'old' groundwater is generally low in anthropogenic contamination and is not often connected to the same degree to Southland's surface water network. Much of the groundwater dataset used to undertake the testing outlined above is from this deeper groundwater, which most likely explains why variation in surface water composition and quality was better resolved than for groundwater. Specifically, regional groundwater data is poorly representative of the shallow, unconfined groundwaters that make up a mean value of 47% of the total water volume of Southland streams. For this reason, and as recognised by many researchers, sampling of streams at low flows when the majority of flow is dominated by groundwater inputs is perhaps the best way of providing representative signatures of the shallow groundwater environment.

[16] The conceptual model is defined as a semi-quantitative, mechanistic model that aims to simulate hydrochemical variation in surface water and young, soil influenced groundwater at any point in the landscape. Accordingly, this model operates across multiple scales, for example regional, low and high order drainage basin or river catchments.

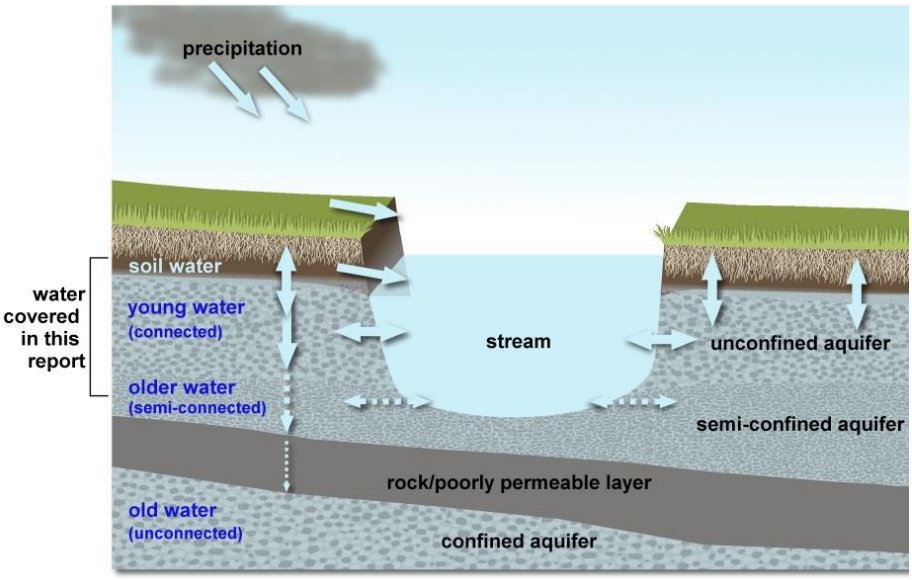

Figure3: Water covered in the Physiographics of Southland project.

A separate validation and testing report was prepared by Land Water People to accompany Part 2 of the Physiographics of Southland science reports. This report assessed whether the physiographic zones used for the Plan represented unique assemblages of drivers, environmental characteristics and observed water quality states.

The results from the assessment showed that the physiographic zones strongly discriminate unique combinations of the drivers and characteristics and performed reasonably well in terms of explaining variation in water quality. The surface water results were better than the groundwater results, presumably for similar reasons as those outlined in paragraphs above.

Peer review process

The peer review process for the Physiographics of Southland project has been extensive and involved many people. A preliminary report setting out the proposed approach was completed in May 2015 and peer reviewed by Dr Chris Daughney (GNS Science), Dr Ross Monaghan (AgResearch) and Prof. Hans Schreier (University of British Columbia) who endorsed the scientific rigour of the approach and also provided critical feedback and guidance on how to progress the work and improvements required.

The approach was also endorsed in July 2015 by the Technical Advisory Group of senior scientists from a range of research organisations set up to provide technical advice and guidance on Environment Southland's science programme. This group includes the following representatives:

- Dr Clive Howard-Williams, NIWA
- Dr Chris Daughney, GNS
- Dr Murray Close, ESR

- Dr Cath Moore, GNS/ESR
- Dr Liz Wedderburn, AgResearch
- Prof. Jenny Webster-Brown, University of Canterbury
- Associate Prof. Peter Almond, Lincoln University
- Dr Mike Scarsbrook, DairyNZ
- Dr Vince Bidwell (independent consultant)
- Mr Bill Dyck, Envirolink Coordinator

The Technical Advisory Group then reviewed the draft science report and user guide in late 2015. In addition to this review, a number of specialist hydrochemists, soil biogeochemists, soil experts and isotope specialists also reviewed the hydrobiogeochemical content of the report including the following:

- Mr Trevor Webb, Landcare Research
- Dr Troy Baisden, GNS
- Dr Matthew Leybourne, Laurentian University
- Prof. Hans Schreier, Univeristy of British Columbia
- Dr Ranvir Singh, Massey University
- Dr Travis Horton, University of Canterbury
- Dr Ross Monaghan, AgResearch
- Dr Allan Hewitt, Landcare Research
- Dr Ton Snelder, Land Water People

The project team spent the first few months of 2016 refining the final documents based on the feedback from these reviewers prior to notification of the Plan in June 2016.

The Part 2 science report went through a further peer review over the latter half of 2016 following the decision to consolidate and merge the original Part 2 reports into a single version 2 document. The independent Validation and Testing report by Land Water People was peer reviewed by Dr Scott Larned, NIWA.

Water quality risk assessment

Overview

Water quality refers to the condition of water relative to ecological or human requirements. The main contaminants of concern in Southland are sediment, microbes, and the plant nutrients nitrogen and phosphorus. Water quality in Southland's groundwater and surface water bodies (such as streams, rivers, lakes, wetlands and estuaries) varies across the region.

Environment Southland has developed a classification system for managing water quality risk across the region, to be used in the pSWLP.

The classification system identifies 'physiographic zones', which are areas of land that have been grouped together on the basis of water quality risk. Each zone has been mapped

using combinations of biogeochemical[17] and hydrological properties[18] (e.g. soils, geology, and topography) that affect water quality outcomes.

'Variants' were used to define areas within individual physiographic zones where drainage pathways result in additional water quality risks.

Water quality assessment

The assessment of water quality risk for each physiographic zone considered the potential for 'dilution'[19] and 'attenuation'[20] of nitrogen, phosphorus, sediment and microbes along five drainage pathways.

The drainage pathways identified for variants operate on an intermittent basis, generally when soils are wet (i.e. at field capacity) and potentially reduce contaminant attenuation. Variants were mapped using assessments of overland flow potential and artificial drainage density.

Dilution (e.g. from alpine snowmelt) reduces contaminant 'concentrations'. Concentration describes the amount of a contaminant in a given amount of water. However dilution does not influence contaminant 'loads'. Load describes the amount of contaminant being discharged during a defined *period of time*.

Two main forms of attenuation were considered for the water quality risk assessment: reduction potential; and processes associated with filtration and sorption[21].

Reduction processes can decrease concentrations of nitrate (NO_3) through denitrification[22] but can increase dissolved phosphorus concentrations under certain conditions. Microbes (with respect to human health) and sediment are generally unaffected by reduction potential.

Filtration and sorption processes can reduce concentrations of microbes, sediment and particulate phosphorus. Soluble nitrogen is generally not affected by these processes.

Water quality risk was assessed by intersecting the spatial coverage of the physiographic zones and variants with maps of dilution potential, reduction potential, filtration and sorption potential, overland flow potential, artificial drainage density, deep drainage potential and natural bypass flow potential. This process allowed the dominant contaminant pathways and associated water quality risks to be identified. See Appendix B17 for more information.

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[17] Biogeochemistry involves the study of the chemical, physical, geological, and biological processes and reactions that govern the composition of the natural environment.
[18] Hydrology refers to the scientific study of the properties, distribution, and effects of water (as a liquid, solid, or gas) on the Earth's surface, in the soil and underlying rocks, and in the atmosphere.
[19] In this context, dilution is the process of decreasing contaminant concentrations in solution. Dilution potential refers to the potential for dilution to occur in a given environmental setting.
[20] In this context, attenuation refers to a variety of physical, chemical, or biological processes that reduce the amount (i.e. mass, toxicity, mobility, volume, or concentration) of contaminants in soil or water.
[21] Sorption refers to the physical and chemical processes by which one substance becomes attached to another.
[22] Denitrification is a naturally occurring process whereby nitrate is converted to nitrogen gas.

The contaminant pathways are summarized in Table 1. Each physiographic zone may comprise of one, or several contaminant pathways (where are several contaminant pathways, variants are used).

Table 1: Major contaminant pathways identified for the physiographic zones and variants.

Contaminant Pathway	Water quality risk
Overland flow	Nitrogen, phosphorus, sediment, microbes
Artificial drainage	Nitrogen, phosphorus, sediment, microbes
Deep drainage and/or natural bypass flow	Nitrogen
Deep drainage and lateral drainage	Phosphorus, microbes

Mitigation

Mitigation measures that may reduce the effects of agricultural land use on water quality were developed for the physiographic zone and variants. These are documented in the *Management practices and mitigation options for reducing contaminant losses from land to water* report (Monaghan, 2016).

Assignment of water quality risk utilized a simple binary risk category of either 'high' or 'low' risk, for policy purposes (

Table).

Table 2: Water quality risk assessment for nitrogen (N), phosphorus (P), sediment (S) and microbes (M). Note that the water quality risk associated with variants are in addition the risk assigned to the relevant physiographic zone.

Physiographic Zone	Variant	Drainage pathways and contaminants				Water Quality Risk			
		Overland flow	Artificial drainage	Lateral drainage	Deep drainage	Nitrogen	Phosphorus	Sediment	Microbes
Alpine		N,P,S,M				High	High	High	High
Bedrock/Hill Country					N	Low *	Low	Low	Low
	Overland Flow	N,P,S,M				High	High	High	High
	Artificial Drainage		N,P,S,M			High	High	High	High
Central Plains			N,P,S,M		N	High	High	High	High
Gleyed			N,P,S,M			High	High	High	High
	Overland Flow	N,P,S,M				High	High	High	High
Lignite-Marine Terraces					N	Low *	Low	Low	Low

-	Overland Flow	N,P,S,M	-	-	-	High	High	High	High
-	Artificial Drainage	-	N,P,S,M	-	-	High	High	High	High
Old Mataura	-	-	-	-	N	High	Low	Low	Low
Oxidising	-	-	-	-	N	High	Low	Low	Low
-	Overland Flow	N,P,S,M	-	-	N	High	High	High	High
-	Artificial Drainage	-	N,P,S,M	-	N	High	High	High	High
Peat Wetlands		-	N,P,S,M	P, M	P	High	High	High	High
Riverine	-	-	-	-	N	High	Low	Low	Low
-	Overland Flow	N,P,S,M	-	-	N	High	High	High	High

*Low risk due to high reduction potential (i.e. denitrification likely to occur)

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~~Southland's physiographic zones have been developed to better understand the region's water, how it moves across the landscape and why water quality varies across the Region. The physiographic zones science, and the way contaminants are transported through the~~

~~landscape underpins the array of management approaches outlined in the Plan. This has also allowed different levels of control to be applied to different zones based on their risk.~~

~~Scientists have divided Southland into nine physiographic zones. Each zone represents areas of the landscape with common attributes that influence water quality, such as climate, topography, geology and soil type. Zones differ in the way sediment, microbes (e.g. *E.coli*) and nutrients, such as nitrogen and phosphorus, build up and move through the soil, aquifers (areas of groundwater) and into rivers and streams. The physiographic zones are:~~

- ~~Alpine~~
- ~~Bedrock/Hill Country~~
- ~~Central Plains~~
- ~~Gleyed~~
- ~~Lignite – Marine Terraces~~
- ~~Old Mataura~~
- ~~Oxidising~~
- ~~Peat Wetlands~~
- ~~Riverine~~

~~Sections 0 to 0 below contain a brief description of each of the physiographic zones.~~

~~There are four main transport pathways via which contaminants travel to ground and surface water. These are:~~

- ~~overland flow (surface run-off);~~
- ~~artificial drainage (such as through tile drains and mole pipe drainage);~~
- ~~deep drainage (leaching to groundwater, of nitrogen in most zones, but of phosphorus in Peat Wetlands);~~
- ~~lateral drainage (movement of contaminants through the soil zone, only a key pathways for of phosphorus and E.coli in Peat Wetlands).~~

~~The key transport pathways for contaminants are different for each physiographic zone, For example, in the Old Mataura zone, deep drainage of nitrogen is the key transport pathway, and in the Alpine zone overland flow is the key transport pathway. For some zones, there are areas within the zone that have an additional transport pathway, these are called variants. There are two types of variants:~~

- ~~overland flow or (o) variant~~
- ~~artificial drainage or (a) variant~~

~~For example, deep drainage of nitrogen is the typical contaminant transport pathway in the Oxidising zone. However, in some parts of the zone, in addition to deep drainage, steeper slopes mean that overland flow is also a key transport pathway, these areas are within the (o) variant. There are other parts of the Oxidising zone which because of lower soil permeability have tile drains, so in addition to deep drainage, artificial drainage is also a key transport pathway.~~

~~The physiographic zones with variants are listed below:~~

- Bedrock/Hill Country – (o) and (a) variants;
- Gleyed – (o) variant;
- Lignite-Marine Terraces – (o) and (a) variants;
- Oxidising – (o) and (a) variants;
- Riverine – (o) variant.

The transport pathways for each of the physiographic zones and their variants are presented in the Table below.

Table 3.4(a) physiographic zones and variants and key transport pathways

Physiographic zone	Key transport pathways (✓)		
	Overland flow[1]	Deep drainage (leaching to groundwater)[2]	Artificial Drainage[1]
Alpine	✓	-	-
Bedrock/Hill Country	✓(o)	-	✓(a)
Central Plains	-	✓	✓
Gleyed	✓(o)	-	✓
Lignite-Marine Terraces	✓(o)	-	✓(a)
Old Mataura	-	✓	-
Oxidising	✓(o)	✓	✓(a)
Peat Wetlands	-	✓*	✓
Riverine	✓(o)	✓	-

NOTE:

[1]Overland flow and artificial drainage transport nitrogen, phosphorus, microbes and sediment

[2]Deep drainage transports nitrogen, except in Peat Wetlands, see * below

*Deep drainage transports phosphorus rather than nitrogen, and lateral drainage of phosphorus and microbes through the soil is also a key pathway in the Peat Wetlands (mitigations are the same as for deep drainage)

✓(o) denotes that overland flow is only a key transport pathway in the parts of the steeper parts of the physiographic zone, referred to as the (o), or overland flow variant (refer to physiographic zones map)

✓(a) denotes that artificial drainage is only a key transport pathway in parts of the physiographic zone where there is artificial drainage, referred to as the (a), or artificial drainage variant (refer to physiographic zones map)

Alpine

The Alpine physiographic zone includes all land above 800 metres elevation, and is mainly found in northern and western parts of Southland. This zone is characterised by steep slopes with thin soils or bare bedrock. Its high elevation results in high snowfall and rainfall, which provides large volumes of pristine water to downstream physiographic zones. Contaminant loss is limited due to low intensity of land use.

Central Plains

The Central Plains Physiographic zone extends across flat to gently undulating terraces in the lower reaches of the Aparima and Oreti Catchments in Central Southland. This zone has many small streams and has an extensive underlying aquifer system. Soils are

~~characteristically rich in clay, which means they swell when wet and crack when dry. When soils are wet, contaminants move quickly through artificial drainage networks to surface waterways. When soils are dry, cracks allow water and contaminants to rapidly drain down through the soil to groundwater.~~

~~Gleyed~~

~~The Gleyed physiographic zone extends across flat to gently undulating land across the plains of both northern and southern Southland. It is generally found in areas that were once wetlands, has a dense network of streams and a high water table during winter. Soils are prone to waterlogging and have some denitrification ability, which reduces build-up of soil nitrogen. However, an extensive network of artificial drainage rapidly transports contaminants to surface water, particularly during heavy rain. The zone also has an overland flow or (o) variant, which means that in parts of the zone, overland flow is also a key transport pathway for contaminants.~~

~~Bedrock/Hill Country~~

~~The Bedrock/Hill Country physiographic zone is the largest in the Southland Region, covering half the mapped area (approximately 1.6 million hectares). It is characterised by rolling to steep land below 800 metres elevation. This zone has high rainfall due to elevation, which results in a dense network of streams that flow to lowland areas. This zone contains an overland flow or (o) variant, as well as an artificial drainage or (a) variant, which means that in some parts of the zone, overland flow is a key transport pathway, and in some parts artificial drainage is the key contaminant transport pathway. This means that streams in developed areas of these variants are at risk of receiving contaminants from surface runoff and artificial drainage.~~

~~Lignite/Marine Terraces~~

~~The Lignite/Marine Terraces physiographic zone is distributed along Southland's south coast and in areas of Eastern and Western Southland where the underlying geology has elevated organic carbon (such as lignite or coal). There is little nitrogen build-up in soils and aquifers due to high denitrification potential. Phosphorus build-up in soils is also low where lignite and marine sediments are close to the surface. Like Bedrock/Hill Country, this zone contains an overland flow or (o) variant, as well as an artificial drainage or (a) variant.~~

~~Old Mataura~~

~~The Old Mataura physiographic zone is located on the older, high terraces in the Mataura catchment. Soils and aquifers in this zone have a high risk of nitrogen build-up due to low denitrification potential. The combination of flat land and well drained soils results in high rates of nitrogen leaching (deep drainage) to underlying aquifers. Groundwater in this zone discharges into springs, streams and aquifers in lower parts of the Mataura catchment, adding to their contaminant levels.~~

~~Oxidising~~

The Oxidising physiographic zone is located on intermediate terraces along the margins of major river systems. Many surface waterways draining this unit originate from headwaters in neighbouring physiographic units. Soils and aquifers in this zone have a high risk of nitrogen build-up due to low denitrification potential. The combination of flat land and well drained soils results in high rates of nitrogen leaching (deep drainage) to underlying aquifers. Like Bedrock/Hill Country and Lignite-Marine Terrances, this zone contains an overland flow or (o) variant, as well as an artificial drainage or (a) variant.

Peat Wetlands

The Peat Wetlands physiographic zone was once extensive across Southland. However, today it accounts for is less than 2% of the total land area. This zone is characterised by highly acidic peaty soils and a naturally high water table. Developed areas have an extensive artificial drainage network, comprised of open and mole-pipe drains. There is little nitrogen build-up in soils and aquifers due to high denitrification potential. However, acidic conditions result in elevated concentrations of soluble phosphorus in both soils and aquifers.

Riverine

The Riverine physiographic zone occurs along the margins of Southland's major river systems. Rivers and streams within this zone carry large volumes of pristine alpine water to the coast. However river water in this zone also contains soil water drainage from adjacent land. Soil water drains quickly through shallow, stony soils to underlying shallow aquifers, which are highly connected to rivers. This, combined with the low denitrifying potential of soils and aquifers, results in aquifers and adjacent rivers being at risk of nitrogen build-up from soil leaching (deep drainage). Therefore, nitrogen loss from aquifers can contribute significant nitrogen loads to downstream environments. Like Gleyed, this zone has an overland flow or (o) variant.

Freshwater Management Units and Implementing the NPSFM

In addition to the Plan, Council and the Southland community will commence the catchment limit setting component of the Water and Land 2020 & Beyond project later this year. During catchment limit setting, Council will work with the Southland community to give effect to the NPSFM through the development of objectives and corresponding limits for freshwater quality and quantity within each of the Freshwater Management Units (FMUs)[23]. In accordance with the NPSFM Council has identified five FMUs based on Southland's surface water catchments. The FMUs identified for Southland are (in order of process implementation):

- Fiordland and islands;
- Aparima and Pourakino – Jacobs River Estuary;
- Mataura – Toetoes Harbour;

[23] Under the NPSFM (2014), a "Freshwater Management Unit" is a "water body, multiple water bodies or any part of a water body determined by the regional council as the appropriate spatial scale for setting freshwater objectives and limits and for freshwater accounting and management purposes."

- ~~Oreti and Waihopai – New River Estuary~~
- ~~Waiau – Te Waewae Lagoon~~

~~The first FMU covers western Fiordland and the offshore islands, including Stewart Island/Rakiura and is predominantly national parks. The remaining four FMUs are based on Southland's four major river catchments and the coastal boundary is at the mouth of each estuary (i.e. it includes the estuary), while also considering the wider coastal environment. These FMUs are largely made up of developed land with primarily agricultural and forestry land uses (although 36% of the region's undeveloped land is within these "developed" FMUs).~~

3.5 Technical documents

A number of technical reports have informed the development of the pSWLP and this Evaluation Report. These include:

Physiographic Science report

Reports from the Science Physiographic zones memo

Environment Southland - Physiographic Zones Technical Sheets

Environment Southland, State of Environment Reporting, 2010

Monaghan, Management practices and mitigation options for reducing contaminant losses from land to water, 2016

Riparian Management Spreadsheet for Southland – Water and Land 2020 & Beyond Steering Group Meeting 5 August 2013

Pearson – Memo - Preliminary analysis of winter forage crops in Southland, 2016

Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations

National Policy Standard for Freshwater Management 2014

Land and Water Forum, 2015. The Fourth Report of the Land and Water Forum

Ngāi Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan 2008 (Te Tangi a Tauria)

Business Case Analysis: Simplifying the regulation of Aerial 1080 under the RMA. Ministry for the Environment. January 2015

Evaluating the use of 1080: Predators, poisons and silent forests. The Parliamentary Commissioner for the Environment. June 2011

Ward, Memo - Used Oil, 24 February 2016

Environment Southland Dust Suppression Guide (http://www.es.govt.nz/media/27717/dust-suppression.pdf)

Kees and Hughes, Memo - Water allocation in Southland, 11 February 2016

Kees, Memo - Use of Q95 versus MALF, 16 February 2016

Kees and Hughes, Memo - Thresholds for permitted groundwater and surface water abstraction, 15 February 2016

Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007

Opus, Recommendations for Maximum Allowable Seepage from Effluent Ponds, April 2016

4 Science Supporting the Plan

4.1 Introduction

The Council, along with other organisations such as NIWA and LAWA24, produces a range of state of the environment information and this information is published from time to time either as Council state of the environment reports, published on the LAWA website or through the Ministry for the Environment, or is the subject of specific technical reporting.

State and trend information, particularly for water quality, was updated and reanalysed as part of the section 42A reporting process. Section 3 of the Section 42A Report and the associated Appendix B outlined the state of the environment reporting and the underpinning science, including for physiographic zones. This information has been consolidated and updated with respect to recent periphyton information, and data on estuaries, and is included below.

The state and trend information contained in section 3 of the Section 42A Report was extensively tested during the Council hearing process. Federated Farmers and Ngāi Tahu presented evidence on the state and trend information. Federated Farmers were critical of the Council's analysis and conclusions.25 Ngāi Tahu generally supported the Council's analysis and conclusions and were not supportive of the Federated Farmers evidence.26 The submitters and Council experts were questioned extensively by the hearing panel. Council's experts took the opportunity to consider the Federated Farmers criticism, but ultimately considered it was unfounded and reaffirmed their position in the Council's reply. In the Decision Report, the hearing panel accepted the Council's experts' conclusions with respect to the state and trend information presented to it.27

The NPSFM directs regional councils to set objectives for the quantity and quality of their freshwater resources, and to define actions, including limits to achieve these objectives. The Council is taking a time-staged approach to the implementation of the NPSFM. A range of measures to manage water quality, including promoting good on farm practices and updates of existing policies and rules have been included in the pSWLP. Outcomes and limits for water quality (discharges) and quantity (abstraction) will be set through the FMU limit setting process.

The Council uses State of the Environment (SOE) monitoring programmes to track long-term environmental trends and to monitor the effects of human activities on the environment. Although SOE networks are designed to be representative of a broader area, a majority of SOE sites are located in developed areas despite ~50% of Southland's land area occurring in national parks. Reference sites in these undeveloped areas are under-represented due to difficulties in accessing remote areas and a tendency towards monitoring developed areas to assess the effectiveness of resource

[24] www.lawa.org.nz
[25] Evidence of Mr Heller
[26] Evidence of Dr Kitson
[27] Decision Report at para 150

management. The SOE monitoring data is considered against the values and water quality attributes in the NPSFM.

A number of submitters have raised issues with the science that underpins the pSWLP. The purpose of this chapter is to provide a high-level summary of the science that has been undertaken, including an up-to-date summary of SOE water quality monitoring data. This chapter describes:

1. **Water quality and ecosystem health** - The condition (state and long-term trend) of Southland's freshwater resources and estuaries, for ecosystem health and human health. The national objectives framework of the NPSFM has been used as the basis for this reporting, as this is consistent with national reporting.
2. **Water quantity** - How allocation of groundwater and surface water resources are managed for water takes and maintaining flows.
3. **Physiographic zone science** - The evolution, key outputs and validation processes involved in the Physiographics of Southland science project including the physiographic zones used in the pSWLP.
4. **Water quality risk assessment** - How water quality risk was assigned to each physiographic zone and variant.
5. **Practical on-farm environmental performance** - Education and advice initiatives used to effect behaviour change to improve environmental outcomes including the promotion of good management practices.

4.2 Water quality and ecosystem health

4.2.1 Overview

Environment Southland operates a number of State of Environment (SoE) monitoring networks in streams, rivers, lakes, and aquifers throughout the region. The monitoring programme has been designed to assess indicators of water quality and ecosystem health in terms of both current state and long-term trends.

Monitoring water quality state and trend, involves measuring both the physical properties of water, temperature and visual clarity, and chemical characteristics, such as nutrient pH, and dissolved oxygen levels at monthly frequency in surface waters and quarterly for groundwaters. The main contaminants of concern for Southland's freshwater are the plant available nutrients nitrogen and phosphorus, sediment, and disease-causing micro-organisms (referred to as microbes[28]).

Environment Southland also undertakes high flow sampling at the bottom of major catchments in order to understand the mass of contaminants that are being transported by the respective river systems. Some key monitoring locations have continuous monitoring, recording results every 10 to 15 minutes.

Ecological health monitoring aims to understand spatial and temporal variation in ecosystem health and how freshwater environments respond to contaminant stressors from human input, such as elevated nitrogen and phosphorus levels. For example, scientists look at the amount and type of slime algae growing on the bottom of a river

[28] For example, *Escherichia coli (E.coli)* levels are used as an indicator of the risk to human health.

bed29, and the number and types of small aquatic animals such as insect larvae, worms and snails30. Using a range parameters (including those above), scientists are able to give an assessment of habitat quality and 'Ecosystem health'.

Water quality and ecosystem health are high priority work areas for Environment Southland in response to the National Policy Statement for Freshwater Management, 2014.

The impact of water quality on human health is monitored and assessed in terms of risk. In particular, scientists assess the risk of contracting illness associated with contact with a water body (e.g. swimming or boating), toxic effects of recreational use, and the suitability of water supplies for human consumption.

4.2.2 Key findings and water quality trends

Data and reports[31] from Environment Southland's SoE monitoring networks show several consistent themes:

- elevated microbial contamination in lowland rivers and streams, resulting in a high risk to human health;
- an increase in nitrate nitrite nitrogen levels in the main stem and some tributaries of the Waiau, Oreti, Mataura and Pourakino rivers, increasing at 15 of 34 and 4 of 6 sites with sufficient data for the time period 2000 - 2016, operated by Environment Southland and NIWA respectively, 2 of 34 and 1 of 6 showed decreases in concentration with the balance being unable to be determined with confidence;
- nuisance growths of benthic periphyton in the lower Mataura, Aparima Rivers and several other lowland streams;
- macroinvertebrate community health standards are not met at 20% of sites;
- isolated pollution 'incidents' linked to toxic levels of nitrate, ammonia or depleted oxygen;
- impacts of intensive land use on groundwater quality with approximately 20% of managed aquifers posing a potential risk to ecosystem health in hydraulically connected surface water bodies;
- most groundwater supplies have nitrate concentrations which are suitable for human consumption, however 58 wells or ~9% have nitrate concentrations in excess of drinking water standards;
- increases in ground water nitrate nitrite nitrogen concentrations at 15 of 23 and 1 of 6 sites with sufficient data for the time period 2000 - 2016 operated by Environment

[29] Called benthic periphyton. 'Benthic' refers to the bottom surface of a water body, such as a river or lake bed. 'Periphyton' refers to the complex mixture of algae, cyanobacteria, microbes, and detritus that forms a slime layer, which attaches to submerged surfaces in most aquatic ecosystems. Although benthic periphyton is an important source of food for many aquatic animals, excessive growth can reduce habitat quality and indicate high nutrient and or sediment levels.
[30] Called macro-invertebrates. Defined as animals without a back-bone or spine that can be caught by using a 500µm net or sieve (i.e. visible to the naked eye without using a microscope). Macro-invertebrates are sensitive to changes in their environment and are good indicators of environmental change such as increased contaminant levels.
[31] Including: Environment Southland, (2000); Environment Southland and Te Ao Marama Incorporated (2010); Snelder et al. (2014); Daughney et al. (2015); Environment Southland (2016(b)); Kitto and Hodson (2016); Hodson, et al. (2017 in press).

Southland and GNS respectively, 3 of 23 and 1 of 6 showed decreases in concentration with the balance being unable to be determined with confidence.

Rivers

Non-point source agricultural inputs, such as leaching and runoff, are the main source of nutrient contaminants in Southland's rivers. Monitoring shows that some of the main stem of the Mataura and Aparima River and several lowland tributaries of the Oreti and Aparima rivers do not meet national bottom lines in the NPSFM for benthic periphyton. Results also show that most lowland streams do not meet the RWP or pSWLP standards for macro-invertebrates, and that Total Nitrogen and nitrate concentrations are increasing in areas where nitrogen concentrations are already high[32].

Estuaries

Some of Southland's more sensitive receiving environments include estuaries located at the bottom of large rivers. Estuaries are particularly at risk from human activities such as run-off from agriculture and wastewater discharges. Threats to ecosystem health in estuaries include sedimentation, excessive nutrients, toxic contaminants, disease-causing microbes, and habitat loss.

Monitoring shows that degraded areas of the Waikawa, Fortrose, Jacobs River and New River estuaries are increasing in size. Increases in degradation have resulted from the cumulative 'stress' of elevated nutrient and sediment loading from upstream catchments[33].

Human health

Freshwater in Southland is commonly used for recreational activities, such as swimming and boating, and for drinking water supplies to both reticulated networks and individual households. Poor water quality can have negative effects on human health, as well as lost opportunities for recreation and commercial use of water.

Recreational activities

Risk to human health from recreational activities is usually associated with illness from exposure to microbial contamination or toxic algal blooms[34]. *Escherichia coli (E.coli)* levels are used as an indicator of the risk from microbial contamination sourced from faecal material[35].

Microbes

Recreational activities can be divided into categories based on the degree of expected immersion in water:

[32] Snelder et al. (2014) developed a regional scale stratification of water quality to assess the ecosystem health of Southland's rivers. A wide range of water quality and ecosystem health indicators were considered for this report.

[33] Townsend and Lohrer (2015) reviewed the ecological health of the Waikawa, Fortrose, Jacobs River and New River estuaries.

[34] The NPSFM 2014, provides a framework for assessing the risk posed to human health from recreation in lake environments from planktonic algae. In river environments, interim national guidelines are available to assess the risk to human health from benthic algae mats (MFE and MOH, 2009)

[35] Standards for *E.coli* levels that can be used to interpret the risk to human health from recreational contact with the water can be found in: The Regional Water Plan for Southland (ES, 2010), proposed Southland Water and Land Plan (ES, 2016a), Microbiological water quality guidelines for marine and freshwater recreational areas (MfE and MoH, 2003) and the National Policy Statement for Freshwater Management (MFE, 2014).

- **Primary contact recreation** - activities that are likely to involve full immersion, such as swimming and white-water rafting;
- **Secondary contact recreation** - activities involving occasional immersion, such as wading, fishing and boating.

Six popular river bathing sites (primary contact recreation) have been identified for Southland in the RWP. However, none of the six meet the standard for bathing waters, they all have a "Very Poor" Suitability for Recreation Grading (SFRG), and also do not meet the NPSFM national bottom line for swimming. Results are shown in Table 1.

Table 2: Popular bathing sites and corresponding human health risk grading (adapted from Larkin, 2013)

Site Name	ES RWP 2010 *E.*coli/100 ml compliance (5 year median (Hazen) from (Larkin 2013)	SFRG (Larken 2013)	MFE 2014 NOF band (Primary contact recreation) (ES 2015)
Oreti River at Winton Bridge*	993	Very Poor	D
Oreti River at Wallacetown Bridge*	1,764	Very Poor	D
Mataura River at Gore Bridge*	3,289	Very Poor	D
Aparima River at Thornbury Bridge*	7,270	Very Poor	D
Waiau River at Tuatapere Bridge*	3,228	Very Poor	D
Waikaia River at Waikaia Bridge*	4,050	Very Poor	D
Waikaia River u/s Piano Flat	1,091	Poor	
Mataura River at Riversdale	3,540	Very Poor	
Mararoa River at South Mavora lake	21	Very Good	
Lake Te Anau at Boat Harbour Beach	221	Very Good	
Lake Manapouri at Frazers Beach	28	Very Good	

* Sites that are explicitly identified as Popular Bathing Sites in Appendix K of the RWP

In addition to the above, six of 55 SoE monitoring locations which had sufficient data for state assessment do not meet the national bottom line, or the RWP standard for *E.coli* for secondary contact recreation[36] (see **Error! Reference source not found.**).

Table 3: E.coli compliance with the national bottom line and Regional Water Plan standard of 1,000 cfu[37]/100ml

Site Name	2009 – 2014 median *E.coli* concentration (ES 2015)	2009 – 2014 NPSFM	2012-2016 (Hodson et al. 2017)
Otautatau Stream at Waikouro	1,500	D	D
Otautau Stream at Otautau Tuatapere Road	900	C	D
Opouriki Stream at Tweedie Road	1,100	D	C

[36] The Regional Water Plan for Southland (ES, 2010) and the National Policy statement for Freshwater Management (MFE, 2014) identify a standard and at national bottom line respectively of 1000 *E.*coli/100 ml.

[37] CFU stands for Colony Forming Unit. CFU is used to determine the number of viable bacterial cells in a sample per mL.

Winton Stream at Lochiel	1,100	D	D
Otepuni Creek at Nith Street	1,200	D	D
Mataura River 200m d/s Mataura Bridge	1,400	D	D
Tussock Creek at Cooper Road	900	C	D

Toxic algae

Toxic algae, such as cyanobacteria (blue green algae), in rivers and streams can also impact suitability for recreation. For example, under certain conditions[38] some periphyton can produce toxins that can be harmful to humans, stock and pets.

The Ministry for the Environment (MFE) and Ministry of Health (MOH) (2009) provide interim guidelines for the percentage cover of benthic cyanobacteria mats in rivers as an alert framework. When percentage cover is greater than 20% and less than 50%, notification is to be provided to the Public Health Unit, and consideration given to increasing the frequency of observation and testing for toxin presence. When percentage cover is greater than 50%, notification is to be made to both the Public Health Unit and the public.

Relatively little published information is available on the frequency of benthic cyanobacteria blooms in Southland Rivers.

McAllister et.al. (2016) published a review article on the cyanobacteria species Phormidium. Figure 3***: Southland rivers where one (or more) sites have experienced*** illustrates the rivers in Southland that have experienced Phormidium proliferations (greater than 20% coverage). Furthermore, McAlister et al. (2016) identify concentrations of toxins in the Oreti and Waikaia Rivers as the highest observed nationally.

Phormidium proliferations have been observed in the main stem and some tributaries of the four main river systems in Southland; Waiau, Aparima, Oreti and Mataura.

Heath and Wood (2010) found that over a summer survey, five out of five sites had high abundances of Phormidium mat cover for at least several weeks during the summer.

Proliferations of benthic cyanobacteria mats have been publically notified during the summer period of several years (Kelly 2017, ICC 2015). During the 1998/99 summer dog deaths were recorded from the Mataura River (Hamill, 2001).

[38] For example, when they 'bloom' or are under 'stress'.

Figure 3: Southland rivers where one (or more) sites have experienced Phormidium proliferations (greater than 20% coverage) on one (or more) occasion since 2009. Adapted from McAllister et al., 2016.

Drinking water supplies

The suitability of water for human consumption can be compromised by the presence of contaminant concentrations in excess of drinking water guidelines (MFE, 2009). In some instances, high concentrations of contaminants in drinking water can be harmful to human and stock health. Elevated nitrogen concentrations in drinking water supplies are of greatest concern to pregnant woman and young children (causing methemoglobinemia[39]).

Microbiological contamination of drinking water by pathogens is indicated by the presence of E.coli, and can result in short-term or reoccurring illness. The consumption of water with other contaminants in high concentrations can also be harmful to human and stock health.

Groundwater

Aquifers are used as a source of human drinking water by a number of population centres in Southland, as well as by individual households to complement rain water supplies. Compromised drinking water quality can result in negative human health outcomes as well as subsequent negative social and economic impacts.

Groundwater human health related issues in Southland are generally related to the presence of either microbial (E.coli) or nitrate (NO3) contaminants. Elevated E.coli levels are mainly related to poor well-head construction and point source contamination (e.g. leaking sewage tanks, stock access)[40]. Regional nutrient loads (e.g. nitrate) are primarily related to non-point, diffuse sources from agricultural land[41].

[39] Methemoglobinemia is condition whereby red blood cells have a reduced ability to release oxygen to the body's tissues.
[40] Daughney et al., 2015; Snelder et al., 2014
[41] Snelder et al., 2014

Microbes

The Drinking Water Standards for New Zealand[42] specify that E.coli should not be present in water to be used for human consumption. Monitoring shows that the number of instances of E.coli in Southland wells has increased since 2001 (Figure 4: Number of monitoring bores showing presence of E.coli (Liquid Earth, 2010).). However, the proportion of affected wells has decreased. This is probably due to improved well-head construction and well protection.

The Drinking Water Standards for New Zealand specify that E.coli should be < 1 cfu/100 ml of water utilised for potable supply to minimise the potential for adverse health effects (Ministry of Health, 2008).

In 2015, median E.coli values were elevated above the drinking water threshold (> 1 cfu/100mL) at ca. 80 of around 300 groundwater sites, where median values could be determined (Daughney et al., 2015). This implies that less than 30% of regional groundwater sites showed presence of indicator bacteria E.coli, and were therefore unsuitable for drinking. In 2010, 23% of the groundwater bores showed presence of E.coli (Liquid Earth, 2010).

However, the general decline in groundwater quality (e.g. increased NO3 concentration) over the past 10-15 years (Daughney et al., 2015) suggest that it is unlikely that the number of incidents caused by land use activities have been decreasing.

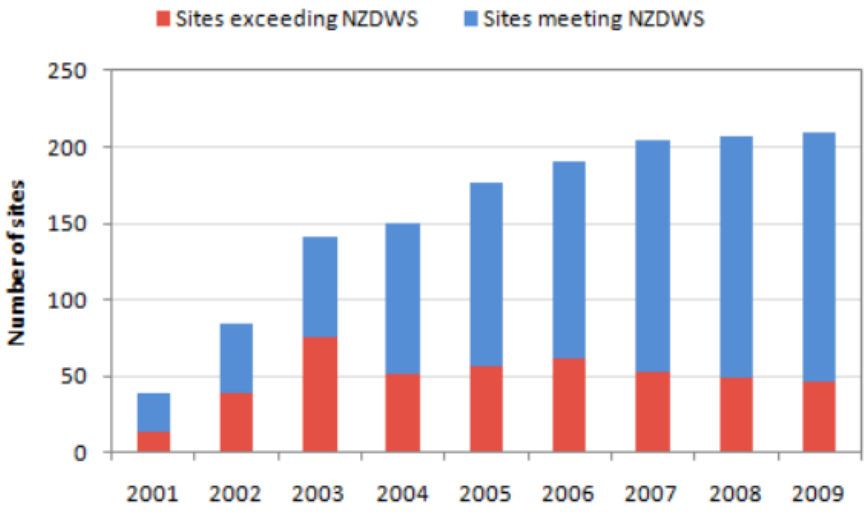


Figure 4: Number of monitoring bores showing presence of E.coli (Liquid Earth, 2010).

Nitrate

The New Zealand drinking water standard for nitrate is 11.3 mg/L NO3-N[43]. Monitoring indicates that most of Southland's groundwaters have nitrate concentrations below this limit and are therefore fit for human consumption[44]. However, 58 wells or ~9% of sites in parts of the: Waimea Plains; Edendale; Lower Mataura; Knapdale; Central plains; Makarewa; Waihopai; Lower Oreti; Castle Rock; Five Rivers; Awarua; Waimatuku; Lower

[42] Ministry of Health, 2008
[43] Ministry of Health, 2008
[44] Rissmann, 2012; Daughney et al., 2015

Aparima; Te Waewae; Blackmount; Longridge; Croydon; Riversdale; Upper Aparima; Wendonside aquifer systems have wells which have recorded nitrate concentrations in excess of drinking water standards. Increasing trends in groundwater nitrate have been determined at about half of the regional SoE monitoring sites[45]. It is expected that further intensification of land use will result in an increase of elevated nitrate concentrations, or nitrate 'hotspots'[46].

The New Zealand drinking water standard for Nitrate is 11.3 mg/L NO3-N (Ministry of Health, 2008). Elevated NO3-N concentrations above 1 mg/L are indicative of contamination of groundwater by anthropogenic land use activities, and concentrations above 3.5 mg/L are considered indicative of moderate to high anthropogenic impacts (Daughney and Reeves, 2005; Morgenstern and Daughney, 2012; Rissmann et al., 2011 and 2012; Rissmann, 2012).

However, low concentrations of NO3-N are not necessarily indicative of no/low anthropogenic inputs, as NO3 is degradable under preferable subsurface conditions, e.g. in anoxic environments (McMahon and Chapelle, 2008). In these (nitrate) reduced groundwaters, other water quality parameters, such as phosphorous or E.coli can be indicative for human/landuse effects.

In Southland, elevated NO3-N concentrations above 1 mg/L account for approximately 50 percent or 265,000 ha of the managed groundwater zones (Rissmann, 2012;

Figure ***5:***). The extensive nature of contamination of the shallow oxidised groundwater within the managed groundwater zones of Southland (

Figure ***5:***) reflects the high sensitivity of the majority of Southland aquifers to losses associated with intensive land use as defined by groundwater quality risk (Wilson and Hughes, 2007) and aquifer sensitivity mapping (Rissmann, 2011).

Comparison of median NO3-N concentrations to water quality guidelines indicates that most of Southland's groundwaters are fit for human consumption, (i.e. have NO3-N concentrations < 11.3 mg/L) (Rissmann, 2012; Daughney et al., 2015). 58 of 334 bores (or 9%) of the sites for which median NO3-N concentrations could be determined (Daughney et al., 2015), account for 0.8% of the region's groundwater resources (on an area basis) (Rissmann, 2012).

Increasing trends in NO3-N have been determined at about half of the regional SoE monitoring sites (Moreau and Hodson, 2015). Further intensification of land use would be expected to result in an expansion of elevated NO3-N concentrations, or NO3-N hotspots within the managed groundwater zones in the near future (Vibart et al., 2015 and, Snelder and Legard, 2014).

[45] Moreau and Hodson, 2015
[46] Vibart et al., 2015; Snelder and Legard, 2014

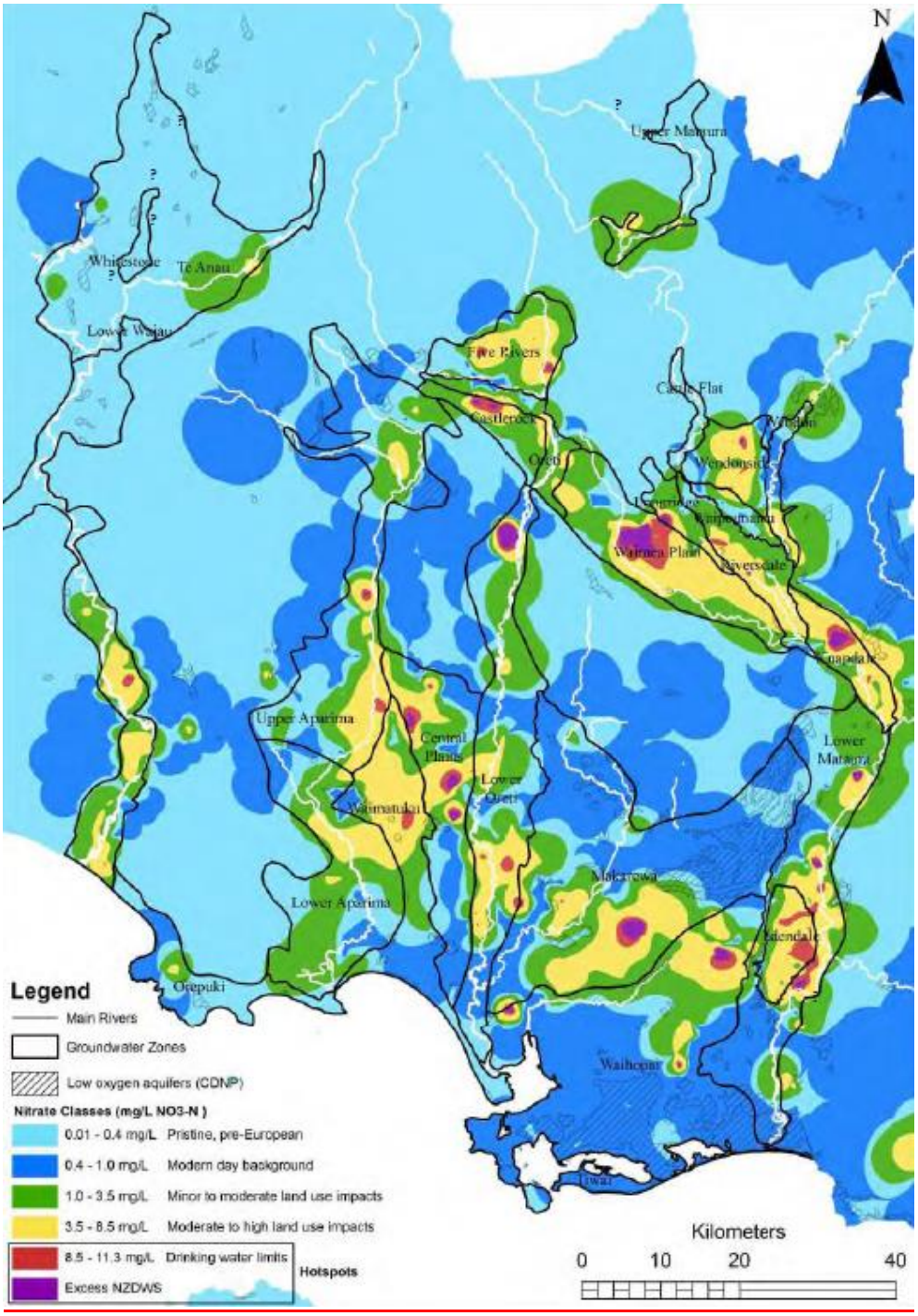


Figure 5: Classed NO3-N map for Southland's managed groundwater zones 2007 - 2012 (Rissmann, 2012). Note, that for some areas of Southland, NO3-N has not been determined in groundwater. These areas, although displayed as 'pristine' pre-European, may actually have elevated NO3-N concentrations (applicable for about 20% of the region's managed groundwater resources).

4.2.3 Ecosystem health

This section summarises the indicators used to assess ecosystem health for both estuarine and freshwater systems. Estuaries, lakes and rivers are all sensitive to eutrophication[47]. In particular, estuaries and lakes[48] can be particularly susceptible due to their location at the bottom of a catchment, which results in the accumulation of contaminants from multiple waterways, including streams, rivers and groundwater.

It is important to monitor for any negative changes in the condition of rivers, lakes, and estuaries as this can signal the need for increased effort to mitigate the loss of contaminants coming from the contributing catchment.

Estuaries

An estuary is a body of water where freshwater from rivers and streams flows into and mixes with saltwater from the sea. Estuaries play many important roles in our environment. For example, they provide critical habitat for species that are valued commercially, recreationally, and culturally. Estuaries filter contaminants from the land and so protect the nearby coastal environment and perform an important function for cycling nutrients. Estuaries are also important to commercial and recreational fishing, as they provide essential nursery areas for many fish and shellfish species. The ecosystem health of the four main estuaries on Southland's mainland are summarised below.

New River Estuary

New River Estuary is located just south of Invercargill City and is the largest estuary in Southland. There are sections in the central and outer portions of the estuary that appear to be moderately healthy. However, there are also sections that are severely degraded. In general, the ecosystem health of the estuary is in decline, with impacts of nutrient enrichment being the main driver of degradation.

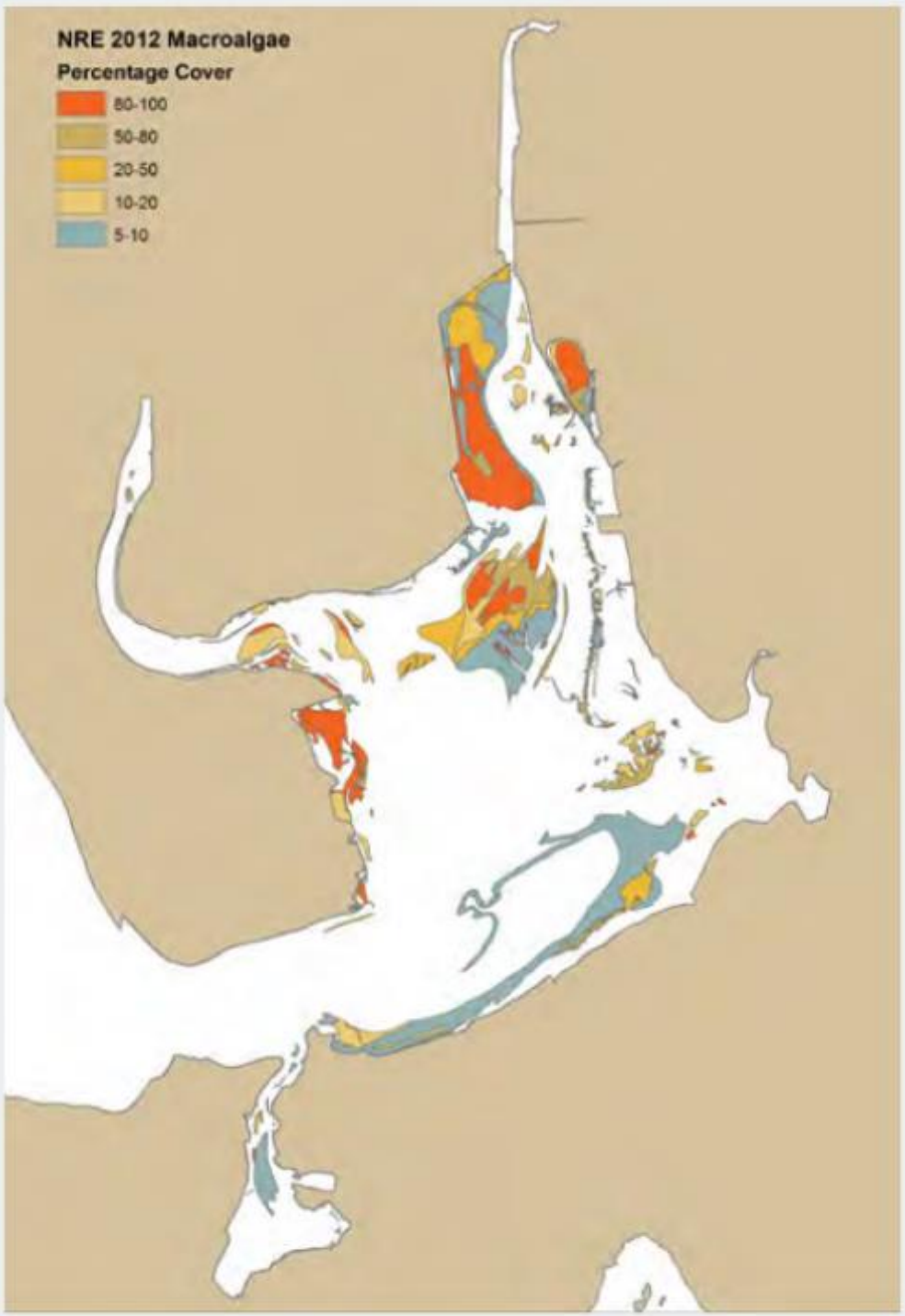
The ecology of the New River Estuary is suffering from the impacts of nutrient enrichment. The broad and increased coverage of macro-algae[49] is an indication of declining condition (Townsend and Lohrer, 2015).

Eutrophication is most apparent in the Waihopai Arm where there seems to have been a long legacy of sedimentation (Robertson and Stevens, 2007). The areas of soft mud in this section of the estuary are commonly associated with dense macro-algae. Comparison of percentage cover of macro-algae from 2007 to 2014 (Figure 6:) shows a marked increase in the area of dense (>50%) cover.

Eutrophic areas of the estuary are in particularly poor ecological condition. Few species are able to persist in the sediment and conditions are so poor that macro-algae are unable to grow during summer months (Figure 7*:*).

[47] The process by which a body of water becomes over enriched in dissolved nutrients (such as nitrogen and phosphorus). The resulting growth of aquatic plant life (e.g. microscopic algae) results in the depletion of dissolved oxygen and reduced capacity to sustain life.
[48] Termed 'reservoir' type receiving environments, due to their capacity to collect and hold water.
[49] Macro-algae are large algae (aquatic plants) that are visible to the naked eye, as opposed to microalgae, which are microscopic.

Decomposing algae drives high sediment oxygen demand, leading to hypoxic/anoxic conditions. This results in the release of odorous gases from the sediment, particularly hydrogen sulphide. The estuary is displaying signs of severe hypoxia with sulphide complexes. Hydrogen sulphide gas emissions are readily smelt by people in the most impacted areas and are high enough to cause headaches and nausea (Townsend and Lohrer, 2015).


NRE 2012 Macroalgae
Percentage Cover
80-100
50-80
20-50
10-20
5-10

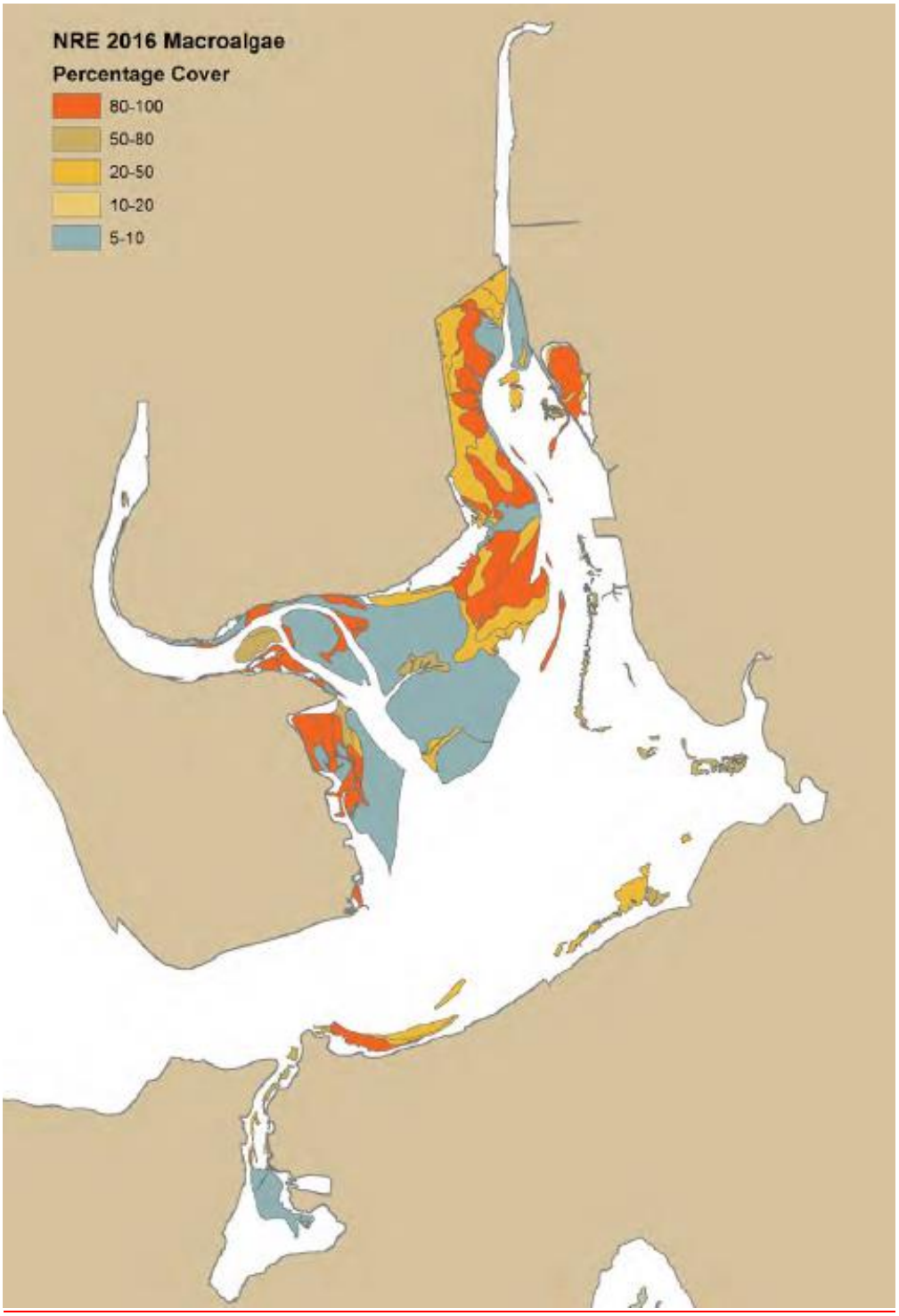


Figure 6: Changes in macroalgal coverage in New River Estuary, 2007(a), 2012(b) and 2016(c). Adapted from Robertson et al. 2017.

Figure 7: An indication of the anoxic sediment surface in the Waihopai Arm of New River Estuary. Adapted from Townsend and Lohrer (2015).

Jacobs River Estuary

Jacobs River Estuary is located in Riverton and is also in ecological decline due to the impacts of nutrient enrichment and sedimentation. The ecological health of the estuary is severely compromised in certain parts, with no indications of improvement, and some evidence of further deterioration.

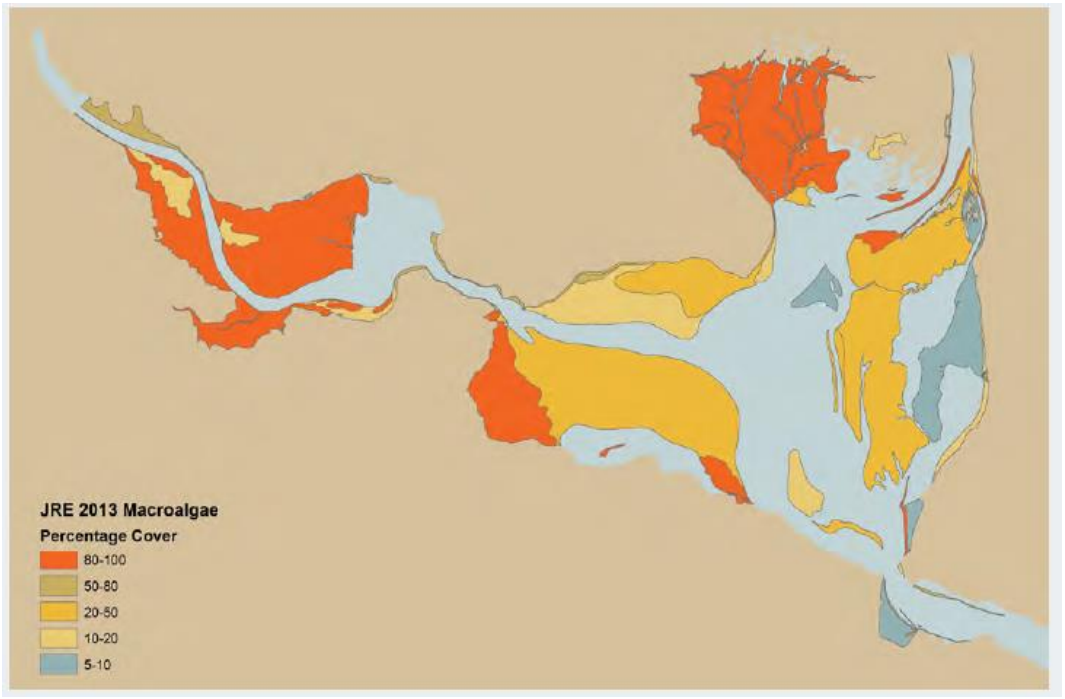
The ecology of Jacobs River Estuary appears to be suffering from the impacts of nutrient enrichment and sedimentation, with the broad and increasing coverage of macro-algae an indication of its declining health.

The ecological health of the estuary contrasts between the central and lower sections of the harbour, which are in a good-moderate state and the large sections of the upper estuary, which are in a poor state of health due to nutrient and sedimentation issues.

There is compelling evidence of large eutrophic areas in the Pourakino River arm and the upper flat by the Aparima arm (Townsend and Lohrer, 2015). 30% of intertidal flats are soft mud, which is associated with the areas of high macro-algae density. The changes from 2008 to 2013 (Figure 8*:*) and observations in 2015 (Townsend and Lohrer, 2015) suggest the area of the estuary affected by eutrophication is expanding (Townsend and Lohrer, 2015 and Stevens and Robertson 2008, 2011 and 2013). There are 'dead spots' (areas with few infaunal species living, low oxygen content and poor sediment environment), which are left in the wake of expanding macro-algal mats.

In summary, Jacobs River Estuary is severely compromised in certain parts, with no indications of improvement, and some evidence of further deterioration (Townsend and Lohrer, 2015).


JRE 2008 Macroalgae
Percentage Cover
80-100
50-80
20-50
10-20
5-10


JRE 2013 Macroalgae
Percentage Cover
80-100
50-80
20-50
10-20
5-10

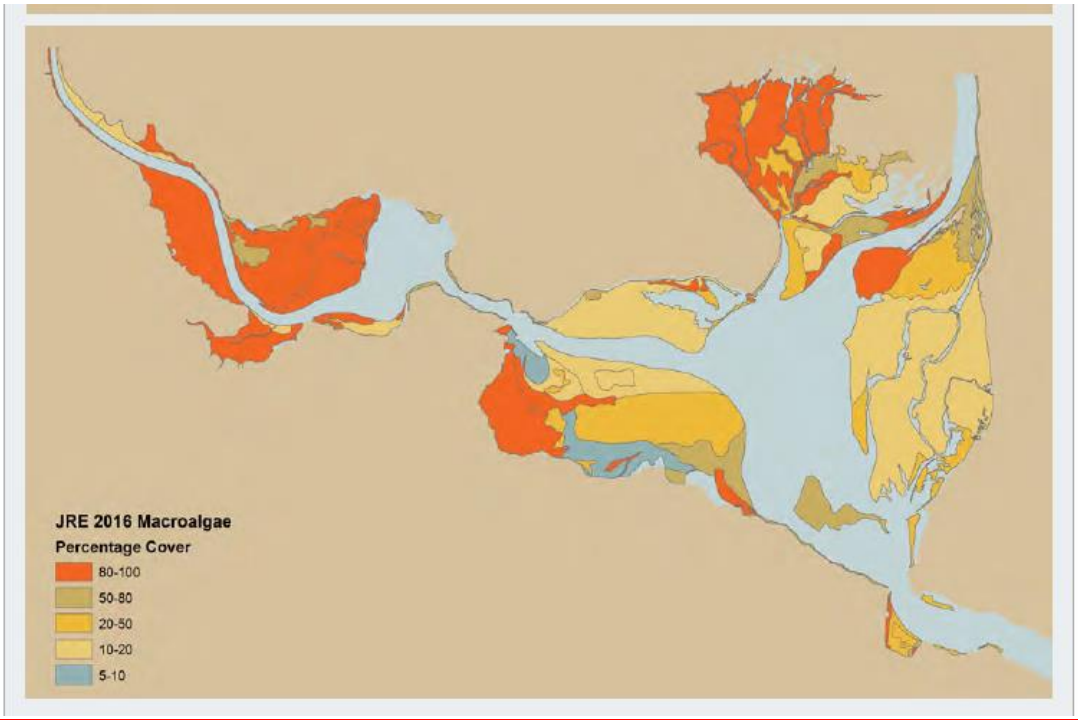


Figure 8: Changes in macro-algal coverage in Jacob's River Estuary over time. Adapted From Stevens and Robertson 2012 and Robertson et al. 2017.

Fortrose (Toetoes) Estuary

Fortrose (Toetoes) Estuary is situated at the mouth of the Mataura River and appears to be in a moderate state of ecological health. The main stress appears to be nutrient enrichment from the estuary catchment, rather than sedimentation.

Fortrose Estuary appears to be in a moderate state of ecological health with firm sandy and gravelly sediments dominating the environment. The physical and chemical properties suggest that the main stress is nutrient enrichment rather than sedimentation.

The accumulation of fine sediments appears to be less of a problem than the expansion of coverage on intertidal areas of the macro-algae Ulva. Ulva has been expanding in coverage since 2004, and is now extensive (Figure 9).

Macro-algal coverage appears to be driving low oxygen and sulphide rich conditions in parts of the estuary (Figure 10). Limiting nutrient loads from the catchment to the estuary may address this issue. Rapid reduction in Ulva coverage in intertidal areas would benefit resident macrofauna and shellfish populations and amenity values to humans (Townsend and Lohrer, 2015).

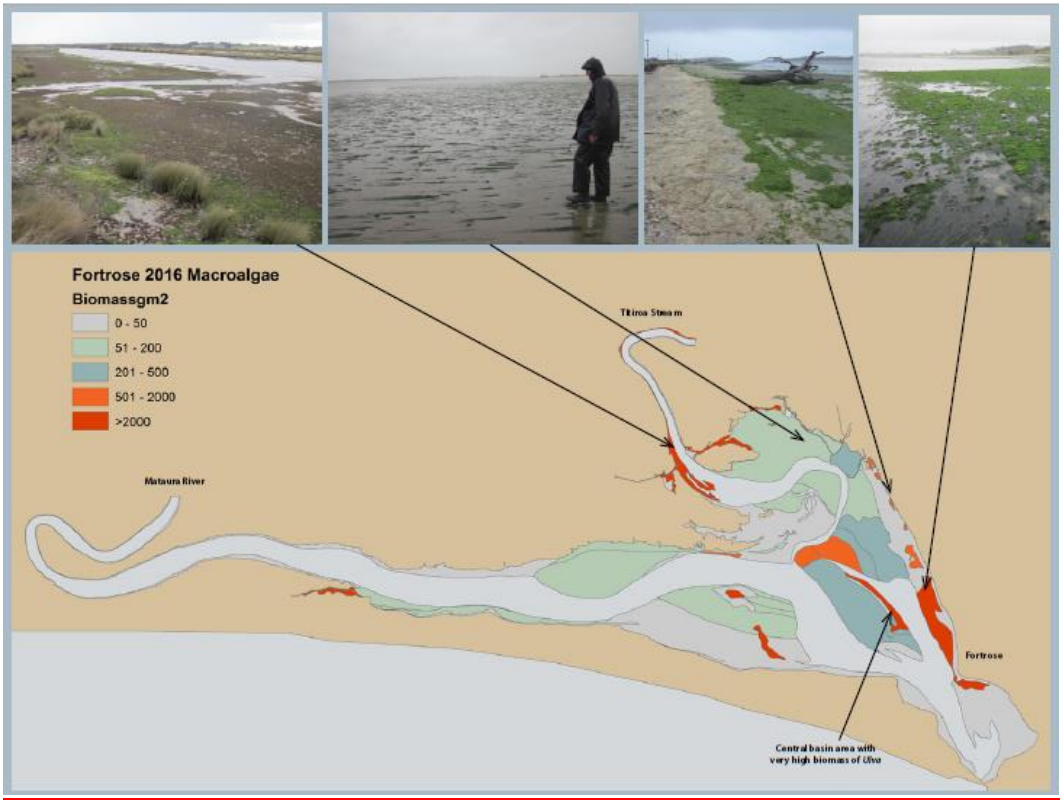


Figure 9: Macro-algal coverage in Fortrose Estuary. From Stevens and Robertson 2017.

Figure 10: Anoxic sediment in Fortrose Estuary. From Stevens and Robertson 2017. GEZ is Gross eutrophic conditions that occur when sediments exhibit combined symptoms of: a high mud content, limited oxygen in the sediment, sediment nutrient enrichment and high macroalgal growth (>50% cover).

Waikawa Estuary

Waikawa Estuary is located south of Niagara on the Catlins Coast and appears to be in good health overall. However, the upper estuary is considered only moderately healthy. Management of nutrient input is necessary to prevent a threshold change, particularly in the sandflats area.

In Waikawa Estuary the central and lower sections are in a good state of ecological health in contrast to the upper estuary, which is moderately healthy. There is muddy sediment in the upper harbour which appears to be a depositional area, however it is not highly degraded ecologically. The sediment is reasonably well oxygenated and lacks a sulphide smell and macro-algae cover (Robertson et al, 2017).

However the sheltered conditions of the upper estuary and small changes in mud since 2004 suggest that residence time for the deposited mud is high, and that the estuary may remain muddy for an extended period even if sediment loads are well managed.

Suitable management would prevent the upper estuary from further deterioration and would facilitate recovery over the longer term. The possible expansion of macro-algae as a response to increased nutrient loading in Waikawa should be a concern, given the estuary has sheltered sections and a prevalence of attachment substrate that could facilitate macro-algal expansion. Management of nutrient input is necessary to prevent a threshold change, particularly in the sandflats area. Overall, the estuary appears to be in good health (Townsend and Lohrer, 2015).

Lakes

Southland lakes are grouped into three categories:

- Shallow lakes
- Intermittently Open and Closed Lakes and Lagoons (ICOLLS)
- Deep glacial lakes.

Shallow lakes and ICOLLS are at a greater risk of developing compromised ecological states than the deep glacial lakes due to having less volume, their position in the landscape, and the type of landuse in surrounding catchments. The ecosystem health of each lake category is discussed below.

Shallow lakes

A calibrated ecological health assessment for Southland lakes was developed by Kelly et al. (2016). This work combines measured parameters belonging to four key components; 'nativeness', 'pristineness', 'resilience', and 'diversity', to provide an overall assessment of ecological health. This expands upon the traditional methods of measuring only water quality parameters to define lake state, i.e. 'pristineness', and incorporates other factors that are central to community values.

Kelly et al. (2016) carried out their assessment of ecological integrity with data that was available at the time, which for shallow coastal lakes was minimal and biased towards the summer period. Since then, Environment Southland has collected additional samples that provide a more robust representation of water quality in shallow lakes, throughout the entire year. These data were analysed against five attributes of the National Objectives Framework, phytoplankton, total nitrogen, total phosphorus, ammonia, and E.coli, in a report by Hodson et al. (2017).

Results indicate that Lakes Calder and Sheila (on Steward Island) are in excellent overall condition (Band A), while the scores for the shallow mainland lakes were lower, with Lakes Vincent and George having an EI in the Excellent to Good range (band A-B). The Reservoir and Lake Murihiku had EI scores in the Good to Fair range (band B-C). Generally, reduced EI scores could be traced back to either degraded water quality (pristineness) or incursion of non-native species, e.g. perch, trout, or non-native macrophytes.

Since the above study, Environment Southland scientists have further improved their knowledge of lakes in Southland by carrying out an assessment against the National

Objectives Framework[50]. Analysis included a higher resolution dataset than that used in the Ecological Health Assessment, which provided more information about in-lake concentrations throughout the entire year. Results showed that all shallow coastal lakes are suitable for secondary contact recreation based on E.coli levels. However, concentrations of nitrogen and phosphorus indicate high nutrient loads from anthropogenic inputs. For example, Lake Vincent had nitrogen levels well in excess of the national bottom line.

Polymictic[51] coastal lakes varied according to the attribute and lake. All polymictic lakes were deemed suitable for primary and secondary contact, based on available E.coli data. However, total nitrogen (TN) and total phosphorus (TP) concentrations scored in the 'C' band at a minimum, indicating high nutrient loads derived from anthropogenic inputs. Lake Vincent was of particular concern, with total nitrogen levels well in excess of the national bottom line at two sites. Seasonal patterns at Lake Vincent show elevated in-lake and inflow TN concentrations throughout the winter period (May-September), indicative of high loss winter management practices.

The Reservoir breached the national bottom line for phytoplankton (chlorophyll a) concentrations, which generally is a manifestation of excess TN and TP; however, this lake scored in the 'C' bands for both of these attributes. This may indicate that this environment is particularly sensitive to nutrient loading, although further investigation is needed.

Intermittently open and closed lakes and lagoons (Waituna Lagoon)

Waituna Lagoon is one of the best remaining examples of a natural coastal lagoon in New Zealand. It is a large coastal lagoon that is fed by three creeks, and drains to the sea through a managed opening. The lagoon is mechanically opened to the sea after the water levels reach the trigger point set in the Lake Waituna Control Association's resource consent. The intermittent opening and closing of the lagoon to the sea strongly influences the lagoon's ecology and water quality.

Waituna Lagoon is monitored during both open and closed periods at four separate sites. Results for nitrogen and phosphorus monitoring indicate considerable nutrient stress when the lagoon is closed. This suggests that the lagoon is still at risk of changing from a clear water state, to an algal dominated state if nutrient loads are not reduced.

Waituna Lagoon was not included in the calibrated ecological assessment by Kelly et al. (2016) described above for shallow lakes, due to this project being limited to permanently closed lakes. However, Waituna Lagoon was included in the analysis of state in Hodson et al. (2017). In this report, ICOLL data collected between 2012 and 2016 were split into open and closed periods, and analysed separately.

Results show that most attributes were poorer when the lagoon was closed vs open, reflecting the role of marine flushing in removing nutrients from the system. Phytoplankton (chlorophyll a) concentrations varied spatially and were of less concern (bands A or B) when the lagoon was open to the sea, but scored in the 'C' band at all four monitoring sites when the lagoon was closed, indicating that "Lake ecological communities are moderately impacted by additional algal and plant growth arising from nutrients levels that are elevated well above natural reference conditions". This pattern was similar for TN concentrations, with better scoring sites (bands A or B) being situated closer to the sea-

[50] Hodson et al., (2017).
[51] Polymictic lakes are too shallow to develop thermal stratification; therefore their waters can mix from top to bottom.

opening, while poorer scoring sites (band C) were closest to major freshwater inflows (Waituna Creek, Moffat Creek, or Carrens Creek).

All sites scored significantly lower for TN concentrations when the lagoon was closed, with two sites, Lagoon Centre and Lagoon West, breaching the national bottom line (D band). All closed sites and two open sites, Lagoon Centre and Lagoon South, rated in the 'C' band for TP concentration.

The combination of high TN, sometimes in excess of the national bottom line, and moderately high TP suggest that there is considerable nutrient stress when the lagoon is closed, which could manifest in a shift from a clear water state to an algal dominated state if phosphorus loads increase further. The 'C' band score for all four sites when the lagoon was closed to the sea, or the recent algal bloom observed at the western end of the lagoon in 2016 (Waituna Partners' News, 2016), may be early warning signs of such a shift.

Other lagoon attributes such as ammonia (NH_3) toxicity and E.coli concentrations for secondary (wading) contact, were of less concern, with all sites (open or closed) scoring either an A or B.

Deep lakes

The Ecological Health Assessment[52] undertaken in 2016 show an 'Excellent' rating for Lake Manapouri and 'Good' for Lake Te Anau[53].

Subsequent assessments by Environment Southland scientists[54] show that Lake Manapouri and Lake Te Anau have the highest ecological health score of all lake types in Southland.

Groundwater

The importance of groundwater quality to ecosystem health is internationally recognised[55], and is increasingly recognised in Southland[56] where groundwater and surface waters are often highly connected. Groundwater is able to mix with hydraulically connected surface water, and can enter estuaries and coastal environments via rivers or coastal aquifers.

The majority of Southland rivers and streams derive between 40 to 60 percent of their flow from groundwater[57]. This percentage increases during low flow conditions, when streams and rivers are almost entirely derived from groundwater. In particular, riparian aquifers[58] have a high degree of connectivity between surface and groundwater, and terrace aquifers commonly discharge to surface water bodies via springs.

The high connectivity between regional surface water and groundwater means that nitrate in groundwater can significantly contribute to the nitrate load of Southland's rivers, lakes and estuaries. The pSWLP does not specify nitrate thresholds in groundwater with regards to ecosystem health, but objective 8 does require aquifers that meet freshwater objectives

[52] Developed by Kelly et al. (2016). This work combines measured parameters of 'nativeness', 'pristineness', 'resilience', and 'diversity' to provide an overall assessment of ecological health.
[53] Lake Te Anau scored slightly lower due to a higher diversity of rotifer (a type of microscopic animal) species. This metric is inversely related to ecological integrity.
[54] Hodson et al., (2017)
[55] Griebler and Avramov (2015)
[56] Rissmann et al., (2012)
[57] Rissmann et al., (2012); Liquid Earth (2011)
[58] Riparian aquifers are those associated with rivers, fluvial deposits, or unconsolidated deposits along river corridors. They account for approximately 10% of Southland's aquifers.

for connected waterbodies to be maintained. Research suggests that to protect ecosystem health in regional streams at low flow conditions, nitrate should not exceed 3.5 mg/L NO3-N[59]. Monitoring shows that approximately 20% of managed aquifers have nitrate concentrations higher than 3.5 mg/L[60]. This implies that one fifth of the region's groundwaters may pose a risk to ecosystem health in regional streams, particularly those with high proportion of high base flow and during periods of low flow.

Figure 11*:* shows a map of median Nitrate-nitrogen (NO3-N) concentrations measured during 2003-04, along with net gain and loss from the river (i.e. base flow discharge or seepage losses) interpreted from concurrent flow gauging measurements (Wilson, 2008).

These data highlight areas where groundwater discharge makes a significant contribution to river flow base flow and nitrate levels during extended low flow. For example, NO3-N concentrations in the lower Waikaia River increase from 0.08 mg/L at Mahers Beach to 0.67 mg/L at Waipounamu Bridge Road over a reach with virtually no inflows from tributary streams. Given that the median NO3-N concentration in this aquifer system is 3.6 mg/L (Liquid Earth, 2010), the observed change in surface water quality is entirely consistent with groundwater base flow discharge being the primary source of NO3-N input to this section of the river system.

Similarly for the Edendale, Waimea Plain and Waimatuku aquifers, the streams they provide recharge to have some of the highest surface water nitrate concentrations in the region (Table 4*:*).

Table 4: Nitrate concentrations in highly impacted aquifers and the respective streams discharging from the same aquifer system.

Aquifer	Median[61] NO_3-N mg/L	Stream receiving discharge	Median[62] NO_3-N mg/L	Maximum[63] NO_3-N mg/L
Edendale (4.9)	4.9	Oteramika	1.5	4.74
Waimea Plain (6.1)	6.1	Waimea	1.9	6.6
		Longridge	2.7	9.34
Waimatuku (5.7)	5.7	Waimatuku	3.2	6.6

Nitrate thresholds in groundwater with regards to ecosystem health have not been included in the pSWLP. To protect ecosystem health in regional streams at low flow conditions, Snelder et al. (2014) suggest that groundwater median concentrations should not exceed 3.5 mg/L NO3-N, equivalent to the B-band threshold, Ministry for the Environment (2014).

According to Rissmann (2012), almost 20% (by area) of the managed aquifers have NO3-N concentrations in excess of 3.5 mg/L (

Figure ***5:***). This implies that a large proportion of the region's groundwaters pose a risk for ecosystem health in regional streams, particularly at low flow. Further, riparian aquifers,

[59] Snelder, et al., (2014)
[60] Rissmann (2012). 20% refers to area, not volume.
[61] Liquid Earth, (2010)
[62] Wilson et al., (2012). Results for 2005-2010
[63] Wilson et al., (2012). Results for 2005-2010

which are the most connected aquifers to surface waters, have on average 3.2 mg/L NO3-N - the highest nitrate concentrations of all aquifers (Liquid Earth, 2011).

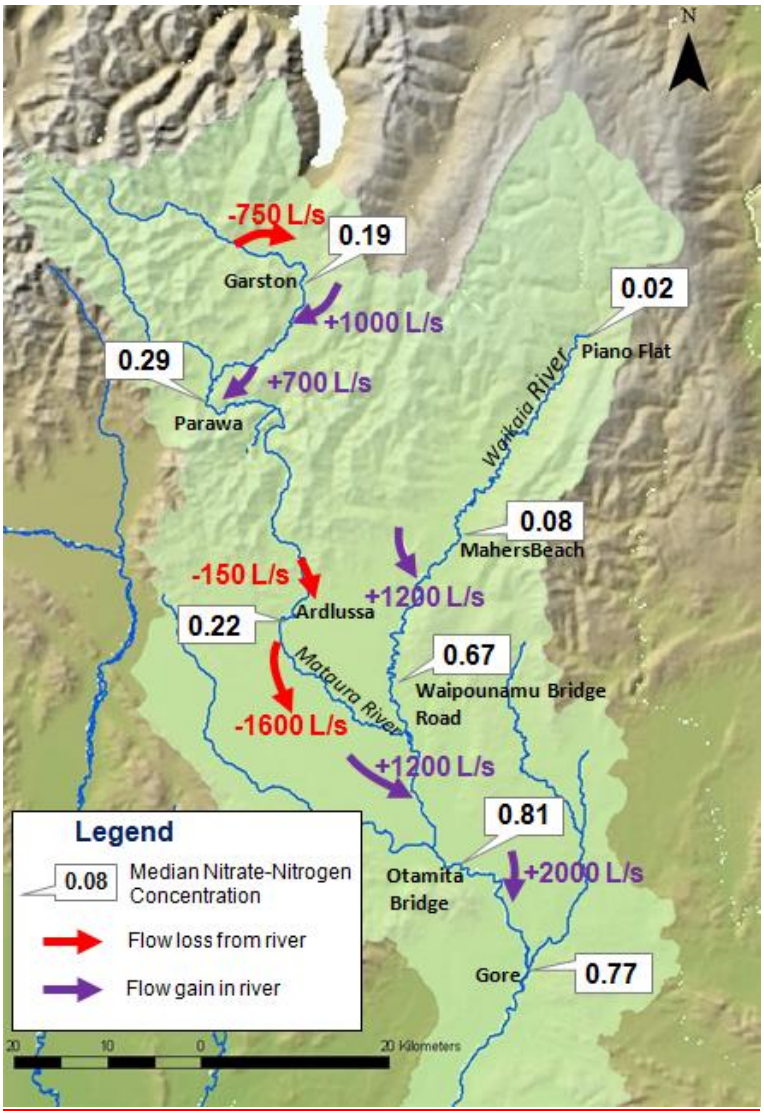


Figure 11: Median NO_3-N concentrations recorded in the Mataura catchment upstream of Gore (2003-04) and indicative flow losses and gains due to groundwater recharge/discharge (Wilson, 2008)

Increases in ground water nitrate nitrite nitrogen concentrations were detected at 15 of 23 and 1 of 6 sites with sufficient data for the time period 2000 to 2016 operated by Environment Southland and GNS respectively. Decreases in concentration were detected at 3 of 23 and 1 of 6 sites operated by Environment Southland and GNS respectively with trend direction at the balance of sites being unable to be determined with confidence.

For the time period January 2012 to December 2016, increases in nitrate nitrite nitrogen concentration were detected at 5 of 25 sites operated by Environment Southland. Decreases in nitrate nitrite nitrogen concentration were detected at 6 of 25 and 2 of 6 sites operated by Environment Southland and GNS respectively, with trend direction at the balance of sites being unable to be determined with confidence.

Rivers

Southland rivers and streams are monitored regularly for a range of physical and chemical characteristics as part of a monthly State of Environment Monitoring programme. Monitoring has illustrated:

- elevated microbial contamination in lowland rivers and streams, resulting in a high risk to human health;
- an increase in nitrate nitrite nitrogen levels in the main stem and some tributaries of the Waiau, Oreti, Mataura and Pourakino rivers, increasing at 15 of 34 and 4 of 6 sites with sufficient data for the time period 2000 - 2016, operated by Environment Southland and NIWA respectively, 2 of 34 and 1 of 6 showed decreases in concentration with trend direction at the balance of sites being unable to be determined with confidence;
- nuisance growths of benthic periphyton in the lower Mataura, Aparima River's and several other lowland streams;
- macroinvertebrate community health standards are not met at 20% of sites.

Environment Southland's State of the Environment reporting for rivers includes a number of indicators of ecosystem health: macroinvertebrates, periphyton, nitrate and ammonia. These indicators are outlined in the sections below with respect to national guidelines.

Macroinvertebrate health

Macroinvertebrates provide an important food source to fish and birds. They provide a good indicator of ecosystem health due to their general lack of mobility and short life-cycles. Some species are more sensitive to contaminants than others.

The Macroinvertebrate Community Index (MCI) is a tool for assessing water quality. Different species of macroinvertebrate are assigned a number based on their tolerance to water contaminants. The index then calculates an average score for a site. The RWP and pSWLP have standards for MCI scores for different stream environments or settings (e.g. mountain vs lowland streams). A higher MCI score generally indicates a more healthy stream. Scores potentially ranging from >150 (very good water quality) to as low as 20 (very poor water quality). National guidelines are commonly used to interpret MCI scores (Stark and Maxted 2007).

Results for Southland show MCI standards are not met at 20% sites in Southland. Between 1996 and 2014, 26% of monitored sites had strongly significant decreasing macroinvertebrate health trends. No sites showed improving trends[64]. A trend direction was unable to be determined with confidence for 73 % of sites.

The RWP and pSWLP include spatially differentiated standards for MCI scores, essentially setting higher standards for MCI in Mountains > Hill > Lowland Hard Bed, Lakes and Spring Fed > Lowland Soft Bed (
Table ***5:***).

[64] Hodson and Akbaripasand (2016)

Table 5: RWP and pSWLP MCI standards for Southland

RWP management unit	Standard
Natural state	NA
Mountains	120
Hill	100
Lowland Hard Bed	90
Lakes	90
Spring Fed	90
Lowland Soft Bed	80

Recent analysis of the relationship between MCI and environmental drivers by Clapcott and Goodwin (2014), suggests that MCI scores are related to land use via a complex chain of causality. Sediment and nutrients were identified as the most probable land use impact on MCI. However, the existence of multiple drives and interactions between drivers, including local habitat means that catchment scale management may not result in a positive MCI response without equal consideration of reach scale management.

Snelder et al (2014), found a high level of non-compliance with RWP standards for Lowland hard Bed and Spring Fed sites. The national MCI quality classification of poor (defined as MCI <80) is exceeded at 7 out of 52 lowland sites included in Environment Southland, (2016b) and Kitto and Hodson, (2016). Note that only sites with both MCI data and water quality were included in this publication.

Compliance with the RWP and pSWLP was assessed by Hodson and Akbaripasand (2016). Results for 2010 – 2014 showed 9% of sites were in a poor state with respect to invertebrate health, and that 20% of sites did not comply with the respective RWP or pSWLP standards (Figure 12:).

Hodson and Akbaripasand (2016) assessed trend for the period between 1996 and 2014, which showed that 26% of sites had strongly significant decreasing macroinvertebrate health trends and a further 2.8% of sites had decreasing trend that was not statistically significant. No sites showed improving trends (Figure 13:).

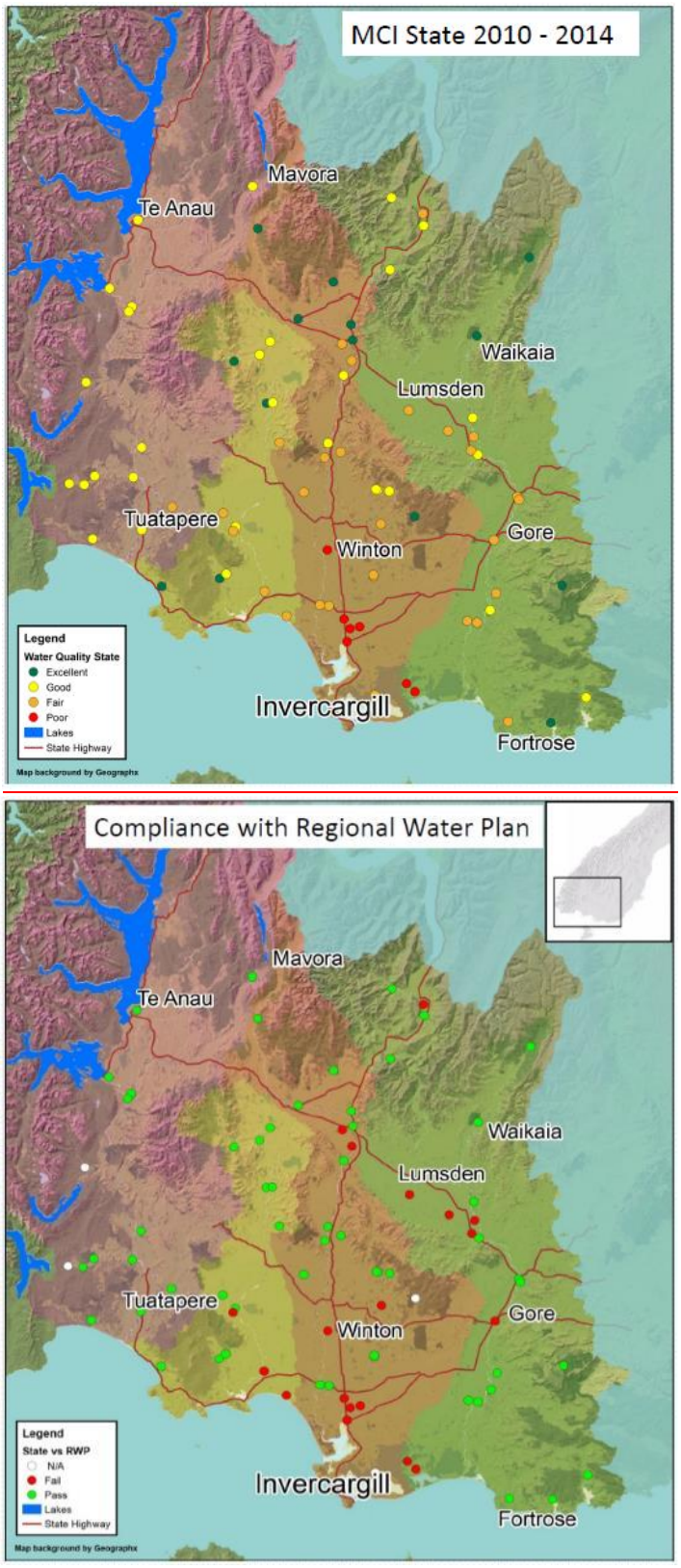


Figure 12: Compliance with Southland Regional Water Plan thresholds for the time period of 2010 – 2014, using median MCI scores (Stark and Maxted 2007). Adapted from Hodson and Akbaripasand (2016).

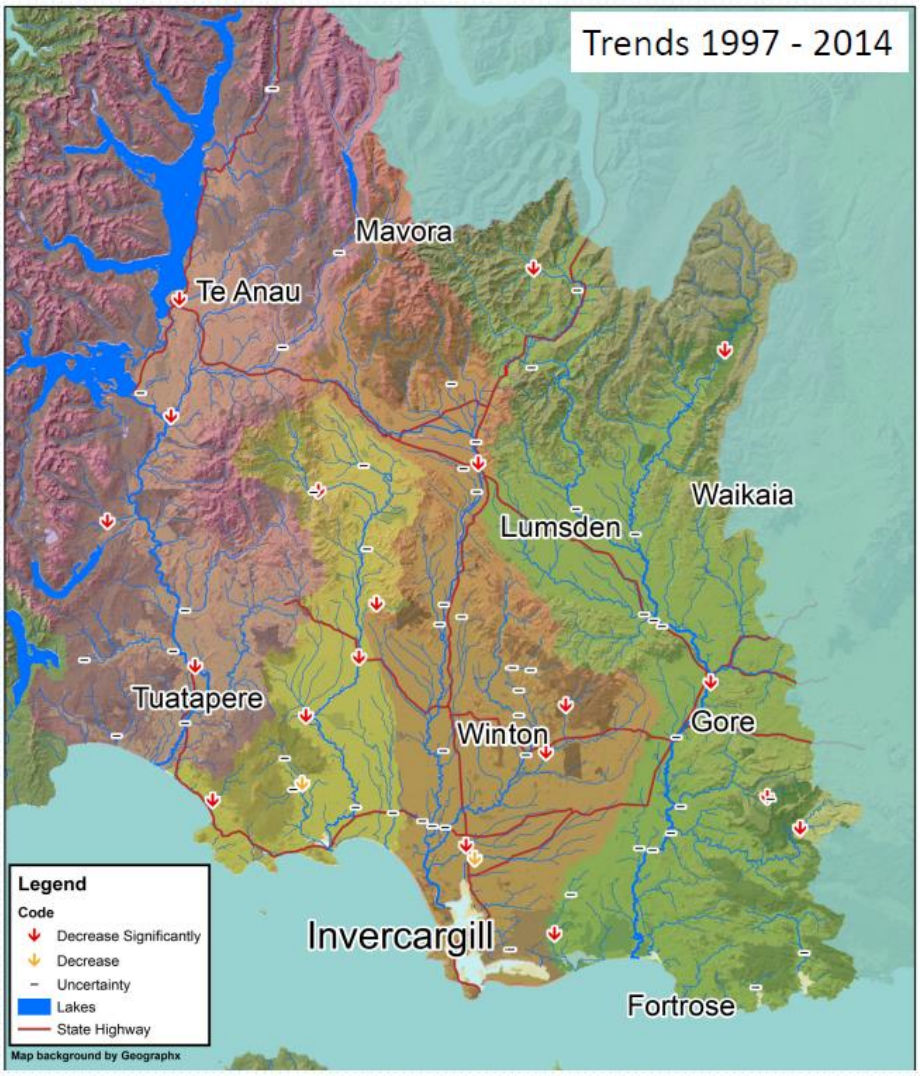


Figure 13: Trends in MCI scores 72 sites in Southland for the time period of 1997 – 2014. Adapted from Hodson and Akbaripasand (2016).

Periphyton

Periphyton most commonly grows on bottom (benthic) substrates as either 'mats' or long filaments. Periphyton is an important source of food for invertebrates, which are in turn food for fish and birds. However, high or nuisance levels of periphyton put stress on aquatic ecosystems by smothering habitat, altering invertebrate communities and driving adverse fluctuations in dissolved oxygen and pH. High levels of periphyton can also alter water colour, odour and the physical nature of the river bed, having a negative impact on aesthetic and human uses of a river.

In 2014 annual frequency summer monitoring data was used to develop predictive models of periphyton cover in Southland rivers[65]. Results indicated that breaches of the national bottom line were likely to occur in the lower reaches of the main stem of the Mataura River and tributaries of the Aparima, Oreti, Waimatuku and Makarewa Rivers.

[65] Snelder et al. (2014)

Subsequent assessments by Environment Southland and Dairy New Zealand scientists[66] show that eight sites are unlikely to meet the national bottom line for periphyton.

The NPSFM national objectives framework sets a national bottom line for benthic periphyton cover, of 200 mg/m2, and allows for frequency of exceedance to be used in the assessment. One exceedance per year (1 month in 12 is approximately 8% of the time) is allowed for, and two exceedances per year in productive classes.

Snelder et al. (2014), used historical summer annual frequency, (not monthly frequency) monitoring data to develop predictive models of periphyton cover and found that breaches of the national bottom line were likely to occur in the lower reaches of the main stem of the Mataura River and tributaries of the Aparima, Oreti, Waimatuku and Makarewa rivers.

Kitto and Hodson (2016) and Environment Southland (2016b) used the Environment Southland annual summer data to assess likely periphyton compliance with the national objectives framework for periphyton using the method of Snelder et al. (2013). Eight sites were found to be likely to not comply with the periphyton bottom line (Table 6**:**).

Table 6: Sites not likely to meet the national bottom line for periphyton based on Kitto and Hodson (2016) and Environment Southland (2016b)

Site Name
Mataura River at Seaward Downs
Mataura River 200 m ds Mataura Bridge
Waimea River at Mandeville
Waikaka Stream at Gore
Aparima River at Thornbury
Otautau Stream at Otautau Tuatapere Highway
Winton Stream at Lochiel
Makarewa River at Wallacetown

Most recently Environment Southland (2018, in press), used a data set from a network of 30 sites with observations made over a three year period (December 2014 to December 2017) to assess the state of periphyton in Southland streams and rivers. The data set included observations of periphyton as: benthic chl-a; Ash Free Dry Matter (AFDM biomass); percentage cover of long filamentous algae; percentage cover of diatom and cyanobacteria algae, collected at monthly frequency from run habitat, with missing data for some months.

The analysis of the monthly frequency benthic chl-a data from run habitat utilised the site mean chl-a to estimate the 92nd percentile or 83rd in productive classed rivers using the exponential distribution. The analysis illustrated that all sites (30 sites within 27 different streams and rivers) are likely to be within the NOF band range of A – C. While none of the sites fell into band D (i.e. below the national bottom line), seven sites (23%) had a 95% upper prediction interval value in the D band (Table 6).

[66] Kitto and Hodson (2016) and Environment Southland (2016b)

Table 7: Monthly monitoring sites with a risk of failing to meet national bottom line for periphyton when 95% upper prediction interval is considered.

Site Name
Lill Burn at Lill Burn-Monowai Road
Aparima River at Thornbury
Mataura River at Mataura Island Bridge
Longridge Stream at Sandstone
Waituna Creek at Marshall Road
Dipton Stream at South Hillend-Dipton Road
Waiau River at Tuatapere

Analysis of the AFDM biomass data from 19 monthly monitoring sites demonstrated that 68% comply with respective AFDM biomass standards defined in the pSWLP (2018)[67],[68] (Figure 12).

[67] 19 sites have been included here as the lowland soft bed and lake fed management units do not apply AFDM biomass standards.

[68] While the pSWLP does not apply AFDM biomass standard to surface water bodies classified as Mataura 1,2 or 3, the authors have applied the equivalent River Environment Classification to sites which would have been classified as lowland hard bed, Hill or Mountain.

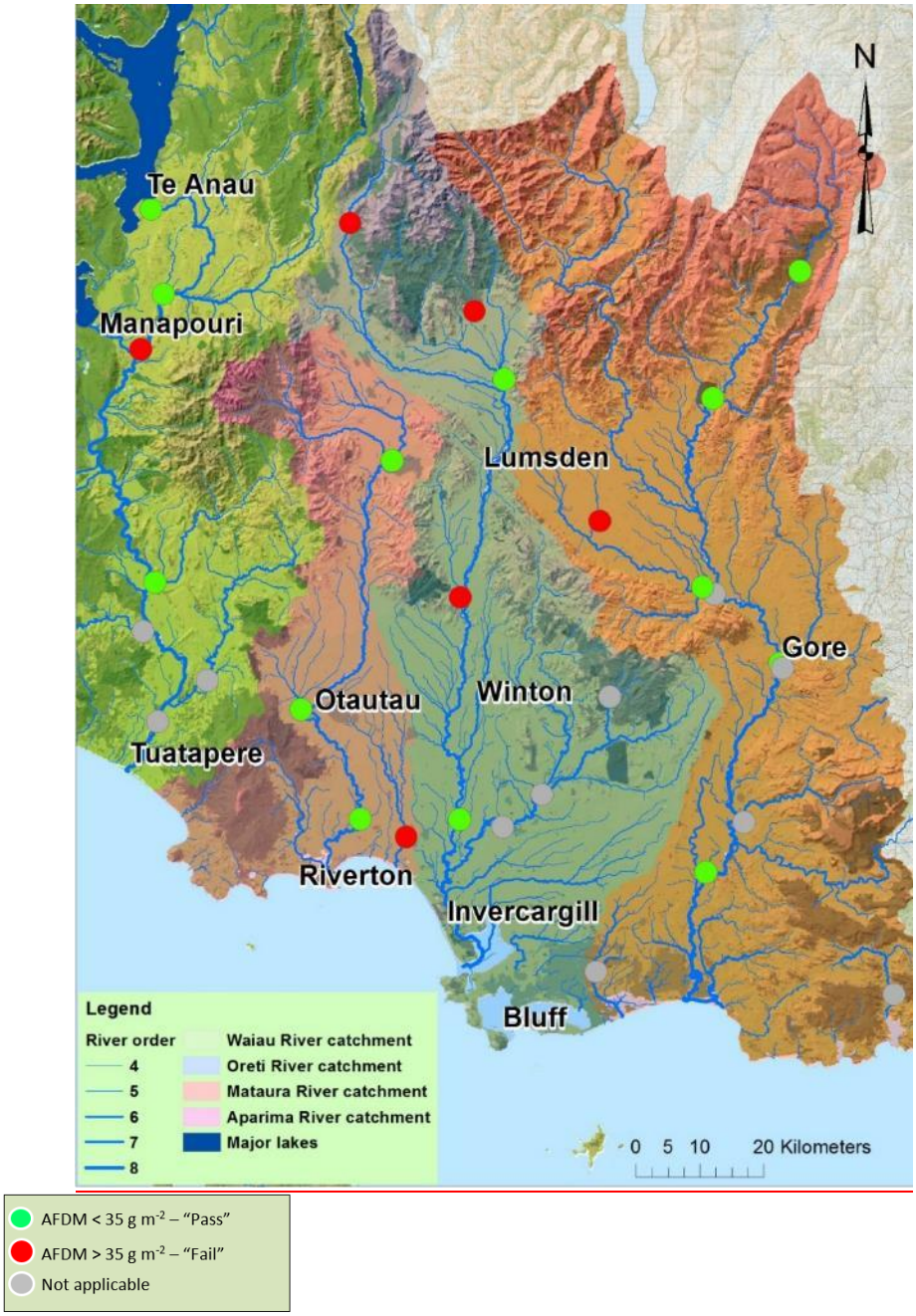
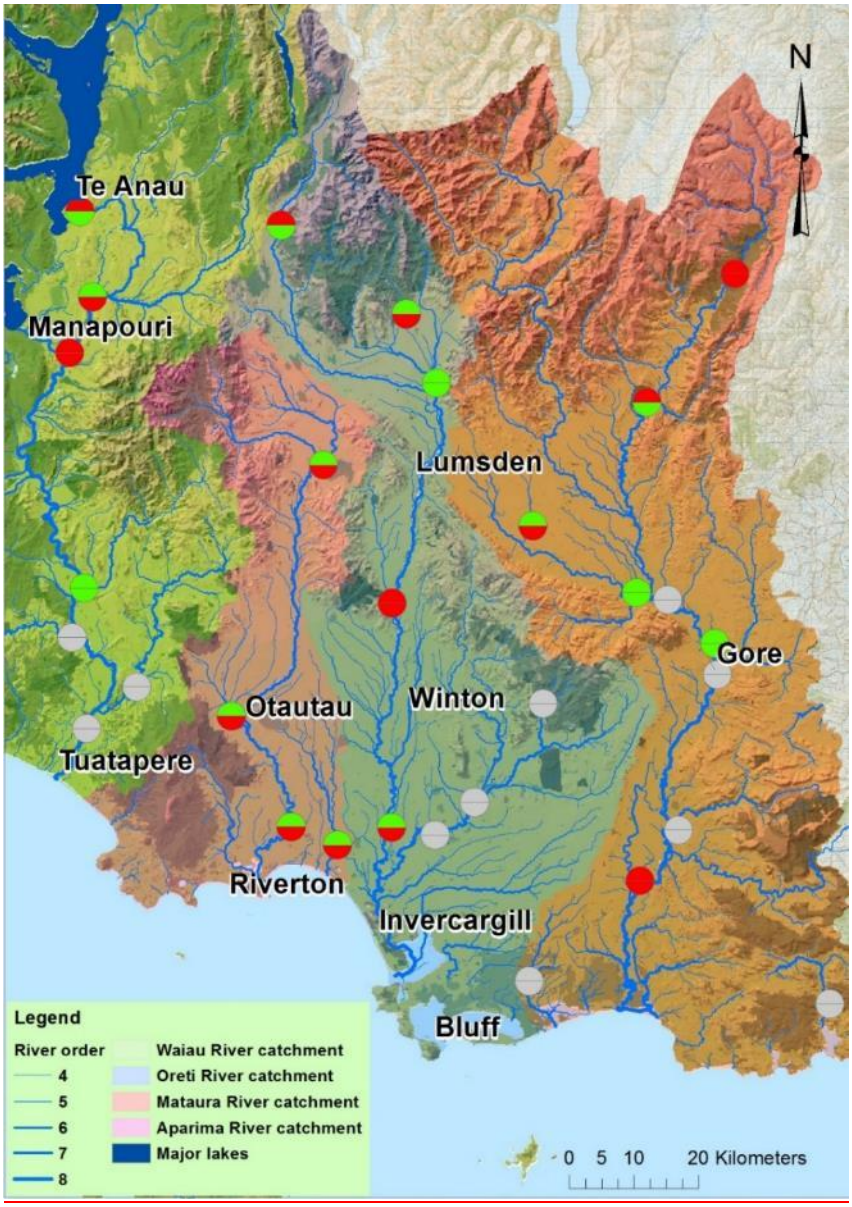


Figure 14: Compliance with proposed Southland Water and Land Plan (2018) maximum AFDM (g m^{-2}) (maximum) thresholds for the time period of 2015 – 2017, Green – "Pass", Red – "Fail",

Note: Mataura 1,2,3 classified sites have been considered against equivalent lowland hard bed, hill, or mountain classification to provide region wide assessment.

Analysis of percentage cover of periphyton from 19 monthly monitoring sites demonstrated that over 21 % of sites were compliant with both long filamentous and diatom/mat periphyton standards defined in the pSWLP (2018).



	Diatoms and cyanobacteria (> 0.3cm thick) <
	Diatoms and cyanobacteria (> 0.3cm thick) >
	Filamentous algae (> 2 cm long) < 30% - "Pass"
	Filamentous algae (> 2 cm long) > 30% - "Fail"
	Not applicable

Figure 15: Compliance with proposed Southland Water and Land Plan (2018) percentage cover of periphyton (maximum) thresholds for the time period of 2015 – 2017, Green – "Pass", Red – "Fail".

Note: Mataura 1,2,3 classified sites have been considered against equivalent lowland hard bed, hill, or mountain classification to provide region wide assessment.

Nitrate toxicity

Southland currently meets the national bottom line for nitrate toxicity to fish at all surface water monitoring sites. However, increasing trends for nitrate in groundwater and surface water suggest that for some locations there is a risk of not meeting this bottom line in the future.

Trend analysis for the time period January 2000 – December 2016 illustrates an increase in nitrate nitrite nitrogen levels in the main stem and some tributaries of the Waiau, Oreti, Mataura and Pourakino rivers. With nitrate nitrite nitrogen levels increasing at 15 of 34 and 4 of 6 sites with sufficient data for the time period 2000 - 2016, operated by Environment Southland and NIWA respectively. Decreases in concentrate were detected at 2 of 24 and 1 of 6 sites operated by Environment Southland and NIWA respectively. Trends for remaining sites which had sufficient data for analysis were indeterminate (Hodson et al. 2017 in press).

Trend analysis for the five year period January 2012 – December 2016 illustrated decreasing trends in concentration at 9 of 55, increasing trends in concentration were detected at 2 of 55 sites and trends direction was unable to be determined with confidence for 38 of 55 sites operated by Environment Southland with sufficient data for analysis. Trend direction was unable to be determined with confidence at any of the sites operated by NIWA (Hodson et al., 2017 in press).

Ammonia toxicity to fish

Southland currently meets the national bottom line for ammonia toxicity to fish at all surface water monitoring sites.

4.3 Water quantity

4.3.1 Overview

There are two main sources of 'available' freshwater in Southland: surface water and groundwater. Areas of available surface water in Southland include streams and rivers. Groundwater is water that collects and flows beneath the Earth's surface, filling the porous spaces in soil, sediment, and rocks. Groundwater ultimately originates from rain and/or infiltration of runoff in rivers and streams that infiltrates through the soil, to underlying areas of porous sand, gravel or rock. A saturated geological material is referred to as an 'aquifer' where the groundwater can be extracted in sufficient quantities and at sufficient flow rates for human use.

The Southland region has significant surface water and groundwater resources. Southland's rivers and aquifers have long been an important source of water supply for domestic, municipal (town and city), and industrial use (including farming), as well as for hydro generation.

Most of Southland's aquifers are found in alluvial sediments, which mainly occur across the Southland Plains and inland basins. Alluvium is typically made up of a variety of loose materials, including sand, gravel, silt and clay. Groundwater is able to collect and move through these materials in large quantities.

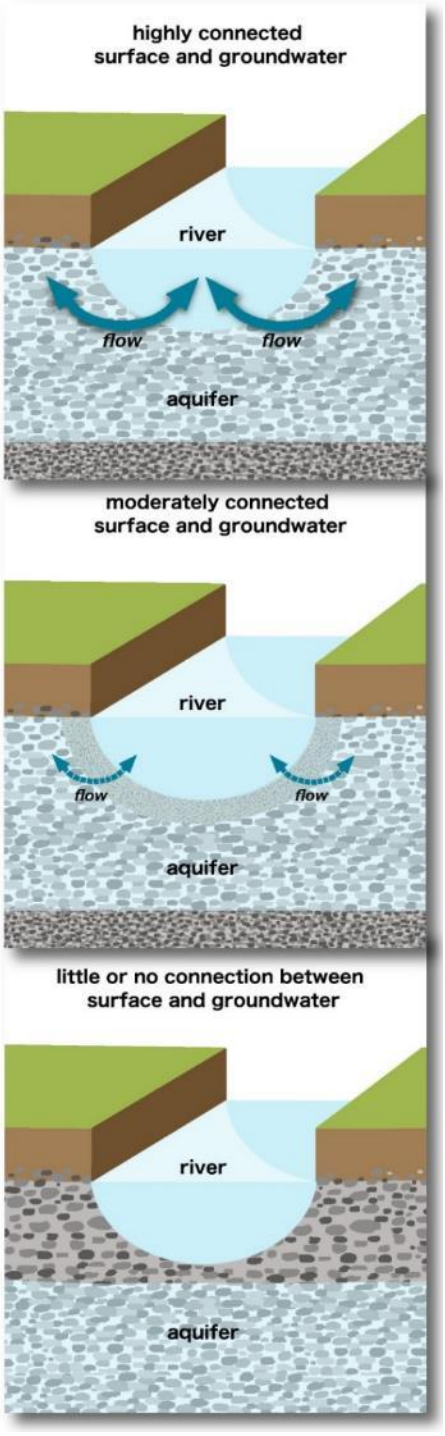
Since the early 2000s, the total volume of groundwater allocation (i.e. volume allowed for abstraction) has increased significantly. The main reason for this has been an increase in pasture irrigation in inland parts of Southland.

Groundwater and surface water connections

Surface waters (streams, rivers and lakes) and shallow groundwater do not exist in isolation. They interconnect and interact with each other at various points throughout the landscape. Therefore, management of the groundwater allocation also has to take into account potential effects on water levels and flows in hydraulically connected rivers, streams, lakes and wetlands.

Managing the cumulative effects of groundwater abstraction on surface water (referred to as stream depletion) is an important component of groundwater quantity management in Southland. In particular, managing the relationship between water quantity allocation and instream habitat is a significant and longstanding work stream at Environment Southland.

Individual groundwater takes are categorised in terms of their hydraulic connection to surface water following methodologies established in the RWP and pSWLP (see right).



Highly connected waters

Allocation for groundwater takes with a high level of connection to surface water is split between groundwater and surface water according to the calculated stream depletion effect. Groundwater takes are therefore subject to the same minimum flow restrictions as equivalent surface water takes.

Moderately connected waters

Groundwater takes with a moderate hydraulic connection are also managed in terms of their potential effect on both surface and groundwater allocation. However, in moderately connected waters there is an extended lag time between water extraction from groundwater and resulting effects on surface water. Therefore, there are no minimum flow restrictions for groundwater takes, as these measures do not provide an effective means of mitigating effects on surface water.

Waters with little or no connection

Groundwater takes classified as having a low degree of hydraulic connection (including confined aquifers) have little to no effect on stream flow and are therefore managed solely in terms of a volumetric groundwater allocation.

4.3.2 Water allocation and stream flow

The volumes of water available for abstraction from both streams/rivers and aquifers, are based upon maintaining instream flows, so they can continue to support life. This allows for instream habitat preservation and the long-term survival of native species, such as giant kokopu and inanga, and introduced species, such trout (see Appendix K of the pSWLP). Groundwater is also managed to ensure long-term aquifer sustainability and reliability of supply.

In-stream allocation is the sum of abstractions directly from the stream and the stream depleting proportion of groundwater takes. Surface water takes have an immediate effect on habitat, with cumulative effects occurring down the river network. However, groundwater takes can have a delayed impact on instream habitat. Therefore, groundwater takes are managed in relation to the rate and period of time that a stream might become affected by water takes.

Specifically, water takes are governed by minimum and ecologically relevant flows, maximum abstraction rates, and volumes specified as conditions of a water permit in conjunction with flow abstraction monitoring. In addition, there are numerous permitted takes for activities such as domestic and stockwater supply. Permitted takes must be below a nominated volume and/or rate to ensure their potential effects on the environment are no more than minor.

The stream depletion effects assessment and the regulations governing the control of groundwater volume are laid out in Appendix L of the pSWLP.

Available groundwater for abstraction

The ability to access groundwater varies considerably between different parts of Southland. For example, in many areas of lowland and coastal Southland alluvial materials have low permeability, resulting in limited volumes of available water. Bores yields in these areas are typically low.

In contrast, aquifers hosted in alluvial sediments deposited along current or historic river channels in inland Southland are highly permeable and have high yields of available water. While significant volumes of water can be accessed from bores in these areas, extraction may be limited by environmental effects, such as stream depletion.

Recent increases in groundwater allocation in inland Southland have largely been driven by both an increased demand for irrigation water during dry months and have typically occurred in areas with easy access to higher yielding aquifers.

Groundwater management zones

Allocation of groundwater (under both the RWP and pSWLP) is undertaken on a volumetric basis within individual management units, called groundwater management zones. Allocation volumes are established for each groundwater management zone based

the percentage of average annual rainfall that is expected to infiltrate down to underlying aquifers (called 'rainfall recharge').

At the current time groundwater allocation is generally well below (i.e. less than 50%) of the allocation limits listed in the pSWLP. Of the groundwater management zones, Wendonside is the only zone fully allocated at the current time. Two confined aquifers in the Oreti Basin (the Lumsden and North Range aquifers) which are physically separated from overlying shallow groundwater are also fully allocated.

In many areas, allocation of groundwater with a moderate to high degree of hydraulic connection to surface water is significantly constrained by water allocation and minimum flow requirements in nearby rivers and streams. Therefore, although these aquifers may be high yielding, the potential for effects on surface water limits groundwater availability. Elsewhere, while allocation may be available, access to groundwater is often constrained by the natural hydraulic properties of the subsurface geological materials.

Minimum flow management and water allocation

Environment Southland maintains a series of permanent long-term recorders that measure the amount of water flowing through a catchment. Using this data Council scientists are able to determine how much water is flowing and where, at a catchment and sub-catchment scale. Management flows are set through the pSWLP to recognise ecological limits for native and introduced species. Thus, ensuring the minimum volume of water that is needed to support aquatic life (section 3).

Under the pSWLP, a minimum flow value has been adopted that represents the period of time (duration) that flow is above a certain critical level. This method for managing minimum flow in Southland describes stream flow rate that occurs at or above a certain level for 95% of the time, with the level called 'Q95'. The minimum flow for primary water allocation is set at Q95 and is currently the preferred management metric as it provides a better description of the length of time that an abstraction might be viable, and of the relative effect of the abstraction on in-stream ecology.

In terms of the primary allocation, the Waiau catchment is fully allocated as a result of the Manapouri Power Scheme (Figure 12). Due to the way the Water Conservation (Mataura River) Order 1997 is structured (i.e. a fixed percentage of flow available for allocation), in theory water can still be allocated from this catchment, however the reliability of supply is not sufficient for run-of-river takes, at least for irrigation.

High flow rate abstractions from surface water are allocated from the 'secondary allocation block'. The seasonal structure of secondary allocation aims to incentivise the filling of storage ponds to times where the abstraction has less impact on instream ecology. This water can be used when instream flows are low in an attempt to strike a balance between ecological dependence and increased availability of water for storage[69].

Management flows for the secondary allocation block are set on the basis that there is higher security of supply in autumn and winter (median flow; 1 April to 30 November), and a lower security of supply in summer (mean flow; 1 December to 31 March). It is recognised that large abstractions may 'flatten' the hydrograph above the management

[69] Hay and Kitson (2013).

flows in small streams and impact on ecologically important instream flow variation. For this reason an upper limit of abstraction is a flow rate that is no more than 10% of the seasonal management flow for the impacted stream.

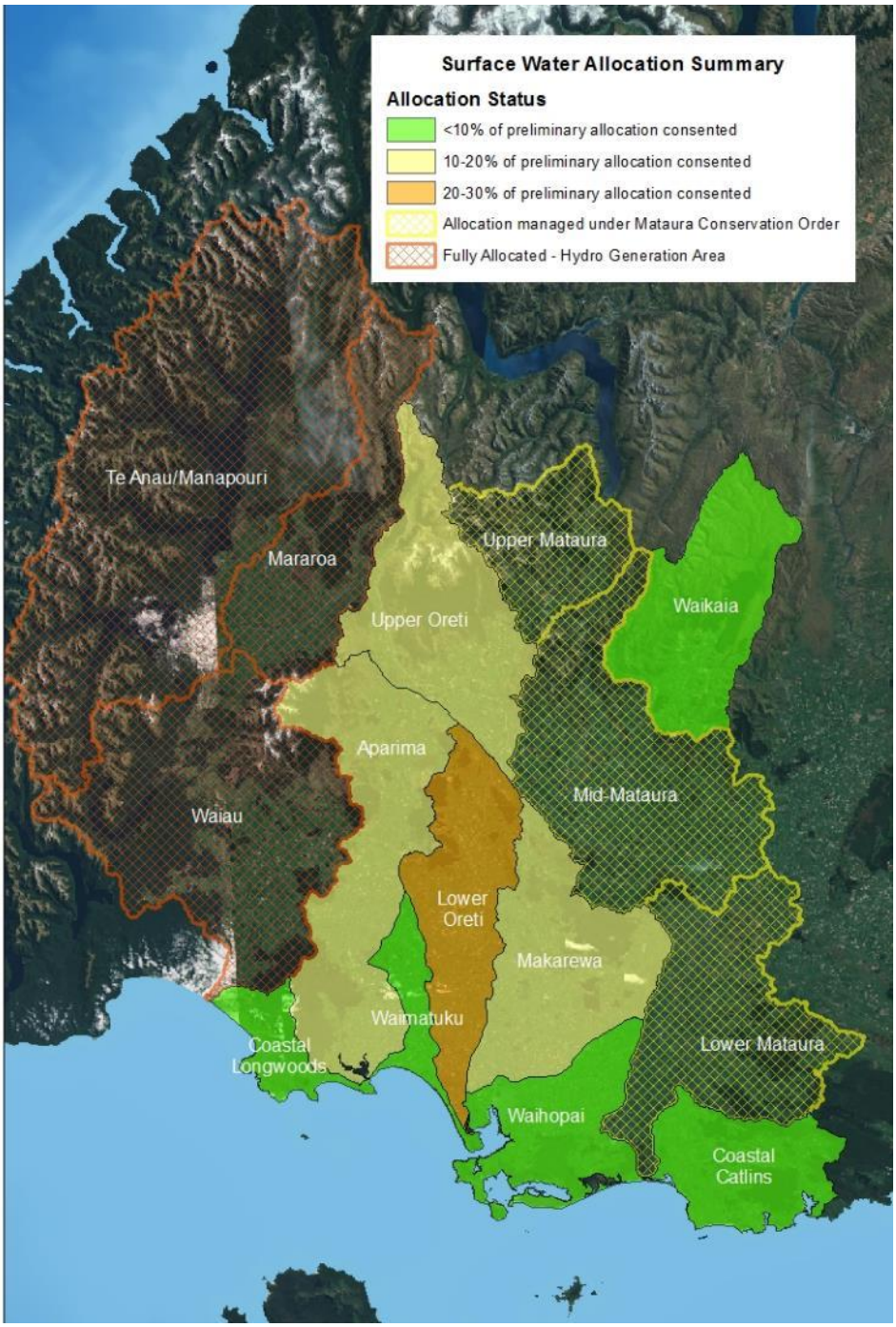


Figure 16: Allocation status of Surface Water Resource Zones

4.3.3 Summary

In summary, while groundwater is accessible across much of the Region, in practical terms its availability is limited in many areas by the allocation status and reliability of supply constraints associated with hydraulically connected surface waterways (see Figure 15). Groundwater with a low hydraulic connection to surface water typically occurs in areas where available yields are naturally limited by the lower permeability nature of the host geological materials. This combination of factors has significantly reduced the rate of groundwater development over the past five years.

Groundwater level monitoring undertaken by Environment Southland indicates some localised variation in groundwater levels in response to increases in abstraction over the past 15 years. However, monitoring shows that variations in aquifer storage over time are mainly due to variations in rainfall from season to season, as well as variations from year to year[70].

In terms of surface water allocation, as noted above the Waiau catchment is fully allocated and significant constraints also exist in the Mataura catchment.

4.4 Indigenous Biodiversity

Indigenous biodiversity covers native flora and fauna in both dryland and wetland environments. Southland contains a variety of ecosystems and habitats, including indigenous vegetation, wetlands, lakes, and rivers. Indigenous plants and animals are an integral part of the natural character values of the Region, and in addition to their intrinsic value, plants and animals are significant for cultural, economic, scientific and educational reasons and biological diversity. The Region contains a number of significant and distinctive ecosystems, including the network of culturally and ecologically significant river mouths, estuaries and lagoons, the largely unmodified alpine environments, particularly of Fiordland, extensive high country, and many lakes and wetlands that provide nationally and internationally significant bird habitat.

There continues to be substantial impacts on ecosystems and losses of significant indigenous biodiversity for a variety of reasons. The most significant losses in indigenous habitat and biodiversity have occurred in lowland and coastal environments where most of the original indigenous vegetation has been lost.

Ngāi Tahu as tāngata whenua have a significant interest in the protection, management and restoration of indigenous ecosystems and biodiversity. This stems from their close interaction with Southland's indigenous biodiversity over centuries of occupation and the importance of it in Māori culture, including its significance as mahinga kai and taonga species.

Wetlands are a vital link between land and water and include permanently and intermittently wet areas, shallow water, and margins that support a natural ecosystem of plants and animals adapted to wet conditions. They provide important hydrological functions and ecosystem services such as filtering contaminants from water and soils. They

[70] Wilson, K. (2011).

are also an important natural and cultural resource, rich in biodiversity and important sources of mahinga kai.

Wetlands were once more prevalent, with Southland having lost approximately 90% of its wetlands in developed areas, including from hill and high country. Many remaining wetlands are on publicly held land and afforded some level of protection. Other wetlands are on private land and little is known about their health, values and use. Land use change leads to conflict between productive use of land, including wet areas, and protecting habitats and biodiversity.

The Awarua Wetlands, comprising of Awarua Bay and Waituna Lagoon are one of the largest remaining wetland complexes in Southland and are important for their biological diversity and cultural values. The wetlands are officially recognised on the Ramsar Convention on Wetlands List of Wetlands of International Importance. The Awarua site includes four major wetland types: Coastal lagoons (notably Waituna Lagoon), freshwater swamps, extensive peatlands, and estuaries. Each ecosystem is unique and maintained by different ecological processes. Awarua Wetlands is frequented by diverse trans-equatorial migrating and wading bird species, as well as threatened plants and insects including sub-alpine species.

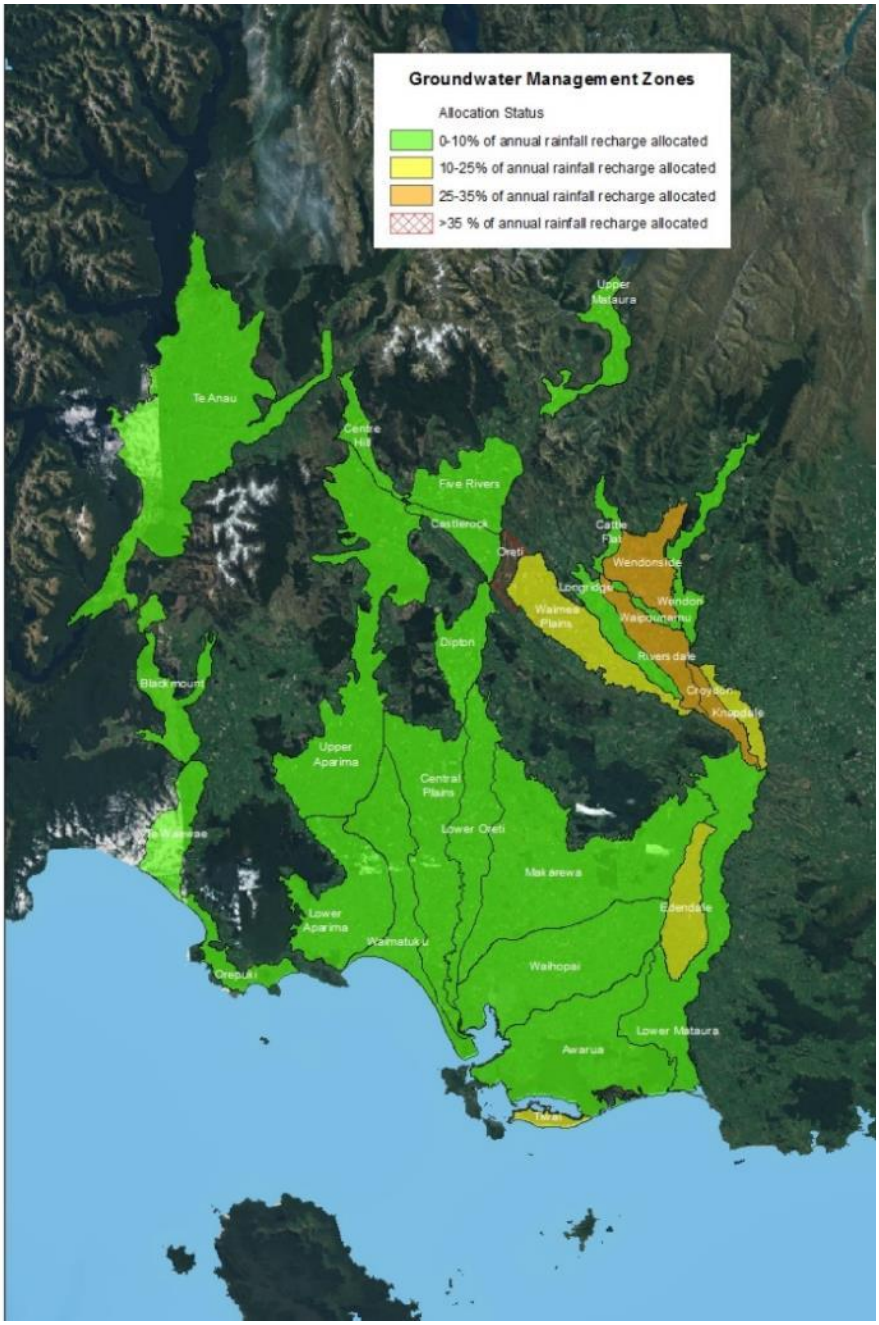


Figure 17: Allocation status of Groundwater Management Zones in Southland

4.1. ~~The Southland Region~~

~~Southland has a total area (land and sea) of around 5.5 million hectares, including several off-shore islands, the largest being Stewart Island/Rakiura. It has the longest coast line in the country at 3,000km stretching from Waiparau Head in the Catlins to Awarua Point in Fiordland. To the north, mountain ranges including the Eyre Mountains and Darran Mountains generally provide a barrier between the region and the remainder of the South Island. Over half (53%) of the land area in Southland is part of New Zealand's Conservation Estate and is managed by the Department of Conservation, including Fiordland and Rakiura.~~

~~The total population of Southland at the 2013 Census was 93,341 people.[71] Southland's natural and physical resources support a thriving agricultural economy and community. Farms occupy a large proportion of the non-conservation land in mainland Southland.[72] This highlights the importance of agriculture to the region and the significant contribution the industry makes to the national economy. The agriculture industry, including primary processing, is the largest contributor to Southland's regional economy.[73] Southland is one of New Zealand's more sparsely populated regions.~~

4.2. ~~Freshwater Management~~

~~4.2.1. Water Quality~~

~~Water is a fundamental resource. The Southland economy is based on rural production and servicing, fisheries, tourism, energy production and industrial processing, all of which rely on the availability of good quality water. Water quality is a key factor in the ecological health of waterbodies, influencing which species are present. The mauri (spiritual essence or life force) of a waterbody is affected by water quality. Many people recreate in or near Southland's waterbodies, including swimming, white baiting, duck hunting, fishing, walking or tramping and boating activities.~~

~~Southland's main catchments end with estuaries, which are particularly sensitive to nutrient and sediment loads. Degraded estuary water quality and habitats are particularly difficult and expensive to reverse. This highlights the importance of maintaining good water quality in upstream rivers.~~

~~Adverse effects on water quality result from point source discharges and non-point source discharges. Over the past two decades, adverse effects from point source discharges have been reduced, largely through resource consenting processes for urban activities. However, they still contribute significant levels of contaminants to waterbodies and there is therefore a need for continuous improvement. The most significant point source discharges are the major industrial and municipal discharges to the Lower Mataura and Ōreti Rivers and tributaries, with a number of smaller point source discharges scattered around the more developed parts of the region.~~

~~Non-point source discharges, such as stormwater in towns and leaching of contaminants from rural activities, are generally caused by rainwater carrying contaminants over or through the ground (e.g. through tile drains) to surface water bodies or groundwater, or by stream bank and bed erosion. To date, there has been little management of non-point source discharges, particularly from rural activities, which cumulatively contribute significant amounts of contaminants to waterbodies. Non-point source discharges from agricultural land are the most significant contributors of contaminants, such as nitrate and~~

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71 Statistics New Zealand (2013) *Quick Stats about the Southland Region.* Retrieved on 26 April 2016 from *http://www.stats.govt.nz/Census/2013-census/profile-and-summary-reports/quickstats-about-a-place.aspx?request_value=15112&tabname*

72 Statistics New Zealand (n.d.) New Zealand: An Urban/Rural Profile Update, http://www.stats.govt.nz/browse_for_stats/people_and_communities/geographic-areas/urban-rural-profile-update.aspx, viewed 29.9.2011.

73 Market Economics Limited (2013). Southland Region: Economic Impacts of Water Policy Decisions Workstream, Author,
NZ.

~~phosphorus, which are by-products of farm systems. Other types of land use, including industrial, urban, forestry, some landfills and horticulture also contribute contaminants.~~

~~Land use intensification also tends to increase the amount of contaminants entering water as by-products of farm systems. The extent to which land use affects water quality varies across the physiographic zones. Nutrient losses are exacerbated when they occur on parts of the landscape that are susceptible to either nitrogen or phosphorus loss. Those physiographic zones which are particularly susceptible to nutrient loss are described below. It should be noted however, that overland flow and artificial subsurface drainage systems allow contaminants to bypass the soil matrix regardless of physiographic zone, and without mitigation actions, adversely affect water quality throughout the region.~~

~~Physiographic zones particularly susceptible to nutrient loss~~

~~Soils and aquifers in the Old Mataura physiographic zone have limited ability to remove nitrate. Water moves slowly through the aquifers, meaning that nitrate builds up, and in many places exceeds the drinking water standard maximum acceptable value (MAV) of 50 mg/L. It has the highest groundwater nitrate concentrations of any physiographic zone, with a median of 10.0 mg/L compared to the national bottom line of 6.9 mg/L. This groundwater contributes base flow to surface waterbodies, evidenced in the Waimea Stream which shows significant degradation with declining water quality trends, posing a significant risk to human health and biota.~~

~~Soils and aquifers in the Oxidising and Riverine physiographic zones also have limited ability to remove nitrate. Surface and groundwater nitrate concentrations in the Oxidising physiographic zone are among the highest for any physiographic zone in the region (second and third respectively) and groundwater fails the drinking water standard MAV for nitrate in some locations. The main difference between Oxidising and Old Mataura is that nitrate moves through the aquifer more quickly so there is less time for nitrate concentrations to build up in groundwater. In the Riverine physiographic zone, the relatively low concentrations of nitrate in surface and groundwater are due to flushing by river water from the Alpine and Bedrock/Hill Country physiographic zones. While it is not clear whether the nitrogen load from the Riverine physiographic zone is having a direct significant impact on downstream ecosystems, both the New River and Jacobs River estuaries are showing signs of degradation and decreasing water quality, and the Riverine zone's contribution to the nitrogen load may be disproportionate to land area.~~

~~The issue is different in the Central Plains physiographic zone, where dry, cracking soils in summer and autumn provide a direct pathway to aquifers which contribute to base flow for surface water. Aquifers have elevated nitrate levels, and the aquifers are particularly susceptible to nitrate accumulation. Surface water nitrate within the Central Plains zone is the highest of any physiographic zone. In these streams with elevated nitrogen, phosphorus is the limiting nutrient, so even a small increase in phosphorus concentration can cause substantial macrophyte and algal growth, often referred to as 'green streams'.~~

~~In the Peat Wetlands physiographic zone, soils are susceptible to phosphorus and *E.coli* loss. Both *E.coli* and phosphorus are elevated in streams, with increasing trends of phosphorus, and some of the highest *E.coli* levels in Southland. In the Waituna catchment,~~

groundwater phosphorous is 50 times higher in the Peat Wetlands zone compared with the rest of the catchment, which is largely comprised of Gleyed zone, demonstrating the risk of phosphorus losses for Peat Wetlands physiographic zone.

4.2.2. Water Quantity

Water has a range of values, both in-stream and for abstraction and use. Historically, Southland has had an abundance of water, with modest limits on use required. However, more recently there has been increasing demand for the use of water for a variety of activities, and an improved understanding of the linkage between water quantity and quality. The primary allocation thresholds in pSWLP are therefore intended to be precautionary, with fixed allocation limits to be developed and implemented within the FMU sections of this Plan over time.

Surface Water

Rivers, lakes and wetlands support a range of instream values that are largely sustained by a sufficient quantity of water. Out-of-stream uses, such as the abstraction, damming and diversion of surface water, can reduce water quantity and alter flow regimes in water bodies, which can have a number of adverse effects on instream values, including reducing water quality and aquatic habitat, diminishing natural character, amenity, aesthetic and landscape values and impacting on recreational and cultural values and fisheries and harvesting. These effects can be particularly significant during summer when rainfall is less, river levels are low, and the demand for water is at a peak. This can lead to a conflict between instream values and out-of-stream values, and between users.

In terms of surface water allocation, as at March 2015 more than 50% of the primary surface water allocation thresholds had been allocated in the majority of the region. The Waiau catchment is fully allocated as a result of the Manapōuri Power Scheme, which uses water in the Fiordland and Waiau catchments for the generation of renewable energy. The resulting flow regime is highly modified, particularly below the Manapōuri Lake Control Structure (Mararoa weir), whilst supporting a range of biological, recreational, landscape, amenity and other community values.

Groundwater

Southland has considerable ground water resources, occurring in aquifers over wide areas and at varying depths, both in shallow river gravel deposits and in deeper sedimentary rock.

Abstracting groundwater may result in a number of adverse effects including depleting aquifer storage volumes and reducing groundwater availability, interfering with existing bore yields, diminishing surface water flows, and collapsing coastal aquifers and sink holes. The significance of these effects depends on the volume and rate of abstraction and on the characteristics of the aquifer. In addition to abstraction, aquifer levels are influenced by changing land use, land drainage development and rainfall patterns.

Due to the hydraulic connection between ground and surface water resources, consideration of the impact of groundwater abstraction on surface water is important, particularly those water bodies subject to a Water Conservation Order.

As at March 2015, less than 50% of the groundwater primary allocation thresholds had been allocated in the majority of the region. Some aquifers are fully allocated in terms of the primary allocation thresholds or close to this point.

Soil Resources

Soil resources are fundamental to the region's primary production economy, and can assist in maintaining or enhancing water quality and supporting human health, cultural, social and economic activities.

Discharges onto or into land can carry contaminants, including heavy metals, hydrocarbons and biological contaminants, that can create adverse effects on the quality and/or structure of the soil resource. Conversely, some contaminants, when applied appropriately, can have positive effects on the soil resource and plant growth, such as fertilisers and agricultural effluent.

River and Lake Beds

River beds (including beds of streams and modified watercourses) and lake beds have a wide variety of values, including natural, ecological, heritage, cultural and spiritual values, with rivers and lakes used for a range of recreational and cultural activities, including walking, fishing, boating, and food gathering. The use and development of river beds and lake beds also has value for economic, social and community health and safety reasons, which can be broken down into two main categories:

- activities that involve structures, such as bridges, culverts, dams, weirs, pipes, cables, boat ramps, jetties, moorings and flood and erosion control works; and
- activities that disturb the bed, such as gravel extraction, channel realignment, construction activities, vegetation planting and removal, and vehicle and stock access

Some of these activities can have positive effects on the natural environment, for example, bridges and culverts allow access across a river without disturbing the bed. Others have important economic and social benefits, for example, erosion control works protect community assets. However, activities in the beds of rivers and lakes can also have adverse effects on the environment, including generating sediment, disturbing habitat and preventing fish passage.

5 Section 32 Evaluation

5.1 Introduction

Section 5 of the RMA states the purpose of the Act, being the sustainable management of natural and physical resources.

Under the RMA, 'sustainable management' means managing resource use, development and protection so as to enable people and communities to provide for their wellbeing (social, cultural and economic), and health and safety while sustaining resource potential needs for future generations, safe-guarding the environment's life-supporting capacity, and managing activities' adverse environmental effects.

5.2 *Section 32 of the RMA*

The following sections set out the approach taken in this evaluation report to meet the requirements of section 32 of the RMA[74]. Section 32 evaluations are required for all proposed policy statements or plans prepared under the RMA (1st Schedule, Clause 5 (1)(a)). Decision makers are required to have particular regard to section 32 evaluations. The full text of section 32 is set out in Appendix A.

In summary, an evaluation report must examine whether the proposed objectives of pSWLP are the most appropriate way of achieving the purpose of the Act.

An evaluation report must also examine whether the proposed provisions (including policies, rules, associated tables, maps, and schedules) in the pSWLP are the most appropriate way of achieving the objectives. To determine this, the provisions in the pSWLP are grouped in the manner set out below, and an evaluation is then carried out for each group that:

- identifies other reasonably practicable options (section 32(1)(b)(i));
- examines the efficiency and effectiveness of the proposed provisions at achieving the identified objectives (section 32(1)(b)(ii));
- provides an overall evaluation summary of the reasons for deciding on the pSWLP provisions (section 32(1)(b)(iii)); and
- Uses a level of detail in the assessment that corresponds with the scale and significance of the effects anticipated from the implementation of the pSWLP provisions (section 32(1)(c)).

The evaluation does not include full details of the technical assessments undertaken that support the pSWLP**.** A full list of the technical reports and other information relied on is included in the reference list contained in section 3.6.

[74] As noted earlier, it is the version of section 32 that was effective at the time of notification that is relevant for this assessment.

5.3 Appropriateness of Proposed Objectives

Throughout the drafting of the pSWLP, a range of objectives were considered, including the objectives in the Water Plan. The wording of these objectives was tested extensively to determine which would be the most appropriate way to achieve the purpose of the Act. ~~This process has resulted in the creation of the proposed objectives listed below.~~ These objectives were then subject to the public submission and hearing process.

As the Council is yet to undertake the process set out in Policy CA2 of the NPSFM (known in Southland as 'limit setting'), these Objectives are not "freshwater objectives" as defined in the NPSFM.

The pSWLP includes 22 ~~proposes 18~~ objectives. Each objective has been evaluated for relevance, feasibility and acceptability.

- **Relevance** - includes whether the objectives relate directly to a resource management issue and whether they will achieve the purpose of the Act and other higher statutory documents.
- **Feasibility** - includes the degree of risk of unintended or adverse effects and the ability to achieve the objective.
- **Acceptability** - evaluates whether the objectives align with community outcomes and whether they recognise differing value sets.

5.3.1 *Objective 1*

Objective 1 states that: *Land and water and associated ecosystems are sustainably managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between freshwater, land and the coast.*

Appropriateness of Proposed Objective 1

Relevance	This objective is an appropriate way of achieving the direction set out in section 5 of the RMA and also Objective C1 of the NPSFM. The objective sets out that the integrated planning of land, water and the coastal environment is a key outcome of the pSWLP. In this respect, it establishes the Council's view that the sustainable management of natural and physical resources cannot occur in isolation. For example, the management of land resources inevitably impacts on water quantity and water quality. On this basis, the objective is highly relevant to the Council's RMA functions.
Feasibility	This objective relates very closely to the issues that have been identified in the pSWLP and to section 5 of the RMA. This objective has guided the development of the pSWLP policies and rules, and will guide decision making on individual resource consents. The objective is within the Council's authority, as manager of both land and water resources, under section 30 of the RMA, but it is recognised

	that it will also influence the actions of others, particularly those with responsibility for the management of land and the coastal environment.
Acceptability	There was limited responses from the community in relation to this objective, however it was generally supported as it is acknowledged that an integrated resource management approach is required. The submissions on the pSWLP largely supported this objective, with only a small number seeking relatively minor changes.
Overall Appropriateness	Objective 1 is considered appropriate to achieve the purpose of the RMA.

5.3.2 *Objective 2*

Objective 2 states that: Water and land is recognised as an enabler of primary production and the economic, social and cultural wellbeing of the region.

Appropriateness of Proposed Objective 2

Relevance	This objective is an appropriate way of achieving the direction set out in sections 5, 6(e), 7(aa), 7(c), 7(d), 7(f) and 7(g) of the RMA. The objective recognises the key importance of water and soils to the Southland community, particularly in terms of primary production and economic, social and cultural outcomes. This objective also achieves the direction set out in Objectives A4 and B5 ~~A1 and B1~~ of the NPSFM.
Feasibility	The objective will guide decision making, particularly on resource consents, and will also guide the decision making of others, including territorial authorities with respect to land use changes, applicants and other managers of land and water resources. Only some elements of the objective are within the Council's control under section 30. Other elements, including the wider appreciation of water and land are reliant on a philosophical approach to water and land by the wider community. In this respect, the pSWLP and the actions of the Council will influence the actions of others.
Acceptability	Overall, this objective is considered well aligned with the community's views as water and land are highly valued resources within the Southland Region. The submissions on the pSWLP largely supported this objective. However, a significant number sought greater recognition of the economic implications, hence the specific recognition of 'primary production'. Conversely some submitters sought greater recognition of environmental constraints.

Overall Appropriateness	Objective 2 is considered appropriate to achieve the purpose of the RMA.

5.3.3 *Objective 3*

Objective 3 states that: *The mauri ~~(inherent health)~~ of waterbodies provide for te hauora o te tangata (health and mauri of the people), te hauora o te taiao (health and mauri of the environment) and te hauora o te wai (health and mauri of the waterbody).*

Appropriateness of Proposed Objective 3

Relevance	This objective is an appropriate way of achieving the direction set out in section 6(e) and 7(a) of the RMA and also the concept of Te Mana o te Wai which is introduced through ~~the o~~Objective AA1 ~~s and policies~~ of the NPSFM. This objective requires that resources within the region are managed to ensure that cultural resources found in the region's waterbodies are of a quality and abundance that is sufficient to support cultural, physical and social health and well-being.
Feasibility	The Council has the appropriate functions under section 30 to ensure this objective can be achieved both over the lifetime of the proposed Plan and into the future.
Acceptability	There was some confusion within the community as to how this objective is measured and achieved. However, it is considered that the intent of the objective is well aligned with the community's views in relation to the management of natural resources within the region. These sentiments were largely repeated through the submissions on the pSWLP.
Overall Appropriateness	Objective 3 is considered appropriate to achieve the purpose of the RMA.

5.3.4 *Objective 4*

Objective 4 states that: *Tā~~a~~ngata whenua values and interests are identified and reflected in the management of freshwater and associated ecosystems.*

Appropriateness of Proposed Objective 4

Relevance	The objective is an appropriate way of recognising a number of statutory and planning documents, including sections 5, 6(e), 7(a), 7(aa) and 8 of the RMA, Objective D1 and policy D1 of the NPSFM and Chapter 3 of the pRPS. This objective introduces the strong relationship Ngāi Tahu have with the water and land of the region, and the need to protect that relationship.

Feasibility	The objective will guide decision making, particularly at a resource consent level, and with respect to the identification and recognition of Ngāi Tahu values in decision making. With positive action by the Council, the objective is able to be achieved, with low risk of poor outcomes. Aspects of the objective are within the control of the Council, however it is recognised that the objective is aspirational, and is reliant on the actions of others. This includes Ngāi Tahu continuing to be actively involved in the management of land and water.
Acceptability	There were limited responses from the community in relation to this objective, however it is considered that the proposed objective provides for the outcomes sought by ~~T~~taā~~a~~gata whenua, which aligns with the wider community's view on the management of freshwater and associated ecosystems. A small number of submissions were lodged on this Objective, with the majority being in support.
Overall Appropriateness	Objective 4 is considered appropriate to achieve the purpose of the RMA.

5.3.5 *Objective 5*

Objective 5 states that: *Ngāi Tahu have access to and sustainable customary use of, both commercial and non-commercial, mahinga kai resources, nohoanga, mātaitai and taiāpure.*

Appropriateness of Proposed Objective 5

Relevance	This objective relates strongly to Ngāi Tahu values for water bodies and recognises that they are important for use by the community, and Ngāi Tahu in particular, for recreational, cultural, food gathering and commercial activities. This objective is an appropriate way of achieving the direction set out in sections 5, 6(a), 6(c), 6(d), 6(e), 7(a), 7(aa), 7(d) and 8 of the RMA, and takes guidance from Ngāi Tahu planning documents and other statutory documents, such as the NPSFM and ~~p~~RPS.
Feasibility	Aspects of the objective are within the control of the Council. However, it is recognised that the objective is positive and directive, with respect to Council functions. There are likely to be discussions and arguments as to how this Objective will be given effect to. However, it is implemented through a number of policies and rules in the pSWLP, which will help give a better understanding of Ngāi Tahu values and aspirations.
Acceptability	There was limited responses from the community in relation to this objective, however it is considered that the ~~proposed~~ objective provides for the outcomes sought by Ngāi Tahu.

	A small number of submissions were lodged on this Objective, with the majority being in support.
Overall Appropriateness	Objective 5 is considered appropriate to achieve the purpose of the RMA.

5.3.6 *Objective 6*

Objective 6 states that: *There is no reduction in the overall quality of freshwater, and water in estuaries and coastal lagoons, by:*

(a) maintaining the quality of water in waterbodies, estuaries and coastal lagoons, where the water quality is not degraded; and

(b) improving the quality of water in waterbodies, estuaries and coastal lagoons, that have been degraded by human activities.

Appropriateness of Proposed Objective 6

Relevance	This objective relates to a primary function under the RMA, in terms of protection of ecosystems. This protection of ecosystems includes all animal and plant life, including humans. It is particularly relevant to sections 5, 6(c), and 7(d) of the RMA. Furthermore, this objective achieves the purpose set out in Policy 21 of the NZCPS which requires that the where coastal water quality has deteriorated, priority shall be given to the improving water quality. The Objective also achieves the Council's obligations as set out in Objective A2 of the NPSFM, and is in accordance with the direction set out in Objectives WQUAL.1 and WQUAL.2 of the ~~p~~RPS. While the objectives and policies of Chapter 4 of the RPS do not refer to "overall water quality", this is the wording used in the NPSFM, which is considered to be the superior document, and "overall" water quality is likely to be more achievable.
Feasibility	The objective will be a useful guide to decision making, but also in setting the parameters for flow regimes and water quality states, and the scientific investigation required. This Objective will also be given effect to through the FMU limit setting process. The objective is strongly reliant on the Council's functions under section 30, particularly with respect to the management of water. The objective will also influence the activities of others, and expectations with respect to surface water bodies in terms of quality and quantity limits.
Acceptability	It is acknowledged within the community that the direction of this objective is required by the NPSFM. As such, the approach proposed is generally supported. While there was support for this Objective through submissions on the pSWLP, a significant number questioned how 'restrictive' the notified objective would be.

Overall Appropriateness	Objective 6 is considered appropriate to achieve the purpose of the RMA.

5.3.7 *Objective 7*

Objective 7 states that: *Any further over-allocation of freshwater (water quality and quantity) is avoided and any existing over-allocation is phased out in ~~in~~ accordance with freshwater objectives, freshwater quality limits and timeframes established under Freshwater Management Unit processes.*

Appropriateness of Proposed Objective 7

Relevance	The Objective achieves the Council's obligations as set out in the NPSFM. In particular Objective B2 of the NPSFM requires that any further over-allocation of fresh water is avoided, and existing over allocation is phased out. The Objective also recognises the NPSFM planning and limit setting process yet to be undertaken by Council. This objective also achieves the Council's primary function under the RMA, in terms of protection of water quality and sustainable management. This protection of ecosystems includes all animal and plant life, including humans. It is particularly relevant to sections 5, 6(c), and 7(d) of the RMA.
Feasibility	The objective will be a fundamental guide to decision making and adherence to limits. It also provides clear parameters for setting flow regimes and water quality limits. This Objective will also be given effect to through the FMU limit setting process, particularly in the identification of outcomes and limits.
Acceptability	It is acknowledged within the community that the direction of this objective relates to a non-optional function under the NPSFM, in terms of protection of water quality and quantity from over-allocation, as a part of sustainable management. As such, the approach proposed is generally supported. The submissions on this Objective were largely split between those seeking overallocation be addressed immediately, and those seeking clarity that overallocation cannot yet be determined.
Overall Appropriateness	Objective 7 is considered appropriate to achieve the purpose of the RMA.

5.3.8 *Objective 8*

Objective 8 states that:

(a) *The quality of groundwater ~~in aquifers~~ that meets both the Drinking-Water Standards for New Zealand 2005 (revised 2008) and any freshwater objectives, including for connected surface waterbodies, established under Freshwater Management Unit processes is maintained; and*

(b) *The quality of groundwater ~~in aquifers~~ that ~~have been degraded by~~ does not meet Objective 8(a) because of the effects of land use ~~and~~ or discharge activities ~~(with the exception of those aquifers where ambient water quality is naturally less than the Drinking-Water Standards for New Zealand 2005 (revised 2008))~~ is progressively improved so that:*

(1) groundwater (excluding aquifers where the ambient water quality is naturally less than the Drinking-Water Standards for New Zealand 2005 (revised 2008)) meets the Drinking-Water Standards for New Zealand 2005 (revised 2008); and

(2) groundwater meets any freshwater objectives and freshwater quality limits established under Freshwater Management Unit processes.

Appropriateness of Proposed Objective 8

Relevance	Groundwater is a substantial resource for Southland, but is vulnerable to over-allocation and the shallow, unconfined aquifers are particularly susceptible to contamination. Southland is reliant upon the sustainable use of groundwater, in terms of recharge rates and maintaining the high quality of the available groundwater, particularly from diffuse discharges, and improving the quality when it has been degraded by land use and discharges. This objective achieves the direction set out in section 5 in terms of sustainable management, along with sections 6(a), 7(b), 7(d) and 7(g), and requires improvement of groundwater where basic water quality standards are not being met, which will assist with alignment with the Drinking Water NES. The Objective also recognises the NPSFM planning and limit setting process yet to be undertaken by Council. ~~It is also considered that the proposed objective achieves the direction set out in the NPSFM.~~
Feasibility	This objective will guide decision making in relation to discharges and land use where these may affect the quality of groundwater. This objective is within the Council's functions to implement, particularly through the setting of limits on groundwater quality and quantity. The Council, through both regulation, and community expectations, has a significant role in protecting drinking water.
Acceptability	The quality of water, and particularly drinking water, is highly valued by the Southland community. As such, is it considered that this objective aligns with the outcomes sought by the community. While there was support for this Objective through submissions on the pSWLP, a number sought greater clarity in the objective and more focus on outcomes.
Overall Appropriateness	Objective 8 is considered appropriate to achieve the purpose of the RMA.

5.3.9 *Objectives 9 and 9A*

Objective 9 states that:

~~(a)~~ The quantity of water in surface waterbodies is managed so that aquatic ecosystem health, life-supporting capacity, outstanding natural features and landscapes, ~~recreational values,~~ and natural character~~, and historic heritage values of surface waterbodies and their margins~~ are safeguarded.~~; and~~

Objective 9A states:

~~(b) *Provided (a) is met, water is*~~ *Surface water is sustainably managed* ~~*available both instream and out of stream*~~ *to support the reasonable needs of people and communities to provide for their social, economic and cultural wellbeing.*

Appropriateness of Proposed Objectives 9 and 9A

Relevance	These objectives ~~This objective~~ seek~~s~~ to safeguard ecosystems, life-supporting capacity and natural character, and to make water available for economic and social activities, and to ensure that the water that is available is used in a way that maintains environmental and social values. These objectives ~~This objective~~ achieve~~s~~ the purpose set out in sections 5, 7(b), 7(g), and 7(j) of the RMA. Maintaining sustainable use of water and obtaining community value from water is also a key tenet of the NPSFM and also Objective WQUAL 1 of the ~~p~~RPS.
Feasibility	These objectives ~~This objective~~ will assist decision making, both in terms of policies and rules of the pSWLP, the decisions of applicants and other parties when preparing applications and designing systems, and in terms of developing the FMU sections of the pSWLP. The majority of the outcomes of these objectives ~~This objective~~ are within the functions of the Council, as detailed in section 30. Other aspects of implementation will be reliant on the actions of others, particularly major water users and these objectives ~~This objective~~ will influence their actions. The prioritising of environmental and social values of water reflects the national direction provided by the RMA and NPSFM.
Acceptability	A few parties have expressed concern with the direction suggested within the notified objective with respect to ~~This objective. They consider that the values protected within the objective do not align with those set out in the NPSFM, particularly the reference to the~~ historic heritage values. ~~However, it is noted that the RMA does not prevent the Council from protecting additional values not specified within the NPSFM, provided the additional values protected achieve the direction set out in section 5 of the RMA.~~
Overall Appropriateness	Objectives 9 and 9A are ~~is~~ considered appropriate to achieve the purpose of the RMA.

5.3.10 Objective 9B

Objective 9B states: *The effective development, operation, maintenance and upgrading of Southland's regionally significant, nationally significant and critical infrastructure is enabled.*

Appropriateness of Proposed Objective 9B

Relevance	This objective recognises the importance of regionally and nationally significant infrastructure and critical infrastructure to the economic, cultural and social wellbeing of the people and communities of Southland. This objective relates to sections 5 and 7(b) of the RMA. This objective also achieves the direction set out in the NPSREG, the NPSET and the RPS. Further, it gives effect to Objectives A4 and B5 of the NPSFM by better enabling communities to provide for their economic well-being, including productive economic opportunities.
Feasibility	This objective will guide decision making, particularly on the FMU processes to follow. Also, it provides some certainty to applicants and other decision makers, as to the value of this infrastructure to the community. The outcomes sought in this Objective are within the functions of the Council, as detailed in section 30(1)(a) of the RMA.
Acceptability	This Objective was introduced in response to submissions on the notified Plan.
Overall Appropriateness	Objective 9B is considered appropriate to achieve the purpose of the RMA.

5.3.11 Objective 10

Objective 10 states: *The national importance of ~~the~~ existing hydro-electric generation schemes, including the Manapōuri ~~Power S~~ hydro-electric generation scheme in the Waiau catchment, is provided for, ~~and~~ recognised in any resulting flow and level regime, and their structures are considered as part of the existing environment.*

Appropriateness of Proposed Objective 10

Relevance	This objective recognises the importance of the existing Manapouri Power Scheme to the economic, cultural and social wellbeing of the people and communities of Southland. This objective relates to sections 7(b), 7(ba), 7(f) and 7(j) of the RMA. This objective also achieves the direction set out in Objective WQUAN.2 of the ~~p~~RPS, which requires that the allocation and use of Southland's water resources recognise and makes provision for the existing hydro-electric generation schemes in the Waiau catchment, specifically through recognition of the structures as a part of the existing environment. The objective achieves the direction set out in the NPSFM, as

	hydro-electric power generation is listed as an other ~~additional~~ national value in Appendix 1 of the NPSFM. Furthermore, the objective achieves the direction set out in the NPS-REG.
Feasibility	This objective will guide decision making, particularly on the FMU processes to follow. Recognition of the structures (but not water takes and discharges) as part of the existing environment is consistent with case-law. Also it provides some certainty to applicants and other decision makers, as to the value of this infrastructure to the community. The outcomes sought in this Objective are within the functions of the Council, as detailed in section 30 of the RMA.
Acceptability	The Manapouri Power Scheme has long been recognised in the community as having national significance. As such, it is considered that Objective will align with the outcomes sought by the community. This Objective received considerable comment through the submissions process, with most submitters opposed or seeking changes.
Overall Appropriateness	Objective 10 is considered appropriate to achieve the purpose of the RMA.

5.3.12 *Objective 11*

Objective 11 states that: *The amount of water abstracted is shown to be reasonable for its intended use and n~~W~~ater is allocated and used efficiently.*

Appropriateness of Proposed Objective 11

Relevance	This objective seeks recognition of the key importance of the efficient allocation and use of water. This objective is relevant to almost all of the pSWLP, and is closely derived from section 5 of the RMA. Efficient use and obtaining the maximum value from water is also a key tenet of the NPSFM and the pRPS, particularly Objectives B3, A4 and B5 and Policies B2, B3, and B4 of the NPSFM and Objective WQUAN.2 and Policy WQUAN.6 of the ~~p~~RPS.
Feasibility	This objective will assist decision making, both in terms of policies and rules of the pSWLP, the decisions of applicants and other parties when preparing applications and designing systems, and in terms of developing the FMU sections of the pSWLP. The ~~majority of the~~ outcomes of this Objective are within the functions of the Council, as detailed in section 30(1)(e). Other aspects of implementation will be reliant on the actions of others, including water users such as territorial authorities and irrigators, and this Objective will influence their actions and the non-regulatory actions of the Council.

Acceptability	There were limited responses from the community in relation to this objective. However, the objective is generally supported by the community as it is acknowledged that the efficient allocation and use of water is an appropriate outcome. Through the submission process, the Objective was largely supported, with several seeking additional emphasis that water taken be 'matched' to the intended use.
Overall Appropriateness	Objective 11 is considered appropriate to achieve the purpose of the RMA.

5.3.13 *Objective 12*

Objective 12 states that: *Groundwater ~~levels~~ quantity is sustainably managed, including safeguarding the life-supporting capacity, ecosystem processes and indigenous species of~~, and minimum~~ surface water bodies ~~flows~~ where ~~these are~~ their flow is, at least in part, derived from groundwater~~, are maintained~~.*

Appropriateness of Proposed Objective 12

Relevance	Groundwater is a substantial resource for Southland, but it is reliant upon its sustainable use, in terms of recharge rates and maintaining the high quality of the available groundwater. This objective recognises both the value of groundwater for abstraction and also the need to sustainably use it so that flows in lowland streams and springs are maintained so that the life-supporting capacity, ecosystem processes and indigenous species are safeguarded, where the groundwater proves a base flow in these waterbodies. This objective achieves the direction set out in section 5 in terms of sustainable management, along with sections 6(a), 7(b), 7(d) and 7(g). Further, it gives effect to Objective B1 of the NPSFM.
Feasibility	This objective will guide decision making as it recognises the balance to be struck between the needs of abstractors for groundwater resources and the relationship between groundwater and surface water and its consequent impacts on ecosystems and social and cultural use. The outcomes sought within this Objective are within the functions of the Council, as detailed in section 30 of the RMA. This objective is within the Council's functions to implement, particularly through the setting of limits on groundwater quality and quantity. On this basis, it is strongly related to the NPSFM and the ~~p~~RPS.
Acceptability	There were limited responses from the community in relation to this objective. However, the objective is generally supported by the community as it is acknowledged that the maintenance of groundwater levels, and minimum surface water flows is an appropriate outcome.

	Through the submission process, the Objective was largely supported, with several seeking additional emphasis on sustainable abstraction of groundwater.
Overall Appropriateness	Objective 12 is considered appropriate to achieve the purpose of the RMA.

5.3.14 *Objectives 13, 13A and 13B*

Objective 13 states that: *Enable the use and development of land and soils to support the economic, social, and cultural wellbeing of the region.~~; provided:~~*

Objective 13A states:

~~(a) t~~The quantity, quality and structure of soil resources are not irreversibly degraded through land use activities ~~and~~ or discharges to land.~~;~~

Objective 13B states:

~~(b)~~ The discharges of contaminants to land or water that have significant or cumulative adverse effects on human health are avoided.~~; and~~

~~(c) adverse effects on ecosystems (including diversity and integrity of habitats), amenity values, cultural values and historic heritage values are avoided, remedied or mitigated to ensure these values are maintained or enhanced.~~

Appropriateness of Proposed Objective 13

Relevance	These objectives ~~This objective~~ recognise~~s~~ the importance of soils to the Southland community, particularly in terms of economic, social and cultural outcomes. The pSWLP includes a number of policies and rules in order to protect soils. The protection of soils is a long-established function of the Regional Council, and management also needs to be integrated with water quality management. This objective achieves the direction set out in sections 5, ~~6(c),~~ 7(aa), 7(c), ~~7(d),~~ 7(f) and 7(g) of the RMA, and Objective RURAL.1 and Policy RURAL.5 of the ~~p~~RPS.
Feasibility	These objectives ~~This objective~~ will guide decision making, particularly on resource consents, and will also guide the decision making of others, including territorial authorities with respect to land use changes. These objectives ~~This objective~~ are ~~is~~ within the Council's functions under section 30, but it is recognised that achievement of these objectives ~~This objective~~ will also rely on the actions of others, particularly land owners and territorial authorities.
Acceptability	There was a wide variety of responses in relation to these objectives ~~This objective~~. Based on these responses a number of amendments were made to the objectives. As a result of these amendments, it is considered that these objectives are ~~This objective is~~ generally supported as it is acknowledged that use and development of land and soils is an appropriate outcome.

	Submissions on these objectives were largely supportive, but sought a range of detailed wording changes, primarily related to what expectations should be set for the protection of soil resources.
Overall Appropriateness	Objectives 13, 13A and 13B are ~~is~~ considered appropriate to achieve the purpose of the RMA.

5.3.15 *Objective 14*

Objective 14 states that: *The range and diversity of indigenous ecosystem types and habitats within ~~dryland environments,~~ rivers, estuaries, wetlands and lakes, including their margins, and their life-supporting capacity are maintained or enhanced.*

Appropriateness of Proposed Objective 14

Relevance	This objective seeks to protect the range and diversity of indigenous ecosystem types and habitats and also recognises the need to enhance certain waterbodies such as wetlands. It is relevant to section 5 of the RMA, particularly in respect to the life supporting capacity of ecosystems and the requirements of sections 6(a), 6(c), 6(e), 7(d) and 7(f). This objective achieves the direction set out in Policy 11 of the NZCPS, to the extent addressed by this Plan, which requires that indigenous biological diversity is protected in the Coastal Environment. It also achieves the direction set out in Objectives A1 and B1 of the NPSFM, and Objective WQUAL.1 of the ~~p~~RPS.
Feasibility	This objective will guide decision making, both with respect to the pSWLP, including the development of the FMUs. It will also guide decision making on individual consents, given that the rules in the pSWLP at a regional level require resource consent for many activities within waterbodies and almost all activities in wetlands. This objective also follows the guidance given in the NPSFM and the ~~p~~RPS. The objective is largely within the Council's control under section 30, but it is recognised that certain waterbodies and other marginal areas are also subject to overlapping controls with territorial authorities, and are often within private ownership. This objective will help to guide other agencies, but will also be reliant on non-regulatory methods to implement.
Acceptability	There were limited responses from the community in relation to this objective, however it is generally supported as it is acknowledged that the maintenance or enhancement of the range and diversity of indigenous ecosystem types is an appropriate outcome. This Objective was largely supported through the submissions process.

Overall Appropriateness	Objective 14 is considered appropriate to achieve the purpose of the RMA.

5.3.16 *Objective 15*

Objective 15 states that: *Taonga species, as set out in Appendix M, and related habitats, are recognised and provided for.*

Appropriateness of Proposed Objective 15

Relevance	This objective seeks to ensure that the part of the redress package agreed to by Ngāi Tahu and the Crown under the Ngāi Tahu Claims Settlement Act that relates the protection of taonga species is implemented within the Plan. This objective achieves the direction set out in section 6(e), 7(a), and 8 of the RMA, as the objective provides for the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga. This objective also achieves the direction set out in Policy 2 of the NZCPS, and Objective TW.4 of the ~~p~~RPS.
Feasibility	The objective will be a fundamental guide to decision making when considering applications which manage activities that may adversely affect taonga species. The objective is within the Regional Council's functions in terms of section 30 of the RMA. The Objective also acknowledges the direction set out in the Ngāi Tahu Claims Settlement Act 1998.
Acceptability	This objective is considered well aligned with the community's views, as it is consistent within the direction set out within the Ngāi Tahu Claims Settlement Act 1998. This Objective was largely supported through the submissions process.
Overall Appropriateness	Objective 15 is considered appropriate to achieve the purpose of the RMA.

5.3.17 *Objective 16*

Objective 16 states that: *Public access to, and along, river (excluding ephemeral rivers) and lake beds is maintained and enhanced, except in circumstances where public health and safety or significant indigenous biodiversity values are at risk.*

Appropriateness of Proposed Objective 16

Relevance	The objective seeks to ensure that the public is able to access rivers and lake beds except in particular circumstances. The objective achieves the direction set out in sections 6(d), 7(c), 7(d), 7(f) and 7(h) of the RMA, Policy 19 of the NZCPS, and Objective BRL.2 and Policy BRL.4

	of the ~~p~~RPS. The objective also recognises the need for maintenance of physical access, so the social and cultural values may be fulfilled.
Feasibility	It is recognised in the ~~p~~RPS that both regulatory and non-regulatory approaches will be needed to improve water quality, and to provide for access. The achievement of this Objective is strongly reliant on the actions of others.
Acceptability	Public access to river and lake beds can be a contentious issue, but is a commonly accepted preference for the community. The Objective appropriately protects the community and enables flexibility for landowners. There were relatively limited submissions on this Objective, with the majority in support.
Overall Appropriateness	Objective 16 is considered appropriate to achieve the purpose of the RMA.

5.3.18 *Objective 17*

Objective 17 states that: *The natural character values of wetlands, rivers and lakes and their margins, including channel and bed form, ~~bed~~ rapids, seasonably variable flows and natural habitats, are protected from inappropriate use and development.*

Appropriateness of Proposed Objective 17

Relevance	This objective achieves the direction set out in Objective B4 of the NPSFM which requires that the significant values of wetlands and of outstanding freshwater bodies are protected. Furthermore, this objective achieves the direction set out in Objective WQUAL.2 of the ~~p~~RPS, which seeks to halt the decline of and improve water quality in lowland water bodies and coastal lakes, lagoons, tidal estuaries, salt marshes and coastal wetlands. Policies 11, 13, and 15 of the NZCPS require the protection of biodiversity, natural character values, and natural features and landscapes within the coastal environment. Policy 14 promotes the restoration and rehabilitation of the natural character of the coastal environment. It is considered that the proposed objective achieves the direction set out in these policies.
Feasibility	The majority of the outcomes of this Objective are within the functions of the Council under section 30 and also the requirement under section 67(3) that regional plans must give effect to a national policy statement. Other aspects of implementation will be reliant on the actions of others, including water users such as territorial authorities and irrigators, and this Objective will influence their actions and the non-regulatory actions of the Council.
Acceptability	It is acknowledged within the community that the direction of this objective is required by the NPSFM, the NZCPS

	and the ~~p~~RPS. As such, the approach proposed is generally supported. There were relatively limited submissions on this Objective, with the majority in support.
Overall Appropriateness	Objective 17 is considered appropriate to achieve the purpose of the RMA.

5.3.19 *Objective 18*

Objective 18 states that: *All activities operate in accordance with ~~at~~ "good ~~(environmental)~~ management practice" or better to optimise efficient resource use, safeguard the life supporting capacity of ~~and protect~~ the region's land~~,~~ and soils, and maintain or improve the ~~water from~~ quality and quantity of the region's water resources. ~~degradation.~~*

Appropriateness of Proposed Objective 18

Relevance	This objective recognises an overall aim of the pSWLP to encourage good practice by all water and land users in the Region, irrespective of activity status under the pSWLP. This objective achieves the direction set out in section 5 of the RMA which seeks the sustainable management of natural and physical resources.
Feasibility	The good practice element of the objective is highly relevant to decision making with respect to resource consents, but also the activities of others, particularly land and water users, and recognises community expectations. While only some elements of the objective are within the Council's functions under section 30, this objective influences the approach taken within the pSWLP, which will flow through decision making and the expectations of others.
Acceptability	It is considered that the intent of the objective is well aligned with the community's views in relation to ensuring that all activities operate at "good (environmental) management practice" or better. However, there is some confusion within the community as to the definition of "good (environmental) management practice". This objective received a large number of submissions, with many in support of the overall concept, but less comfortable with how it would be implemented, considered it was too uncertain, particularly as to what constituted "good management practice", or it lacked balance, particularly with respect to economic outcomes.
Overall Effectiveness	Objective 18 is considered appropriate to achieve the purpose of the RMA.

5.3.20 *Conclusion on Objectives*

Considering the assessment above, Environment Southland considers that the objectives of the pSWLP are the most appropriate way to achieve the purpose of the RMA.

5.4 Appropriateness of Provisions

5.4.1 Grouping of Provisions

For the purposes of evaluation, the provisions have been grouped into topics as set out below. This approach has been taken to the grouping of provisions for evaluation purposes because these issues are the drivers behind the pSWLP. Due to the interrelated nature of the issues, the responses proposed to address them (i.e. the provisions in the pSWLP) are an integrated package, and therefore the evaluation, while broken into topic groupings, should be considered as a whole.

The pSWLP represents a change in management of water and land from the current Water and RELAP Plan to ensure that ES is adapting to changing legislative requirements and water quality issues that have arisen. The groups of provisions are separated into three groups, based on the significance of the change from the Water Plan and RELAP to the pSWLP; these being minor changes, mid-level changes and a set of matters that require more significant changes.

The matters that require more significant changes and that have been analysed in more depth are:

- incorporating Ngai Tahu values;
- diffuse nutrient discharges/farming;
- stock exclusion; and
- cultivation.

The mid-level changes seek to better give effect to the intent of current provisions and ensure that the activity status of activities is commensurate with their anticipated effects, including ensuring that similar activities are treated consistently across the pSWLP. These groups of provisions are:

- vertebrate pest control;
- tile drains;
- dust suppressants;
- discharges (point-source, cemeteries, solid animal and vegetative wastes, horticultural wash-water);
- water takes (permitted activity thresholds and schedules);
- drinking water protection;
- wetlands;
- effluent systems (commercial/community and domestic); and
- effluent storage.

The minor changes are not substantive and are often technical corrections of omissions, improvements to certainty and clarity, and drafting improvements from the RELAP and Water Plans.

5.4.2 Approach to Efficiency and Effectiveness Assessments

The assessment of the efficiency and effectiveness of the proposed provisions relates to the achievement of the pSWLP objectives. The full list of pSWLP objectives are set out and discussed above. While all the objectives must be considered, some are more relevant than others for evaluation of particular groupings of provisions. Both efficiency and effectiveness are therefore assessed against the particularly relevant objectives for each group of provisions.

The efficiency and effectiveness assessment identifies and assesses the benefits and costs of the environmental, economic, social, and cultural effects anticipated from the implementation of the provisions, including expected changes to economic growth and employment opportunities (section32(2)(a)). Where practicable, costs and benefits are quantified (section32(2)(b)).

When evaluating benefits and costs, the starting point used is the current policy and rule framework of the RELAP and Water Plan. This approach means that the costs and benefits identified are in relation to the status quo. The approach taken in this report essentially provides a comparative assessment between the status quo and the proposed provisions. Where another reasonably practicable option is identified, an assessment of its effectiveness has been undertaken to also provide a comparative assessment. If the alternative is effective, then its efficiency is assessed.

In evaluating the pSWLP provisions, the benefits and costs are broadly thought of as follows:

- impacts on ecosystems, including to their intrinsic values. Generally, these impacts tend to occur in the surrounding area or lower down in the catchment;
- impacts on the stocks and flows of all types of capital: labour, financial, built, and natural capital. These impacts relate to people and communities' ability to provide for their wellbeing;
- impacts are either direct or indirect (i.e. there are flow-on effects);
- impacts have a time dimension. In other words, they occur in the short-term, medium term or long term. These impacts relate to the wellbeing of present and future generations.

Impacts can be observed at different spatial scales, namely local, regional and national, and on individuals or communities. It is important to consider various scales and who is impacted to understand distributional and equity issues.

5.4.3 Scale and significance

Section 32(1)(c) requires that the evaluation report contains a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal.

The level of detail contained in the evaluation sections of this report reflects the scale and significance of the changes proposed. In some cases, no change is predicted from the status quo provided by the pSWLP compared to the provisions in the RELAP and Water Plan and therefore a cost or benefit is not identified.

It is noted that the effects of the provisions will be widespread and will affect many rural properties, as the controls applying to farming activities (in relation to nutrient management) are changing. In other cases, the provisions will simplify the current RELAP and Water Plan approach, for example by providing clear thresholds for permitted activities.

The pSWLP is considered to be an evolutionary change, not a radical departure from the current approach to resource management in Southland. The evaluation sections have taken these considerations into account, and therefore the level of detail in the analysis corresponds with the scale and significance of the proposed changes.

~~5.5 Overall Plan Structure and FMU Sections~~

~~The basic structure of a regional plan is set out in section 67 of the RMA. The pSWLP follows a simple and conservative structure of having objectives, policies and rules. These are supported by a number of appendices and a series of planning maps. The pSWLP is a departure from the existing Water Plan and RELAP Plan, in that the pSWLP has fewer of the optional components in section 67, and does not have explanations to objectives, polices or rules. The one optional component that the plan has is a statement of issues, in the introductory sections of the Plan.~~

~~The structure of the pSWLP has been developed to enable the addition of components resulting from the FMU processes that are about to commence. The FMU processes are in response to the requirements of the NPSFM, primarily Objective CA1 and Policies CA1 to CA4. As has been detailed above, the Council has identified the relevant FMUs, and has published a staged implementation programme, in accordance with part E of the NPSFM.~~

~~Policies 44 to 47 and Rule 2 of the pSWLP provide context for the development and incorporation of the FMU sections. Whether these FMU sections are standalone chapters, or are integrated into the pSWLP polices and rules is yet to be determined. However, these policies and the rule establish the basic construct for developing FMU responses.~~

~~Policies 44 to 47 and Rule 2 are considered by Environment Southland to be effective and efficient, in that they provide certainty and clarity as to the process to be undertaken, and therefore reduce cost through the specification of a process to be followed consistently across the region. These policies have the specific support of Ngāi Tahu, and align closely with the requirements of the NPSFM.~~

~~Environment Southland is satisfied that Policies 44 to 47 and Rule 2, along with the overall plan structure, are the most appropriate way to achieve the objectives of the pSWLP, and Environment Southland is satisfied that the structure of the pSWLP provides a considerable improvement in terms of clarity and certainty over the Water and RELAP Plan structures.~~

6 Significant changes

6.1 Cultivation

6.1.1 Introduction

This section of the section 32 report assesses the provisions relating to cultivation within the pSWLP.

The proposed provisions manage cultivation on sloping ground primarily through setbacks from waterways, with setback distances increasing with increasing slope. The provisions aim to prevent soil loss into waterways. This has benefits for soil conservation, water quality, and in- and near-stream habitats and ecosystems.

6.1.2 Statutory Context

6.1.2.1 Resource Management Act 1991 (RMA)

Section 30(1)(c) of the RMA states that every regional council shall control the use of land for the purpose of soil conservation, the maintenance and enhancement of ecosystems in water bodies and coastal water, and the maintenance and enhancement of the quality of water in water bodies and coastal water. In addition, the Council is responsible for the establishment, implementation, and review of objectives, policies, and methods for maintaining indigenous biological diversity.

6.1.1.1 Regional Policy Statements

Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. ~~There are two relevant Regional Policy Statements, the Southland Regional Policy Statement 1997 (RPS), and the proposed Southland Regional Policy Statement (pRPS).~~

~~Part 2 of the RPS lists soil loss and degradation from cultivation (among other activities) as a resource management issue relevant to Southland.~~

~~Objective 8.2 requires adverse effects arising from sedimentation and nutrient runoff from land into waterbodies to be avoided wherever practicable. This is supported by Method 8.9, which specifies regional plans as a method to address disturbance of soil differently for different land types, sighting steep slopes as an example of where different management techniques may be applicable.~~

The relevant sections of the ~~p~~RPS in relation to the effects of cultivation include Chapter 4: Water, Chapter 5: Rural Land/Soils and Chapter 6: Biodiversity.

Objective WQUAL.1 requires that water quality in the region: safeguards the life-supporting capacity of water and related ecosystems and the health of people and communities. This is supported by Policy WQUAL.1 which requires that discharges and

land uses activities are managed to maintain water quality, or improve it, to ensure freshwater objectives are met.

Policies RURAL.3 and RURAL.5 both focus on the effects of development of land for rural activities, including the potential for soil loss and sedimentation from developing steep land.

Objective BIO.2 requires that maintenance and protection of indigenous biodiversity in Southland and the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna for present and future generations. Objective BIO.3 requires the range, extent and condition of indigenous biodiversity in Southland is enhanced, with a particular emphasis on those areas most at risk to further loss or degradation. These objectives are supported by:

- Policy BIO.2 which requires that areas of significant indigenous vegetation and significant habitats of indigenous fauna in the Southland region are protected and where appropriate enhanced.
- Policy BIO.5 which requires that biodiversity initiatives are encouraged, promoted and supported to retain, maintain and restore or enhance coastal, aquatic, and terrestrial ecosystems and habitats.
- Policy BIO.7 which requires that an active and integrated management approach to maintaining and restoring or enhancing indigenous biodiversity is promoted, through methods including the Regional Pest Management Plan for Southland, and advice and information on pest management, fencing and planting.

6.1.3 Relevant Objectives of the pSWLP

The RMA requires an examination of whether the provisions in the proposal are the most appropriate way to achieve the pSWLP objectives. The relevant proposed objectives of the pSWLP are:

Objective 1 *Land and water and associated ecosystems are sustainably managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between freshwater, land and the coast.*

Objective 2 *Water and land is recognised as an enabler of primary production and the economic, social and cultural wellbeing of the region.*

Objective 6 *There is no reduction in the overall quality of freshwater, and water in estuaries and coastal lagoons, by:*

(a) maintaining the quality of water in waterbodies, estuaries and coastal lagoons, where the water quality is not degraded; and

(b) improving the quality of water in waterbodies, estuaries and coastal lagoons, that have been degraded by human activities.

Objective 13 *Enable the use and development of land and soils to support the economic, social, and cultural wellbeing of the region.~~, provided:~~*

Objective 13A ~~(a) t~~*The quantity, quality and structure of soil resources are not irreversibly degraded through land use activities ~~and~~ or discharges to land~~.~~;*

Objective 13B ~~(b)~~ *The discharges of contaminants to land or water that have significant or cumulative adverse effects on human health are avoided~~.; and~~*

~~(c) adverse effects on ecosystems (including diversity and integrity of habitats), amenity values, cultural values and historic heritage values are avoided, remedied or mitigated to ensure these values are maintained or enhanced.~~

Objective 14 *The range and diversity of indigenous ecosystem types and habitats within ~~dryland environments,~~ rivers, estuaries, wetlands and lakes, including their margins, and their life-supporting capacity are maintained or enhanced.*

Objective 17 *The natural character values of wetlands, rivers and lakes and their margins, including channel and bed form, ~~bed~~ rapids, seasonably variable flows and natural habitats, are protected from inappropriate use and development.*

Objective 18 *All activities operate in accordance with ~~at~~ "good ~~(environmental)~~ management practice" or better to optimise efficient resource use, safeguard the life supporting capacity of ~~and protect~~ the region's land~~,~~ and soils, and maintain or improve the ~~water from~~ quality and quantity of the region's water resources. ~~degradation.~~*

6.1.4 Overview of practical options

Environment Southland has considered three reasonably practicable options (as required under section 32(b)(i) RMA) for managing the adverse effects of cultivation to assist in achieving the objectives of the pSWLP. These are as follows:

- Option A – (Status quo) - No setbacks for cultivation, 3 m setbacks for intensive winter grazing
- Option B – (pSWLP decisions provisions) - Setbacks from waterways increase to 5 metres ~~ing with slope~~, consent required for cultivation over 800 ~~700~~ m above sea level or 20 degrees slope.
- Option C - (Hill and high country provisions) - Applies to land over 200 m above sea level. Setbacks from waterways, gullies and swales, consent required over 700 m above sea level or establishment of fodder crop on slopes greater than 20 degrees.

6.1.4.1 *Scale and Significance*

Section 32(1)(c) requires that when examining whether the provisions in the proposal are the most appropriate way to achieve the objectives, the analysis must contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal. The proposed provisions within this section relate to improving the controls over cultivation, in order to limit sedimentation risk. It is considered that the provisions will increase the level of involvement the Council has in consenting cultivation activities. As such, the scale and significance is considered to be high. The level of detail in the analysis below corresponds with the higher level of significance.

6.1.4.2 *Option A – Status quo*

Cultivation is not explicitly regulated under the Regional Water Plan 2010. However, disturbance of lake and river (including a modified water course) beds is a discretionary activity. Cultivation in a river or lake bed would fall under this provision. Additionally, the setback requirement for intensive winter grazing of 3 m for stock exclusion creates a pseudo cultivation setback for cultivation of fodder crop.

6.1.4.3 *Option B – ~~Proposed~~ pSWLP Decisions Provisions*

Option B includes a policy and rule structure for cultivation which aims to deal with both sediment loss into water bodies, and disturbance of the beds of waterbodies caused by cultivation across the region.

Cultivation can be undertaken as a permitted activity provided it is not within 5 metres of a waterbody or wetland, ~~specified distances (setbacks) from waterbodies. The setback distances increase with steeper slope,~~ with resource consent needed above 20 degrees (moderately steep) or 800 ~~700~~ m above sea level. Cultivation within the setbacks can be undertaken as a permitted activity once every 5 years for renewing or establishing pasture provided it is not closer than 3 m to the waterbody and does not involve cultivation for establishing a winter grazing crop. If the permitted activity status cannot be met, cultivation is to be a restricted discretionary activity. Council would restrict its discretion to:

- the management of sediment and other contaminants ~~from critical source areas~~;
- ~~risk to biodiversity and water quality and mitigation measures for addressing those risks; and~~
- monitoring, inspection and audit requirements.

Extent of land potentially affected by Option B[75]

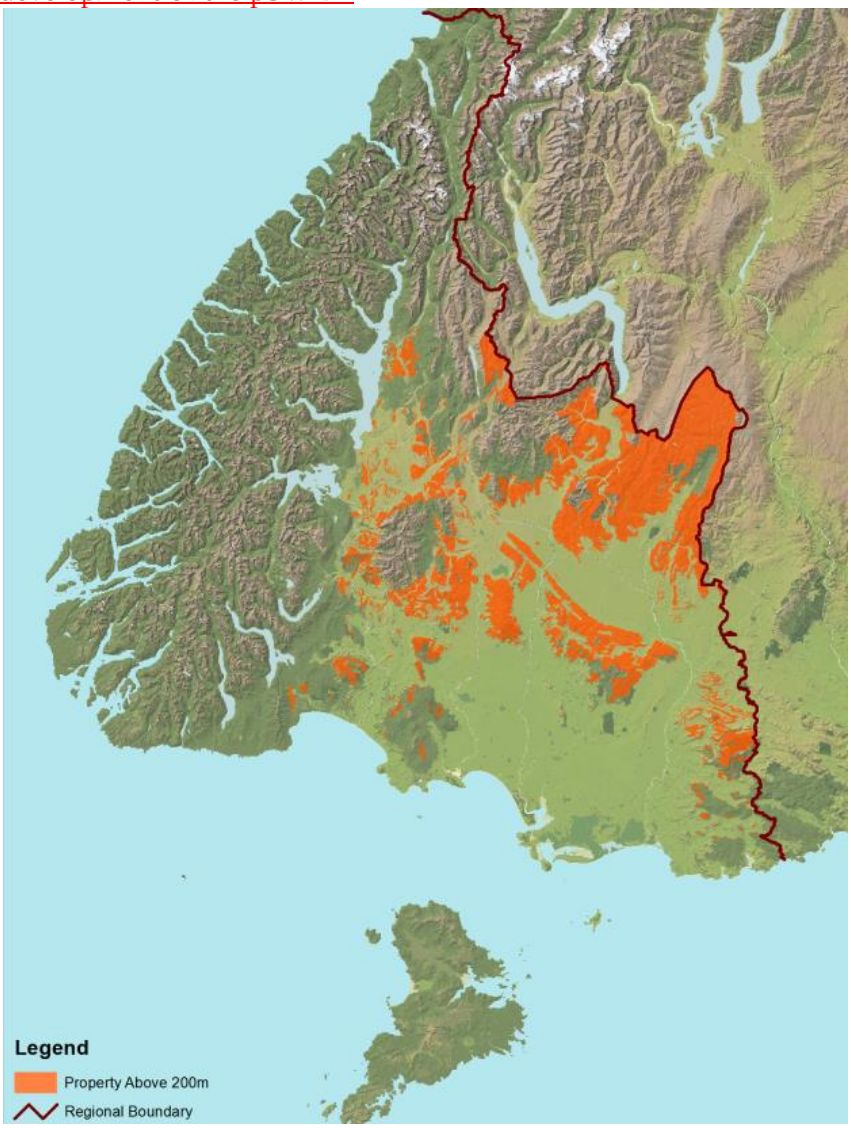
Total area in Southland	3,115,470 ha
Area of agricultural land where permitted activity setbacks would increase from the status quo (slopes below 700 m between 4 and 20 degrees)	326,056 ha
Area of land over 700 m above sea level or over 20 degree slope	170,917 ha
Number of properties with any land over 700 m above sea level or over 20 degree slope	442 Note - 397 of these properties have less than 5 ha over 700m

6.1.4.4 *Option C – Hill and high country proposal*

Option C introduces a new policy and a permitted activity rule for hill and high country development and requires a resource consent for activities that cannot meet the requirements of the permitted activity rule. Hill and high country is defined as land in over 200 m altitude (shown below).

[75] These figures have not been updated to show differences between 700m and 800m above sea level.

The "Hill and high country" proposal generally represents a policy and rule package that was consulted on as a stand-alone plan change to the Regional Water Plan, prior to the development of the pSWLP.



Proposed Hill and High Country Management Area

The new rule would permit hill and high country development, with conditions on:

- altitude of development (i.e. lower than 700 metres about sea level);
- separation distances from water, and gullies and swales; and
- slope of land where fodder crops are going to be established.

Any hill and high country development that cannot meet the permitted activity status would require a resource consent. Applications would be considered as either a controlled activity or discretionary activity. A controlled activity would mean the hill and high country development would be able to occur, subject to conditions. Council would exercise its control over:

- a hill and high country development plan;

- separation distances from water, critical source areas, and gullies and swales;
- the slope of land being developed;
- location of critical source areas; and
- inspection and audit requirements.

A discretionary activity gives the Council discretion as to whether to grant the resource consent or not and is considered on a case-by-case basis. This option also proposes to expand non-regulatory work through increasing awareness and education. The table below provides details on the number of landholdings and areas of land affected by Option C.

Extent of land potentially affected by Option C

Total area in proposed hill and high country management area	1,735,000 ha
Number of landholdings affected by permitted activity	833[76]
Area of landholdings affected by permitted activity	331,000 ha
Number of landholdings potentially requiring discretionary consent (700m above sea level)	65
Area of landholdings requiring discretionary consent	95,000

6.1.5 Assessment of efficiency and effectiveness

Section 32(1)(b)(ii) of the RMA requires the assessment of the 'efficiency and effectiveness' of provisions in achieving the objectives, in a level of detail that corresponds to the scale and significance of the anticipated effects.

Each individual option is evaluated below. First the effectiveness of each option in assisting the achievement of the objectives of the pSWLP is assessed. The following factors have been assessed as part of the effectiveness assessment:

- ***Relevance*** *- includes the extent to which the provisions are targeted to achieve the objectives and the length of time taken to achieve the objective.*
- ***Feasibility*** *– includes the degree of uncertainty of achieving the objectives, degree of risk associated with the provisions (e.g. unintended consequences), ease of implementation (e.g. likelihood of compliance and ability to monitor/enforce).*
- ***Acceptability*** *– level of community and stakeholder acceptance.*

Where options are evaluated as being effective in achieving the objectives in the pSWLP they are subsequently evaluated for their 'efficiency'. Efficiency is about the use of resources (for example, human, financial and natural) as required for a particular policy option to be fully effective in comparison with other options. It also relates to how people will be able to provide for their social, economic and cultural wellbeing now and in the future.

To determine efficiency, the evaluation investigated the anticipated benefits and opportunities, and costs and risks anticipated from the options, taking into account both

[76] This is an approximate figure, it is anticipated the actual number of farms affected will be lower as some landowners may have been counted multiple times as 'land holdings' (certificates of title) have been used, data on actual farm units affected could not be obtained at the time of completing this assessment.

short and longer term, individuals and the wider community. Benefits and opportunities, and costs and risks have been integrated across the four wellbeings (cultural, social, economic and environmental)."

6.1.5.1 *Option A – Status Quo*

Effectiveness

To assist the assessment of effectiveness of Option A, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
1	✓	Relevance: The status quo does little to recognise the connection between freshwater, land and the coast. Doing nothing to address the potential for contaminants, particularly sediment and phosphorous, to enter waterways as a result of cultivation, the risk of which increases with slope. Feasibility: This Option is easy to implement, as there is limited regulation to comply with. Acceptability: Given the effects of sedimentation on waterbodies and estuaries we anticipate this Option will be unacceptable to the community generally.
2	✓✓	While this option recognises land as an enabler of economic wellbeing by minimising regulation, it provides little opportunity to protect land from sediment loss which can be associated with cultivation near waterbodies. Option A also does not recognise water as an enabler of economic, social and cultural wellbeing. The potential effects of cultivation on water quality (particularly sediment and phosphorus) may impact on commercial and recreational uses of water (e.g. water takes, fishing and swimming), community water supplies, mahinga kai resources and the mauri of water, which Option A does not provide for. Feasibility and acceptability as for Objective 1 above.
6	✓	Option A does not contribute to maintaining water quality as negative water quality trends and declining estuary heath are evident in many areas of Southland under the status quo. Feasibility and acceptability as for Objective 1 above.
13, 13A	✓	Objective 13 and 13A: Option A does not contribute to managing soil resources. ~~reducing adverse effects on ecosystems, and avoiding significant impacts on human health.~~ Cultivation near waterways has the potential to adversely affect water quality (particularly phosphorus and sediment), stream bank stability, and riparian and riverine habitat. Feasibility and acceptability as for Objective 1 above.
14	✓	Objective 14: Option A does not contribute to maintaining and improving the range and diversity of indigenous ecosystem types and habitats. This is because cultivation near waterbodies can damage these ecosystems and habitats. Feasibility and acceptability as for Objective 1 above.

17	✓	Objective 17: Under Option A, cultivation near waterbodies may result in continued loss of natural character of wetlands river and lakes. As such, Option A does not contribute to Objective 17. Feasibility and acceptability as for Objective 1 above.
18	✓	Objective 18: Setbacks for cultivation from waterbodies is considered good ~~(environmental)~~ management practice. Option A does not require a setback ~~stock exclusion~~, so does not facilitate activities operating at good ~~(environmental)~~ management practice. Feasibility and acceptability as for Objective 1 above.
Average	✓	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Option A is anticipated to have an average effectiveness of one out of five in assisting the achievement of Objectives 1, 2, 6, 13, 13A, 14, 17, and 18 of the pSWLP. This Option will therefore not be assessed for its efficiency as it would not be an appropriate option to implement.

6.1.5.2 *Option B – pSWLP Decisions Provisions*

Effectiveness

To assist the assessment of effectiveness of Option B, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
1	✓✓✓✓	Relevance: Option B recognises the connection between freshwater, land and the coast by regulating land use to reduce impacts on water quality and subsequently coastal environments. Cultivation increases the potential for contaminants, particularly sediment and phosphorous, to enter waterways, either through spraying existing ground cover or mechanical tillage. Feasibility: While the ~~The~~ risk of sediment loss associated with cultivation increases with increasing slope, the practical difficulties of measuring slope, particularly adjacent to waterbodies, means that a single setback distance is feasible and certain. It will also avoid constantly changing setback distances along a river reach, ~~which is reflected in the increasing setbacks required as slopes beside water bodies increases. As a permitted activity standard this is feasible to implement and judge compliance, however, at the boundaries of slope classes, e.g. 15 vs 16 degrees, and as slope varies across a terrace face, some pragmatism will be required in its implementation.~~

		Acceptability of this Option is likely to be enhanced by cultivation within the buffer distances being allowed once every 5 years for pasture renewal to a distance of 3 m from the waterbody. The setback provides protection for wahi tapu, mahinga kai and other taonga tuku iho and progresses towards an abundance of mahinga kai.[77]
2	✓✓✓✓	Option B recognises water and land are enablers of economic, social and cultural wellbeing by providing setbacks from waterways for cultivation. This is likely to have positive effects on water quality, and reduce soil loss during cultivation, with associated positive effects on economic, social and cultural wellbeing. Allowing cultivation within the buffer widths periodically for pasture renewal also recognises the land as an enabler of economic wellbeing. Feasibility and acceptability as for Objective 1 above.
6	✓✓✓	Objective 6: Option B contributes to maintaining water quality by requiring setback from waterways for cultivation and limits cultivation on steeper land.~~, increasing with slope~~. Setbacks are likely to have positive benefits for reducing sediment and phosphorous loss into rivers. Feasibility and acceptability as for Objective 1 above.
13, 13A	✓✓✓✓	Objective 13 and 13A: Setbacks from waterways for cultivation contribute to managing soil resources by reducing soil loss to waterways. ~~Subsequently, this reduces adverse effects on ecosystems, caused by sediment, and avoids significant impacts on human health by reducing stream nutrient inputs.~~ Setbacks and limits cultivation on steeper land are likely to have positive benefits for reducing sediment and phosphorous loss into rivers. Feasibility and acceptability as for Objective 1 above.
14	✓✓✓✓	Objective 14: Setbacks for cultivation contribute to maintaining and improving the range and diversity of indigenous ecosystem types and habitats. Habitats can be damaged by cultivation too close to waterbodies, and both habitats and ecosystems can be adversely affected by sediment and nutrients that may be lost to waterways while ground is exposed. Feasibility and acceptability as for Objective 1 above.
17	✓✓✓✓	Objective 17: Preventing the damage which may be caused by cultivation, and associated contaminant losses, will help protect the natural character of wetlands river and lakes. Feasibility and acceptability as for Objective 1 above.
18	✓✓✓✓	Objective 18: Cultivation setbacks from waterbodies and limits to cultivation on steeper land are ~~is~~ considered good ~~(environmental)~~ management practice. Feasibility and acceptability as for Objective 1 above.
Total	4/5[78]	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

[77] Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations

[78] This is an average based on a review of Objectives 1 to 7 of the Water Plan.

Option B is anticipated to have an average effectiveness score of four out of five in assisting the achievement of Objectives 1, 2, 6, 13, 13A, 14, 17, and 18 of the pSWLP.

Efficiency

The efficiency of Option B has been assessed below. To assist in assessing the efficiency of Option B the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**
Individual	➢ Landowners below 800 ~~700~~m above sea level on slopes less than 20 degrees can continue to cultivate within required setbacks on a limited basis. ➢ Reduction in soil erosion resulting in better quality soil resource. ➢ Reduction of pest species along riparian margins in the longer term as native species regenerate (within 3 m of the waterbody). ➢ Positive effect on water quality downstream e.g. for stock drinking water. ➢ Increase in recreational values of water bodies e.g. fishing. ➢ Retention of vegetation in riparian margins for stock shelter.	➢ Loss of potential production land. ➢ Costs associated with resource consenting and meeting conditions where required, and monitoring. ➢ Time and resources required for farm planning. ➢ Increased stress on landowners as a result of increased regulatory requirements. ➢ Risk of additional development of land as a result of loss of land in buffers to ensure productive farm unit. ➢ Pest plant control along riparian margins in the short term for pest plant containment. ➢ Reduced farm surplus for reinvestment.
Community	➢ Positive effect on aquatic ecosystems health. ➢ Reduction in soil erosion resulting in better quality soil resource retention of nutrient filtering ability and better crops. ➢ Restoration of mahinga kai sites. ➢ Increased protection for wahi tapu, mahinga kai and other taonga tuku iho. ➢ Supports protection of, and access, to taonga species. ➢ Enhanced recreational opportunities. ➢ Enhanced visual amenity values. ➢ Public health benefits downstream from reducing contaminant runoff entering waterways. ➢ Support of Ngāi Tahu values, in particular improving water quality through alignment with Te Mana o te Wai and Ki uta ki tai.[79]	➢ Cost to Council (rates) – Monitoring permitted activity mostly covered by existing monitoring programme. ➢ Cost to Council (rates) - Land Sustainability additional workload assisting with implementation. ➢ Reduced farm surplus for reinvestment.

[79] Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations

Efficiency discussion

It is anticipated this Option will have medium to high efficiency in achieving the Objectives of the Plan. Cultivation will continue to be allowed as a permitted activity provided setbacks from waterbodies are met across most of the region. This aims to reduce the loss of sediment and phosphorus into waterbodies as a result of cultivation. Above 800 ~~700~~ m and greater than 20 degree slopes, consent will be required for cultivation, which recognises the sensitivity of these environments and manages steeper slopes for soil conservation purposes, which is strongly aligned with Policy RURAL.3 of the RPS. There are associated benefits of this approach across all four wellbeings particularly for environmental wellbeing, across the region. These benefits to both landowners and the wider community would assist the achievement of Objectives 1, 2, 6, 13, 13A, 14, 17, and 18 of the pSWLP.

There is an opportunity cost[80] associated with this option, as the land within the setbacks would no longer be able to be cropped, and some (within 3m of the bed) will not be able to be cultivated at all. This opportunity cost is low for intensive winter cropping land, as a setback of 3m is already required under the Regional Water Plan. The opportunity cost will be slightly greater for arable use, where the 3 m setbacks are not currently in place. This assumes that current arable practice is to cultivate right to the bank of waterbodies. Of the 5m setback area, 2m can still be cultivated for pasture renewal every 5 years, and the rule does not preclude grazing of pasture in the setback areas. ~~Based on an average riparian margin of 0.04 km/ha[81], and an average fodder crop area of 20 ha[82] per property which intensively winter grazes (i.e. cultivation is not for pasture renewal so would have to meet the setbacks), the permitted activity rules would result in reductions in the land available to be winter cropped on land with greater than 4 degree slopes. For land with less than 4 degree slopes there will be a small no change in land available to be cultivated for fodder crop compared to the status quo, which requires intensive winter grazing (and therefore crop) to be at least 3 m from a waterbody. For land with slopes of between 4 and 16 degrees, approximately 0.6 ha (3%) of current crop land would be unavailable for cropping, and for land with 16 and 20 degree slopes, approximately 1.4 ha (7%). This would be slightly higher for arable use, where the 3 m setbacks are not currently in place. The reduction in cultivatable land under the permitted activity rule would range from 1% for 0-4 degree slopes, up to 8% for 16-20 degree slopes. This assumes that current arable practice is to cultivate right to the bank of waterbodies. Most of this setback area (up to 3 m from the waterbody) can still be cultivated for pasture renewal every 5 years, and the rule does not preclude grazing of pasture in the setback areas.~~

This will result in a cost to farm businesses, which may have to adjust the position of their cropping activities accordingly. The costs associated with restricted discretionary activities will be consenting and compliance costs. Costs are relative to the risk of adverse effects resulting from the development, and are limited to those landholdings above 700 m or with slopes greater than 20 degrees, of which there are 45 with more than 5 ha. Option B also

[80] An opportunity cost is the loss of the ability to implement other alternatives when one alternative is chosen

[81] Riparian Management Spreadsheet for Southland – Water and Land 2020 & Beyond Steering Group Meeting 5 August 2013

[82] Preliminary analysis of winter forage crops in Southland, Pearson, 2016

has anticipated community costs (through rates) for permitted activity monitoring and implementing the proposal, which are likely to be similar to Option C.

6.1.5.3 *Option C – Hill and High Country*

Effectiveness

To assist the assessment of effectiveness of Option C, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
1	✓✓✓	Objective 1: Option C recognises the connection between freshwater, land and the coast by regulating land use to reduce impacts on water quality and subsequently coastal environments. However, it is only applicable above 200 m so does not recognise the potential effects of cultivation in lowland parts of the Region. This means Option C is unlikely to be as effective in achieving Objective 1 than Option B. The risk of sediment loss associated with cultivation increases with increasing slope, which is reflected in the regulation by focusing on hill and high country development and requiring resource consent applications above certain slopes. The permitted activity standard is feasible to implement and judge compliance, however, at the boundaries of slope thresholds, and as slope varies across a terrace face, some pragmatism would be required in its implementation. This Option may be unacceptable to those with land above 200 m as it singles them out in the regulation when the potential effects of cultivation are widespread. Additionally, this Option was tested with the community in 2014 and Council at the time decided not to proceed based on community feedback. Notifying the same proposal a second time is considered unlikely to enhance acceptability of the cultivation provision.
2	✓✓✓	Objective 2: Option C recognises that water and land are enablers of economic, social and cultural wellbeing by providing setbacks from waterways for cultivation in hill country areas. This is likely to have positive effects on water quality, and reduce soil loss during cultivation, with associated positive effects on economic, social and cultural wellbeing. However, this positive impact is likely to be less than Option B as the regulation does not reflect the potential extent of the issue – cultivation, and loss of soil can occur throughout the region. Feasibility and acceptability as for Objective 1 above.
6	✓✓	Objective 6: Option C contributes to maintaining water quality by requiring setback from waterways for cultivation, for hill country development. Setbacks are likely to have positive benefits for reducing sediment and phosphorous loss into rivers, although as mentioned above, this is likely to be less effective than Option B. Feasibility and acceptability as for Objective 1 above.
13, 13A	✓✓✓	Objective 13 and 13A: Setbacks from waterways for cultivation contribute to managing soil resources by reducing soil loss to

		waterways. ~~Subsequently, this reduces adverse effects on ecosystems, caused by sediment, and avoids significant impacts on human health by reducing stream nutrient inputs.~~ Setbacks are likely to have positive benefits for reducing sediment and phosphorous loss into rivers. However, as the scope of this Option is limited to hill and high country, it is likely to be less effective than Option B, which recognises the potential impacts of cultivation across the Region. Feasibility and acceptability as for Objective 1 above.
14	✓✓✓	Objective 14: Setbacks for cultivation contribute to maintaining and improving the range and diversity of indigenous ecosystem types and habitats. This Option manages effects on sensitive high country habitats, which can be damaged by cultivation, and offers protection for both habitats and ecosystems which may be adversely affected by sediment and nutrients lost to waterways. However, this can be an issue across the Region, and Option C focuses on hill and high country development only. Feasibility and acceptability as for Objective 1 above.
17	✓✓	Objective 17: Preventing the damage which may be caused by cultivation, and associated contaminant losses will help protect the natural character of wetlands, rivers and lakes. However, as the scope of this Option is limited to hill and high country, it is likely to be less effective than Option B, which recognises the potential impacts of cultivation across the Region. Feasibility and acceptability as for Objective 1 above.
18	✓✓	Objective 18: Cultivation setbacks from waterbodies is considered good ~~(environmental)~~ management practice. However, as the scope of this Option is limited to hill and high country, it is likely to be less effective than Option B, which recognises the potential impacts of cultivation across the Region. Feasibility and acceptability as for Objective 1 above.
Total	✓✓✓	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Option C is anticipated to have an average effectiveness score of two out of five in assisting the achievement of Objectives 1, 2, 6, 13, 13A, 14, 17, and 18 of the pSWLP.

Efficiency

The efficiency of Option C has been assessed below. To assist in assessing the efficiency of Option C the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed.

Assessment of Benefits and Opportunities, and Costs and Risks		
Indi	**Benefits and Opportunities**	**Costs and Risks**
	➢ Landowners below 700m above sea level can continue to undertake hill and high country development with an enhanced awareness of management	➢ Loss of potential production land. ➢ Costs associated with resource consenting and meeting conditions

	considerations to minimise adverse effects. ➢ Reduction in soil erosion resulting in better quality soil resource. ➢ Reduction of pest species along riparian margins in the longer term as native species regenerate. ➢ Positive effect on water quality downstream e.g. for stock drinking water. ➢ Retention of vegetation in gullies and riparian margins for stock shelter. ➢ Increase in recreational values of water bodies e.g. fishing. ➢ Enhanced visual amenity and biodiversity values.	where required, processing, and monitoring. ➢ Time and resources required for farm planning. ➢ Increased stress on landowners as a result of increased regulatory requirements. ➢ Risk of additional development of land as a result of loss of land in buffers to ensure productive farm unit. ➢ Pest plant control along riparian margins and gullies in the short term for pest plan containment. ➢ Reduced farm surplus for reinvestment.
Community	➢ Positive effect on aquatic ecosystems health. ➢ Habitat creation for biodiversity. ➢ Reduction in soil erosion resulting in better quality soil resource retention of nutrient filtering ability and better crops. ➢ Restoration of mahinga kai sites. ➢ Increased protection for wahi tapu, mahinga kai and other taonga tuku iho. ➢ Supports protection of, and access, to taonga species. ➢ Enhanced recreational opportunities. ➢ Enhanced visual amenity values. ➢ Public health benefits downstream from reducing runoff entering waterways. ➢ Support of Ngāi Tahu values, in particular improving water quality through alignment with Te Mana o te Wai and Ki uta ki tai.[83]	➢ Cost to Council (rates) – Monitoring permitted activity mostly covered by existing monitoring programme. ➢ Cost to Council (rates) – Land Sustainability additional workload assisting with implementation of Option B. ➢ Reduced farm surplus for reinvestment.

Efficiency discussion

It is anticipated this option will have medium efficiency when compared to the current situation. Option C will enable many landowners to continue their current development and management work within the permitted activity criteria. There are associated benefits of this approach across all four well-beings particularly for environmental wellbeing, however, these are less than Option B as regulations apply only to those areas above 200 m above sea level. These benefits to both landowners and the wider community would assist the achievement of Objectives 1, 2, 6, 13, 13A, 14, 17, and 18 of the Water Plan.

However, there are also anticipated costs associated with Option C, particularly for those individuals that cannot meet the permitted activity criteria. Anticipated costs associated

[83] Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations

with Option C largely fall on individuals undertaking hill and high country development. Costs are relative to the risk of adverse effects resulting from the development, and are limited to the 65 landholdings above 700 m and as such, the total cost is likely to be less than Option B. Option C also has anticipated community costs (through rates) for monitoring and implementing the proposal, which are likely to be similar to Option B.

6.1.6 Risk of acting or not acting

An evaluation report must contain an assessment of the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions (under section 32(2)(c) RMA). It is considered that the information relating to the effects of sedimentation on waterways and cultivation practices to manage this. As such, it is considered that there is low risk of acting as set out in Option B, and high risk if no action is taken.

6.1.7 Conclusion

The assessment in section 6.1.5 shows Option B – pSWLP to be the most appropriate option to achieve the objectives of the pSWLP.

6.1.8 References

Riparian Management Spreadsheet for Southland – Water and Land 2020 & Beyond Steering Group Meeting 5 August 2013

Preliminary analysis of winter forage crops in Southland, Pearson, 2016

6.2 Stock exclusion

6.2.1 Introduction

This section of the evaluation report assesses stock exclusion provisions. Stock exclusion is intended to mean the permanent or temporary exclusion of stock from banks and waterways. The benefits of stock exclusion include preventing direct deposition of contaminants to waterways, as well as damage to stream banks and beds, riparian margins and riverine habitats. Stock exclusion is a good management practice (GMP) that can be applied in most instances, and exceptions can be clearly defined.

6.2.1.1 ~~Proposed~~ Draft national regulations

~~Proposed~~ Draft national regulations for stock exclusion assessed in both the LAWF Fourth Report and the MfE 2016 discussion document – *Next Steps for Freshwater*, suggest staged exclusion of all stock except sheep, on the basis that sheep do less damage to stream banks and beds than other stock, and do not have the same affinity for water. Both documents suggest that sheep pose a lower level of environmental risk, so a national stock exclusion regulation should not include them. However, both documents also outline that, in particular circumstances, a regional council may need to adopt a more stringent approach to managing sheep due to individual circumstances and water quality issues.

6.2.1.2 Southland monitoring data

Under the NPSFM, the National Objectives Framework (NOF) contains numeric attribute states ~~two bottom lines~~ for *E. coli* and classifies waterbodies into five attribute states – A to E. Appendix 6 gives detail on the National Target for water quality improvement, which is "*to increase proportions of specified rivers and lakes that are suitable for primary contact (those that are in the blue, green and yellow categories) to at least 80% by 2030, and 90% no later than 2040, but also to improve water quality across all categories*".

There are significant lengths of waterbodies in Southland that are presently not suitable for primary contact recreation, using the National Objectives Framework criteria. The MfE website indicates that currently 29% (by length) has "poor" or E quality water, and a further 9% has "intermittent" or D quality water in Southland.

~~- For those sites identified through Community values setting as swimming sites, the primary contact bottom line of 540 E. coli/100 mL; and~~
~~- For all other freshwater, the secondary contact bottom line of 1000 E. coli/100 mL.~~

~~Of the monitored swimming sites in Southland, there are 7 where *E. coli* is not meeting the primary contact recreation bottom line, and where intervention is required. The monitoring of primary contact sites is done weekly from December through March when people are most likely to be in the water. The limit setting process will be used to determine what, how, and by when the intervention is required.~~

~~Of the other monitoring sites throughout the region, there are 5 sites where *E. coli* is not meeting the secondary contact recreation bottom line. The NOF uses an annual median *E.coli* measurement, which indicates that during some months *E.coli* is low, and in other months it is high. The sites currently not meeting the secondary contact bottom line are:~~

~~- Otautau Stream at Waikouro~~
~~- Opouriki Stream at Tweedie Road~~

- ~~Winton Stream at Lochiel~~
- ~~Otepuni Creek at Nith Street; and~~
- ~~Mataura River, 200 m downstream of the Mataura Bridge~~

6.2.1.3 E.coli transport pathways

There are three key pathways for agricultural sources of E. coli to enter waterbodies:

- Overland flow;
- Direct deposition into the channel (such as on gravel bars) or onto the stream banks; and
- Artificial drainage.

Fencing prevents direct deposition, and riparian management more broadly (such as fencing off critical source areas and riparian planting) can mitigate *E.coli* transport via overland flow. Direct deposition presents the greatest risk to human health during low flow conditions, when recreational activities such as swimming are most likely. Overland flow however is considered to be the biggest contributor to *E.coli* on an annual average basis. *E.coli* source tracking work undertaken by Environment Southland demonstrates a ruminant signature is present across many monitoring locations in Southland, providing a basis on which to exclude ruminants from waterbodies, particularly those with an affinity for water (such as deer and cattle). For some ~~five~~ monitoring sites ~~which fail the secondary bottom line~~ listed below ~~above where E.coli~~ , a sheep *E.coli* signature has also been identified, although the proportion of the signature directly attributable to sheep has not yet been quantified:

- Otautau Stream at Waikouro
- Opouriki Stream at Tweedie Road
- Winton Stream at Lochiel
- Otepuni Creek at Nith Street; and
- Mataura River, 200 m downstream of the Mataura Bridge

6.2.2 Statutory Context

6.2.2.1 NPSFM

Objective A2 of the National Policy Statement on Freshwater Management 2014 (NPSFM) requires the overall quality of fresh water within a region to be maintained or improved. In many locations across Southland water quality is declining under the current regulatory regime.

Objective A3 requires the quality of water in FMUs to be improved, so that it is suitable for primary contact more often.

Policy A3 enables Councils to make rules requiring the adoption of the best practicable option to prevent or minimise any actual or likely adverse effect on the environment of any discharge which may enter water. This is particularly relevant for stock exclusion, as stock access to waterways often results in direct discharges of contaminants to waterways, which cannot be managed at the source in any way except by excluding stock.

6.2.2.2 ~~Regional Policy Statement for Southland 1997 (RPS)~~

~~Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. Section 43AA then defines "regional policy statement" as "an operative regional policy statement approved by a regional council under Schedule 1." The most relevant part of the RPS in relation to installed subsurface drainage systems is section 5.5 – Water Quality.~~

~~Objective 5.2 requires that in the use and development of water and land resources, and the discharges of contaminants, water quality is maintained and wherever practicable, enhanced. Similarly, Objective 5.3 requires that the discharge of contaminants into water does not compromise water quality standards established for the region. These objectives are supported by Policy 5.2 which requires all point source discharges to comply with water quality standards after reasonable mixing. As noted above, this is particularly relevant to stock exclusion where the only mitigation for direct deposition is to keep stock out of waterbodies.~~

6.2.2.3 ~~Proposed~~ Southland Regional Policy Statement 2017 ~~2012~~ (~~p~~RPS)

Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. ~~Section 66(2)(a) of the RMA states that a Regional Plan shall have regard to any proposed regional policy statement. The pRPS is currently under appeal, however mediation is nearing conclusion and a number of consent orders have been lodged with the Environment Court. It is expected that the pRPS will be made operative once all appeals are resolved, which is likely to be before the pSWLP becomes operative. It is therefore important that the pSWLP gives effect to the pRPS as well as the RPS.~~ The most relevant section of the ~~p~~RPS in relation to stock exclusion from water is Chapter 4: Water.

Objective WQUAL.1 requires that water quality in the region safeguards the life-supporting capacity of water and related ecosystems and the health of people and communities. This is supported by Policy WQUAL.1 which requires that discharges and land uses activities are managed to maintain water quality, or improve it, to ensure freshwater objectives are met. Policy WQUAL.2 specifies that in managing water quality, particular regard will be had to nitrogen, phosphorus, sediment and microbiological contaminants. As noted above, this is particularly relevant to stock exclusion where the only mitigation for direct deposition is to keep stock out of waterbodies.

6.2.3 Relevant Objectives of the pSWLP

The pSWLP contains the following objectives which are considered the most relevant for managing stock exclusion from waterbodies:

Objective 1 *Land and water and associated ecosystems are sustainably managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between freshwater, land and the coast.*

Objective 2 *Water and land is recognised as an enabler of primary production and the economic, social and cultural wellbeing of the region.*

Objective 6 *There is no reduction in the overall quality of freshwater, and water in estuaries and coastal lagoons, by:*

(a) maintaining the quality of water in waterbodies, estuaries and coastal lagoons, where the water quality is not degraded; and

(b) improving the quality of water in waterbodies, estuaries and coastal lagoons, that have been degraded by human activities.

Objective 13 *Enable the use and development of land and soils to support the economic, social, and cultural wellbeing of the region.~~, provided:~~*

Objective 13A *~~(a) t~~The quantity, quality and structure of soil resources are not irreversibly degraded through land use activities ~~and~~ or discharges to land.~~:~~*

Objective 13B *~~(b)~~ The discharges of contaminants to land or water that have significant or cumulative adverse effects on human health are avoided.~~; and~~

~~*(c) adverse effects on ecosystems (including diversity and integrity of habitats), amenity values, cultural values and historic heritage values are avoided, remedied or mitigated to ensure these values are maintained or enhanced.*~~

Objective 14 *The range and diversity of indigenous ecosystem types and habitats within ~~dryland environments,~~ rivers, estuaries, wetlands and lakes, including their margins, and their life-supporting capacity are maintained or enhanced.*

Objective 17 *The natural character values of wetlands, rivers and lakes and their margins, including channel and bed form, ~~bed~~ rapids, seasonably variable flows and natural habitats, are protected from inappropriate use and development.*

Objective 18 *All activities operate in accordance with ~~at~~ "good ~~(environmental)~~ management practice" or better to optimise efficient resource use, safeguard the life supporting capacity of ~~and protect~~ the region's land~~,~~ and soils, and maintain or improve the ~~water from~~ quality and quantity of the region's water resources. ~~degradation.~~*

6.2.4 Overview of practical options

Environment Southland has considered four reasonably practicable options (as required under section 32(b)(i) RMA) for managing the adverse effects of stock access to waterbodies. These are as follows:

- Option A – (Status quo) – Stock access allowed provided there is no breach of water quality standards and stock must be excluded for intensive winter grazing
- Option B – (~~Proposed~~ pSWLP Decision Provisions) – staged stock exclusion (except sheep), based on the slope of the land, type of stock or farming activity, and stocking rate. ~~in all physiographic zones, except for the part of the Hill Country/Bedrock physiographic zone above 16 degree slopes, and the Alpine physiographic zone, where stock exclusion is not mandatory.~~
- Option C – (Proposed Provisions + Sheep) – staged stock exclusion (including sheep) in all physiographic zones, except for the part of the Hill Country/Bedrock physiographic zone above 16 degree slopes, and the Alpine physiographic zone, where stock exclusion is not mandatory.

- Option D – (Proposed provisions + targeted exclusion of sheep) – staged stock exclusion (except sheep) in all physiographic zones, except for the part of the, Hill Country/Bedrock physiographic zone above 16 degree slopes, and the Alpine physiographic zone, where stock exclusion is not mandatory. Sheep excluded only within three of the catchments failing the secondary contact bottom line where sheep *E.coli* verified.

6.2.4.1 *Scale and Significance*

Section 32(1)(c) requires that when examining whether the provisions in the proposal are the most appropriate way to achieve the objectives, the analysis must contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal. The proposed provisions within this section relate to improving the controls on stock access to waterbodies, primarily to limit contamination and sedimentation risk, and improve biodiversity. It is considered that the provisions will require increased management of stock, with increased riparian fencing a high likelihood. As such, the scale and significance is considered to be high. The level of detail in the analysis below corresponds with the higher level of significance.

6.2.4.2 Option A – Status quo

Stock access is generally permitted provided there is no breach of water quality standards (e.g. conspicuous discolouration), and access does not result in significant devegetation or alteration of profile of bed/banks. Exceptions include grazing in the coastal marine areas and use of beds for supplementary feeding, fodder crop, or stock runoff, which are not allowed.

6.2.4.3 Option B – ~~Proposed~~ pSWLP decision provisions

Option B requires staged exclusion of cattle, pigs and deer ~~all stock, except sheep, from waterways within most physiographic zone~~s. Stock exclusion is based on the slope of the land, type of stock or farming activity, and stocking rate for beef cattle and deer. ~~within the Bedrock/Hill Country physiographic zone is only required on slopes below 16 degrees, and is not required within the Alpine zone.~~ In effect, stock exclusion is targeted at lower altitude land where stocking rates may be more intensive. Exclusion in this instance does not necessarily require permanent fencing but rather active management. This is broadly consistent with ~~proposed~~ draft national regulations for stock exclusion assessed in both the LAWF Fourth Report and the MfE 2016 discussion document – *Next Steps for Freshwater*, although the proposed dates for exclusion differ.

For sheep, this Option requires farmers to consider exclusion and other management methods ~~prepare and implement a Riparian Management Plan~~ as part of the Farm Environmental Management Plan in Appendix N. ~~The Riparian Management Plan focuses on the methods to manage critical source areas on sheep properties.~~

6.2.4.4 Option C – Proposed provisions + sheep

Option C requires staged exclusion of all stock from waterways within most physiographic zones. Stock exclusion within the Bedrock/Hill Country physiographic zone is only

required on slopes below 16 degrees, and is not required within the Alpine zone. Like Option B, this Option is intended to target lower altitude, higher intensity areas.

6.2.4.5 Option D – Proposed provisions + targeted exclusion of sheep

Option D requires staged exclusion of all stock, except sheep from waterways within most physiographic zones. Stock exclusion within the Bedrock/Hill Country physiographic zone is only required on slopes below 16 degrees, and is not required within the Alpine zone.

For sheep, this option would require specific management of, and exclusion from, waterbodies within some of the catchments identified in Section 6.2.1.3 which do not meet the secondary contact bottom line for *E.coli*.

Monitoring has identified five catchments with ~~which do not meet the secondary contact bottom line and all five have~~ a positive sheep *E.coli* signature. Two of the five catchments however are not included in Option D because they show either a persistent human source of *E.coli,* (as for the Otepuni) or the *E.coli* concentrations indicate a local source rather than an upstream source (for the Mataura site). In short, these two sites did not warrant targeted intervention for sheep under this option.

This Option requires sheep exclusion on all land with less than 16 degree slopes within the catchments of the following monitoring sites and subject to a timeframe:

- Otautau Stream at Waikouro
- Opouriki Stream at Tweedie Road
- Winton Stream at Lochiel

If farmers within these catchments are not able to meet the timeframe, they are required to obtain a resource consent as a controlled activity (a controlled activity is one to which consent must be granted). The Council would exercise its control over the quality and implementation of a Riparian Management Plan, which focuses on critical source area management on land with less than 16 degree slopes.

6.2.5 Assessment of efficiency and effectiveness

Section 32(1)(b)(ii) of the RMA requires the assessment of the 'efficiency and effectiveness' of provisions in achieving the objectives, in a level of detail that corresponds to the scale and significance of the anticipated effects. The objectives against which the proposed options are being evaluated are introduced in section 5.3 of this report. As discussed in section 5.2, the overall scale and significance of the anticipated effects of the stock exclusion provisions is considered to be high.

Each individual option is evaluated below. First, the effectiveness of each option in assisting the achievement of the objectives of the pSWLP is assessed. The following factors have been assessed as part of the effectiveness assessment:

- Relevance – includes the extent to which the provisions are targeted to achieve the objectives and the length of time taken to achieve the objective.

- Feasibility – includes the degree of uncertainty of achieving the objectives, degree of risk associated with the provisions (e.g. unintended consequences), ease of implementation (e.g. likelihood of compliance and ability to monitor/enforce).
- Acceptability – level of community and stakeholder acceptance.

Each option has been given an effectiveness score out of five (from low effectiveness through to high effectiveness) against the relevant objectives in the pSWLP. An average overall score out of five has been given to each of the options. It should be noted that the provisions alone will not fully achieve the objectives of the pSWLP, as the outcomes and limit setting processes are yet to occur.

To determine efficiency, the evaluation investigated the anticipated benefits and opportunities, and costs and risks anticipated from the options, taking into account both short and longer term benefits and risks, to both the individual and the wider community. Benefits and opportunities, and costs and risks have been integrated across the four wellbeings (cultural, social, economic and environmental).

6.2.5.1 Option A – Status Quo

Effectiveness

To assist the assessment of effectiveness of Option A, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
1	✔	While there are some instances where stock access is not allowed, the status quo does little to recognise the connection between freshwater, land and the coast. Given the focus on the impacts of stock on waterbodies, particularly cattle, we anticipate this Option will be unacceptable to most of the community. Additionally, given the fencing already undertaken by dairy farmers, it is unlikely the dairy industry would be supportive of allowing all non-dairy stock to have continued access to waterways.
2	✔	Allowing stock access to waterways adversely affects economic, social and cultural wellbeing. This includes potential impacts on commercial and recreational uses of water (e.g. water takes, fishing, and swimming), community water supplies, mahinga kai resources and the mauri of water. There may be some short term savings compared to Options B and C as sheep, beef and deer farmers would not be required to exclude stock. However, such savings would likely be short lived, as the Ministry for the Environment has signalled its intention to require stock exclusion nationally. Feasibility and acceptability as for Objective 1 above.
6	✔	Option A does not contribute to maintaining water quality as negative water quality trends are evident in many areas of Southland under the status quo. Feasibility and acceptability as for Objective 1 above.

13, 13A and 13B	✔	Option A does not contribute to managing soil resources, ~~reducing adverse effects on ecosystems,~~ and avoiding significant impacts on human health. Stock access to waterways adversely affects water quality (particularly *E.coli* and sediment), stream bank stability, and riparian and riverine habitat. Acceptability and feasibility as for Objective 1 above.
14	✔	Option A does not contribute to maintaining and improving the range and diversity of indigenous ecosystem types and habitats, as stock with access to waterbodies can damage indigenous ecosystems and habitats. Acceptability and feasibility of compliance as for Objective 1 above.
17	✔	Under Option A, there would be continued loss of natural character of wetlands, rivers, and lakes. As such, Option A does not contribute to Objective 17. Acceptability and feasibility as for Objective 1 above.
18	✔	Excluding stock from waterbodies is considered good (environmental) management practice. Option A does not require stock exclusion, so does not facilitate activities operating at good (environmental) management practice. Acceptability and feasibility as for Objective 1 above.
Average	✔	

* ✓- Low; ✓✓- Low to Medium; ✓✓✓ - Medium; ✓✓✓✓ - Medium to High; ✓✓✓✓✓ - High

Option A is anticipated to have an average effectiveness of one out of five in assisting the achievement of Objectives 1, 2, 6, 13, 13A, 13B, 14, 17, and 18 of the pSWLP. Given the low effectiveness of Option A – status quo, its efficiency has not been evaluated.

6.2.5.2 Option B – ~~Proposed~~ pSWLP Decision Provisions

Effectiveness

To assist the assessment of effectiveness of Option B, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
1	✔✔✔	Option B recognises the connection between freshwater, land and the coast by managing stock access to address impacts of land use on surface water quality, ecosystems, and habitat. In terms of feasibility, the cost of excluding stock is substantial and needs to be spread over several years. The timeframes for exclusion in Option B reflect the cost of fencing different stock types. It is relatively easy to judge compliance with this Option, as stock are either excluded from waterways or they are not. Whether riparian management has been planned and undertaken as part of the FEMP would require closer inspection to determine compliance. Most dairy cattle are

		already excluded from waterways, and given the impact on habitat and water quality of deer and cattle, combined with the timeframes before exclusion is required, we anticipate this Option will be acceptable to the community.
2	✔✔✔✔	Option B recognises that water and land are enablers of economic, social and cultural wellbeing by excluding most stock types. Given sheep do not have the same affinity for water, and the cost of excluding them is significantly greater than cattle, sheep are not included in this Option. The expense of deer fencing has been balanced against their potential impact on habitat, and propensity to wallow. This is reflected in Option B by allowing deer farmers longer timeframes before exclusion is required. Option B allows farmers to stage their investment in fencing or actively manage their stock next to waterways, facilitating community acceptability. Feasibility and acceptability as for Objective 1 above.
6	✔✔✔	Option B contributes to maintaining water quality by requiring exclusion of stock (other than sheep) from waterways. In terms of feasibility, given the affinity deer and cattle have for waterways, combined with their size (relative to sheep) excluding these animals is likely to have positive benefits for bank stability, and riparian and riverine habitat. *E.coli* source tracking has identified ruminant signatures across Southland. Direct deposition of manure and urine while stock are in waterways, particularly during low flow conditions when people are more likely to be swimming, is a key transport pathway for *E.coli*. Removing this transport pathway for those animals most likely to linger in water will contribute to maintaining water quality. For sheep, management of critical source areas is required as part of the FEMP. The subsequent outcomes for water quality will vary depending on the management options chosen on-farm. Acceptability and feasibility of compliance as for Objectives 1 and 2 above.
13, 13A and 13B	✔✔✔	The requirement to exclude stock, other than sheep, from waterbodies contributes to managing soil resources~~, reducing adverse effects on ecosystems,~~ and avoiding significant impacts on human health. The impacts on water quality, stream bank stability (including sediment), and riparian and riverine habitat are as for Objective 6 above. Acceptability and feasibility as for Objectives 1 and 2 above.
14	✔✔✔	Excluding stock, other than sheep, from waterbodies will contribute to maintaining and improving the range and diversity of indigenous ecosystem types and habitats as stock can damage these ecosystems and habitats where they occur near waterbodies. Acceptability and feasibility as for Objectives 1 and 2 above.
17	✔✔✔	Preventing the damage caused by stock, other than sheep, by excluding them will help protect the natural character of wetlands river and lakes. Acceptability and feasibility as for Objectives 1 and 2 above.
18	✔✔✔✔	Excluding stock from waterbodies is considered good (environmental) management practice. While this does not include sheep, the requirement to prepare and implement a FEMP which includes riparian management ~~a Riparian~~

Average		~~Management section~~ will facilitate activities operating at good ~~(environmental)~~ management practice. Acceptability and feasibility as for Objectives 1 and 2 above.
	✔✔✔	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Option B is anticipated to have an average effectiveness of three out of five in assisting the achievement of Objectives 1, 2, 6, 13, 13A, 13B, 14, 17, and 18 of the pSWLP.

Efficiency

To assist the assessment of the efficiency of Option B, the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed below. When evaluating benefits and costs, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**
Individual	➢ Increased awareness of on-farm actions and implications for the environment. ➢ Maintain or improve quality of water used domestically or on-farm. ➢ Maintain or improve water quality downstream e.g. for stock drinking water. ➢ Increase in recreational values of water bodies e.g. fishing.	➢ Time and resources required for fencing and undertaking riparian management, including preparation. ➢ Increased stress on landowners as a result of increased regulatory requirements and associated cost.
Community	➢ Maintained aquatic ecosystems and habitat health. ➢ Maintained surface water quality. ➢ Restoration of mahinga kai sites. ➢ Enhanced recreational opportunities. ➢ Public health benefits downstream from reducing direct deposition into waterways. ➢ Opportunity for additional business for service sector e.g. fencing contractors.	➢ Cost to Council (rates) – Monitoring permitted activity mostly covered by existing monitor programme. ➢ Cost to Council (rates) - Land Sustainability additional workload assisting with implementation of farm practices.

6.2.5.3 Option C – Proposed Provisions + Sheep

Effectiveness

To assist the assessment of effectiveness of Option C, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
1	✔✔✔	Option C recognises the connection between freshwater, land and the coast by excluding stock to address impacts of land use on surface water quality, ecosystems, and habitat. In terms of feasibility, the cost of excluding stock is substantial and needs to be spread over several years. The timeframes for exclusion in Option C reflect the cost of fencing different stock types and the need to spread the cost. However, the cost to sheep and beef farmers under this Option is significantly greater than under Option B. It is easy to assess compliance with this Option, as stock are either excluded from waterbodies or they are not. Given sheep do less damage to stream banks and beds, and do not have the same affinity for water, combined with the cost of sheep fencing, we anticipate this Option would not be as well received in the agricultural community.
2	✔✔	Option C recognises that water and land are enablers of economic, social and cultural wellbeing by excluding all stock from waterbodies. The expense of fencing has been balanced against the potential impacts of stock on waterbodies through longer timeframes before exclusion is required for sheep and deer. However, given sheep do less damage to stream banks and beds, and do not have the same affinity for water, combined with the cost of sheep fencing, this Option is not as effective as Option B in achieving Objective 2. Acceptability as for Objective 1 above.
6	✔✔✔✔	Option C contributes to maintaining water quality by requiring exclusion of stock from waterways. In terms of feasibility, excluding animals is likely to have positive benefits for bank stability, riparian and riverine habitat. *E.coli* source tracking has identified ruminant signatures across Southland. Direct deposition of manure and urine while stock are in waterways, particularly during low flow conditions when people are more likely to be swimming, is a key transport pathway for *E.coli*. Removing this transport pathway will contribute to maintaining water quality. Acceptability and feasibility as for Objectives 1 and 2 above.
13, 13A and 13B	✔✔✔	The requirement to exclude stock contributes to managing soil resources~~, reducing adverse effects on ecosystems,~~ and avoiding significant impacts on human health. The impacts on water quality, stream bank stability (including sediment), and riparian and riverine habitat are as described for Objective 6 above. Acceptability and feasibility as for Objectives 1 and 2 above
14	✔✔✔	Excluding stock will contribute to maintaining and improving the range and diversity of indigenous ecosystem types and habitats, as stock can damage these ecosystems and habitats where they occur near waterbodies. Acceptability and feasibility as for Objectives 1 and 2 above.
17	✔✔✔	Preventing the damage caused by stock by excluding them will help protect the natural character of wetlands, rivers and lakes. Acceptability and feasibility as for Objectives 1 and 2 above.

18	✔✔✔✔	Excluding stock from waterbodies is considered good ~~(environmental)~~ management practice. Acceptability and feasibility as for Objectives 1 and 2 above.
Average	✔✔✔	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Option C is anticipated to have an average effectiveness of three out of five in assisting the achievement of Objectives 1, 2, 6, 13, 13A, 13B, 14, 17, and 18 of the pSWLP.

Efficiency

To assist the assessment of the efficiency of Option C, the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed below. When evaluating benefits and costs, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**
Individual	➢ Increased awareness of on-farm actions and implications for the environment. ➢ Maintain or improve quality of water used domestically or on-farm. ➢ Maintain or improve water quality downstream e.g. for stock drinking water. ➢ Increase in recreational values of water bodies e.g. fishing.	➢ Greater time and resources required for fencing compared to Option B ➢ Time and resources required to undertake riparian management, including planning. ➢ Increased stress on landowners as a result of increased regulatory requirements and associated cost.
Community	➢ Maintained aquatic ecosystems and habitat health. ➢ Maintained surface water quality. ➢ Restoration of mahinga kai sites. ➢ Enhanced recreational opportunities. ➢ Public health benefits downstream from reducing direct deposition into waterways. ➢ Opportunity for additional business for service sector e.g. fencing contractors.	➢ Cost to Council (rates) – Monitoring permitted activity mostly covered by existing monitor programme. ➢ Cost to Council (rates) - Land Sustainability additional workload assisting with implementation of farm practices.

6.2.5.4 Option D – Proposed Provisions + Sheep in Specific Catchments

Effectiveness

To assist the assessment of effectiveness of Option D, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Option D		
Objective	**Ranking***	**Reasons**
1	✔✔✔	Option D recognises the connection between freshwater, land and the coast by excluding stock to address impacts of land use on surface water quality, ecosystems, and habitat. In terms of feasibility, the cost of excluding stock is substantial and needs to be spread over several years; this is reflected in the timeframes for exclusion in Option D. The cost to sheep and beef farmers under this Option is limited to farmers within three specified catchments where the sheep *E.coli* signature is significant ~~concentration does not meet the secondary contact bottom line~~. We anticipate that 284 sheep properties will be required to fence sheep out of waterways in these catchments. It is easy to assess compliance with this Option, as stock are either excluded from waterbodies or they are not. While sheep do less damage to stream banks and beds, and do not have the same affinity for water, combined with the cost of sheep fencing, we anticipate this Option is likely to be more acceptable to the agricultural community than Option C because the intervention is targeted explicitly to those areas currently not meeting the NOF secondary contact recreation standards. However while a sheep signature has been identified in these catchments, it is not possible to quantify the relative contribution which may hinder acceptability from those within the three catchments specified. This Option is likely to be more acceptable to the community more broadly, as it demonstrates stronger action where water quality does not meet the national targets ~~bottom line~~ for *E.coli*.
2	✔✔✔	Option D recognises that water and land are enablers of economic, social and cultural wellbeing by excluding all stock from waterbodies within three catchments which are not meeting the *E.coli* national targets ~~bottom line~~ and where sheep *E.coli* is considered to be a significant contributor. The expense of fencing has been balanced against the potential impacts of stock having access to waterbodies – through longer timeframes before exclusion is required for sheep and deer where the costs of exclusion are higher. Acceptability as for Objective 1 above.
6	✔✔✔	Option D contributes to maintaining water quality by requiring exclusion of sheep from waterways in three catchments where *E.coli* sheep signature is significant ~~does not meet the secondary contact bottom line~~, and all other stock across Southland. In terms of feasibility, excluding animals is likely to have positive benefits for bank stability, riparian and riverine habitat. Direct deposition of manure and urine while stock are in waterways, particularly during low flow conditions, when people are more likely to be swimming, is a key transport pathway for *E.coli*. Removing this transport pathway will contribute to maintaining water quality to a greater extent than Option B. Acceptability and feasibility as for Objective 1 and 2 above.

13, 13A and 13B	✔✔✔	Option D contributes to managing soil resources, ~~reducing adverse effects on ecosystems,~~ and avoiding significant impacts on human health. The impacts on water quality, stream bank stability (including sediment), and riparian and riverine habitat are as described for Objective 6 above. Acceptability and feasibility as for Objectives 1 and 2 above.
14	✔✔✔	Option D will contribute to maintaining and improving the range and diversity of indigenous ecosystem types and habitats, as stock (particularly deer and cattle) can damage these ecosystems and habitats where they occur near waterbodies. Acceptability and feasibility as for Objectives 1 and 2 above.
17	✔✔✔	Option D will reduce the damage caused by stock and so will help protect the natural character of wetlands, rivers and lakes. Acceptability and feasibility as for Objectives 1 and 2 above.
18	✔✔✔	Excluding stock from waterbodies is considered good ~~(environmental)~~ management practice. Option D allows sheep access to waterways across most of the region, so does not contribute to this Objective as strongly as Option C. Acceptability and feasibility as for Objectives 1 and 2 above.
Average	✔✔✔	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Option D is anticipated to have an average effectiveness of three out of five in assisting the achievement of Objectives 1, 2, 6, 13, 13A, 13B, 14, 17, and 18 of the pSWLP.

Efficiency

To assist the assessment of the efficiency of Option D, the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed below. When evaluating benefits and costs, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**
Individual	➢ Increased awareness of on-farm actions and implications for the environment. ➢ Maintain or improve quality of water used domestically or on-farm. ➢ Maintain or improve water quality downstream e.g. for stock drinking water. ➢ Increase in recreational values of water bodies e.g. fishing.	➢ Greater time and resources required for fencing compared to Option B, but significantly less than Option C. ➢ Time and resources required to undertake riparian management, including planning. ➢ Increased stress on landowners as a result of increased regulatory requirements and associated cost.

Community	➢ Maintained aquatic ecosystems and habitat health. ➢ Maintained surface water quality. ➢ Restoration of mahinga kai sites. ➢ Enhanced recreational opportunities. ➢ Public health benefits downstream from reducing direct deposition into waterways. ➢ Opportunity for additional business for service sector e.g. fencing contractors.	➢ Cost to Council (rates) – Monitoring permitted activity mostly covered by existing monitor programme. ➢ Cost to Council (rates) - Land Sustainability additional workload assisting with implementation of farm practices.

6.2.5.5 Efficiency discussion

Overall, Options B, C and D are considered to be moderately efficient ways of achieving the Plan's objectives. Under all three Options, exclusion of stock to varying degrees will help prevent damage to stream banks and beds, riparian margins, and riverine habitats, and reduce the amount of contaminants, particularly *E.coli*, entering waterways. The environmental, cultural and social benefits of better management of stock exclusion have been identified, in the tables above, in the background reporting, and through policy direction such as the NPSFM and the ~~pS~~RPS. These benefits are difficult, if not impossible, to quantify in dollar terms and no attempt has been made to do so here.

Stock exclusion is clearly defined, so fits easily within a permitted activity framework - either stock are excluded or they are not. This is efficient, as, provided the permitted activity standards are met, there is no need for resource consent, and the associated costs both to farmers and Council. A. In terms of economic efficiency, the Options vary in terms of fencing cost to sheep farmers, but are the same for dairy, beef and deer farmers. Fencing costs have been calculated using the *Riparian Management Spreadsheet for Southland*, Water and Land 2020 & Beyond Steering Group Meeting 5 August 2013. Fencing costs are likely to be $2,600 per year until 2018 for dairy farmers, $17,300 per year until 2018 for sheep and beef farmers who have to fence out cattle and $16,900 per year until 2020 for deer farmers (these are the timeframes required under Rule 70 in the pSWLP). However, exclusion does not necessarily require permanent fencing but rather active management, so these costs represent a 'worst' case. Option B does not require sheep exclusion, so there is no fencing cost for sheep farmers from this provision. For Option C it is estimated that additional fencing for sheep would cost in the order of $21 million across the region. For Option D, a preliminary assessment of current fencing was undertaken by ES in the sub-catchments identified for sheep exclusion in Option D. It was found that the proportion of waterways currently fenced varied from 0%-100% for those properties assessed. However, on the basis that 50% of the sheep fencing that would be required under Option D is already in place, the additional fencing cost for sheep is estimated at $900,000.

Option B manages sheep, critical source areas and overland flow through riparian management within the Farm Environmental Management Plan (Appendix N). As sheep farming is a permitted activity under the pSWLP, there is no Council oversight of the FEMP, except where intensive winter grazing thresholds are exceeded. Given this lack of oversight, and as the specific actions included in the FEMP are decided by individual farmers, the efficiency of managing sheep in this way is likely to vary across the region.

Option C, and Option D in some catchments, require exclusion of sheep. This will have a further positive impact on *E.coli* in waterbodies during low flow conditions compared with

Option B, however the magnitude of the difference is unclear. While a ruminant *E.coli* signature, including sheep specifically, has been identified at many monitoring locations across the Region, it is currently unclear what portion of the *E.Coli* is from sheep. Given sheep have a lower affinity for water; it is unlikely that the contribution of sheep per stock unit is comparable to cattle or deer.

This is reflected in the LAWF Fourth Report and the MfE 2016 discussion document – *Next Steps for Freshwater*, neither of which recommend exclusion of sheep, on the basis that they do less damage to stream banks and beds, and do not have the same affinity for water. Option B is broadly consistent with proposed national regulations for stock exclusion assessed in the LAWF Fourth Report and the MfE 2016 discussion document – *Next Steps for Freshwater*, although the proposed dates for exclusion differ. In terms of efficiency, if and when the proposed national regulations come into force, further fencing is unlikely to be required. Neither the LAWF Report nor Next Steps for Freshwater recommend exclusion of sheep on the basis that they do less damage to stream banks and beds, and do not have the same affinity for water. The documents suggest that sheep pose a lower level of environmental risk, so a national stock exclusion regulation should not include them. However, this does not preclude Environment Southland from including controls in the pSWLP and the ability to impose more stringent controls is outlined in both documents.

The impact on employment is difficult to assess because of the diversity of farm systems in the region. For all Options, and Option C particularly, the additional cost to sheep and beef farmers for fencing off waterways is likely to put a limitation on economic growth and employment growth in the sheep and beef sector. However, there may be some increases in employment within the fencing industry for all three Options.

6.2.6 Appropriateness discussion

The third requirement of the provisions analysis under section 32(b) is to summarise the reasons for deciding on the provisions. This is self-evident when the chosen option is the most efficient and effective, however, in this instance Options B, C and D are all considered moderately effective and efficient.

ES considers Option C would negatively impact buy-in into the pSWLP as a whole from the agricultural community and undermine the Plan's effectiveness. ES considers that the additional cost of fencing for sheep, given their limited affinity for water, would be viewed as unjustifiably expensive~~, particularly in light of the stricter regulatory approval faced by farmers, particularly in the Peat Wetlands and Old Mataura physiographic zones who may wish to convert to dairy, increase cow numbers, or undertake intensive winter grazing beyond permitted activity thresholds~~. ES envisages that the risk to water quality from sheep access to waterways will be dealt with through the catchment limit setting process.

In terms of Option D, ES is concerned it would send the message to the public that sheep access to waterways is only an issue within the three specified catchments, which is not the case.

ES, cognisant of the cost of sheep fencing, and the extent of sheep farming throughout the Region, considers Option B, which does not require specific exclusion of sheep, the most appropriate option. ES considers that excluding all stock except sheep, and particularly deer and cattle, will make a sufficient contribution to maintaining and

improving water quality ahead of catchment limit setting. This option also requires specific oversight on the management of critical source areas which is anticipated to have positive effects on water quality.

6.2.7 Risk of acting or not acting

An evaluation report must contain an assessment of the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions (under section 32(2)(c) RMA). It is considered that the information relating to the effects of contaminants and sedimentation on waterways and stocking practices to manage this. As such, it is considered that there is low risk of acting as set out in Option B, and high risk if no action is taken.

The implications for farmers are less well known, particularly in terms of potential for adjusted farming operations to reduce the impact of the provisions (such as a shift toward more sheep). However, given ES consider Option B the most appropriate option, which does not require sheep exclusion, this risk posed by this uncertainty is reduced.

6.2.8 Conclusion

As described above, Council's assessment is that Option B – pSWLP Decisions Provisions is the most appropriate option to achieve the objectives of the pSWLP.

6.2.9 References

LAWF – Fourth Report

Next Steps for Freshwater - MfE 2016 discussion document

Technical Comment – Microbial contamination in Southland, Environment Southland 2016

Riparian Management Spreadsheet for Southland – Water and Land 2020 & Beyond Steering Group Meeting 5 August 2013.

6.3 Diffuse nutrient discharges/farming

6.3.1 Introduction

6.3.1.1 Intensification

Water quality in Southland is degraded in many places, largely as a result of contaminants from increasingly intensive land-based activities. This is particularly so in the lowland areas of Southland, where vegetation clearance, land drainage and intensive pasture production has occurred. Over the last 20 years or so, intensive farming activities have increased in Southland, for example, there has been a significant increase in dairy cattle, refer Figure 6.3.1(a) below. At the same time as the increase in dairy cattle numbers, the total number of stock units has increased. Year-on-year, the average increase in stock units between 1992 and 2015 is between 30,000 and 40,000 stock units per year.

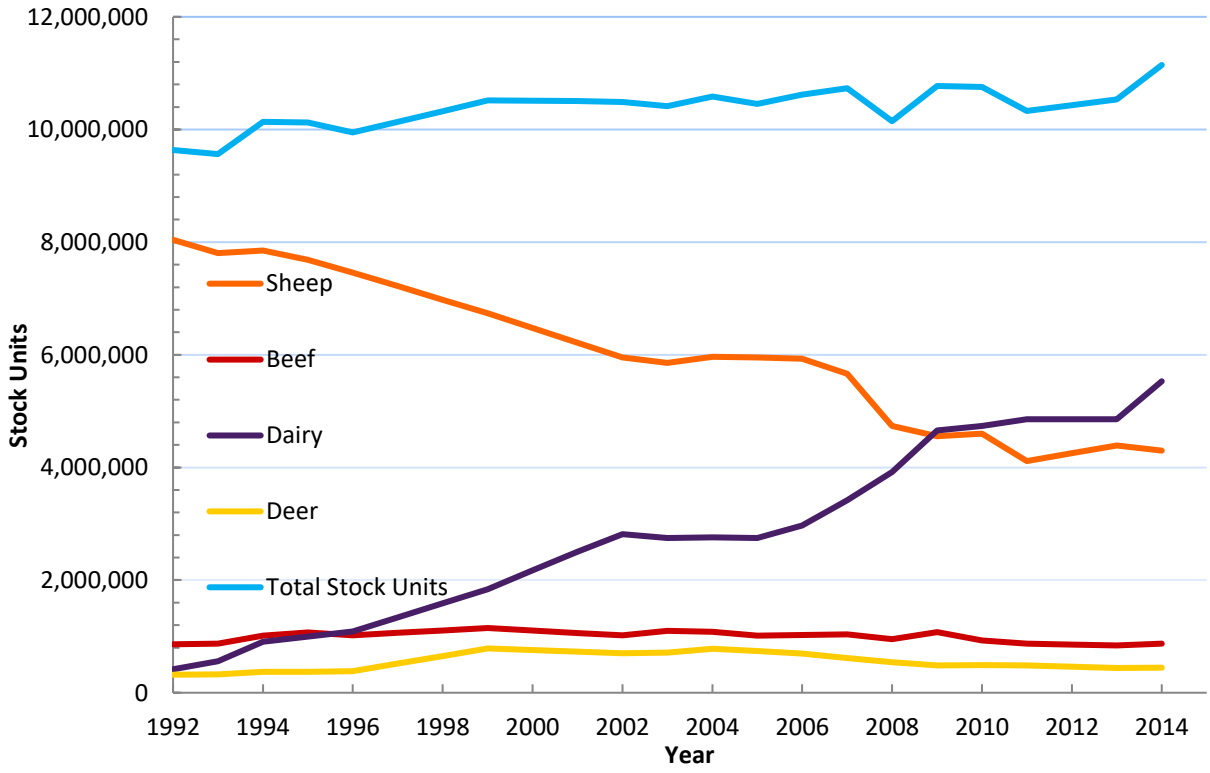


Figure 6.3.1(a): Change in stock numbers from 1992-2015.

6.3.1.2 Physiographic zones

Intensive farming activities are often associated with high losses of nutrients as a by-product of their production systems. Nutrient losses from these practices are exacerbated when they occur on parts of the landscape that are relatively more susceptible to either nitrogen or phosphorus loss. For example, dairy grazing on shallow stony soils that have no or very little ability to remove nitrogen or store water results in transport of any excess or unused nitrogen below the root zone with drainage.

The physiographic zones provide a mechanism for identifying these areas of high susceptibility. The scientific work to identify and characterise the physiographic zones of Southland, more fully explained in the introductory sections of this report, has undergone extensive peer review, and informs ~~underpins~~ ES's response to managing agricultural activities in light of degraded water quality.

The physiographic zones that are most susceptible to nutrient loss under intensive land uses are outlined below. The determination of susceptibility was based not only on the contamination of the direct receiving environment, but also to down gradient effects. For example, a contaminated aquifer feeding a stream during baseflow may cause the stream to exceed a particular water quality threshold.

Soils and aquifers in the Old Mataura physiographic zone have limited ability to remove nitrate. Water moves slowly through the aquifers meaning that nitrate builds up, and in many places, exceeds the drinking water maximum acceptable value (MAV) of 11.3 mg/L nitrate-nitrogen. It has the highest groundwater nitrate concentrations of any physiographic zone with a median of 10.0 mg/L. This groundwater contributes base flow to surface waterbodies (such as the Waimea Stream) which shows significant degradation and declining water quality trends, posing a significant risk to human health and biota.

Soils and aquifers in the Oxidising and Riverine physiographic zones also have limited ability to remove nitrate. Surface and groundwater nitrate concentrations in the Oxidising zone are among the highest in the region and nitrate levels in groundwater exceed the drinking water standard MAV in some locations. The main difference between Oxidising and the Old Mataura zone is that nitrate moves through the aquifers in the Oxidising zone more quickly so there is less time for nitrate concentrations to build up in groundwater. In the Riverine zone, the relatively low concentrations of nitrate in surface and groundwater are due to flushing by river water from the Alpine and Bedrock/Hill Country zones. While it is not clear whether the nitrogen load from the Riverine physiographic zone is having a direct significant impact on downstream ecosystems, both the New River and Jacobs River estuaries are showing signs of degradation and decreasing water quality, and it is thought that the Riverine zone's contribution to the nitrogen load may be disproportionate to land area. It is noted that the catchment limit setting process will focus on issues relating to contaminant load.

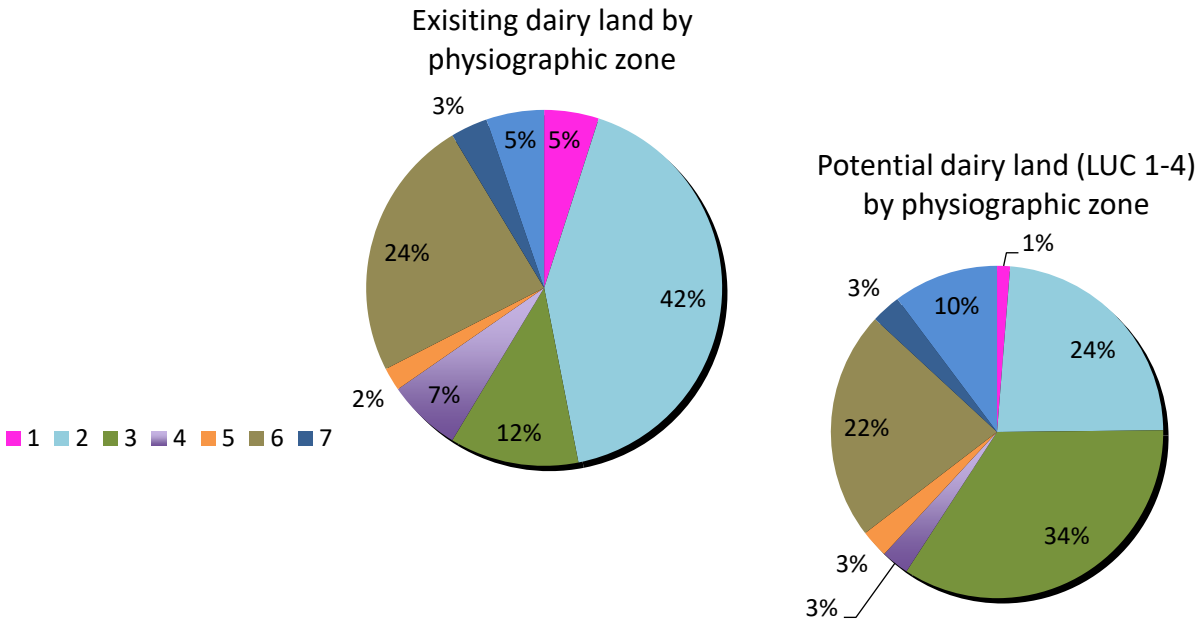
The issue is different in the Central Plains physiographic zone, where dry, cracking soils in summer and autumn provide a direct pathway to aquifers which then contribute to base flow for surface water. Aquifers in this zone have elevated nitrate levels and are particularly susceptible to nitrate accumulation. Surface water nitrate within the Central Plains zone is the highest of any physiographic zone. In these streams with elevated nitrogen, phosphorus is the limiting nutrient, so even a small increase in phosphorus concentration can cause substantial macrophyte and algal growth, often referred to as 'green streams'.

In the Peat Wetlands physiographic zone, soils are susceptible to phosphorus and *E.coli* loss. Both *E.coli* and phosphorus are elevated in streams, with increasing trends of phosphorus and some of the highest *E.coli* levels in Southland. In the Waituna catchment, groundwater phosphorous is 50 times higher in the Peat Wetlands zone compared with the rest of the catchment (which is largely comprised of Gleyed zone) demonstrating the risk to water quality of phosphorus losses in the Peat Wetlands zone.

When intensive farming activities (such as dairying and intensive winter grazing) occur in the physiographic zones most susceptible to nutrient loss, there is greater potential for nutrients to enter water as the environment in these zones has limited capacity to assimilate them. As a result, more mitigation is needed on-farm in these zones to reduce the amount of nutrients entering water. The limited assimilative capacity means any additional nutrient load within these zones (typically as a result of intensification) creates more pressure within the wider catchment, than the same activity in other physiographic zones. The increased pressure carries with it both investment and business risk for new and existing farm activities.

Figure 6.3.1(b) shows the spread of existing dairy land across the physiographic zones. This shows that 39% of current dairy land is within physiographic zones most susceptible to nutrient losses. It also shows the potential land available for dairy (being Land Use Capability Classes (LUC) 1–4 land not yet converted to dairying) which demonstrates which physiographic zones new dairying activities are more likely to occur in. Figure 6.3.1(c) shows the spatial distribution of LUC classes, dairy and dairy support across the Region. Given the spatial variation year to year of intensive winter grazing, and the variation in intensity of other land uses (e.g. sheep and beef farming), similar analysis has not been undertaken for other intensive land uses.

Figure 6.3.1(b): Southland existing and potential dairy land presented by physiographic zone.



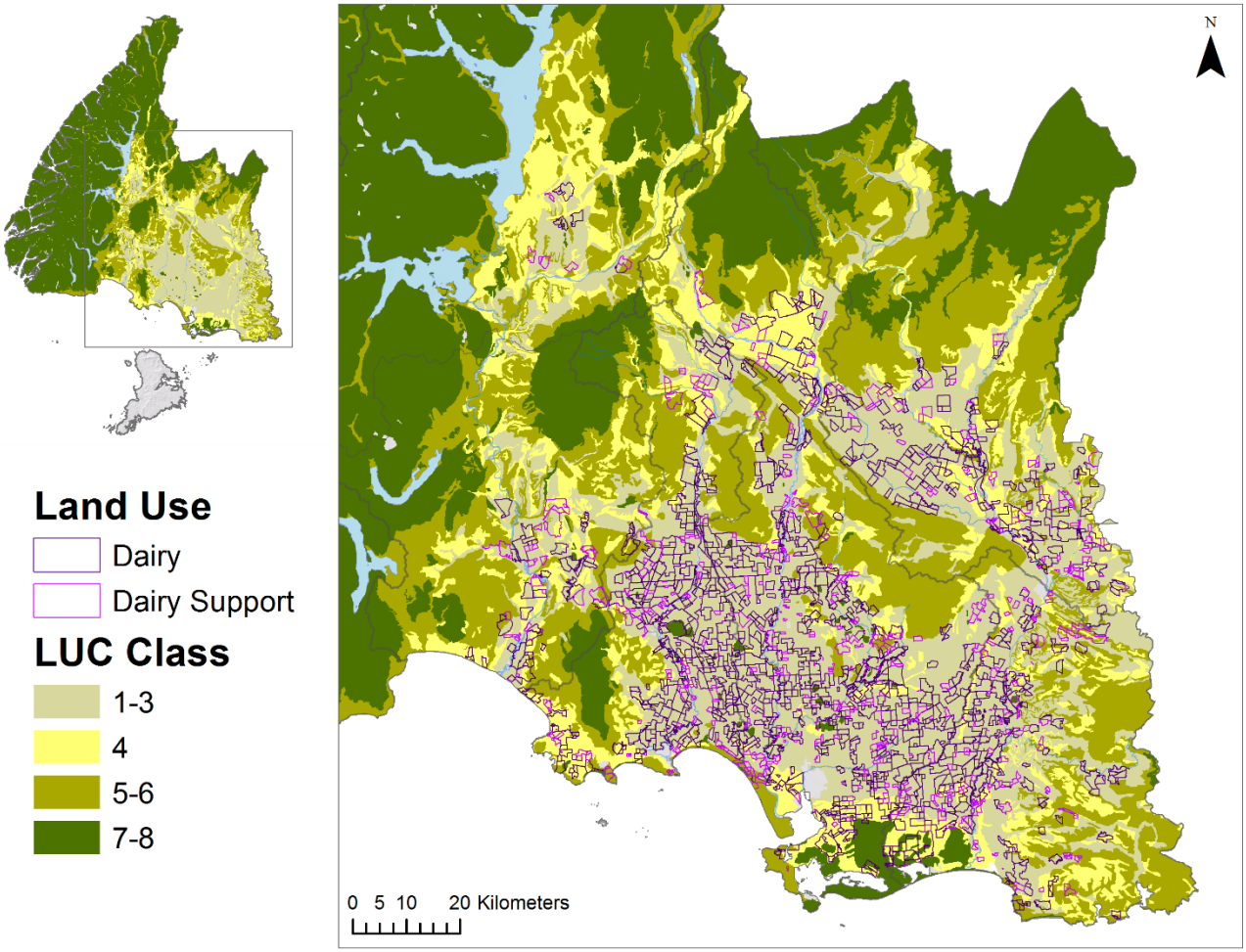


Figure 6.3.1(c): Southland LUC classes and exist dairy and dairy support activities.

6.3.1.3 Good management practices

A number of farmers and industries have been proactive about understanding their impact on water quality, and investing in mitigations to reduce that impact. There has been significant investment in streamside fencing and planting, winter grazing management practices, and effluent storage and application. However, the continuing decline in water quality in many parts of Southland indicates that further understanding and appropriate investment is needed.

Change to farm systems is likely to be part of the long term solution. However, Environment Southland has identified the pSWLP as a first step towards the NPSFM limit-setting process and, as such, systems change is not the intended outcome at this time. Environment Southland is also acutely aware of the significant contribution of farming to the Southland economy (over 20% of GDP at the farm gate) meaning progress toward maintaining water quality needs to manage the short to medium term economic impacts while still providing the correct market signals and meeting community expectations.

6.3.2 Statutory Context

6.3.2.1 Resource Management Act 1991 (RMA)

The Council has a number of functions under section 30(1) of the RMA that are relevant to this aspect of the pSWLP. They include:

- Establishing, implementing and reviewing objectives, policies and methods to achieve integrated management of the natural and physical resources of the region (section 30(1)(a)).
- Preparing objectives and policies in relation to any actual or potential effects of the use, development or protection of land which are of regional significance (section 30(1)(b)).
- The control of the use of land for the purpose of the maintenance and enhancement of the quality of water in water bodies, and the maintenance and enhancement of ecosystems in water bodies; (section 30(1)(c)).
- The control of discharges of contaminants into or onto land or water, and discharges of water into water (section 30(1)(f)).
- If appropriate, setting rules in a regional plan to allocate the water quality. i.e. the capacity of water to assimilate contaminants from discharges.

6.3.2.2 NPSFM

Objective A2 of the NPSFM requires the overall quality of fresh water within a region to be maintained or improved. In many locations in Southland water quality is declining under the current regulatory regime.

Objective A4 seeks to enable communities to provide for their economic wellbeing in sustainably managing water

Policy A3 enables Councils to make rules requiring the adoption of the best practicable option to prevent or minimise any actual or likely adverse effect on the environment of any discharge which may enter water. For farming activities, this is particularly relevant in those zones most susceptible to nutrient enrichment where the key transport pathway is deep or lateral drainage, as few options to mitigate this discharge pathway are currently available without systems change. For overland flow and artificial drainage, the mitigation measures are more straightforward, as the point of discharge is more easily identified.

6.3.2.3 ~~Regional Policy Statement for Southland 1997 (RPS)~~

~~Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. Section 43AA then defines "regional policy statement" as "an operative regional policy statement approved by a regional council under Schedule 1." The most relevant part of the RPS in relation to farming is 5.5 Water Quality.~~

~~Objective 5.1 requires the quality of the region's water resources to be sustained to meet the needs of a range of uses, including the reasonably foreseeable needs of future generations, and to safeguard the life-supporting capacity of water and related ecosystems. This is supported by Policy 5.5 which requires local authorities to assess the effects of land use and development on ground water and surface water quality, including both point and non-point source discharges, and provide for any adverse effects to be avoided, remedied or mitigated.~~

~~Objective 5.2 requires that in the use and development of water and land resources, and the discharges of contaminants, water quality is maintained and, wherever practicable, enhanced. Similarly, Objective 5.3 requires that the discharge of contaminants into water does not compromise water quality standards established for the region. These objectives are supported by Policy 5.2 which requires all point source discharges to comply with water quality standards after reasonable mixing.~~

6.3.2.4 ~~Proposed~~ Southland Regional Policy Statement 2017 ~~2012~~ (~~p~~RPS)

~~Section 66(2)(a) of the RMA states that a Regional Plan shall have regard to any proposed regional policy statement. The pRPS is currently under appeal, however Council must still have regard to it (as a minimum) when preparing the pSWLP. It is likely that the pRPS will become operative before the pSWLP, at which point the Plan will be required to give effect to the pRPS. Given this likely overlap, it would be efficient for Council to ensure that the pSWLP already gives effect to the pRPS.~~ Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. The following provisions are particularly relevant ~~(those under appeal are marked with an asterisk)~~:

Objective WQUAL.1 Water quality in the region:

a. safeguards the life-supporting capacity of water and related ecosystems;
b. safeguards the health of people and communities;
c. is maintained, or improved in accordance with freshwater objectives formulated under the NPS-FM 2014;
d. is managed to meet the reasonably foreseeable social, economic and cultural needs of future generations.

Objective WQUAL.2 Halt the decline, and improve water quality in lowland water bodies and coastal lakes, lagoons, tidal estuaries, salt marshes and coastal wetlands in accordance with freshwater objectives formulated in accordance with the NPS-FM 2014.

Policy WQUAL.1

a. identify values of surface water, groundwater, and water in coastal lakes, lagoons, tidal estuaries, salt marshes and coastal wetlands, and formulate freshwater objectives in accordance with the NPS-FM 2014;
b. Manage discharges and land use activities to maintain water quality, or improve it, to ensure freshwater objectives are met.

Policy WQUAL.2 In managing water quality, particular regard will be had to the following contaminants:

a. nitrogen;
b. phosphorus;
c. sediment;

d. microbiological contaminants.

Policy WQUAL.11 Integrate the management of land use, water quality, water quantity, coast and air, and the use, development and protection of resources wherever possible to achieve the freshwater objectives formulated in accordance with Policy WQUAL.1.

Method WQUAL.1 Establish and maintain provisions in regional plans in accordance with the NPS-FM 2014 that:

a. identify freshwater management units, and the values of each unit for which water quality is to be managed;
b. establish freshwater objectives, taking the identified values into consideration;
c. set limits or targets to allow the freshwater objectives to be met;
d. manage land use activities and discharges of contaminants to meet limits;
e. determine timeframes and appropriate methods for the improvement of degraded freshwater management units;
f. in implementing the matters outlined in (a) to (e) above, the Southland Regional Council will work with tangata whenua, the community, territorial authorities, industry, stakeholders and the agricultural sector.

Policy WQUAL.2 in the ~~p~~RPS is one provision which provides more specific direction on the management of land use activities. The approach taken by the physiographic zone work supports Council's direction in Policy WQUAL.2 by focusing on nitrogen and phosphorus in particular. The pSWLP uses this as a foundation for establishing controls for land use activities which produce these contaminants.

6.3.3 Relevant objectives of the pSWLP

The pSWLP contains the following objectives which are considered the most relevant for managing nutrient loss from farms:

Objective 1 *Land and water and associated ecosystems are sustainably managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between freshwater, land and the coast.*

Objective 2 *Water and land is recognised as an enabler of primary production and the economic, social and cultural wellbeing of the region.*

Objective 6 *There is no reduction in the overall quality of freshwater, and water in estuaries and coastal lagoons, by:*

(a) maintaining the quality of water in waterbodies, estuaries and coastal lagoons, where the water quality is not degraded; and

(b) *improving the quality of water in waterbodies, estuaries and coastal lagoons, that have been degraded by human activities.*

Objective 8 (a) *The quality of groundwater ~~in aquifers~~ that meets both the Drinking-Water Standards for New Zealand 2005 (revised 2008) and any freshwater objectives, including for connected surface waterbodies, established under Freshwater Management Unit processes is maintained; and*

(b) *The quality of groundwater ~~in aquifers~~ that ~~have been degraded by~~ does not meet Objective 8(a) because of the effects of land use ~~and~~ or discharge activities ~~(with the exception of those aquifers where ambient water quality is naturally less than the Drinking-Water Standards for New Zealand 2005 (revised 2008))~~ is progressively improved so that:*

(1) groundwater (excluding aquifers where the ambient water quality is naturally less than the Drinking-Water Standards for New Zealand 2005 (revised 2008)) meets the Drinking-Water Standards for New Zealand 2005 (revised 2008); and

(2) groundwater meets any freshwater objectives and freshwater quality limits established under Freshwater Management Unit processes

Objective 13 *Enable the use and development of land and soils to support the economic, social, and cultural wellbeing of the region.~~, provided:~~*

Objective 13A *~~(a)~~ ~~t~~The quantity, quality and structure of soil resources are not irreversibly degraded through land use activities ~~and~~ or discharges to land.~~:~~*

Objective 13B *~~(b)~~ The discharges of contaminants to land or water that have significant or cumulative adverse effects on human health are avoided.~~;~~ and

~~(c) adverse effects on ecosystems (including diversity and integrity of habitats), amenity values, cultural values and historic heritage values are avoided, remedied or mitigated to ensure these values are maintained or enhanced.~~

Objective 18 *All activities operate in accordance with ~~at~~ "good ~~(environmental)~~ management practice" or better to optimise efficient resource use, safeguard the life supporting capacity of ~~and protect~~ the region's land~~,~~ and soils, and maintain or improve the ~~water from~~ quality and quantity of the region's water resources. ~~degradation.~~*

6.3.4 Overview of practicable options

Environment Southland has considered four reasonably practicable options for managing the adverse effects of farming, particularly in terms of diffuse discharges of contaminants. These are as follows:

- Option A – (Status quo) – new dairy farms are required to seek land use consent to convert land to dairy farming, which only addresses the effects from establishment and not from the ongoing operation.
- Option B – (Engagement option) – policies and rules apply to all farming activities and focus on managing intensification of any farming activity, including intensive sheep and beef farming, arable and horticulture.
- Option C – (pSWLP decisions provisions) – policies and rules require progress towards good management practices through the adoption of environmental

management plans for dairy farming and intensive winter grazing, farmer-led choices as to mitigation options and a focus on new dairy and wintering activities~~, particularly in the Old Mataura and Peat Wetlands physiographic zones~~.

- Option D – (pSWLP alternative) - policies and rules require progress towards good management practices through the adoption of environmental management plans, farmer-led choices as to mitigation options and a focus on dairy and wintering activities, particularly in the Oxidising, Old Mataura and Peat Wetlands physiographic zones.

6.3.4.1 Scale and Significance

Section 32(1)(c) requires that, when examining whether the provisions in the proposal are the most appropriate way to achieve the objectives, the analysis must contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal. The proposed provisions within this section relate to significant new controls on all farming activities, to move towards good management practices and reduce contaminant losses to water. It is considered that the provisions will require a range of changes to farming practices and increased resource consenting. As such, the scale and significance is considered to be high. The level of detail in the analysis below corresponds with the higher level of significance.

6.3.4.2 Option A – Status Quo

Management of nutrient losses from dairy farming and winter grazing activities currently occurs through the policy and rule framework in two Plans: the Water Plan and RELAP. The majority of the policies in both Plans direct the consideration of the adverse effects arising from particular activities, rather than seeking to achieve a particular outcome. There is an assumption that by managing adverse effects, the objectives regarding water quality can be achieved.

Together, the two Plans either permit or require resource consent for a range of common farming activities to manage the effects of these activities, largely through controls on discharges to land and water. The controls tend to manage direct discharges (i.e. applying agricultural effluent to land) rather than indirect discharges which arise from the use of land to keep stock.

The only land use control comes through Rule 17A in the Water Plan which requires resource consent to establish a dairy farm as a discretionary activity. This rule seeks to manage land use at the point of conversion, but does not manage the ongoing operation of dairy farms once established. This means any ongoing management requirements can only be attached to any discharge or water permits accompanying the land use consent.

6.3.4.3 Option B – Engagement Option

Option B introduces a policy and rule framework focussed on managing 'high intensity' farming and wintering operations. The policies are based largely on physiographic zones, and support declining consent applications for high and increasing intensity farming in riskier physiographic zones.

High intensity farming is defined as all dairying operations, other farming operations with a stocking rate greater than 15 stock units per hectare, intensive winter grazing occupying more than 15% of a landholding, and cropping.

The policy and rule framework relies on a specified set of minimum farm practices, rather than a farm management plan. The practices include riparian management, nutrient budgeting, effluent management and irrigation management. Through these practices, it is assumed that 'high intensity' farming activities and wintering would be operating at good management practice.

High intensity farming controls are based on permitting existing activities, capped at their current levels of intensity. Any increase in stocking rates beyond that requires a resource consent, with the activity status set by the physiographic zone in which the activity is operating as follows:

- Discretionary in Riverine, Gleyed or Lignite
- Non-complying in Hill Country (now called Bedrock/Hill Country), Oxidising, Old Mataura, Peat Wetlands and Central Plains

A non-complying activity status means that an application either must be consistent with the objectives and policies in the pSWLP or have no more than minor effects. If one of these tests can be met, the consent authority can then consider the application and grant consent with or without conditions or decline consent. Applications are assessed against criteria in the relevant plan (such as the pSWLP) and relevant matters set out in section 104 of the RMA.

Wintering controls are based around a permitted land area per landholding of 15%. This is intended to enable the wintering of a farmer's own stock as a permitted activity. Beyond that, a resource consent would be required, with the activity status set by the physiographic zone in which the activity is operating as follows:

- Discretionary in Riverine, Gleyed, Lignite, or Oxidising
- Non-complying in Hill Country (now called Bedrock/Hill Country)
- Prohibited in Old Mataura, Peat Wetlands and Central Plains

6.3.4.4 Option C – pSWLP decisions provisions

Farm Environmental Management Plans and Good Management Practices

The pSWLP policy and rule framework addresses nutrient losses from dairy farming and intensive winter grazing ~~farming~~ activities through the requirement for ~~either~~ a Farm Environmental Management Plan (FEMP) ~~or membership of an Independently Audited Self-Management Scheme (IASM)~~.

Appendix N of the pSWLP outlines the requirements of an FEMP. FEMPs must include measures to manage riparian zones, cultivation, wintering and effluent application, nutrient budgeting as well as good management practices (GMPs) specific to the property, taking into account the physiographic units the property is located in, and the key transport pathways for contaminants.

Five lists of GMPs have been prepared by AgResearch and are available on the Environment Southland website. There is a list of general GMPs which are relevant everywhere, and then there is a list for each of the key contaminant transport pathways:

- Overland flow (runoff)
- Artificial drainage (such as tile drains and mole pipe drainage)
- Deep drainage of nitrogen (leaching to groundwater)
- Deep drainage of phosphorus and lateral drainage of phosphorus and microbes (grouped because this is only applicable in the Peat Wetlands zone)

The GMPs are designed to provide guidance for preparing the FEMP, and as they do not form part of the pSWLP itself, can be updated as GMPs develop in the future. This provides the ability for the pSWLP to be adaptable to changing technology and innovation over time as the lists can continuously be updated when new mitigations are developed.

The engagement process on the Working Draft (Option B in this section) suggested that FEMPs are currently rare in the Southland agricultural community. In response, the notified plan required FEMPs to be prepared by different dates in different circumstances, allowing for a staged approach.. However, by focussing earlier requirements on dairy farms and farming that includes intensive winter grazing, staging is undertaken by the risk associated with farming type, rather than geographic area. ~~As a result, the requirement to have, and put into practice, an FEMP is staged over time. The timeframes were based on current contaminant concentrations, the amount of LUC 1-4 land available for conversion (used as a proxy for intensification potential) and risk based on contaminant load.~~

~~The inclusion of IASM in the pSWLP is a future-proofing mechanism to avoid the need for a plan change in the event industry develop such a scheme. At the time of drafting the plan there was good support, in principle, for the adoption of an IASM scheme but no such scheme had been established.~~

Activity classifications

Through the engagement process on the Working Draft it became obvious that defining intensive farming in the Southland context was problematic. As a result, the pSWLP provisions for intensive farming focus explicitly on dairy farming and intensive winter grazing on forage crops, both of which are comparatively easy to define, with a rule framework that address the whole farm activities, rather than specific components.

Increases in area or intensity of dairy farming and intensive winter grazing above 15% of a landholding or 100ha (whichever is the lesser) trigger a resource consent as a restricted discretionary activity, provided it can be shown that contaminant losses are not increasing. If this cannot be shown, resource consent is required as a discretionary activity.

For the notified version of the pSWLP, nine physiographic zones were described. There was a policy related to each one, and in some of the physiographic zones considered to be more sensitive, the activity status for new dairy farming and intensive winter grazing was more restrictive, with a noncomplying activity status. The pSWLP also included a map series depicting the nine physiographic zones.

Physiographic zones had not been used in an RMA plan context prior to the notification of the pSWLP.

Through the hearing process, particular issues identified with the physiographic zone approach were:

- the use of the physiographic zones at a "farm scale" when the mapping and source data was not as 'fine-grained';
- the imperfect ability of the physiographic zones to project water quality risks from different land uses at a farm scale;
- the condensing of a complex model into nine physiographic zones; and
- a poor appreciation of the concept by landowners – for example much of the activity occurs below the top-soil – and therefore it can't be seen, and in some cases zone names may conflict with surface features.

That being said, the physiographic zone information is a useful tool to assist with decision-making on resource consent applications, and for the activities to be included in a farm environment plan.[84]

~~Farming activities are delineated as follows:~~

- ~~Existing intensive winter grazing operations on forage crop above 20 ha in the Old Mataura and Peat Wetlands physiographic zones, and above 50 ha in other zones are restricted discretionary activities~~
- ~~New (including additional) dairy farming of cows and intensive winter grazing on forage crop are non-complying in the Old Mataura and Peat Wetlands physiographic zones, and discretionary in other physiographic zones~~
- ~~All other farming activities are permitted provided that:~~
  - ~~Intensive winter grazing occurs on less than 20 ha in the Old Mataura and Peat Wetlands physiographic zones, and less than 50ha in other zones~~
  - ~~Existing dairy farms hold a farm dairy effluent permit which specifies a maximum number of cows~~

Discharge provisions for farming are divided as follows:

- Fertiliser and incidental discharges from farming are permitted activities
- Renewal of farm dairy effluent consents are restricted discretionary activities
- New farm dairy effluent consents or where the cow numbers are proposed to increase are discretionary activities

Specific policies have been included in the plan to ensure that proposed rules are applied consistently, including guidance on duration of consent, mitigation, and specific elimination of the application of the 'permitted baseline'. While these policies are not specific to the management of farming, they are expected to play a significant role in the management of diffuse discharges and water takes by providing additional clarity that is currently not available for ES or land owners.

6.3.4.5 Option D – pSWLP alternative

[84] Ref decision report

As for Option C above except that dairy farming of cows and intensive winter grazing in the Oxidising, Old Mataura and Peat Wetlands physiographic zone is classified as non complying~~, in line with the Old Mataura and Peat Wetlands zones~~.

Farming activities are delineated as follows:

- Existing intensive winter grazing operations on forage crop above 20 ha in the Oxidising, Old Mataura and Peat Wetlands physiographic zones, and above 50 ha in other zones are restricted discretionary activities
- New (including additional) dairy farming of cows and intensive winter grazing on forage crop are non-complying in the Oxidising, Old Mataura and Peat Wetlands physiographic zones, and discretionary in other physiographic zones
- All other farming activities are permitted provided that:
  - Intensive winter grazing occurs on less than 20 ha in the Oxidising, Old Mataura and Peat Wetlands physiographic zones, and less than 50ha in other zones
  - Existing dairy farms hold a farm dairy effluent permit which specifies a maximum number of cows

6.3.5 Assessment of efficiency and effectiveness

Section 32(1)(b)(ii) of the RMA requires the assessment of the 'efficiency and effectiveness' of provisions in achieving the objectives, in a level of detail that corresponds to the scale and significance of the anticipated effects. The objectives against which the proposed options are being evaluated are introduced in section 5.3 of this report. As discussed in section 1.1.4.1, the overall scale and significance of the anticipated effects of the farming provisions is considered to be high.

Each individual option is evaluated below. First the effectiveness of each option in assisting the achievement of the objectives of the pSWLP is assessed. The following factors have been assessed as part of the effectiveness assessment:

- Relevance - includes the extent to which the provisions are targeted to achieve the objectives and the length of time taken to achieve the objective.
- Feasibility – includes the degree of uncertainty of achieving the objectives, degree of risk associated with the provisions (e.g. unintended consequences), ease of implementation (e.g. likelihood of compliance and ability to monitor/enforce).
- Acceptability – level of community and stakeholder acceptance.

Each option has been given an effectiveness score out of five (from low effectiveness through to high effectiveness) against the relevant objectives in the pSWLP. An average overall score out of five has been given to each of the options. It should be noted that the provisions alone will not fully achieve the objectives of the pSWLP, as the outcomes and limit setting processes are yet to occur which also aim to give effect to the pSWLP and higher order documents

Where options are evaluated as being effective in achieving the objectives in the pSWLP they are subsequently evaluated for their 'efficiency'. Efficiency is about the use of resources (for example, human, financial and natural) required for a particular policy option to be fully effective in comparison with other options. It also relates to how people

will be able to provide for their social, economic and cultural wellbeing now, and in the future.

To determine efficiency, the evaluation investigated the anticipated benefits and opportunities, and costs and risks anticipated from the options, taking into account short and longer term benefits and costs, to both the individual and the wider community. Benefits and opportunities, and costs and risks have been integrated across the four wellbeings (cultural, social, economic and environmental).

6.3.5.1 Option A – Status Quo

Effectiveness

To assist the assessment of effectiveness of Option A, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
1	✔	Objective 1 requires the integrated management of land and water and associated ecosystems. The current management framework has a strong focus on discharges and lacks consideration of the connectivity between land uses and impacts on water and coast. As such, it will not be possible to achieve the objective with the current management framework. Rule 17A attempted to introduce a land use component to managing nutrient loss, however it only manages the initial establishment of dairy farms. There is limited ability to enforce conditions as applicants may surrender their consent once a dairy farm is established. Rule 17A was proposed in 2012 and received considerable opposition from the community and stakeholders – many of whom considered the previous rule framework was sufficient for managing water quality.
2	✔✔	The status quo is predominantly a permitted activity framework for farming activities, which enables use of land to reflect the changing economic values of the community over time. However, the framework allows minimal consideration of social and cultural wellbeing, which impedes the framework's ability to achieve the objective. There is uncertainty in the achievement of the objective as Council holds little information on permitted activities, including their effects. There is also risk of ongoing unintended consequences due to this lack of information. The status quo of predominantly permitted activities is supported by the agricultural community, but is less acceptable to those with a greater interest in social and cultural wellbeing than economic wellbeing.

6	✔	The current provisions are not well targeted to achieve this objective due to their lack of consideration of the impacts of land use on water quality. Scientific monitoring and investigations confirm that Southland's water quality is continuing to decline at a number of sites, indicating that the current provisions are not sufficiently robust to achieve the objective. The main risk with the current provisions is that they are not providing a means to address declining water quality, which will only get more difficult to address and rectify over time. ES undertakes little permitted activity monitoring which makes it difficult to chart the effects of these activities over time. Many stakeholders accept that the current framework is not sufficient to prevent further reduction in water quality, however engagement with the community has demonstrated minimal understanding of current water quality and the reasons for its declining trends.
8	✔✔✔	Rule 17A is not targeted to achieve the objective. Because Rule 17A does not seek to manage the ongoing operation of dairy farms, the only avenue to achieve the objective is through any accompanying discharge permits. There is considerable uncertainty around the degree to which Rule 17A can achieve the improvement of aquifer water quality. There is a risk that not managing ongoing dairying operations may result in further degradation of groundwater, especially on soils where the main contaminant transport pathways are through soils into aquifers rather than overland flow or artificial drainage. It is not clear how acceptable the current provisions are to the community and stakeholders. While the management of discharges may be well accepted, there may be concerns regarding the lack of controls on land uses which contribute to degradation of groundwater quality.
13, 13A, 13B	✔✔	Rule 17A does not address the matters in this objective specifically. ~~The rule does not clearly seek to maintain or enhance ecosystems, amenity values or cultural values. Scientific monitoring and investigations show that in some areas contaminant concentrations are such that they are having adverse effects on ecosystems, which does not meet the objective.~~ There will always be uncertainty in the degree to which any management regime can achieve this objective. However, it is clear that the current provisions are not sufficient to achieve the objective. Council has not yet commenced identifying values as part of the freshwater objective setting process as required by the NPSFM, however it is likely there are sites where water quality is having adverse effects on human health (e.g. where drinking water

		limits are not met) ~~amenity and cultural values, preventing these values from being maintained or enhanced~~. This may not be acceptable to parts of the community or to some stakeholders.
18	✔	Rule 17A does not require specific good management practices to be implemented to achieve this objective. Due to the land use consent lapsing following establishment, the only regulatory 'hook' for any good management practices relies on conditions being placed on any accompanying discharge or water permits. For practices which relate to land management specifically, there is often not scope to include these as conditions. As a result, good management practices are implemented on an ad hoc and voluntary basis, for example through the work of Council's Land Sustainability officers. It is unlikely that all activities will ever operate at good management practice under the current framework. The combination of restricting regulatory mechanisms to conditions on discharge and consent permits, and relying on voluntary uptake of good management practices means there is considerable uncertainty around whether the objective can be achieved, and a significant risk that it will not. Because uptake is left largely to individuals to determine, implementation is currently simple. There is general acceptance that it would be beneficial for farming activities to operate at good management practice, and that decisions around which practices should be adopted on each farm should, as through the current framework, largely be left to individuals.
Total	✔✔	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Option A is anticipated to have an average effectiveness of two out of five in assisting the achievement of Objectives 1, 2, 6, 8, 13, 13A, 13B and 18 of the pSWLP. This demonstrates low to medium effectiveness in achieving the objectives. This Option will therefore not be assessed for its efficiency as it would not be an appropriate option to implement.

6.3.5.2 Option B – Engagement Option

Effectiveness

To assist the assessment of effectiveness of Option B, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**

1	✓✓✓✓	Objective 1 requires the integrated management of land and water and associated ecosystems. The provisions of Option B are focussed towards 'capping' the existing level of nutrient losses, with some improvement due to requiring resource consent for any increases in nutrient discharges and discharges from larger scale wintering activities. This is likely to lead to a short to medium-term stabilisation, if not reduction in nutrient losses, which is highly relevant in terms of Objective 1. If implemented, Option B would be a feasible way to recognise the connectivity between land use and surface and groundwater. The feedback on the Engagement Option was generally negative from large sectors of the Southland community. In general, the feedback suggested that while the option may be effective, it was not considered appropriate or efficient.
2	✓✓	Option B is limited in the extent that it is recognised as an enabler of economic, social and cultural wellbeing of Southland as the option proposes significant limitations on expansion of existing activities, and does not easily enable year-to-year flexibility to respond to market and climatic conditions. The option would potentially not be a feasible way to achieve Objective 2, as the feedback indicated the option is both poorly targeted and could produce unintended outcomes, particularly using stock units and 15% of a landholding as consent thresholds. As stated above, the Option is not seen by the community as particularly acceptable.
6	✓✓✓	The science advice on this option is that in the short to medium term it is likely to achieve the maintenance of water quality, but is unlikely to lead to any substantive improvement in degraded waterbodies. ES anticipates that FMU programmes will achieve the longer-term outcomes. Due to implementation challenges identified through the engagement process, particularly around year-to-year variability, this option is neither likely to be very feasible to achieve the objective, nor very acceptable to the farming community.
8	✓✓✓✓	Agricultural activities, particularly those associated with high nutrient losses, contribute to reducing water quality in some Southland aquifers. There are a number of nitrate 'hot-spots' that are highly correlated with intensive farming practices and with some physiographic zones. For example, 16 of the 17 hotspots occur in either the Oxidising or Old Mataura zones, with the other hotspot in the Central Plains zone. Therefore, the significant controls in Option B would likely lead to some stabilisation of groundwater quality. Feasibility and acceptability as for Objective 6.

13, 13A, 13B	✓✓✓	Objective 13 enables development, provided certain conditions are met. Option B is likely to contribute to meeting these conditions in much the same way as it contributes to Objective 6 above. Feasibility and acceptability as for Objective 6.
18	✓✓	Option B requires those farms undertaking high intensity farming, or those needing resource consent, to operate under a set of blanket minimum requirements, set out in the then "Appendix U". As these good management practices are not applicable everywhere and have minimal ability to be tailored to a specific property Option B will not achieve Objective 18. There is general acceptance that it would be beneficial for farming activities to operate at good management practice level.
Total	3/5	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Option B is anticipated to have an average effectiveness of three out of five in assisting the achievement of the Objectives of the pSWLP.

Efficiency

To assist the assessment of the efficiency of Option B, the benefits and opportunities, and costs and risks over time anticipated from its implementation have been identified and assessed below. When evaluating benefits and costs over time, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**
Individual	➢ Most landowners can continue to operate at current levels. ➢ Increased awareness of on-farm actions and implications for the environment. ➢ Maintain or improve quality of water used domestically or on-farm. ➢ Increase in water quality downstream e.g. for stock drinking water. ➢ Increase in recreational values of water bodies e.g. fishing.	➢ Reduction in commercial value of undeveloped land in physiographic zones with a more stringent activity classification. ➢ Increased cost associated with intensification – resource consenting and meeting conditions where required. ➢ Time and resources required for implementation of minimum farm practices. ➢ Increased stress on landowners as a result of increased regulatory requirements.

		➢ Use of stock unit and production measures do not align well with year-to-year variability. ➢ Some existing activities/businesses, such as large scale wintering, would be forced to change current practices significantly and immediately, and in some cases the existing activity may be prohibited. ➢ Time and cost calculating whether or not intensification has occurred. ➢ Uncertainty about how the '15% rule' would be applied, and risk of perverse outcomes.
Community	➢ Improved aquatic ecosystems health. ➢ Improved ground and surface water quality. ➢ Restoration of mahinga kai sites. ➢ Enhanced recreational opportunities. ➢ Public health benefits downstream from reducing runoff entering waterways. ➢ Opportunity for additional business for service sector e.g. contractors. ➢ Increased ecosystem services, such as water filtering ➢ Increased value to future generations for commercial or recreational uses, as well as enhanced bequest value, option value, existence value, aesthetic value, and ecosystem services value. ➢ Increased existence value - value that comes from something existing, even if you don't use it (e.g. knowing the river is safe to swim in even if you don't swim). ➢ Increased aesthetic value, of particular importance to the tourism industry.	➢ Cost to Council (rates) – Monitoring permitted activity mostly covered by existing monitor programme. ➢ Cost to Council (rates) - Land Sustainability additional workload assisting with implementation of farm practices. ➢ Significant slowing of economic growth and limits on employment opportunities.

6.3.5.3 Option C – pSWLP Decisions Provisions

Effectiveness

To assist the assessment of effectiveness of Option C, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective 1	**Ranking***	**Reasons**
	✓✓✓	Option C contributes toward achieving Objective 1 by recognising the connectivity between surface and groundwater through more stringent activity classifications for some activities which typically have greater nutrient losses. ~~in areas~~

		~~most susceptible to nutrient enrichment of groundwater. This option means more stringent controls are imposed on Old Mataura and Peat Wetlands physiographic zones. These two zones comprise 1% and 2% (respectively) land in Southland, a total of 6% of the unconverted LUC 1-4 land. 20% of the land area in Southland is considered highly susceptible to nutrient loss, which represents 39% of the unconverted LUC 1-4 land.~~ Option C also recognises the connection between freshwater, land and the coast by managing land use (through FEMPs ~~and IASM~~) to address impacts of land use on surface water, and subsequently, estuarine and coastal environments. In terms of feasibility, the requirements for a FEMP have been designed so a farmer can prepare it without assistance from a consultant ~~in most cases~~ (except for the preparation of nutrient budgets). The consent process for activities with higher nutrient losses ~~on land most susceptible to losing nutrients to groundwater (and subsequently surface water)~~ reduces the uncertainty associated with meeting Objective 1. This approach makes Option C more implementable with an estimated 500 ~~300~~ resource consents generated for existing activities, which is within ES's capacity to process and monitor for compliance. Option C also avoids prescriptive regulation, giving farmers the opportunity to choose management practices most applicable to their land and business, which we anticipate will facilitate community acceptance.
2	✓✓✓	Option C recognises that water and land are enablers of economic, social and cultural wellbeing by limiting the number of resource consents required to those activities which have the greatest nutrient losses. Most existing activities will be able to continue as permitted activities, with around 500 ~~300~~ landholdings requiring resource consent for intensive winter grazing. Farmers will also be able to choose their own good management practices, facilitating innovation and acceptability. Feasibility and acceptability as for Objective 1 above.
6	✓✓	Option C contributes to maintaining water quality by requiring farm-specific GMPs and Council oversight of those activities with greatest potential for nutrient loss, which collectively have the potential to reduce nutrient losses by 10-15% (Monaghan et al 2012). Acceptability is likely to be enhanced by the farmers' ability to choose appropriate GMPs, but the extent to which the GMPs maintain water quality will depend on the practices selected. As noted above, more stringent controls apply only to 3% of the region (or 5 % of the potential remaining dairy land).
8	✓✓	Option C has more stringent controls for those activities with high nutrient losses ~~in some areas most susceptible to nutrient enrichment of groundwater~~. This contributes to maintaining groundwater quality. ~~However, three of the zones which have been identified as having deep drainage of nitrate to groundwater as a key transport pathway do not have more stringent controls for high nutrient loss activities.~~

13, 13A, 13B	✓✓✓	The requirements of the FEMP (which include riparian, cultivation and wintering management) contribute to managing soil resources~~, reducing adverse effects on ecosystems,~~ and avoiding significant impacts on human health. Feasibility and acceptability as for Objective 1 above.
18	✓✓✓	Option C requires all farming practices to operate at "good ~~(environmental)~~ management practice" through the requirement to prepare FEMPs. A list of GMPs specific to each transport pathway prepared by AgResearch is available on the Environment Southland website. However, for farming activities that do not require resource consent, the risk in not prescribing which GMP or how many GMPs are required to be implemented means that Council will have little control over the quality of the FEMPs, or the quality of environmental outcomes, and will be reliant on industry bodies to provide a non-regulatory response.
Total	3/5	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Option C is anticipated to have an average effectiveness of three out of five in assisting the achievement of the Objectives of the pSWLP.

Efficiency

To assist the assessment of the efficiency of Option C, the benefits and opportunities, and costs and risks over time anticipated from its implementation have been identified and assessed below. When evaluating benefits and costs over time, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**
Individual	➢ Most landowners can continue to operate at current levels. ➢ Requires movement towards good practice for all farming types. ➢ Increased awareness of on-farm actions and implications for the environment. ➢ Contribution to maintaining or improving quality of water used domestically or on-farm. ➢ Contribution to maintaining water quality downstream e.g. for stock drinking water. ➢ Increase in recreational values of water bodies e.g. fishing.	~~➢ Some reduction in value of unconverted LUC 1-4 land in the Old Mataura and Peat Wetlands zones due to the non-complying activity status to convert to dairy.~~ ➢ Costs associated with resource consenting and meeting conditions where required, processing (>$2,000 – dependent on circumstances), monitoring (annual cost case-by-case). ➢ Time and resources required for preparation and implementation of FEMP.

	~~➢ Potential enhancement of land value in physiographic zones other than Old Mataura and Peat Wetlands.~~ ➢ Reduction in farm costs from GMPs which target efficiency – such as targeted fertiliser application.	➢ Increased stress on landowners as a result of increased regulatory requirements. ➢ Some existing activities/businesses, such as large scale wintering, may need to change practices to continue post 2017. It is unclear whether such changes would be sufficient to meet future FMU processes. ~~➢ The regulatory signal this Option sends farmers in Central Plains, Oxidising and Riverine physiographic zones about further intensification on their land is not aligned with the risk to water quality. This may result in investment decisions which do not remain viable through the future FMU process.~~ ➢ Due to further intensification occurring existing farmers who, as a result of increased total catchment nutrient load, may need to reduce their losses further to meet catchment limits than otherwise would have been the case. ~~This may be most difficult for existing intensive activities on the physiographic zones most susceptible to nutrient loss, which includes 39% of existing dairy land.~~
Community	➢ Contribution to improving aquatic ecosystems health. ➢ Contribution to maintaining or improving ground and surface water quality. ➢ Restoration of mahinga kai sites. ➢ Enhanced recreational opportunities. ➢ Public health benefits downstream from reducing runoff entering waterways. ➢ Opportunity for additional business for service sector e.g. contractors. ➢ Increased ecosystem services, such as water filtering ➢ Increased value to future generations for commercial or recreational uses, as well as enhanced bequest value, option value, existence value, aesthetic value, ecosystem services value ➢ Increased existence value - value that comes from something existing, even if you don't use it (e.g. knowing the river is safe to swim in even if you don't swim).	➢ Cost to Council (rates) – Monitoring permitted activity mostly covered by existing monitor programme. ➢ Cost to Council (rates) - Land Sustainability additional workload assisting with implementation of farm practices. ➢ Slowing of economic growth and impact on employment opportunities within the dairy industry. ➢ Cost to industry of preparing/ assisting farmers in preparing FEMPs. ➢ Due to further intensification occurring existing farmers who, as a result of increased total catchment nutrient load, may need to reduce their losses further to meet catchment limits than otherwise would have been the case. ~~This may be most difficult for existing intensive activities on the physiographic zones most susceptible to nutrient loss,~~

➢ Increased aesthetic value, of particular importance to the tourism industry.	~~which includes 39% of existing dairy land.~~

6.3.5.4 Option D – pSWLP alternative

Effectiveness

To assist the assessment of effectiveness of Option D, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
1	✓✓✓✓	Option D recognises the connectivity between surface and groundwater through more stringent activity classifications for some activities which typically have greater nutrient losses in three of the five physiographic zones most susceptible to nutrient enrichment of ground and surface water. This option puts more stringent controls on Old Mataura, Oxidising and Peat Wetlands physiographic zones, which combined make up 14% of land area in Southland (28% of unconverted LUC 1-4 land). The remaining zones with high susceptibility to nutrient loss make up a further 6% of land in Southland (11% of unconverted LUC 1-4 land). Option D also recognises the connection between freshwater, land and the coast by managing land use (through FEMPs and IASM) to address impacts of land use on surface water, and subsequently, estuarine and coastal environments. In terms of feasibility, the requirements for a FEMP have been designed so a farmer can prepare it without assistance from a consultant in most instances. The consent process for activities with higher nutrient losses on land most susceptible to losing nutrients to groundwater and subsequently surface water reduces uncertainty associated with meeting Objective 1. This approach makes Option D more implementable, with an estimated 350 resource consents generated for existing activities which is within ES's capacity to process and monitor for compliance. Option D also avoids prescriptive regulation, giving farmers the opportunity to choose management practices most applicable to their land and business, which it is anticipated will facilitate community acceptance. However, ES consider the inclusion of the Oxidising zone in the list of non-complying zones will jeopardise acceptance of the plan as a whole from the agricultural community
2	✓✓✓	Option D recognises that water and land are enablers of economic, social and cultural wellbeing by limiting the number of resource consents required to those activities which have the

		greatest nutrient losses. Most existing activities will be able to continue as permitted activities, with around 350 landholdings requiring resource consent for intensive winter grazing. Farmers will also be able to choose their own good management practices, facilitating innovation and acceptability. Feasibility and acceptability as for Objective 1 above.
6	✓✓✓✓	Option D contributes to maintaining water quality by requiring farm specific GMPs and Council oversight of those activities with greatest potential for nutrient loss, which have the potential to reduce nutrient losses by 10-15% (Monaghan et al 2012). Acceptability is likely to be enhanced by the farmers ability to choose appropriate GMPs but the extent to which the GMPs maintain water quality will depend on the practices selected.
8	✓✓	Option D has more stringent controls for those activities with high nutrient losses in areas most susceptible to nutrient enrichment of groundwater. This contributes to maintaining groundwater quality. However, three of the zones which have been identified as having deep drainage of nitrate to groundwater as a key transport pathway do not have more stringent controls for high nutrient loss activities making them vulnerable, and therefore weakening the alignment with this objective.
13, 13A, 13B	✓✓✓	The requirements of the FEMP (which include riparian, cultivation and wintering management) contribute to managing soil resources~~, reducing adverse effects on ecosystems,~~ and avoiding significant impacts on human health. Feasibility and acceptability as for Objective 1 above.
18	✓✓✓✓	Option D requires all farming practices to operate at "good ~~(environmental)~~ management practice" through the requirement to prepare FEMPs. A list of good management practices specific to each transport pathway, prepared by AgResearch, is available on the Environment Southland website. However, the risk in not prescribing good management practices is that Council will have little control over the quality of the FEMPs.
Total	4/5	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Option D is anticipated to have an average effectiveness of four out of five in assisting the achievement of the Objectives of the pSWLP.

Efficiency

To assist the assessment of the efficiency of Option D, the benefits and opportunities, and costs and risks over time anticipated from its implementation have been identified and assessed below. When evaluating benefits and costs over time, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**
Individual	➢ Most landowners can continue to operate at current levels. ➢ Requires movement towards good practice for all farming types. ➢ Increased awareness of on-farm actions and implications for the environment. ➢ Contribution to maintaining or improving quality of water used domestically or on-farm. ➢ Contribution to maintaining water quality downstream e.g. for stock drinking water. ➢ Increase in recreational values of water bodies e.g. fishing. ➢ Potential enhancement of land value in physiographic zones other than Oxidising, Old Mataura and Peat Wetlands. ➢ Reduction in farm costs from GMPs which target efficiency – such as targeted fertiliser application.	➢ Some reduction in value of unconverted LUC 1-4 land in the Oxidising, Old Mataura and Peat Wetlands zones due to the non-complying activity status to convert to dairy. ➢ Costs associated with resource consenting and meeting conditions where required, processing (>$2,000 – dependent on circumstances), monitoring (annual cost case-by-case). ➢ Time and resources required for preparation and implementation of FEMP. ➢ Increased stress on landowners as a result of increased regulatory requirements. ➢ Some existing activities/businesses, such as large scale wintering, may need to change practices to continue post 2017. It is unclear whether such changes would be sufficient to meet future FMU processes. ➢ The regulatory signal this Option sends farmers in Central Plains and Riverine physiographic zones about further intensification on their land is not aligned with the risk to water quality. This may result in investment decisions which do not remain viable through the future FMU process. ➢ Due to further intensification occurring existing farmers who, as a result of increased total catchment nutrient load, may need to reduce their losses further to meet catchment limits than otherwise would have been the case. This may be most difficult for existing intensive activities on the physiographic zones most susceptible to nutrient loss, which includes 39% of existing dairy land.
Community	➢ Contribution to improving aquatic ecosystems health. ➢ Contribution to maintaining or improving ground and surface water quality. ➢ Restoration of mahinga kai sites.	➢ Cost to Council (rates) – Monitoring permitted activity mostly covered by existing monitor programme. ➢ Cost to Council (rates) - Land Sustainability additional workload

➢ Enhanced recreational opportunities. ➢ Public health benefits downstream from reducing runoff entering waterways. ➢ Opportunity for additional business for service sector e.g. contractors. ➢ Increased ecosystem services, such as water filtering ➢ Increased value to future generations for commercial or recreational uses, as well as enhanced bequest value, option value, existence value, aesthetic value, ecosystem services value ➢ Increased existence value - value that comes from something existing, even if you don't use it (e.g. knowing the river is safe to swim in even if you don't swim). ➢ Increased aesthetic value, of particular importance to the tourism industry.	assisting with implementation of farm practices. ➢ Slowing of economic growth and impact on employment opportunities within the dairy industry. ➢ Cost to industry of preparing/ assisting farmers in preparing FEMPs. ➢ Due to further intensification occurring existing farmers who, as a result of increased total catchment nutrient load, may need to reduce their losses further to meet catchment limits than otherwise would have been the case. This may be most difficult for existing intensive activities on the physiographic zones most susceptible to nutrient loss, which includes 39% of existing dairy land.

Efficiency Discussion

The NPSFM sets out a process for setting freshwater objectives to maintain and improve water quality (often referred to as the catchment limit-setting or FMU process) and lists compulsory values (including bottom lines for water quality) which must be met. The first step of the FMU process is to identify community values. Community values include both market values (such as tourism, agricultural and fishing values) and non-market values (such as mahinga kai and recreational values). These values are interconnected, as are the costs and benefits of maintaining and improving them. In Southland, the FMU process is due to begin later in 2018 ~~2016~~, so the community values have not yet been identified. As such, it is currently not possible to quantify the costs and benefits of meeting the values set by the community.

More generally, the environmental, cultural and social benefits of better management of nutrient discharges from farming have been identified in the table above, in the background reporting, and through policy direction such as the NPSFM and the ~~p~~SRPS. These benefits are difficult, if not impossible, to quantify in dollar terms and no attempt has been made to do so here.

Overall, both Options C and D are considered to be moderately efficient ways of achieving the Plan's objectives. Both target regulatory intervention towards those farming activities that have the highest nutrient losses and those increasing in intensity.

The key difference between the two options is 'cost now' or 'cost later'. Option C is considered less costly in the short term ~~as the more stringent regulation applies only to land within the Old Mataura and Peat Wetlands physiographic zones. These zones comprise approximately 55,000 ha of agricultural land, i.e. land which could conceivably be intensively grazed in winter, of which approximately 33,000 ha is potential dairy land (based on LUC 1-4)~~. Compared to Option D, Option C is more enabling of further intensification. It can be reasonably assumed that the more intensification occurs~~,~~

~~particularly on those physiographic zones most susceptible to nutrient loss,~~ the more change will be required in time, to comply with catchment limits or targets, which translates to greater costs and uncertainty. This includes costs to:

- those farmers who undertake a new dairy/intensive winter grazing activity ~~in zones most susceptible to nutrient loss and consequently~~ who may not be able manage their nutrient losses sufficiently to meet future catchment limits for water quality; and
- existing farmers who, as a result of increased total catchment nutrient load, may need to reduce their losses further to meet catchment limits than otherwise would have been the case. ~~This may be most difficult for existing intensive activities on the physiographic zones most susceptible to nutrient loss, which includes 39% of existing dairy land.~~

By comparison, Option D lessens the cost and uncertainty during the FMU process compared to Option C, but the immediate cost will be greater. The zones which incur more stringent regulation comprise approximately 254,000 ha of agricultural land, i.e. land which could conceivably be intensively grazed in winter, of which approximately 163,000 ha is potential dairy land (based on LUC 1-4).

The costs of meeting the objectives of the pSWLP are likely to be associated with measures to avoid, remedy or mitigate adverse effects on water quality. These measures can be implemented either at source (such as not discharging FDE directly over tile drains) or downstream (such as remediating a eutrophic estuary or treating town water supplies) and the magnitude and distribution of costs varies accordingly. At source the costs are direct and likely to be felt by individual farmers, while downstream the costs are indirect and felt by the community (including farmers). Indirect costs of remediation are uncertain, particularly as community values have not been established. As such, while they have been described in the sections above, they have not been quantified in this section.

In terms of direct economic costs, there are three main components: regulatory costs, mitigation costs and changes in the market value of land. Each are discussed below and quantified where possible.

Regulatory costs

Regulatory costs include:

- the costs of obtaining resource consents for:
  - existing permitted activities that do not comply with the proposed rules
  - activities that are seeking to change and will therefore require resource consent under the farming or intensive winter grazing rules
- The cost of preparing a FEMP

The resource consent costs will most significantly affect existing intensive winter grazing farming activities where, once thresholds have been passed based on physiographic zone risk, the requirement for resource consent is triggered. Predictions based on the forage crop distribution from 2014 suggests that approximately 500 ~~300 to 350~~ consent applications would be generated for existing activities (around 15 ~~10~~% of the properties where forage crop was grown). Based on the 2014 information, this would capture around 26% ~~between 46 and 52%~~ of the total area of land which is intensively winter grazed. ES is working through templates and procedures in order to minimise the cost of this process with a view that it is more efficient for farmers to spend money on mitigation practices

than resource consent processes. Overall, at an average cost of approximately $2500 per consent (inclusive of application preparation and processing fees), the cost across the region is approximately $1.25 ~~0.9~~ million.

Staging the requirement to implement the farming provisions ensures that the work is more evenly spread over time, rather than all occurring at once. The downside to this staged implementation is that any potential gains for water quality are further delayed.

In addition, costs associated with the preparation of FEMPs are anticipated. The FEMP requirements are designed so that farmers themselves can prepare them in most cases. This has a cost in terms of time rather than a cost in terms of engaging consultants or contractors. We estimate that it will take approximately 20-40 hours to prepare an FEMP but this is likely to vary significantly. If a farmer decides to engage a consultant to prepare their FEMP, industry estimates the cost (including nutrient budgeting) is in the vicinity of $5,000 per farm per year.[85] It is envisaged that existing industry programmes (such as Beef and Land NZ's *Land Environment Plan II* and DairyNZ's *Sustainable Milk Plans*) will, with minor adjustment, meet the FEMP requirements. There are costs to industry associated with altering these existing programmes and there is likely to be increased interest in them from farmers, which may cause capacity issues for these industry bodies.

~~In light of feedback on the Working Draft, the provisions also encourage industry to develop IASM schemes. Farmers would join these schemes and members would be exempt from preparing an FEMP in accordance with Appendix N. There are costs to industry of preparing and implementing such schemes however it is not possible to quantify the costs to industry at this stage.~~

Some additional cost may be incurred for a number of farming activities where Overseer budgets are not currently prepared. This is a necessary component for most land holdings preparing a FEMP under Appendix N. This particularly applies in locations where the fertiliser spend is insufficient to obtain this information through fertiliser companies, or the farmer chooses to go down an alternative route.

If it was assumed that 20% of landholdings for which Overseer is required currently do not have nutrient budgets prepared, the additional cost across the region would be in the order of $275,000. This cost would be repeated at least every three years or when there is a farming system change.

Additional spend on resource consents for dairy farming could be generated by expansion of existing farms. New farms require resource consent under the existing Water Plan provisions. ~~Additional costs could also be incurred through the higher activity status thresholds for the more sensitive physiographic zones.~~ Due to the high year-to-year variability in the number of new or expanded dairy farms (averaging approximately 30 per annum for the last three years) it is not prudent to attempt to quantify these costs.

Mitigation costs

To be relevant on every property GMPs must be site specific, as the most effective and efficient methods to manage effects on water quality differs between properties. This

[85] Assumed cost of preparing an Industry Plan, and used as an average in this instance

variation means a list of mandatory GMPs applied across the region would be inefficient and ineffective in some circumstances. As permitted activity rules must be very prescriptive and leave no room for discretion, there cannot simply be a list of GMPs in the rules for people to choose from either. The FEMP structure provides an efficient mechanism to incorporate site specific GMPs into a permitted activity rule. The specific GMPs in the FEMP can then be chosen on a farm-by-farm basis, provided the requirements of Appendix N of the pSWLP are met.

As described above, Southland specific GMPs compiled and assessed by AgResearch are available on the ES website. The Council considers the FEMP, which enables farmers to decide on the most appropriate mitigations for their property, to be the most efficient means of reducing contaminant loss. The GMPs are considered to be efficient in that they are processes or practices that are well proven and the lists provide options ranging in complexity and cost, so there are GMPs suitable for all systems and industries.

In addition, ES has a considerable outreach programme through Land Sustainability officers and Farm Focus Activity Plans, and this is expected to be further enhanced to help more farmers prepare FEMPs. As part of an Implementation Programme, attention will be focused on those areas or activities requiring the most immediate response for the Farm Focus Activity Plans.

Adjustment in the market value of land

~~Both~~ Option~~s C and~~ D is ~~are~~ likely to result in an adjustment to the market value of land. For land within the physiographic zones with a discretionary activity status for new dairying and intensive winter grazing this adjustment is likely to be positive and further intensification is likely to be driven into these areas. For land within the physiographic zones with a non-complying activity status the market value of land has the potential to decrease. This is because the non-complying activity status to convert to dairy (or increase cow numbers) means greater mitigations are likely to be required to obtain resource consent which may affect the economic viability of the application and there is greater likelihood of consent being declined. Subsequently, the capital cost of conversion will be greater and less certain. As the market value of land is largely determined by the perceived profitability, this additional cost and uncertainty is likely to be reflected in the market value of the land. The extent of this cost can be estimated by considering the reduction in land value of unconverted potential dairy land in the Old Mataura, ~~and~~ Peat Wetlands and ~~zones for Option C as well as~~ the Oxidising physiographic zone for Option D. These changes are expected to be long term, and muted by the current low demand for land capable of development for dairying.

The impact on employment is difficult to assess because of the diversity of farm systems in the region. However, the thresholds for intensification and overall reduction in the amount of wintering are likely to limit employment growth in the rural sector, particularly the dairy industry.

6.3.6 Appropriateness discussion

The third requirement of the provisions analysis under section 32(b) is to summarise the reasons for deciding on the provisions. This is self-evident when the most efficient and

effective option is selected, however MfE, in *A guide to section 32 of the Resource Management Act 1991* provides the following guidance on the matter:

> To date, section 32 case law has interpreted 'most appropriate' to mean "suitable, but not necessarily superior". This means the most appropriate option does not need to be the most optimal or best option, but must demonstrate that it will meet the objectives in an efficient and effective way.

Both Option C and Option D are at least moderately efficient and effective options to achieve the objectives in the Plan. Option D is the most effective and efficient option considered by ES. However, ES does not consider Option D to be the most appropriate option to achieve the objectives.

ES considers Option D would negatively impact buy-in into the pSWLP as a whole from the agricultural community and undermine the Plan's effectiveness. ES considers that a non-complying activity status for new and expanding dairying, and new and expanding intensive winter grazing, within the Oxidising zone would be perceived by the public as a moratorium on dairy farming. There is concern that, because the Oxidising zone covers 11% of the land in the region and 22% of the unconverted land in LUC 1-4, a non-complying activity status would be unacceptable to the agricultural community, particularly those with convertible land in the Oxidising zone. In addition to the Old Mataura and Peat Wetlands zones, the Oxidising, Central Plains and Riverine zones are particularly susceptible to nutrient loss. ES envisages that the risk to water quality from further intensification in these zones will be dealt with through the catchment limit setting process.

~~Cognisant of the current downturn in milk prices~~ ES considers Option C, which takes a less stringent approach to regulating new dairy and new intensive winter grazing, the most appropriate option. ES considers that given the strengthened policies and objectives and the removal of the permitted baseline argument through Policy 39, a discretionary activity classification provides ES sufficient flexibility to decline resource consents ~~applications in the Oxidising physiographic zone~~ as required to achieve the objectives of the Plan. This is particularly due to a strengthened framework which provides a mechanism for declining consent applications for higher risk activities that previously wasn't as readily available.

6.3.7 Risk of acting or not acting

An evaluation report must contain an assessment of the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions (under section 32(2)(c) RMA). It is considered that the information relating to the effects arising from contaminants discharges from intensive winter grazing and dairy farming are both certain and sufficient, as is the susceptibility to nutrient loss across the physiographic zones. Further empirical investigation to confirm the transport pathways operating in the Central Plains physiographic zone is required, however, the state of water quality in the zone is both certain and sufficient, with the highest nitrate levels in surface water in the region. As such, it is considered that there is some risk of acting as in Option C, as this may not go far enough to achieve the objectives across all physiographic zones. However, there is a very high risk if no action is taken.

There is uncertainty around the acceptability of Option C to the farming community. ~~While~~ Feedback on the Working Draft suggested a preference for GMPs and concern about the

15% rule. However, the submissions and hearing process have identified that the thresholds established are likely to be the most acceptable of the options available. ~~, this Option benefits some parts of the community and imposes costs on others. Overall, Option C is likely to impose addition costs on a small number of people now (primarily those within the Peat Wetlands and Old Mataura physiographic zones looking to convert) with delayed costs in other physiographic zones to come catchment limit setting~~.

There is also some uncertainty about the implementation of GMPs, as farmers choose which ones will be applied on their farm. ES has sought to reduce this risk by providing guidance on GMPs.

6.3.8 Conclusion

As described above, Council's assessment is that Option C – pSWLP Decisions Provisions is the most appropriate option to achieve the objectives of the pSWLP.

6.3.9 References

LAWF – Fourth Report

Next Steps for Freshwater – MfE 2016 discussion document

A guide to section 32 of the Resource Management Act 1991 – MfE 2014

Physiographic Zones of Southland – Environment Southland 2016

Management practices and mitigation options for reducing contaminant losses from the land to water – AgResearch 2016

Assessment of Farm Mitigation Options and Land Use Change on Catchment Nutrient Contaminant Loads in the Southland Region – Aqualinc Research Ltd 2014

6.4 Incorporation of Ngāi Tahu values

6.4.1 Introduction

This section of the report assesses the provisions relating to incorporation of Ngāi Tahu values within the pSWLP. It outlines the practicable options for incorporation of Ngāi Tahu associations, uses and values, and assesses their effectiveness, benefits and costs and efficiency in achieving the objectives of the pSWLP, to determine which is the most appropriate.

For Ngāi Tahu, the natural environment (including lands, coasts, water, air and biodiversity) is tāonga, and how they engage with it is a critical component of their identity as a people and in maintaining their culture. The life-giving and life-sustaining properties of water are intrinsically linked to the spiritual, cultural, economic, environmental and social well-being of Ngāi Tahu whānui.

The management of natural resources is undertaken using holistic approaches such as Ki Uta ki Tai and Te Mana o te Wai. Kaitiakitanga is central to Ngāi Tahu and is key to their mana whenua. Exercising kaitiakitanga includes ensuring the protection, restoration and enhancement of the productivity and life supporting capacity of mahinga kai, indigenous biodiversity, air, water, land, natural habitats and ecosystems, and all other natural resources valued by Ngāi Tahu ki Murihiku.

The pSWLP recognises the national significance of Te Mana o te Wai to Ngāi Tahu. As discussed in the introduction of the pSWLP, Te Mana o te Wai puts the mauri (inherent health) of the water body and its ability to provide for te hauora o te tangata (the health of the people), te hauora o te taiao (health of the environment) and te hauora o te wai (the health of the waterbody) to the forefront of freshwater management. Te Mana o te Wai has three key functions:

1. it is a korowai (cloak) or overarching statement associating the values relating to a particular waterbody and freshwater management unit;
2. it provides a platform for tangata whenua and the community to collectively express their values for freshwater; and
3. it aligns management tools with values and aspirations to maintain and improve both water quality and quantity.

Te Mana o te Wai is influenced by five key factors:

1. the values that are determined for the waterbody and how they are weighed locally;
2. the current state of the waterbody;
3. the timeframes tangata whenua and the community establish to achieve defined objectives, and quality and quantity;
4. the mechanisms and tools used to achieve defined objectives, and quality and quantity states; and
5. the quality and availability of technical information.

The NPSFM provides a framework for recognising the national significance of freshwater and Te Mana o te Wai. Te Mana o te Wai is fundamental to the integrated framework for

freshwater management in Southland. It provides a way of expressing Southland's aspirations for freshwater, now and into the future.

6.4.2 Statutory Context

Resource Management Act 1991 (RMA)

Part 2 of the RMA seeks that the sustainable management of the region's environment involves both tangata whenua and the local authorities working together, under Treaty of Waitangi principles, in accordance with section 8.

Additionally, the RMA has specific obligations for regional councils regarding kaitiakitanga, Māori in decision making, and the relationship between Māori and their culture and their traditions with their ancestral lands, water, sites wāhi tapu and other taonga.

NPSFM

The NPSFM is about recognising the national significance of fresh water for all New Zealanders and Te Mana o te Wai. The NPSFM also states that "addressing tangata whenua values and interests across all of the wellbeings, and including the involvement of iwi and hapu in the overall management of freshwater, are key to giving effect to ~~meeting obligations under~~ the Treaty of Waitangi." Specifically, the NPSFM provides for:

Objective D1 *To provide for the involvement of iwi and hapū, and to ensure that tāngata whenua values and interests are identified and reflected in the management of fresh water including associated ecosystems, and decision-making regarding freshwater planning, including on how all other objectives of this national policy statement are given effect to.*

Policy D1 *Local authorities shall take reasonable steps to:*

a) involve iwi and hapū in the management of fresh water and freshwater ecosystems in the region;

b) work with iwi and hapū to identify tāngata whenua values and interests in fresh water and freshwater ecosystems in the region; and

c) reflect tāngata whenua values and interests in the management of, and decision-making regarding, fresh water and freshwater ecosystems in the region.

Iwi Management Plan

Iwi Management Plans are non-statutory, however since 2003 local authorities are required under the RMA to take them "into account" when preparing their own regional planning documents and making decisions on an activity.

Te Tangi a Tauira: The Cry of the People (2008) is an Iwi Management Plan recognised by Ngāi Tahu which encompasses the Southland region. Te Tangi a Tauira is based around the Ngāi Tahu philosophy of ki uta ki tai. Giving effect to this concept could include the imbedding of Iwi values and policies throughout Council decision-making processes on activities covered by the pSWLP, to ensure connections and an holistic view is achieved.

~~***Regional Policy Statement for Southland 1997 (RPS)***~~

~~Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. The most relevant part of the RPS in relation to Ngai Tahu values is 5.1 Takata Whenua.~~

~~Relevant objectives, which supported by relevant Policies are:~~

- ~~Objective 1.1 - To protect wahi tapu from the adverse effects of resource use activities.~~
- ~~Objective 1.2 - To recognise the importance of wahi tapu, wahi taoka, mahika kai and the customary use of water to Kai Tahu.~~
- ~~Objective 1.3 - To incorporate Maori cultural and traditional spiritual values where appropriate into resource management decision making processes.~~
- ~~Objective 1.4 - To have particular regard to the concept of kaitiakitanga in relation to managing the use, development and protection of natural and physical resources.~~

~~***Proposed*** ***Southland Regional Policy Statement 2017 2012 (pRPS)***~~

~~Section 66(2)(a) of the RMA states that a Regional Plan shall have regard to any proposed regional policy statement. The pRPS is currently under appeal, however mediation is nearing conclusion and a number of consent orders have been lodged with the Environment Court. It is expected that the pRPS will be made operative once all appeals are resolved, which is likely to be before the pSWLP becomes operative. It is therefore important that the pSWLP gives effect to the pRPS as well as the RPS.~~ Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. The most relevant section of the ~~p~~RPS in relation to Ngāi Tahu values is Chapter 3: Tangata Whenua.

Specific Objectives include:

- Objective TW.1 - Decision-making and partnerships with tangata whenua;
- Objective TW.2 - Provision for iwi management plans;
- Objective TW.3 - Tangata whenua spiritual values and customary resources;
- Objective TW.4 - Sites of cultural significance; and
- Objective TW.5 - Provision for Māori land and resources.

Ngāi Tahu Claims Settlement Act 1998 (the Settlement Act)

The Ngāi Tahu Claims Settlement Act 1998 (the Settlement Act) gives effect to the Deed of Settlement signed by the Crown and Te Rūnanga o Ngāi Tahu on 21 November 1997 to achieve a final settlement of Ngāi Tahu's historical claims against the Crown.

The Settlement Act put into effect the terms and redress package agreed to by Ngāi Tahu and the Crown to mitigate and remedy breaches of the Treaty of Waitangi. It includes several mechanisms specifically designed to be used in implementing other legislation such as the RMA and Fisheries Act 1996. These mechanisms legally recognise the importance of natural resources to Ngāi Tahu.

The Settlement Act includes an instrument called a Statutory Acknowledgement. Statutory Acknowledgements recognise Ngāi Tahu's mana in relation to a range of sites and areas in the South Island, and provides for this to be reflected in the management of those areas. Statutory Acknowledgements must be provided for in any Resource Management Act 1991 (RMA) processes concerning these sites and areas.

Charter of Understanding – He Huaraki mā Ngā Uri Whakatupu

ES is an active participant and signatory to a Charter of Understanding – He Huaraki mā Ngā Uri Whakatupu in place between the southern councils and Ngāi Tahu ki Murihiku. The Charter sets out the basis and conduct of the councils and rūnanga in the context of the RMA and the agreed common goal of "the sustainable management of the region's environment and for the social, cultural, economic and environmental well-being of the community, for now and into the future."

The Charter provides for an ongoing relationship to assist in developing the capacity of Ngāi Tahu ki Murihiku to contribute to the decision-making processes.

6.4.3 Relevant Objectives of the pSWLP

The RMA requires an examination of whether the provisions in the proposal are the most appropriate way to achieve the pSWLP objectives. The pSWLP Objectives that relate specifically to Ngāi Tahu are:

Objective 1 *Land and water and associated ecosystems are sustainably managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between freshwater, land and the coast.*

Objective 3 *The mauri ~~(inherent health)~~ of waterbodies provide for te hauora o te tangata (health and mauri of the people), te hauora o te taiao (health and mauri of the environment) and te hauora o te wai (health and mauri of the waterbody).*

Objective 4 *Taāngata whenua values and interests are identified and reflected in the management of freshwater and associated ecosystems.*

Objective 5 *Ngāi Tahu have access to and sustainable customary use of, both commercial and non-commercial, mahinga kai resources, nohoanga, mātaitai and taiāpure.*

Objective 15 *Taonga species, as set out in Appendix M, and related habitats, are recognised and provided for.*

6.4.4 Overview of practicable options

Environment Southland has considered two reasonably practicable options (as required under section 32(b)(i) RMA) for incorporation of Ngāi Tahu values. These are as follows:

- **Option A – (Status quo)** – retain the current policies and rules that make up the framework within the Water Plan relating to Ngāi Tahu values. These values are intended to align with policies and rules throughout the Water Plan, however explicit

references throughout are not common and extend to only a handful of Policies and Rules[86].

- **Option B - pSWLP** – contains extended references to the values of Ngāi Tahu to better align with the requirements in the statutory framework. Three specific Ngāi Tahu Policies[87] are proposed that particularly require the Council to identify and reflect Ngāi Tahu values in the management of land and water. These mechanisms include making specific reference to Statutory Acknowledgement areas, topuni, nohoanga, mātaitai, taiapure, to Te Rūnanga o Ngāi Tahu, the relevant papatipu Rūnanga, the Charter of Understanding, and to the protection of Ngāi Tahu associations, uses and values throughout the proposed policies and rules in the pSWLP.

Scale and significance

Section 32(1)(c) requires that when examining whether the provisions in the proposal are the most appropriate way to achieve the objectives, the analysis must contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal. The proposed provisions in the pSWLP seek to incorporate Ngāi Tahu values more consistently within the pSWLP to reflect the requirements of the RMA framework relating to the rights and interests of Te Rūnanga o Ngāi Tahu. This change relates to most policy and resource consent decisions, activities in relation to consultation with Ngāi Tahu and consideration of Ngāi Tahu values. As such, the scale and significance is considered to be significant. The level of detail in the analysis below corresponds with that level of significance.

Option A: Status Quo – Water Plan provisions

This option involves retaining the current policies and methods of the Water Plan without amendments, in relation to Ngāi Tahu values.

The Water Plan requires the council to take into account the spiritual and cultural values and beliefs of the tangata whenua within some Rules (26, 27, 28, 32, 33, 36, 37, 40 and 41) and some Policies (14, 14A, 15A and 32) with Policy 1A a specific Ngāi Tahu policy requiring the council to take into account Iwi Management Plans.

The Ngāi Tahu values are provided for in the Water Plan, in particular relating to the protection of water and land quality and within the specific policies and rules set out above.

[86] Rules 26, 27, 28, 32, 33, 36, 37, 40 and 41, and Policies 14, 14A, 15A and 32
[87] Policies 1, 2 and 3

Option B – pSWLP provisions

Option B proposes the inclusion of two further Ngāi Tahu specific Policies and the expansion of current Policy 1A, to provide:

Policy 1 – Enable papatipu rūnanga to participate

Enable papatipu rūnanga to effectively undertake their kaitiaki (guardian/steward) responsibilities in freshwater and land management through the ~~Environment~~ the Southland Regional Council:

1. *providing copies of all applications that may affect a Statutory Acknowledgement area, topuni (landscape features of special importance or value), nohoanga, mātaitai or taiapure to Te Rūnanga o Ngāi Tahu and the relevant papatipu rūnanga;*
2. *identifying Ngāi Tahu interests in freshwater and associated ecosystems in ~~Southland/~~Murihiku (includes the Southland Region); and*
3. *reflect Ngāi Tahu values and interests in the management of and decision-making on fresh water and freshwater ecosystems in ~~Southland/~~Murihiku (includes the Southland Region), consistent with the Charter of Understanding.*

Policy 2 – Take into account iwi management plans

Any assessment of an activity covered by this plan must:

1. *take into account any relevant iwi management plan; and*
2. *assess water quality and quantity taking into account ~~based on~~ Ngāi Tahu indicators of health.*

Policy 3 – Ngāi Tahu ki Murihiku taonga species

To manage activities that adversely affect taonga species, identified in Appendix M.

The pSWLP has expanded on the inclusion of Ngāi Tahu values from those included in the Water Plan. They are set out throughout the proposed Policies and Rules, which have been assessed for their effectiveness in the assessment of the pSWLP prepared by Te Ao Marama Inc. on behalf of Ngāi Tahu ki Murhiku.[88]

In particular, there are a number of references to specific Ngāi Tahu values in many rules, especially as matters of control or discretion.

6.4.5 Assessment of efficiency and effectiveness

Section 32(1)(b)(ii) of the RMA requires the assessment of the 'efficiency and effectiveness' of provisions in achieving the objectives, in a level of detail that corresponds to the scale and significance of the anticipated effects.

[88] Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations

Each individual option is evaluated below. First the effectiveness of each option in achieving the proposed objectives of the pSWLP is assessed. The following factors have been assessed as part of the effectiveness assessment:

- **Relevance** - includes the extent to which the provisions are targeted to achieve the objectives and the length of time taken to achieve the objective.
- **Feasibility** – includes the degree of uncertainty of achieving the objectives, degree of risk associated with the provisions (e.g. unintended consequences), ease of implementation (e.g. likelihood of compliance and ability to monitor/enforce).
- **Acceptability** – level of community and stakeholder acceptance.

Where options are evaluated as being effective in achieving the objectives in the pSWLP they are subsequently evaluated for their 'efficiency'. Efficiency is about the use of resources (for example, human, financial and natural) is required for a particular policy option to be fully effective in comparison with other options. It also relates to how people will be able to provide for their social, economic and cultural wellbeing now and in the future.

To determine efficiency, the evaluation investigated the anticipated benefits and opportunities, and costs and risks anticipated from the options, taking into account both short and longer term, individuals and the wider community. Benefits and opportunities, and costs and risks have been integrated across the four well-beings (cultural, social, economic and environmental).

Option A – Status Quo

Effectiveness

To assist the assessment of effectiveness of Option A, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
3	✓✓	This objective is a reflection of Appendix 1 of the NPSFM which provides a framework for recognising the national significance of fresh water and Te Mana o te Wai by setting out compulsory national values that must be complied with. The Water Plan is drafted with the goal of maintaining or improving the health of Southland's waterbodies which aligns with Objective 3. The provisions of the Water Plan include requirements to consider Ngāi Tahu values at both the policy and rule level. The provisions contain a level of alignment with this objective in that both documents aim to maintain or improve water quality, however the provisions of the Water Plan do not appropriately align with the NPSFM.

4	✓✓	This objective is taken from Objective D1 of the NPSFM and requires Ngāi Tahu values and interests to be identified and reflected in the provisions of the operative plan. Some provisions within the Water Plan provide the council with the discretion to consider the "spiritual and cultural values beliefs of the tangata whenua" and "historic heritage" when determining consents for certain discharges. This provides the council with the opportunity to identify Ngāi Tahu values and reflect them in any conditions contained in discharge consents. The Water Plan incorporates mechanisms to maintain and improve water quality which align with Ngāi Tahu values, although there is limited incorporation of specific Ngāi Tahu values which prevents the provisions in the Water Plan properly aligning with this objective. The level of incorporation of Ngāi Tahu values and interests in the plan provisions is below what is expected by Ngāi Tahu[89] and does not appropriately align with the NPSFM.
5	✓✓	The Water Plan provisions provide for maintenance and improvement of water quality and matters such as protection of estuaries which progress towards improved abundance of mahinga kai.[90] However, the provisions only contain limited references to consideration of mahinga kai resources, nohoanga, mātaitai and taiapure in policies such as 14, 15A, 16 and 32, but these references fail to translate into the rules in the plan. The provisions do little to positively accommodate Ngāi Tahu access to, and sustainable use, of the resources. The provisions do not inhibit this access but they do not enable access and use either.
15	✓✓	The provisions in the Water Plan identify taonga species but references to recognition and protection within the rules is limited, therefore, the proposed provisions fail to achieve what was intended by this objective.
Total	✓✓	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Efficiency

Option A is anticipated to have a low to medium effectiveness in assisting the achievement of Objectives 3, 4, 5 and 15 of the pSWLP. This Option will therefore not be assessed for its efficiency as it would not be an appropriate option to implement.

[89] Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations
[90] Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations

Option B – pSWLP Decisions Provisions

Effectiveness

To assist the assessment of effectiveness of Option B, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking** *	**Reasons**
1	✓✓	The Plan incorporates mechanisms that are intended to maintain and improve water quality. However, links between water quality and matching land type with land use activities in high risk areas or high risk activities have not been adequately achieved.
3	✓✓✓✓	This objective is a reflection of Appendix 1 of the NPSFM which provides a framework for recognising the national significance of fresh water and Te Mana o te Wai by setting out compulsory national values that must be complied with. The Plan provides for the assessment of water quality and quantity based on Ngāi Tahu indicators of health[91]. Inclusion of Ngāi Tahu values and alignment with the NPSFM throughout the provisions ensures the proposed provisions are effective at achieving this objective. The provisions also seek to maintain or improve water quality by establishing a process for refinement of the provisions through Freshwater Management Units and requiring Good Management Practice[92].
4	✓✓✓✓	The proposed provisions improve upon the existing provisions, increasing the ability for Ngāi Tahu ki Murihiku to exercise rangatiratanga. The proposed provisions being structured around Te Mana o Te Wai and ki uta ki tai show an understanding of the principles of the Treaty of Waitangi and the interests and values of Ngāi Tahu ki Murihiku, including Te Mana o te Wai and Ki uta ki tai. Through the inclusion of such values, this will assist in ensuring these are applied and used.[93] The Provisions refer to the Charter of Understanding in Policy 1 and recognise nohoanga, mataitai and taiapure.[94]
5	✓✓✓✓	The proposed provisions provide some protection for wāhi tapu, mahinga kai and other taonga tuku iho although not all objectives and policies are carried through into the rules.[95] The Plan affords protection through requiring that all applications that may affect a

[91] Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations
[92] Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations
[93] Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations
[94] Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations
[95] Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations

		Nohoanga, mātaitai or taiapure are sent to Te Rūnanga o Ngāi Tahu, trustees or tāngata tiaki. Where the Plan provides for maintenance and improvement of water quality, and matters such as the protection of estuaries and riparian habitats, this progresses towards improved abundance of mahinga kai[96], however more could be done to ensure access to and sustainable use of the resources.
15	✓✓✓	The proposed provisions provide some protection for wai and taonga species reflected in a number of rules and policies. There are however inconsistencies between protections given to trout and those given to taonga species. There are also no general provisions about the nesting/spawning/breeding of these species, or harvesting times.[97] The afforded protection has improved from the Water Plan provisions although Ngāi Tahu request further protection to achieve their expectations.
Total	✓✓✓✓	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Efficiency

To assist the assessment of the efficiency of Option B, the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed. They are presented below. When evaluating benefits and costs, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks		
Indi	**Benefits and Opportunities**	**Costs and Risks**
	➢ There are not considered to be individual benefits or opportunities.	➢ There are not considered to be individual costs or risks.

[96] Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations
[97] Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations

Community	➢ Improve ability of Ngāi Tahu to exercise rangatiratanga. ➢ Aligns with provisions set out in the NPSFM. ➢ Water quality maintained and improved. ➢ Improved aquatic ecosystem health. ➢ Ngāi Tahu values more adequately catered for. ➢ Better protection of areas relating to mahinga kai, nohoanga, mataitai and taiapure. ➢ Recognises and provides opportunities in the management of tribal assets and freshwater quality. ➢ Increased engagement with Ngāi Tahu ki Murihiku.	➢ Higher costs for consenting process due to increased requirements for consultation. ➢ Does not meet Ngāi Tahu expectations regarding increased abundance of, access to and use of mahinga kai[98].

Effectiveness Discussion

As shown above, proposed Option B is considered to be a Medium to Highly effective method of achieving Objectives 3, 4, 5 and 15 of the pSWLP. It is noted in the table that the proposed provisions provide more comprehensive alignment with Ngāi Tahu values and higher order documents, such as the NPSFM.

Efficiency Discussion

As shown above, the introduction of additional Ngāi Tahu values within proposed Option B will ensure that the provisions of the pSWLP will increase engagement with Ngāi Tahu ki Murihiku and improve the ability of Ngāi Tahu to exercise rangatiratanga. This will result in better protection for the environment including water quality and important ecosystems. This provides a range of social, cultural, environmental, and economic benefits to the community.

6.4.6 Risk of acting or not acting

An evaluation report must contain an assessment of the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions (under section 32(2)(c) RMA).

In many ways, the incorporation of Ngāi Tahu values incorporates wider community views, and aligns closely with the NPSFM and the regional policy statements. On this basis, the risk of incorporating Ngāi Tahu values is considered low. There is some risk of a lack of community understanding of Ngāi Tahu concepts and terminology, however this risk can be overcome without significant difficulty and is not a justification for not acting.

[98] Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations

6.4.7 Conclusion

The assessment in section 6.1.5 shows Option B – pSWLP to be the most appropriate option to achieve the objectives of the pSWLP.

6.4.8 References

Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations

7 Medium level changes

7.1 Effluent Systems

7.1.1 Introduction

This part of the section 32 report assesses proposed changes to the provisions relating to effluent systems within the pSWLP: domestic, commercial, community and on-site effluent systems.

On-site wastewater systems treat domestic wastewater within the boundaries of the property of origin. There are many types of on-site wastewater systems, which are designed to achieve safe treatment of domestic wastewater through a combination of human-controlled processes and soil treatment within a soakage field. While the various types of system vary in complexity (and running costs), all of them come within the daily 'control' of the occupier, and require correct maintenance and use to avoid system failure.[99]

Anecdotal information from ES staff, territorial authority staff and industry members provided at a key stakeholder meeting in September 2012 indicates that a significant number of the estimated 12,400 on-site wastewater systems in Southland are likely to be failing. The number and distribution of on-site wastewater systems poses a significant potential risk for adverse effects on the environment, particularly on public health, and surface water and groundwater quality.

The existing policies and rules governing discharges from on-site wastewater systems to land are contained in the Regional Effluent Land Application Plan for Southland 1998 (the RELAP Plan), and other effluent system disposal is addressed primarily in the Water Plan. The pSWLP aims to update the existing provisions and insert the updated provisions into the new plan framework.

Environment Southland has undertaken a review of the rules related to the management of effluent systems. The section outlines the options considered and assesses their effectiveness, benefits and costs and efficiency in achieving the objectives of the WAL Plan, in order to determine which option is the most appropriate.

7.1.2 Statutory Context

NPSFM

Objective A1 of the NPSFM seeks to safeguard the health of people and their communities in sustainably managing the use and development of land and discharges of contaminants.

Objective A2 seeks to ensure the overall quality of fresh water within a region is maintained or improved while protecting the quality of outstanding freshwater bodies, protecting the significant values of wetlands and improving the quality of fresh water in water bodies that have been degraded by human activities to the point of being over-allocated.

[99] Australian/New Zealand Standard AS/NZS 1547:2000: domestic-wastewater management. Standards New Zealand.

Policy A3 requires regional councils, where permissible, making rules requiring the adoption of the best practicable option to prevent or minimise any actual or likely adverse effect on the environment of any discharge of a contaminant into fresh water, or onto or into land in circumstances that may result in that contaminant (or, as a result of any natural process from the discharge of that contaminant, any other contaminant) entering fresh water.

Regional Policy Statement for Southland 1997 (RPS)

Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. The most relevant part of the RPS in relation to effluent *systems* is 5.5 Water Quality.

Objective 5.2 requires ensuring that in the use and development of water and land resources, and the discharges of contaminants, water quality is maintained and wherever practicable enhanced. *This is supported by Policy 5.5* which requires that in preparing, implementing and administering Regional and District Plans and in considering resource consents, local authorities shall assess the effects of land use and development on ground water and surface water quality, including both point and non-point source discharges, and provide for any adverse effects to be avoided, remedied or mitigated.

***Proposed* Southland Regional Policy Statement 2017 2012 (pRPS)**

Section 66(2)(a) of the RMA states that a Regional Plan shall have regard to any proposed regional policy statement. The pRPS is currently under appeal, however mediation is nearing conclusion and a number of consent orders have been lodged with the Environment Court. It is expected that the pRPS will be made operative once all appeals are resolved, which is likely to be before the WAL Plan becomes operative. It is therefore important that the WAL Plan gives effect to the pRPS as well as the RPS. Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. The most relevant section of the pRPS in relation to effluent systems is Chapter 4: Water and Chapter 5: Rural Land/Soils.

Objective WQUAL.1 requires that water quality in the region safeguards the life-supporting capacity of water and related ecosystems and the health of people and communities. Objective WQUAL.2 aims to halt the decline and enhance water quality in lowland water bodies. These objectives are supported by Policy WQUAL.1 which requires that discharge activities are managed to maintain water quality, or improve it, to ensure freshwater objectives are met.

Policy WQUAL.610 requires the management and the siting and operation of activities that result in point source discharges of contaminants to land to ensure that adverse effects on groundwater and surface water quality are minimised.

Objective RURAL.1 seeks to achieve sustainable land use of Southland's rural areas, in respect of on-site wastewater systems. Policy RURAL.6 supports this by requiring councils provide for the use of onsite wastewater disposal systems in rural areas provided adverse effects, including cumulative effects, are avoided or mitigated.

7.1.3 Relevant objectives in the pSWLP ~~WAL Plan~~

The RMA requires an examination of whether the provisions in the proposal are the most appropriate way to achieve the pSWLP objectives. The most relevant proposed objectives in relation to effluent systems are:

Objective 6 *There is no reduction in the overall quality of freshwater, and water in estuaries and coastal lagoons, by:*

(a) maintaining the quality of water in waterbodies, estuaries and coastal lagoons, where the water quality is not degraded; and

(b) improving the quality of water in waterbodies, estuaries and coastal lagoons, that have been degraded by human activities.

Objective 8 *(a) The quality of groundwater ~~in aquifers~~ that meets both the Drinking-Water Standards for New Zealand 2005 (revised 2008) and any freshwater objectives, including for connected surface waterbodies, established under Freshwater Management Unit processes is maintained; and*

(b) The quality of groundwater ~~in aquifers~~ that ~~have been degraded by~~ does not meet Objective 8(a) because of the effects of land use ~~and~~ or discharge activities ~~(with the exception of those aquifers where ambient water quality is naturally less than the Drinking-Water Standards for New Zealand 2005 (revised 2008))~~ is progressively improved so that:

(1) groundwater (excluding aquifers where the ambient water quality is naturally less than the Drinking-Water Standards for New Zealand 2005 (revised 2008)) meets the Drinking-Water Standards for New Zealand 2005 (revised 2008); and

(2) groundwater meets any freshwater objectives and freshwater quality limits established under Freshwater Management Unit processes.

Objective 18 *All activities operate in accordance with ~~at~~ "good ~~(environmental)~~ management practice" or better to optimise efficient resource use, safeguard the life supporting capacity of ~~and protect~~ the region's land~~,~~ and soils, and maintain or improve the ~~water from~~ quality and quantity of the region's water resources. ~~degradation.~~*

7.1.4 Overview of practical options

Environment Southland has considered two options for managing effluent storage. These are as follows:

- **Option A: (Status Quo)** - The status quo would consist of continuing the existing relatively general policy approach and the existing rules within the RELAP Plan and Water Plans.
- **Option B (pSWLP decisions provisions)** - the proposed provisions include a similar consent regime to the RELAP for on-site wastewater systems with the included requirement for new and replace wastewater systems to meet the New Zealand Standard controlling On-site Domestic Wastewater Management and provide separate rules for pit toilets or discharges from waterless composting toilets. In addition, policies and rules for other effluent system discharges are updated and made more certain and outcome focussed.

- **Option C** - testing and compliance is required for on-site effluent systems prior to sale of a property, with repair required if the system is found to be faulty.

Scale and significance

Section 32(1)(c) requires that when examining whether the provisions in the proposal are the most appropriate way to achieve the Objectives, the analysis must contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal. The scale and significance of the suggested changes to rules around affluent storage within the WAL Plan are considered to have a moderate effect on a common activity in the Southland region, and the level of detail in this analysis corresponds with that.

Option A: (Status Quo) ~~– Water Plan provisions retained~~

The status quo would consist of continuing the existing relatively general policy approach and the existing rules, which:

- classify discharges from existing, new and replacement systems as permitted activities, subject to different conditions;
- classify discharges from dedicated foul water dump stations and most farm effluent and community waste water systems as a discretionary activity;
- prohibit foul water discharges to land from campervans, mobile homes, caravans and other vehicles used for human occupation, as well as raw sewerage discharges;
- don't provide separate rules for pit toilets or discharges from waterless composting toilets.

Option B – Proposed pSWLP Decisions ~~WAL Plan~~ provisions

Option B proposes expanding the effluent systems regime in the pSWLP ~~WAL Plan~~, to more specifically provide for a wider range of potential discharge sources. The major changes include new and replacement on-site waste water systems are required to be designed and installed in accordance with AS/NZS 1547:2012 – On-site Domestic Wastewater Management. The rules relate to Policies 13 – Management of land use activities and discharges and 17A – ~~Effluent Management~~ Community sewerage schemes and on-site wastewater systems.

Rule 26 of the pSWLP updates and replaces Rules 5.1.1., 5.1.2 and 5.1.3 of the RELAP with current good practice. It continues a permitted activity threshold with most conditions aimed to protect the surface and ground water quality and public health. New or replacement on-site wastewater systems are subject to additional permitted activity conditions to ensure that the long term operation of the systems is sustainable.

Rules 27, 28 and 29 provide separate permitted activity rule for pit toilets and the discharge of liquid from a waterless composting toilet with conditions that are specifically tailored to that type of activity.

Rules 33, 33A, 34 and 35 bring across the rules from the RELAP relating to community, industrial and trade and agricultural effluent, with some amendments, primarily dealt with

in 7.9 – Effluent Storage. New Policy 17A sets out how discharges from community sewerage schemes and on-site wastewater systems are to be managed, including in particular a requirement to progressively improve the quality of discharges from community sewerage schemes.

A specific non-complying activity status is included in Rule 6 for discharges of raw sewage form community systems.

Option C – Testing and Compliance on sale of property

Option C proposes a similar provision set-out as Option B but with the requirement that upon sale of a property the property owner will be required to have the on-site wastewater system tested and, if required, made compliant with AS/NZS 1547:2012 – On-site Domestic Wastewater Management.

7.1.5 *Assessment of efficiency and effectiveness*

Section 32(1)(b)(ii) of the RMA requires the assessment of the 'efficiency and effectiveness' of provisions in achieving the objectives, in a level of detail that corresponds to the scale and significance of the anticipated effects.

Each individual option is evaluated below. First the effectiveness of each option in achieving the objectives of the pSWLP is assessed. The following factors have been assessed as part of the effectiveness assessment:

- **Relevance** - includes the extent to which the provisions are targeted to achieve the objectives and the length of time taken to achieve the objective.
- **Feasibility** – includes the degree of uncertainty of achieving the objectives, degree of risk associated with the provisions (e.g. unintended consequences), ease of implementation (e.g. likelihood of compliance and ability to monitor/enforce).
- **Acceptability** – level of community and stakeholder acceptance.

Where options are evaluated as being effective in achieving the objectives in the pSWLP they are subsequently evaluated for their 'efficiency'. Efficiency is about the use of resources (for example, human, financial and natural) is required for a particular policy option to be fully effective in comparison with other options. It also relates to how people will be able to provide for their social, economic and cultural wellbeing now and in the future.

To determine efficiency, the evaluation investigated the anticipated benefits and opportunities, and costs and risks anticipated from the options, taking into account both short and longer term, individuals and the wider community. Benefits and opportunities, and costs and risks have been integrated across the four well-beings (cultural, social, economic and environmental).

Option A: Status Quo

Effectiveness

To assist the assessment of effectiveness of Option A, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
6	✔✔	The current provisions set out in the RELAP provide for on-site wastewater systems as a permitted activity. The conditions included in the rules are intended to protect surface and ground water quality and public health. However, the widespread discharges from on-site wastewater systems have the potential to adversely affect water quality so any improvement in the management of on-site wastewater systems will contribute positively to improving water quality across the region. Maintaining the status quo will not lead to improvement. The maintenance requirement within the conditions in the rules are not adequate to ensure that maintenance occurs to an appropriate level. This has led to a significant number of systems being faulty, resulting in leaks that can enter waterways and are harmful to the environment. The provisions provide some environmental protection but fail to ensure an acceptable level of water quality protection due to the poor maintenance requirements and risks of the systems becoming faulty.
8	✔✔	The provisions are intended to protect water quality in general, therefore, the reasons addressed against objective 6 above will also apply to the effectiveness assessment for objective 8. In addition, potentially potable water bores and wells are being contaminated by discharges from on-site wastewater systems. The status quo will not address this issue.
18	✔	This objective is not being achieved with the current provisions in the RELAP due to the reasons set out against Objective 6 above. The status quo would result in the continued management of discharges, but would not allow the incorporation of current good practice into permitted activity conditions, or its encouragement through policy.
Total	✔✓	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Efficiency

Option A is anticipated to have a low to medium effectiveness in assisting the achievement of Objectives 6, 8 and 18 of the WAL Plan. This Option will therefore not be assessed for its efficiency as it would not be an appropriate option to implement.

Option B – ~~Proposed~~ ~~WAL Plan~~ pSWLP Decisions Provisions

Effectiveness

To assist the assessment of effectiveness of Option B, the relevance, feasibility and acceptability of the provisions have been identified and presented below.

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
6	✔✔✔	This option aims to improve the performance of on-site wastewater systems over time rather than immediately. It limits the requirements on existing systems so that an additional cost is not borne by people with current on-site wastewater systems. This does mean that the negative environmental effects of current faulty systems will not be remedied unless the owner decides to replace the system. The effect of the proposed provisions on the environment is limited by this. The proposed new provisions require a higher level of compliance for new or replacement systems both in the initial build, but also in monitoring and compliance. The provisions for new and replacement systems provide a framework for improving the performance of on-site wastewater systems through the adoption of good practice in the various matters which contribute to an adequately functioning on-site wastewater system. The requirement in Policy 17A for discharges from community sewerage schemes to be gradually improved over time will also contribute to achieving this objective. Acceptability of this option is likely to be enhanced due to the decrease of contaminants entering waterbodies, improving water quality and aligning with Ngāi Tahu philosophies such as Ki uta ki tai and Te Mana o te Wai.
8	✔✔✓	The proposed provisions are intended to protect water quality in general, therefore, the reasons addressed against Objective 6 above will also apply to the effectiveness assessment for Objective 8. The proposed provisions increase the setback distances for new or replacement systems from sensitive waterbodies or other properties and includes a setback from the microbial health protection zones.
18	✔✓	~~T~~For on-site wastewater systems, the proposed provisions are an upgrade of good management from the existing provisions contained in the RELAP plan. However, this option only increases the compliance

		requirements for new and replacement systems which does not address the effects of faulty current systems. Policy 17A implements this objective by requiring the design, operation and maintenance of community sewerages schemes to be in accordance with recognised industry standards. The reduction in activity status from prohibited to non-complying for raw sewage discharges from community systems recognises the reality of the largely aged existing urban systems, but is not considered good practice. This recognition is supported by the requirements in Policy 17A to upgrade systems and improve the quality of discharges over time.
Total	✔✓✓	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Efficiency

To assist the assessment of the efficiency of Option B, the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed. They are presented below. When evaluating benefits and costs, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks

	Benefits and Opportunities	Costs and Risks
Individual	➢ Ensures that the individual and community drinking water supply sites are better protected from contaminants ➢ Improvement in land and water health ➢ Cost of system is likely to be included in the cost of constructing a new system anyway (due to building consent requirements)	➢ The additional cost for replacement of systems may result in people with faulty systems delaying any necessary repairs ➢ Costs of replacement systems (land application system $7,000 to $9,000, new septic tank system or aerated wastewater treatment system in the range of $10,000 to $26,000) ➢ Resource consent costs ($700 to $3,000) ➢ Potential use of additional land for new system
Community	➢ Reduction in adverse effects on water quality due to improved location, design, construction, operation, maintenance and monitoring of new and replacement systems, and implementing good practice	➢ Potential ongoing effects on water quality until poorly performing on-site and community systems are upgraded ➢ Potential effects on water quality from ongoing discharges from existing systems, although many of the effects should be addressed by

- Reduction in adverse effects on water quality as poorly performing existing systems are upgraded
- Protection of potable water supplies
- Protection of public health
- Improved aquatic ecosystem health.
- Improved soil health
- Increased protection for wāhi tapu, mahinga kai and other taonga tuku iho
- Aligns with Ngāi Tahu's desire to protect the health of land and water from potentially harmful discharges

the conditions that are common to existing and new systems

- Negative environmental effects continue from faulty existing systems

Option C – Testing and Compliance on sale of property

Effectiveness

To assist the assessment of effectiveness of Option C, the relevance, feasibility and acceptability of the provisions have been identified and presented below.

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
6	✔✓✔✓	A requirement for inspection and upgrade of on-site wastewater systems on sale of properties would make a significant contribution towards the maintenance and enhancement of water quality in surface water bodies over a long period of time. Houses could have faulty systems for years before they decide to sell the property, at which time they would be required to upgrade if the system was deemed faulty. The widespread discharges from on-site wastewater systems have the potential to adversely affect water quality so any improvement in the management of on-site wastewater systems will contribute positively to improving water quality across the region. This policy approach will encourage improvement in the performance of on-site wastewater systems.
8	✔✓✔✓	The proposed provisions are intended to protect water quality in general, therefore, the reasons addressed against Objective 6 above will also apply to the effectiveness assessment for Objective 8. Failing on-site wastewater systems pose a significant risk to potable water supplies due to the reduced level of treatment they provide. A requirement for inspection and upgrade would remedy existing potable water source contamination issues.
13	✔✓✔	Environmentally this option would result in an improvement water quality over time, primarily through

		better design and management of systems, with is in line with good practice.
Total	✔✓✔✓	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Efficiency

To assist the assessment of the efficiency of Option C, the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed. They are presented below. When evaluating benefits and costs, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks

	Benefits and Opportunities	Costs and Risks
Individual	➢ Ensures that the individual and community drinking water supply sites are better protected from contaminants ➢ Improvement in land and water health ➢ Ensures that the individual and community drinking water supply sites are better protected from contaminants	➢ Increased costs to individuals upon sale of the property both for compliance testing and upgrade cost (if system is deemed faulty) ➢ Reduced discretionary income if more complex designs needed ➢ Costs of replacement systems (land application system $7,000 to $9,000, new septic tank system or aerated wastewater treatment system in the range of $10,000 to $26,000) ➢ Resource consent costs ($700 to $3,000) ➢ Potential use of additional land for new systems ➢ Cost of replacement systems may be a very substantial part of the value of a property in some townships, leading to significant economic hardship ➢ Site size and topography may limit ability to meet NZS1547, therefore a failing site could not meet the requirements for an upgrade, leaving ES and the landowner in a difficult position.
Community	➢ Additional business for designers, manufacturers and installers ➢ Employment opportunities at Councils arising from the need for more regulatory staff ➢ Tourism gains arising from the improvement in recreational opportunities and clean green image	➢ Rates increases due to increased compliance activities to confirm compliance with new conditions ➢ Negative environmental effects continue from faulty existing systems not being sold

- Protection of potable water supplies
- Protection of public health
- Improved aquatic ecosystem health.
- Improved soil health
- Increased protection for wāhi tapu, mahinga kai and other taonga tuku iho
- Aligns with Ngāi Tahu's desire to protect the health of land and water from potentially harmful discharges

Efficiency Discussion

Option B is considered to be efficient at achieving increased environmental protection by reducing the potential for unwanted discharges from new and replaced effluent systems due to the design, build and maintenance requirements, and by requiring progressive improvement to community sewerage schemes. The economic costs to individuals are limited as new systems would be required to adhere to these requirements anyway as part of the building consent. This has a flow on effect to create benefits to the individual by better protecting drinking water and aligns with Ngāi Tahu values through better environmental protection. However, it does not prevent existing faulty systems continuing to cause environmental issues until the owner decides to upgrade the system. The cost of upgrading the system is a deterrent to owners doing so, therefore the negative environmental effects will be ongoing. There are economic costs to Southland's territorial authorities in upgrading their community sewerage schemes in line with the direction in the pSWLP, however this is, at least in part, already recognised through their long term plans. Option C results in a potential higher economic cost to homeowners upon sale of the property but achieves a more efficient environmental protection as existing faulty systems would be required to be improved. This has a flow on effect to create benefits to the individual by better protecting drinking water and aligns with Ngāi Tahu values through better environmental protection.

7.1.6 Risk of acting or not acting

An evaluation report must contain an assessment of the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions (under section 32(2)(c) RMA). It is considered that the information relating to effluent systems is relatively uncertain, primarily due to a lack of quantitative knowledge of the proportion of systems failing, and knowledge of what the effects, particularly on human health actually are. Similarly, the performance and more diffuse effects of effluent systems generally and community schemes are not well known. This lack of certainty has tended toward the adoption of Option B over options A or C.

7.1.7 Conclusion

The assessment in section 7.1.5 shows Option B is the most appropriate option to assist achieving the objectives of the pSWLP.

7.2 Wetlands

7.2.1 Introduction

This section of the section 32 report assesses the provisions relating to wetland controls within the pSWLP.

Wetlands are a vital link between land and water and include permanently and intermittently wet areas, shallow water, and margins that support a natural ecosystem of plants and animals adapted to wet conditions. They provide important hydrological functions and ecosystem services such as filtering contaminants from water and soils. They are also an important natural and cultural resource, rich in biodiversity and important sources of mahinga kai.

Wetlands were once more prevalent, with Southland having lost approximately 90% of its wetlands in developed areas. Many remaining wetlands are on publicly held land and afforded some level of protection. Other wetlands are on private land and little is known about their health, values and use. Land use change can lead to conflict between productive use of land, including wet areas, and protecting habitats and biodiversity.

The Awarua Wetlands, comprising of Awarua Bay and Waituna Lagoon are one of the largest remaining wetland complexes in Southland and are important for their biological diversity and cultural values. The wetlands are officially recognised on the Ramsar Convention on Wetlands List of Wetlands of International Importance. The Awarua site includes four major wetland types: Coastal lagoons (notably Waituna Lagoon), freshwater swamps, extensive peatlands, and estuaries. Each ecosystem is unique and maintained by different ecological processes. Awarua Wetlands is frequented by diverse trans-equatorial migrating and wading bird species, as well as threatened plants and insects including sub-alpine species.

7.2.2 Statutory Context

Resource Management Act 1991 (RMA)

Section 30(1)(c) of the RMA states that every regional council shall control the use of land for the purpose of soil conservation, the maintenance and enhancement of ecosystems in water bodies and coastal water, and the maintenance and enhancement of the quality of water in water bodies and coastal water. In addition, the regional council is responsible for the establishment, implementation, and review of objectives, policies, and methods for maintaining indigenous biological diversity.

National Policy Statement for Freshwater Management 2014 (NPSFM)

Objective A1 of the NPSFM seeks to safeguard the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems of fresh water.

Objective A2 requires that the overall quality of fresh water within a region is maintained or improved while protecting the significant values of wetlands.

Objective B4 of the NPSFM seeks to protect significant values of wetlands and of outstanding freshwater bodies.

~~***Regional Policy Statement for Southland 1997 (RPS)***~~

~~Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. Section 43AA then defines "regional policy statement" as "an operative regional policy statement approved by a regional council under Schedule 1." The most relevant part of the RPS in relation to wetlands is section 5.2 – Biodiversity and 5.4 – Water.~~

~~Objective 2.1 requires the council to protect areas of significant indigenous vegetation and significant habitats of indigenous fauna within Southland where this will maintain or enhance biodiversity of indigenous ecosystems. This is supported by Policy 2.1 which ensures regard is given to any adverse impacts on biodiversity and the natural processes of ecosystems.~~

~~Objective 4.1 requires that the quantity of the Region's water resources is sustained so as to safeguard the life-supporting capacity of water and related ecosystems. This is supported by Policy 4.5 which requires the council to assess the effects of land use and development and provide for any adverse effects to be avoided wherever practicable, or remedied or mitigated.~~

~~Objective 5.1 requires that the quality of the region's water resources is sustained so as to meet the needs of a range of uses, including the reasonably foreseeable needs of future generations and safeguard the life-supporting capacity of water and related ecosystems. This is supported by Policy 5.5 which requires local authorities considering a decision to assess the effects of land use and development on ground water and surface water quality, including both point and non-point source discharges, and provide for any adverse effects to be avoided, remedied or mitigated.~~

Southland Regional Policy Statement 2017 ~~2012~~ (~~p~~RPS)

~~Section 66(2)(a) of the RMA states that a Regional Plan shall have regard to any proposed regional policy statement. The pRPS is currently under appeal, however Council must still have regard to it (as a minimum) when preparing the pSWLP. It is likely that the pRPS will become operative before the pSWLP, at which point the Plan will be required to give effect to the pRPS. Given this likely overlap, it would be efficient for Council to ensure that the pSWLP already gives effect to the pRPS.~~ Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. The relevant sections of the pRPS in relation to the management of wetlands include Chapter 4: Water~~.~~ ~~and~~ Chapter 6: Biodiversity and Chapter 7: Coast.

Objective WQUAL.1 requires that water quality in the region: safeguards the life-supporting capacity of water and related ecosystems and the health of people and communities. This is supported by Policy WQUAL.1 which requires that discharges and land uses activities are managed to maintain water quality, or improve it, to ensure freshwater objectives are met.

Objective WQUAL.2 seeks to halt the decline, and improve water quality in lowland water bodies and coastal lakes, lagoons, tidal estuaries, salt marshes and coastal wetlands in accordance with freshwater objectives formulated in accordance with the National Policy Statement for Freshwater Management 2014. This is supported by:

- Policy WQUAL.2 which requires that when managing water quality, particular regard is had to: nitrogen, phosphorus, sediment, and microbiological contaminants.
- Policy WQUAL.3 which requires the identification and protection of the significant values of wetlands and outstanding freshwater bodies.

Objective WQUAN.1 seeks to ensure that all flow, level and allocation regimes are developed in accordance with the NPSFM, while supporting the maintenance or improvement of water quality and related ecosystems. This is supported by Policy WQUAN.1 which requires that the instream values of surface water are maintained, while recognising that the Waiau catchment is a special case.

Objective BIO.2 requires that maintenance and protection of indigenous biodiversity in Southland and the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna for present and future generations. Objective BIO.3 requires the range, extent and condition of indigenous biodiversity in Southland is enhanced, with a particular emphasis on those areas most at risk to further loss or degradation. These objectives are supported by:

- Policy BIO.2 which requires that areas of significant indigenous vegetation and significant habitats of indigenous fauna in the Southland region are protected and where appropriate enhanced.
- Policy BIO.5 which requires that biodiversity initiatives are encouraged, promoted and supported to retain, maintain and restore or enhance coastal, aquatic, and terrestrial ecosystems and habitats.
- Policy BIO.7 which requires that an active and integrated management approach to maintaining and restoring or enhancing indigenous biodiversity is promoted, through methods including the Regional Pest Management Plan for Southland, and advice and information on pest management, fencing and planting.

Objectives COAST.3 and .4 and Policies COAST.5 and COAST.6 reflect the importance of protecting the natural character of coastal environments, including of biodiversity and coastal ecosystems.

7.2.3 Relevant Objectives of the pSWLP

The RMA requires an examination of whether the provisions in the proposal are the most appropriate way to achieve the pSWLP objectives. The relevant proposed objectives of the pSWLP are:

Objective 1 *Land and water and associated ecosystems are sustainably managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between freshwater, land and the coast.*

Objective 3 *The mauri ~~(inherent health)~~ of waterbodies provide for te hauora o te tangata (health and mauri of the people), te hauora o te taiao (health and mauri of the environment) and te hauora o te wai (health and mauri of the waterbody).*

Objective 14 *The range and diversity of indigenous ecosystem types and habitats within ~~dryland environments,~~ rivers, estuaries, wetlands and lakes, including their margins, and their life-supporting capacity are maintained or enhanced.*

Objective 17 *The natural character values of wetlands, rivers and lakes and their margins, including channel and bed form, ~~bed~~ rapids, seasonably variable flows and natural habitats, are protected from inappropriate use and development.*

7.2.4 Overview of practicable options

Environment Southland has considered two reasonably practicable options (as required under section 32(b)(i) RMA) for managing wetlands. These are as follows:

- **Option A – (Status quo)** – contains policies, rules, and non-regulatory framework. The current provisions manage wetlands through a range of activity specific rules and also a range of integrated management and non-regulatory methods.
- **Option B – (pSWLP decisions provisions)** – contains a policy and rule framework that manage activities that affect wetlands, including ~~a~~ specific rules to protect wetlands, stock exclusion and a range of activity specific rules, including mapping of significant wetlands.

Scale and significance

Section 32(1)(c) requires that when examining whether the provisions in the proposal are the most appropriate way to achieve the objectives, the analysis must contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal. The proposed provisions within this section relate to increasing the protection of wetland areas in accordance with the direction set out in the NPSFM. It is considered that the provisions will increase the level of involvement the Southland Regional Council has in the protection of wetland areas. However, the proposed changes will not increase the areas defined as wetlands within the Plan. As such, the scale and significance is considered to be moderate. The level of detail in the analysis below corresponds with the moderate level of significance.

Option A: Status Quo – Water Plan provisions

This option involves retaining the current policies and methods in the Water Plan without amendments, in relation to the management of wetlands.

The Water Plan contains three policies specifically relating to the management of wetlands (Policies 38, 39, and 40). Policy 38 requires that the adverse effects of activities on wetlands are avoided, remedied or mitigated through an integrated management approach with the Southland territorial authorities. Policy 39 requires that non-regulatory methods are used to promote best management practice in relation to retaining or enhancing the natural

values of wetlands. Policy 40 encourages the maintenance and restoration of existing wetlands and the creation of new wetlands. The Water Plan also contains a number of policies associated with managing specific activities to ensure discharges do not adversely affect wetlands.

The Water Plan contains two tiers of activity specific rules. Firstly, Rule 17 requires that stock grazing on public conservation land affecting regionally significant wetlands identified in Appendix B of the Water Plan gain resource consent as a non-complying activity, and Rule 20 requires that the diversion of water from a regionally significant wetland or any naturally occurring wetland gain resource consent as a discretionary activity.

Secondly, there are a number of rules which control specific activities which have the ability to adversely affect wetlands. These rules contain matters of discretion related to the effects on wetlands, or setback from surface water bodies.

The current Water Plan contains a number of non-regulatory approaches to the management of wetlands. It seeks to encourage the establishment and maintenance of riparian margins to reduce non-point source discharges into wetlands, and also to promote and facilitate the use of Best Management Practices to prevent or reduce sediment inputs into wetlands.

The current Water Plan contains a definition of a naturally occurring wetland, and also a definition of a surface water body (which includes wetlands).

The current Water Plan also contains Appendix B - Regionally Significant Wetlands in Southland, and Appendix C - Ngāi Tahu Statutory Acknowledgement Areas. There are four wetland areas listed as Statutory Acknowledgement Areas:

- Manawapōpōre/Hikuraki (Mavora Lakes)
- Toi Toi Wetland, Rakiura
- Lake George (Urewera)
- Waituna Wetland

Option B – ~~Proposed~~ pSWLP decisions provisions

Option B proposes to include Policies 32, 33 and 34 which provide a directive policy position on the management of wetlands and indigenous vegetation and habitats. These proposed policies seek to: protect significant indigenous vegetation, prevent the reduction in area, function and quality of wetlands, and recognise the importance of wetlands and indigenous biodiversity.

This option introduces a new rule (Rule 74) which controls the use of land ~~for the modification of~~ within a wetland. The proposed rule permits the ~~modification of~~ use of land within a wetland ~~areas~~ for the purposes of maintaining and enhancing the wetland, or maintaining and enhancing ~~pedestrian access to~~ existing structures within the wetland if particular standards are met. However, if the permitted activity standards are not met, the modification of the wetland becomes a discretionary, or non-complying, activity. The existing rule framework in the Water Plan for managing drainage of wetlands is rolled over in this option.

This option also proposes increased controls on stock exclusion from wetland areas (greater detail on the efficiently and effectiveness and cost and befits of this rule can be found in the stock exclusions section), and introduces a new rule which requires cultivation on sloping ground to be setback from wetland areas.

Similar to Option A, this option also contains a range of activity specific rules which ensure that activities which have the ability to adversely affect wetlands are appropriately manged through matters of discretion related to the effects on wetlands, or setback from wetland areas.

The definition of natural wetland, to which many of the rules refer, is from the fourth report of the Land and Water Forum.

Under the operative Water Plan, there is a simple list of regionally significant wetlands. There is some confusion as to the naming of various wetlands, and the spatial extent is potentially uncertain. Accordingly, a map layer, showing the spatial extent of the wetlands is included in the pSWLP.

7.2.5 Assessment of efficiency and effectiveness

Section 32(1)(b)(ii) of the RMA requires the assessment of the 'efficiency and effectiveness' of provisions in achieving the objectives, in a level of detail that corresponds to the scale and significance of the anticipated effects.

Each individual option is evaluated below. First the effectiveness of each option in achieving the proposed objectives of the pSWLP is assessed. The following factors have been assessed as part of the effectiveness assessment:

- **Relevance** - includes the extent to which the provisions are targeted to achieve the objectives and the length of time taken to achieve the objective.
- **Feasibility** – includes the degree of uncertainty of achieving the objectives, degree of risk associated with the provisions (e.g. unintended consequences), ease of implementation (e.g. likelihood of compliance and ability to monitor/enforce).
- **Acceptability** – level of community and stakeholder acceptance.

Where options are evaluated as being effective in achieving the objectives in the pSWLP they are subsequently evaluated for their 'efficiency'. Efficiency is about the use of resources (for example, human, financial and natural) is required for a particular policy option to be fully effective in comparison with other options. It also relates to how people will be able to provide for their social, economic and cultural wellbeing now and in the future.

To determine efficiency, the evaluation investigated the anticipated benefits and opportunities, and costs and risks anticipated from the options, taking into account both short and longer term, individuals and the wider community. Benefits and opportunities, and costs and risks have been integrated across the four well-beings (cultural, social, economic and environmental).

Option A – Status Quo

Effectiveness

To assist the assessment of effectiveness of Option A, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
1	✓✓	There are elements within the current provisions that are somewhat effective at recognising the connectivity between land, the water, and the wetland areas. The current provisions include activity based rules which recognise that land use and abstraction activities will have an effect on the wetland areas. For example, there are a range of rules within the current provisions which manage: stock grazing, the diversion of water, the abstraction and use of groundwater, weed and sediment removal for drainage maintenance, and the discharge of farm dairy effluent to land. All of these activities allow the effects on wetlands to be considered either through avoiding significant wetland areas, or as matters of discretion, which provides an element of integrated managed between natural resources. However, within the activity based provisions there are a number of significant gaps which result in the wetland areas not being effectively managed as integrated natural resources. In particular, the provision relating to stock access only require the protection of the regional significant wetlands which are on public conservation land, with no protection of wetlands in private ownership. The current provisions also include a specific rule on the diversion of water within a regionally significant wetland or any naturally occurring wetland as a discretionary activity. However, within the Water Plan provisions there is limited policy direction related to wetland protection. Policies 38, 39, and 40 within the Water Plan set out non-regulatory and integrated management methods, with no directive policy guidance which requires the values of the wetland areas to be protected. As such, overall it is considered that the current provisions have a low to medium effectivities at managing wetlands as an integrated natural resource.
3	✓	The current provisions do not effectively protect the mauri (inherent health) of wetlands, as there are no specific rules which require the protection of wetlands. The current provisions provide a range of activity specific provisions, which requires setbacks from waterbodies, and also allow the effects on wetlands to be considered as a matter of discretion. However, as noted above, there is limited policy direction related to wetland protection. Policies 38, 39, and 40 within the current plan set out non-regulatory and integrated management methods, with no directive policy guidance which would require the te hauro o te taiao (health of the environment) and te hauora o te wai (health of the waterbody) the wetland areas to be maintained through the regulatory approach.

14	✓	The current provisions do not effectively maintain or enhance the range and diversity of indigenous ecosystem types and habitats within the region's wetlands. The current Water Plan contains limited protection of the vegetation and ecosystem within the wetlands. As noted above the current rules contain a number of gaps within the rules which lead to the degradation of the wetland areas and the current policy framework does not provide directive policy guidance which requires maintenance and enhancement of the wetland areas. The proposed provisions do however, set out a non-regulatory framework which promotes best management practice in relation to retaining or enhancing the natural values of wetlands. This non-regulatory approach is implemented through Environment Southland's land sustainability officers, who actively work with landowners to encourage good management practices can have a positive effect on water quality. Overall, given the sustained loss of wetlands and wetland values under a non-regulatory framework, the effectiveness of this framework is apparent.
17	✓	The current provisions do not effectively protect the natural character values of wetlands, and their natural habitats from inappropriate use and development, as the current provisions do not contain policies or rules which restrict the reduction of wetlands, or ensure that activities which have the ability to adversely affect the values of wetlands are adequately managed. It is also considered that the current provisions do not give effect to Objective B4 of the NPSFM which requires the protection of significant values of wetlands.

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Efficiency

Option A is anticipated to have a low effectiveness in assisting the achievement of Objectives 1, 3, 14, and 17 of the pSWLP and Objective B4 of the NPSFM. This Option will therefore not be assessed for its efficiency as it would not be an appropriate option to implement.

Option B – pSWLP Decisions Provisions

Effectiveness

To assist the assessment of effectiveness of Option B, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
1	✓✓✓✓	The provisions proposed within Option B will be reasonably effective at managing land, water, and ecosystems as integrated

		natural resources. At a policy level Option B introduces Policy 34 which recognises the importance of wetlands and indigenous biodiversity, particularly the potential to improve water quality. It also encourages the establishment of wetland areas, on-farm, in subdivisions, on industrial sites, for community sewage schemes, for offsetting peak flows, and assisting flood control. This policy is supported by a number of activity specific rules which recognise that land use and abstraction activities will have an effect on the wetland areas. Activities such as: the discharge of fertiliser, intensive winter grazing, cultivation on sloping ground, and the discharge of agricultural effluent to land all include a setback for wetland areas as to acknowledge that land uses have the potential to adversely affect the values within wetlands. Additionally, Rule 74 manages the use of land within wetlands specifically. The provisions proposed within Option B also include policy 32 which seek the protection of significant indigenous vegetation and significant habitats of indigenous fauna to improve soil health, water quality, water quantity and ecosystem health.
3	✓✓✓✓	The provisions proposed within Option B will effectively provide for the mauri (inherent health) of wetlands. The provisions within Option B include a specific policy and rule framework which require the protection of wetlands. The proposed provisions also include a range of activity specific provisions, which requires setbacks from waterbodies, and also allow the effects on wetlands to be considered as a matter of discretion. Associated with these activity specific rules are a number of robust policies which seek to: protect significant indigenous vegetation, prevent the reduction in area, function and quality of wetlands, and recognise the importance of wetlands and indigenous biodiversity. This directive policy guidance will ensure that the te hauro o te taiao (health of the environment) and te hauora o te wai (health of the waterbody) will be maintained through the regulatory approach.
14	✓✓✓✓✓	The provisions proposed within Option B will effectively maintain and enhance the range and diversity of indigenous ecosystem types and habitats within the region's wetlands. The proposed provisions within Option B contain a policy and rule framework which prevents the reduction in areas, function and quality of wetlands. The rule framework sets a permitted activity status for the ~~modification of~~ use of land within a wetland for the purpose of maintaining and enhancing the wetland and for maintaining existing structures, with a range of conditions. The ~~modification of~~ use of land within a wetland for the purpose of maintaining and enhancing the wetland or maintaining existing structures that does not meet a permitted activity condition and the use of land within a wetland for any other purposes are ~~is~~ then ~~a~~ discretionary activities~~y~~. A specific rule provides for the continuation of existing peat harvesting operations as a discretionary activity. Any other use

		of land that modifies a natural wetland is required to gain a resource consent as a non-complying activity. This policy and rule framework will very effectively maintain and enhance the range and diversity of wetlands, especially natural wetlands, within the Southland Regional as a non-complying activity status and a directive policy which seeks to prevent the reduction of wetlands will result in a very restrictive consenting framework. This is because Section 104D of the RMA states that an application for a non-complying activity can only be granted if the consent authority is satisfied that either the adverse effects of the activity on the environment will be minor, or the application is for an activity that will not be contrary to the objective and policies of the Plan.
17	✓✓✓✓	The provisions proposed within Option B will effectively protect the natural character values of wetlands, and their natural habitats from inappropriate use and development, as the proposed policy and rule framework only permits the modification of wetland where they are for the purposes of maintaining and enhancing the wetland. It is also considered that the provisions proposed within Option B will align direction sought in Objective B4 of the NPSFM which requires the protection of significant values of wetlands. The proposed provisions within Option B also propose a definition of a 'natural wetland', and include mapping of ~~Appendix A which lists~~ the regionally significant wetlands in Southland. The rules within Option B then ensures that these 'natural wetlands' and 'regionally significant wetlands' are protected as there are a number of activities which are required to be setback from the wetlands as these activities are have the ability to adversely effect on the values of areas.

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Efficiency

To assist the assessment of the efficiency of Option B, the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed below. When evaluating benefits and costs, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks

	Benefits and Opportunities	Costs and Risks
Individual	➢ Protects the indigenous biodiversity and ecological values associated with wetlands as the proposed policy and rule framework seeks to prevent the reduction in area, function and quality of wetlands.	➢ The proposed amendments to the stock access rule which requires stock be progressively excluded from waterbodies (including wetlands) will result in an increased fencing cost.

	~~Enables greater recreational use of wetlands and associated waterbodies as the proposed provisions allow the modification of wetland areas in order to allow pedestrian access to the areas.~~ Enables existing peat harvesting operations to seek consent to continue. The staged requirement for stock exclusion from wetlands over a number of years allows landowners to spread the cost of the fencing over a number of years. Improved wetland quality will lead to enhanced mahinga kai gathering opportunities. Enhanced visual amenity and biodiversity values.	Given that large areas of wetlands have been modified in the past in order to increase productive land, the proposed restrictions on the reduction of wetlands will result in an opportunity cost for production
	~~Prevents wetlands from being degraded or destroyed and thereby~~ maintains and possibly enhances the indigenous biodiversity values associated with wetlands. Healthy functioning wetlands, as well as providing interesting habitats, also assist in filtering water thereby maintaining or improving water quality. Aligns with Ngāi Tahu philosophies such as Ki uta ki tai and Te Mana o te Wai. Restoration of mahinga kai sites. Increased protection for wāhi tapu, mahinga kai and other taonga tuku iho. Supports protection of and access to taonga species.[100] Provides for sustainable land management including the use of wetlands as filters for surrounding land. Can mitigate or avoid localised flooding of land. The increased regulation associated with the management of indigenous vegetation associated with wetlands creates numerous valued habitats as well as carrying out a water filtering function.	Increased consenting cost as the proposed provisions increase restrictions on the modification of wetland, on stock access, and cultivation on sloping ground.
Community		

Effectiveness Discussion

Option B is considered to be a Medium to Highly effective method of achieving Objectives 1 and 3 of the pSWLP. It is noted in the table that the proposed provisions include a range of activity specific rules which seek to manage the land, water and associated ecosystems

[100] Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations

as an integrated natural resource. This ensures that activities such as the discharge of fertiliser, intensive winter grazing, cultivation on sloping ground, the discharge of agricultural effluent to land will not have an adverse effect on the values associated with the region's wetland areas.

The introduction of a specific rule and directive policy related to the management of wetlands which ensures that the modification does not result in any destruction or removal of any indigenous vegetation or the reduction of the wetland areas, is consider to be a highly effective method of achieving both Objectives 14 and 17. In addition, the use of a definition of natural wetland from the Land and Water forum will lead to a higher level of acceptance of the framework and lower likelihood of inappropriately restricting activities.

Efficiency Discussion

It is considered that Option B is an efficient method of achieving Objective 1, 3, 14, 17 and also Objective B4 of the NPSFM, as the proposed provisions allow the ~~modification of~~ use of land within wetland areas for the purposes of maintaining and enhancing the wetland, or maintaining ~~and enhancing pedestrian access to~~ existing structures within the wetland. However, any land use activity which has the ability to adversely effects the values of the wetland is required to either be set back from the wetland or require a resource consent. In relation to the stock exclusion provisions, it is noted that the proposed provision will result in increased consenting or fencing costs as landowners will have a greater requirement to exclude stock from areas defined as wetlands. However, the staged requirement for stock will allow landowners to spread the cost of the fencing over a number of years.

Given the limited number of wetlands remaining, the relative value of the remaining wetlands is high, also justifying an increased level of protection.

As such, it is considered Option B is an efficient method of achieving the relevant objective and also the higher order policy requirements.

7.2.6 Risk of acting or not acting

An evaluation report must contain an assessment of the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions (under section 32(2)(c) RMA). It is considered that the information relating to the management of wetlands is both certain and sufficient. A significant information deficiency relates to the knowledge of exactly what wetlands are present, and what their values are. This lack of knowledge affects the ability to determine the effectiveness of the provisions, particularly in the short to medium term. Overall, it is considered that there is low risk of acting as set out in Option B.

7.2.7 Conclusion

The assessment in section 7.1.5 shows Option B – pSWLP to be the most appropriate option to achieve the objectives of the pSWLP.

7.2.8 References

NPSFM

Land and Water Forum, 2015. The Fourth Report of the Land and Water Forum

Te Ao Marama Inc. Southland Water and Land Regional Plan – Assessment of Plan in meeting Ngāi Tahu aspirations

Ngāi Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan 2008 (Te Tangi a Tauria).

7.3 Vertebrate Pest Control

7.3.1 Introduction

This section of the report assesses the provisions relating to vertebrate pest control within the pSWLP.

The June 2011 Parliamentary Commissioner for the Environment Report noted that New Zealand has one of the highest extinction rates of native species in the world, largely due to predation by introduced mammals. It stated that introduced mammals are costly to both our economy and our environment. Possums, wild deer and stoats can carry bovine TB and can infect cattle and farmed deer, while possums, deer, wild pigs, rats, feral cats and stoats threaten our native ecosystems.[101]

New Zealand currently has two levels of control on the use of vertebrate toxic agents. The first level of controls are national controls that apply to all vertebrate toxic agents uses, particularly the controls imposed under Hazardous Substances and New Organisms Act 1996 (HSNO) and the Agricultural Compounds and Veterinary Medicines Act 1997 (ACVM). A vertebrate toxic agent cannot be imported, manufactured, sold or used until it has gained authorisation under both these Acts.

The second level of controls are local controls placed on an individual operation that uses a specific vertebrate toxic agent in a specific circumstance. Depending on the vertebrate toxic agent and the way it is to be used, other legislation may also apply. In particular, the Conservation Act 1987 and the Fisheries Act 1996 control the use of poisons to kill fish. The Health Act 1956 is used to regulate 1080 to protect public health. Restrictions are set by local health authorities, and generally include measures to protect public drinking water supplies and measures to mitigate human health risks, such as establishing buffer zones around poisoning operations. The RMA can control the release of chemicals into the environment, and also the manufacture, storage and transport of hazardous substances in accordance with section 30(1)(c).

[101] Evaluating the use of 1080: Predators, poisons and silent forests

ES has undertaken a review of the rules related to the management of vertebrate pest control. This section outlines the two options considered, and assesses their effectiveness, benefits and costs and efficiency in achieving the objectives of the pSWLP, in order to determine which is the most appropriate.

7.3.2 Statutory Context

Resource Management Act 1991 (RMA)

Section 30(1)(c) of the RMA states that every regional council shall control the use of land for the purpose of controlling the manufacture, storage and transport of hazardous substances.

~~***Regional Policy Statement for Southland 1997 (RPS)***~~

~~Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. Section 43AA then defines "regional policy statement" as "an operative regional policy statement approved by a regional council under Schedule 1." The most relevant part of the RPS in relation to vertebrate pest control is section 5.2 – Biodiversity and section 5.5 – Water Quality.~~

~~Objective 2.1 requires the council to protect areas of significant indigenous vegetation and significant habitats of indigenous fauna within Southland where this will maintain or enhance biodiversity of indigenous ecosystems. This is supported by Policy 2.1 which ensures regard is given to any adverse impacts on biodiversity and the natural processes of ecosystems. Of particular regard is Policy 2.5 which requires the reduction of the adverse effects of pest plants and pest animals on biodiversity, areas of significant indigenous vegetation and significant habitats of indigenous fauna.~~

~~Objective 5.1 requires that the quality of the region's water resources is sustained so as to meet the needs of a range of uses, including safeguard the life-supporting capacity of water and related ecosystems. Objective 5.3 requires ensuring that the discharge of contaminants into water does not compromise water quality standards established for the region. These objectives are supported by Policy 5.9 which requires discouragement, and where practicable prohibition, of the discharge of persistent and bio-accumulative contaminants into water.~~

Proposed Southland Regional Policy Statement 2017 ~~2012~~ (pRPS)

~~Section 66(2)(a) of the RMA states that a Regional Plan shall have regard to any proposed regional policy statement. The pRPS is currently under appeal, however mediation is nearing conclusion and a number of consent orders have been lodged with the Environment Court. It is expected that the pRPS will be made operative once all appeals are resolved, which is likely to be before the pSWLP becomes operative. It is therefore important that the pSWLP gives effect to the pRPS as well as the RPS.~~ Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. The relevant sections of the pRPS in relation to vertebrate pest control include Chapter 4: Water and Chapter 6: Biodiversity.

Objective WQUAL.1 requires that water quality in the region: safeguards the life-supporting capacity of water and related ecosystems and the health of people and communities. This is supported by Policy WQUAL.1 which requires that discharges and land uses activities are managed to maintain water quality, or improve it, to ensure freshwater objectives are met.

Objective BIO.2 requires that the maintenance and protection of indigenous biodiversity in Southland and the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna for present and future generations. Objective BIO.3 requires the range, extent and condition of indigenous biodiversity in Southland be enhanced, with a particular emphasis on those areas most at risk to further loss or degradation.

These objectives are supported by:

- Policy BIO.2 which requires that areas of significant indigenous vegetation and significant habitats of indigenous fauna in the Southland region are protected and where appropriate enhanced.
- Policy BIO.5 which requires that biodiversity initiatives are encouraged, promoted and supported to retain, maintain and restore or enhance coastal, aquatic, and terrestrial ecosystems and habitats.
- Policy BIO.7 which requires that an active and integrated management approach to maintaining and restoring or enhancing indigenous biodiversity is promoted, through methods including the Regional Pest Management Plan for Southland, and advice and information on pest management, fencing and planting.

7.3.3 Relevant Objectives of the pSWLP

The RMA requires an examination of whether the provisions in the proposal are the most appropriate way to achieve the pSWLP objectives. The relevant proposed objectives of the pSWLP are:

Objective 13 *Enable the use and development of land and soils to support the economic, social, and cultural wellbeing of the region.~~, provided:~~*

Objective 13A *~~(a) t~~The quantity, quality and structure of soil resources are not irreversibly degraded through land use activities ~~and~~ or discharges to land.~~;~~*

Objective 13B *~~(b)~~ The discharges of contaminants to land or water that have significant or cumulative adverse effects on human health are avoided.~~; and~~*
~~(c) adverse effects on ecosystems (including diversity and integrity of habitats), amenity values, cultural values and historic heritage values are avoided, remedied or mitigated to ensure these values are maintained or enhanced.~~

Objective 14 *The range and diversity of indigenous ecosystem types and habitats within ~~dryland environments,~~ rivers, estuaries, wetlands and lakes, including their margins, and their life-supporting capacity are maintained or enhanced.*

7.3.4 Overview of practicable options

Environment Southland has considered two reasonably practicable options (as required under section 32(b)(i) RMA) for managing the adverse effects of vertebrate pest control. These are as follows:

- Option A – (Status quo) – contains a relatively restrictive policy and rule framework which requires the discharge of vertebrate pest control poisons to gain consent as either a controlled or restricted discretionary activity.

- Option B – contains a permissive policy and rule framework which permits the discharge of all vertebrate pest control poisons provided the poison is approved and applied in accordance with the HSNO Act, and the application does not occur within a drinking water supply protection area.

Scale and significance

Section 32(1)(c) requires that when examining whether the provisions in the proposal are the most appropriate way to achieve the objectives, the analysis must contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal. The proposed provisions within this section relate to removing the unnecessary duplication between the controls of the Southland Regional Council and those of the Environmental Protection Agency. It is considered that the provisions will significantly reduce the level of involvement ES has in consenting pest control activities. While a significant portion of Southland is Conservation estate, this change will only relate to a very small number of consents. As such, the scale and significance is considered to be moderate. The level of detail in the analysis below corresponds with the moderate level of significance.

Option A: Status Quo – Water Plan provisions

This option involves retaining the current policies and methods of the Water Plan without amendments, in relation to vertebrate pest control.

The Water Plan contains one specific policy (Policy 12) on the application of agrichemicals and vertebrate pest control poisons. The policy promotes the application of agrichemicals in a manner that avoids adverse effects on water quality. The Water Plan also contains a number of policies associated with ensuring that the level of management that is required for discharges of contaminants matches the level of environmental risk posed by the discharge (Policy 31A), and also a policy related to managing the discharge of contaminants into or onto land (Policy 31C).

The Water Plan contains two rules associated with the controlling the discharge of vertebrate pest control poisons:

- Rule 6 requires that the aerial discharge of 1080 into or onto land where it may enter water requires a resource consent as a controlled activity.
- Rule 7 then requires that all other discharges of vertebrate pest control poisons gain a resource consent as a restricted discretionary activity, with the matters of discretion

relating to: the concentration and application rate, method of application, signage requirements, location, and duration of the activity.

The current Water Plan does not contain any policies or rules related to the maintenance and enhancement of ecosystems or biodiversity.

Option B – Proposed SWLP

Option B proposes the deletion of Policy 12 which specifically relates to managing the application of agrichemicals and vertebrate pest control poisons, and instead proposes the addition of Policy 36 which provides a broader policy direction to the management of hazardous substances, and also the inclusion of Policy 32 which provides direction on the management of biodiversity.

These proposed policies are as follows:

Policy 32 *Protect significant indigenous vegetation and significant habitats of indigenous fauna associated with natural wetlands, lakes and rivers and their margins ~~to improve soil health, water quality, water quantity and ecosystem health~~.*

Policy 36 *Require the best practicable option be adopted to prevent or minimise adverse effects from contaminated land or a discharge of a hazardous substance.*

This option also proposes replacing the controls in Rules 6 and 7 of the Water Plan and replacing them with a single permitted activity rule as follows:

Rule 11 - Discharge of vertebrate pest control poisons

The discharge of ~~vertebrate pest control poisons, including sodium monofluoroacetate (1080), baits, pre-feed and deer repellent,~~ a vertebrate toxic agent, other than those complying with the Resource Management (Exemption) Regulations 2017, into or onto land where it may enter water is a permitted activity provided the following conditions are met:

(a) the vertebrate toxic agent ~~agrichemical~~ is approved for use within New Zealand under the Hazardous Substances and New Organisms Act 1996, and the use and discharge of the substance is in accordance with all the conditions of the approval; and

(b) The discharge does not occur within the microbial health protection zone of a drinking water supply site identified in Appendix J, or where no such zone is identified, then within 250 metres of the abstraction point of a drinking water supply site identified in Appendix J.

***Note:** Any discharge of the vertebrate toxic agents brodifacoum, rotenone or sodium fluoroacetate that complies with the Resource Management (Exemption) Regulations 2017 is exempt from any discharge controls under the Resource Management Act and this regional plan.*

Any discharge of vertebrate pest control poisons which do not meet the conditions set out in Rule 11, would then default to the 'catch all' discharge rules listed as Rules 5 and 6.

7.3.5 Assessment of efficiency and effectiveness

Section 32(1)(b)(ii) of the RMA requires the assessment of the 'efficiency and effectiveness' of provisions in achieving the objectives, in a level of detail that corresponds to the scale and significance of the anticipated effects.

Each individual option is evaluated below. First the effectiveness of each option in achieving the proposed objectives of the pSWLP is assessed. The following factors have been assessed as part of the effectiveness assessment:

- **Relevance** - includes the extent to which the provisions are targeted to achieve the objectives and the length of time taken to achieve the objective.
- **Feasibility** – includes the degree of uncertainty of achieving the objectives, degree of risk associated with the provisions (e.g. unintended consequences), ease of implementation (e.g. likelihood of compliance and ability to monitor/enforce).
- **Acceptability** – level of community and stakeholder acceptance.

Where options are evaluated as being effective in achieving the objectives in the pSWLP they are subsequently evaluated for their 'efficiency'. Efficiency is about the use of resources (for example, human, financial and natural) is required for a particular policy option to be fully effective in comparison with other options. It also relates to how people will be able to provide for their social, economic and cultural wellbeing now and in the future.

To determine efficiency, the evaluation investigated the anticipated benefits and opportunities, and costs and risks anticipated from the options, taking into account both short and longer term, individuals and the wider community. Benefits and opportunities, and costs and risks have been integrated across the four well-beings (cultural, social, economic and environmental).

Option A – Status Quo

Effectiveness

To assist the assessment of effectiveness of Option A, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
13	✓	The current provisions require that the discharge of vertebrate pest control poisons are managed through either a controlled or restricted discretionary activity resource consent framework. As such, the provisions within this option avoid the discharge of contaminants to land and water that have significant or cumulative effects on human health as the concentration, application rate, method of application, signage requirements, location, and duration of the activity location is managed through the consent process. However, this consenting process duplicates the restrictions and approvals required under the other relevant legislation (e.g. the HSNO Act and the Agricultural Compounds and Veterinary Medicines Act 1997). As such, it is considered that this option does not effectively enable the use of

		the land and soils, as it is considered that the controls with the Water Plan (which require a resource consent be obtained) do not add any additional environmental protection to that which is provided in other relevant legislation.
14	✓	The current provisions do not provide policy direction in relation to the maintenance and enhancement of indigenous ecosystem types and habitats. This option requires that all discharges of vertebrate pest control poisons are managed through either a controlled or restricted discretionary activity resource consent framework, which means that agencies which seek to apply vertebrae pest control poisons are required to apply for a resource consent every time they wish to undertake a pest control programme. This consent process is then duplicated through the HSNO Act. This duplication is a not an effective method of achieving the maintenance and enhancement indigenous ecosystems, as resources that could have been used to on the pest control operations are being used to apply for consent which are not providing any additional environment protection.

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Efficiency

Option A is anticipated to have a low effectiveness in assisting the achievement of Objectives 13 and 14 of the pSWLP. This Option will therefore not be assessed for its efficiency as it would not be an appropriate option to implement.

Option B – pSWLP Decisions Provisions

Effectiveness

To assist the assessment of effectiveness of Option B, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking** *	**Reasons**
13	✓✓✓✓	Option B proposes a permissive policy and rule framework, which provides a permitted activity status for the discharge of vertebrate pest control. It is considered that this permissive framework is an effective method of enabling the use of land, while ensuring the discharge of contaminants that have significant or cumulative effects on human health are avoided. This is because the HSNO Act provides a robust set of controls managing hazardous substances throughout all aspects of their existence and for the management of vertebrate toxic agents. Given the complete protection provided by the HSNO Act, it is considered that it is not necessary for the Southland Regional Council to duplicate the controls of the Environmental Protection Agency. As such, it is considered that allowing these activities to be undertaken as a permitted activity will not result in a reduction in environmental

		protection. Instead, it is considered that the proposed provisions will ensure that the same level of environmental protection will be provided while enabling the use and development of land and soils.
14	✓✓✓✓	As noted in the introduction to this section, there are a range of regulations which control the control of vertebrate toxic agents. The provisions contained within Option B seek to remove the duplication between these regulations by providing for the discharge of vertebrate pest control poisons as a permitted activity. This permitted activity status removes the resource consenting requirement for agencies which seek to apply vertebrae pest control poisons. This permitted activity status is considered an efficient method of achieving the maintenance and enhancement indigenous ecosystems as it ensures that less time and resources are being spent on consenting, which allows more resources to be spent on the pest control operations, which in turn allows the range and diversity of indigenous ecosystems and types are maintained and enhanced.

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Efficiency

To assist the assessment of the efficiency of Option B, the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed. They are presented below. When evaluating benefits and costs, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**
Individual	➢ Enhanced biodiversity and ecological values, as less time and money is spent on consenting, so more can be spent on pest management. ➢ A reduction in cases of bovine tuberculosis (TB) as more resource can be spent on pest control operations. ➢ Ensures that the community drinking water supply sites are protected from contaminants.	➢ The use of a permitted activity status within the Southland Regional Plan may be unpopular with some individuals who considered themselves affected by the pest control operations, as they may consider the resource consent process provides an opportunity to be consulted on the specifics of a pest control operations.
Community	➢ The proposed provisions remove the overlap between RMA restrictions and the controls with the HSNO Act, which will result in greater resources available for agencies to undertaken additional pest control operations. ➢ Will reduce the consenting and monitoring of pest control consents required by the Regional Council.	➢ The use of a permitted activity status within the Regional Plan may result in a perception that the controls relating to vertebrae pest control are inadequate.

	➢ The permitted activity status for all vertebrae pest control poisons will ensure that the regulatory regime does not bias the choice of vertebrate toxic agents for an individual operation, so the best toxin is used in each case. ➢ The permitted activity status for vertebrate pest control aligns with the 'Streamlining the regulatory regime for pest control' consultation document that was released by the Ministry of the Environment in April 2016. The intent of the provisions within this option also align with the Parliamentary Commissioner for the Environments Report in 2011 on Evaluating the use of 1080: Predators, poisons and silent forests. Both of these reports concluded that the labyrinth of laws, rules and regulations that govern 1080 and the other poisons used to control introduced pests creates unnecessary complexity and confusion. ➢ The reduction in consenting costs will enable the aerial use of 1080 for animal pest control, which is critical to controlling the threat of TB to the $14 billion per year beef, dairy and deer export industries, and reducing the impacts of animal pests on productive land.[102] ➢ The reduction in consenting costs will also enable aerial application of 1080 which provides effective control of vertebrate pests to protect and enhance our unique natural heritage, which is the cornerstone of a $23.9-billion-dollar tourism industry. Providing for the safe, efficient and effective use of 1080 is also important for maintaining biosecurity and protecting New Zealand's unique biodiversity and landscapes.[103] ➢ The business case analysis associated with the *Business case: Simplifying the regulation of Aerial 1080 under the RMA* has revealed that the further regulation of 1080 at a regional level under the RMA is affording no extra protection to the environment or public health.	

Effectiveness Discussion

[102] Business Case Analysis: Simplifying the regulation of Aerial 1080 under the RMA.
[103] Business Case Analysis: Simplifying the regulation of Aerial 1080 under the RMA.

As shown above, proposed Option B is considered to be a Medium to Highly effective method of achieving Objectives 13 and ~~15~~ 14 of the pSWLP. It is noted in the table that the HSNO Act provides a robust set of controls managing hazardous substances throughout all aspects of their existence and, for the management of vertebrate toxic agents. As such, it is considered that allowing these activities to be undertaken as a permitted activity will not result in a reduction in environmental protection. Instead, it is considered that the proposed provisions will ensure that the same level of environmental protection will be provided while enabling the use and development of land and soils.

Efficiency Discussion

As shown above, the introduction of the permitted activity standard within proposed Option B will ensure that the provisions of the pSWLP will not overlap with the other legislation which controls vertebrate toxic agents. The removal of this overlap ensures that agencies who undertake pest control operations will be able to efficiently undertaken these operations without requiring unnecessary resources consents from the Southland Regional Council. This removal of duplication provides a range of social, environmental, and economic benefits to both individuals and the community.

7.3.6 Risk of acting or not acting

An evaluation report must contain an assessment of the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions (under section 32(2)(c) RMA). It is considered that the information relating to vertebrate pest control is both certain and sufficient. As such, it is considered that there is no perception of risk of acting as set out in Option B.

7.3.7 Conclusion

The assessment in section 7.1.5 shows Option B – pSWLP to be the most appropriate option to achieve the objectives of the pSWLP.

7.3.8 References

Business Case Analysis: Simplifying the regulation of Aerial 1080 under the RMA. Ministry for the Environment. January 2015.

Evaluating the use of 1080: Predators, poisons and silent forests. The Parliamentary Commissioner for the Environment. June 2011.

7.4 *Installed subsurface drainage systems*

7.4.1 Introduction

This section of the report assesses the provisions relating to managing installed subsurface drainage systems.

Installed subsurface drainage systems (such as tile drains or mole pipe drainage) are used extensively throughout much of Southland. These systems are an essential component of agricultural development in many parts of Southland. They allow for improved productivity and profitability of agricultural activities by maintaining appropriate soil conditions and the ecosystem services necessary for efficient pastoral production.

Installed subsurface drainage systems can be a significant transport pathway for agricultural contaminants entering waterways, in particular nitrogen, phosphorus, E. coli and suspended sediment. Where treated wastewater from farm dairy effluent systems is being discharged to land directly above subsurface drainage systems, there is a higher risk of wastewater being transported and then discharged into water bodies. The risk is elevated further if the application of wastewater to land is not managed appropriately (for example, applying too much effluent, or at the wrong time). The effects from installed subsurface drainage systems have the potential to be mitigated if appropriate mitigation techniques can be found.

Environment Southland has undertaken a review of the rules related to the management of installed subsurface drainage systems. This section outlines the three options considered, and assesses their effectiveness, benefits and costs and efficiency in achieving the objectives of the pSWLP, in order to determine which is the most appropriate.

7.4.2 Statutory Context

7.4.2.1 *Resource Management Act 1991 (RMA)*

Section 30(1)(f) of the RMA states that every regional council shall control the discharges of contaminants into or onto land, air, or water and discharges of water into water.

7.4.2.2 ~~*Regional Policy Statement for Southland 1997 (RPS)*~~

~~Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. Section 43AA then defines "regional policy statement" as "an operative regional policy statement approved by a regional council under Schedule 1." The most relevant part of the RPS in relation to installed subsurface drainage systems is section 5.5 – Water Quality.~~

~~Objective 5.2 requires that in the use and development of water and land resources, and the discharges of contaminants, water quality is maintained, and wherever practicable, enhanced. Similarly, Objective 5.3 requires that the discharge of contaminants into water does not compromise water quality standards established for the region. These objectives are supported by Policy 5.2 which requires all point source discharges to comply with water quality standards after reasonable mixing.~~

7.4.2.3 ~~*Proposed*~~ *Southland Regional Policy Statement 2017 ~~2012~~ (~~p~~RPS)*

~~Section 66(2)(a) of the RMA states that a Regional Plan shall have regard to any proposed regional policy statement. The pRPS is currently under appeal, however mediation is nearing conclusion and a number of consent orders have been lodged with the Environment Court. It is expected that the pRPS will be made operative once all appeals are resolved, which is likely to be before the pSWLP becomes operative. It is therefore important that the pSWLP gives effect to the pRPS as well as the RPS.~~ Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. The most relevant section of the ~~p~~RPS in relation to managing discharges from installed subsurface drainage systems is Chapter 4: Water.

Objective WQUAL.1 requires that water quality in the region safeguards the life-supporting capacity of water and related ecosystems and the health of people and communities. This is supported by Policy WQUAL.1 which requires that discharges and land uses activities are managed to maintain water quality, or improve it, to ensure freshwater objectives are met. Policy WQUAL.2 specifies that in managing water quality, particular regard will be had to nitrogen, phosphorus, sediment and microbiological contaminants.

7.4.3 Relevant Objectives of the Proposed Plan

The RMA requires an examination of whether the provisions in the proposal are the most appropriate way to achieve the pSWLP objectives. The relevant proposed objectives of the pSWLP are:

Objective 2: *Water and land is recognised as an enabler of primary production and the economic, social and cultural wellbeing of the region.*

Objective 6: *There is no reduction in the overall quality of freshwater, and water in estuaries and coastal lagoons, by:*

(a) maintaining the quality of water in waterbodies, estuaries and coastal lagoons, where the water quality is not degraded; and

(b) improving the quality of water in waterbodies, estuaries and coastal lagoons, that have been degraded by human activities.

Objective 13: *Enable the use and development of land and soils to support the economic, social, and cultural wellbeing of the region.~~, provided:~~*

Objective 13A: ~~*(a) t*~~*The quantity, quality and structure of soil resources are not irreversibly degraded through land use activities ~~and~~ or discharges to land.~~:~~*

Objective 13B: ~~*(b)*~~ *The discharges of contaminants to land or water that have significant or cumulative adverse effects on human health are avoided.~~; and~~*

~~*(c) adverse effects on ecosystems (including diversity and integrity of habitats), amenity values, cultural values and historic heritage values are avoided, remedied or mitigated to ensure these values are maintained or enhanced.*~~

Objective 14: *The range and diversity of indigenous ecosystem types and habitats within ~~dryland environments,~~ rivers, estuaries, wetlands and lakes, including their margins, and their life-supporting capacity are maintained or enhanced.*

Objective 18: *All activities operate in accordance with ~~at~~ "good ~~(environmental)~~ management practice" or better to optimise efficient resource use, safeguard the life supporting capacity of ~~and protect~~ the region's land~~,~~ and soils, and maintain or improve the ~~water from~~ quality and quantity of the region's water resources. ~~degradation.~~*

7.4.4 Overview of practical options

Environment Southland has considered 3 reasonably practicable options (as required under section 32(b)(i) RMA) for managing the adverse effects of discharges from installed subsurface drainage systems to assist in achieving the objectives of the Plan. These are as follows:

- Option A – (Status quo) - Rule 9 of the Regional Water Plan
- Option B – (Draft SWLP~~WAL~~) - Rule 13 of the working draft for Water and Land
- Option C – (~~Proposed~~ pSWLP~~WAL~~ Decisions Provisions) - Rule 13 of the proposed Southland Water and Land Plan

7.4.4.1 *Scale and significance*

Section 32(1)(c) requires that when examining whether the provisions in the proposal are the most appropriate way to achieve the objectives, the analysis must contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal. The proposed provisions within this section are all different ways of providing for installed subsurface drainage systems as permitted activities where particular conditions are met, and discretionary activities where the conditions are not met. Some of the options require a higher level of management action by landowners than is currently required, which brings with it financial implications. As such, the scale and significance is considered to be moderate. The level of detail in the analysis below corresponds with the moderate level of significance.

Option A: Status Quo – Regional Water Plan provisions

This option involves retaining the current policies and rule in the Water Plan without amendment.

The Water Plan does not contain any specific policies on the management of installed subsurface drainage systems but does contain a number of general policies relating to water quality and management of discharges, including:

- ensuring there is no reduction in water quality beyond the zone of reasonable mixing from discharges to surface water bodies unless the discharges are consistent with Part 2 of the RMA (Policy 3)
- managing point source and non-point source discharges to meet or exceed the water quality standards in Appendix G unless they are consistent with Part 2 of the RMA (Policy 4)
- managing discharges to water in artificial watercourses so that any new discharge, in conjunction with existing discharges, does not reduce the water quality of the surface water body into which the artificial watercourse flows below any standards set for that water body in Appendix G following a zone of reasonable mixing (Policy 5)

The Water Plan contains one rule associated with managing discharges from installed subsurface drainage systems:

> ***Rule 9 – Discharge from installed subsurface drainage systems***
>
> *The discharge of land drainage water from an installed subsurface drainage system to water is a permitted activity, provided that there is no conspicuous change to the colour and/or clarity of the receiving waters at a distance of 20 metres from the point of discharge.*

This means that discharges are permitted so long as the condition regarding changes to colour and clarity of the receiving waters is met. If the condition is not met, section 2.1 of the Plan determines that the discharge becomes a discretionary activity and resource consent is required.

Option B: Working Draft for Water and Land provisions

This option outlines the draft provisions which were consulted on during 2015.

Option B does not contain any specific policies on the management of installed subsurface drainage systems but does contain a number of general policies relating to water quality and management of discharges. This option sees a considerable strengthening of the existing rule framework for managing drainage systems.

It provides two permitted activity frameworks:

- one for systems existing as at 1 June 2015
- one for those installed after 1 June 2015 – permitted provided there is some form of treatment at the point of discharge and to report the location of new systems to Council within 3 months of installation.

Both permitted activity frameworks strengthen the management of these types of discharges compared to the existing framework (i.e. Rule 9 in the Regional Water Plan).

If the permitted activity conditions were not met, the discharges would be discretionary activities and therefore require resource consent. Option B also strengthens the policies which would be used to determine whether to grant resource consent. In particular, Policies 12, 14, 16 and 18 would set a high threshold for granting consent and support the policy intent to require 'end of pipe' treatment.

Option C – ~~Proposed Water and Land Plan~~ – pSWLP - decision provisions

The option outlines the provisions proposed through the pSWLP.

As with the other options, the pSWLP does not include specific policies regarding installed subsurface drainage systems. The relevant general policies relating to water quality and management of discharges include:

- managing land use activities and discharges (point source and non point source) to land and water so that water quality and the health of humans, domestic animals and aquatic life is protected (Policy 13).

- maintaining and improving water quality by avoiding new discharges to surface waterbodies, and avoiding discharges to artificial watercourses, that will reduce water quality beyond the zone of reasonable mixing (~~Policy 15~~ Policies 15A and 15B).

Option C allows for the discharge from installed subsurface drainage systems as a permitted activity provided conditions are met. This Option attempts to find a middle ground between Option A and Option B. It retains the ~~four~~ conditions relating to section 70 requirements, ~~suitability for consumption by animals, exacerbating flooding, scouring or erosion~~, and mapping of known existing and new systems but removes the requirement for some form of 'end of pipe' treatment that was proposed in Option B. ~~It also includes an additional condition that permitted activities do not give risk to any significant effects on aquatic life, in accordance with section 70(1)(g) of the Act.~~

Rule 20 requires all farms to have a Farm Environment Management Plan (FEMP), staged from 2019 ~~2018~~, and which includes landowner-selected good management practices. Some of these good management practices relate to matters which affect the discharges from subsurface drainage systems such as managing or reducing stock levels on particular soil types, reducing fertiliser use in particular conditions, and planting catch crops to capture nitrogen from forage crops. There are no mandatory good management practices – each landowner will decide individually which to implement on their particular farm.

7.4.5 Assessment of efficiency and effectiveness

Section 32(1)(b)(ii) of the RMA requires the assessment of the 'efficiency and effectiveness' of provisions in achieving the objectives, in a level of detail that corresponds to the scale and significance of the anticipated effects.

Each individual option is evaluated below. First the effectiveness of each option in assisting the achievement of the objectives of the pSWLP is assessed. The following factors have been assessed as part of the effectiveness assessment:

- **Relevance** - includes the extent to which the provisions are targeted to achieve the objectives and the length of time taken to achieve the objective.
- **Feasibility** – includes the degree of uncertainty of achieving the objectives, degree of risk associated with the provisions (e.g. unintended consequences), ease of implementation (e.g. likelihood of compliance and ability to monitor/enforce).
- **Acceptability** – level of community and stakeholder acceptance.

Where options are evaluated as being effective in achieving the objectives in the pSWLP, they are subsequently evaluated for their 'efficiency'. Efficiency is about the use of resources (for example, human, financial and natural) is required for a particular policy option to be fully effective in comparison with other options. It also relates to how people will be able to provide for their social, economic and cultural wellbeing now and in the future.

To determine efficiency, the evaluation investigated the anticipated benefits and opportunities, and costs and risks anticipated from the options, taking into account both short and longer term, individuals and the wider community. Benefits and opportunities,

and costs and risks have been integrated across the four wellbeings (cultural, social, economic and environmental).

Option A – Status Quo

Effectiveness

To assist the assessment of effectiveness of Option A, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
2	✔✔	Option A recognises that on many farms across Southland subsurface drainage systems are critical to productivity. While the option is not specifically designed to achieve the objective and will not achieve it alone, the spirit of the objective underpins the policy direction contained in the rule particularly. Although Option A indirectly recognises economic wellbeing, there is risk that taking a 'hands off' approach may negatively affect the ability of other provisions to achieve water quality objectives. Option A reflects that the community views subsurface drainage systems as important on-farm infrastructure for maintaining economic wellbeing.
6	✔	Option A is not targeted to achieve Objective 6. Discharges which result in conspicuous changes to colour or clarity of water are not the only types of discharges which can negatively affect water quality, therefore it is difficult to see the rule achieving the objective over any period of time. As discharge points are often far from the 'hub' of farms, and in a number of cases unknown, the condition would be difficult to monitor and enforce – land owners are unlikely to know at any given time whether the discharge from their drainage system is leading to conspicuous change in colour or clarity of the receiving water. The lack of stringency in this rule reflects the level of acceptance the community has regarding both the problem and any management approaches. Feedback has shown that many people do not consider that discharges from subsurface drainage contribute to poor water quality, with a number considering that these systems undertake a type of filtration so that the water is cleaner when discharged than it would be running off paddocks directly.
13, 13A, 13B	✔~~✔~~	Option A does seek to enable the use and development of land by making installation of subsurface drainage systems essentially unregulated. ~~However, it is not targeted to achieve sub-parts (a) to (c). Without conditions which address sub-parts (a) to (c) the~~ It is unlikely that these objectives can~~not~~ be achieved by this rule. This reflects the level of acceptance in the community about the adverse effects arising from subsurface drainage systems.
14	✔	Option A is not designed to achieve this objective. While presumably one reason behind the condition in Rule 9 regarding change in colour or clarity is due to the potential affect on the life-supporting capacity of ecosystems, this is not explicit in the rule and is unlikely to be monitored. Without more information on the effects

		of subsurface drainage systems on ecosystems and subsequently more targeted conditions, this rule is unlikely to achieve the objective, particularly the maintenance or enhancement of life-supporting capacity. Option A is aligned with community acceptance levels.
18	✔	Under Option A the management of subsurface drainage systems is unlikely to be considered good management practice and is therefore not designed to achieve the objective. While there is uncertainty around what good management practice might be, it seems unlikely that the current approach is sufficient to "protect the region's … water from quality and quantity degradation." An unintended consequence of this approach may be that other activities are required to operate at a higher level of good management practice in order to offset the effects from subsurface drainage system discharges. Operating at the current level of management reflects the community's acceptance levels.
Total	✔	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Efficiency

Option A is anticipated to have a low effectiveness in assisting the achievement of Objectives 2, 6, 13, 13A, 13B, 14 and 18 of the pSWLP. This Option will therefore not be assessed for its efficiency.

Option B – Working Draft for Water and Land

Effectiveness

To assist the assessment of effectiveness of Option B, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
2	✔✔✔	Option B recognises that on many farms across Southland subsurface drainage systems are critical to productivity. While Option B is not specifically designed to achieve the objective, the spirit of the objective underpins the policy direction contained in Rule 13. Option B attempts to introduce a greater focus on environmental considerations while still providing for these types of systems as permitted activities. There is uncertainty around whether this option can enable cultural wellbeing and therefore whether the objective can be achieved. Feedback on the Working Draft suggests the community considers this rule did not place enough emphasis on economic considerations , and was also impractical in many instances and so was not acceptable.
6	✔✔✔	The strong policies and requirement to treat discharges in Option B is a targeted response to this objective. Reducing nutrients in discharged water would support the maintenance of water quality.

		Permitted activities can be difficult to monitor and enforce due to issues with charging associated costs. The requirement for treatment only applies to new subsurface drainage systems, so discharges from existing systems would see no improvement under this rule. As a result, at best this rule would contribute to the maintenance of water quality. Given the lack of community acceptance and support for Option B, and its permitted activity status, there may be a high degree of non-compliance with the rule.
13, 13A, 13B	✔✔✔	Option 2 enables the use and development of land and soils by providing a permitted activity framework. It also seeks to require mitigation of adverse effects on ecosystems by requiring treatment of drainage water prior to discharge. However, this is only in relation to new systems. The approach in Option B for managing already installed systems is not designed to achieve this objective. Due to the lack of information around the extent and scale of current drainage systems, there is uncertainty about whether the objective could be achieved. It is likely that already installed systems would make up the majority of systems for a considerable length of time, posing a risk that the objective is not able to met in the foreseeable future. Feedback on the Working Draft suggests that the approach to new systems is not acceptable to the community.
14	✔✔	The part of Option B that deals with new systems is designed to achieve this objective by requiring treatment which would reduce adverse effects on indigenous ecosystems and maintain their life-supporting capacity. However, the approach to already installed systems would struggle to meet this objective over any period of time. Feedback on the Working Draft suggests the community largely does not consider that drainage systems adversely affect indigenous ecosystems.
18	✔✔✔	Option B is designed to move new systems towards good management practice, as required by this objective. However, as outlined previously, this does not apply to already systems. Without requiring already systems to also move towards good management practice, this objective cannot be fully achieved. Feedback on the Working Draft suggests the community currently does not accept than any improvement to current practice is necessary.
Total	✔✔✔	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Option B is anticipated to have a medium effectiveness in assisting the achievement of Objectives 2, 6, 13, 13A, 13B, 14 and 18 of the pSWLP.

Efficiency

To assist the assessment of the efficiency of Option B, the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed. They are presented below. When evaluating benefits and costs, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**
Individual	➢ Landowners can maintain their existing subsurface drainage systems without the cost of installing treatment. ➢ Increased awareness of on-farm actions and implications for the environment. ➢ Contribute to maintaining quality of water used domestically or on-farm. ➢ Contribute to maintaining water quality downstream e.g. for stock drinking water. ➢ Increase in recreational values of water bodies e.g. fishing.	➢ Time and monetary costs associated with installing treatment for new subsurface drainage systems, or resource consenting and meeting conditions where required, processing (>$2,000 – dependent on circumstances), monitoring (annual cost case-by-case). ➢ Increased stress on landowners as a result of increased regulatory requirements. ➢ Limits on development of farming activities to avoid consenting processes
Community	➢ Improved aquatic ecosystems health. ➢ Improved ground and surface water quality. ➢ Small decrease in impact of flood events ➢ Restoration of mahinga kai sites. ➢ Enhanced recreational opportunities. ➢ Public health benefits downstream from reducing contaminants in artificial drainage water entering waterways. ➢ Opportunity for additional business for service sector e.g. contractors. ➢ Increased ecosystem services, such as water filtering ➢ Increased value to future generations for commercial or recreational uses, as well as enhanced bequest value, option value, existence value, aesthetic value, ecosystem services value ➢ Increased existence value - value that comes from something existing, even if you don't use it (e.g. knowing the river is safe to swim in even if you don't swim). ➢ Increased aesthetic value, of particular importance to the tourism industry.	➢ Cost to Council (rates) – Monitoring permitted activity mostly covered by existing monitor programme. Cost to Council (rates) - Land Sustainability additional workload assisting with implementation of farm practices. ➢

Option C – ~~Proposed Water and Land Plan~~ – pSWLP decisions provisions

Effectiveness

To assist the assessment of effectiveness of Option C, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
2	✔✔	Option C recognises the importance of subsurface drainage systems to the productivity of farming and therefore economic wellbeing in Southland, though it is not targeted to achieve this entire objective. It is not clear that this option enables cultural wellbeing as no improvement in the quality of discharges is required. Option C will be fairly straightforward to implement as it is a permitted activity and does not require any action by landowners except providing maps of new/upgraded systems on request. This option reflects the farming community's views on managing subsurface drainage systems.
6	✔~~✔~~	Option C is not designed to achieve this objective. The option is more effective than the status quo because it includes additional conditions requiring that discharges not render water unsuitable for consumption by animals and do not result in toxicity to aquatic life. However, this is not likely to be sufficient to maintain water quality in waterbodies. Although an improvement on the status quo, Option C is very unlikely to achieve this objective as it does not require any improvement in the quality of discharges. Option C reflects the farming community views that subsurface drainage systems do not contribute to degradation of water quality.
13, 13A, 13B	✔✔✔ ✔	Option C is partially designed to achieve these ~~this~~ objectives in that it seeks to enable the use and development of land and soils. ~~However, it is not targeted towards, and would likely not achieve, the conditions in the objective, particularly (c) regarding maintaining or enhancing ecosystems. Without mitigation, discharges from subsurface drainage systems will continue to transport nutrients to artificial watercourses and waterbodies which may have adverse effects on ecosystems.~~ This option reflects the community's perspective that it is acceptable to prioritise enabling land use over potential effects on ecosystems.
14	✔✔	Many subsurface drainage systems connect to larger water bodies housing indigenous ecosystems. Option C is not designed to achieve this objective as it does not seek to mitigate adverse effects arising from these discharges either at the source or further downstream. The option is an improvement on the status quo due to the additional conditions it includes, however the objective is unlikely to be achieved. Option C reflects community acceptance about the impact of discharges from drainage systems and the lack of current information about the extent and location of these systems.
18	✔✔	Option C includes an opportunity for subsurface drainage systems to operate at good management practice or better through the requirement in Rule 20 for all farms to have an FEMP. However, the specific practices included in an individual FEMP are at the discretion of the landowner so it is impossible to predict the

		potential uptake or level of improvement in this area. Because of this uncertainty, it is unlikely the objective will be achieved by this option. There is an additional risk that by not requiring these discharges to operate at good management practice level, other activities will be required to operate at a higher level in order to achieve the objectives. Option C reflects the community's view that on-farm management practices should be determined by the landowner not Council.
Total	✔✔	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Option C is anticipated to have low to medium effectiveness in assisting the achievement of Objectives 2, 6, 13, 14 and 18 of the pSWLP.

Efficiency

Despite having a low to medium effectiveness, because it is the proposed Option, it will be assessed for its efficiency.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**
Individual	➢ Landowners can maintain their existing subsurface drainage systems, and install new systems without the cost of installing treatment.	➢ Reduction in quality of water used domestically or on-farm. ➢ Reduction in quality of water downstream e.g. for stock drinking water. ➢ Decrease in recreational values of water bodies e.g. fishing.
Community	➢ The information on the position of new drains and outlets may be useful for future investigations. ➢ Because of the requirement to locate new or maintained drains, there are opportunities the development of location technologies and applications. ➢ Contractors can continue to install subsurface drainage systems as they do currently. ➢ Information about the location of subsurface drainage systems may be useful for future policy processes.	➢ Cost to Council (rates) – Monitoring permitted activity mostly covered by existing monitor programme. Cost to Council (rates) - Land Sustainability additional workload assisting with implementation of farm practices. ➢ Decline of ground and surface water quality. ➢ Degradation of aquatic ecosystems health. ➢ Reduced recreational opportunities. ➢ Public health effects downstream from additional contaminants in artificial drainage water entering waterways. ➢ Reduced ecosystem services. ➢ Reduced value to future generations for commercial or recreational uses, as well as reduced bequest value, option value, existence value, aesthetic value, ecosystem services value ➢ Reduced existence value - value that comes from something existing, even if

		you don't use it (e.g. knowing the river is safe to swim in even if you don't swim). ➢ Reduced aesthetic value, of particular importance to the tourism industry.

Effectiveness Discussion

Option A presents a permissive policy framework which largely seeks to avoid managing discharges from subsurface drainage systems unless they are resulting in a conspicuous change to the colour or clarity of the receiving waters. This does not support the intent of the objectives in the pSWLP which are designed to 'raise the bar' from the status quo. Option B goes some way in assisting the achievement of the pSWLP objectives by requiring some form of treatment of discharges. However, this only applies to new systems and does not address the majority of the problem which occurs with existing systems. This option was particularly badly received by the community and proved to be unacceptable.

Option C contains significantly strengthened policies and a slightly strengthened rule framework from the status quo. The permitted activity framework does not appear to give effect to the objectives and policies of the pSWLP, however it is likely that applications for resource consent for these discharges will be subject to a higher degree of scrutiny than they currently are. Option C includes a requirement to provide maps of new and known ~~/upgraded~~ systems to Council on request, which reflects the feedback from the farming community that there is not enough information about the location, extent and impacts of subsurface drainage systems for more stringent rules to be adopted.

Efficiency Discussion

Overall, Option B is considered to be a moderately efficient way of achieving the Plan's objectives. It targets regulatory intervention at installation of new subsurface drainage systems. This approach will, at best contribute to maintaining water quality, as existing subsurface drainage systems, which are currently contributing significant contaminant load off-farm, are largely unregulated. The permitted activity status is efficient in that it minimises cost to both the community and individuals from the regulation, and contributes in some way to each of the objectives to which it pertains. It has the broadest range of benefits to both individuals and the community more generally of all the options considered, however, the cost of implementation would be the greatest of the three options. This cost would fall primarily to individuals installing new subsurface drainage systems.

Like Option B, Option C regulates subsurface drainage as a permitted activity. However, it requires no treatment prior to discharge. It is more stringent than Option A as there is a requirement to locate drains and the outlets when maintaining them or installing new drains. This will assist in understanding the regional distribution of tile drains, which would be useful for future policy processes. However, this is one of the few benefits of this approach of regulating tile drains, and the lack of direct regulation of the effects cause by tile drainage means there are a large number of costs and risks shouldered by the community. Most of these costs result from degradation of water quality.

7.4.6 Risk of acting or not acting

An evaluation report must contain an assessment of the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions (under section 32(2)(c) RMA). It is considered that the information relating to the effects arising from discharges from subsurface drainage systems is both certain and sufficient. However, there is risk in terms of acceptability of any of the options to the farming community. Tile drains are often old systems, that were installed for essentially and engineering purpose, of lowering the water table, and there is some uncertainty regarding the extent and location and operation of these systems. There is also uncertainty about the extent and performance of mitigation measures, particularly in relation to reduction of nitrogen from drainage water. However, Option C is designed to reduce this uncertainty by at least clarify the extent and location of the networks, to better enable responses through the FMU processes.

7.4.7 Appropriateness discussion

The third requirement of the section 32(b) provisions analysis is to summarise the reasons for deciding on the provisions. Guidance from the Ministry for the Environment on this point states that:

> *To date, section 32 case law has interpreted 'most appropriate' to mean "suitable, but not necessarily superior".*

Option B is the most effective and efficient option considered by the Council. However, the Council considered Option C to be the most appropriate option to achieve the objectives. This is due in large part to the strength of the opposition to Option B through the engagement process on the working draft. Submitters considered that in many instances it would be impractical to include some form of 'end of pipe' treatment system due to physical constraints, such as slope and financial implications. Many submitters highlighted that there is little information about the exact locations of tile drains – often these were constructed through the mid-20th Century and the locations not necessarily known, or mapped.

On this basis, the Council considered Option B was impractical, and would negatively impact buy-in into the Plan as a whole from the agricultural community, which could undermine the Plan's effectiveness. Option C, while being low to moderately effective, provides an avenue to learn more about the distribution of subsurface drainage systems throughout the province, with a longer term view that further controls on subsurface drainage systems could be addressed through the limit setting process.

7.4.8 Conclusion

As outlined above, Council's assessment is that when considered in the context of the whole of the pSWLP Option C – pSWLP is the most appropriate option to achieve the objectives of the pSWLP.

7.5 Dust Suppressants

7.5.1 Introduction

This section of the report assesses proposed provisions relating to dust suppressants within the pSWLP.

The proposed provisions seek to give a clearer direction around dust suppressants to ensure plan users have a better indication of what dust suppressants can be used and any controls around their use.

It is accepted that dust from gravel roads pollute the air, reduces visibility and road safety, aggravates respiratory conditions and generally provides a nuisance to rural residences. To combat these difficulties some rural landholders in Southland apply dust suppressants to the roads close to their property. [104] It has long been practice that waste engine oil has been applied to gravel roads in order to suppress dust.

Waste oil contains a large number of hazardous contaminants which are picked up when the oil is used in engines and transmissions, including a number of carcinogens. These contaminants are known to be hazardous to both human health and the environment. These contaminants can be transferred to the environment during application of the waste oil as a dust suppressant or once the surface of the oiled road breaks down. This breakdown causes the road to become dusty again, the contaminants bind to the dust, which can be blown into the air or shifted by traffic or water flow. There are safer alternatives to waste oil for human and environmental health.[105]

The current provisions in the RELAP or Water Plan do not contain specific rules relating to dust suppressants but do deal with discharge of contaminants and hazardous substances as activities requiring resource consent.[106]

This section outlines the reasonably practicable options for managing dust suppressants, and assesses their effectiveness, benefits and costs and efficiency in achieving the objectives of the pSWLP, in order to determine which is the most appropriate.

7.5.2 Statutory Context

Resource Management Act 1991 – section 70

Section 70 states that before a regional council includes in a regional plan a rule that allows as a permitted activity a discharge to water or a discharge to land where it may enter water the regional council must be satisfied none of the following effects are likely to arise in the receiving waters, after reasonable mixing, as a result of the discharge:

(a) the production of conspicuous oil or grease films, scums or foams, or floatable suspended materials;

[104] Memo from Nick Ward to Anita Dawe regarding Used Oil dated 24 February 2016
[105] Environment Southland Dust Suppression Guide (http://www.es.govt.nz/media/27717/dust-suppression.pdf)
[106] Rules 1,2 and 57

(b) any conspicuous change in colour or visual clarity;
(c) the rendering of freshwater unsuitable for consumption by farm animals; and
(d) any significant adverse effects on aquatic life.

Southland Regional Policy Statement~~s~~

Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. ~~There are two relevant Regional Policy Statements, the Southland Regional Policy Statement 1997 (RPS), and the proposed Southland Regional Policy Statement 2012 (pRPS).~~

~~Objective 5.2 of the RPS requires that in the use and development of water and land resources, and the discharges of contaminants, water quality is maintained and wherever practicable, enhanced. This is supported by Policy 5.5 which requires local authorities considering a decision to assess the effects of land use and development on ground water and surface water quality and provide for any adverse effects to be avoided, remedied or mitigated.~~

The relevant sections of the ~~p~~RPS in relation to dust suppressants include Chapter 5: Rural Land~~/ and~~ Soils and Chapter ~~10~~ 9: Air Quality. Objective RURAL.2 provides for the protection of life-supporting capacity of soils. The objective requires users to maintain and enhance the life-supporting capacity, mauri and health of soils and avoid or mitigate the adverse effects of soil disturbance. In relation to dust suppressants, Policy RURAL.5 promotes sustainable use of rural land to maintain or improve soil properties and water quality.

Objective AQ.1 provides for the protection of human health and wellbeing and the environment from the adverse effects of odours, chemicals, particulate matter and dust. Following on from this, Policy AQ.1 seeks to ensure users avoid where practicable the adverse effects of discharges to air of odours, chemicals, particulate matter and dust on human health, amenity values and the environment.

7.5.3 Relevant Objectives of the pSWLP

The RMA requires an examination of whether the provisions in the proposal are the most appropriate way to achieve the pSWLP objectives. The most relevant proposed objectives in relation to dust suppressants are:

Objective 6 *There is no reduction in the overall quality of freshwater, and water in estuaries and coastal lagoons, by:*

(a) maintaining the quality of water in waterbodies, estuaries and coastal lagoons, where the water quality is not degraded; and

(b) improving the quality of water in waterbodies, estuaries and coastal lagoons, that have been degraded by human activities.

Objective 13 *Enable the use and development of land and soils to support the economic, social, and cultural wellbeing of the region.~~, provided:~~*

Objective 13A ~~(a) t~~*The quantity, quality and structure of soil resources are not irreversibly degraded through land use activities* ~~*and*~~ *or discharges to land*~~*.*~~*.*

Objective 13B ~~(b)~~ *The discharges of contaminants to land or water that have significant or cumulative adverse effects on human health are avoided*~~*.*~~*.* ~~*and*~~

~~*(c) adverse effects on ecosystems (including diversity and integrity of habitats), amenity values, cultural values and historic heritage values are avoided, remedied or mitigated to ensure these values are maintained or enhanced.*~~

Objective 18 *All activities operate in accordance with* ~~*at*~~ *"good* ~~*(environmental)*~~ *management practice" or better to optimise efficient resource use, safeguard the life supporting capacity of* ~~*and protect*~~ *the region's land*~~*,*~~ *and soils, and maintain or improve the* ~~*water from*~~ *quality and quantity of the region's water resources.* ~~*degradation.*~~

7.5.4 Overview of Practicable Options

Environment Southland has considered two reasonably practicable options (as required under section 32(b)(i) RMA) for managing the adverse effects of dust suppressants. These are as follows:

- **Option A: (Status Quo)** - includes a number of rules dealing with discharges and hazardous substances, but no rule dealing specifically with dust suppressants.
- **Option B: (~~Proposed~~ pSWLP Decisions Provisions)** – include a rule in the plan dealing specifically with dust suppressants as a permitted activity providing specific conditions are met.

Scale and significance

Section 32(1)(c) requires that when examining whether the provisions in the proposal are the most appropriate way to achieve the Objectives, the analysis must contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal. The scale and significance of the suggested changes to rules around dust suppressants within the pSWLP are considered to have a moderate effect as the activity is only carried out to a limited extent, and the level of detail in this analysis corresponds with that.

Option A: (Status Quo) – Water Plan provisions retained

Currently there is no specific rule which applies specifically to dust suppressants, but a number of provisions which apply to discharge of contaminants, in particular Rules 1, 2 and 57, and Policies 3, 4 and 31C. The rules seek to achieve control of discharges through a number of general rules preventing or limiting discharges to land or water. However, it is difficult to determine whether these rules actually apply to the activity of applying dust suppressants. Section 15 of the RMA states that if a regional plan does not have a rule that covers a certain activity, a resource consent is required. Applying dust suppressants is a very limited activity, but is one that commonly occurs without an application for a resource consent.

Under this option there would continue to be a lack of clarity regarding the application of dust suppressants in the pSWLP and no policy limiting the application of waste oil as a dust suppressant. In practice this has resulted in a general understanding that no resource consent is required for applying a dust suppressant to land.

Option B – ~~Proposed~~ pSWLP Decisions Provisions

Option B proposes introducing a new rule to the pSWLP which deals specifically with dust suppressants and ensures that any suppressant used does not breach established requirements of human health and environmental protection:

Rule 17

(a) The discharge of a dust suppressant onto or into land in circumstances where a contaminant may enter water is a permitted activity, provided either of the following conditions are met:

(i) the dust suppressant is not a hazardous substance; or ~~The discharge is only of vegetable oil, or of new light fuel or lubricating oil and is:~~

~~(1) applied in a manner that does not result in pooling or runoff, with a maximum application rate not exceeding 2 litres per metres squared per day and 4 litres per metres squared per annum; and~~

~~(2) not within 20 metres of a surface water body, the Coastal Marine Area, a bore or soakhole; or~~

(ii) The dust suppressant is approved under the Hazardous Substances and New Organisms Act 1996 and the use and discharge of the dust suppressant is undertaken in accordance with all conditions of the approval.

(b) The discharge of ~~oil as~~ a dust suppressant onto or into land in circumstances where a contaminant may enter water that does not meet ~~one or more of~~ the conditions in Rule 17(a) is a ~~restricted~~ discretionary activity.

~~The Council will restrict the exercise of its discretion to the following matters:~~

~~(i) The actual and potential environmental effects of not meeting the condition or conditions of Rule 17(a).”~~

This Rule does not enable the use of waste oil as a dust suppressant as a permitted activity. Instead it specifies what type of suppressant can be used and ensures that the provisions relating to dust suppressants are clearly established. The Rule also does not duplicate approved processes under the HSNO Act.

7.5.5 Assessment of efficiency and effectiveness

Section 32(1)(b)(ii) of the RMA requires the assessment of the ‘efficiency and effectiveness’ of provisions in achieving the objectives, in a level of detail that corresponds to the scale and significance of the anticipated effects. As discussed above the overall scale and significance of these proposed changes is considered to be potentially moderate in their effect. Therefore, the following evaluation has been developed on that basis. When evaluating the two options introduced in section 7.4.4, Environment Southland’s reference point is the current environmental, social, economic and policy context.

Each individual option is evaluated below. First the effectiveness of each option in assisting the achievement of the objectives of the pSWLP is assessed. The following factors have been assessed as part of the effectiveness assessment:

- **Relevance** - includes the extent to which the provisions are targeted to achieve the objectives and the length of time taken to achieve the objective.
- **Feasibility** – includes the degree of uncertainty of achieving the objectives, degree of risk associated with the provisions (e.g. unintended consequences), ease of implementation (e.g. likelihood of compliance and ability to monitor/enforce).
- **Acceptability** – level of community and stakeholder acceptance.

Where options are evaluated as being effective in achieving the objectives in the pSWLP they are subsequently evaluated for their 'efficiency'. Efficiency is about the use of resources (for example, human, financial and natural) is required for a particular policy option to be fully effective in comparison with other options. It also relates to how people will be able to provide for their social, economic and cultural wellbeing now and in the future.

To determine efficiency, the evaluation investigated the anticipated benefits and opportunities, and costs and risks anticipated from the options, taking into account both short and longer term, individuals and the wider community. Benefits and opportunities, and costs and risks have been integrated across the four well-beings (cultural, social, economic and environmental).

Option A – Status Quo

Effectiveness

To assist the assessment of effectiveness of Option A, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
	Ranking*	**Reasons**
Objective 6:	✓	The current provisions of the Water Plan are designed to maintain or improve the water quality in Southland by restricting discharges into these waterbodies. The lack of a specific rule relating to the use of dust suppressants limits the relevance and feasibility of the current plan structure when dealing with dust suppressants. The current provisions do not align with the section 70 requirements relating to discharges that may enter water and does little to achieve the objectives in the RPS. The lack of clarity about what a plan user is required to do when seeking to apply dust suppressants to land may result in the user not applying for any type of resource consent.
Objective 13, 13A, 13B:	✓✓	The current provisions are designed to protect the soil quality from contaminants being discharged to land. The lack of a specific rule relating to dust suppressants reduces

		the clarity of how the plan intends to deal with those specific discharges. Similar to the above objective, due to the lack of clarity about what a plan user is required to do when seeking to apply dust suppressants to land may result in the user not applying for any type of resource consent.
Objective 18:	✓	The current rule framework does not require good management practices to be implemented to achieve this objective. This objective would be reliant on a resource consent application being made and that consent containing conditions that prevents the use of a non-complying dust suppressant being used. The lack of good management practice to control the activity of dust suppression will ultimately result in a discharge of hazardous contaminants to soil and water.
Total	✔	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Option A is anticipated to have an average effectiveness of one out of five in assisting the achievement of Objectives 6, 13, 13A, 13B and 18 of the pSWLP. This demonstrates low effectiveness in achieving the objectives. This Option will therefore not be assessed for its efficiency as it would not be an appropriate option to implement.

Option B – ~~Proposed~~ pSWLP Decisions Provisions

Effectiveness

To assist the assessment of effectiveness of Option B, the relevance, feasibility and acceptability of the provisions have been identified and presented below

Assessment of Effectiveness		
Objective **Objective 6:**	**Ranking***	**Reasons**
	✓✓✓✓	The proposed rule relating to dust suppressants gives a permissive activity status based on certain conditions that limit the type of suppressant used and the volume and regularity of the application. The restrictions on the volume of application will limit over-use of the contaminant which will decrease pooling of the suppressant and possible overland flow into water sources. Overall, water quality is appropriately protected. The inclusion of the Hazardous Substances and New Organisms Act 1996 (HSNO) in the Rule avoids an overlap with the Act and prevents any conflict.

		Acceptability of this option is likely to be enhanced due to the decrease of contaminants entering waterbodies, improving water quality and aligning with Ngāi Tahu philosophies such as Ki uta ki tai and Te Mana o te Wai.
Objective 13, 13A, 13B:	✓✓✓✓	The proposed new rule is a clear attempt to stop discharges of hazardous contaminants and over-application of suppressants and inappropriate suppressants to land. The permissive framework limits the need to apply for a consent to undertake the works as long as the suppressant complies with the Rule and HSNO. This will help to prevent discharges of contaminants harmful to human health. The clarity of the Rule will limit any uncertainty about how the Plan relates to applying a dust suppressant. The inclusion of the HSNO Act in the Rule avoids an overlap with the Act and prevents any conflict.
Objective 18:	✓✓✓✓	This framework limits the regulatory framework while providing clear indicators about what is determined as good management practice.
Total	✓✓✓✓	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Efficiency

To assist the assessment of the efficiency of Option B, the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed. They are presented below. When evaluating benefits and costs, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**
Individual	➢ The plan clearly states what can be used as a dust suppressant so it is easy for plan users to find out whether the suppressant they intend using comes within the conditions. ➢ Moves the use from a restrictive to permissive activity reducing the requirement to apply for a consent, provided the conditions are complied with. ➢ Avoids overlap with HSNO. ➢ Opportunity for additional business for compliant dust suppression.	➢ If a suppressant is used but not approved by the new Rule or under the HSNO Act, then the user would have to apply for a resource consent ➢ The cost of dust suppression will likely rise as use of the low-cost waste oil will require consent. ➢ Higher cost to individuals for disposal of waste oil if not close to a recycling facility.

Community	➢ Avoids damage to human health and the environment through preventing the use of waste oil and other harmful substances as a dust suppressant. ➢ Improved aquatic ecosystem health. ➢ Improved soil health. ➢ Aligns with Ngāi Tahu philosophies such as Ki uta ki tai and Te Mana o te Wai. ➢ Increased protection for wāhi tapu, mahinga kai and other taonga tuku iho.	➢ Cost to Council (monitoring costs) if continued use of substances not approved by the Rule results in monitoring and enforcement requirements. ➢ Higher cost to businesses for disposal of waste oil. ➢ Implications on contractors who currently rely on the use of a dust suppressant that will not be compliant with the new Rule.

Effectiveness Discussion

Overall, Option B is considered to be a medium to highly effective way of achieving the Plan's objectives, compared to the current provisions of the Water Plan. The key amendment introduced to the pSWLP is the introduction of the Rule dealing specifically with dust suppressants. The proposed Rule complies with section 70 of the RMA and all higher order RMA documents and aligns with Ngāi Tahu philosophies such as Ki uta ki tai and Te Mana o te Wai.

The current provisions in the Water Plan lack certainty regarding the discharge of dust suppressants and do not adequately align with the higher order documents giving it a low effectiveness.

Efficiency Discussion

Given that the Water Plan does not have any provision relating to the application of dust suppressants the efficiency of the pSWLP in achieving the proposed objectives is much higher. There will be some increased costs but the human and environmental health protection will increase significantly.

7.5.6 Risk of acting or not acting

An evaluation report must contain an assessment of the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions (under section 32(2)(c) RMA). It is considered that the information relating to dust suppressants is both certain and sufficient as:

- in the short-term the degree of shift from status quo is modest. However, the use of dust suppressants not approved under the HSNO Act is low and the changes are designed to directly improve human health and environmental protection;
- the proposed provisions give better effect to the requirements set out in the NPSFM and ~~P~~RPS;
- there will be a limited level of uncertainty which may stem from people being unsure whether a suppressant is permitted by the new Rule.

Overall, the information relating to the effects of the activities addressed by the provisions set out in this section of the report is considered to be sufficient, such that the risk of acting is low.

7.5.7 Conclusion

The assessment in section 7.4.5 shows Option B – Proposed pSWLP Provisions to be the most appropriate option to assist achieving the objectives of the pSWLP.

7.5.8 References

Memo from Nick Ward to Anita Dawe regarding Used Oil dated 24 February 2016

Environment Southland Dust Suppression Guide (http://www.es.govt.nz/media/27717/dust-suppression.pdf)

7.6 General Discharges

7.6.1 Introduction

This section of the section 32 report assesses the provisions relating to general discharges within the proposed SWLP Plan.

The proposed provisions for the management of water quality seek to give better effect to the NPSFM and the proposed new objectives. The proposed plan also seeks to ensure that full assessment of potential effects from discharges is undertaken, with requirements to meet water quality standards. The proposed plan introduces clear guidance to plan users for determining the appropriate size of the zone of reasonable mixing in order to minimise the size of the area where the relevant water quality standards are breached.

The provisions assessed in this section generally involve changes to the wording and/or order of the provisions that are contained in the existing Water Plan, however, are not included in the 'minor changes' section as they are considered to have a potentially moderate impact by changing, for example, the activity status of various activities and introducing new permitted activity rules for specific discharges.

The section outlines the reasonably practicable options for managing water quality as they relate to general discharges, and assesses their effectiveness, benefits and costs and efficiency in achieving the objectives of the proposed SWLP, in order to determine which is the most appropriate.

7.6.2 Statutory Context

The proposed changes are to a range of provisions throughout the definitions, policies, rules and schedules within the pSWLP. The proposed changes also include amendments to the objectives which are dealt with in section 4 of this report.

NPSFM

Objective A1 of the NPSFM seeks to safeguard the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, of fresh water; and the health of people and communities, at least as affected by secondary contact with fresh water in sustainably managing the use and development of land, and of discharges of contaminants.

This is supported by Policy A3 requiring regional councils to impose conditions on discharge permits to ensure the limits and targets specified pursuant to Policy A1 and Policy A2 can be met; and where permissible, making rules requiring the adoption of the best practicable option to prevent or minimise any actual or likely adverse effect on the environment of any discharge of a contaminant into fresh water, or onto or into land in circumstances that may result in that contaminant (or, as a result of any natural process from the discharge of that contaminant, any other contaminant) entering fresh water.

~~***Regional Policy Statement for Southland 1997 (RPS)***~~

~~Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. Section 43AA then defines "regional policy statement" as "an operative regional policy statement approved by a regional council under Schedule 1." The most relevant part of the RPS in relation to discharges is section 5.5 – Water Quality.~~

~~Objective 5.2 requires that in the use and development of water and land resources, and the discharges of contaminants, water quality is maintained and wherever practicable enhanced. Similarly, Objective 5.3 requires that the discharge of contaminants into water does not compromise water quality standards established for the region. These objectives are supported by Policy 5.2 which requires all point source discharges to comply with water quality standards after reasonable mixing.~~

~~***Proposed*** **Southland Regional Policy Statement** [2017](#) ~~2012~~ **(~~p~~RPS)**~~

~~Section 66(2)(a) of the RMA states that a Regional Plan shall have regard to any proposed regional policy statement. The pRPS is currently under appeal, however mediation is nearing conclusion and a number of consent orders have been lodged with the Environment Court. It is expected that the pRPS will be made operative once all appeals are resolved, which is likely to be before the pSWLP becomes operative. It is therefore important that the pSWLP gives effect to the pRPS as well as the RPS.~~ Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. The most relevant section of the ~~p~~RPS in relation to discharges is Chapter 4: Water.

Objective WQUAL.1 requires that water quality in the region safeguards the life-supporting capacity of water and related ecosystems and the health of people and communities. This is supported by Policy WQUAL.1 which requires that discharges and land uses activities are managed to maintain or improve water quality to ensure freshwater objectives are met. Policy WQUAL.2 specifies that in managing water quality, particular regard will be had to nitrogen, phosphorus, sediment and microbiological contaminants.

7.6.3 Relevant Objectives of the pSWLP

The pSWLP contains the following objectives which are considered the most relevant for managing water quantity:

Objective 1 *Land and water and associated ecosystems are sustainably managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between freshwater, land and the coast.*

Objective 3 *The mauri ~~(inherent health)~~ of waterbodies provide for te hauora o te tangata (health and mauri of the people), te hauora o te taiao (health and mauri of the environment) and te hauora o te wai (health and mauri of the waterbody).*

Objective 6 *There is no reduction in the overall quality of freshwater, and water in estuaries and coastal lagoons, by:*

(a) maintaining the quality of water in waterbodies, estuaries and coastal lagoons, where the water quality is not degraded; and

(b) *improving the quality of water in waterbodies, estuaries and coastal lagoons, that have been degraded by human activities.*

Objective 8 (a) *The quality of groundwater ~~in aquifers~~ that meets both the Drinking-Water Standards for New Zealand 2005 (revised 2008) and any freshwater objectives, including for connected surface waterbodies, established under Freshwater Management Unit processes is maintained; and*

(b) *The quality of groundwater ~~in aquifers~~ that ~~have been degraded by~~ does not meet Objective 8(a) because of the effects of land use ~~and~~ or discharge activities ~~(with the exception of those aquifers where ambient water quality is naturally less than the Drinking-Water Standards for New Zealand 2005 (revised 2008))~~ is progressively improved so that:*

(1) groundwater (excluding aquifers where the ambient water quality is naturally less than the Drinking-Water Standards for New Zealand 2005 (revised 2008)) meets the Drinking-Water Standards for New Zealand 2005 (revised 2008); and

(2) groundwater meets any freshwater objectives and freshwater quality limits established under Freshwater Management Unit processes.

7.6.4 Overview of practicable options

Environment Southland has considered two reasonably practicable options (as required under section 32(b)(i) RMA) for managing the adverse effects of the taking and using of water to assist in achieving the proposed objectives. These are as follows:

- **Option A – (Status quo)** - the Regional Water Plan for Southland manages point source and non-point source discharges (excluding on-site dairy effluent) under 17 existing policies and 23 general and activity specific rules.

- **Option B – (pSWLP Decisions Provisions)** - retains Policy A4 of the National Policy Statement for Freshwater Management 2014, and replaces the remaining existing 17 policies and 23 rules with three new policies and 25 new rules. Option B increases the threshold for permitted abstraction and use of surface water and groundwater.

Scale and significance

Section 32(1)(c) requires that when examining whether the provisions in the proposal are the most appropriate way to achieve the Objectives, the analysis must contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal. As noted above, the changes assessed within this section relate to relatively minor wording changes, but which could have a moderate impact on in terms of whether activities require resource consent. As such, the scale and significance of the suggested changes is considered to be moderate. The level of detail in this analysis corresponds with this.

Option A: Status Quo – Water Plan provisions

This option involves retaining the current policies and rules of the Water Plan without amendment in relation to general and minor discharges. The key policies of the Water Plan

that manage general discharges are currently considered to be complex and contain duplication. The key policies and rules related to general discharges include:

- Definition: Mixing zone (zone of reasonable mixing)
- Policy A4 of the NPSFM and Policies 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13 and 31A, 31B, 31C, 31D
- Rules 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, 14, 15, 16A, 16B, 16C, 16D, 53, 54, 55, 56, 57 and 58
- Appendix G: Water Quality Standards.

The suite of 17 policies and 23 rules manage minor point-source and non-point source discharges originating from a wide range of activities, including stormwater, use of agrichemicals and/or fertiliser, works in waterways, landfills (including closed, farm landfills and cleanfill sites), and offal pits.

The existing provisions seek to provide for discharges where there are no measurable adverse effects on Natural State Waters, or if outside of Natural State Waters, then discharges are to meet specified water quality standards following reasonable mixing.

The provisions provide guidance regarding appropriate management tools, including preference for discharges to be to land where appropriate. They also provide clear guidance that the discharge of untreated effluent is to be avoided.

The Water Plan manages to water quality standards following reasonable mixing, with the size of the zone of reasonable mixing to be determined on a case-by-case basis.

Option B – pSWLP Decisions Provisions

Option B proposes to retain Policy A4 of the NPSFM and replaces the remaining 20 policies with a more simplistic and practical suite of provisions that includes only three new policies and retains the majority of the rules form the Water Plan.

The relevant policies, rules and appendices related to minor discharges are as follows:

- Definition: Reasonable Mixing Zone
- Policies
  - Policy A4 NPSFM
  - Policy 13: Management of land use activities and discharges
  - Policy 14: Preference for discharges to land
  - Policy 15A: Maintain water quality where standards are met
  - Policy 15B: Improve water quality where standards are not met
  - Policy 15C: Maintaining and improving water quality after FMU processes
- Rules
  - Rule 5: Discharges to surface water bodies ~~that meet water quality standards~~ – discretionary activity
  - Rule 6: Discharges to surface water bodies that do not meet the water quality standards – non-complying activity
  - ~~Rule 7: Other discharges to water – discretionary~~
  - Rule 8: Discharges of surface water – controlled activity

- Rule 9: Discharge of agrichemicals onto or into surface water (permitted activity)
- Rule 10: Discharge of agrichemicals to land where they may enter water (permitted activity)
- Rule 12: Discharge of non-toxic dyes (controlled activity)
- Rule 13: Discharge from ~~installed~~ subsurface drainage systems (permitted activity)
- Rule 14: Discharge of fertiliser (permitted or non-complying activity)
- Rule 15: Discharge of stormwater ~~onto land~~ (permitted or discretionary activity)
- Rule 16: Discharge of water from bores and wells for aquifer testing (permitted activity)
- Rule 18: Discharge of water from purging of instruments at a water treatment plant and portable potable water treatment units (permitted activity)
- Rule 18A: Discharge from emergency fire-fighting (permitted activity)
- Rule 18B: Discharge from emergency response training activities (permiited activity)
- Rule 19: Discharge of water associated with water treatment processes (controlled activity)
- Rule 34: ~~Discharge from~~ Industrial ~~or~~ and trade ~~waste~~ processes (discretionary or non-complying activity)
- Rule 36: Horticulture wash-water (permitted activity)
- Rule 37: Agricultural dips (permitted activity)
- Rule 38: Animal and vegetative waste (permitted activity)
- Rule 39: Other agricultural effluent disposal (discretionary activity)
- Rule 42: Clean fill sites (permitted or restricted discretionary activity)
- Rule 43: Farm landfills (permitted or discretionary activity)
- Rule 44 Offal Pits (permitted or discretionary activity)
- Rule 45: Landfills (discretionary activity)
- Rule 46: Land Contaminated by Hazardous Substances (permitted or discretionary activity)
- Rule 47: Closed landfills (permitted or discretionary activity)
- Rule 48: Cemeteries (permitted or discretionary activity)

- Appendix E: Receiving Water Quality Standards

While Option B significantly reduces the number of policies related to general discharges, the overall water quality outcomes and management options remain largely unchanged. This option introduces requirements for discharges to land to consider the effects not only on surface water, but also groundwater.[107]

Option B retains the majority of rules from the Water Plan, however the key differences to the rule regime for discharges include:

- a specific methodology for determining the "reasonable mixing zone" (rather than the zone being determined on a case by case basis) for activities that require resource consent. The intention of the new definition of the "reasonable mixing zone" is not to set monitoring points for discharges;

- reliance on general discharge rules to manage the discharge of:

[107] Policy 15

- stormwater into surface water (this activity is provided for by more general discharge rules)
- whey from industrial and trade premises
- raw sewage, foul water or untreated agricultural effluent

- the introduction of a new rule specifically for urban stormwater systems, which requires that the systems be on a trajectory of improvement of discharge quality.

- the introduction of new permitted activity rules for the discharge of:
  - contaminants associated with new or existing cemeteries
  - water containing contaminants from horticultural wash-water
  - sludge from dips
  - solid animal waste, sludge or vegetative material

- marginally less restrictive requirements for discharges associated with closed landfills and the discharge of raw sewage (proposed non-complying activity compared to prohibited in the Water Plan);

- Additional requirements for the following activities:
  - permitted activity rule for the discharge of agrichemicals to land now excludes any discharge to Natural State Waters or waterways that are subject to a water conservation order;
  - permitted activity rule for the discharge from installed subsurface drainage systems includes new requirements limiting the effects on flooding, scour, erosion and water quality; and
  - controlled activity rule for the discharge of water associated with standard water treatment processes.

- The discharge of sediment associated with drainage maintenance is now addressed under a general rule for works in waterways, and is not further evaluated in this section of the report.

The introduction of the new permitted activity rules for the discharge of contaminants associated with new or existing cemeteries, from horticultural wash-water, dips, solid animal waste, sludge or vegetative material enable low risk activities to operate without obtaining resource consent, where the conditions of the permitted activity rules are sufficient to ensure that the effects of the activities are acceptable.

The remaining key amendments proposed by Option B are largely to amendments to the wording and order of provisions in the Water Plan to reduce the complexity and improve readability.

7.6.5 Assessment of efficiency and effectiveness

Section 32(1)(b)(ii) of the RMA requires the assessment of the 'efficiency and effectiveness' of provisions in achieving the proposed objectives, in a level of detail that corresponds to the scale and significance of the anticipated effects. The pSWLP has 18 objectives for the Southland region which are set out in Section 4 of this report.

Each option is evaluated below. First the effectiveness of each option in assisting the achievement of the objectives of the pSWLP is assessed. The following factors have been assessed as part of the effectiveness assessment:

- **Relevance** - includes the extent to which the provisions are targeted to achieve the objectives and the length of time taken to achieve the objective.
- **Feasibility** – includes the degree of uncertainty of achieving the objectives, degree of risk associated with the provisions (e.g. unintended consequences), ease of implementation (e.g. likelihood of compliance and ability to monitor/enforce).
- **Acceptability** – level of community and stakeholder acceptance.

Each option has been given an effectiveness score out of five (from low effectiveness through to high effectiveness) against the relevant objectives in the proposed Water and Land Plan. An average overall score out of five has been given to each of the options.

Where options are evaluated as being effective in achieving the objectives in the pSWLP they are subsequently evaluated for their 'efficiency'. Efficiency is about the use of resources (for example, human, financial and natural) required for a particular policy option to be fully effective in comparison with other options. It also relates to how people will be able to provide for their social, economic and cultural wellbeing now and in the future.

To determine efficiency, the evaluation investigated the benefits and opportunities, and costs and risks anticipated from the options, taking into account both short and longer term, individuals and the wider community. Benefits and opportunities, and costs and risks have been integrated across the four well-beings (cultural, social, economic and environmental).

5.4.1 Option A – Status Quo

Effectiveness

To assist the assessment of effectiveness of Option A, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
1	✓✓	Objective 1 requires the integrated management of land and water and associated ecosystems. The existing provisions include requirements to manage the effects of discharges onto or into land and water on surface water quality, acknowledging the interaction between land and water. However, the provisions of the Water Plan have little consideration of the effects of discharges on groundwater quality, thus will not give effect to the requirements set out in Objective 1 in regards to integrated management of land and water. As the existing provisions do not enable full consideration of the actual and potential effects of discharges as part of an

		integrated natural resource, the acceptability to the community is limited, including Ngāi Tahu.
3	✓✓✓	Objective 3 seeks that the mauri of water bodies provides for the health of the people, environment and waterbody. The provisions contained in the Water Plan specifically require the management of discharges to maintain specified water quality standards in order that the mauri of each waterway is maintained or improved. Option A does not set clear guidance regarding an appropriate reasonable mixing zone, resulting in uncertainty for those implementing the plan when determining an acceptable level of effect. As such, the provisions of the Water Plan in regards to general discharge will not be able to give full effect of the requirements set out in Objective 3. Acceptability is as for Objective 1.
6	✓✓	Objective 6 seeks to ensure there is no reduction in the quality of freshwater, and water in estuaries and lagoons by maintaining quality where it is not degraded, or improving quality in water bodies that have been degraded by human activities. The requirement for discharges to meet water quality standards assists in achieving this objective, however the plan does not require improving water quality where the existing water quality is degraded. Option A has limited ability to maintain and improve water quality, which is a key aim of the community, as expressed in the pRPS. Provisions that do not achieve this objective are not considered acceptable to the community.
8	✓	The Water Plan does not contain any provisions related to the management of general discharges and the associated effects on groundwater. Poor groundwater quality, especially drinking water, is a particular issue for affected communities, who expect improvement.
Total	✔✔	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Option A is anticipated to have low to medium effectiveness of two out of five in assisting the achievement of Objectives 1, 3, 6, 7 and 8 of the Water Plan. This demonstrates low to medium effectiveness in achieving the objectives. This Option will therefore not be assessed for its efficiency as it would not be an appropriate option to implement.

Option B – pSWLP Decisions Provisions

To assist the assessment of effectiveness of Option B, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
1	✓✓✓✓	The existing provisions include requirements to manage the effects of discharges onto or into land and water on surface water quality, acknowledging the interaction between land and water. In addition, the proposed provisions recognise the connectedness between groundwater and surface water, and includes requirements to manage general discharges while avoiding, remedying or mitigating adverse effects on groundwater quality. The proposed provisions enable full consideration of the actual and potential effects of general discharges as part of an integrated natural resource, which is a more acceptable approach to a number of stakeholders and in line with the community feedback received through engagement on the draft pSWLP.
3	✓✓✓✓✓	Objective 3 seeks that the mauri of water bodies provides for the health of the people, environment and waterbody. The provisions contained in the Water Plan specifically require the management of discharges, beyond the zone of reasonable mixing, to maintain specified water quality standards in order that the mauri of each waterway is maintained or improved. The introduction of a specific definition of the zone of reasonable mixing provides greater certainty to those implementing the plan. Policy 13 also specifically requires the management of land use activities and discharges to land and water so that water quality and the health of humans, domestic animals and aquatic life is protected, assisting with the achievement of Objective 3. Ngai Tahu ki Murihiku have identified support for the improved management of discharges generally, and the policy support for the recognition of Ngai Tahu values.
6	✓✓✓✓✓	Objective 6 seeks to ensure there is no reduction in the quality of freshwater, and water in estuaries and lagoons by maintaining quality where it is not degraded, or improving quality in water bodies that have been degraded by human activities. Policy 15 specifically requires the maintenance or improvement of water quality, thus giving effect to Objective 6. The proposed provisions also permit a number of specific discharges where the effects associated with those activities are considered to be acceptable, and where consent is required, the discharges are to meet water quality standards.
8	✓✓✓✓✔	The proposed region-wide water quality policies specifically seek to maintain and improve water quality to avoid land use activities and discharges that will reduce groundwater quality, so that water quality meets the Drinking-Water Standards for New Zealand 2005 (revised 2008).

		Acceptability is as per Objective 1.
Total	✓✓✓✓✓	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Option B is anticipated to have a high effectiveness of five out of five in assisting the achievement of Objectives 1, 3, 6, 7 and 8 of the proposed SWLP. This demonstrates high effectiveness in achieving the objectives. The efficiency of this Option is assessed in the following section, as it is considered an appropriate option to implement.

Efficiency

To assist the assessment of the efficiency of Option B, the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed below. When evaluating benefits and costs, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**
Individual	➢ Introduction of permitted activity rules for horticultural wash-water, agricultural dips and animal and vegetative waste results in the use of less resources (both time and money) associated with resource consenting for low risk activities. ➢ Introduction of specific methodology to determine "reasonable mixing zone" provides greater certainty to those implementing the plan, resulting in potentially less costs (both time and money) associated with modelling and agreeing on the extent of the zone.	➢ It is anticipated that there may be a small increase in cost for landowners to meet the requirements of permitted activity rule for the discharge of water from subsoil drainage, where the effects of the discharge are not considered acceptable (Rule 12)
Community	➢ It is anticipated that the proposed provisions will result in a small increase in environmental benefits, with additional controls associated with protecting Natural State Waters and waterways subject to Water Conservation Orders, as the discharge of agrichemicals to land where they may enter water is no longer permitted in these areas. ➢ There will likely be a minor increase in environmental and community benefits associated with the additional requirements for permitted discharges	➢ Small increase in cost to Council (i.e. small reduction in revenue): Under the proposed provisions, the introduction of permitted activity rules for specific discharges may result in a reduction of resource consents and associated monitoring charges. ➢ Small increase in cost to Council (monitoring costs): Monitoring of permitted activities will impose a cost on the council that is not recoverable from the resource user.

	from sub-surface drainage, including limiting effects of the discharge on flooding, scour, erosion and on water quality. ➢ Small reduction in the number of resource consent applications with a corresponding small reduction in council work-loads.	

Efficiency Discussion

Overall, Option B is considered to be a moderately efficient way of achieving the Plan's objectives, compared to the existing provisions in the Water Plan. The key amendments introduced by the pSWLP largely consist of:

- minor amendments in order to meet the requirements of the NPSFM;
- introducing new permitted activity rules for discharges associated with horticultural wash-water, agricultural dips and animal and vegetative waste;
- introducing a specific methodology to determine the reasonable mixing zone in order to minimise the size of the area where the relevant water quality standards are breached; and
- amendments to the wording and order of provisions to reduce the complexity and improve readability of the corresponding provisions in the Water Plan.

Given that the management of water quality in relation to general discharges will remain largely unchanged in the Southland region until the completion of FMU processes, the assessment of the efficiency of the provisions relative to the Water Plan does not show any significant benefits/opportunities or costs/risks compared to the status quo.

7.6.6 Risk of acting or not acting

An evaluation report must contain an assessment of the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions (under section 32(2)(c) RMA). The level of information available is considered high, and uncertainty low for the following reasons:

- In the short-term the degree of shift from status quo is small, however the proposed plan provides an opportunity to set catchment specific management regimes through future FMU processes;
- The proposed provisions give better effect to the requirements set out in the NPSFM and ~~p~~RPS; and
- There is sufficient information relating to the effects of the proposed permitted activity rules for discharges associated with horticultural wash-water, agricultural dips and animal and vegetative waste.
- The introduction of a specific definition for reasonable mixing zones reduces risk and uncertainty associated with determining an acceptable area where specific water quality standards may be breached.

Overall, the information relating to the effects of the activities addressed by the provisions set out in this section of the report is considered to be sufficient, such that the risk of acting is low.

7.6.7 Conclusion

The assessment in section 7.2.5 shows Option B – pSWLP to be the most appropriate option to achieve the objectives of the pSWLP.

7.7 Water Takes

7.7.1 Introduction

This section of the report assesses the provisions relating to water takes within the pSWLP.

The proposed provisions for the management of water quantity seek to give better effect to the NPSFM and the proposed new objectives. The proposed plan change also seeks to ensure that the activity status of activities is commensurate with their anticipated effects, including reducing the threshold for permitted activities for small-scale abstractions and introducing a prohibited activity status for waterbodies that are considered to be over-allocated. These provisions relate to:

- the abstraction, diversion, damming and use of surface water; and
- the abstraction and use of groundwater.

The provisions assessed in this section generally involve changes to the wording and/or order of the provisions that are contained in the existing Water Plan, however, they are not included in the 'minor changes' section as they are considered to have a potentially moderate impact by changing, for example, the activity status of various activities.

The section outlines the reasonably practicable options for managing water quantity, and assesses their effectiveness, benefits and costs and efficiency in achieving the objectives of the pSWLP, in order to determine which is the most appropriate.

7.7.2 Statutory Context

The proposed changes are to a range of provisions throughout the definitions, policies, rules and schedules within the pSWLP. The proposed changes also include amendments to the objectives which are dealt with at section 4 of this report.

NPSFM and RPS Framework

Both the NPSFM and the Southland Regional Policy Statement (~~p~~RPS) seek to either maintain or improve the quantity of freshwater in Southland. A full evaluation of the proposed pSWLP provisions against the NPSFM is contained in each relevant section. It is important to note that Environment Southland has a programme for full implementation

of the NPSFM through a series of Freshwater Management Unit process as identified in its progressive implementation plan in order to implement Te Mana o Te Wai.

As set out in Section 2 of this report, a regional plan must give effect to any national policy statement and any regional policy statement[108], and must not be inconsistent with any water conservation order[109]. The relevant provisions of the NPSFM and the ~~p~~RPS, in relation to water quantity, are set out below.

NPSFM

Objective B1 of the NPSFM seeks to safeguard the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems of fresh water, in sustainably managing the taking, using, damming, or diverting of fresh water.

The NPSFM also requires that further over-allocation of fresh water is avoided and existing over-allocation is phased out (Objective B2) and that the efficient allocation and use of water is improved and maximised (Objective B3).

Objective B4 of the NPSFM seeks to protect significant values of wetlands and of outstanding freshwater bodies.

An assessment showing how the pSWLP gives effect to the provisions in the NPSFM is set out in as required in each relevant section

~~***Regional Policy Statement for Southland 1997 (RPS)***~~

~~Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. Section 43AA then defines "regional policy statement" as "an operative regional policy statement approved by a regional council under Schedule 1." The most relevant part of the RPS in relation to water takes is section 5.4 – Water Quantity.~~

~~All provisions in the RPS relating to Water Quantity apply to water takes, but of particular importance are Objective 4.2 which requires the management of the use and development of water and land resources so as, wherever practicable, to maintain and enhance flow regimes, and Objective 4.3 which requires that it is ensured the taking, use, damming and diversion of water does not compromise environmental standards established for the Region.~~

~~Policies 4.1-4.8 set out how Objectives 4.2 and 4.3 are to be achieved and include policy direction on minor takes as permitted activities[110], managing effects of abstractions or transfers of permits[111], encouraging efficient allocation and use[112] and assessing the effects of land use and development on the quantity and sustainability of water in water bodies when a council is making a decision and providing for any adverse effects.~~

~~***Proposed*** **Southland Regional Policy Statement** ***2017*** ~~***2012***~~ **(~~*p*~~*RPS)***

[108] Section 67(3)(b) and 67(3)(c) of the RMA
[109] Section 67(4)(a) of the RMA
[110] Policy 4.2
[111] Policy 4.3
[112] Policy 4.4

~~Section 66(2)(a) of the RMA states that a Regional Plan shall have regard to any proposed regional policy statement. The pRPS is currently under appeal, however mediation is nearing conclusion and a number of consent orders have been lodged with the Environment Court. It is expected that the pRPS will be made operative once all appeals are resolved, which is likely to be before the pSWLP becomes operative. It is therefore important that the pSWLP gives effect to the pRPS as well as the RPS.~~ Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. The most relevant section of the ~~p~~RPS in relation to water takes is Chapter 4: Water.

The ~~p~~RPS contains two objectives that specifically address the sustainable management of the region's water resources. Objective WQUAN.1 of the ~~p~~RPS seeks to ensure that all flow, level and allocation regimes are developed in accordance with the NPSFM, while supporting the maintenance or improvement of water quality.

Objective WQUAN.2 of the ~~p~~RPS addresses the efficient allocation and use of water, while making provision for existing Manapōuri and Monowai hydro-electric generation schemes in the Waiau catchment.

Policies WQUAN.1-WQUAN.7 set out how Objectives WQUAN.1 and WQUAN.2 are to be achieved, and include policy direction on maintaining instream values of surface water[113], how to address over-allocation[114], requirements for identifying water management regimes[115] (including the management of cumulative effects[116]), the efficient use of water[117] and recognising the social, economic and cultural benefits associated with the use, development or protection of water[118].

7.7.3 Relevant Objectives of the pSWLP

The pSWLP contains the following objectives which are considered the most relevant for managing water quantity:

Objective 1 *Land and water and associated ecosystems are sustainably managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between freshwater, land and the coast*

Objective 2 *Water and land is recognised as an enabler of primary production and the economic, social and cultural wellbeing of the region.*

Objective 3 *The mauri ~~(inherent health)~~ of waterbodies provide for te hauora o te tangata (health and mauri of the people), te hauora o te taiao (health and mauri of the environment) and te hauora o te wai (health and mauri of the waterbody).*

Objective 7 *Any further over-allocation of freshwater (water quality and quantity) is avoided and any existing over-allocation is phased out in ~~in~~ accordance with freshwater objectives,*

[113] Policy WQUAN.1
[114] Policy WQUAN.2
[115] Policy WQUAN.3 and Policy WQUAN.4
[116] Policy WQUAN.5
[117] Policy WQUAN.6
[118] Policy WQUAN.7

freshwater quality limits and timeframes established under Freshwater Management Unit processes.

Objective 9 ~~*(a)*~~ *The quantity of water in surface waterbodies is managed so that aquatic ecosystem health, life-supporting capacity, outstanding natural features and landscapes,* ~~*recreational values,*~~ *and natural character*~~*, and historic heritage values of surface waterbodies and their margins*~~ *are safeguarded.*~~*; and*~~

Objective 9A ~~*(b) Provided (a) is met, water is*~~ *Surface water is sustainably managed* ~~*available both instream and out-of-stream*~~ *to support the reasonable needs of people and communities to provide for their social, economic and cultural wellbeing.*

Objective 9B *The effective development, operation, maintenance and upgrading of Southland's regionally significant, nationally significant and critical infrastructure is enabled.*

Objective 11 *The amount of water abstracted is shown to be reasonable for its intended use and n*~~*W*~~*ater is allocated and used efficiently*

Objective 12 *Groundwater* ~~*levels*~~ *quantity is sustainably managed, including safeguarding the life-supporting capacity, ecosystem processes and indigenous species of*~~*, and minimum*~~ *surface water bodies* ~~*flows*~~ *where* ~~*these are*~~ *their flow is, at least in part, derived from groundwater*~~*, are maintained*~~*.*

7.7.4 Overview of practicable options

Environment Southland has considered two reasonably practicable options (as required under section 32(b)(i) RMA) for managing the adverse effects of the taking and using of water to assist in achieving the proposed objectives. These are as follows:

- **Option A – (Status quo)** - the Regional Water Plan for Southland manages the abstraction and use of surface water and groundwater under 21 existing policies and four rules.

- **Option B – (pSWLP Decisions Provisions)** - retains Policy B7 of the NPSFM ~~National Policy Statement for Freshwater Management 2014~~, and replaces the remaining existing 20 policies and four rules with ~~four~~ ten new policies and two new rules. Option B increases the threshold for permitted abstraction and use of surface water and groundwater.

Scale and significance

Section 32(1)(c) requires that when examining whether the provisions in the proposal are the most appropriate way to achieve the Objectives, the analysis must contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal. As noted above, the changes assessed within this section relate to relatively minor wording changes, but which could have a moderate impact on in terms of whether activities require resource consent. As such, the scale and significance of the suggested changes is considered to be moderate. The level of detail in this analysis corresponds with this.

Option A: Status Quo – Water Plan provisions

This option involves retaining the current policies and rules of the Water Plan without amendment in relation to the abstraction and use of groundwater and surface water. Under this option there would continue to be a large number of resource consents for small-scale abstractions that have limited environmental effects[119]. The key policies and rules of the Water Plan that manage the taking and use of water are currently considered to be complex and contain significant duplication. The key policies and rules related to the take and use of water include:

Surface water:

- Policy B7 of the National Policy Statement for Freshwater Management 2014
- Policy 14 - Taking, use, damming or diversion or surface water
- Policy 14A – Determining the term of a water permit
- Policy 14B – Considering a water permit application for a previously authorised activity
- Policy 15 – Surface water abstraction, damming, diversion and use
- Policy 15A – Water abstraction for community water supply
- Policy 15B – Water demand management strategy
- Policy 16 – Environmental flow and level regimes
- Policy 18 Fully allocated surface water bodies
- Policy 19 – Existing hydroelectric generation facilities in the Waiau catchment
- Policy 19A – Renewable energy
- Policy 19B – Natural state water quantity
- Policy 20 – Transferable water permits
- Policy 21 – Reasonable use of water
- Policy 22 - Water measuring devices
- Policy 23 – Review of water permits
- Policy 24 – Priority takes
- Policy 28 – To manage groundwater abstraction
- Policy 29 – Stream depletion effects
- Policy 30 – Groundwater abstraction
- Policy 31 – Interference effects
- Rule 18 – Abstraction, diversion and use of surface water.
- Rule 18A – Community water supply
- Rule 21 – Water abstraction, damming diversion and use form the Waiau catchment
- Appendix I: Methods for determining minimum flows and levels

Groundwater:

- Policy 28 – To manage groundwater abstraction
- Policy 29 – Stream depletion effects

[119] Kees, L., Hughes, B. Memorandum: Thresholds for permitted groundwater and surface water abstraction, dated 15 February 2016

- Policy 30 - Groundwater abstraction
- Policy 31 – Interference effects
- Rule 23 - Abstraction and use of groundwater.

The existing provisions of the Water Plan recognise the positive effects resulting from the use and development of water resources while managing the taking, use, damming or diversion of surface water and groundwater to avoid, remedy or mitigate significance effects (Policy 14 and Policy 28)

Allocation of Water

- Use a staged management approach to allocate surface water and groundwater for the abstraction, damming, diversion and use in Southland to allow the knowledge gained to be built into future management of water resources (Policy 15(a) and Policy 30(a)).
- Apply allocation and minimum flow and level regimes established under any Water Conservation Order and have regard to lake management guidelines developed by the Guardians of Lakes Manapouri, Monowai and Te Anau (Policy 15(c) and (d)).
- Recognise and provide for surface water abstraction, damming diversion and use that results in positive effects and for the abstraction, diversion and use permitted under Section 14(3) of the RMA (Policy 15(e) and (f)).
- Provide for a level of permitted surface water and groundwater abstraction, damming and diversion where there is a minimal risk of adverse effects, and a primary and secondary allocation for consented abstractions, damming, diversion and use (Policy 15(g) and Policy 30(d)).
- Ensure that surface water or groundwater abstractions, damming or diversions with a high risk of environmental effects, in conjunction with existing abstractions, damming and diversions, will not result in significant adverse effects (Policy 15(i) and Policy 30(i)).
- Establish environmental flow and level regimes for surface water bodies taking into account cultural values associated with the waterway, effects on flows and connectedness to groundwater, effects on ecosystems and habitat (including fish passage), geomorphological processes, recreation opportunities and accessibility to water bodies, vegetation, natural character, landscape and visual amenity; and the positive effects resulting from the use and development of the water resources (Policy 16(b)).
- Instigate appropriate water conservation procedures at times of low flow (Policy 17).

Option A includes a large suite of provisions related to managing the effects of groundwater and surface water take and use (i.e. resource consents) including:

- provisions for replacement consents (Policy 14B);
- guidance for level of information supplied to support a resource consent (Policy 15(h) and Policy 30(e));
- management of stream depleting groundwater abstractions with a rate of take exceeding 2 litres per second (Policy 29);
- limiting the cumulative interference effect of any new groundwater abstraction (Policy 31);

- requirements for environmental flows and levels (including flow cut-offs) for resource consents for take and/or diversion of water (Policy 16(a)) and (c) and Policy 30(f));
- water from a surface water body will not be over allocated through the resource consent process (Policy 18);
- limiting the rate of abstraction and abstraction volumes to no more than reasonable for the intended end use (Policy 21);
- guidance for determining the appropriate term for a water permit (Policy 14A).

Option A provides for the transfer of water permits to take and use water provided the transfer occurs in the same catchment or aquifer and is consistent with the provisions of the plan (Policy 20).

Option A also includes six different policies/clauses that relate to monitoring and review of consents that take and use water, including requiring water metering, monitoring conditions and requirements for review of consents where monitoring shows adverse environmental effects.[120]

Authorisations and resource consents:

- **Abstraction, diversion and use of surface water**
  - Permitted activities
    - Rule 18(a) establishes a permitted activity threshold for surface water abstraction at an instantaneous rate of 5 litres per second up to a daily volume of 10 cubic metres.
    - Rule 18(b) permits the abstraction, diversion and use of water from an artificial storage pond.
    - Rule 18(c) permits the abstraction and use of water for milk-cooling water or washing down of dairy sheds and piggeries, provided that the abstraction and use was lawfully established prior to 25 June 2005 and the scale or intensity of the abstraction does not increase.

  - Resource consent required:
    - Abstraction, diversion and use of water from the following sources is a restricted discretionary activity (Rule 18(d)):
      - any surface water body where the total volume of water allocated at any time is less than 10 percent of the mean annual low flow; or
      - any surface water body where the minimum flow applied is equal to the natural mean flow;
      - any surface water body where the water abstracted or diverted is returned in the vicinity of the abstraction or diversion point; or
      - any surface water body where the volume of water taken is less than 70 cubic metres per day.

    - Abstraction, diversion and use of water from the following sources is a discretionary activity:

[120] Policies 15(j) and 15(k), 22, 23, 30(g) and 30(h).

- any surface water body where the total volume of water allocated at any time is between 10 and 30 percent of the mean annual low flow, or any surface water body or artificial watercourse that does not drain into a river or stream (Rule 18(e))
- from the Waiau catchment, provided the abstraction is authorised by an existing consent and the effects of the activity are the same or similar in character, intensity and scale to the effects authorised by the resource consent (Rule 21(a))

- Abstraction, diversion and use of water from the following sources is a non-complying activity (Rule 18(f)):
  - any surface water body where the total volume of water allocated at any time is greater than 30 percent of the mean annual low flow (Rule 18(f)); or
  - Any further or new abstraction, damming, diversion and use of water from the Waiau catchment (Rule 21(b)).

- **Abstraction, diversion and use of groundwater**
  - Permitted activity:
    - Rule 23(a) permits the abstraction and use of up to 20 cubic metres of groundwater per landholding per day, provided the rate of abstraction does not exceed 2 litres per second.
    - Rule 24(b) permits the abstraction and use of groundwater for milk-cooling water or washing down of dairy sheds and piggeries, provided that the abstraction and use was lawfully established prior to 31 July 2004 and the scale or intensity of the abstraction does not increase.

  - Resource consent required:
    - The abstraction and use of groundwater from any of the following sources is a restricted discretionary activity, provided the rate of take is less than or equal to 2 litres per second (Rule 23(c)):
      - a riparian or terrace aquifer where the total volume of water allocated from the relevant groundwater zone is less than 25 percent of mean annual land surface recharge;
      - a confined aquifer where the total volume of water allocated from the relevant groundwater zone is less than 25 percent of aquifer through-flow; or
      - a source outside of the groundwater zones or a fractured rock aquifer, where the total volume of water applied for is less than 25 percent of rainfall recharge over the relevant land area where the water is to be used.

    - The abstraction and use of groundwater from any of the following sources is a discretionary activity (Rule 23(d)):
      - a riparian or terrace aquifer where the total volume of water allocated from the relevant groundwater zone is between 25 and 50 percent of mean annual land surface recharge;

- a lowland aquifer where the total volume of water allocated from the relevant groundwater zone is less than or equal to 15 percent of mean annual land surface recharge;
- a confined aquifer where the total volume of water allocated from the relevant groundwater zone is between 25 and 75 percent of aquifer throughflow;
- a riparian, terrace, confined or, fractured rock aquifer, or a source outside of the groundwater zones where the rate of take is greater than 2 litres per second, except as provided for in Rule 23(e); or
- a source outside of the groundwater zones identified or a fractured rock aquifer, where the total volume of water applied for is between 25 and 50 percent of the rainfall recharge over the relevant land area where the water is to be used.

- The abstraction and use of groundwater from any of the following sources is a non-complying activity (Rule 23(e)):
  - a riparian or terrace aquifer where the total volume of water allocated from the relevant groundwater zone is greater than 50 percent of mean annual land surface recharge;
  - a lowland aquifer where the total volume of water allocated from the relevant groundwater zone is greater than 15 percent of mean annual land surface recharge;
  - a confined aquifer where the total volume of water allocated from the relevant groundwater zone is greater than 75 percent of aquifer throughflow; or
  - a source outside of the groundwater zones or a fractured rock aquifer, where the total volume of water applied for is greater than 50 percent of the rainfall recharge over the relevant land area where the water is to be used.

Option B – pSWLP Decisions Provisions

In contrast to Option A, while Option B proposes to retain Policy B7 of the NPSFM, it replaces the remaining 20 policies and four rules with a more simplistic and practical suite of provisions that includes ~~six~~ ten new policies and two new rules. In addition, Option B introduces requirements for setting catchment specific freshwater objectives and the mechanisms required to meet those objectives, known as the Freshwater Management Unit (FMU) processes. The relevant policies, rules and Appendices related to water quantity are as follows:

- Policy 20 Management of water resources
- Policy 21 Allocation of water
- Policy 22 Management of the effects of groundwater and surface water use
- Policy 23 Stream depletion effects
- Policy 26 Renewable energy
- Policy 42 Consideration of water permit applications
- Policy 43 Transfer of water permits
- Policies 44-47 Freshwater Management Unit Policies

- Proposed Rule ~~48~~ 49, 52 and 52A for the management of abstraction, diversion and use of surface water and
- Proposed Rule ~~53~~ 54 for the management of the abstraction and use of groundwater.
- Appendix K and L

Option B proposes changes to the management of water resources in the Southland region by way of introducing increased permitted activity thresholds for the abstraction and use of small-scale abstractions, and requires resource consent[121] for activities that cannot meet the requirements of the permitted activity rules.

The proposed provisions also introduce the prohibition of the taking, diversion and use of water from the Cromel Stream, unless the application is for the replacement of an expiring water permit pursuant to section 124 of the Act, and the rate and volume is not increasing and the use of water is not changing (Rule ~~48~~ 49(e)). These provisions also provide for the national and regional significance of the renewable electricity generation activities of the Manapōuri Power Scheme.

The new rules that would permit the abstraction and use of groundwater and surface water include Rules ~~48~~ 49(a), 52A and ~~53~~ 54(a), with conditions on:

- The total rate and volume of water taken per day:
  - for surface water, a maximum rate of 2 litres per second and a volume of 250 litres per hectare per day, up to a maximum of 40 cubic metres per holding per day;
  - for groundwater, 5 litres per second, and a maximum volume of 86 cubic metres per day per landholding;
- Additional limits to avoid effects on the environment:
  - for surface water, the volume of take does not exceed 30 percent of the naturalised instantaneous flow in the surface water body at the time of the take and fish are prevented from entering the intake;
  - for groundwater, the point of abstraction is not within 50 metres of an existing lawfully established groundwater take
- The provision of information to the council upon request, including details of the abstraction and use of water.

Rule 52A provides for the replacement of an expiring consent for the Manapōuri Power Scheme with conditions requiring:

- the rate and take of water is not increasing;
- the use of the water is not changing, and
- the rate of take and volume complies with the flow and level regimes of the pSWLP.

[121] **Restricted discretionary activity (Rule 48(b)), discretionary activity (Rules 48 (c), 53(d), 53(e) and 53(f)); or non-complying activity (Rules 48(d) and Rule 53(g)).**

Rule ~~53~~54 (b) would also permit the non-consumptive take and use of groundwater, with conditions on:

- The total rate and volume of water taken;
- Additional limits to avoid effects on the environment:
  - if the interference effects are "acceptable" as set out in Appendix L.3 ~~degree of hydraulic connection is not Riparian, Direct or High, the relevant surface water minimum flows and allocation limits are met~~, and
  - any interference effects are acceptable;
- The amount and timing of water returned to the same waterbody or aquifer:
  - within 250 metres of the point at which it was taken; and
  - there is no significant delay in the returning of the water.

Rule ~~53~~ 54(c) introduces new requirements for permitted take and use of water for hydraulic testing, with conditions on:

- notifying the Council at least 3 days prior to test commencement;
- the maximum rate of abstraction and duration of the pump test;
- controls on the discharge of water; and
- the provision of records to the Council following the pump test.

Increasing the permitted activity thresholds for small-scale abstractions reduces the number of resource consents by approximately 685.

In addition to the provisions that set out the management of water resources, Option B introduces a number of policies that set out future processes and requirements in order to set catchment specific solutions to water quality and quantity issues, known as the Freshwater Management Unit (FMU) process. The FMU process includes setting water quality and quantity objectives; limits and targets to achieve the objectives; methods to phase out over-allocation, and assess water quantity and quality based on Ngāi Tahu indicators of health.

7.7.5 Assessment of efficiency and effectiveness

Section 32(1)(b)(ii) of the RMA requires the assessment of the 'efficiency and effectiveness' of provisions in achieving the proposed objectives, in a level of detail that corresponds to the scale and significance of the anticipated effects. The pSWLP has 18 objectives for the Southland region which are set out in Section 4 of this report.

Each option is evaluated below. First the effectiveness of each option in assisting the achievement of the objectives of the pSWLP is assessed. The following factors have been assessed as part of the effectiveness assessment:

- **Relevance** - includes the extent to which the provisions are targeted to achieve the objectives and the length of time taken to achieve the objective.
- **Feasibility** – includes the degree of uncertainty of achieving the objectives, degree of risk associated with the provisions (e.g. unintended consequences), ease of implementation (e.g. likelihood of compliance and ability to monitor/enforce).

- **Acceptability** – level of community and stakeholder acceptance.

Each option has been given an effectiveness score out of five (from low effectiveness through to high effectiveness) against the relevant objectives in the proposed Water and Land Plan. An average overall score out of five has been given to each of the options.

Where options are evaluated as being effective in achieving the objectives in the pSWLP they are subsequently evaluated for their 'efficiency'. Efficiency is about the use of resources (for example, human, financial and natural) required for a particular policy option to be fully effective in comparison with other options. It also relates to how people will be able to provide for their social, economic and cultural wellbeing now and in the future.

To determine efficiency, the evaluation investigated the benefits and opportunities, and costs and risks anticipated from the options, taking into account both short and longer term, individuals and the wider community. Benefits and opportunities, and costs and risks have been integrated across the four well-beings (cultural, social, economic and environmental).

Option A – Status Quo

Effectiveness

To assist the assessment of effectiveness of Option A, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
1	✓✓	Objective 1 requires the integrated management of land and water and associated ecosystems. The existing provisions include requirements to consider the effects of abstraction of groundwater on surface water resources, and conversely, when setting surface water flow and allocation regimes, regard must be had to the connectedness to groundwater. The provisions of the Water Plan do not specify methods or dates to determine an appropriate level of abstraction from groundwater resources, thus reducing the ability to protect surface water resources from cumulative effects associated with groundwater abstraction. The existing provisions do not enable full consideration of the actual and potential effects of water allocation as part of an integrated natural resource, limiting the acceptability of the provisions.
2	✓✓✓	Objective 2 seeks to recognise water and land as an enabler of the economic, social and cultural wellbeing of the region. The provisions contained in the Water Plan specifically recognise the benefits associated with the take, diversion,

		damming and use of freshwater resources. The plan also requires the effects on social and cultural values to be taken into account when establishing environmental flow and level regimes for surface water bodies. While the plan does not provide specific guidance on how to assess these matters, there are no constraints in the plan that would stifle the implementation of the relevant policies[122]. However, requiring resource consents for small rates and volumes of water may reduce the accessibility of the resource to some users, preventing the region from achieving its fullest potential, particularly in regards to economic and social wellbeing.
3	✓✓	The policies of the existing Water Plan require the establishment of environmental flow and level regimes for surface water bodies that take into account mauri and healthy ecosystems of indigenous species, wahi tapu sites and wahi taonga, and the spiritual and cultural values and beliefs of the tangata whenua. While the provisions do require consideration of some cultural matters, the Water Plan does not specifically require that the mauri of water bodies also provides for Te hauora o te tangata, or te hauora o te wai. Appendix I of the Water Plan provides five methods for determining minimum flows and levels, none of which provides any guidance for determining an appropriate flow regime that provides for mauri.
7	✓	There are no provisions in the Water Plan that prohibit the further allocation of water resources in catchments that are over-allocated, other than the Waiau, nor are there any requirements in the plan that sets out future processes or timeframes in relation to the Freshwater Management Unit processes. The limited ability to reduce over-allocation, or prevent over-allocation from occurring is not considered acceptable to stakeholders, including Ngāi Tahu.
9, 9A	✓	The existing provisions of the Water Plan requires the management of water quantity so as to avoid, remedy or mitigate significant adverse effects on the environment, where the inclusion of Policy B7 of the NPSFM enables the consent authority to have regard to the extent to which the activity would adversely affect safeguarding the life-supporting capacity of freshwater and any associated ecosystem. However, the provisions do not require "safeguarding" of the remaining matters listed in Objective 9~~(a)~~ (including ~~recreational values,~~ natural character, ecosystem health and life-supporting capacity ~~historic heritage values~~). The provisions of the Water Plan provide equal weighting to the matters outlined in Objective 9~~(a)~~ and 9A~~(b)~~.

[122] Policies 14 and 16(b)

		Given that the existing provisions do not provider higher priority to the matters listed in Objective 9(a), there is a high level of uncertainty and risk that Objective 9 will not be achieved.
9B	✓✓✓	The policies and rules of the existing Water Plan give some recognition to water takes for infrastructure, community water supply and electricity generation. However, that is not as well informed by more recent direction in NPS and RPS documents.
11	✓✓✓	Policy 21 of the Water Plan requires that the rate and volume of water specified on water permits to be no more than reasonable for the intended end use (which is distinct from the efficient allocation and use of water). The explanation for this policy goes on to describe that only the amount of water needed for the efficient operation of each activity is taken to avoid wastage, help ensure the sustainability of the resource and maximise its availability. The matters of discretion afforded to the Council when considering consent applications for restricted discretionary activities to take and use water include consideration of the efficiency of water use. While the explanation of the relevant policy (Policy 21) provides further guidance, there is a small degree of risk and uncertainty that efficient use is not considered when determining consent applications for discretionary or non-complying activities.
12	✔✔	The existing provisions in the Water Plan[123] require the management of groundwater abstraction to avoid significant adverse effects on, amongst other things, long-term aquifer storage volumes and surface water flows. In addition, Policy 29 requires the management of stream depletion effects associated with the abstraction of groundwater, including minimising the cumulative stream depletion effect of groundwater abstraction. The existing plan also provides provisions to impose minimum level and/or flow cut-offs and seasonal recovery triggers. While the plan provides for the consideration of the effects associated with groundwater abstraction and includes a number of management practices to avoid and/or mitigate adverse effects, there is no requirement to maintain groundwater levels. As such, there is a moderate risk that resource consents could continue to be granted that erodes existing groundwater levels.
Total	✔✔	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Option A is anticipated to have low to medium effectiveness of two out of five in assisting the achievement of Objectives 1, 2, 3, 7, 9, 9A, 9B, 11 and 12 of the Water Plan. This

[123] Policy 28

demonstrates low to medium effectiveness in achieving the objectives. This Option will therefore not be assessed for its efficiency as it would not be an appropriate option to implement.

Option B – pSWLP Decisions Provisions

To assist the assessment of effectiveness of Option B, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
1	✓✓✓✓	The proposed provisions recognise the connectedness between groundwater and surface water, and include requirements to manage the abstraction, use, damming or diversion of surface water while avoiding, remedying or mitigating adverse effects on areas of significant vegetation and significant habitats of indigenous fauna, groundwater quality and quantity. In addition, there is a requirement to avoid, remedy or mitigate significant adverse effects from the use and development of groundwater resources on surface water flow and levels and water quality. The proposed provisions enable full consideration of the actual and potential effects of water allocation as part of an integrated natural resource, which is an acceptable approach to a number of stakeholders including Ngai Tahu. Acceptability as for Objective 3 and 7 below.
2	✓✓✓✓	The proposed provisions specifically recognise the benefits associated with the take, diversion, damming and use of freshwater resources. There is nothing in the proposed provisions that would limit the implementation of this policy. The proposed provisions include increased permitted abstractions, meaning that accessibility to some ~~the~~ water resource is improved with the potential to enhance economic and social wellbeing. This reduction in the need for resource consents for small water takes, in line with acknowledgement of negligible environmental effects, is particularly welcomed by these consent holders. Otherwise, acceptability as for Objective 3 and 7 below.
3	✓✓✓✓✓	The proposed policies require the establishment of environmental flow and level regimes for surface water bodies that take into account mauri and healthy ecosystems of indigenous species, wahi tapu sites and wahi taonga. The methodology set out in Appendix K also require these matters to be taken into consideration when setting flow and allocation regimes. The proposed plan also sets out an FMU process which, amongst other things, seeks to implement Te Mana o te Wai and assess water quantity based on Ngāi Tahu indicators of

		health. The specific consideration of cultural values when setting freshwater objectives and water quality and quantity limits/targets will assist with the achievement of Objective 3 and assist in community acceptance of the proposed provisions as they align with Ngāi Tahu values.
7	✓✓✓✓✓	The proposed provisions in the pSWLP specifically seek to avoid over-allocation or further over-allocation from occurring, with policy 42 stating that consent will not be granted if a waterbody is fully allocated or to do so will result in a waterbody becoming over allocated or over allocation being increased. Proposed policies 44-47 set out the requirements for FMU processes, including avoiding further allocation of freshwater and phasing out any existing over-allocation. Specific policies avoiding over-allocation and guiding the future FMU processes will enable the achievement of Objective 7. The processes set out in policies 44-47 enable the development of catchment-specific solutions that will include the involvement of the local community. This means that any solution set to phase out over-allocation, and the timeframes by which that is achieved, is more likely to be acceptable to each community. Additional community acceptance as for Objective 3 above.
9, 9A	✓✓✓✔	The proposed region-wide water quantity policies seek to manage surface water bodies so that the values set out in Objective 9~~(a)~~ are safeguarded, with methods in place to determine appropriate allocation limits. The allocation limits are to also provide for the reasonable needs of people and communities to provide for their social, economic and cultural wellbeing. The catchment specific, community focused FMU process outlined in the proposed provisions also enables the protection of the values set out in Objective 9. Acceptability as for Objective 3 and 7 above.
9B	✓✓✓✓	A focussed range of policies and rules specifically identify and provide for regionally significant, nationally significant and critical infrastructure. This includes specific provisions for community water takes and renewable energy generation. The effectiveness of these provisions in achieving Objective 9B will also be significantly influenced by FMU processes to come, which will also reflect community aspirations for the management of infrastructure.
11	✓✓✓✔	Proposed policy 20 seeks to ensure that water is used efficiently and reasonably, with requirements to specify abstraction rates and volumes on water permits that are no more than reasonable for the intended end use. The associated rule framework also enables consideration of reasonable and efficient use of water. Given that the proposed provisions explicitly require consideration of the efficient and reasonable use of water, there is little uncertainty that Objective 11 will be achieved.
12	✓✓✓✔	The proposed provisions require the management of groundwater abstraction to avoid significant adverse effects on, amongst other things, long-term aquifer storage volumes

		and surface water flows. In addition, Policy 23 requires the management of stream depletion effects associated with the abstraction of groundwater, including minimising the cumulative stream depletion effect of groundwater abstraction. Proposed policy 42 also requires the imposition of minimum level and/or flow cut-offs and seasonal recovery triggers. The proposed FMU process also enables catchment specific water quantity limits to be set. While the proposed provisions initially require the setting of limits on a consent by consent basis, the proposed FMU process will enable a more cohesive package of set limits to maintain groundwater levels, by which consent applications will be assessed against. The proposed combination of an interim methodology to determine allocation, with the FMU process to set limits in the future is considered to be an effective means of achieving Objective 12, taking into consideration the amount of information that will be required to inform the limit setting process. Acceptability as for Objective 3 and 7 above.
Total	✓✓✓✓	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Option B is anticipated to have a medium to high effectiveness of four out of five in assisting the achievement of Objectives 1, 2, 3, 7, 9, 9A, 9B, 11 and 12 of the proposed SWLP. This demonstrates medium to high effectiveness in achieving the objectives. The efficiency of this Option is assessed in the following section, as it is considered an appropriate option to implement.

Efficiency

To assist the assessment of the efficiency of Option B, the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed and are presented below. When evaluating benefits and costs, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**
Individual	➢ Increase in permitted activity threshold for small scale abstraction results in less resources (time and money) associated with resource consenting. ➢ Long term benefit of having set allocation limits from FMU process, as opposed to providing the necessary information during a consent process, resulting in reduced costs for resource consent applications.	➢ Time and resources required for future FMU processes

	➢ Reduction in likelihood for penalty for non-supply of water abstraction data (a total of $43,000 for the past financial year) and reduced monitoring costs.	
Community	➢ Setting catchment specific water quantity limits through the FMU process provides greater long term opportunities for enhancing cultural, social, economic and environmental values. ➢ Supports protection of, and access, to taonga species. ➢ Reduction in the number of resource consent applications (currently there are 647 groundwater takes and 38 surface water takes), resulting in a reduction in council work-loads. ➢ Align with Ngāi Tahu values. ➢ Implement Te Mana o te Wai and assess water quantity based on Ngāi Tahu indicators of health.	➢ Cost to Council (reduction in revenue) – under the proposed provisions, the reduction in permitted activity threshold for small scale abstraction would result in a reduction of approximately 685 resource consents, which equates to a loss of approximately $225,000 per annum in annual monitoring charges, and $43,000 in fines for non-supply of water data (based on the last financial year). ➢ Cost to Council (monitoring costs) – monitoring of permitted activities will impose a cost on the council that is not recoverable from the resource user. ➢ A reduction in the number of resource consents will result in the loss of monitoring data associated with those abstractions, and a reduction in ability of the council to account for all freshwater abstractions.

Efficiency Discussion

Overall, Option B is considered to be a moderately efficient way of achieving the Plan's objectives, compared to the existing provisions in the Water Plan. The key amendments introduced by the pSWLP largely consist of:

- minor amendments in order to meet the requirements of the NPSFM;
- outlining requirements for future FMU processes;
- amendments to the wording and order of provisions to reduce the complexity and improve readability of the corresponding provisions in the Water Plan; and
- a reduction in the permitted activity threshold for small-scale abstractions

Given that the management of water quantity in the Southland region will remain largely unchanged until the completion of FMU processes (with the exception of the proposed lower threshold for permitted abstractions), the assessment of the efficiency of the provisions relative to the Water Plan does not show any significant benefits/opportunities or costs/risks compared to the status quo.

7.7.6 Risk of acting or not acting

An evaluation report must contain an assessment of the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions (under

section 32(2)(c) RMA). The level of information available is considered high, and uncertainty considered low for the following reasons:

- in the short-term the degree of shift from status quo is small, however provides an opportunity to set catchment specific management regimes through future FMU processes;
- the proposed provisions better give effect to the requirements set out in the NPSFM and pRPS;
- there is sufficient information relating to the effects of the proposed permitted activity threshold for small scale abstractions. The lower threshold for permitted activities will mean that approximately 685 existing consent holders will no longer require resource consent for small scale abstractions;
- a medium level of uncertainty remains for future consent applicants who wish to take and use water where there is limited information on existing allocation, however the introduction of a new flow statistic (Q95 as set out in Appendix K of the pSWLP) to determine flow and allocation should reduce the risk and uncertainty associated with limited flow information.

Overall, the information relating to the effects of the activities addressed by the provisions set out in this section of the report is considered to be sufficient, such that the risk of acting is low.

7.7.7 Conclusion

The assessment in section 7.2.5 shows Option B – pSWLP to be the most appropriate option to achieve the objectives of the pSWLP.

7.7.8 References

Kees and Hughes, Memo - Water allocation in Southland, 11 February 2016

Kees, Memo - Use of Q95 versus MALF, 16 February 2016

Kees and Hughes, Memo - Thresholds for permitted groundwater and surface water abstraction, 15 February 2016

7.8 Drinking Water Protection

7.8.1 Introduction

This part of the report assesses the provisions relating to drinking water protection within the pSWLP.

Many activities cause discharges to land or water that have the potential to negatively affect the quality of human drinking water. Access to clean and safe drinking water is fundamental to people's health and wellbeing.

Discharges of contaminants, or water, into water, or onto or into land in circumstances which may result in contaminants entering water, come under section 15 of the RMA and either has to be expressly allowed by a regional rule, or by a resource consent. The alternative of taking an entirely non regulatory approach – no rules and no consents - is not an option.

The proposed provisions seek to give a clearer direction around drinking water protection to ensure the provisions in the plan align with the requirements set out in the Drinking Water NES. The current provisions in the Water Plan contains only one rule[124] relating to community drinking water and a handful of other rules[125] managing discharges for the purpose of protecting water quality. The proposed provisions apply drinking water protection across multiple rules within the pSWLP[126] relating to discharges, as the Drinking Water NES intended.

The proposed provisions in the pSWLP include a degree of protection on two levels. The first level relates to the control of community drinking water by including specific provisions relating to drinking water supply and the protection of drinking water supply sites from contamination. The second level involves protection of individual bores by way of setback of discharges from the point of abstraction.

The section outlines the reasonably practicable options for managing drinking water protection, and assesses their effectiveness, benefits and costs and efficiency in achieving the objectives of the pSWLP, in order to determine which option is the most appropriate.

7.8.2 Statutory Context

Resource Management Act 1991 (RMA)

Section 70 of the Act states that before a regional council includes in a regional plan a rule that allows as a permitted activity a discharge to water, or a discharge to land where it may enter water, the regional council must be satisfied none of the following effects are likely to arise in the receiving waters, after reasonable mixing, as a result of the discharge:

(a) the production of conspicuous oil or grease films, scums or foams, or floatable suspended materials;

[124] Rule 18A.
[125] Rule 16B, 16C, 54, 55 and 57.
[126] Rules 11, 19, 23, 26, 27 28, 29, 32, 35, 36, 37, 40, 41, 43, 44, 46, 48, 49.

(b) any conspicuous change in colour or visual clarity;
(c) the rendering of freshwater unsuitable for consumption by farm animals; and
(d) any significant adverse effects on aquatic life.

National Policy Statement for Freshwater Management 2014 (NPSFM)

Objective A1 of the NPSFM seeks to safeguard the health of people and their communities in sustainably managing the use and development of land and discharges of contaminants. The NPSFM also requires that water quality is maintained or improved in water bodies that have been degraded by human activities to the point of being over-allocated (Objective A2).

Southland Regional Policy Statement 2017 ~~for Southland~~

Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. ~~There are two relevant Regional Policy Statements, the Southland Regional Policy Statement 1997 (RPS), and the proposed Southland Regional Policy Statement 2012 (pRPS).~~

~~Objective 5.2 of the RPS requires ensuring that in the use and development of water and land resources, and the discharges of contaminants, water quality is maintained and wherever practicable enhanced. Similarly, Objective 5.3 requires ensuring that the discharge of contaminants into water does not compromise water quality standards established for the region. These objectives are supported by Policy 5.2 which requires all point source discharges to comply with water quality standards after reasonable mixing.~~

The relevant section of the ~~p~~RPS 2017 ~~2012~~ in relation to the effects of drinking water protection is Chapter 4: Water. Objective WQUAL.1 requires that water quality in the region safeguards the life-supporting capacity of water and related ecosystems and the health of people and communities. This is supported by Policy WQUAL.1 which requires that discharges and land uses activities are managed to maintain water quality, or improve it, to ensure freshwater objectives are met. Policy WQUAL.2 specifies that in managing water quality, particular regard will be had to nitrogen, phosphorus, sediment and microbiological contaminants.

Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007

The Drinking Water NES applies specifically to this topic and requires regional councils to ensure that effects of activities on drinking water sources are considered in decisions on resource consents and regional plans. Specifically, regional councils are required to:

- decline discharge or water permits that are likely to result in community drinking water becoming unsafe for human consumption following existing treatment;
- be satisfied that permitted activities in regional plans will not result in community drinking water supplies being unsafe for human consumption following existing treatment; and
- place conditions on relevant resource consents that require notification of drinking water suppliers if significant unintended events occur (eg. spills) that may adversely affect sources of human drinking water.

7.8.3 Relevant Objectives of the pSWLP

The RMA requires an examination of whether the provisions in the proposal are the most appropriate way to achieve the pSWLP objectives. The most relevant proposed objectives in relation to drinking water protection are:

Objective 6 *There is no reduction in the overall quality of freshwater, and water in estuaries and coastal lagoons, by:*

(a) maintaining the quality of water in waterbodies, estuaries and coastal lagoons, where the water quality is not degraded; and

(b) improving the quality of water in waterbodies, estuaries and coastal lagoons, that have been degraded by human activities.

Objective 8 *(a) The quality of groundwater ~~in aquifers~~ that meets both the Drinking-Water Standards for New Zealand 2005 (revised 2008) and any freshwater objectives, including for connected surface waterbodies, established under Freshwater Management Unit processes is maintained; and*

(b) The quality of groundwater ~~in aquifers~~ that ~~have been degraded by~~ does not meet Objective 8(a) because of the effects of land use ~~and~~ or discharge activities ~~(with the exception of those aquifers where ambient water quality is naturally less than the Drinking-Water Standards for New Zealand 2005 (revised 2008))~~ is progressively improved so that:

(1) groundwater (excluding aquifers where the ambient water quality is naturally less than the Drinking-Water Standards for New Zealand 2005 (revised 2008)) meets the Drinking-Water Standards for New Zealand 2005 (revised 2008); and

(2) groundwater meets any freshwater objectives and freshwater quality limits established under Freshwater Management Unit processes.

Objective 13 *Enable the use and development of land and soils to support the economic, social, and cultural wellbeing of the region.~~, provided:~~*

Objective 13A *~~(a) t~~The quantity, quality and structure of soil resources are not irreversibly degraded through land use activities ~~and~~ or discharges to land.~~;~~*

Objective 13B *~~(b)~~ The discharges of contaminants to land or water that have significant or cumulative adverse effects on human health are avoided.~~; and~~

~~(c) adverse effects on ecosystems (including diversity and integrity of habitats), amenity values, cultural values and historic heritage values are avoided, remedied or mitigated to ensure these values are maintained or enhanced.~~

7.8.4 Overview of practicable options

Environment Southland has considered two options for providing drinking water protection. These are as follows:

- **Option A (Status Quo)** - retain the rule relating to community drinking water and the few rules that take human drinking water into account when controlling discharges. However, this option is not considered to be reasonably practicable (as required under section 32(b)(i) RMA) because it fails to consider the effects of activities on human drinking water throughout the plan as required by the Drinking Water NES[127]. Therefore, this option will not be assessed for efficiency and effectiveness.
- **Option B (pSWLP decisions provisions)** – the proposed provisions take into account drinking water protection throughout the plan within specific rules or is required during consent assessment to align with the requirement of the Drinking Water NES.

Scale and significance

Section 32(1)(c) requires that when examining whether the provisions in the proposal are the most appropriate way to achieve the Objectives, the analysis must contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal. The scale and significance of the suggested changes to rules around drinking water protection within the pSWLP are considered to have a moderate effect on a number of activities, and the level of detail in this analysis corresponds with that.

Option A: (Status Quo) – Water Plan provisions

This option involves retaining the current provisions of the Water Plan without amendments, in relation to drinking water protection.

As noted above this option would fail to align with the level of drinking water protection required by the Drinking Water NES so is not considered to be reasonably practicable in accordance with section 32(b)(i) of the RMA and will not be assessed.

Option B – pSWLP decisions provisions

Option B proposes expanding the drinking water protection in the pSWLP so that it is considered throughout the plan and in any consents required for activities (such as discharges) that may affect community drinking water sources.

This is achieved on two levels which stem from Policies 13, 14, 24 and A4 of the NPSFM. The first level provides for a community water supply and applies a specific protection to the microbial health protection zone of a drinking water supply site identified in Appendix J of the pSWLP, or establishes a setback from the abstraction point if there is no protection zone. This application applies to Policy 24 and in Rules 9, 11, 26, 27, 28, 29, 35, 35A, ~~36~~, 37, 40, 41, 43, ~~44,~~ 48 and 50.

The second level establishes an individual setback for abstraction points which act to protect the smaller scale human drinking water supplies. This protection is not as

[127] Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007 sections 6-12

comprehensive as the first level, but impacts on a smaller proportion of people. The rules are Rules 26, 27, 28, 29, 35, 36, 37, 41 and 46.

7.8.5 Assessment of efficiency and effectiveness

Section 32(1)(b)(ii) of the RMA requires the assessment of the 'efficiency and effectiveness' of provisions in achieving the objectives, in a level of detail that corresponds to the scale and significance of the anticipated effects.

Each individual option is evaluated below. First the effectiveness of the option in assisting the achievement of the objectives of the pSWLP is assessed. The following factors have been assessed as part of the effectiveness assessment:

- **Relevance** - includes the extent to which the provisions are targeted to achieve the objectives and the length of time taken to achieve the objective.
- **Feasibility** – includes the degree of uncertainty of achieving the objectives, degree of risk associated with the provisions (e.g. unintended consequences), ease of implementation (e.g. likelihood of compliance and ability to monitor/enforce).
- **Acceptability** – level of community and stakeholder acceptance.

Where options are evaluated as being effective in achieving the objectives in the pSWLP they are subsequently evaluated for their 'efficiency'. Efficiency is about the use of resources (for example, human, financial and natural) required for a particular policy option to be fully effective in comparison with other options. It also relates to how people will be able to provide for their social, economic and cultural wellbeing now and in the future.

To determine efficiency, the evaluation investigated the anticipated benefits and opportunities, and costs and risks anticipated from the options, taking into account both short and longer term, individuals and the wider community. Benefits and opportunities, and costs and risks have been integrated across the four well-beings (cultural, social, economic and environmental).

Option A – Status Quo

Not considered.

Option B – ~~Proposed~~ pSWLP Decisions Provisions

Effectiveness

To assist the assessment of effectiveness of Option B, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
6	✓✓✓✓	The proposed provisions which include further drinking water protection align with the intention of the Drinking Water NES. The policies and suite of permitted and

		discretionary activity rules provide an appropriate level of control of discharges that may affect drinking water sources. Conditions on the permitted activities mean that activities that comply with these conditions should not have significant adverse effects on water quality, and consents can be tailored to address water quality impacts of activities that do not comply. Collectively the suite of provisions will be an effective way of dealing with adverse effects, and for achieving the quality of freshwater as required by objective 6. The proposed provisions align with all other higher order RMA documents and overall water quality is adequately protected. Acceptability of this option is likely to be enhanced due to the protection of human health, improving water quality and aligning with the relationship Ngāi Tahu has with the land and water and its life-supporting capacity. It also achieves Ngāi Tahu's desire for clean drinking water supplies.
8	✓✓✓✓	The provisions are included with the intention of maintaining or improving both surface water and groundwater quality, therefore, the reasons addressed against objective 6 above will also apply to the effectiveness assessment for objective 8.
13, 13A, 13B	✓✓✓✓	The rules that relate to the use and development of land and soils generally maintain a permitted status with conditions relating to the discharge of contaminants. This allows those activities to proceed provided the conditions of use are adhered to, which includes protection of drinking water to align with Objectives 13, 13A and 13B. In general, the proposed provisions support the development of land and soil while still protecting water quality to the level required by the Drinking Water NES.
Total	✓✓✓✓	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Efficiency

To assist the assessment of the efficiency of Option B, the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed and are presented below. When evaluating benefits and costs, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**

Individual	➢ Aligns with the Drinking Water Standards of New Zealand 2005 (revised 2008) to prevent any conflict. ➢ Less contaminated drinking water. ➢ The types of discharges covered have long been areas for which consents are required so the proposed provisions will not significantly change those requirements.	➢ There is an initial cost to obtain a consent for many activities that affect water quality and potentially relocation of discharges or improvement in treatment required.
Community	➢ Expands the scope of the pSWLP in the protection of water quality from the adverse effects of the discharge of contaminants. ➢ The pSWLP provisions for protecting drinking water supply areas should avoid the high cost of finding alternative drinking water supplies, remediation of water quality in source areas, or having to add new treatment measures. ➢ Protects health and well-being of communities through having safe clean drinking water supplies. ➢ Recognises the relationship of Ngāi Tahu with the land and water and its life-supporting capacity. Achieves Ngāi Tahu's desire for clean drinking water supplies.	➢ Small risk that permitted activities will not comply, and because they are not routinely monitored that low level localised contamination may occur. ➢ There will also be consent compliance monitoring costs that cover inspections to ensure consent conditions are being implemented and complied with.

Effectiveness Discussion

Option B is considered to be a medium to highly effective way of achieving Objectives 6, 8 and 13 of the pSWLP. The key amendment introduced to the pSWLP is spreading the requirement for the protection of drinking water across a wider range of rules to comply with the requirements in the Drinking Water NES. The proposed provisions comply with section 70 of the RMA, NPSFM, SRPS, all other higher order RMA documents and Ngāi Tahu's philosophies.

Efficiency Discussion

Option B is considered to be highly efficient at achieving Objectives 6, 8 and 13 as well as aligning with higher order documents such as the Drinking Water NES. The proposed provisions achieve their main objective which is to safeguard supplies of human drinking water to ensure human health is protected. The proposed provisions achieve this without limiting activity within the Southland region.

7.8.6 Risk of acting or not acting

An evaluation report must contain an assessment of the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions (under section 32(2)(c) RMA). It is considered that the information relating to drinking water protection is both certain and sufficient. As such, it is considered that there is no risk of acting as set out in Option B.

7.8.7 Conclusion

The assessment in section 7.8.5 shows Option B – pSWLP to be the most appropriate option to assist achieving the objectives of the pSWLP.

7.8.8 References

Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007.

National Policy Statement for Freshwater Management 2014.

7.9 Effluent Storage

7.9.1 Introduction

This part of the report assesses proposed changes to the provisions relating to effluent storage within the pSWLP.

The current Water Plan contains a consenting regime for establishing a storage facility for agricultural effluent. There are no ongoing requirements continuing after the facility has been established. This has proven to be an issue in Southland, where all storage facilities generate some level of leaking and integrity can degrade over time. In addition, the Water Plan is focussed only on discharges of dairy farm effluent.

The proposed provisions in the pSWLP expands on the rules relating to effluent storage and discharge to include community, industrial and trade effluent storage and require performance certification of the storage facility.

The Southland Regional Council has undertaken a review of the rules related to the management of effluent storage. The section outlines the options considered and assesses their effectiveness, benefits and costs and efficiency in achieving the objectives of the pSWLP, in order to determine which option is the most appropriate.

7.9.2 Statutory Context

National Policy Statement for Freshwater Management 2014 (NPSFM)

Objective A1 of the NPSFM seeks to safeguard the health of people and their communities in sustainably managing the use and development of land and discharges of contaminants.

Adopting a more comprehensive consenting regime relating to effluent storage as proposed in the pSWLP aligns with the objectives of the NPSFM.

~~***Regional Policy Statement for Southland 1997 (RPS)***~~

~~Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. Section 43AA then defines "regional policy statement" as "an operative regional policy statement approved by a regional council under Schedule 1." The most relevant part of the RPS in relation to effluent storage is 5.5 Water Quality.~~

~~Objective 5.2 requires ensuring that in the use and development of water and land resources, and the discharges of contaminants, water quality is maintained and wherever practicable enhanced. This is supported by Policy 5.4, which requires land treatment of liquid wastes be utilised where this can be undertaken in a sustainable manner and without significant adverse environmental effects. In preparing, implementing and administering Regional and District Plans and in considering resource consents, local authorities shall assess the effects of land use and development on ground water and surface water quality, including both point and non-point source discharges, and provide for any adverse effects to be avoided, remedied or mitigated.~~

~~Proposed~~ Southland Regional Policy Statement 2017 ~~2012~~ (~~p~~RPS)

~~Section 66(2)(a) of the RMA states that a Regional Plan shall have regard to any proposed regional policy statement. The pRPS is currently under appeal, however mediation is nearing conclusion and a number of consent orders have been lodged with the Environment Court. It is expected that the pRPS will be made operative once all appeals are resolved, which is likely to be before the pSWLP becomes operative. It is therefore important that the pSWLP gives effect to the pRPS as well as the RPS.~~ Section 67(3)(c) of the RMA states that a Regional Plan must give effect to any regional policy statement. The most relevant section of the ~~p~~RPS in relation to effluent storage is Chapter 4: Water.

Objective WQUAL.1 requires that water quality in the region safeguards the life-supporting capacity of water and related ecosystems and the health of people and communities. Objective WQUAL.2 aims to halt the decline and enhance water quality in lowland water bodies. These objectives are supported by Policy WQUAL.1 which requires that discharges and land uses activities are managed to maintain water quality, or improve it, to ensure freshwater objectives are met and Policy WQUAL.2 which specifies that in managing water quality, particular regard will be had to nitrogen, phosphorus, sediment and microbiological contaminants.

Policy WQUAL.~~6~~ 10 requires the management and the siting and operation of activities that result in point source discharges of contaminants to land to ensure that adverse effects on groundwater and surface water quality are minimised.

7.9.3 Relevant objectives in the pSWLP

The RMA requires an examination of whether the provisions in the proposal are the most appropriate way to achieve the pSWLP objectives. The most relevant proposed objectives in relation to effluent storage are:

Objective 6 *There is no reduction in the overall quality of freshwater, and water in estuaries and coastal lagoons, by:*

(a) maintaining the quality of water in waterbodies, estuaries and coastal lagoons, where the water quality is not degraded; and

(b) *improving the quality of water in waterbodies, estuaries and coastal lagoons, that have been degraded by human activities.*

Objective 8 (a) *The quality of groundwater ~~in aquifers~~ that meets both the Drinking-Water Standards for New Zealand 2005 (revised 2008) and any freshwater objectives, including for connected surface waterbodies, established under Freshwater Management Unit processes is maintained; and*

(b) *The quality of groundwater ~~in aquifers~~ that ~~have been degraded by~~ does not meet Objective 8(a) because of the effects of land use ~~and~~ or discharge activities ~~(with the exception of those aquifers where ambient water quality is naturally less than the Drinking-Water Standards for New Zealand 2005 (revised 2008))~~ is progressively improved so that:*

(1) groundwater (excluding aquifers where the ambient water quality is naturally less than the Drinking-Water Standards for New Zealand 2005 (revised 2008)) meets the Drinking-Water Standards for New Zealand 2005 (revised 2008); and

(2) groundwater meets any freshwater objectives and freshwater quality limits established under Freshwater Management Unit processes.

Objective 13 *Enable the use and development of land and soils to support the economic, social, and cultural wellbeing of the region.~~, provided:~~*

Objective 13A *~~(a) t~~The quantity, quality and structure of soil resources are not irreversibly degraded through land use activities ~~and~~ or discharges to land.~~;~~*

Objective 13B *~~(b)~~ The discharges of contaminants to land or water that have significant or cumulative adverse effects on human health are avoided.~~; and~~

~~(c) adverse effects on ecosystems (including diversity and integrity of habitats), amenity values, cultural values and historic heritage values are avoided, remedied or mitigated to ensure these values are maintained or enhanced.~~

7.9.4 Overview of practical options

Environment Southland has considered two options for managing effluent storage. These are as follows:

- **Option A: (Status Quo)** - retain the current provisions from the Water Plan which provides a consent regime for establishing effluent storage for agricultural effluent.
- **Option B – (pSWLP decisions provisions)** - the ~~proposed~~ provisions include a ~~similar~~ consent regime ~~to the Water Plan~~ for establishing and using effluent storage but ~~extends the~~ also includes requirements ~~to include~~ for industrial, trade and community effluent storage. Additionally, the provisions relating to discharges of ~~the~~ effluent from industrial and trade processes are amended so that a discharge consent is conditional on the integrity of the storage facility.

Scale and significance

Section 32(1)(c) requires that when examining whether the provisions in the proposal are the most appropriate way to achieve the Objectives, the analysis must contain a level of

detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal. The scale and significance of the suggested changes to rules around affluent storage within the pSWLP are considered to have a moderate effect on a common activity in the Southland region, and the level of detail in this analysis corresponds with that.

Option A: (Status Quo) – Water Plan provisions retained

This option involves retaining the current provisions of the Water Plan without amendment in relation to effluent storage.

Resource consents will continue to be granted for the construction of agricultural effluent storage but no conditions will apply to ensure the storage facility will be maintained to manage leaks. The key rules that currently manage effluent storage is Rule 49 – Agricultural effluent ponds.

The rules relating to discharges, such as Rule 50 – Discharge of farm dairy effluent to land, loosely apply to the storage rule but do not address conditions that could determine how effluent storage facilities are maintained.

Option B – ~~Proposed~~ pSWLP decisions provisions

Option B proposes expanding the effluent storage regime in the pSWLP, to ensure the rules cover community, industry and trade effluent storage and that effluent storage facilities are maintained once they have been established. The rules relate to Policies 13 – Management of land use activities and discharges, 15 – Maintaining and improving water quality, 17 – Effluent management and Policy A4 of the NPSFM.

Rules 32A, B, C and D manage the reconstruction, construction, maintenance and use of agricultural and non-agricultural effluent storage facilities. ~~is expanded to include effluent storage from industrial or trade processes.~~ Rules 33 and 33A are ~~is~~ included to manage community sewerage scheme discharges. Rule 34~~ and 35~~ manages discharges from industrial and trade processes and provides that the consent is conditional on certification of any pond, tank or structure used to store the effluent or bio-solids prior to discharge to ensure leakage is minimised. Rule 35 manages discharges of agricultural effluent to land where Council retains discretion over matters such as the duration of the consent, any measures to avoid remedy or mitigate adverse effects and the application rate and depth of the effluent discharge.

7.9.5 Assessment of efficiency and effectiveness

Section 32(1)(b)(ii) of the RMA requires the assessment of the 'efficiency and effectiveness' of provisions in achieving the objectives, in a level of detail that corresponds to the scale and significance of the anticipated effects.

Each individual option is evaluated below. First the effectiveness of each option in achieving the objectives of the pSWLP is assessed. The following factors have been assessed as part of the effectiveness assessment:

- **Relevance** - includes the extent to which the provisions are targeted to achieve the objectives and the length of time taken to achieve the objective.
- **Feasibility** – includes the degree of uncertainty of achieving the objectives, degree of risk associated with the provisions (e.g. unintended consequences), ease of implementation (e.g. likelihood of compliance and ability to monitor/enforce).
- **Acceptability** – level of community and stakeholder acceptance.

Where options are evaluated as being effective in achieving the objectives in the pSWLP they are subsequently evaluated for their 'efficiency'. Efficiency is about the use of resources (for example, human, financial and natural) is required for a particular policy option to be fully effective in comparison with other options. It also relates to how people will be able to provide for their social, economic and cultural wellbeing now and in the future.

To determine efficiency, the evaluation investigated the anticipated benefits and opportunities, and costs and risks anticipated from the options, taking into account both short and longer term, individuals and the wider community. Benefits and opportunities, and costs and risks have been integrated across the four well-beings (cultural, social, economic and environmental).

Option A: Status Quo

Effectiveness

To assist the assessment of effectiveness of Option A, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
6	✓✓	The current provisions in the Water Plan provide for the establishment of effluent storage for agricultural effluent as a restricted discretionary activity. The conditions contained in the rule include building requirements for the storage pond and setback from water sources to limit the possibility of discharges to water. The council's discretion is limited to the quality of the constructed effluent pond, the relevant setback and possible monitoring requirements. The intention of the provisions is to prevent discharges reaching water sources and it achieves this by ensuring the storage pond is built adequately and separated from any water body. The current provisions fail to provide policy direction in relation to effluent storage for industrial or trade purposes. These types of effluent storage facilities are able to be established with limited control around the build or setback of the storage facility. This lack of control has the potential to result in faulty effluent storage facilities that leak and that could lead to decreased water quality. In addition, the current provisions fail to encourage maintenance of any effluent storage after establishment. Anecdotal evidence suggests this

		can result in a large number of storage facilities leaking contaminants. The provisions provide some environmental protection but fail to ensure an acceptable level of water quality protection due to the risks of the storage facilities leaking.
8	✓✓	The provisions are intended to protect water quality in general, therefore, the reasons addressed against objective 6 above will also apply to the effectiveness assessment for objective 8.
13, 13A, 13B	✓✓	The points addressed under Objective 6 above also apply to Objectives 13, 13A and 13B. The Water Plan enables the use and development of land for the establishment of effluent storage, however the current wording of the provisions fails to protect against discharges from trade, industrial or community effluent storage facilities or any degradation of a consented agricultural effluent pond. The provisions support the development of land and soil but fail to protect the environment from potential discharges to an appropriate level.
Total	✓✓	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Efficiency

Option A is anticipated to have a low to medium effectiveness in assisting the achievement of Objectives 6, 8 ~~and~~ 13, 13A and 13B of the pSWLP. This Option will therefore not be assessed for its efficiency as it would not be an appropriate option to implement.

Option B – ~~Proposed~~ pSWLP Decisions Provisions

Effectiveness

To assist the assessment of effectiveness of Option B, the relevance, feasibility and acceptability of the provisions have been identified and presented below.

Assessment of Effectiveness		
Objective	**Ranking***	**Reasons**
6	✓✓✓✓	The proposed provisions provide for constructing new agricultural effluent storage facilities as permitted, controlled, discretionary or non-complying depending on the circumstances and are designed to incentivise the use of less risky construction methods and materials (for example, liners). There are separate provisions for the establishment of community, industrial or trade effluent storage. ~~retain the restricted discretionary~~

		~~activity status for establishing agricultural effluent storage. It now also includes establishment of industrial or trade effluent storage.~~ This gives the council some discretion over how and where community, industrial or trade effluent storage facilities can be established, which will assist in reducing discharges to water and provide a higher level of environmental protection. The proposed provisions also include a condition for discharge consents requiring the applicant to demonstrate the industrial or trade effluent storage facility does not leak. This must be completed for consented discharges from ~~agricultural, community,~~ trade or industrial effluent storage facilities. This requirement reduces the risk of harmful contaminants leaking into groundwater or waterways. Overall water quality is adequately protected. Acceptability of this option is likely to be enhanced due to the decrease of contaminants entering waterbodies, improving water quality and aligning with Ngāi Tahu philosophies such as Ki uta ki tai and Te Mana o te Wai.
8	✓✓✓✓	The proposed provisions are intended to protect water quality in general, therefore, the reasons addressed against Objective 6 above will also apply to the effectiveness assessment for Objective 8.
13, 13A, 13B	✓✓✓✓	The proposed provisions enable the development of land and soils by providing a framework for the establishment and ongoing use of effluent storage facilities for community, industrial, agricultural or trade effluent in Rules 32 to 35. These Rules ~~This Rule~~ contains a ~~similar~~ higher level of protection ~~as~~ than the Water Plan to ensure ~~the~~ effluent storage is built and maintained to an appropriate standard which acts to prevent unnecessary discharge. The conditions included in Rules 32A, 32B, 32C and 32D ~~33, 34 and 35~~ means that applicants for a discharge consent must show there is no substantial leak in the effluent storage facility. Leaking from effluent storage facilities has been addressed as a significant concern, particularly in older or poorly constructed storage facilities. Acceptability will be as for Objective 1 above. Overall land and water health is better protected while allowing development of land and soil.
Total	✓✓✓✓	

* ✔- Low; ✔✔- Low to Medium; ✔✔✔ - Medium; ✔✔✔✔ - Medium to High; ✔✔✔✔✔ - High

Efficiency

To assist the assessment of the efficiency of Option B, the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed and are presented below. When evaluating benefits and costs, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**
Individual	➢ Ensures that the individual and community drinking water supply sites are better protected from contaminants. ➢ Improvement in land and water health generally. ➢ Ensures better overall performance of effluent systems.	➢ Higher cost to consent holders for effluent storage facilities for testing, monitoring and possible repair work. ➢ More substantial costs for those with poor performing soil/clay ponds, which may require geo-membrane liner
Community	➢ Reduce the negative environmental effects caused by leaking of effluent storage pond, tank or structure. ➢ Improved aquatic ecosystem health. ➢ Improved soil health. ➢ Increased protection for wāhi tapu, mahinga kai and other taonga tuku iho. ➢ Establishes some certainty around what is required for the establishment and operation of community trade and industrial effluent storage facilities. ➢ Recognises the relationship of Ngāi Tahu with the land and water and its life-supporting capacity. Aligns with Ngāi Tahu's desire to protect the health of land and water from potentially harmful discharges.	➢ None identified.

Effectiveness Discussion

Option B is considered to be a medium to highly effective way of achieving Objectives 6, 8 and 13. The key amendments introduced to the pSWLP are the introduction of additional standards for construction, maintenance and ongoing use of agricultural effluent storage facilities, ~~is~~ the introduction of additional consenting required for community, trade and industrial effluent storage and the condition on a discharge consent requiring certification that industrial and trade ~~the~~ effluent storage facility contains no substantial leak. It is considered these additions to the effluent storage provisions result in increased environmental protection by decreasing the risk of contamination discharges.

Efficiency Discussion

Option B is considered to be highly efficient at achieving increased environmental protection by reducing the potential for unwanted discharges from effluent storage facilities. This has a flow on effect to create benefits to the individual by better protecting drinking water, and to Ngāi Tahu through better environmental protection generally. Increased costs to individuals and council are shown to be the main costs of the proposed provisions.

The costs of this Option have been estimated, and will be borne by the individual farmer operating a system that requires leak testing, at a cost of approximately $2,000 per test. Additional and substantial costs would be incurred by some owners of effluent systems if they are demonstrated to be leaky. An estimate of the costs of this, using various assumptions (attached in Table 7.9.5 (A)) totals approximately $18.5 million, bringing the total region-wide cost of leak testing, remediation of leaking systems and re-testing to approximately $21 million. If a large-scale storage system, such as an urban system, be leaking, this cost would be considerably greater.

Table 7.9.5 (A)

Effluent Storage		
Number of Systems		
Dairy		900
Other		100
Total		1000
Leak Test		
Cost of leak test (per site)	$	2,000
Leak test cost (Region-wide)	$	2,000,000
System Upgrades/Repairs		
Proportion soil/clay (%)		50
Proportion leaking (soil/clay) (%)		25
Proportion leaking (other) (%)		10
Cost of geomembrane (installed per m^3 pond volume)	$	80
Average pond volume (m^3)		1800
Average upgrade cost per site	$	144,000
Average repair cost per site	$	10,000
Number of 're-tests'		175
Leak re-test cost (Region-wide)	$	350,000
Repair/Upgrade cost (Region-wide)	$	18,500,000
Total cost (spread over 2-5yrs)	**$**	**20,850,000**

Assumptions
1. Leak testing undertaken approx every 10 years
2. NPV of costs not calculated, as expected to be incurred in short-term
3. Average pond volume, failure rate and cost from ES estimates

7.9.6 Risk of acting or not acting

An evaluation report must contain an assessment of the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions (under

section 32(2)(c) RMA). It is considered that the information relating to effluent storage is both certain and sufficient with the benefits to human health and the environment to be high. As such, it is considered that there is no risk of acting as set out in Option B.

7.9.7 Conclusion

The assessment in section 7.5.5 shows Option B – Proposed Provisions to be the most appropriate option to assist achieving the objectives of the proposed pSWLP.

7.9.8 References

Opus, Recommendations for Maximum Allowable Seepage from Effluent Ponds, April 2016

8 Minor Changes

8.1 Introduction

This section of the report assesses a number of separate, minor changes that have been proposed as part of the pSWLP. These provisions are based on the existing Water Plan and RELAP, and where not mentioned in this section 32 report, the existing provisions have been included in the pSWLP.

The changes within this section relate to a range of definitions, rules, schedules and maps. The changes are not considered to be substantive as they are minor corrections of inconsistencies, omissions, and drafting improvements from the Water Plan or the RELAP and will have minimal effect. The minor changes are listed below with an explanation of each change.

The section outlines the reasonably practicable options, and an assessment of the effectiveness, benefits and costs and efficiency of the proposed provisions in achieving the objectives of the pSWLP.

8.2 Statutory Context

The Regional Water Plan was established through a robust RMA process. Consequently, a number of the existing provisions give effect to the relevant statutory documents including the RPS and NZCPS, and have taken into account the relevant planning documents recognised by an iwi authority.

Given that the proposed changes relate to minor technical changes which do not fundamentally change the intent of the provisions or the way activities are managed, it is considered that there are no specific statutory provisions within these higher level statutory documents that need to be assessed in relation to these minor changes.

8.2.1 *Relevant Objectives of the pSWLP*

The RMA requires an examination of whether the provisions in the proposal are the most appropriate way to achieve the pSWLP objectives. Given the wide range of provisions which fall within this 'minor changes' category, no specific pSWLP Objective is considered to be more relevant than any other. A full list of objectives in the pSWLP against which the following assessment has been undertaken, is contained in section 4 of this report.

8.2.2 Overview of Practicable Options - Description of Provisions

Two reasonably practicable options were identified to address minor inconsistencies, omissions, and drafting errors identified in the Regional Water Plan definitions, rules, schedules and maps. These are as follows:

- **Option A – (Status quo)** – The operative region-wide definitions, rules, schedules and maps would still apply. No additions to the pSWLP would be included to correct the minor technical inaccuracies identified by Council Officers and align the plan with the significant changes.
- **Option B – pSWLP Decisions Provisions** - Minor changes would be made to the region-wide definitions, rules, schedules, and maps as part of the pSWLP process to correct identified inaccuracies, align with significant changes and improve certainty and readability.

8.2.2.1 *Scale and significance*

Section 32(1)(c) requires that when examining whether the provisions in the proposal are the most appropriate way to achieve the Objectives, the analysis must contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal. As noted above, the changes assessed within this section relate to technical corrections of minor inconsistencies, omissions, and drafting errors in the existing Water Plan. As such, the scale and significance of the suggested changes is considered minor, and the level of detail in this analysis corresponds with that.

8.2.2.2 *Option A: Status Quo – Regional Water Plan provisions*

This option involves retaining the current definitions, rules, schedules, and mapping of the Regional Water Plan without amendment. Under this option there would continue to be a range of technical errors, minor inconsistencies, omissions, uncertainties, duplications, and drafting errors within the Regional Water Plan.

8.2.2.3 *Option B – pSWLP Decisions Provisions – Minor wording changes*

This option involves making the minor technical changes listed below. These changes have been identified by SRC Officers as they have been implementing the provisions of the Regional Water Plan. The exact wording changes proposed can be found in the proposed plan change document.

Rules – General Changes

Minor Changes to align with significant changes to the Plan:

- Deleting "any other Southland Regional Council regional plan" – Rules 5 and 6
  - A minor change to delete reference to "any other Southland Regional Council regional plan" as the pSWLP is the SRC Plan that deals with discharges so reference to other plans is not required.

- Delete "after reasonable mixing" and replace it with "at the downstream edge of the reasonable mixing zone" – Rules 5 and 8.
  - This this minor change is required to reflect the new definition for "reasonable mixing zone".

- Include "onto or into land in circumstances where contaminants may enter water or" or just "in circumstances where contaminants may enter water or" – for example in Rule 15(a) or 18
  - A minor change to align the Rules with a purpose of the Plan to control discharges to water and land (where the discharge may enter water).

- Including "and discharge" – for example in Rule 25
  - The words "and discharge" are now included after to align with the changes made to the discharge Rules in the Plan.

- A minor change to insert "or discharge" or "or discharge resulting from the carrying out of the activity" after the words "bed disturbance" to ensure the Rule deals with any discharges – for example see Rule 55.
  - To align with discharge changes made to the rest of the Plan.

- ~~A minor change to include the condition that "the structure is not within any mataitai, nohoanga, or taiapure" – for example Rule 64.~~
  - ~~To align with updates to the Plan.~~

Minor Changes to improve certainty of the Rule

- Replace "cannot" with "does not" – For example in Rule 6 (ii)
  - A minor change which is more appropriate wording for determining that a condition can be met but has not been met.

- Replace various wording such as "all" with "one or more" when referring to conditions in an earlier Rule – for example in Rule 44(b)
  - A minor change proposed to align the wording between similar Rules.

- ~~A minor change removing reference to "the main stems" of rivers – for example Rule 42(a)(ii)(3)~~
  - ~~Rule applies to full length of river.~~

Minor Changes to better align with current legislation (RMA, Building Act etc.)

- Reference to any Water Conservation Order as opposed to just the Water Conservation (Mataura River) Order – for example in Rules 9 and 10

- Include the provisions from section 70 of the RMA – for example in Rule 15(a)(iv)
  - Minor changes to align with the RMA.

- Stream – for example in Rule 25

- Removal of the word "stream" when listing waterways that the rule will affect. Stream was removed as it is a colloquial term which falls under the definition of "river" in the RMA so is not required in this Plan.

Minor Changes to improve readability:

- Replace "shall" with "does" – for example in Rule 8(c)
  - Improves readability.

- "The Council will restrict the exercise of its control to the following matters" – Rules 12 and 19
  - Amended to align with the wording in the rest of the Plan

- "Rule [x] will be processed and considered without public or limited notification" – for example in Rule 12
  - A minor change proposed to improve the readability of this sentence.

- Minor changes to delete "above" or "comply with part [(a)] above" when referencing conditions and including the specific Rule the conditions are included in – for example in Rule 14(b) and 40(b)
  - Improves readability.

- A minor amendment to add "and" on the second last point of a list – for example in Rule 16(a)
  - Improves readability.

- Minor changes to replace symbols with words – for example "m^3" to "cubic metres" in Rule 18(a) and mg/l to milligrams per litre in Rule 18(b)
  - Improves readability.

- Minor changes to rearrange the order of a sentence – for example moving "methods of discharge" in Rule 19(c)(iv)
  - Improves readability.

- Minor changes to align the wording in relation to abstraction point – for example in Rule 40(b)(i)(4)
  - Intended to align with wording in current rules (see current Water Plan ~~Rule (7)~~ Rule (51)

- ~~A minor change replacing "there are no adverse effects on" with "the activity does not modify, damage or destroy" – for example in Rules 42, 43 and 44~~
  - ~~Improve readability~~

- The reference "modify, damage or destroy any record of historic heritage sites" has been removed from all rules within the Plan and a note has been inserted in alongside the appropriate rules directing the user to Appendix S Archaeological Site Responsibilities.

- A minor change to delete "From 1 November 2015" when referring to microbial health protection zone as it is after that date – for example in Rule 43(a)(viii).
  - Removal of conditions where timeframes have passed.

- A minor change to delete the wording "this rule does not need to be notified and does not need to be served on persons who may be adversely affected by the activity" and replaced with "Rule [x] will be processed and considered without public or limited notification" – for example see the note under Rule 40(b).
  - Improve readability.

- A minor change to include "surface" before water where the Rule is referring to surface water but it is not expressly stated as such – for example in Rule 41(a)(ii).
  - Improves consistency of wording.

- Minor changes to include "supply" in "drinking water supply site" to align the wording with other Rules – Rules 43 and 44.
  - Improves consistency of wording.

- A minor change to delete "abstraction" and replace with "take" or "taking" – for example in Rule 49
  - To improve readability.

- A minor change to ensure consistency of wording being "total volume of water" – for example in Rule 49.
  - Improves consistency of wording.

- Delete "Notwithstanding" and replace with "Despite" – Rules 46 and 51.
  - To improve readability.

- Delete Director of Environmental Management and replace with Director of Policy, Planning and Regulatory Services - for example in Rule 51.
  - To align with a change in the title of this position.

- ~~Moving the conditions from Rule 48 (a), (b) and/or (c) to each specific Rule – for example in Rule 55~~
  - ~~Reference to the "standard conditions" in Rule 48 (a), (b) or (c) have been replaced in each individual Rule with the actual provisions. This is for ease of understanding of the Rule.~~

- A minor change inserting the word "use" into (a) and delete the parts of the Rule that previously dealt with use– for example in Rule 55 (deleting(c) and (d)).
  - To compact the rule and improve readability.

- A minor change to remove conditions or parts of conditions such as "the structure was lawfully established (either before or after this plan came into force)", "use of the structure shall not cause a hazard to navigation" or "the structure shall not be used to store hazardous substances" – for example Rule 55.

- Minor changes to remove conditions no longer required due to other Rules in the Plan.

- A minor change to move "and any associated bed disturbance" – for example see Rule 56.
  - To improve readability.

Rules – Specific

Discharge Rules

- Rule 6
  - A minor change to delete Rule 6(b) to remove the exemption on discharges from the Lorneville Alliance plant.

- Rule 8
  - A minor change to delete "this Plan coming into force" and replace it with "1 January 2010" as the rule requires a more certain date now that the Plan has changed.
  - A minor change to Rule 8(b) removing reference to "Plan came into force" and improve readability.
  - A minor change is proposed to remove the words "listed in Section 107(1)(c) to (g) of the Resource Management Act 1991" to prevent duplication as the list set out below at Rule 8 (c)(i)-(iv) are the effects listed in the Act.
  - Minor changes are proposed to include the words "the potential for" and "as a result of the discharge" to ensure SRC's discretion is appropriately considered in relation to the discharge.

- Rule 9 and 10
  - Delete Rule 9(g) and 10(c) as notification of agrichemical use is dealt with in New Zealand Standard 8409: 2004.
  - Amend wording in 10(a) and (c) to improve readability.

- Rule 11
  - Deletion of previous Rule 6 as these provisions have now been moved in Rule 11.
  - A minor change to replace "other than" with "including" to reflect the fact the 1080 specific rule is now included in the rule with the other pest control poisons.

- Rule 13
  - A minor change to replace "installed" with "on-farm" to clarify the Rule is intended to apply to farm drainage. Also a deletion of "to water" is proposed so this Rule will apply to drainage to both water and land (as intended in the pSWLP).
  - A minor change moving wording from within Rule 13(a) to Rule 13(a)(i).

- Rule 15

- A minor change to delete "foul water" and replace it with "contaminants from on-site wastewater systems and mobile toilets" to align with the provisions brought across from the Regional Effluent Land Application Plan (RELAP).
- A minor change to include "for discharges to a surface water body" in Rule 15(a)(iv) to clarify the difference between this and Rule 15 (a)(vi) which is specific to land.
- A minor change to include Rule 15(a)(vi) to align with changes made to the Rules.

Wastewater, effluent and sludge

- Rule 32
  - Minor changes to replace "agricultural effluent pond" with "effluent storage" to capture all effluent storage within this Rule.
  - Minor changes such as adding "use of land for the", "including of waste-water, sludge or effluent from an industrial or trade processes or agricultural effluent" to give better effect to this Rule.
  - Minor changes to (a)(i), condition (i), condition (iii), condition (v), condition (vi), (b) and deletion of (c) to comply with current requirements, remove unnecessary requirements and improve readability.

- Rule 35
  - Minor changes to replace "farm dairy effluent" with "agricultural effluent" to capture all agricultural effluent within this Rule.

- Rule 40
  - Minor changes to the wording in Rule 40(a)(iv) to improve readability and provide specifics relating to heritage sites.
  - Minor changes are proposed to replace "contaminated" with specific reference to HAIL sites.
  - Minor changes to remove provisions with specific dates that have already passed.
  - A minor change to remove "or other contaminants from the silage storage facility" as it is not required to deal with control of silage leachate.

- Rule 41
  - A minor change to include (a)(i) to align with the other updated Rules.
  - Minor changes removing the previous (a)(ii), (a)(iv)(4) and (a)(v) and the words "or contamination of water" at (a)(iv)(1).
  - A minor change removing "outside of a silage storage facility" in (a)(iii) and (iv).
  - A minor change to include "the discharge of" prior to silage leachate in Rule 41 (a)(iv) to clarify the Rule is intended to control discharges.

Landfills

- Rule 43
  - Remove "other than those in tanalised timber, furniture and furnishings" from (a)(ii) as the wording is not required.

- A minor amendment to include "on-farm subsurface drain" in (a)(vi) to align with other Rules.

- Rule 44
  - Replace "discharge "site with "dead hole" site to align with Rule wording.
  - A minor amendment to include "on-farm subsurface drain" in (a)(vi) to align with other Rules.
  - Remove "sufficient" from (c)(iii) as the wording is not required.

Land Contamination

- Rule 46
- A minor change to delete "the application of a fertiliser or agrichemical to the land" and replace with "an activity" to reflect the increased in types of discharges authorised by this Plan.
- A minor change to delete "this Plan" and replace it with "a regional plan for Southland" to reflect that the Water Plan is intended to replace any other Plan.
- A minor change to delete "that Standard" and replace it with "those Guidelines"
- ~~A minor change to delete "prevent" and replace it with "avoid, remedy or mitigate" to align with wording in the RMA.~~

- Rule 47
- Amend (b) and delete (c) to remove reference to requirements being due by 1 November 2015.

Taking and Using Water

- ~~Rule 49~~
  - ~~Removal of "and the takes authorised by Section 14(3) of the Act" as the wording is not required.~~

- Rule 50
  - Minor changes made to 50(a) to improve readability.

- Rule 51
  - Include "hydrologic research" to (a)(i) to align with the requirements of the NPSFM requiring further research.
  - Amend the wording in (a)(iv) to improve readability.
  - Delete reference to NZMS and change to NZTopo50 to reflect a change in the type of mapping used by ES.

- Rule 52
  - Amend the wording in Rule 52(a) to improve readability.

- Rule 53
  - Include Rules53(a)(ii) and (iii) to comply with the Building Code.

Structures in river and lake beds

- Rule 58
  - Delete "monitoring structure" as this is dealt with in other Rules.

- Insert "(including any intake or discharge pipe or temporary gauging)" into (b) to align with wording earlier in the Rule.

- Rule 59
  - Delete "less than 2.5 square metres surface area" and "less than 2 square metres"
  - Delete "is less than or equal to" and replace it with "maximum diameter of the culvert shall be" to improve readability.

- Rule 60
  - Minor changes to Rule 60 and inclusion of notes proposed to increase readability and ensure compliance with the Building Code.

- Rule 61
  - Minor changes to Rule 61 to increase certainty and improve readability.

- Rule 63
  - Delete reference to "not provided in Rule 27" so this Rule is not subject to new Rule 58 (Cables, Wires and Pipes).

- Rule 65
  - Minor changes to Rule 65 to increase readability and remove conditions covered by other Rules or the Building Act.

- Rule 66, 67 and 68
  - Insert "Unless otherwise stated in this Plan," as a minor amendment to clarify this Rule will apply to structures, unless they are already dealt with in another rule.

- Rule 67 and 68
  - Insert "New Zealand Heritage List/Rarangi Korero" for clarity.

Bed disturbance activities in river and lake beds

- Rule 71
  - Insert "widening" to ensure this excavation activity is covered by the Rule.

- Rule 72
  - Insert new part (b) as previously there was no activity status if a dry cut has not complied with (a).

- Rule 73
  - Delete MALF and replace with Q95 to comply with other changes in the Plan.

- Rule 75
  - Amend the wording in (a)(ii) to improve readability.

- Rule 79

- Include high country burning as a Rule to provide some form of authority control over this activity.

8.2.3 Assessment of efficiency and effectiveness

Section 32(1)(b)(ii) of the RMA requires the assessment of the 'efficiency and effectiveness' of provisions in achieving the objectives, in a level of detail that corresponds to the scale and significance of the anticipated effects.

This proposed plan includes new objectives which are set out in section 4 of this report. As discussed above the overall scale and significance of these proposed changes is considered to be minor, therefore the following evaluation has been developed on that basis. When evaluating the two options Council's reference point is the current environmental, social, economic and policy context. Environment Southland has assessed the effectiveness and efficiency of the two options.

The minor changes do not relate specifically to one obligation more than another, therefore the assessment takes into account the effectiveness and efficiency of achieving the objectives as a whole. Each Option has been assessed on its effectiveness and efficiency. Efficiency is about the use of resources (for example, human, financial and natural) which is required for a particular policy option to be fully effective in comparison with other options and is further assessed. It also relates to how people will be able to provide for their social, economic and cultural wellbeing now, and in the future.

To determine efficiency, the evaluation investigated the anticipated benefits and opportunities, and costs and risks anticipated from the options. Taking into account the minor significance of these proposed changes, this was assessed on a broad level. Benefits and opportunities, and costs and risks have been integrated across the four well-beings (cultural, social, economic and environmental).

8.2.3.1 *Option A – Status Quo*

Effectiveness

To assist the assessment of effectiveness of Option A, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

	Effectiveness	Efficiency
	➢ This option is suitably effective at achieving the Plan's objectives as they are, however due to the amended objectives and significant rule amendments proposed by the **pSWLP** and the omissions or uncertainties currently in the Plan, the effectiveness of the Plan as it is currently written is reduced.	➢ The provisions within this option contain a number of minor uncertainties, inconsistencies and omissions. They also fail to align with the proposed new obligations, significant changes to the Plan or changes in legislation. As a result, the efficiency of this option at achieving the Plan's objectives is reduced. ➢ The current provisions are also inefficient in terms of the time and money required to interpret and apply the provisions.

Efficiency

To assist the assessment of the efficiency of Option A, the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed and are presented below. When evaluating benefits and costs, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**
Individual	➢ This option would provide consistency for current users of the Regional Water Plan.	➢ Due to minor inconsistencies, uncertainties and omissions within the current provisions, users of the Plan may find it difficult to understand and interpret which provisions relate to their activity.
Community	➢ There are a number of minor uncertainties and omissions within the Plan which may lead to small environmental costs.	➢ There are a number of minor inconsistencies, uncertainties and omissions within the Plan which may lead to small environmental costs.

8.2.3.2 *Option B – Minor wording changes*

Effectiveness

To assist the assessment of effectiveness of Option B, the relevance, feasibility and acceptability of the provisions have been identified and presented below:

	Effectiveness	Efficiency
	➢ This option is effective at achieving the objectives of the Plan. The minor corrections are proposed to fix some uncertainties or omissions, improve readability or better align the provisions with legislation or the proposed new rules.	➢ This option is an efficient method of achieving the relevant objectives of the Plan. The option corrects a range of minor errors and clarifies a number of rules, making the Plan more user friendly.

Efficiency

To assist the assessment of the efficiency of Option B, the benefits and opportunities, and costs and risks anticipated from its implementation have been identified and assessed and are presented below. When evaluating benefits and costs, the starting point used is the current environment and the policy and rule framework of the Water Plan. This approach means that the costs and benefits identified of the proposed provisions are a comparison against the status quo.

Assessment of Benefits and Opportunities, and Costs and Risks		
	Benefits and Opportunities	**Costs and Risks**
Individual	➢ This option provides more robust environmental protection through correcting minor errors and better aligning the provisions in the Plan with legislation and the significant proposed amendments.	➢ No individual costs or risks determined.
Community	➢ This option provides more robust environmental protection through correcting minor errors and better aligning the provisions in the Plan with legislation and the significant proposed amendments.	➢ No individual costs or risks determined.

8.2.4 Risk of acting or not acting

Section 32(2)(c) of the RMA requires the Council to take into account the risk of acting or not acting if there is uncertain or insufficient information. Given that the proposed changes are considered to be minor corrections of inconsistencies or omissions in the Plan, it is considered that there is little uncertainty or insufficiency associated with them. The risks of including the proposed amendments is therefore considered to be low.

8.2.5 Conclusion

This evaluation has been undertaken in accordance with section 32 of the RMA. It has identified the reasonably practicable options to address minor inconsistencies and

omissions in the Plan, taking into account their efficiency and effectiveness at achieving the Plan's objectives, and their costs and benefits. Overall it has concluded that Option B is the most appropriate to achieve the relevant objectives of the pSWLP.

Appendix A: Full text of Section 32 of the RMA

32 Requirements for preparing and publishing evaluation reports

(1) An evaluation report required under this Act must—

(a) examine the extent to which the objectives of the proposal being evaluated are the most appropriate way to achieve the purpose of this Act; and

(b) examine whether the provisions in the proposal are the most appropriate way to achieve the objectives by—

(i) identifying other reasonably practicable options for achieving the objectives; and

(ii) assessing the efficiency and effectiveness of the provisions in achieving the objectives; and

(iii) summarising the reasons for deciding on the provisions; and

(c) contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal.

(2) An assessment under subsection (1)(b)(ii) must—

(a) identify and assess the benefits and costs of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the provisions, including the opportunities for—

(i) economic growth that are anticipated to be provided or reduced; and

(ii) employment that are anticipated to be provided or reduced; and

(b) if practicable, quantify the benefits and costs referred to in paragraph (a); and

(c) assess the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions.

(3) If the proposal (an **amending proposal**) will amend a standard, statement, regulation, plan, or change that is already proposed or that already exists (an **existing proposal**), the examination under subsection (1)(b) must relate to—

(a) the provisions and objectives of the amending proposal; and

(b) the objectives of the existing proposal to the extent that those objectives—

(i) are relevant to the objectives of the amending proposal; and

(ii) would remain if the amending proposal were to take effect.

(4) If the proposal will impose a greater prohibition or restriction on an activity to which a national environmental standard applies than the existing prohibitions or restrictions in that standard, the evaluation report must examine whether the prohibition or restriction is justified in the circumstances of each region or district in which the prohibition or restriction would have effect.

(5) The person who must have particular regard to the evaluation report must make the report available for public inspection—

(a) as soon as practicable after the proposal is made (in the case of a standard or regulation); or

(b) at the same time as the proposal is publicly notified.

(6) In this section,—

objectives means,—

(a) for a proposal that contains or states objectives, those objectives:

(b) for all other proposals, the purpose of the proposal

proposal means a proposed standard, statement, regulation, plan, or change for which an evaluation report must be prepared under this Act

provisions means,—

(a) for a proposed plan or change, the policies, rules, or other methods that implement, or give effect to, the objectives of the proposed plan or change:

(b) for all other proposals, the policies or provisions of the proposal that implement, or give effect to, the objectives of the proposal.

32A Failure to carry out evaluation

(1) A challenge to an objective, policy, rule, or other method on the ground that an evaluation report required under this Act has not been prepared or regarded, a further evaluation required under this Act has not been undertaken or regarded, or section 32 or 32AA has not been complied with may be made only in a submission under section 49, 149E, 149F, or 149O or under Schedule 1.

(2) Subsection (1) does not prevent a person who is hearing a submission or an appeal on a proposal from having regard to the matters stated in section 32.

(3) In this section, proposal means a proposed statement, plan, or change for which—

(a) an evaluation report must be prepared under this Act; or

(b) a further evaluation must be undertaken under this Act.

32AA Requirements for undertaking and publishing further evaluations

(1) A further evaluation required under this Act—

(a) is required only for any changes that have been made to, or are proposed for, the proposal since the evaluation report for the proposal was completed (the **changes**); and

(b) must be undertaken in accordance with s32(1) to (4); and

(c) must, despite paragraph (b) and s32(1)(c), be undertaken at a level of detail that corresponds to the scale and significance of the changes; and

(d) must—

(i) be published in an evaluation report that is made available for public inspection at the same time as the approved proposal (in the case of a national policy statement or a New Zealand coastal policy statement), or the decision on the proposal, is publicly notified; or

(ii) be referred to in the decision-making record in sufficient detail to demonstrate that the further evaluation was undertaken in accordance with this section.

(2) To avoid doubt, an evaluation report does not have to be prepared if a further evaluation is undertaken in accordance with subsection (1)(d)(ii).

(3) In this section, **proposal** means a proposed statement, plan, or change for which a further evaluation must be undertaken under this Act.

Appendix B – Plan Linkages

Objectives	Policies	Rules
Objective 1 Land and water and associated ecosystems are sustainably managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between freshwater, land and the coast.	All policies within the Plan implement this Objective.	All rules within the Plan implement this Objective.
Objective 2 Water and land is recognised as an enabler of primary production and the economic, social and cultural wellbeing of the region	**Policy 13** Management of land use activities and discharges	**Rule 5-19** Discharge rules **Rule 20** Farming **Rule 24** Incidental discharges from farming **Rule 25** Cultivation **Rule 26 - 31** Wastewater discharge rules **Rule 33 and 33A** Community sewerage schemes **Rule 35– 41** Agricultural effluent discharges **Rule 42 – 48** Landfill rules **Rule 49 – 54** Water use rules **Rule 70 – 79** Bed disturbance rules
	Policy 16 Farming activities that affect water quality	**Rule 20** Farming **Rule 24** Incidental discharges from farming **Rule 25** Cultivation **Rule 32B** New agricultural effluent storage facilities **Rule 32D** existing agricultural effluent storage facilities **Rule 35** Discharge of agricultural effluent to land **Rules 36-43** Other farming discharge rules **Rule 70** Stock exclusion from waterbodies
	Policy 18 Stock exclusion from waterbodies	**Rule 70** Stock exclusion from waterbodies

Objectives	Policies	Rules
	Policy 20 Management of water resources	**Rule 49** Abstraction, diversion and use of surface water **Rule 50** Community water supply **Rule 51** Minor diversions of water **Rule 52** Water abstraction, damming, diversion and use from the Waiau catchment **Rule 52A** Manapouri Power Scheme **Rule 53** Bores and wells **Rule 54** Abstraction, and use of groundwater
	Policy 21 Allocation of water	**Rule 49** Abstraction, diversion and use of surface water **Rule 50** Community water supply **Rule 52** Water abstraction, damming, diversion and use from the Waiau catchment **Rule 52A** Manapōuri Power Scheme **Rule 54** Abstraction and use of groundwater
	Policy 23 Stream depletion effects	**Rule 49** Abstraction, diversion and use of surface water **Rule 52** Water abstraction, damming, diversion and use from the Waiau catchment **Rule 53** Bores and wells **Rule 54** Abstraction and use of groundwater
	Policy 24 Water abstraction for community water supply	**Rule 50** Community water supply
	Policy 25 Priority takes	
	Policy 28 Structures and bed disturbance activities of rivers and lakes	**Rules 55-69** Structures in river and lake beds and wetland rules
	Policy 29 Provide for the extraction of gravel	**Rule 66** Maintenance of structures **Rule 73** Gravel extraction
	Policy 39 Application of the permitted baseline	
	Policy 39A Integrated management	

Objectives	Policies	Rules
	Policy 40 Determining the term of resource consents	
	Policy 41 Matching monitoring to risk	
	Policy 42 Consideration of water permit applications	
	Policy 43 Transfer of water permits	
Objective 3 The mauri of waterbodies provide for te hauora o te tangata, te hauora o te taiao and te hauora o te wai.	**Policy 1** Enable papatipu runanga to participate **Policy 2** Take into account iwi management plans **Policy 3** Ngai Tahu ki Murihiku taonga species **Policy 44** Implement Te Mana o te Wai	Tangata whenua themes and issues are integrated through the Plan provisions to reinforce the Ngai Tahu philosophy of ki uta ki tai.
Objective 4 Tangata whenua values and interests are identified and reflected in the management of freshwater and associated ecosystems.	**Policy 1** Enable papatipu runanga to participate **Policy 2** Take into account iwi management plans **Policy 3** Ngai Tahu ki Murihiku taonga species **Policy 20** Management of water resources	Tangata whenua themes and issues are integrated through the Plan provision to reinforce the Ngai Tahu philosophy of ki uta ki tai.
Objective 5 Ngai Tahu have access to sustainable customary use of, both commercial and non-commercial, mahinga kai resources, nohoanga, mataitai and taiapure.	**Policy 1** Enable papatipu runanga to participate **Policy 2** Take into account iwi management plans **Policy 3** Ngai Tahu ki Murihiku taonga species **Policy 20** Management of water resources	Tangata whenua themes and issues are integrated through the Plan provision to reinforce the Ngai Tahu philosophy of ki uta ki tai.
Objective 6 There is no reduction in the overall quality of freshwater, and water in estuaries and coastal lagoons, by: (a) maintaining the quality of water in waterbodies, estuaries and coastal lagoons, where the water quality is not degraded; and (b) improving the quality of water in waterbodies, estuaries and coastal lagoons, that have been degraded by human activities.	All policies within the Plan implement this objective.	All rules in the Plan implement Objective 6.

Objectives	Policies	Rules
Objective 7 Any further over-allocation of freshwater (water quality and quantity) is avoided and any existing over-allocation is phased out in accordance with freshwater objective, freshwater quality limits and timeframes established under Freshwater Management Unit processes.	**Policy 13** Management of land use activities and discharges **Policy 15A** Maintain water quality where standards are met **Policy 15B** Improve water quality where standards are not met **Policy 15C** Maintain and improve water quality after FMU process **Policy 16** farming activities that affect water quality **Policy 20** Management of water resources **Policy 21** Allocation of water **Policy 22** Management of effects of groundwater and surface water use **Policy 23** Stream depletion effects **Policy 24** Water abstraction for community supply **Policy 25** Priority takes **Policy 39** Application of permitted baseline **Policy 39A** Integrated Management **Policy 40** Determining the term of a consent **Policy 41** Matching monitoring to risk **Policy 42** Consideration of water permit applications **Policy 43** Transfer of water permits **Policy 44** Implementing Te Mana o te Wai **Policy 45** Priority of FMU values **Policy 46** identified FMU **Policy 47** FMU processes	All rules within the Plan implement Objective 7.
Objective 8 (a) The quality of groundwater that meets both the DWSNZ and any freshwater objectives, including	**Policy 13** Management of land use activities and discharges	**Rules 5-19** Discharge rules **Rule 20** Farming **Rule 24** Incidental discharges from farming **Rule 25** Cultivation

Objectives	Policies	Rules
for connected surface waterbodies, established under FMU processes is maintained, and (b) the quality of groundwater that does not meet Objective 8(a) because of the effects of land use or discharge activities is progressively improved so that; (1) groundwater (excluding aquifers where the ambient water quality is naturally less than DWSNZ) meets the DWSNZ and (2) groundwater meets any freshwater objectives and freshwater quality limits established under FMU processes.		**Rules 26-41** Wastewater, effluent discharge rules **Rule 42-48** Landfill and contaminated land rules
	Policy 14 Preference for discharges to land	**Rule 26-31** Wastewater, effluent discharge rules **Rule 33** Community sewerage schemes (discharge to land) **Rule 33A** Community sewerage schemes (discharge to water) **Rule 34** Industrial and trade processes **Rule 35** Discharge of agricultural effluent to land
	Policy 15A Maintain water quality where standards are met	
	Policy 15B Improve water quality where standards are not met	
	Policy 15C Maintaining and improving water quality after FMU processes	
	Policy 16 Farming activities that affect water quality	**Rule 20-25** Farming rules **Rule 32A, B, C, D** Agricultural effluent storage facilities **Rule 35-41** Agricultural discharges **Rule 43** Farm landfills **Rule 70** Stock exclusion from waterbodies
	Policy 16A Industrial and trade processes that may affect water quality	**Rule 34** Industrial and trade processes
	Policy 17 Agricultural effluent management	**Rules 32-41** Agricultural discharges
	Policy 17A Community wastewater schemes and on-site systems	**Rules 26-31** Wastewater rules **Rule 33** Community sewerage schemes (discharge to land) **Rule 33A** Community sewerage scheme (discharge to water)
	Policy 18 Stock exclusion from waterbodies	**Rule 70** Stock exclusion from waterbodies
	Policy 39 Application of permitted baseline	

Objectives	Policies	Rules
	Policy 39A Integrated Management	
	Policy 40 Determining the term of resource consents	
	Policy 41 Matching monitoring to risk	
	Policy 42 Consideration of water permit applications	
Objective 9 The quantity of water in surface waterbodies is managed so that aquatic ecosystem health, life-supporting capacity, outstanding natural features and landscapes and natural character are safeguarded.	**Policy 20** Management of water resources	**Rules 49-54** Water quantity rules
	Policy 21 Allocation of water	**Rule 49** Abstraction, diversion and use of surface water **Rule 51** Minor diversion of water
	Policy 22 Management of the effects of groundwater and surface water use	**Rule 49** Abstraction, diversion and use of surface water **Rule 52** Water abstraction, damming, diversion and use from the Waiau catchment **Rule 52A** Manapōuri Power Scheme
	Policy 23 Stream depletion effects	**Rule 49** Abstraction, diversion and use of surface water **Rule 52** Water abstraction, damming, diversion and use from the Waiau catchment **Rule 54** Abstraction and use of groundwater
	Policy 40 Determining the term of resource consents	
	Policy 42 Consideration of water permit applications	**Rule 49** abstraction, diversion and use of surface water **Rule 52** Water abstraction, damming, diversion and use from the Waiau catchment **Rule 54** Abstraction and use of groundwater
Objective 9A Surface water is sustainably managed to support the reasonable needs of people and communities to	**Policy 20** Management of water resources	**Rule 49** Abstraction, diversion and use of surface water **Rule 50** Community water supply **Rule 51** Minor diversions of water

Objectives	Policies	Rules
provide for their social, economic and cultural wellbeing.		**Rule 52** Water abstraction, damming, diversion and use from the Waiau catchment **Rule 52A** Manapouri Power Scheme
	Policy 21 Allocation of water	**Rule 49** Abstraction, diversion and use of surface water **Rule 50** Community water supply **Rule 52** Water abstraction, damming, diversion and use from the Waiau catchment **Rule 52A** Manapōuri Power Scheme
	Policy 24 Water abstraction for community supply	**Rule 50** Community water supply
	Policy 25 Priority takes	
	Policy 26A Infrastructure	**Rule 52A** Manapōuri Power Scheme
	Policy 39 Application of permitted baseline	
	Policy 40 Determining the term of resource consents	
	Policy 41 Matching monitoring to risk	
	Policy 42 Consideration of water permit applications	
	Policy 43 Transfer of water permits	
Objective 9B The effective development, operation, maintenance and upgrading of Southland's regionally significant, nationally significant and critical infrastructure is enabled.	**Policy 17A** Community sewerage schemes and on-site wastewater systems	**Rule 33** Community sewerage schemes (discharge to land) **Rule 33A** Community sewerage schemes (discharge to water)
	Policy 20 Management of water resources	**Rule 50** Community water supply **Rule 52A** Manapōuri Power Scheme
	Policy 24 Water abstraction for community supply	**Rule 50** Community water supply
	Policy 26 Renewable energy	**Rule 52A** Manapōuri Power Scheme
	Policy 26A Infrastructure	**Rule 52A** Manapōuri Power Scheme **Rule 56** Boat ramps, jetties, wharves and slipways **Rule 57** Bridges **Rule 58** Cables, wires and pipes **Rule 60** Dams and weirs

Objectives	Policies	Rules
		Rule 61 Erosion control structures **Rule 66** Maintenance of structures **Rule 67** Alteration or extension of structures **Rule 68** Demolition or removal of structures **Rule 69** Structures not covered by any other rule **Rule 73** Gravel extraction **Rule 77** Vehicles and machinery
Objective 10 National importance of the existing hydro-electric generation schemes, including the MPS in the Waiau catchment, is provided for, recognised in any resulting flow and level regime, and their structures are considered as part of the existing environment.	**Policy 26** Renewable energy	**Rule 52A** Manapōuri Power Scheme
	Policy 26A Infrastructure	**Rule 52A** Manapōuri Power Scheme
Objective 11 The amount of water abstracted is shown to be reasonable for its intended use and water is allocated and used efficiently.	**Policy 20** Management of water resources	**Rule 49** Abstraction, diversion and use of surface water **Rule 54** Abstraction and use of groundwater
	Policy 21 Allocation of water	**Rule 49** Abstraction, diversion and use of surface water **Rule 54** Abstraction and use of groundwater
	Policy 22 Management of the effects of groundwater and surface water use	**Rule 49** Abstraction, diversion and use of surface water **Rule 51** Minor diversion of water **Rule 54** Abstraction and use of groundwater
	Policy 23 Stream depletion effects	**Rule 49** Abstraction, diversion and use of surface water **Rule 52** Water abstraction, damming, diversion and use from the Waiau catchment **Rule 54** Abstraction and use of groundwater

Objectives	Policies	Rules
	Policy 24 Water abstraction for community water supply	**Rule 50** Community water supply
	Policy 25 Priority takes	**Rule 50** Community water supply
	Policy 42 Consideration of water permit applications	**Rule 49** Abstraction, diversion and use of surface water **Rule 52** Water abstraction , damming, diversion and use from the Waiau catchment **Rule 52A** Manapōuri Power Scheme **Rule 54** Abstraction and use of groundwater
Objective 12 Groundwater quantity is sustainably managed, including safeguarding the life-supporting capacity, ecosystem processes and indigenous species of surface water bodies where their flow is, at least in part, derived from groundwater	**Policy 20** Management of water resources	**Rule 49** Abstraction, diversion and use of surface water **Rule 54** Abstraction and use of groundwater
	Policy 21 Allocation of water	**Rule 49** Abstraction, diversion and use of surface water **Rule 54** Abstraction and use of groundwater
	Policy 22 Management of the effects of groundwater and surface water use	**Rule 49** Abstraction, diversion and use of surface water **Rule 54** Abstraction and use of groundwater
	Policy 42 Consideration of water permit applications	
Objective 13 Enable the use and development of land and soils to support the economic, social and cultural wellbeing of the region.	**Policy 13** Management of land use activities and discharges	**Rules 5-19** Discharge rules **Rule 20** Farming **Rule 24** Incidental discharges from farming **Rule 25** Cultivation **Rule 32B** New agricultural effluent storage facilities **Rule 32D** Existing agricultural effluent storage facilities **Rule 35A** Feed pads/lots **Rule 40** Silage storage **Rule 48** Cemeteries

Objectives	Policies	Rules
		Rule 79 High country burning
	Policy 16 Farming	**Rule 20-25** Farming rules **Rule 59A** On-farm sediment traps Rul**e 70** Stock exclusion
	Policy 26 Renewable energy	**Rule 52A** Manapōuri Power Scheme
	Policy 26A Infrastructure	**Rule 55A** General conditions for activities in river and lake beds **Rule 57** Bridges **Rule 60** Dams and weirs **Rule 61** Erosion control structures **Rule 66** Maintenance of structures **Rule 67** Alteration or extension of structure **Rule 68** Demolition or removal of structures **Rule 69** Structures not covered by any other rule
	Policy 28 Structures and bed disturbance activities of river and lakes	**Rule 57** Bridges **Rule 59A** On-farm sediment traps **Rule 60** Dams and weirs
	Policy 29 Provide for the extraction of gravel	**Rule 66** Maintenance of structures **Rule 73** Gravel extraction
	Policy 30 Drainage maintenance	**Rule 71** Channel realignment, widening or deepening **Rule 75** Vegetation flood debris removal
	Policy 35 Discharge waste and cleanfill appropriately	**Rule 42** Cleanfill sites **Rule 43** Farm landfills **Rule 45** Landfills
	Policy 36 Manage contaminated land	**Rule 46** Land contaminated by a hazardous substance **Rule 46A** Site investigations **Rule 47** Closed landfills **Rule 48** Cemeteries
	Policy 39 Application of the permitted baseline	

Objectives	Policies	Rules
	Policy 39A Integrated Management	
	Policy 40 Determining the term of resource consents	
	Policy 41 Matching monitoring to risk	
Objective 13A The quantity, quality and structure of soil resources are not irreversibly degraded through land use activities or discharges to land.	**Policy 4** Alpine Physiographic Zone	**Rule 20** Farming **Rule 24** Incidental discharges from farming **Rule 25** Cultivation **Rule 79** High country burning
	Policy 16 Farming activities that affect water quality	**Rule 13** Discharge from subsurface drainage systems **Rule 14** Discharge of fertiliser **Rule 20** Farming **Rule 24** Incidental discharges from farming **Rule 25** Cultivation
	Policy 17 Agricultural effluent management	**Rule 32B** Construction, maintenance and use of new agricultural effluent storage facilities **Rule 32D** Existing agricultural effluent storage facilities **Rule 35** Discharge of agricultural effluent to land **Rule 35A** Feed pads/lots
	Policy 18 Stock exclusion from waterbodies	**Rule 70** Stock exclusion from waterbodies
	Policy 36 Manage contaminated land	**Rule 46** Land contaminated by a hazardous substance **Rule 46A** Site investigations **Rule 47** Closed landfills
	Policy 39 Application of the permitted baseline	
	Policy 40 Determining the term of resource consents	
	Policy 41 Matching monitoring to risk	
Objective 13B	**Policy 13** Management of land use activities and discharges	**Rule 11** Discharge of vertebrate pest control poisons **Rule 26-31** Discharges of domestic wastewater rules

Objectives	Policies	Rules
The discharge of contaminants to land or water that have significant or cumulative adverse effects on human health are avoided.		
	Policy 14 Preference for discharges to land	**Rule 33** Community sewerage schemes (discharge to land) **Rule 33A** Community sewerage schemes (discharge to water)
	Policy 16 Farming activities that affect water quality	**Rule 24** Incidental discharges from farming **Rule 35-43** Discharge of contaminants from on-farm activities
	Policy 16A Industrial and trade processes that may affect water quality	**Rule 34** Industrial and trade processes
	Policy 18 Stock exclusion from waterbodies	**Rule 70** Stock exclusion from waterbodies
	Policy 39 Application of the permitted baseline	
	Policy 39A Integrated Management	
	Policy 40 Determining the term of resource consents	
	Policy 41 Matching monitoring to risk	
Objective 14 The range and diversity or indigenous ecosystem types and habitats within rivers, estuaries, wetlands and lakes, including their margins, and their life-supporting capacity are maintained or enhanced.	**Policy 18** Stock exclusion from waterbodies	**Rule 70** Stock exclusion from waterbodies
	Policy 20 Management of water resources	**Rule 49** Abstraction, diversion and use of surface water
	Policy 28 Structures and bed disturbance activities	**Rule 70** Stock exclusion from waterbodies **Rule 72** Dry cuts **Rule 73** Gravel extraction
	Policy 30 Drainage maintenance	**Rule 77** Vehicles and machinery
	Policy 32 Protect significant indigenous vegetation and habitat of rivers and lakes	**Rule 74** Wetlands **Rule 75** Vegetation flood debris removal **Rule 76** vegetation planting **Rule 77** Vehicles and machinery
	Policy 33 Adverse effects on natural wetlands	**Rule 74** Wetlands **Rule 70** Stock exclusion from waterbodies
	Policy 34 Restoration of existing wetlands, the creations of wetlands and riparian planting	**Rule 76** Vegetation planting

Objectives	Policies	Rules
	Policy 39 Application of the permitted baseline	
	Policy 41 Matching monitoring to risk	
Objective 15 Taonga species and related habitats are recognised and provided for.	**Policy 1** Enable papatipu Runanga to participate	
	Policy 2 Take into account iwi management plans	
	Policy 3 Ngai Tahu ki Murihiku taonga species	
	Policy 13 Management of land use activities and discharges	**Rule 9** Discharge of agrichemicals onto or into surface water **Rule 10** Discharge of agrichemicals to land where they may enter water
	Policy 20 Management of water resources	**Rule 49** Abstraction, diversion and use of surface water
	Policy 28 Structures and bed disturbance activities of rivers and lakes	**Rule 72** Dry cuts **Rule 73** Gravel extraction
	Policy 32 Protect significant indigenous vegetation and habitat	**Rule 74** Wetlands **Rule 76** Vegetation planting **Rule 77** Vehicles and machinery **Rule 79** High country burning
Objective 16 Public access to, and along, river (excluding ephemeral rivers) and lake beds is maintained and enhanced, except in circumstances where public health and safety or significant indigenous biodiversity values are at risk.	**Policy 28** Structures and bed disturbance activities in rivers and lakes	**Rule 65** Whitebait stands **Rule 65A** Maimai
	Policy 29 Provide for extraction of gravel	**Rule 73** Gravel extraction
	Policy 32 Protect significant indigenous vegetation and habitat	**Rule 72** Dry cuts **Rule 76** Vegetation planting **Rule 77** Vehicles and machinery
Objective 17 The natural character values of wetlands, rivers and lakes and their margins, including channel and bed form, rapids, seasonably variable flows and natural	**Policy 16** Farming activities that affect water quality	**Rule 20** Farming **Rule 25** Cultivation
	Policy 18 Stock exclusion from waterbodies	**Rule 70** Stock exclusion from waterbodies
	Policy 20 Management of water resources	**Rule 51** Minor diversions of water

Objectives	Policies	Rules
habitats are protected from inappropriate use and development.	**Policy 22** Management of the effects of groundwater and surface water use	**Rule 51** Minor diversions of water
	Policy 28 Structures and bed disturbance activities of river and lakes	**Rules 71-77** Bed disturbance rules
	Policy 32 Protect significant indigenous vegetation and habitat	**Rules 5-19** Discharge rules **Rules 26-41** Wastewater and agricultural discharges **Rule 42-48** Cleanfill and landfill rules **Rules 70-78** Activities in beds of lakes and rivers
	Policy 33 Adverse effects on natural wetlands	**Rules 5-19** Discharge rules **Rules 26-41** Wastewater and agricultural discharges **Rules 42-48** Cleanfill and landfill rules **Rules 70-78** Activities is lakes and rivers
	Policy 34 Restoration of existing wetlands, the creation of wetlands and riparian planting	**Rule 74** Wetlands **Rule 76** Vegetation planting
	Policy 39 Application of the permitted baseline	
	Policy 41 Matching monitoring to risk	
Objective 18 All activities operate in accordance with "good management practice" or better to optimise efficient resource use, safeguard the life supporting capacity of the regions land and soils, and maintain or improve the quality and quantity of the regions water resources.	All policies within the Plan relate achieving the outcomes of Objective 18	All rules in the Plan relate to achieving the outcomes of Objective 18

Appendix	Objective	Policy	Rule	Other
Appendix A - Regionally Significant Wetlands and Sensitive Water Bodies in Southland		16 – farming activities that affect water quality	20 – farming 51 – minor diversions of water 70 – stock exclusion from water bodies	
Appendix B - Ngai Tahu Statutory Acknowledgement Areas				Required by Ngāi Tahu Claims Settlement Act 1998
Appendix C - ANZECC Sediment Guidelines		15A – maintain water quality where standards are met 15B – improve water quality where standards are not met 16 – farming activities that affect water quality	Rule 9 – discharge of agrichemicals onto or into surface water	
Appendix E - Receiving Water Quality Standards		15A – maintain water quality where standards are met 15B – improve water quality where standards are not met 16 – farming activities that affect water quality	Rule 5 – discharges to surface waterbodies Rule 19 – discharge of water associated with water treatment processes	
Appendix F -Water Conservation Orders				
Appendix G -Popular Bathing Sites				Appendix E

Appendix	Objective	Policy	Rule	Other
Appendix I -Natural State Waters Outside National parks				Definition – natural state waters (water quality)
Appendix J -Drinking Water Protection Zones			9 – discharge of agrichemicals onto or into surface water 11 – discharge vertebrate pest control poisons 26 – discharges from on-site wastewater systems 27 – discharges from pit toilets 28 – discharge of liquid from waterless composting toilet systems 29 – discharge of aerobically composted human excreta 35 – discharge of agricultural effluent to land 35A – feedpad /lots 36 – horticulture wash-water 37 - agricultural dips 40 – silage storage 41 – silage leachate 43 - farm landfills 48 – cemeteries	Definition – reasonable mixing zone

Appendix	Objective	Policy	Rule	Other
			54 – abstraction and use of groundwater	
Appendix K Surface Water Appendix		42 – consideration of water permit applications	49 – abstraction, diversion and use of surface water	Appendix L.2
Appendix L Groundwater Appendix		20 – management of water resources 21 – allocation of water 22 – management of the effects of groundwater and surface water use 23 – stream depletion effects	9 – discharge of agrichemicals onto or into surface water 52 – water abstraction, damming, diversion and use from the Waiau catchment 54 – abstraction and use of groundwater	Definition – total groundwater allocation Appendix K Appendix O
Appendix M Taonga Species List	15 – taonga species	3 – Ngāi Tahu ki Murihiku taonga species	76 – vegetation planting	
Appendix N Farm Environmental Management Plan		16 – farming activities that affect water quality	20 – farming 76 – vegetation planting	
Appendix O Reasonable and Efficient Use of Water		20 – management of water resources 42 – consideration of water permit applications	49 – abstraction, diversion and use of surface water	Definition – reasonable mixing zone Appendix L
Appendix P Effluent Pond Drop Test methodology			32B – construction, maintenance and use of new agricultural effluent storage facilities	

Appendix	Objective	Policy	Rule	Other
			32C – construction, maintenance and use of new non-agricultural effluent storage facilities 32D – existing agricultural effluent storage facilities	
Appendix R Fish Screen Standards and Guidelines			49 - abstraction, diversion and use of surface water 50 – community water supply 58 – cables, wires and pipes	
Appendix S Archaeological Site Responsibilities			9 - discharge of agrichemicals onto or into surface water 32C – construction, maintenance and use of new non-agricultural 32D – existing agricultural effluent storage facilities 40 – silage storage 42 – cleanfill sites 43 – farm landfills 51 – minor diversions of water 57 – bridges 58 – cables, wires and pipes 59 – culverts 60- dams and weirs 61 – erosion control structures 62 – fords	

Appendix	Objective	Policy	Rule	Other
			63 – moorings and signs 64 – temporary canoe gate or ski lane markers 65A – maimai 66 – maintenance of structures 67 – alteration or extension of structures 68 – demolition or removal of structures 72 – dry cuts 73 – gravel extraction 75 – vegetation flood debris removal 76 – vegetation planting 77 – vehicles and machinery 78 – weed and sediment removal for drainage maintenance	

Definition	Objective	Policy	Rule	Appendix	Other
Abstraction		20, 21, 22, 23, 24, 25, 26, 42, 43.	9, 11, 26, 27, 28, 29, 32B, 32C, 33, 35, 35A, 36, 37, 38, 40, 41, 42, 43, 46, 48, 49, 52, 54.	K, L.1, L.2, L.3, L.4, L.5, O, R.	NPSFM section Issues: – water quantity – surface water – groundwater Definitions: – allocation – aquifer – drawdown – fractured rock aquifer – minimum flow
Agrichemical			9, 10, 36, 46.		
Agricultural effluent		17.	15, 32A, 32B, 32C, 32D, 34, 35, 37, 39, 41.		Issues – soil resources Definition – agricultural effluent storage
Agricultural effluent storage			32A, 32B, 32C, 32D.		
Allocation		21, 23, 31, 42, 43.	49, 54.	B, K, L.2, L.4, L.5, L.6, L.7, O.	Issues: – water quantity – Surface water – Groundwater Definitions: – total groundwater allocation – total surface water allocation – water demand management strategy

Definition	Objective	Policy	Rule	Appendix	Other
Aquifer	8.	20, 21, 24, 43.	16, 49, 50, 53, 54.	L.1, L.2, L.3, L.5, L.6.	Issues – groundwater Physiographic zones: – central plains – lignite marine terraces – old Mataura – oxidising – peat wetlands – riverine Definitions: – confined aquifer – fractured rock aquifer – physiographic zone – potentiometric head – properly constructed and operated bore – unconfined aquifer
Artificial watercourse		16, 18, 30.	5, 6, 8, 14, 15, 16, 18A, 18B, 19, 20, 25, 26, 27, 28, 29, 32B, 32C, 33, 33A, 35, 35A, 36, 37, 38, 40, 41, 42, 43, 46, 48, 49, 50, 54.	E, K, N.	Definitions: – abstraction – bed of an artificial watercourse – critical source area – natural wetland – reasonable mixing zone
Biodiversity	16 - refers to "indigenous biodiversity"	34 – refers to "indigenous biodiversity"	14 – refers to "indigenous		Partnership section Issues – indigenous biodiversity

Definition	Objective	Policy	Rule	Appendix	Other
			biodiversity", 25, 74, 76.		
Bore or well			16, 26, 27, 28, 29, 53,	L.3.	Definitions: – drawdown – interference effects – potentiometric head
Bore only		27.	32B, 32C, 38, 46, 54	J, L.1, L.5.	Issues – groundwater Definitions: – properly constructed and operated bore – headworks
Well only			54.	L.2.	Definition – radius of influence
Catchment	10.	18, 26, 39A, 43, 45, 47.	15, 51, 52, 60	B, I, J, K, L.2.	framework of this plan Partnership section NPSFM Issues: – water quality – surface water Physiographic zones: – central plains – old Mataura
Cleanfill		35.	42.		Definitions: – cleanfill site – landfill
Cleanfill site			42.		Definition – landfill

Definition	Objective	Policy	Rule	Appendix	Other
Closed landfill			47.		
Community sewerage scheme		17A, 34.	33, 33A.		Definition – effluent
Community water supply		24.	50.	O.	Definitions: – natural wetland – water demand management strategy
Composting toilet			28, 29, 32C.		Definition - effluent
Confined aquifer		21.	54.	L.1, L.3, L.5.2, L.6.	Definition – potentiometric head
Conspicuous change in clarity[128] - various other terms used			8, 9 – both refer to conspicuous change in visual clarity, 13 – refers to conspicuous change to the colour or clarity 15, 24 – refer to conspicuous change in the colour or visual clarity 16 – refers to conspicuous change to colour and clarity		

[128] Only in the Glossary

Definition	Objective	Policy	Rule	Appendix	Other
			18B, 19 – conspicuous change in visual clarity		
Crest			59, 60.		
Critical infrastructure	9B.	26A.	9.		Definition – regionally significant infrastructure
Critical source area		16, 18.	20, 25, 35A, 40, 43.	N.	
Cultivation		4, 16, 44.	20, 25.	N.	Definition – critical source area
Damming		20, 26, 42,	52, 52A, 60	F.	Issues – surface water
Dairy farming of cows		5, 9, 10, 11, 12, 16.			
Dairy platform			20, 70.		
Deposition			51, 55A, 57, 58, 59, 60, 65, 65A, 67, 68, 72, 73, 75, 77.		Definitions: – cleanfill site – landfill
Diadromous				K.	Definition - Galaxiid
Diversion		20, 26, 42.	42, 49, 51, 52, 52A, 60.	K, R.	Partnership section Issues – surface water Definition – allocation
Domestic wastewater		17A.	26.		Definition – land application system
Drawdown				L.1, L.3.	Definition – interference effects
Dry cut			72.		
Dump station			31.		

Definition	Objective	Policy	Rule	Appendix	Other
Ecosystem	1, 4, 9, 12, 14.	1, 18, 20, 24, 28, 39A,	8, 49, 50, 52A, 57, 58, 59, 65A, 72, 73, 75, 77.		Partnership section RMA section Issues – indigenous biodiversity Financial contributions Definitions: – natural wetland – wetland
Effluent		17.	15, 20, 26, 30, 31, 32A, 32B, 32C, 32D, 33, 33A, 34, 35, 35A, 37, 38, 39, 41.	E, P.	Issues – soil resources Definitions: – agricultural effluent – agricultural effluent storage – community sewerage scheme – domestic wastewater – dump station – land application system – natural wetland – sludge – soil infiltration surface – untreated animal effluent
Ephemeral rivers	16.	18.	14, 20, 25, 35A, 40, 59A, 70.	L.2, N.	Financial contributions Definitions: – artificial watercourse – modified watercourse
Erosion control structures			61.		

Definition	Objective	Policy	Rule	Appendix	Other
Feed pad/lot			35, 35A, 38.		
Fertiliser			14, 46.		Issues – soil resources Definitions: – agrichemical – agricultural effluent
Field capacity			14, 35, 36, 37, 38.		
Ford			62.	F, N.	
Galaxiid				K.	
Good management practices	18.	4, 5, 6, 9, 10, 11, 12, 40.	20.	N.	
Gravel		29.	27, 66, 73.	A.	Issues – groundwater – river and lake beds Definitions: – cleanfill – intermittent river – perched water
Groundwater	1, 8, 12.	16, 20, 21, 22, 23, 29, 42, 43.	14, 20, 26, 27, 28, 29, 32B, 32C, 35, 37, 40, 41, 43, 48, 49, 50, 52, 53, 54.	F, I, J, K, L, L.1, L.2, L.3, L.4, L.5, L.6, L.7, N.	Issues – water quality – groundwater Physiographic zones – central plains – old Mataura Definitions: – abstraction

Definition	Objective	Policy	Rule	Appendix	Other
					– bore or well – drawdown – mean seasonal high groundwater – natural state (water quantity) – perched water – properly constructed and operated bore – receiving waters – silage leachate – total groundwater allocation – total surface water allocation
Habitat	14, 15, 17.	18, 20, 22, 24, 28, 29, 30, 32.	51, 55A, 57, 58, 59, 65A, 72, 73, 75, 77, 78, 79.	B, F, K.	Partnership section Mahinga kai Issues – water quality – surface water – river and lake beds – indigenous biodiversity financial contributions Definition – mahinga kai
Headworks			53.		
Intensive winter grazing		4, 5, 9, 10, 11, 12, 16.	20, 25.	N.	
Interference effects		22.	54.	L.3.	

Definition	Objective	Policy	Rule	Appendix	Other
Intermittent river			59A (intermittent or ephemeral river)	L.2 – refers to intermittent waterbodies	
Land application system		17 – refers to GPG for land application systems.	26, 28.		NES – air quality Definition – soil infiltration surface
Landfill			43 (farm landfill), 45.		NES section Issues – water quality Definition – closed landfill
Landholding		12A.	13, 18, 19, 20, 26, 28, 29, 32B, 32C, 32D, 33, 35, 35A, 36, 37, 38, 40, 41, 42, 43, 46, 49, 54, 60.	N.	Definitions: – cleanfill site – community sewerage scheme – dairy platform – on-site wastewater system – reticulated system
Lawfully established			8, 40, 49, 54, 56, 57, 59A, 60, 62, 65, 66, 67.	L.3.	
Leaching		16.			Issues – water quality Physiographic zones – old Mataura – oxidising – riverine Definition – silage leachate
Loading			35, 38, 41.		
Low flow				E (footnote).	Definition – spring-fed

Definition	Objective	Policy	Rule	Appendix	Other
Mahinga kai	5.	18, 22, 29, 44.	76.	B.	Partnership section Treaty of Waitangi section Issues – indigenous biodiversity Definition - Ngāi Tahu indicators of health
Main stem			40, 42, 43, 60.	F.	Statutory context – WCO's
Maintenance	9B.	26, 26A, 27, 30, 34.	9, 26, 32B, 32C, 32D, 49, 51, 53, 54, 59, 59A, 63, 65, 65A, 66, 69, 73, 78.	F, K, R.	Statutory context – RMA, NPS, NES Financial contributions Definition - Water demand management strategy
Mauri	3.	22, 44.		B.	Te mana o te wai Partnership section Issues – water quality
Mean sea level			20, 25, 79.		
Mean seasonal high groundwater			26, 27, 28.		Definition – spring-fed
Median flow				E, K.	Definition – spring-fed
Method		42.	49, 53.	E (footnote), K.	Definitions: – bore or well – water demand management strategy
Minimum flow		23, 42, 43.	49, 50, 54.	K, L.2.	
Mitigate (includes mitigated)		4, 5, 6, 9, 10, 11, 12, 15A, 15B, 16, 17,	35.	L.3.	Treaty of Waitangi section

Definition	Objective	Policy	Rule	Appendix	Other
		17A, 20, 24, 26A, 28, 29, 30, 37.			Issues – water quality Financial contributions Definition – water demand management strategy
Mobile toilet			15, 26, 30, 32C.		Definitions: – dump station – effluent
Modified watercourse		16, 18, 21, 28, 30, 31.	5, 6, 8, 14, 15, 16, 18A, 18B, 20, 25, 26, 27, 28, 29, 32B, 32C, 33, 33A, 35, 35A, 36, 37, 38, 40, 41, 42, 43, 46, 48, 49, 50, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 63A, 64, 65, 65A, 66, 67, 68, 69, 70, 71, 72, 73, 75, 76, 77, 78.	E, K, N.	Issues – river and lake beds Financial contributions Definitions: – abstraction – artificial watercourse – conspicuous change in clarity – critical source area – landholding – reasonable mixing zone – receiving waters – rip rap – spring-fed – stock crossing
Mooring			63.		Issues – river and lake beds
National Park			49, 61, 63.	A, B, I.	Definitions: – natural state (water quantity) – natural state (water quality) – nohoanga
Nationally significant infrastructure	9B – exact phrase is not used –	26A – same wording as 9B	9 – "provider of regional, national or		

Definition	Objective	Policy	Rule	Appendix	Other
	"regionally significant, nationally significant and critical infrastructure"		critical infrastructure"		
Natural character values	17.	20, 24, 28.	68.		Issues – indigenous biodiversity
Natural mean flow				K.	
Natural state (water quantity)				I.	
Natural state (water quality)			9, 10, 12, 15, 26, 27, 28, 29.	E, I.	
Natural wetland		18, 20, 21, 32, 33, 34.	5, 6, 8, 13, 14, 18B, 20, 25, 26, 27, 28, 29, 32B, 32C, 33, 33A, 35, 35A, 36, 37, 38, 40, 41, 42, 43, 46, 48, 49, 50, 51, 54, 59, 70, 74.	E, K, N.	Definitions: – abstraction – artificial watercourse – spring-fed – wetland
Ngāi Tahu indicators of health		2, 40, 47.			
Non-consumptive take			49, 54.		Definitions: – total groundwater allocation – total surface water allocation
Non-point source discharges					Issues – water quality Definition – agricultural effluent

Definition	Objective	Policy	Rule	Appendix	Other
Nohoanga	5.	1, 20,	57, 58, 59, 59A, 60, 61, 63.	B.	Treaty of Waitangi section Statutory acknowledgements
Nutrient		16, 39A.	35.	N.	Issues – water quality Physiographic zones Definitions: – critical source area – fertiliser – nutrient budget – physiographic zone
Nutrient budget				N.	
On-site wastewater system		17A.	15, 26, 31.		Definitions: – effluent – land application system – subsurface drainage system
Organism			9, 10, 11, 17, 37, –all refer to HSNO Act. Rule 55A, 61, 74, 76, – all refer to Biosecurity Act	C.	Definition: – ecosystem (micro-organism) – habitat – toxicity – unwanted organisms
Perched water			26, 28, 29.		
Pest species			63, 63A.		
pH			18.	E, F.	
Pit toilet			27.		
Physiographic zone		4, 5, 6, 9, 10, 11, 12, 12A.		N.	Physiographic zones – alpine

Definition	Objective	Policy	Rule	Appendix	Other
					– central plains – gleyed – bedrock/hill country – lignite-marine terraces – old Mataura – oxidising – peat wetlands – riverine
Place of assembly			33, 35, 40, 41, 43.		
Point source discharges					Issues – water quality
Potable water			18, 37, 40.		Definition – community water supply
Potentiometric head				L.3.	Definition – radius of influence
Properly constructed and operated bore				L.3.	
Q95				K.	Definition – reasonable mixing zone
Raw sewage			5.		
Reasonable mixing zone			5, 8, 9, 15, 19.		
Receiving waters			8, 9, 13, 15, 16, 19, 24.	E, F.	
Reconstruction			32A, 55, 56, 57, 58, 59, 60, 61, 63, 63A, 64, 65, 69.		

Definition	Objective	Policy	Rule	Appendix	Other
Regionally significant infrastructure	9B – exact phrase is not used – "regionally significant, nationally significant and critical infrastructure"	26A – same wording as 9B	9 – "provider of regional, national or critical infrastructure"		
Reticulated system			15.		
Rip rap			61.		
Riparian area/margins		16 – reference to "riparian setbacks", 18.		N.	
RMA			24, 49.		Introduction – purpose of this plan Partnership section Treaty of Waitangi section Statutory context of plan NES section Financial contributions Stat acknowledgements
Sediment trap		16.	59A.		
Septage			26.		
Sewage			5, 15.		Definitions: – community sewerage scheme – raw sewage
Silage			40, 41.		Definitions:

Definition	Objective	Policy	Rule	Appendix	Other
					– feed pad/lot – silage leachate – silage storage facility
Silage leachate			40, 41.		
Sludge			32C, 34, 37, 38, 39, 43.	P.	Definitions: – cleanfill – septage
Soil infiltration surface			26, 28.		
Spring-fed		20.	53, 78.	E (does not have hyphen), G.	
Stock		16, 18.	14, 20, 35, 35A, 59A, 70.	E, F, L.4, N, O.	Issues – river and lake beds Definitions: – agricultural effluent (refers to "livestock") – ford (refers to "livestock") – intensive winter grazing – stock crossing
Stormwater			5, 15, 26, 27, 28, 32B, 32C, 35A, 40, 42, 43.		Issues – water quality Definitions: – artificial watercourse – bore or well – reticulated system – sewage – subsurface drainage systems

Definition	Objective	Policy	Rule	Appendix	Other
Subsurface drainage systems			13, 26, 27, 28.	N.	Definitions: – artificial watercourse – critical source area
Suitably qualified person			20, 32D.		
Tangata whenua	4.	20, 24, 28, 40, 44.	57, 58, 59, 63, 64, 65A, 67, 68, 72, 73,	S.	Te mana o te wai Partnership section Treaty of Waitangi Regional policy statement Issues – indigenous biodiversity
Total groundwater allocation				L.4.	Definition – total surface water allocation
Total surface water allocation			49.	K.	
Unconfined aquifer			53.	L.1, L.3, L.5.	
Unwanted organism			55A, 61, 74, 76.		
Values	4, 16, 17.	1, 14, 20, 24, 28, 29, 30, 40, 44, 45, 47.	51, 57, 58, 59, 63, 64, 65, 65A, 66, 67, 68, 72, 73, 74,	B, C, E, F, K, L.2.	Te mana o te wai Framework of this plan Treaty of Waitangi NES - soil WCO's Issues: – water quantity – surface water – river and lake beds

Definition	Objective	Policy	Rule	Appendix	Other
					– indigenous biodiversity Financial contributions Definitions – natural character values
Vegetation flood debris			75.		
Wāhi taonga	Lots of references to "taonga" without the word "wāhi"			B.	
Wāhi tapu				B.	• Partnership section
Water demand management strategy		24.	50.		
Wetland	14, 17.	11, 16, 18, 20, 21, 32, 33, 34.	5, 6, 8, 13, 14, 15, 16, 18A, 18B, 20, 25, 26, 27, 28, 29, 32B, 32C, 33, 33A, 35, 35A, 36, 37, 38, 40, 41, 42, 43, 46, 48, 49, 50, 51, 52A, 54, 55, 56, 57, 58, 59, 65A, 66, 69, 70, 74, 76, 79,	A, B, E, K, L.2, N.	Framework of this plan NZCPS Issues: – surface water – indigenous biodiversity Physiographic zones – gleyed – peat wetlands Definitions: – abstraction – artificial watercourse – conspicuous change in clarity – natural wetland – receiving waters

Definition	Objective	Policy	Rule	Appendix	Other
					– riparian area/margins – spring-fed
Whitebait stand		31.	65.		

Appendix C

Environment Southland's Progressive Implementation Programme for Implementing the Policies of the National Policy Statement for Freshwater Management 2014 (amended 2017)

Pursuant to Policy E1 of the National Policy Statement for Freshwater Management 2014 (amended 2017) (the NPS-FM), Environment Southland gives public notice of its revised Progressive Implementation Programme to fully implement the NPS-FM, by establishing freshwater objectives and setting limits, by 31 December 2025.

Environment Southland notified an earlier version of its Progressive Implementation Programme in November 2015. Since that time, both the NPS-FM and the process by which Environment Southland proposes to implement it have changed. Environment Southland, in partnership with Te Ao Marama Incorporated (as the environmental arm of Ngāi Tahu Ki Murihiku), will be working with the communities of Southland to implement the NPS-FM as part of its People, Water and Land Programme.

The People, Water and Land Programme is underpinned by preparatory work evaluating and developing a model of Southland's economy and a science programme evaluating land use inputs, fluxes and flows, ecosystem health and research reports. Together this work has assisted in developing:

- an understanding of the history and connections within Southland's economy, and an economic model for the region capable of testing the socio-economic impacts of limits established under the NPS-FM; and
- a strong conceptual understanding of the functioning of natural systems within Southland, which will provide the spatial and temporal context for community engagement and better resource management.

In addition, Council has developed, notified and held hearings on the proposed Southland Water and Land Plan to better manage land use intensification issues and prevent any further decline in water quality. Council has also worked closely with farmers, including the provision of land sustainability advice, such as wintering, nutrient management and riparian planting.

The purpose of the revised Progressive Implementation Programme is to set out the tasks, in stages, to implement the NPS-FM by 31 December 2025. These stages are summarised in the table below.

Stage	Process	Timeline
Communication and engagement	Communicate programme goals, objectives and activities. Engage our communities and businesses in robust discussions about our freshwater.	Underway and ongoing through to 2025.
Ongoing freshwater improvement initiatives – 'Action on the ground'.	Supporting, facilitating and leading on-ground activities that change land use practices to improve freshwater. Projects are underway in the Waituna, Aparima and Mataura catchments.	Underway and ongoing beyond 2025.
Development of regional targets (swimmability)	Develop and publicly notify final regional (swimmability) targets.	Final regional targets notified prior to 31 December 2018.

Stage	Process	Timeline
Develop freshwater values, targets and objectives.	Through community engagement raise awareness of freshwater and the challenges facing it. Determine the community's values and objectives using a national consistent process for formulating freshwater objectives, for all Freshwater Management Units (FMU's), in accordance with the National Objectives Framework set out in the NPS-FM. Additional values will also be integrated through linking in to the ongoing Murihiku Cultural Monitoring Project.	Underway – an environmental health baseline information is being collated and an inventory of known freshwater values has been compiled. The process to determine freshwater values, targets and objectives for each FMU and the region will occur in stages, beginning in November 2018.
Regional forum	Establish a Southland forum made up of representatives from across the region to act in an advisory role for Council. The forum will advise Council via an agreed policy proposal, of the preferred objectives, limits, methods and timeframes required to achieve the community's values and objectives for freshwater.	Agreed policy position to Council by 2022.
The proposed Southland Water and Land Plan (pSWLP)	The pSWLP was notified in June 2016 and was developed to prevent further degradation of freshwater quality in Southland while limits are developed through the People, Water and Land Programme. The pSWLP implements some objectives and policies from the NPS-FM and outlines the basic process for the future inclusion of five FMU sections of the pSWLP as a future plan change.	Underway – resolution of appeals is subject to court process. The pSWLP could be fully operative as early as the end of 2019.
Southland Water and Land Plan – plan change	The pSWLP will need to be amended to include freshwater objectives, limits and targets developed through the community and council process for all FMUs. It must also include policies and methods to achieve those limits, in accordance with the NPS-FM. Components of this are highlighted above.	A Plan Change for freshwater objectives, limits and targets in Southland (that includes all Freshwater Management Units) to be notified by 2022 and operative by 2025.

Reporting on the staged Progressive Implementation Programme will occur annually in the Council's Annual Report prepared under the Local Government Act 2002.

Information about the National Policy Statement for Freshwater Management 2014 and Environment Southland's Progressive Implementation Programme can be sourced on the

Council's website www.es.govt.nz or by phoning Environment Southland's offices on (03) 211 5115 or toll free (within Southland) 0800 76 88 45.