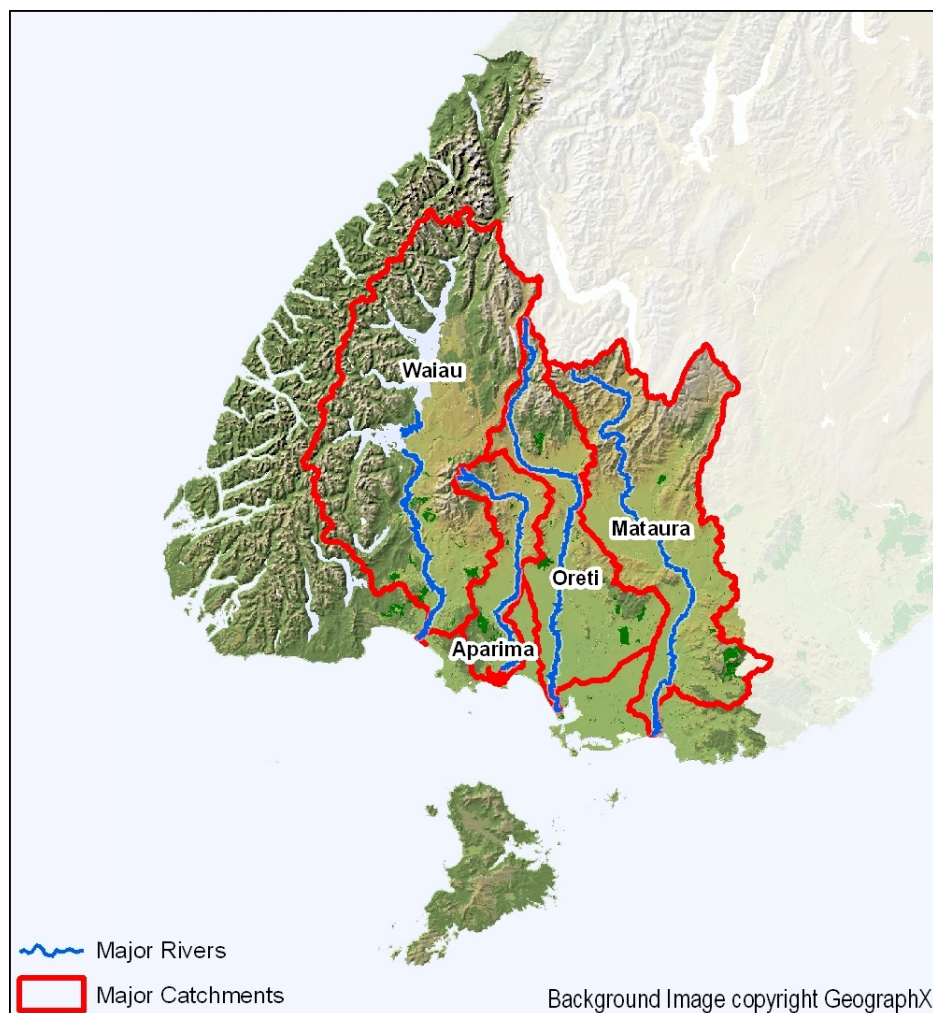


1. INTRODUCTION

As a primary production economy, Southland is dependent on both the quantity and quality of water available in the region. Water in the region is found either as surface water (in rivers, streams, lakes and wetlands) or groundwater. Water has both instream and abstractive values. Instream it provides for a wide variety of ecological values, and natural character, aesthetic values and recreational values. Abstraction of water provides for the social and economic wellbeing and sustainability of people and communities. Water is also frequently used to assimilate waste.

Southland water resources

The region is drained by four major river catchments – the Waiau, Aparima, Oreti and Mataura catchments (see figure below). These catchments cover a combined area of 18,305 km², or 54% of the land area of Southland.



The Waiau catchment lies on the eastern edge of Fiordland, and is Southland's largest catchment. Its major tributary is the Mararoa River. The Waiau catchment contains a

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large number of lakes, and is the least developed of the four major catchments. However, the operation of the Manapouri Hydro-Electric Power Scheme on the western arm of Lake Manapouri results in the diversion of 485 m³/sec of water (up to 90% of the flow in the catchment) and its discharge into Doubtful Sound. Even with this volume of water diverted, the mean flow of the river is still 144 cumecs. There are also a small number of rural community water supplies sourced from the lower Mararoa River. Because of the catchment's development for hydro-electric power generation, any consent applications for further abstractions of surface water are classified as non-complying activities. Further abstractions of surface water are therefore only likely to be considered acceptable if they do not significantly affect both the existing environmental flow and level regime for the catchment and the availability and reliability of supply for existing consent holders. Groundwater from a confined aquifer that is not in hydraulic connection with the river may be available for abstraction, subject to suitable consent conditions.

The Mataura catchment is the second largest in Southland, both in terms of area and flow of water. The catchment stretches from the Eyre Mountains to the Fortrose estuary, east of Invercargill. It has a mean flow of 90.9 cumecs (at Seaward Downs) based on data collected from 1983 – 2007. The major tributary in the catchment is the Waikaia River, which joins the Mataura east of Riversdale, and contributes half the flow of the catchment above its confluence with the Mataura. Other major Mataura catchment tributaries include the Brightwater Spring, Eyre Creek and Roberts Creek in the upper catchment, the Nokomai River, Waimea Stream and Waikaka Stream in the mid catchment, and the Mokoreta River in the lower catchment. The catchment has significant water supply values for various communities and industrial uses, with a reasonably high level of allocation in the middle and lower reaches of the catchment. The Mataura and Waikaia Rivers are the subject of a National Water Conservation Order, which was promulgated to protect the outstanding fisheries and angling amenity features of the catchment. Because of these features, the provisions of the Order restrict the granting of water permits to take water by requiring that flows not be reduced beyond a specified limit, prohibit damming of the main stem of the Mataura or Waikaia Rivers and restrict damming of other tributaries, and place restrictions on discharge permits to ensure that water quality is maintained.

The Oreti catchment is the third largest in the region and runs from the Thomson Mountains in the north of the region to the New River estuary adjacent to Invercargill. It has a mean flow of 41.3 cumecs (at Wallacetown) based on data collected from 1977 – 2007. Major tributaries of the Oreti mainstem include the Windley River and Irthing Stream, Winton Stream, Waikiwi Stream and the Makarewa River. Within the upper catchment several surface water takes supply water to community supply schemes, and recent changes in land use from sheep farming to intensive dairy farming are causing increasing pressure on groundwater as a result of abstraction for irrigation. Groundwater takes for the Winton and Lumsden/Balfour reticulated community water supply schemes are also significant. In the lower catchment Invercargill city and Bluff source drinking water from the river at Branxholme, and water is abstracted from the lower Makarewa River for industrial use. Because the level of water allocation in the catchment is steadily increasing, Environment Southland is considering reviewing the minimum flow that has

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been set at Wallacetown, to ensure that instream habitat will be protected to a reasonable level while also providing water for out of stream use. In August 2008 the Oreti River became subject to a National Water Conservation Order, in order to recognise the value of the catchment in terms of habitat for brown trout and black-billed gulls, angling amenity and significance in accordance with tikanga Maori. Because of these values, the provisions of the Order prohibit the damming of any of the waters covered by the Order, require fish passage to be maintained associated with any abstractions of water, and require that discharges not reduce water quality beyond a zone of reasonable mixing.

The Aparima catchment is the smallest of the four main catchments and extends from west of Mossburn to the coast at Riverton. It has a mean flow (at Thornbury) of 24.6 cumecs, based on data collected from 1992 - 2007. Important areas of wetland remain in the catchment, particularly the Castle Downs Swamp, the largest remaining wetland area in Southland. The Aparima catchment has a relatively low level of water abstraction, with the major uses being the abstraction of water for the Riverton reticulate community water supply in the lower reaches of the catchment, and irrigation takes from groundwater in the upper catchment.

The balance of the region is drained by smaller rivers and streams (such as the Waimatuku Stream and Waihopai River) in the lower Southland Plains and the Catlins, or the larger waterways contained within the Fiordland and Rakiura National Parks. The Waimatuku Stream is located between the Oreti and Aparima catchments. Its headwaters are fed by a large swamp area (the Bayswater Peat Bog) with small springs in the Drummond district also contributing to the base flow. The stream underwent significant straightening works from the 1920s and now is now a channelised stream with uniform bank margins. The Waimatuku Stream typically has moderate flows however, with few flood or extreme low flow events, probably because of the contribution from swamp and spring areas. The Waihopai River is another significantly modified river catchment on the eastern area of the Southland Plains. It rises in the hills adjacent to the lower Maitua Valley and flows through straightened channels with flood banks along the margins to the New River estuary. The land in the catchment has largely been drained and cleared over the years to allow for the development of intensive land use. The catchment area includes the Waituna wetlands on the Awarua Plains. A number of small streams contribute to the catchment flow, with a mean flow of 2.7 cumecs in the mid-catchment (at Kennington). Rivers and streams in the Catlins include the Titiroa and Waimahaka Streams, the Tokanui and Waikawa Rivers and Longbush Creek. The majority of these catchments have been cleared of timber and developed into highly productive farmland.

There are no significant levels of water abstraction from any of these waterways.

Groundwater in Southland is principally found under the plains and downlands of central and eastern Southland, as well as the Waimea Plains and Te Anau Basin in northern Southland. Alluvial gravel aquifers associated with the region's surface waterways form the major unconfined aquifers in Southland, with the sandstone and fractured limestone sediments underlying the alluvial gravels, and the mudstone and lignite sequences throughout the region forming extensive semi-confined and confined aquifer systems.

The greywacke basement rocks of the Hokonui Hills and Catlins areas also form locally significant aquifers. Groundwater resources contained in unconfined aquifers have been divided into 29 zones on the basis of aquifer types for management purposes.

Abstraction of groundwater has typically been preferred over surface water abstraction in Southland. While only a small number of the groundwater zones are showing more than low levels of abstraction, Environment Southland has adopted a precautionary approach in terms of water allocation in the absence of extensive information. Increasing pressure is therefore occurring on what are currently relatively limited groundwater resources, particularly with the intensification of land use on the Southland Plains and in northern Southland, and the consequent demand for irrigation water. These types of increases in demand have also been evident in other areas of New Zealand, such as Canterbury.

Water allocation on a national basis

The Ministry for the Environment has gathered information from resource consents issued by regional councils on the volume of water that has been allocated from rivers, lakes and groundwater. This information has been reported in ENZ07, the second national State of the Environment report, published in early 2008.

ENZ07 states that the total allocation of water in New Zealand in 2006 was 676 cumecs (or 676 cubic metres of water being abstracted every second). 60% of this water is taken from surface water. Canterbury and Otago together account for almost three-quarters of the total allocation, with the majority of the total allocation being used for irrigation. It should be noted that these figures are likely to represent an underestimation of the volume of water being abstracted, Environment Southland staff have noted for example that this figure does not include the diversion of water from Lake Manapouri for hydro-electric power generation.

Demand for water in New Zealand has been estimated at two to three times higher than in most other OECD countries. Significantly, ENZ07 notes that:

*'In most cases, consent holders do not use the full volume of water they are allowed under the consent. The proportion of actual water used is highly variable. Regional consents indicate that actual use typically ranges from 20 per cent to 80 per cent of the allocated volumes (Ministry for the Environment, 2006c). Demand for water varies according to factors such as the time of year, the crop type, and the growth stage of the crop. Use of allocated water often declines in the margins of the irrigation season.'*¹

ENZ07 also notes that total water allocation in New Zealand increased by 50% between 1999 and 2006, with the greatest demand coming from irrigation. Relative to the land irrigated in 1999, Southland is identified as one of four regions where rate of growth in water allocation is largest, with the area of land irrigated having doubled between 1999 and 2006.

¹ Ministry for the Environment. 2008. Environment New Zealand 2007. p300.

Southland water quantity

The original Water Plan for Southland was developed in the late 1990s and reflected the situation at that time:

- most water takes in the region were for existing domestic and stock water supplies, with some for municipal supply and irrigation use
- Southland was perceived as a region where irrigation was not required for reliable agricultural production
- while there was an awareness of water quality issues, the full extent and nature of these issues was not fully understood.

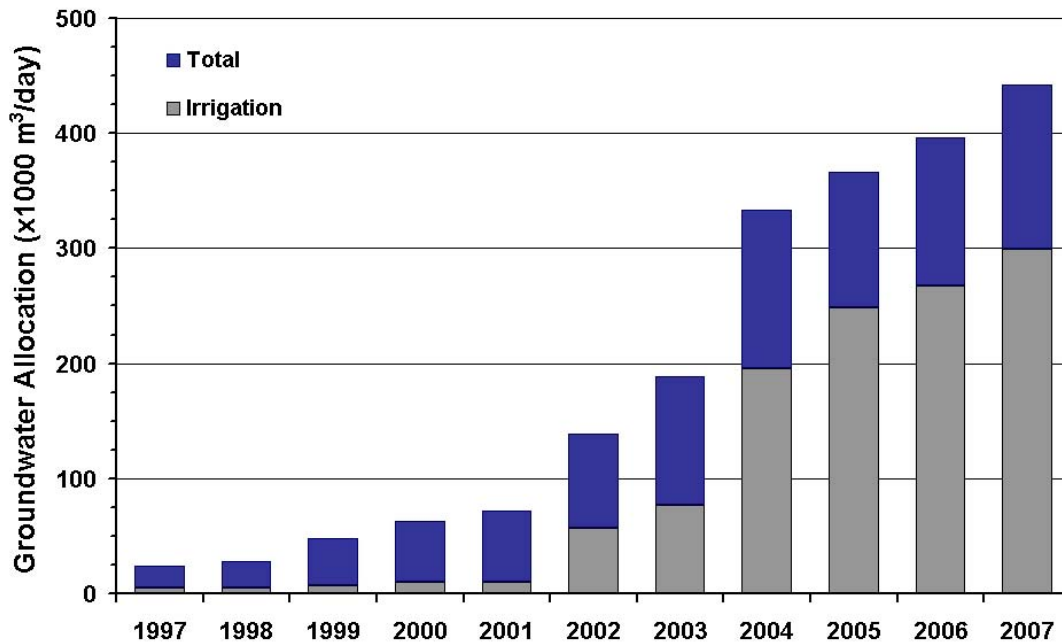
However, subsequent to the public notification of the Proposed Regional Water Plan in October 2000, the picture with respect to water allocation altered. Demand for water increased significantly in the region, particularly for irrigation purposes. With land intensification and the need for more efficient production to remain competitive, this trend has continued, with irrigation increasingly being used in the region as a tool to increase reliability of production. Understanding of the issues and the region's water resources also increased significantly from the late 1990s. As a result, Environment Southland embarked on a series of variations to the Proposed Regional Water Plan from 2004 onwards.

In October 2000, when Environment Southland published its first State of the Environment Report for Water it was noted that in general there appeared to be enough groundwater to meet the demand at the time, although it was acknowledged that there was relatively limited data on groundwater levels. With respect to surface water, the 2000 report noted that in major rivers and tributaries there was generally sufficient water to provide for ecosystem and human needs, but that this was less certain in smaller waterways, and during drought conditions.

As part of the 2003 Southland Water Resources Study, likely future demand for water in Southland was investigated, and a number of scenarios developed. The study suggested that pasture irrigation would be the main cause of significant increases in water demand, and that, in the future, there was some doubt about whether some areas of the region would have sufficient water to meet demand.

In 2005/06 and 2006/07 Environment Southland has reported on groundwater and surface water allocation as an update of its regular State of the Environment reporting. Groundwater allocation has risen rapidly over the last few years, increasing from approximately 25,000 cubic metres per day in 1997 to over 425,000 cubic metres per day in 2007. Pasture irrigation now accounts for the largest percentage of the water abstracted, as shown in the figure below.

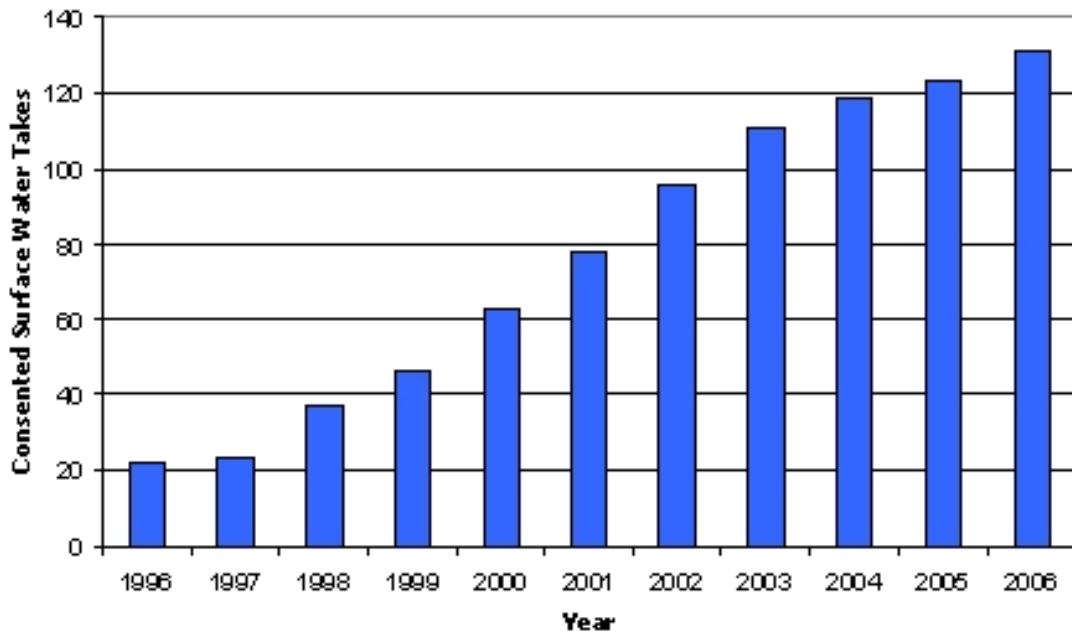
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As of the 2006/07 monitoring year, the rate of increase in demand for groundwater currently exceeds the conservative scenario contained in the Southland Water Resources Study, which suggests that available of groundwater may become an issue in some areas sooner than expected. In addition it is important to note that the Southland Water Resources Study based its assessment of the volume of groundwater available on the basis of sustainable yield, and did not take into account matters such as stream depletion and the physical ability of the aquifer to provide water.

Consented surface water takes have also increased significantly over this time period, rising from approximately 20 consents in 1996 to over 120 in 2006 (see figure below). Surface water remains the less preferred source of water for abstractive use (with the exception of some large takes for municipal and/or industrial supply), reflecting the history of reliance on groundwater in Southland.

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Compared to other regions (particularly Canterbury and Otago) the amount of irrigation in Southland is still relatively small. However, the groundwater resources in particular in Southland are considerably more limited than those in other areas of the country, and groundwater abstractions are tending to concentrate within relatively confined areas (for example Five Rivers and Lumsden in northern Southland). This increases the potential for adverse effects.

The other major allocation of surface water in the region is for the generation of hydro-electric power in the Waiiau catchment. The transfer of water from the catchment to Doubtful Sound means that the catchment is classified as fully allocated. Minimum flows need to be maintained downstream of the Manapouri Lake Control to protect the remaining instream habitat and aquatic life.

Pressures on water quantity

The major pressures on water quantity in Southland are:

- abstraction of surface water for consumptive use (industrial, municipal and agricultural)
- abstraction of groundwater for consumptive use (principally for pastoral irrigation and dairying uses)
- the closely interrelated nature of groundwater and surface water meaning that abstraction from one can also have effects on the other
- the holding of allocated water through resource consents that are not fully used preventing or restricting other individuals or communities gaining access to the water resource²

² Although this un-used allocation can represent a 'buffer' for waterbodies against effects of significant abstraction of water.

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- the diversion of water for hydro-electricity generation purposes, both currently and with potential for further schemes to be promulgated in the future, and
- the interaction of the above pressures and the needs of local communities, giving rise to restriction on takes in order to protect instream values (such as recreational, amenity and ecological effects) and conflict between instream and out-of-stream uses.

Extraction of large quantities of water can also reduce levels and flows of water in rivers and streams with consequent effects on water quality as the volume of water available to dilute pollutants decreases.

The Regional Policy Statement identifies the following as being issues in relation to water quantity/allocation:

- adverse effects resulting from low flows and/or over allocation of water
- changes in flows and levels
- conflicts in allocation of water between instream and abstractive uses
- the positive and negative consequences of the uses to which water is put
- the wide range of human and natural activities that can cause effects on water quantity
- inefficient and wasteful use of water, and
- the lack of information on the extent and state of groundwater resources are all identified as issues in the existing Regional Policy Statement.

Experience with water management, increasing demand for water and the gaining of better knowledge about the region's water resources have refined the issues since the Regional Policy Statement became operative. Considerable policy advice and additional requirements have also been released by central government in this time. It is important that the Regional Policy Statement both accurately reflects the water quantity/allocation issues in Southland and is consistent with national requirements.

2. RELEVANCE OF EXISTING REGIONAL POLICY STATEMENT AND SOUTHLAND DISTRICT PLAN ISSUES

One of the purposes of this paper is to assess whether the existing issues relating to water quantity/allocation contained in the Regional Policy Statement and the Southland District Council District Plan are still relevant to the management of water quantity in Southland, and whether the objectives and policies that are presently contained in the Regional Policy Statement and the District Plan address those issues appropriately.

Regional Policy Statement

There are eight issues contained in the existing Regional Policy Statement with respect to water quantity in Southland. In summary the issues are that:

- low flows and/or overallocation can cause adverse effects because of the increased concentrations of contaminants that may result (Issue 1);
- changes in flows and levels can significantly affect aquatic ecosystems and groundwater recharge or discharge (Issue 2);
- conflicts in allocation because of competing needs, and insufficient water to provide for the full range of competing needs and ecological needs (Issue 3);

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- the positive and negative, direct and indirect effects of the taking, diversion and damming of water (Issue 4);
- the positive and negative consequences of the use of water and the manner in which water is changed by that use (Issue 5);
- the positive and negative effects of a wide range of events and activities on water quantity (Issue 6);
- current uses of water may be inefficient and wasteful (Issue 7);
- the need for further information on the extent and state of groundwater resources in the region (Issue 8).

There are a number of examples of waterbodies in the region where water quality has been affected by summer low flows, or where measures have been put in place to ensure sufficient flows are available year round to protect habitat and aquatic values. The interaction between surface water and groundwater has also become of increasing concern to Environment Southland as demand for groundwater has increased, and effects of groundwater takes on spring-fed streams are already being experienced in the region. Issues 1 and 2 are therefore considered to still be relevant. Analysis of the objectives, policies and methods that give effect to Issues 1 and 2 has identified that the majority of them remain relevant and appropriate to addressing the issues.

As demand for both surface water and groundwater in the region increases, conflicts in allocation, both between competing users and between abstractions and the needs of instream values and uses will increase as well. In this sort of environment the issue of efficient use of water is likely to become more and more relevant. Issues 3 and 7 therefore remain relevant in the region. Analysis of the objectives, policies and methods that give effect to Issues 3 and 7 has identified that while some are appropriate, a number of them need amendment or updating in order to be more relevant to the issues that they are attempting to address.

The information that is available relating to the state and extent of groundwater resources also remains an issue in Southland, although to a lesser extent than when the Regional Policy Statement first became operative. In response to the previous lack of information, from 2000 onwards Environment Southland has implemented a comprehensive groundwater monitoring programme, although there is an ongoing need to advance knowledge of the groundwater resource in Southland in order to aid decision making and the sustainable management of the resource. Issue 8 therefore continues to be relevant. While the objective that is identified as giving effect to Issue 8 is not considered to be relevant to it (being more about flow regimes than a need to gather further information), the policy and method are both considered appropriate to the issue. Analysis of the objectives, policies and methods that give effect to Issue 8 has identified that the majority of them remain appropriate.

Issues 4 (relating to positive and negative, direct and indirect effects of the taking, diversion and damming of water) and 6 (relating to the events and activities that can affect water quantity), are more statements of fact than issues. Even though Issue 6 lists a range of events and activities and Issue 4 is wide-ranging in the types of effects that it

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lists, it is not clear whether or not in Southland water quantity is affected and in what way, which events and activities specifically are issues in relation to Southland’s water resources, and what sort of adverse effects are occurring.

The effects of the use of water has not been identified as a relevant issue during the research and consultation undertaken as part of the preparation of this paper.

A detailed analysis of each issue and, where relevant, its objectives, policies and methods is included in Appendix 1. A tabular summary of this information is provided in Table 1 below.

Table 1: Relevance of existing Regional Policy Statement policy framework

Issue	Relevant?	Relevant Objectives	Relevant Policies	Relevant Methods
1	Y	4.1, 4.2*, 4.3, 4.5, 5.1P, 5.3	4.1 ^P , 4.2 ^P , 4.3, 4.4*(?), 4.5	4.1*, 4.2 ^P , 4.3*, 4.5, 4.8, 4.9*, 4.10*, 4.11*, 4.13*, 4.14*
2	Y	4.1, 4.2*, 4.3 ^P	4.1*, 4.3, 4.4, 4.5, 4.7	4.1, 4.2, 4.5, 4.8, 4.9*, 4.10*, 4.11*, 4.13*
3	Y	4.1, 4.2 ^P , 4.3 ^P , 4.4	4.1*, 4.2, 4.3 ^P , 4.4, 4.7 ^P	4.9*, 4.11, 4.13
4	N			
5	N			
6	N			
7	Y	4.2 ^P , 4.4	4.1*, 4.3, 4.4	4.1, 4.2, 4.5*, 4.6, 4.7, 4.9*, 4.13
8	Y		4.7	4.6, 4.7

* = needs amendment in order to be completely relevant.

^P = partially relevant

Issues contained in other parts of the Regional Policy Statement are also considered to be relevant to water quantity/allocation, and are outlined in Appendix 1.

District Plan

Staff at Southland District Council have provided input into this paper by way of this section, which provides a Southland District Council perspective on water quantity/allocation.

The Southland District Plan contains a number of sections relevant to water. Section 1 of the Southland District Plan (‘The Resources of the District’) includes a section on water (Section 1.5), which details the District’s water sources, including river catchments, lakes and wetlands, and identifies the following issues relating to water:

The need to avoid and mitigate the degradation of water quality as a result of human activities, removal of vegetation and contamination from sewage and animal effluent.

Explanation

While the control of water quality is the responsibility of the Southland Regional Council the proposed Regional Policy Statement (Policy 4.5) requires Local Authorities to assess the effects of land use activities at the time of consent.

The need to maintain and enhance the District's significant aquatic plant and animal life, particularly indigenous species, and the district's fresh water fishing resources.

Explanation

Many water bodies within the District are expected to perform a diverse range of function and care needs to be exercised to ensure a balance is achieved between activities and species.

The need to avoid and mitigate the degradation of water is clearly identified in this section of the District Plan; however water quantity is not specifically recognised as an important issue in its own right. In addition, while human activities, removal of vegetation, contamination from sewage and contamination from animal effluent are all identified as water issues in Section 1.5 of the District Plan, there are other land uses and issues that could be included.

Section 2 of the District Plan outlines its statutory background. The maintenance and enhancement of public water supply in the district is listed in Section 2.4 of the District Plan as a cross-boundary issue. In order to determine how the issue of maintaining and enhancing public water supply is to be addressed, the Southland District Council will be guided by the contents of the Regional Policy Statement.

Section 3 of the District Plan lists the significant resource management issues facing the District's water resources, included among them the major impact that land use activities can have on water bodies. Section 3 also sets out objectives and policies relating to water.

3.5.2 – THE ISSUES

The following are considered to be significant resource management issues facing the District's water resource;

- ***Land use activities may have an adverse effect on water quality in some parts of the District.***

Explanation

Both ground water and surface water quality and quantity are being adversely affected by certain land management practices. Activities such as vegetation clearance, working soil on steep slopes, grazing riparian margins, applying fertiliser in riparian margins, draining wetlands, effluent discharge and harvesting tree crops in riparian margins have all contributed to a significant increase in sediment and nutrient loads in a number of the District's waterways. Degradation of the District's water seriously affects the ecological health of the District and greatly affects recreation and consumption uses.

- ***The viability of water schemes can be threatened by the change of land uses in their catchment areas.***

Explanation

The viability of water schemes can come under threat if land uses were to change in their catchment areas. The principal options Council has considered include economic measures such as rates relief, the funding of fencing, and the outright purchase of properties affecting the supply catchment and the control of the effects of land use in those affected areas.

As the explanation to the second issue notes, the viability of water schemes can come under threat where land use change occurs. Changes in the patterns of land management practice since the District Plan was adopted, and the potential impact these changes can have on water schemes need to be recognised. An example of changing land management practice would be the conversion of rural properties from pastoral farming to dairying, or pastoral farming to forestry; and the potential for large scale water-intensive land use changes in catchments to impact on the viability and integrity of the Southland District Council's reticulated community water schemes.

Section 3.5 of the District Plan also lists the following objective and policy relating to water quantity:

Objective WAT.5 – Water Supply Catchments

To ensure land use practises maintain, and where appropriate, enhance, both the quality and quantity of water within the catchment areas of Southland District's, Invercargill City's and Gore District's water supply schemes to ensure a continued sage and economic supply of water.

Policy WAT.11

To avoid, remedy or mitigate the adverse effects of land use on water quality and quantity within the water supply catchments in the District.

Explanation

Any increase in sediment or pollutants significantly increases the cost of clean water and can undermine the future operation of water schemes. Activities such as wetland drainage, vegetation clearance, and intensive grazing can have effects such as increased sedimentation, increased runoff and a resultant decrease in quality and quantity.

Other objectives and policies in Section 3.5 recognise that land use activities can have an adverse effect on water quality. As outlined above, objectives and policies also recognise that the viability of water schemes can be threatened by land use changes within a scheme's catchment area.

As noted earlier in this report in ‘Southland water quantity’ (pages 5-7) the situation in relation to water allocation has altered significantly since 2001. It is now recognised that the demand for water and the amount of water allocated has increased significantly, and as a result the amount of water available in certain catchment areas has reduced. Section 3.5 of the District Plan currently focuses primarily on water quality. There may now be a need for recognition of the importance of water quantity issues in the second-generation District Plan.

Section 4 of the District Plan, which relates to the Rural Resource Area, also details the following method:

Method PRA.1 – Research

In conjunction with Invercargill City Council, Gore District Council and the Southland Regional Council, to investigate the effects land use is having on groundwater

Reason

There is a great deal of concern in the District that land use activities are adversely affecting ground water supplies. Before any formal action is taken, the territorial and regional authorities of the Southland region propose to investigate this issue. Until these investigations indicate that currently held concerns are invalid, Council will adopt a precautionary approach in assessing proposals.

In summary, the level of knowledge about water quantity issues has increased significantly since the adoption of the current District Plan, while at the same time there is an increased level of concern in the District regarding the adverse effects of land use change on water supplies.

3. EMERGING WATER QUANTITY/ALLOCATION ISSUES IN SOUTHLAND

Since the Regional Policy Statement became operative in 1997 a variety of water quantity/allocation issues have arisen, both nationally and regionally. In general terms the regional issues have primarily arisen as a result of significant economic growth in the agricultural sector.

Over the last ten years the Government has also taken a more active role in determining and directing national policy in relation to water quantity.

3.1 National Issues

Resource Management Act 1991

The Resource Management Amendment Act 2005 introduced or amended provisions that affect the responsibilities and functions of Environment Southland in relation to the management of water quantity/allocation.

Sections 30(1)(c)(iiia), (ga) and (gb) were all introduced by the Amendment Act:

Every regional council shall have the following functions for the purpose of giving effect to this Act in its region:

- ...
- (c)(iiia) *the maintenance and enhancement of ecosystems in water bodies...*
- ...
- (ga) *the establishment, implementation, and review of objectives, policies, and methods for maintaining indigenous biological diversity*
- (gb) *the strategic integration of infrastructure with land use through objectives, policies and methods*

Ecosystems and indigenous biological diversity can both be affected by the quantity of water available in a water body, and the review of the Regional Policy Statement should take these new functions for Environment Southland into account. The strategic integration of infrastructure with land use is most likely to refer to provision of infrastructure (such as water supply, wastewater treatment and disposal, and land transport networks) in co-ordination with the growth of towns and cities. Embodying strategic consideration of infrastructure development in the Regional Policy Statement could allow demands for abstractive use of water to be managed.

Section 67(3) of the Resource Management Act now requires any regional plans prepared by Environment Southland to 'give effect to' any regional policy statement. The pre-eminent position of the Regional Policy Statement is therefore confirmed, and it is important that it sets out strategic direction for the management of water quantity/allocation in the region.

Section 75(3) mirrors section 67(3) and requires district plans to 'give effect to' any regional policy statement. This has been recognised through the co-ordinated approach that Environment Southland and the Southland District Council are adopting to the review of the Regional Policy Statement and the Southland District Plan.

In any discussion of national initiatives it is important to note that the recent change in Government may lead to some re-prioritisation. Prior to the 2008 election the National Party's resource management policy included putting the National Policy Statement on hold and initiating a 'collaborative governance process' to engage key stakeholders to develop an effective framework for addressing issues of water quality and allocation. For completeness, the existing national policy documents are discussed below because no matter what the final fate of these documents is, there has been a clear signal from both the past and present Governments that there will be more national direction in terms of how our water resources are managed.

Proposed National Policy Statement for Freshwater Management

The Proposed National Policy Statement for Freshwater Management (the NPS) was publicly released in July 2008. The purpose of the NPS is:

'...to state inter-related and integrated objectives and policies as to the management of Freshwater Resources as a matter of national significance that is relevant to achieving the purpose of the Act.'

In developing the NPS the Government has recognised the need for clear central government policy on freshwater management, in order to achieve the following goals:

- addressing existing and future constraints on the availability of water
- addressing effects of existing and future discharges of contaminants on fresh water
- providing more certainty with respect to competing demands for water and facilitating opportunities to increase benefits from the use of water
- meeting the community's aspirations for water that is suitable for recreation
- addressing matters of national significance relating to water, and
- improving integrated management of water by territorial authorities, regional councils and other stakeholders.

The NPS has a number of specific objectives and policies that relate to the management of water quantity. The objectives include ensuring life-supporting capacity and ecological values are protected from inappropriate taking, use, damming or diverting of fresh water, ensuring that demands for fresh water are sustainably managed (having regard to available supply, the need for resilience against the biophysical effects of climate change, and adverse effects that arise from demand) and ensuring efficient use of fresh water.

Policies 1 and 4 are of particular relevance to Environment Southland and the current review of the Regional Policy Statement. Policy 1 requires that:

'By the second anniversary of the date of commencement of this National Policy Statement, every regional council must notify, in accordance with Schedule 1 of the Act, a proposed regional policy statement or variation to a proposed regional policy statement or change to its operative regional policy statement in order that as soon as practicable thereafter every regional policy statement specifies objectives, policies and methods which –

- (a) *Determine and timetable priorities for when regional plans will set ...Environmental Flows and Levels for all Freshwater Resources of the region; and*
- (b) *Identify Notable Values (including potential values) of –*
 - (i) *Any Outstanding Freshwater Resources; and*
 - (ii) *Any Degraded Freshwater Resources; and*
- (c) *In accordance with Policy 1(a) and (b), guide and direct the setting in regional plans for all Freshwater Resources of the region of –*
 - ...
 - (ii) *Environmental Flows and Levels including for the protection of Notable Values of any Outstanding Freshwater Resources and the enhancement or restoration of Notable Values of any Degraded Freshwater Resources; and*

- ...
- (g) *Guide and direct regional plans (including considerations for the determination of resource consent applications and notices of requirement) to restrict existing takes, uses, damming and diversion of fresh water in order to sustain Notable Values and non-consumptive Tangata Whenua Values and Interests in times of low flow; and*
- ...
- (i) *Guide and direct regional and district plans (including considerations for the determination of resource consent applications and notices of requirement) to manage demands for fresh water, including demands arising from Land-use Development and discharges of contaminants, in a manner which –*
- (i) *Provides certainty to communities and water users (including as appropriate through prioritisation of allocation for takes of fresh water for reasonably foreseeable Consumptive Use); and*
 - (ii) *Provides priority for reasonably foreseeable domestic water supply, over other competing demands, provided that appropriate demand strategies are established for such supply; and*
 - (iii) *Promotes efficient Freshwater use (including through the transferability of resource consents, where appropriate); and*
 - (iv) *Increases resilience to the effects of climate change; and*
 - (v) *Controls adverse effects; and*

Policy 4 requires that:

‘When preparing a regional policy statement or variation or change to give effect to Policy 1...every regional council must consider the following:

- (a) *The Notable Values of each Freshwater Resource*
- (b) *The sensitivity of each Freshwater Resource and its Notable Values to adverse effects including effects of Land-use Development and the discharge of contaminants*
- (c) *The needs of primary and secondary industry and communities for sustainable fresh water supply*
- (d) *The contribution of existing and potential uses of Freshwater Resources and of existing economic investment to regional and national social, economic and cultural well-being*
- (e) *The importance of avoiding over-allocation of Freshwater for Consumptive Use*

Policy 2 relates to regional plans. Policy 2 requires regional councils to notify proposed regional plans (or changes or variations to existing plans) to give effect to the regional policy statement. The notified regional plans are to set Environmental Flows and Levels, and include rules requiring:

- (i) *...that all water permits for the Consumptive Use of fresh water granted after the date of commencement of this National Policy Statement include conditions for the efficient Consumptive Use of fresh water including, as a minimum, providing for the use of industry good practice and technology to achieve efficient use*

- (ii) *...that all water permits for the Consumptive Use of fresh water granted after the date of commencement of this National Policy Statement include conditions for, where appropriate, the return of fresh water to Freshwater Resources...'*

Proposed National Environmental Standard for Water Measuring Devices

In late 2006 the Ministry for the Environment commenced consultation on a proposed National Environmental Standard for water measuring devices. The standard was proposed to ensure accurate and comprehensive measurement of water taken from rivers, streams and aquifers, with the aim of understanding and improving efficiency of water use, and assisting in understanding water resources and how they respond to the abstraction of water.

The proposed standard has three parts specifying technical requirements for water measurement. First, the standard would establish minimum requirements for water measuring devices or systems to ensure that they are able to continuously measure the amount of water taken, record to an accuracy of between +/- 5% and +/- 10%, and provide output in a form suitable for electronic storage.

Second, the proposed standard recognises that installation can be as important as the device that is selected, and would require installation to comply with manufacturer's instructions, be able to measure all the water taken, and for accuracy to be verified independently at a minimum of every 5 years.

Finally, the proposed standard sets out the consent holder's responsibilities to provide regional councils with data.

As part of the development of regulations for the proposed standard exemptions for each region will be specified for the size of takes that will not have to comply with the management requirements. The proposed standard would not apply to take that are permitted activities, but would require a review of existing consents to ensure compliance with the standard within 5 years of the regulations becoming operative.

The proposed standard aligns with the issues in the existing Regional Policy Statement relating to the need to use water efficiently. Te Ao Marama has identified the need to use water efficiently as important within the context of Southland today.

Approximately two thirds of Southland's consented water takes have water measuring devices already installed, and those that don't are generally those where no significant benefits would accrue from the take being measured (because it is small for example, or non-consumptive). There is, however, an issue with the adequacy of information that is provided to Environment Southland from these water measuring devices. It is Environment Southland's intention to develop a full water metering/data logging/telemetry programme for high demand areas and the region's larger consents.

Proposed National Environmental Standard on Ecological Flows and Water Levels

The Proposed NES on ecological flows and water levels has been developed by the Government as part of the Sustainable Water Programme of Action. Ecological flows and water levels are defined as *'The flows and water levels required in a water body to provide for the ecological function of the flora and fauna present within water bodies and their margins.'* As part of consultation associated with the Sustainable Water Programme of Action three key problems were identified with ecological flows and water levels:

- '1. There remain some water bodies, principally small streams and groundwater systems, for which no specific environmental flows and water levels have been determined. The lack of an established environmental flow increases the potential for ecological (and other) values to be adversely impacted by water abstraction. Many of these water bodies are likely to come under increasing development pressure as major surface and groundwater resources reach full allocation.*
- 2. In some cases, environmental flows and water levels do not clearly define available water. This situation results in uncertainty for existing and potential users, and for wider public interests on whether the consent process will avoid adverse impacts on the ecological (and other) values of freshwater systems and on continued security of supply for water users.*
- 3. The existing process for evaluating the impacts of alternative flows and water levels on ecological values is costly and contentious. Debate regarding the selection and application of technical methods has overshadowed the more important resource management decision regarding the appropriate level of protection given to the values attributed to a water body.'*

The proposed standard therefore aims to address these problems by setting interim limits on alterations to flows and/or water levels for waterbodies where no limit has yet been set, and providing a process for selecting the technical method to be used to assess the ecological component of an environmental flow or water level.

Environmental flows and water levels have been established for the majority of ground and surface water bodies in New Zealand. In the Regional Water Plan for Southland a tiered approach is set out for establishing minimum flows and levels, and a combination of rule classifications and policy guidance are used to establish how much water can be allocated from a surface water body. Water levels for management of groundwater have not been developed for all of Southland's groundwater zones/aquifers and for these areas the National Environmental Standard may have more effect.

Te Ao Marama has noted that the National Environmental Standard is of real concern for Māori, as they consider that ecological flows only provide for instream values, they don't provide for adjacent riparian margins and wetlands, and the flora and fauna values within. Te Ao Marama notes that in Māori culture and tradition there is a whakapapa relationship not only with the instream values but also with the values contained within the riparian margins and wetlands.

Fish and Game has identified a concern with the potential for higher standards set by Environment Southland planning documents being downgraded to match the flow required by the National Environmental Standard when it becomes operative. Fish and Game considers that the Regional Policy Statement should accommodate this concern by ensuring that higher standards set in regional plans are not able to be decreased to match national standards.

3.2 Emerging regional issues

Existing water quantity issues

Relative to other areas of New Zealand, surface and groundwater resources in Southland are generally not significantly allocated. However, some catchments are considered to be fully allocated, and moderate to high levels of allocation exist in some northern Southland aquifers. In those surface water bodies where moderate levels of allocation are being reached increased information requirements are being placed on consent applicants in order to demonstrate that abstractions will cause no more than minor effects (requirements for habitat assessments for example). In areas of high demand it has been identified that Environment Southland needs to undertake some of the work to characterise the existing environment in order to address the equity issues of individual consent applicants providing information that subsequent applicants can then benefit from.

Numbers of water permits to take surface and groundwater have steadily increased over the past 10 years. Recent dry years, (particularly in the first half of 2008) in combination with land use intensification in areas where it is not traditional in Southland, have demonstrated that water allocation issues are becoming apparent in some catchments.

The potential effects on water availability as a result of climate change has also been identified as an issue, and is recognised by Environment Southland as part of the ongoing scientific investigation programme. Te Ao Marama in particular has identified a concern with the establishment of a management regime based on historical information when climate change and the effects of the Interdecadal Pacific Oscillation may mean that the information is no longer appropriate to today's climate patterns.

Southland is still in the early stages of both development and understanding of its water resources, therefore a precautionary approach to water allocation is needed where increases in allocation occur on a careful basis, consistent with the amount of information available.

The traditional approach to managing water abstraction in New Zealand is to set a fixed allocation volume for an individual water body based on an estimate of the maximum sustainable allocation for that water body. The level of confidence in this estimate depends on the level of knowledge and understanding of the water body. Generally, there is a higher level of knowledge and understanding of water bodies that have a long history of development.

For example, the aquifer systems in Canterbury, Marlborough and Tasman have a long history of development and a corresponding length of environmental monitoring record with which to correlate abstraction and any resulting environmental effects. Accordingly, fixed allocation volumes for these aquifer system can be set with a reasonable degree of confidence. In contrast, aquifer systems such as those in northern Southland, where there has been significant development of the resource over a short time period, only have a correspondingly short monitoring record, and there is currently insufficient knowledge and understanding of these aquifer systems to develop fixed allocation volumes.

In order to address the uncertainty regarding sustainable allocation volumes for the region's water bodies, a staged management approach to water allocation in Southland has been developed.

The approach maintains an appropriate level of management intervention to ensure adverse environmental effects remain within acceptable limits, while allowing progressive development of the water resource. The knowledge that is gained by the progressive development of the resource will be built into its future management. Such an approach is ideally suited to deal with the varying risk of adverse environmental effects resulting from the differing stages of resource knowledge and development in the Southland region. Fish and Game notes however that the approach taken must still be conservative and be adhered to.

Increasing demand and land use change

Intensification of land use within Southland is leading to greater demand for water (with dairy conversion, forestry conversion, nurseries and cereal cropping as examples). Aquifers in northern Southland in particular are coming under increased demands from consumptive water use, principally for irrigation needs.

Increasing allocation of groundwater is beginning to affect surface water in some areas of the region. Effects on spring fed streams in northern Southland are beginning to become apparent, as the effects of abstraction of groundwater decrease the source water for the springs. The recent drought also demonstrated that pressure on water resources is increasing to a point where, in dry periods, water availability can become a problem. Particularly affected by this are community water supply takes. With some 30 different community supplies, Southland District Council is experiencing issues in obtaining new consents for supplies, particularly in areas where irrigation permits are accounting for the majority of the allocation from groundwater aquifers. Irrigation permits could be seen as 'locking-up' the resource and leaving higher priority and higher value uses with reduced access to the resource. At present there is no mechanism within the existing Regional Policy Statement to recognise the importance of community water supplies over other uses of water, apart from re-allocating existing abstractions of water, which has significant social and economic implications. It is worth noting that the Proposed National Policy Statement on Freshwater Management does recognise the primary importance of community water supply, and would require amendments to the existing Regional Policy Statement if it is made operative in its current form. Fish and Game has

also noted that permitted use of groundwater for individual domestic needs and stock drinking water needs should also be prioritised over allocation for irrigation.

A potential emerging issue for Southland is the effects of conversion of land use to forestry. A study of paired catchments (one planted in pines, the other consisting of lightly grazed tussock grassland) in Otago has shown a potentially significant reduction in water yield from catchments with a large proportion of forestry. The Southland Water Resources Study identified that the potential reduction in available water due to forestry conversion could be higher than the total consented water abstraction in Southland at the time of the study. With the potential effects of climate change (leading to generally drier conditions) and the advent of the Emissions Trading Scheme (which will potentially lead to greater afforestation of catchments, effects on water yield from catchments, and therefore on stream flows and groundwater levels could be significant. The quantum of effects remains to be seen, a 2003 assessment of planned afforestation of an area of the upper Mataura catchment (commissioned by Environment Southland) concluded that measurable reductions in the flow of the Mataura River at Garston were extremely unlikely. This assessment was however based on a relatively small proportion of the upper catchment area being planted, larger areas of afforestation could cause more significant effects.

The recognition of the finite nature of the water resource is becoming an issue in Southland. Two rivers (the Mataura and the Oreti) now have Water Conservation Orders in force. The Mataura order restricts the volume of water that can be removed from the catchment. A number of the groundwater aquifers may be self-limiting in terms of abstraction (depending on the amount of water being sought for a particular use), so that only a finite number of bores and wells will be able to access the resource before well yields drop to a point where obtaining water is difficult. With a finite resource the cumulative effects of both consented and permitted takes becomes more important, and this has been identified as a major issue in terms of water quantity/allocation by a number of stakeholders. While the combined effect of permitted takes on water quantity is not yet measurable, it is an issue that needs to be considered, because of the cumulative effect of the total volume of water that is being abstracted in Southland. Attempts to consider cumulative effects of permitted and consented takes are being made by Environment Southland, particularly in groundwater aquifers with a high level of allocation.

Lastly, the Department of Conservation considers that the Regional Policy Statement should be refocused to take into consideration the likely pressures on water quantity/allocation as a result of the further development of industry within the region, particularly increasing demand from the energy sector and dairy farming and associated industrial processes. The Department of Conservation has suggested that the Regional Policy Statement should introduce strategies to address the competing requirements for a finite resource.

Information needs

In contrast to water quality, there is generally less information available on water quantity/allocation, particularly with respect to groundwater resources (for example in

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relation to transmissivity, hydraulic conductivity of aquifers where consent applications have not been frequently made). The level of information has increased over recent years with the establishment of a comprehensive state of the environment monitoring programme, but further information would assist in managing the availability of the water resource.

Council staff and stakeholders have identified particularly the difficulty of assessing the effects of water abstraction on spring fed watercourses, the need for more information on confined aquifers in the region (particularly with the increasing allocation of water from unconfined aquifers) and a better understanding of the effects of land use in headwater areas on water availability and water quality as areas on which more information is needed.

With demand for water increasing in northern Southland, this is one particular area that has been identified as needing better information in order to facilitate water quantity management.

Protection of ecological/environmental values

While the Regional Water Plan for Southland contains provisions relating to the setting of flow cut-offs and allocation volumes on a case-by-case basis, there are no overall catchment minimum flows or defined allocation volumes for catchments in Southland contained within the policy framework.

There are also some difficulties being experienced in implementing flow cut-offs, either physically because of the set-up of the abstraction point or the difficulty of establishing a monitoring point (for example in rivers with active beds), or because of the remote nature of monitoring points from where abstraction points are located.

Fish and Game New Zealand considers that defined allocation volumes or catchment minimum flows would be useful, but note that their development would require catchment flow modelling to establish a “natural” flow so that existing takes could be appropriately accounted for.

Efficiency of use

Throughout New Zealand there is an increased focus on the efficient use of water developing. As access to water resources decreases, efficient use allows a finite resource to be spread between more resource users. Fish and Game New Zealand note however that 100% efficiency of use would remove a built in ‘buffer’ that exists for aquatic ecosystems through the fact that not all water permits are 100% exercised, nor 100% efficient.

At the time of development of the existing Regional Policy Statement there was not a particular focus on efficiency of use of water in Southland. This has changed as demand for water has increased and groundwater and surface water resources have become more allocated. Daily and seasonal abstraction limits are now applied to irrigation takes, and

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use of water is tied to soil moisture requirements. A focus on efficiency of use is likely to continue in the future.

There has also been increasing scrutiny and media coverage of water quality and quantity issues, both within Southland and at a national level in relation to efficiency.

Administrative issues

While not specific water quantity issues, a number of administrative issues were also identified that relate to how water quantity/allocation issues are currently managed and addressed.

Many of the issues raised in relation to water quantity and the relationships necessary to address them are cross-jurisdictional. It has been suggested that the Regional Policy Statement needs to recognise this and provide for a clearer understanding of the relative roles and responsibilities of the various agencies and organisations involved in water quantity management.

The need for better integration between Environment Southland and the region's territorial authorities with respect to land development and its effects on water quantity has been identified. While not as acute as the effects of land development on water quality, effects on water quantity can still occur as a result of changing land use. The ability to undertake land use change can also be restricted due to a lack of available water. A potentially significant issue was identified by a number of Council staff and stakeholders relating to the development of the region's lignite, coal and gas resources and the possible effects of this on water availability, particularly in relation to groundwater levels and accessibility of the resource. Concerns have been expressed about the necessity for draining aquifers to enable this type of resource development to proceed, and the significant adverse effects that this could have.

The need to recognise the difference between catchments and the significance of specific waterways, particularly those of national and international significance was also raised as an issue. A possible approach to this is discussed further in section 4 of this paper.

It should be acknowledged that the Regional Policy Statement was prepared before the Regional Water Plan, and that the various amendments to the Regional Water Plan have meant that the management of water quantity has moved on since the Regional Policy Statement was first notified. It is therefore important that this is taken into account in reviewing the Regional Policy Statement and that any revisions support the advances that have been made through the Regional Water Plan.

Stakeholders have identified the need to have a Regional Policy Statement that sets timelines and performance targets for the achievement of objectives, in order to make it both practical and meaningful. Fish and Game New Zealand has also suggested the establishment of '*visionary working principles*' in the Regional Policy Statement.

3.3 Local Issues

The Southland District covers approximately 11% of the land area of New Zealand, an area of 30,753km². Of the four major catchment systems in region, the Southland District encompasses the whole of the Waiau and Aparima catchments, and the majority of the Maitai and Oreti catchments (parts of which fall within Gore District and Invercargill City boundaries). The existing District Plan has clearly identified water quality as an issue throughout the district, but water quantity has not generally been recognised as an issue in its own right.

While lower quantities of water can influence water quality, the quantity of water in rivers, streams, lakes and wetlands is also intrinsically important. Variations in surface water flows and groundwater levels can occur, affecting both instream values and the viability of consumptive uses. Pressure on these water sources for agricultural, industrial and municipal uses has been increasing since the District Plan became operative, and this has implications for agricultural, industrial and municipal water uses as well as the potential for effects on aquatic ecosystems.

Some of these issues have become more prominent over recent years, for example the increasing pressure on water quantity from intensification of land use on the Southland Plains and in Northern Southland. Currently, the District Plan has quite a permissive approach to land use change, whereby conversion of farmland from one use to another does not require any land use consent from the Southland District Council. There has been a significant increase in recent years in the number of dairy conversions, and it is expected that this trend is likely to continue.

As noted in Section 1 of this report in ‘Southland water quantity’ (pages 5 -7) Environment Southland has reported large increases in groundwater allocation (from 25,000 cubic metres per day in 1997 to over 425,000 cubic metres per day in 2007). Although all the water allocated may not be used in its entirety, these figures do indicate a significant increase in demand for water. It is important the increased demand for water and the resulting water allocation issues that have arisen are recognised as current issues, and that appropriate objectives and policies in response are formulated as part of the pending overall review of the District Plan.

The Southland District Council is required to ensure that its water supplies comply with drinking water standards. The Health (Drinking Water) Amendment Act 2007 requires compliance with set drinking water standards, whereas previously compliance with these standards was voluntary.

The Southland District Council’s Long Term Council Community Plan 2006 – 2016 (the LTCCP) notes that assessments of the performance and condition of existing water assets indicates that a number of townships within the District have medium to high risks to public health due to the absence of reticulated water supplies. These townships include Edendale, Wyndham, Browns, Drummond, Riversdale, Tokanui and Waikaia. It is noted that in some cases this risk is being addressed, such as in Edendale where a reticulated

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community water supply scheme is being progressed. For all of these communities the Southland District Council proposes the construction of reticulated community water supply schemes between 2008 and 2012. These works are required to ensure compliance with the new drinking water standards. There are a number of issues associated with new and existing water supplies.

The construction of these new reticulated water supplies will contribute to increasing pressure on water quantity within the District. For example, the majority of the households in Edendale currently source drinking water from roof water supply. The construction of a new reticulated supply for the township (likely to be sourced from groundwater) will result in a new take of significant volumes of water from groundwater, increasing the pressure on the local aquifer.

In addition, some water supply sources within the District are already under pressure from other consumptive uses, and this pressure can lead to problems for existing and proposed community water supplies. Difficulties in obtaining consent for a new deep bore water supply for Lumsden and Balfour is a relevant example of some of the difficulties being experienced. The Southland District Council's 2008/2009 Annual Plan notes that there is increasing demand for water and a need to improve the water quality in both Lumsden and the wider Lumsden/Balfour area. In 2007/2008 the Lumsden Community Board and Lumsden/Balfour Rural Water Supply Committee decided to include an additional project to locate a new deep water supply source.

The existing Lumsden/Balfour water supply is obtained from the Oreti River, but due to the shifting nature of the river bed there are problems getting sufficient water to supply the scheme. A resource consent from Environment Southland is required for the extraction of water for the proposed new scheme. The water source that was initially proposed was already fully allocated and the Southland District Council's Water and Wastewater Services Department is currently trying to locate another source. The Water and Wastewater Services Department has indicated that this has been problematic due to the demand already placed on the aquifer.

Population growth in some towns within the District (for example Te Anau) is leading to increased water demand. In recent years these communities have experienced domestic, commercial and industrial growth, and the potential for further growth needs to be considered in terms of water management decisions.

The Lumsden/Balfour, Mossburn, Riverton, Eastern Bush, Otahu Flat and Ohai Nightcaps reticulated community water supplies and others in the District that are sourced from rivers can also experience water supply problems at times of drought or flood in the region.

The Tuatapere reticulated community water supply is another township scheme that can at times be subject to low river flows. The Waiau River is the source of this water supply, and as noted in Section 1 of this paper, up to 90% of the flows in this catchment is diverted by the Manapouri Hydro-electric Power Scheme.

Southland District Council's Water and Wastewater Services Department has also indicated that the aquifer that supplies water to Riversdale via individual bores is fully allocated. Issues with this water supply could arise if increased demand arises or there is a contamination problem with the existing source.

In terms of potential content of the second-generation Southland District Plan, and changes to the Regional Water Plan and Regional Policy Statement, the Southland District Council would encourage the adoption of policies and rules that recognise the primary importance of community water supplies when making water management decisions.

Finally, there has been criticism that the District Plan provides insufficient and/or weak provisions in terms of addressing the protection of riparian margins, and there is an associated concern about lack of monitoring resources.

4. OPTIONS FOR ADDRESSING ISSUES

This section identifies potential options for addressing issues identified in section 3 of this paper.

Guidance and advice

Through its Catchment, Environmental Information and Environmental Education sections, Environment Southland provides guidance and advice to resource users within the region on a wide variety of issues. Like many regional councils around the country however, this guidance and advice tends to be more focussed on issues of water quality than on water quantity/allocation. Information is available through Environment Southland's website on river flows and rainfall, and there is good information on groundwater levels, although the Department of Conservation has suggested that detailed advice on the status of Southland's groundwater and surface water resources should be regularly updated on the Environment Southland website.

However, there appears to be a real gap in guidance and advice on water quantity and how to manage effects on water quantity arising from agricultural, industrial and municipal water use. Guidance and advice on these matters would help to raise awareness of the issues in the regional community, and (in combination with other approaches discussed below) could be used to reduce effects on water quantity.

The following are examples of the type of work that could be undertaken:

- In May 2007 Environment Southland published *Farm Dairy Effluent Best Practice Guidelines*. This contains some useful information at page 4 on minimising water use, but there is merit in considering preparing separate best practice guidelines for water use, which could cover farm dairy use, irrigation management and ways of maintaining or enhancing instream flows on properties

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- Similarly, the existing environmental farm plans that are prepared by the Catchment section of Environment Southland for properties in the region could have an expanded consideration of water use and instream flow maintenance, and field days could concentrate on water use as one component of farm management
- Environment Southland could consider working in partnership with the territorial authorities in the region to provide guidance and advice on maximising the efficiency with which the water for reticulated community water supplies is taken and used
- Similarly, partnerships could be developed with the major industries that have independent water supplies to provide guidance and advice on how to use the water as efficiently as possible and measures to protect the source water bodies. Industry codes of practice (such as the *Irrigation Design Code of Practice* developed by Irrigation New Zealand) could also be investigated for applicability and usefulness in the region.

The Southland District Council could maintain a non-regulatory approach to land use change with the potential to affect water quantity. Policy RU.3(a) of the existing District Plan, for example, seeks to encourage restoration of riparian areas by planting. The explanation to this policy states that voluntary replanting of riparian areas, particularly in native species, will be supported by the Southland District Council. Policy RU.3(a) does not specifically detail the form of this support, and any new provisions should adopt best management practices being utilised elsewhere in the country.

Other non-regulatory approaches, for example economic incentives or education programmes, could be adopted in the District Plan and promoted as an alternative to regulatory controls. At the same time, Southland District Council's monitoring resources could be increased in order to monitor and assess the performance of non-regulatory approaches, as well as to ensure that existing consent holders for activities that can impact on water quantity and quality (such as large scale gravel extractions) are meeting consent conditions.

Regulation and conditions on resource consents

The existing regulatory regime in the Water Plan sets up a hierarchy of rules for abstraction, with minor takes and continuation of some existing takes permitted, and larger takes being restricted discretionary, discretionary or non-complying depending on the level of allocation compared to the mean annual low flow (for surface water) or mean annual land surface recharge (for groundwater). The District Plan, while having no jurisdiction to impose rules relating to the taking and use of water, currently also contains no rules restricting land use change with the potential to affect water quantity.

If the level of allocation, pressure on surface or groundwater and/or effects of changing land use on flows and levels justifies it, Environment Southland and the Southland District Council could revisit the existing regulatory regime. Environment Southland's current staged approach to water allocation is considered to be an appropriate management approach, and recognises the increasing pressure on water resources by 'raising the bar' for consent applications as groundwater aquifers or surface water

catchments become more allocated. The staged approach could be refined however, for example:

- surface water can be taken at a volume of up to 10,000 litres per day and a rate of 5 litres per second, and groundwater at a volume of up to 20,000 litres per day and a rate of 2 litres per second, as a permitted activity. Environment Southland could reconsider the appropriateness of these volumes and rates, either on a region-wide basis, or in specific catchments or aquifers where existing allocation has the potential to cause adverse effects
- assessments of water use by dairy sheds or piggeries could be undertaken to ensure that water is being used efficiently, again either on a region-wide or specific catchment basis
- the majority of rivers and streams in the region don't have absolute minimum flows established and contained in the Regional Water Plan. Catchments that are under greater pressure in terms of allocation could have minimum flows specified and existing water permits reviewed to impose these flow cut-offs.

One option for addressing the effects of land use change could be for the Southland District Council to modify the regulatory regime to require a land use consent to be obtained under the new District Plan for specified land use changes. Altering the regulatory regime would provide a mechanism for conditions to be imposed relating to matters such as maintenance of riparian margins that could have positive effects on water quantity and quality.

It is interesting to note that the Department of Conservation considers that a more regulatory approach needs to be adopted in order to address its serious concerns about the cumulative effects of surface and groundwater takes, including permitted activities.

A degree of self-regulation is another option that could be considered for the management of water allocation under resource consents in particular catchments or aquifers. Some regional councils (for example Otago) have 'allocation committees' established in river catchments. These committees consist of consented water users within the catchment who are mandated by the council to manage the abstraction of water within the catchment in order to keep the flow in the river above a minimum flow. As flows in the river decrease the committees implement a rostering system to ensure an equitable sharing of the remaining resource between resource users in order to make as efficient a use of the available water as possible.

As well as some amendments to the existing regulatory framework, it is important to note that the 2005 amendments to the Resource Management Act 1991 resulted in the introduction of sections 30(1)(fa) and 30(4), which allow Environment Southland to establish water allocation rules in a regional plan. Of prime importance, section 30(4)(d) would allow Environment Southland to allocate water for specific types of activity. If it was considered appropriate, on either a catchment/aquifer or region-wide basis, Environment Southland could prioritise types of activities for allocation of water, such as reticulated community supplies. This would be one potential option for resolving

conflicts over different types of uses within catchments or aquifers that are under allocation pressure.

As part of reviewing the existing allocation/regulatory framework, further investigations and research could be carried out in particular areas of the region or with reference to particular issues, in order to inform any new policy framework. For example, in areas such as northern Southland, where demand for water is continuing to increase, further investigations of the available resource, the potential pressures on it, and ways in which this pressure can be addressed may prove useful.

While policy on efficiency of water use has been developed as part of the variations to the Proposed Regional Water Plan, a need for policy on reliability of supply criteria has also been identified.

Catchment management planning

Several of the stakeholders consulted as part of the development of this Water Quantity/Allocation Issues and Options paper suggested that catchment management planning would be an appropriate way to address many of the issues that are arising in Southland. This is an approach that is gaining increasing traction in the North Island as well, with a number of regional councils reviewing Regional Policy Statements and contemplating adopting a hybrid model where area specific as well as region-wide issues are identified and addressed.

Catchment management planning has potential advantages over the current region-wide consideration of issues, in that it can allow an integrated approach to interconnected issues of both land and water planning within a relatively restricted geographic area. Consideration of interconnected issues is not as easy on a region-wide basis because of the sheer physical size of the region and the difference in variables contributing to issues in different areas of the region. In comparison the generally reduced size of catchments (and sub-catchments for that matter) provides greater opportunities to understand the linkages between variables, such as for example land use and water yield or water abstraction and water quality, and therefore plan management approaches to address issues.

It has also been recognised however by stakeholders that constraints on Council resources mean that it is unlikely that catchment management planning can be implemented over a short time period throughout the region, and instead a priority catchment approach has been suggested, in order to address the most vulnerable catchments first.

Amendment of Water Conservation Orders

Some of the identified issues in relation to water quantity/allocation in Southland relate to the restricted availability of water under, in particular, the Maitai Water Conservation Order. The Maitai Water Conservation Order specifies that water permits cannot be issued that would result in the minimum flow above the Maitai Island road bridge falling to less than 95% of the flow in the river, nor the minimum flow below the bridge falling to less than 90% of the flow in the river. The Maitai Water Conservation Order

applies to water permits issued for both surface water and groundwater and restricts the allocation of water within the catchment (as it was designed to do) while being inconsistent with the water allocation framework adopted in the rest of the region.

One of the conclusions of the Southland Water Resources Study was that restrictions on the availability of water from the Mataura River could be addressed by seeking an amendment to the Water Conservation Order to reassess its applicability and the need for abstractive water use in the catchment. An amendment to the Order could also potentially bring some consistency to the management of surface water abstraction in the region. However, amendment of the Order is strongly opposed by Fish and Game New Zealand, which considers that the Order is functioning as intended, and restricting the abstraction of water in the catchment to protect the river ecological values, particularly the outstanding brown trout fishery and angling features. Fish and Game New Zealand considers that it would be better to examine the sustainability of land uses in the Mataura catchment that require the abstraction of water and to restrict such land uses. It is suggested that the RPS should see the Order as a mechanism to provide certainty with regard to the management of the catchment's water resources, and accept and recognise that the Mataura River is an "Outstanding Freshwater Resource".

Either of these options could potentially be considered to address water allocation pressures in the catchment for both surface water and groundwater.

5. QUESTIONS FOR DISCUSSION

Question 1 – the existing Regional Policy Statement and District Plan

What are your thoughts on the relevance of the issues identified in the existing RPS and District Plan? Are some issues more relevant now than others? Should the existing policy framework be revisited or is what we have still appropriate to manage today's issues?

Question 2 – emerging issues

Do we have a complete list of the major pressures on water quantity/allocation in Southland and have we identified all the potentially significant emerging issues? Are there other issues that are also relevant and need to be considered for Southland? How should the RPS deal with these issues – should it deliberately set out a management framework, or leave that to the Water Plan? Should the District Plan also have rules for activities that might affect water quantity? How should Southland address the matters raised in national planning instruments such as the Proposed National Policy Statement for Freshwater Management and National Environmental Standards?

Question 3 – priorities

What are the priority areas for action? Should there be an increased focus on efficient water use? Should reticulated community water supplies be given priority over other types of water use? How might we do this? Are there other areas where more guidance and information would be helpful to the Southland community?

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Question 4 – Environment Southland and territorial authorities

How might Southland councils work together to address the interconnected issues of land use and water quantity? Should the region's district and city councils develop land use controls to manage the effects of land use change on water quantity? Or should Environment Southland develop rules to manage the use of land to control effects on water quantity? Does the issue need a rule framework, or can it be effectively managed by other means (such as economic incentives or guidance and information)?

Question 5 – catchment management planning

How do you think the concept of catchment management planning might work? Would it be more effective than Environment Southland's current region-wide approach to water management?

APPENDIX 1: ANALYSIS OF EXISTING REGIONAL POLICY STATEMENT
ISSUES

Issue 1

Low flows and/or overallocation of water can result in adverse effects on aquatic ecosystems from increased concentrations of contaminants which may be present.

[Refer to Objectives 4.1 – 4.3, 5.1, 5.3; Policies 4.1 – 4.5; Methods 4.1, 4.2, 4.4 – 4.14]

This issue remains relevant today. Summer low flows in combination with non-point source discharges of nitrogen and phosphorus have led to increased algal biomass and water quality standards being exceeded in some waterways in the region, notably the Mataura River. The diversion of a significant portion of the flow in the Waiau catchment at Lake Manapouri has resulted in no further allocation of surface water or hydraulically connected groundwater from the catchment for consumptive use being likely, in order to safeguard the remaining habitat and aquatic values of the lower catchment.

The issue could be written more definitely to identify that not only can low flows and/or overallocation cause adverse effects on water quality, but that there are examples in Southland already where this does happen.

Objective 4.1: To sustain the quantity of the Region's water resources so as to –

a meet the needs of a range of uses, including the reasonably foreseeable needs of future generations

b safeguard the life-supporting capacity of water and related ecosystems.

Objective 4.1 is appropriate to address Issue 1, as by sustaining the quantity of the region's water resources sufficient water will be available to avoid adverse effects on water quality.

Objective 4.2: To manage the use and development of water and land resources so as, wherever practicable, to maintain and enhance flow regimes.

Objective 4.2 is also appropriate to address Issue 1. However, in order to truly address Issue 1, the objective could be to 'maintain at each opportunity', rather than 'wherever practicable', flow regimes. If flow regimes are not at least maintained, it will be more difficult to address the issue of declining water quality. Over recent years a greater understanding of the importance of environmental level and flow regimes (rather than solely minimum flows) and the importance of maintaining them has been gained. It may also be appropriate to include reference to allocation regimes, in order to develop a truly holistic view of a particular water resource.

Objective 4.3: To ensure the taking, use, damming and diversion of water does not compromise environmental standards established for the Region.

This objective provides a good link between water quantity and water quality by making reference to environmental standards, which typically relate to water quality. As such, it is directly applicable to addressing Issue 1.

Objective 5.1: To sustain the quality of the Region's water resources so as to:

a meet the needs of a range of uses, including the reasonably foreseeable needs of future generations

b safeguard the life-supporting capacity of water and related ecosystems.

Objective 5.1 is partially relevant to addressing Issue 1, as it relates to sustaining the quality of the region's water resources, which Issue 1 has identified as a potential problem. However, neither Objective 5.1 nor its explanation make reference to the important link between water quantity and water quality.

Objective 5.3: To ensure the taking, use, damming, diversion of water and the discharge of contaminants into water does not compromise water quality standards established for the region.

Objective 5.3 clearly recognises the interaction between water quantity and water quality by its reference to taking, use, damming and diversion of water. It is therefore a relevant objective to addressing Issue 1.

Note that Objective 4.5 (recognising the relationship of Maori with water) is also considered to be relevant to addressing Issue 1, as recognition of that relationship will require that decisions be made that take into account the importance of water quality to Maori cultural and spiritual values.

Policy 4.1: Prepare regional plan(s) to clearly identify regimes for the management of water quantity.

This policy is only partially relevant to addressing Issue 1. Identifying a regime for the management of water quantity will implicitly also take into account the effects of reduced water quantity on water quality, but a management regime will also need to be implemented and monitored to ensure that it is achieving the outcomes that are sought.

Policy 4.2: Continue to recognise and provide for minor permanent and temporary takes and uses of water, as permitted activities where there are no adverse effects.

Policy 4.2 is partially relevant to Issue 1, but does not make it explicit that adverse effects need to include those on both water quantity and water quality. Without reference to water quality it is difficult to determine how the provision of permitted activity classification for minor takes will address the issue of low flows/overallocation and their effects on water quality. Te Ao Marama has noted that the intent of the policy, in terms of only permitting activities where there are less than minor adverse effects, is supported.

Policy 4.3: Manage abstraction of water and the transferability of permits on the basis of the effects of that abstraction, or transfer, taking into account the standards set for the water body and the use to which the water is to be put.

Reference to 'standards set for the water body' makes Policy 4.3 directly relevant to addressing Issue 1. Standards are typically set to provide bottom lines for water quality, and therefore, managing abstraction of surface water and hydraulically connected groundwater taking into account the standards for a particular waterbody will ensure that sufficient flows are maintained instream to avoid or mitigate adverse effects on water quality.

Policy 4.4: Encourage the conservation of water and its efficient allocation and use.

The explanation to Policy 4.4 makes reference to ‘*the availability of water for the needs of aquatic organisms...*’. Implicitly this suggests that, by encouraging the efficient allocation of water, sufficient water will be left instream to provide for aquatic ecosystems. This would also suggest that sufficient water would then be available to avoid adverse effects on water quality.

Policy 4.5: 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 the quantity and sustainability of water in water bodies and provide for any adverse effects to be avoided wherever practicable, or remedied or mitigated.

This policy is appropriate to address Issue 1, as by ensuring that adverse effects on the quantity of water in waterbodies are avoided, remedied or mitigated, sufficient water should remain in waterbodies to avoid adverse effects on water quality.

Method 4.1: Information, education and public awareness

The method is partially appropriate to give effect to Issue 1. By providing information on the effects of activities on water quality and encouraging water conservation, it is possible that less water will need to be abstracted from rivers and streams. This would then reduce the possibility of adverse effects on water quality.

Method 4.2: Promotion (of water conservation and efficient use)

Method 4.2 is also partially appropriate to give effect to Issue 1, for the same reasons as discussed in relation to Method 4.1 above.

Method 4.4: Consultation

It is not clear how consultation will have any effect on low flows and overallocation, and therefore on water quality.

Method 4.5: Developing guidelines for resource users

The explanation to Method 4.5 notes that activities on adjacent land can affect water quantity, and that the development of guidelines will assist in minimising any potential adverse effects. If adverse effects can be minimised, then greater quantities of both groundwater and surface water are likely to be able to be retained, therefore increasing instream flows, and resulting in a lower potential for adverse effects on water quality. Method 4.5 is therefore an appropriate way of addressing Issue 1.

Method 4.6: Monitoring

Method 4.6 is of relevance in addressing Issue 1. A number of consents (for both abstractions of water and discharges of contaminants) have conditions relating to flows in surface waterbodies that control when and how the consent can be exercised. Monitoring these consent conditions is therefore essential to ensuring that water quantity and quality is maintained.

Method 4.7: Investigations and Research

Investigations and research in isolation will have no effect on water quantity and therefore quality, but have a direct impact on how activities are then managed. Method 4.7 is therefore considered to still be relevant to addressing Issue 1.

Method 4.8: Strategies

Method 4.8 is of relevance in addressing Issue 1. The development of strategies to, for example, address low flows or overallocation in a specific catchment would also address the effects of low flows/overallocation on water quantity. As it is 10 years since the Regional Policy Statement became operative, this method could be revisited and made more specific in order to direct the development of strategies for particular issues or catchments where a need has been demonstrated.

Method 4.9: Prepare, implement and administer a Regional Plan(s) for the management of water quantity which considers –

- a minimum water levels and flow regimes required to protect instream values and the aquatic environment*
- b specific reaches of rivers or streams where further abstractions will not be permitted*
- c criteria, in addition to the matters set out in Part II of the Act, to assess competing applications to take water from streams and aquifers, including their efficiency of use*
- d residual flow needs of in-stream uses and values that must be provided for when considering applications to dam or divert water*
- e conditions on permits regarding bore construction, any recording of water use and its environmental effects*
- f standards that may be required to manage the effects of discharges and land use on water quantity*
- g links between water quality, water quantity and ecosystems*
- h circumstances where minor permanent and temporary takes and uses of water are permitted activities*
- i provision for the transfer of water permits*
- j the level of in-stream flows and/or ground water volumes that are required for maintaining water supplies to settlements*
- l the means by which the cumulative effects of resource consents shall be monitored*
- m circumstances under which priorities will be assigned to new water permits*
- n criteria for assessing applications to take and use water*

The explanation to Method 4.9 notes that, ‘where necessary such plan(s) will contain management regimes for the quantity (and quality) of water’. Matter (g) of the method acknowledges the need to address the links between water quality and water quantity. Method 4.9 is therefore an appropriate way to address Issue 1. The method could however be substantially updated to reflect the various variations to the Proposed Regional Water Plan that have been undertaken in recent years, and the emerging issues for water quantity/allocation identified later in this paper. For example, in matter (a) reference could also be made to minimum groundwater levels.

Method 4.10: Prepare, implement and administer Regional and District Plans

Method 4.10 is relevant to Issue 1, but, in part, repeats Method 4.9. It is acknowledged that other regional plans that are not specific to water may contain provisions that are relevant to the management of water quantity and therefore water quality. Either the method or the explanation could be made more specific to relate it more clearly to Issue 1.

Method 4.11: Resource consents

A requirement to obtain a resource consent for an activity that will have adverse effects on water quantity is an appropriate way to address the effects that reduced quantities of water may have on water quality. Method 4.11 is therefore an effective means of addressing Issue 1. The explanation to Method 4.11 makes reference to cases where activities are likely to affect water quantity but no water related consent is needed, and suggests that it would be appropriate for bodies deciding these sorts of consents to have regard to water quantity matters. This would also be an appropriate way of ensuring that the quantity (and therefore quality) of water is sustained.

Method 4.12: Conditions on Public Works

The explanation to Method 4.12 is confusing, in that it makes reference to areas being ‘designated for public works’ and conditions being recommended ‘*outlining management practices that should be adopted to protect water quantity*’. The control of the use of land in order to avoid, remedy or mitigate adverse effects on water resources is a function of Environment Southland (under section 30 of the Resource Management Act 1991), but the functions relating to designations lie with the region’s three territorial authorities. It is considered therefore that Method 4.12 is unlikely to be effective in obtaining the desired outcomes to address Issue 1.

Method 4.13: Economic Instruments

The explanation to Method 4.13 provides an example of using tradeable water permits where water is in short supply, in order to enable conservation of water. Environment Southland has also submitted to the Ministry for the Environment with respect to the development of a National Policy Statement, identifying that resource rentals may form a useful economic instrument for the management of fresh water. If the effect of the method is that flows in rivers and streams are maintained and that therefore the quality of the water is not significantly affected, then Method 4.13 would be an effective way of addressing Issue 1. Te Ao Marama has noted that economic instruments could be contentious for Māori, as they consider that there is an ownership issue that needs to be addressed. Fish and Game has expressed concern about the practicality of tradeable water permits because of the natural variability of both the water resource and the effects of uses of that resource.

Method 4.14: Water Conservation Orders

Method 4.14 may be an appropriate way to address Issue 1. Water Conservation Orders are often focused on maintaining flows in surface waterbodies, and could therefore ensure that sufficient water was available to avoid adverse effects on water quality. However, Environment Southland has expressed its concerns about the efficiency and

effectiveness of Water Conservation Orders to the Minister for the Environment recently. Specific concerns relate to the relatively limited consultation and assessment of alternatives required, and the inflexibility of Water Conservation Orders. Other stakeholders, such as Fish and Game New Zealand, do not share these concerns and are satisfied with the existing provisions relating to Water Conservation Orders.

Issue 2

Changes in flows and levels of water can significantly affect aquatic ecosystems and the ability of ground water to recharge, or discharge.

[Refer to Objectives 4.1 – 4.3; Policies 4.1, 4.3 – 4.5, 4.7, 6.11; Methods 4.1, 4.2, 4.4 – 4.13]

Issue 2 is still relevant in Southland today. As noted above for Issue 1, summer low flows are resulting in adverse effects on aquatic ecosystems. The interaction between surface water and groundwater has also become of increasing concern to Environment Southland as demand for groundwater has increased, and effects of groundwater takes on spring-fed streams are already being experienced in the region.

Objective 4.1: To sustain the quantity of the Region's water resources so as to –

a meet the needs of a range of uses, including the reasonably foreseeable needs of future generations

b safeguard the life-supporting capacity of water and related ecosystems.

Objective 4.1 is appropriate to address Issue 2, as by sustaining the quantity of the region's water resources and safeguarding the life-supporting capacity of water and related ecosystems, effects of changes in flows and levels of water on aquatic ecosystems and groundwater can be avoided.

Objective 4.2: To manage the use and development of water and land resources so as, wherever practicable, to maintain and enhance flow regimes.

Objective 4.2 is also appropriate to address Issue 2. However, in order to truly address Issue 2, the objective could be to maintain at each opportunity, rather than wherever practicable, flow regimes. If flow regimes are not at least maintained, it will be more difficult to address the issues of effects on aquatic ecosystems and avoid effects on groundwater discharge and recharge. However, the influence of past activities such as establishment of tile drains and the deepening of stream beds needs to be acknowledged when selecting an appropriate enhancement of flow regimes.

Objective 4.3: To ensure the taking, use, damming and diversion of water does not compromise environmental standards established for the Region.

This objective is partially relevant to Issue 2. Environmental standards typically focus on water quality parameters rather than flows and levels, which is why Objective 4.3 is considered to only be partially relevant to Issue 2. For example, the standards contained in the Regional Water Plan for Southland only make reference to water quality parameters.

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Policy 4.1: Prepare regional plan(s) to clearly identify regimes for the management of water quantity.

Policy 4.1 is relevant to Issue 2, but amendment could make it more relevant and effective. Identifying a regime for the management of water quantity will identify how flows and levels of water will be managed, and therefore how significant adverse effects on aquatic ecosystems and groundwater recharge and discharge can be avoided, but a management regime will also need to be implemented and monitored to ensure that it is achieving the outcomes that are sought.

Policy 4.3: Manage abstraction of water and the transferability of permits on the basis of the effects of that abstraction, or transfer, taking into account the standards set for the water body and the use to which the water is to be put.

Policy 4.3 is relevant to addressing Issue 2. By managing abstractions in a way that is cognisant of environmental effects, significant adverse effects on aquatic ecosystems and hydraulically connected groundwater can be avoided, remedied or mitigated.

Policy 4.4: Encourage the conservation of water and its efficient allocation and use.

Conservation and efficient allocation of water implies that only the water that is needed will be taken from a waterbody. In this way, effects on flows and levels will be minimised as far as possible, and thus so will significant adverse effects on aquatic ecosystems and groundwater recharge and discharge. Policy 4.4 is therefore relevant to addressing Issue 2.

Policy 4.5: 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 the quantity and sustainability of water in water bodies and provide for any adverse effects to be avoided wherever practicable, or remedied or mitigated.

This policy is appropriate to address Issue 2. By ensuring that adverse effects on the quantity of water in waterbodies are avoided, remedied or mitigated, significant adverse effects on aquatic ecosystems and groundwater recharge and discharge will also be avoided, remedied or mitigated.

Policy 4.7: Adopt a precautionary approach in allocating ground water resources until there is a better knowledge and understanding of those resources.

Policy 4.7 is relevant to addressing Issue 2. Adopting a precautionary approach, and not allocating groundwater where there is insufficient knowledge to understand the effects, can avoid significant adverse effects on groundwater recharge and discharge, and therefore on aquatic ecosystems. It should be noted however that precautionary approaches to allocation should be reviewed regularly on the basis of new information. There have been examples in Southland of groundwater being managed on what was thought to be a precautionary basis but adverse effects are now shown to be still occurring.

Policy 6.11: Manage the effects of activities that could adversely impact on the quality and quantity of water in rivers and lakes used for public and rural water supplies, and the structures used to draw such waters.

Policy 6.11 is focused on providing for water to be available for abstraction for public supply. It is therefore not relevant to addressing the issue of significant adverse effects on aquatic ecosystems and groundwater recharge and discharge, insofar as abstracting water (for whatever purpose) may have adverse effects on these matters. Policy 6.11 also does not recognise the effects of land use on groundwater quality, which can be a significant issue in areas of Southland.

Method 4.1: Information, education and public awareness

The method is appropriate to give effect to Issue 2 and should continue. By providing information on the effects of activities on flows and levels of water, and raising public awareness of the effects of changes in flows and levels of water on aquatic ecosystems and groundwater recharge and discharge, it is possible that less water will be abstracted from rivers and streams. This would then reduce the possibility of adverse effects on aquatic ecosystems and groundwater recharge and discharge.

Method 4.2: Promotion (of water conservation and efficient use)

Method 4.2 is also appropriate to give effect to Issue 2, for the same reasons as discussed in relation to Method 4.1 above.

Method 4.4: Consultation

It is not clear how consultation will have any effect on changes in flows and levels of water, and therefore on aquatic ecosystems and groundwater recharge and discharge. The method could be clarified in order to address Issue 2.

Method 4.5: Developing guidelines for resource users

The explanation to Method 4.5 notes that activities on adjacent land can affect water quantity, and that the development of guidelines will assist in minimising any potential adverse effects. If adverse effects can be minimised, then greater quantities of water are likely to be able to be retained instream and within aquifers, and there would therefore be a lower potential for adverse effects on aquatic ecosystems and groundwater recharge and discharge. Method 4.5 is therefore an appropriate way of addressing Issue 2.

Method 4.6: Monitoring

Method 4.6 is of relevance in addressing Issue 2. A number of consents for abstractions of water have conditions relating to flows in surface waterbodies that control when and how the consent can be exercised. Monitoring these consent conditions is therefore essential to ensuring that water quantity is maintained and adverse effects avoided.

Method 4.7: Investigations and Research

Investigations and research in isolation will have no effect on flows and levels of water, but have a direct impact on how activities are then managed. Method 4.7 is therefore considered to still be relevant to addressing Issue 2.

Method 4.8: Strategies

Method 4.8 is of relevance in addressing Issue 2. The development of strategies to, for example, address changes in water levels and flows in a specific catchment or aquifer would also address the effects on aquatic ecosystems and groundwater recharge and discharge. As it is 10 years since the Regional Policy Statement became operative, this method could be revisited and made more specific in order to direct the development of strategies for particular issues or catchments where a need has been demonstrated.

Method 4.9: Prepare, implement and administer a Regional Plan(s) for the management of water quantity which considers –

- a minimum water levels and flow regimes required to protect instream values and the aquatic environment*
- b specific reaches of rivers or streams where further abstractions will not be permitted*
- c criteria, in addition to the matters set out in Part II of the Act, to assess competing applications to take water from streams and aquifers, including their efficiency of use*
- d residual flow needs of in-stream uses and values that must be provided for when considering applications to dam or divert water*
- e conditions on permits regarding bore construction, any recording of water use and its environmental effects*
- f standards that may be required to manage the effects of discharges and land use on water quantity*
- g links between water quality, water quantity and ecosystems*
- h circumstances where minor permanent and temporary takes and uses of water are permitted activities*
- i provision for the transfer of water permits*
- j the level of in-stream flows and/or ground water volumes that are required for maintaining water supplies to settlements*
- l the means by which the cumulative effects of resource consents shall be monitored*
- m circumstances under which priorities will be assigned to new water permits*
- n criteria for assessing applications to take and use water*

Method 4.9 is of direct relevance to addressing Issue 2. Matters outlined in the method to address water quantity include minimum water levels and flows, and flow needs for instream uses and values (and therefore by inference aquatic ecosystems), both of which are identified in Issue 2. The method could be improved to recognise the links between surface water and groundwater, and it should be substantially updated to reflect the various variations to the Proposed Regional Water Plan that have been undertaken in recent years, and the emerging issues for water quantity/allocation identified later in this paper.

Method 4.10: Prepare, implement and administer Regional and District Plans

Method 4.10 is relevant to Issue 2, but, in part, repeats Method 4.9. It is acknowledged that other regional plans that are not specific to water may contain provisions that are relevant to the management of water quantity and therefore water quality. Either the

method or the explanation could be made more specific to relate it more clearly to Issue 2.

Method 4.11: Resource consents

A requirement to obtain a resource consent for an activity that will have adverse effects on water quantity is an appropriate way to address the issue of changes in water flows and levels and effects on aquatic ecosystems and groundwater recharge and discharge. Method 4.11 is therefore an effective means of addressing Issue 1. The explanation to Method 4.11 makes reference to cases where activities are likely to affect water quantity but no water related consent is needed, and suggests that it would be appropriate for bodies deciding these sorts of consents to have regard to water quantity matters. This would also be an appropriate way of ensuring that water flows and levels are sustained (and adverse effects on aquatic ecosystems and groundwater recharge and discharge therefore avoided).

Method 4.12: Conditions on Public Works

The explanation to Method 4.12 is confusing, in that it makes reference to areas being ‘designated for public works’ and conditions being recommended ‘*outlining management practices that should be adopted to protect water quantity*’. The control of the use of land in order to avoid, remedy or mitigate adverse effects on water resources is a function of Environment Southland (under section 30 of the Resource Management Act 1991), but the functions relating to designations lie with the region’s three territorial authorities. It is considered therefore that Method 4.12 is unlikely to be effective in obtaining the desired outcomes to address Issue 2.

Method 4.13: Economic Instruments

The explanation to Method 4.13 provides an example of using tradeable water rights where water is in short supply, in order to enable conservation of water. If the effect of the method is that water flows and levels are maintained and that therefore aquatic ecosystems and groundwater recharge and discharge are not significantly affected, then Method 4.13 would be an effective way of addressing Issue 2. The method and explanation could be clarified to reflect this intention. However, it should be noted that Fish and Game has expressed concern about the practicality of tradeable water permits because of the natural variability of both the water resource and the effects of uses of that resource.

Issue 3

There may be conflicts in allocation of water because of competing uses including the needs of aquatic ecosystems and values. At times there is insufficient water of a suitable quality to provide for the full range of competing uses and for the ecological needs of nature.

[Refer to Objectives 4.1 – 4.5; Policies 4.1 – 4.4, 4.6, 4.7; Methods 4.9, 4.11, 4.13]

Issue 3 is still relevant in Southland, and in fact is becoming more relevant as demand for both surface water and groundwater increases. Discussions with Southland District Council have identified issues already in northern Southland with being able to obtain sufficient quality and quantity of water to service communities. Concerns were also

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expressed by a variety of stakeholders about the cumulative effects of permitted takes in relation to instream values and uses. The Consents Section at Environment Southland has identified an issue with the allocation of water versus its actual use. For example, water that is authorised to be abstracted by a consent, but which is not actually used, cannot be used by other resource users.

Conflicts in allocation, both between competing users, and between abstractions and the needs of instream values and uses will only increase as demand for water increases and availability reduces. Te Ao Marama has suggested that the issue could also be about ensuring that sufficient regard is given to alternatives.

Objective 4.1: To sustain the quantity of the Region's water resources so as to –
a meet the needs of a range of uses, including the reasonably foreseeable needs of future generations

b safeguard the life-supporting capacity of water and related ecosystems.

Objective 4.1 is appropriate to address Issue 3, as it seeks to provide for both instream values and uses, the needs of current water users, and the needs of future generations. The policies and methods proposed in order to achieve this objective will, however, be of critical importance in determining whether or not it can be achieved.

Objective 4.2: To manage the use and development of water and land resources so as, wherever practicable, to maintain and enhance flow regimes.

Objective 4.2 is partially appropriate to address Issue 3. While it recognises the need to maintain and enhance flow regimes (and therefore, by inference, maintain and enhance instream values and uses) it does not address the conflict between instream and abstractive uses and needs. Reference to abstractive needs and uses could also be included.

Objective 4.3: To ensure the taking, use, damming and diversion of water does not compromise environmental standards established for the Region.

This objective is also only partially relevant to Issue 3, as it does not acknowledge the potential conflicts between instream and abstractive uses and needs. If environmental standards were set that related to both instream and abstractive uses and needs then Objective 4.3 would wholly relate to Issue 3.

Objective 4.4: To achieve the efficient use of water extracted from water bodies.

Objective 4.4 is relevant to Issue 3. Ensuring efficient use of water that is abstracted will mean that only the volume of water necessary will be taken from the waterbody. There is therefore the potential that water would be available for other users and the ecological needs of nature that would not otherwise have been available if water was not being used efficiently.

Objective 4.5: To recognise the relationship of Maori with water.

While recognising the relationship that Māori have with water is vital in order to provide for cultural and spiritual values and to give effect to the requirements of the Resource Management Act 1991, Objective 4.5 does not serve to reduce conflicts in the allocation

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of water. The objective does not specify that the relationship of Māori with water is to be given primacy, or more priority than other needs, and is not likely to reduce conflict among water users and between water users and instream needs for a limited resource. Te Ao Marama considers that the objective should be rewritten as *To recognise and provide for the relationship of Māori and their culture and their traditions with water*, and notes that Māori consider ensuring a minimum environmental flow a 'use' for them (a responsibility that goes with kaitiakitanga). Te Ao Marama noted that there is a real concern among Māori over proposed National Environmental Standards for ecological flows (see discussion earlier in this paper) and that the whakapapa relationship that Māori have is not only with instream values but also with the values contained within riparian margins and wetlands.

Policy 4.1: Prepare regional plan(s) to clearly identify regimes for the management of water quantity.

Policy 4.1 is relevant to Issue 3, but amendment could make it more relevant and effective. Identifying a regime for the management of water quantity will identify how conflicts in allocation will be managed, but a management regime will also need to be implemented and monitored to ensure that it is achieving the outcomes that are sought.

Policy 4.2: Continue to recognise and provide for minor permanent and temporary takes and uses of water, as permitted activities where there are no adverse effects.

Policy 4.2 assists in addressing Issue 3 by outlining two types of abstractions that are to be afforded priority by being made permitted activities. Policy 4.2 is therefore relevant to Issue 3, but it is important to note that a number of stakeholders consulted with as part of the preparation of this Water Quantity/Allocation Issues and Options paper have identified cumulative effects as an increasing issue in Southland. The role of permitted takes in the occurrence of cumulative effects in a specific catchment may need to be assessed if adverse effects on water quantity are demonstrated to be occurring.

Policy 4.3: Manage abstraction of water and the transferability of permits on the basis of the effects of that abstraction, or transfer, taking into account the standards set for the water body and the use to which the water is to be put.

Managing abstraction on the basis of effects may reduce conflict between instream and out of stream values and uses of water, by affording some priority to instream values and uses if they will be significantly adversely affected, however, this type of management regime may not manage conflicts between different water users. Policy 4.3 is therefore only likely to be partially effective in addressing Issue 3.

Policy 4.4: Encourage the conservation of water and its efficient allocation and use.

Conservation and efficient allocation of water implies that only the water that is needed will be taken from a waterbody. In this way, effects on instream uses and values are recognised. As discussed above in relation to Objective 4.4, efficient use allocation and use of water can potentially spread a limited resource among more water users than would be the case if water was not used efficiently. Policy 4.4 is therefore relevant to addressing Issue 2.

Policy 4.6: Manage the Region's water resources in ways that recognise and provide for the values that Maori place on water.

Policy 4.6 is not considered to be relevant to Issue 3, for the reasons discussed above in relation to Objective 4.5.

Policy 4.7: Adopt a precautionary approach in allocating ground water resources until there is a better knowledge and understanding of those resources.

Policy 4.7 is partially relevant to addressing Issue 2. Adopting a precautionary approach, and not allocating groundwater where there is insufficient knowledge to understand the effects, will avoid conflict between instream and out of stream needs, by ensuring that only water that is definitely identified as being available can be allocated. However, Policy 4.7 will not reduce conflicts between multiple users seeking to use a resource that has been further limited by lack of information.

Method 4.9: Prepare, implement and administer a Regional Plan(s) for the management of water quantity which considers –

- a minimum water levels and flow regimes required to protect instream values and the aquatic environment*
- b specific reaches of rivers or streams where further abstractions will not be permitted*
- c criteria, in addition to the matters set out in Part II of the Act, to assess competing applications to take water from streams and aquifers, including their efficiency of use*
- d residual flow needs of in-stream uses and values that must be provided for when considering applications to dam or divert water*
- e conditions on permits regarding bore construction, any recording of water use and its environmental effects*
- f standards that may be required to manage the effects of discharges and land use on water quantity*
- g links between water quality, water quantity and ecosystems*
- h circumstances where minor permanent and temporary takes and uses of water are permitted activities*
- i provision for the transfer of water permits*
- j the level of in-stream flows and/or ground water volumes that are required for maintaining water supplies to settlements*
- l the means by which the cumulative effects of resource consents shall be monitored*
- m circumstances under which priorities will be assigned to new water permits*
- n criteria for assessing applications to take and use water*

Method 4.9 is directly relevant to Issue 3, as it specifies that criteria are to be developed to assess competing applications to take water from streams and aquifers. Method 4.9 also makes reference to protecting instream values and the aquatic environment, which could lead to conflict between different stakeholder groups. Developing a regime to manage water quantity would allow conflicts in allocation to be managed appropriately. The method could however be substantially updated to reflect the various variations to the Proposed Regional Water Plan that have been undertaken in recent years, and the emerging issues for water quantity/allocation identified later in this paper.

Method 4.11: Resource consents

Method 4.11 is an appropriate method to address Issue 3 and should be continued with. Requiring resource consents to be obtained for any takes that are of more than minor effect will allow the conflicting needs of instream and out of stream uses and values to be considered. In combination with other methods, Method 4.11 will also allow conflicts between out of stream water users to be managed.

Method 4.13: Economic Instruments

The explanation to Method 4.13 states that ‘*..in cases where water is in short supply, the use of tradeable water rights should enable conservation and efficient use of water to be achieved.*’ Both conservation and efficient use will allow a limited resource to be spread among more users than might be the case if water use was not efficient, thereby reducing allocation conflicts between abstractive water users.

Issue 4

The taking, diversion and damming of water has direct and indirect social, cultural, economic and environmental effects at local, regional and national level, in both a positive and negative way.

[Refer to Objective 4.3; Policies 4.2 – 4.4; Methods 4.1, 4.2, 4.9, 4.11 – 4.13]

Issue 4 as currently written is more a statement of fact than an issue. It is true that the taking, diversion and damming of water has direct and indirect effects in both a positive and negative way, but it is not clear what type of effects these activities have, and where specifically in Southland issues are occurring. Significant examples of negative effects are known (for example the diversion of water from the Waiau catchment for hydro-electricity generation) to stakeholders throughout the region, but are not identified specifically in Issue 4.

As a further note, whether or not positive consequences of taking, diversion and damming of water can be seen to be an ‘issue’ is also debateable. Identifying something as an issue gives rise to a clear expectation that some measures will be undertaken to address it. However, by their very nature, positive consequences do not need to be addressed, unless the issue is actually that they are not being recognised and provided for through the existing resource management framework (for example). However, Issue 4 does not currently identify that positive effects are not being appropriately recognised.

Issue 4 is not considered to be relevant or effective in its current form, and therefore a detailed analysis of the objectives, policies and methods that are referred to as addressing the issue has not been undertaken.

Issue 5

The uses to which water is put, and the manner in which the water is changed by that use, has social, cultural, economic and environmental positive and negative consequences.

[Refer to Objectives 4.1 – 4.5; Policies 4.1 – 4.8; Methods 4.1 – 4.13]

The effects of the use of water has not been identified as a relevant issue during the development of this Water Quantity/Allocation Issues and Options paper. Any adverse effects of the use of water (such as the fact that using water typically removes it from a waterbody, which has consequent adverse effects) are covered in other issues, such as Issue 2. The way in which water is changed by its use (for example becoming contaminated by its use as a potable water supply for communities and then being discharged as treated municipal sewage) is addressed by issues in the Water Quality section of the existing Regional Policy Statement. As with Issue 5, it is considered to be debateable whether the positive consequences of the use of water can be seen as an ‘issue’, unless they are not being appropriately recognised. This does not appear to be an issue in Southland presently.

Issue 5 is therefore not seen as relevant or necessary. A detailed analysis of the objectives, policies and methods that are referred to as addressing the issue has therefore not been undertaken.

Issue 6

Water quantity can be affected in both a positive and negative way by a wide range of events and activities, including:

- *natural causes, for example, earthquakes and other events blocking rivers and creating lakes, seepage, evaporation, changes in the direction of water courses, climate change*
- *building of dams*
- *diversion of water*
- *taking of water*
- *climatic conditions, for example, weather patterns and climatic cycles*
- *land use practices.*

[Refer to Objectives 4.1 – 4.4, 8.2; Policies 4.1 – 4.8, 6.10, 6.11, 15.7, 15.8, 15.19; Methods 4.1 – 4.13]

Issue 6 as currently written is more a statement of fact than an issue. It is true that water quantity can be affected, both positively and negatively by the sorts of activities and events that are listed in the issue. However, Issue 6 is not clear about whether or not in Southland water quantity is affected by these sorts of activities, which activities and events specifically are issues in relation to Southland’s water resources, and what sort of adverse effects are occurring.

As a further note, whether or not positive effects can be seen to be an ‘issue’ is also debateable. As has been noted previously in relation to Issues 4 and 5, identifying something as an issue gives rise to a clear expectation that some measures will be undertaken to address it. However, by their very nature, positive effects do not need to be addressed, unless the issue is actually that they are not being recognised and provided

for through the existing resource management framework (for example). However, Issue 6 does not currently identify that positive effects are not being appropriately recognised.

In addition, the provision of a list of ‘events’ and ‘activities’ as currently appears in Issue 6 runs the risk of not being sufficiently comprehensive or targeted to identify what the real issues for the quantity of Southland’s water are.

In order to improve Issue 6 a more detailed analysis of what are actually the activities that cause water quantity issues could be undertaken, and the issue rewritten. It may be appropriate to split the issue into a number of more specific issues, if there will be different policies and methods for addressing different activities that are causing effects.

As Issue 6 is not considered to be relevant or effective in its current form, a detailed analysis of the objectives, policies and methods that are referred to as addressing the issue has not been undertaken.

Issue 7

Current uses of water may be inefficient and wasteful.

[Refer to Objectives 4.1 – 4.4; Policies 4.1, 4.3, 4.4; Methods 4.1, 4.2, 4.5 – 4.7, 4.9, 4.13]

The majority of stakeholders spoken to in the preparation of this Issues and Options paper identified increasing demand for water as a significant issue for Southland (see also the discussion in Section 1 of this paper about Southland’s water resources). In an environment of increasing demand, the issue of efficient use of water is likely to become more and more relevant.

Inefficient and wasteful use of water causes adverse effects by unnecessarily removing water from waterbodies and thus reducing water available for instream uses and values, and results in water not being able to be used by the greatest possible number of individual uses due to waste. Wasteful use of water can also cause water quality effects, for example by creating runoff from land that then carries contamination into surface waterbodies, or by causing the leaching of contaminants through soil to groundwater.

- Objective 4.1: To sustain the quantity of the Region’s water resources so as to –*
- a meet the needs of a range of uses, including the reasonably foreseeable needs of future generations*
 - b safeguard the life-supporting capacity of water and related ecosystems.*

Objective 4.1 is not relevant to Issue 7. Sustaining the quantity of the region’s water resources does not necessarily ensure that the quantity available is used efficiently.

Objective 4.2: To manage the use and development of water and land resources so as, wherever practicable, to maintain and enhance flow regimes.

Objective 4.2 is partially relevant to Issue 7. Implicitly, managing the use of water so as to maintain and enhance flow regimes will require efficient use of that water, which would then address Issue 7. However, Objective 4.2 is not currently clear enough about the need to use water efficiently to achieve the outcome sought by the objective, and thus truly relevant to Issue 7.

Objective 4.3: To ensure the taking, use, damming and diversion of water does not compromise environmental standards established for the Region.

Objective 4.3 is not relevant to Issue 7. Ensuring that environmental standards are not compromised does not ensure that the water that is able to be taken is used efficiently.

Objective 4.4: To achieve the efficient use of water extracted from water bodies.

Objective 4.4 is directly relevant to Issue 7. Ensuring efficient use of water that is abstracted will avoid inefficient and wasteful use of water.

Policy 4.1: Prepare regional plan(s) to clearly identify regimes for the management of water quantity.

Policy 4.1 is relevant to Issue 7, but amendment could make it more relevant and effective. Identifying a regime for the management of water quantity could include reference to ensuring efficient use of water in order to be truly relevant to Issue 7, and the policy could also be amended to identify that a management regime will also need to be implemented and monitored to ensure that it is achieving the outcomes that are sought.

Policy 4.3: Manage abstraction of water and the transferability of permits on the basis of the effects of that abstraction, or transfer, taking into account the standards set for the water body and the use to which the water is to be put.

Taking into account the use to which water is to be put as part of managing abstraction of water and transferability of permits will allow the efficiency of use of the water to be assessed. Policy 4.3 is therefore relevant to addressing Issue 7.

Policy 4.4: Encourage the conservation of water and its efficient allocation and use.

Policy 4.4 is directly relevant to achieving Objective 4.4 and addressing Issue 7. Encouraging water conservation and efficient use will assist in ensuring that inefficient use and wastage of water is minimised as far as possible.

Method 4.1: Information, education and public awareness

The method is appropriate to give effect to Issue 7 and should continue. By providing information on efficient use of water, and raising public awareness of conservation and efficiency, inefficient and wasteful use can be reduced.

Method 4.2: Promotion (of water conservation and efficient use)

Method 4.2 is also appropriate to give effect to Issue 7, for the same reasons as discussed in relation to Method 4.1 above.

Method 4.5: Developing guidelines for resource users

The explanation to Method 4.5 notes that activities on adjacent land can affect water quantity, and that the development of guidelines will assist in minimising any potential adverse effects. The explanation could be expanded to note that guidelines on conservation and efficient use of water, in combination with Methods 4.1 (information, education and public awareness) and 4.2 (promotion) could help to address the issue of inefficient and wasteful use of water.

Method 4.6: Monitoring

Monitoring of water abstractions can offer indications of whether or not water is being used efficiently. For example, based on information on the area of a property that is irrigated, weather conditions, and soil moisture conditions, the volume of water abstracted can be assessed and calculations of efficiency made. Method 4.6 is therefore appropriate to address Issue 7.

Method 4.7: Investigations and Research

Investigations and research into efficient use of water can be an effective method of addressing inefficient and wasteful use of water, particularly when combined with methods such as Method 4.1 (information, education and public awareness) and Method 4.5 (guideline development). Method 4.7 is therefore appropriate to address Issue 7.

Method 4.9: Prepare, implement and administer a Regional Plan(s) for the management of water quantity which considers –

- a minimum water levels and flow regimes required to protect instream values and the aquatic environment*
- b specific reaches of rivers or streams where further abstractions will not be permitted*
- c criteria, in addition to the matters set out in Part II of the Act, to assess competing applications to take water from streams and aquifers, including their efficiency of use*
- d residual flow needs of in-stream uses and values that must be provided for when considering applications to dam or divert water*
- e conditions on permits regarding bore construction, any recording of water use and its environmental effects*
- f standards that may be required to manage the effects of discharges and land use on water quantity*
- g links between water quality, water quantity and ecosystems*
- h circumstances where minor permanent and temporary takes and uses of water are permitted activities*
- i provision for the transfer of water permits*
- j the level of in-stream flows and/or ground water volumes that are required for maintaining water supplies to settlements*
- l the means by which the cumulative effects of resource consents shall be monitored*
- m circumstances under which priorities will be assigned to new water permits*
- n criteria for assessing applications to take and use water*

Method 4.9 is directly relevant to Issue 7, particularly with respect to matter c, which requires criteria to be developed that will allow efficiency of water use to be assessed. The method could however be substantially updated to reflect the various variations to the Proposed Regional Water Plan that have been undertaken in recent years, and the emerging issues for water quantity/allocation identified later in this paper.

Method 4.13: Economic Instruments

The explanation to Method 4.13 states that ‘*..in cases where water is in short supply, the use of tradeable water rights should enable conservation and efficient use of water to be achieved.*’ Method 4.13 is therefore directly relevant to addressing the issue of inefficient and wasteful use of water.

Issue 8

Further information on the extent and state of ground water resources within the Region is required for informed decision making.

[Refer to Objective 4.2; Policy 4.7; Method 4.7]

Issue 8 remains relevant in relation to the management of water quantity in Southland, although to a lesser extent than when the existing Regional Policy Statement became operative 10 years ago. When the existing Regional Policy Statement was notified, the demand for water and the relative lack of information was not as acute as it is now, and the level of information needed was not as great. Since 2000 Environment Southland has implemented a comprehensive groundwater monitoring programme, in response to the lack of information. There is however an ongoing need to advance knowledge of the groundwater resource in Southland in order to aid decision making and the sustainable management of the resource.

Objective 4.2: To manage the use and development of water and land resources so as, wherever practicable, to maintain and enhance flow regimes.

Objective 4.2 is not relevant to Issue 8. The objective refers to maintaining and enhancing flow regimes, but does not acknowledge the need to gather further information on groundwater resources in order to enable this sort of management to occur.

It is important to note that none of the other objectives in the Water Quantity section of the existing Regional Policy Statement are considered to be relevant to Issue 8.

Policy 4.7: Adopt a precautionary approach in allocating ground water resources until there is a better knowledge and understanding of those resources.

Policy 4.7 is appropriate to address Issue 8. The policy recognises the reduced amount of information currently available on groundwater resources, and adopts an appropriate approach to managing the resource in the absence of information. The policy also recognises that over time knowledge of the resource is likely to increase. A precautionary approach will be adaptive to any increase in information over time.

Method 4.7: Investigations and Research

The explanation to Method 4.7 uses groundwater as a specific example of a resource about which there is insufficient information. Method 4.7 is fundamental to addressing Issue 8, as investigations and research are the only way to gain further information on the groundwater resource. The explanation to the method could be amended to recognise that over the last eight years considerably more information has become available, but that the state of knowledge of groundwater still lags behind that of surface water.

It should be noted that Method 4.6 (Monitoring) is also relevant to addressing Issue 8.

WATER QUANTITY/ALLOCATION

Table 1 below sets out the analysis detailed above in tabular form for ease of reference.

Table 1: Relevance of existing Regional Policy Statement policy framework

Issue	Relevant?	Relevant Objectives	Relevant Policies	Relevant Methods
1	Y	4.1, 4.2*, 4.3, 4.5, 5.1P, 5.3	4.1 ^P , 4.2 ^P , 4.3, 4.4*(?), 4.5	4.1*, 4.2 ^P , 4.3*, 4.5, 4.8, 4.9*, 4.10*, 4.11*, 4.13*, 4.14*
2	Y	4.1, 4.2*, 4.3 ^P	4.1*, 4.3, 4.4, 4.5, 4.7	4.1, 4.2, 4.5, 4.8, 4.9*, 4.10*, 4.11*, 4.13*
3	Y	4.1, 4.2 ^P , 4.3 ^P , 4.4	4.1*, 4.2, 4.3 ^P , 4.4, 4.7 ^P	4.9*, 4.11, 4.13
4	N			
5	N			
6	N			
7	Y	4.2 ^P , 4.4	4.1*, 4.3, 4.4	4.1, 4.2, 4.5*, 4.6, 4.7, 4.9*, 4.13
8	Y		4.7	4.6, 4.7

* = needs amendment in order to be completely relevant.

^P = partially relevant

There are other resource management issues contained within the existing Regional Policy Statement that were considered to be relevant to water quantity, as follows:

Takata whenua

- Issue 1* *Protection of wahi tapu*
- Issue 2* *Recognition of customary use of water and importance of wahi tapu, wahi taoka and mahika kai*
- Issue 3* *Consideration of cultural and traditional spiritual values*
- Issue 4* *Regard for kaitiakitanga*

Takata whenua issues relate to water quantity because changes in flows and levels of water in waterbodies affect the cultural and spiritual values that takata whenua associate with water, and affect their ability to exercise kaitiakitanga. These issues will be covered in greater depth in the Tangata Whenua paper.

Biodiversity

- Issue 3* *Effects on biodiversity*
- Issue 4* *Ecological effects beyond the immediate area*
- Issue 6* *Scarcity of information on the Region's ecosystems*
- Issue 7* *Lack of awareness of ecological processes and potential environmental impacts of activities*

Biodiversity issues relate to water quantity because of the significant adverse effects that reduced flows and water levels can have on aquatic ecosystems and therefore biodiversity. Biodiversity issues will be covered in greater depth in the Biodiversity paper.

Water Quality

Issue 2 Effects of water quality

Water quality and water quantity are inextricably intertwined. Reductions in the quantity of water in a waterbody can lead to effects on water quality because of a reduced assimilative capacity for discharges of contaminants. This issue has been discussed in this Water Quantity/Allocation paper, and is also covered and discussed in the Water Quality paper.

Lakes, Rivers and Wetlands

Issue 6 Changes in levels and flows can result in loss of natural character and instream values

Issue 12 Impacts of hydro-electric power generation

Issues relating to lakes, rivers and wetlands relate to water quantity because of the close connection between the flows and levels of water in rivers and lakes and the natural character and instream values of rivers and lakes. The quantity of water available in a specific waterbody has fundamental implications for the use of that waterbody for hydro-electric power generation. Issues relating to instream values have been discussed in this Water Quantity/Allocation paper. Issues relating to natural character and hydro-electric power generation will be covered and discussed in greater depth in the Energy paper and the Land Use paper.

Soils

Issue 6 Activities can have cumulative effects lower in the catchment

Land use activities can affect water quantity, by reducing or increasing the flow of water to surface waterbodies and groundwater. The issue of cumulative effects is covered and addressed both in this Water Quantity/Allocation paper and in the Land Use paper.

Built Environment

Issue 5 Cumulative adverse effects can be significant

Issue 7 Effects of the built environment

The effects of the built environment on water quantity are largely those associated with land use and its associated reduction or increase in the flow of water from off the land to surface waterbodies and groundwater. Issues associated with land use and water quantity, are covered and addressed in this Water Quantity/Allocation paper.

Natural Hazards

Issue 1 Activities can increase the risk of natural hazards

Flooding is the natural hazard most associated with issues of water quantity. Land use activities can increase the quantity and rate at which water runs off land into surface water. Issues associated with natural hazards are covered and addressed in greater depth in the Natural and Other Hazards paper.

WATER QUANTITY/ALLOCATION

Cross Boundary

Issue

Water quality and quantity

Consistency in monitoring

Natural hazards

A number of issues related to water quantity cross local authority boundaries, both within Southland (between each of the territorial local authorities) and across the regional boundary (between the three regional councils and the various territorial local authorities). An issues and options paper specifically relating to Cross Boundary Issues has not been prepared, however a number of the issues are covered and addressed in other papers, such as the Natural Hazards and Water Quality papers. In addition, Cross Boundary issues will be considered in greater detail as part of consultation with key stakeholders during the RPS review process.

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