

Notes for track changes. Recommendations made by the Historic Heritage officer are shown in **Blue**. Recommendations made by the Water officer are shown in **Green**. Changes shown in **Red** are draft Mighty River Power changes. Sentences shown in ~~black~~ strikethrough or are recommended within the Beds of Rivers and Lakes officer's report to be relocated to other parts of the document, those sentences that have been relocated are shown in black underline. Words recommended to be added are shown in underline, words recommended to be removed are shown in ~~strike through~~

Terms defined within the Proposed One Plan Glossary are *italicised* and marked with an asterisk (\*) symbol. Terms defined in the Resource Management Act 1991 are *italicised* and marked with a caret (^) symbol.

## 6 Water

### 6.1 Scope and Background

#### 6.1.1 Scope

This chapter addresses the management of fresh water in the Manawatu-Wanganui Region. It covers:

- **Wwater Mmanagement Ssub-zones\*<sup>1</sup> and values** – the establishment of Wwater Mmanagement Ssub-zones\*<sup>1</sup> and associated water management values for each sub-zone<sup>1</sup>, for the purpose of managing water quality, water quantity and activities in the beds of rivers and lake beds.
- **Surface water quality** – the establishment of water quality standards for rivers and lakes water bodies,<sup>2</sup> in order to give effect to the values, together with a policy regime of maintaining water quality in those Wwater Mmanagement Ssub-zones\*<sup>1</sup> that meet their water quality standards, and improving water quality over time in those Wwater Mmanagement Ssub-zones\*<sup>1</sup> that do not.
- **Groundwater quality** – the maintenance of existing groundwater quality to maintain its existing and future uses and values.
- **Discharges and land- use activities affecting water quality** – the management of discharges into surface water, discharges onto or into land, and diffuse run-off and other land- use activities affecting surface water and groundwater quality.
- **Surface water quantity and allocation** – the establishment of minimum flows and allocation regimes for rivers, and the management of water takes and other activities affecting surface water quantity.
- **Groundwater quantity and allocation, and bores\*** – the establishment of Ggroundwater Mmanagement Zzones (GWMZs)\* and Ggroundwater Mmanagement Sub-zones, identification of respective allocable volumes and the active management of groundwater takes.
- **Beds of rivers and lakes** – the management of activities that disturb the beds of rivers and lakes, the management of existing and new structures in the beds of rivers and lakes, and the establishment of sustainable gravel extraction limits for rivers.

<sup>1</sup> Consequential changes as a result of changes to Schedule D

<sup>2</sup> Water officers report – recommendation WTR 6

The effects of hill country erosion on water quality are addressed in Chapter 5. The ecological impacts of takes, diversions, discharges and drainage on *rare habitats*<sup>3</sup>, ~~and~~ *threatened habitats*<sup>\*</sup> and *at-risk habitats*<sup>\*</sup> are addressed in Chapter 7.

### 6.1.2 Overview

Water is critical for life to exist. People living in the Manawatu-Wanganui Region enjoy a temperate climate, a large number of rivers, streams and lakes and an extensive groundwater system. The Region does not experience the severity of droughts that impact on some other parts of New Zealand and generally there is enough water to meet everyone's needs. People have grown up with an expectation of<sup>4</sup> access to clean, safe water. But ready access means that water has not always been valued highly. The health of the surface water resource has steadily declined in most catchments as a result.

Despite this decline, there has been a revolution around water in the past few decades. In response to public concerns, significant improvements have been made to the quality of discharges from towns and industrial *sites*<sup>\*</sup>. For example, ~~raw untreated~~<sup>4</sup> sewage is no longer discharged directly into waterways bodies, and rivers no longer ~~run red from the~~ receive<sup>4</sup> blood discharged from freezing works. Many former discharges to water, particularly discharges of dairy shed effluent, are now discharged to land. New large water takes, such as those associated with hydroelectric development, are carefully managed to ensure that the downstream needs of people and ecosystems are catered for. Although there have been substantial improvements in the quality of point source discharges to water, ~~some~~ improvement is still possible and is necessary.

There has been a substantial intensification within the agricultural sector in recent years. This has contributed to a vibrant and booming regional economy but has also increased pressure on ~~our~~ the Region's water resources. There has been a significant increase in irrigation demand and the amount of nutrients leaching to surface water and groundwater. Although the impacts of agricultural intensification are less obvious than those caused by the major point source discharges and abstractions mentioned above, they have increased progressively over time.

As ~~our~~ the Region has grown, we have significantly altered the physical nature of many of ~~our~~ its waterways bodies with structures, drainage and flood protection works, particularly in the Manawatu Plains. These changes have led to a poor and declining state of physical health in ~~our~~ the Region's water ~~ways bodies~~.

The impact of discharges and run-off on water quality and the increasing demand for water abstraction are two of the four most critical issues addressed in this Plan.

### 6.1.3 Water Quantity

The demand on surface water and groundwater resources is one of the most critical issues addressed in this Plan.

Water from the two main fresh water sources within the Region – surface water (rivers and lakes) and groundwater – is abstracted for a variety of uses, including drinking water supply, stock ~~watering~~ supply, irrigation, electricity generation and industrial use.

The single largest user of water in the Region is the energy sector. Hydroelectric power generation takes are concentrated around Mount Ruapehu and on the

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<sup>3</sup> Consequential change as a result of the Provisional Determinations

<sup>4</sup> Water officers report – recommendation WTR 8

Mangahao River. The amount of water used for power generation has not changed significantly in the past decade, although there is potential for more hydroelectricity generation in the Region over the next decade.<sup>5</sup> The take and use of water for power generation has the potential to create significant benefits, as is recognised in Chapter 3. Further water takes for hydro-electricity can differ from other takes in that the takes can be non-consumptive. In this regard the water can be returned to the same catchment and remains available for environmental values and down stream users.

In contrast, other uses have steadily increased over the past few decades in response to towns growing, stock numbers increasing, and the establishment of industrial plants. In recent years there has been a dramatic increase in water demand. From 1997 to 2004, consented groundwater takes almost doubled and consented surface water takes more than doubled (Table 6.1).

**Table 6.1** Change in consented water abstraction volumes from 1997 to ~~2004~~ 2009,<sup>5</sup> excluding hydroelectric power generation<sup>5</sup>

Source	Sector	1997 to 2004 percentage change in consented water takes		
		1997 (m <sup>3</sup> /d)	2004 (m <sup>3</sup> /d)	Increase (%)
Groundwater	All Sectors	287,000	425,000	+45%
Surface water	Agriculture	70,668	291,949	+313%
	Industry	38,835	56,003	+44%
	Water supply	162,024	219,088	+34%
	All Sectors	271,527	567,040	+108%

Total volume	Surface/ riparian (m <sup>3</sup> /day)	Groundwater (m <sup>3</sup> /day)	Total Surface water plus groundwater (m <sup>3</sup> /day)
1997	271,527	290,172	561,699
2004	567,040	426,267	993,307
2009	616,620	537,179	1,153,799
<b>Total increase 1997-2007</b>	345,093	247,008	592,101

The greater the amount of water taken from a waterway body, the greater the potential impact on instream life, recreational activities (including<sup>5</sup> fishing and swimming), cultural/spiritual values and the ability of the water body way to assimilate waste\*. Even more important than the volume of water abstracted is the timing of abstraction. Rivers in the Region experience natural low flows during summer, which coincides with the period of greatest demand. The taking of water during winter higher flows generally has little impact, ~~but even small takes during summer low flow conditions can have major impacts and measures which avoid the adverse effects from takes during the more critical summer low flow conditions should be encouraged. Maintaining natural flow variability is important for the habitat requirements of fish species, natural character and water quality~~<sup>5</sup>. The ever-increasing demand on ~~the Region's~~ our surface water resource means that ~~we must manage it must be managed~~ to ensure that the water taken is used efficiently, and is therefore available to as many users as possible.

<sup>5</sup> Water officers report – recommendation WTR 9

Groundwater monitoring indicates that groundwater levels are stable and research indicates that there is sufficient water for all users at a regional scale. A recent increase in large groundwater takes along the west coast has raised the potential for saltwater intrusion. This occurs when enough water is removed from an aquifer to allow seawater to migrate inland. Groundwater contaminated with saltwater is no longer suitable for irrigation or as stock water. Seawater-contaminated groundwater will clear with time, but the timescale is measured in centuries.

The high density of bores\* in some areas has caused localised problems. These include:

- (a) impacts on other groundwater users. Allowing too many new users to access the groundwater resource will impact on the amount that is available to existing users and can affect the ability of existing bores\* to draw water.
- (b) impacts on groundwater-fed streams, lakes and wetlands. Many of the streams, lakes and wetlands along the west coast of the Region ([e.g. Lakes Papaitonga and Horowhenua](#))<sup>5</sup> are dependent upon groundwater. Groundwater is particularly important during summer, as it may be the only source of inflow.

Bores\* are the main means of accessing groundwater resources. They provide the principal way of studying the subsurface environment by enabling sampling of subsurface geology, allowing direct measurement of groundwater levels and quality and allowing testing of aquifer yields. This Plan adopts the NZS 4411:2001 Environmental Standard for Drilling of Soil and Rock in its entirety for the management of bores\* (design, drilling, completion, development, testing, maintenance\*, cleaning/disinfection, record keeping and decommissioning).

The take and use of water for power generation has the potential to create significant benefits, as is recognised in Chapter 3. Further, water takes for hydro-electricity can differ from other takes in that the takes can be non-consumptive. In this regard the water can be returned to the same catchment and remains available for environmental values and downstream users.

#### 6.1.4 Water Quality

There is significant variation in water quality across the Region. Streams and rivers emerging from the mountains or areas that have retained their original vegetation cover tend to have very good water quality. The one exception to this is the Whangaehu River, ~~which that~~ flows from the crater lake on Mt Ruapehu. It is naturally acidic and contains high levels of sulphur and heavy metals.

As waterways bodies flow towards the sea, they pick up sediment and nutrients from the surrounding land. As would be expected, water quality in the lower reaches of rivers and streams is poorer than in the headwaters.

In the past, the biggest threats to water quality were municipal (e.g. sewage), industrial (e.g. meat works and fellmongers) and agricultural (dairy shed effluent) discharges. Although considerable improvements have been made to discharges to water, further ~~measures are~~ improvement is still possible and necessary.<sup>6</sup>

The intensification in agriculture during the past 10 to 15 years has been especially marked in the dairy sector. Raising stock numbers increases the quantity of dairy shed effluent requiring disposal, the quantity of stock urine produced (a concentrated source of nutrients), and the opportunities for stock to access waterways bodies. The agricultural sector is recognising the impact it is

<sup>6</sup> Water officers report – recommendation WTR 10

having on the nation's New Zealand's waterways bodies and has started to act. The dairy sector was the first to respond, with the Dairying and Clean Streams Accord, (an agreement between Fonterra, the Ministry for the Environment, Regional Councils and others on an approach to enhance water quality). However, the results of These voluntary approaches are not being seen, are one mechanism to assist with the as lowering of nutrient or faecal levels in the water bodies rivers and further improvements are needed.<sup>6</sup>

Groundwater quality within the Region varies according to both depth and location. Generally, deeper groundwater is of higher quality. For example, shallow groundwater within the Horowhenua District near Levin has high concentrations of nitrates, which are believed to be the result of septic tank discharges and *fertiliser*\* use on market gardens. There have been no significant changes in groundwater quality over the length of the Regional Council's monitoring record (more than 15 years). There is no evidence that groundwater quality is deteriorating.

The overall state of fresh water quality in the Manawatu-Wanganui Region is as follows:

- (a) The middle reaches of many rivers are unsafe to swim in because of bacterial contamination, or are unpleasant to swim in because of slime (periphyton) growth (Figure 6.1). Elevated nitrate and phosphate levels promote slime growth. The slime also impacts on fish and instream invertebrate communities.
- (b) The lower reaches of many rivers have high concentrations of bacteria, nitrates, phosphates and sediments, and these levels are increasing.
- (c) There is minimal contamination of surface water from heavy metals, hydrocarbons and other toxic substances.
- (d) The quality of groundwater in the Region is generally suitable for stock needs and irrigation, with a low sodium hazard and a low-medium salinity hazard.
- (e) Nitrate levels are high in shallow groundwater in parts of the Region, but the levels have not changed during the period of monitoring.
- (f) Groundwater is free of herbicides and pesticides.

### 6.1.5 River and Lake Beds

People have always been attracted to rivers and lakes to live, work and play. Despite the economic, cultural, social and environmental importance of rivers and lakes, many of the waterways bodies in the Region have been highly modified over the years. Works to control flooding and erosion, dams, and diversions for hydroelectricity generation can be large scale and have significant effects on the physical nature of our waterways bodies. Smaller-scale changes like river crossings and small dams can have negative cumulative impacts. Urban expansion often alters watercourses. Gravel extraction, when not managed well, can lead to increased flooding and erosion risk.

This modification has contributed to the economic growth and wellbeing of our Region, but it has also negatively altered the character and ecology of most waterways bodies in the Region, impacting on cultural values attributed to waterways bodies and leading to the loss or fragmentation of indigenous plant and animal populations. Both the positive and adverse effects of such modification are recognised and provided for in the Plan.

## 6.2

### Significant Resource Management Issues

#### Issue 6-1: *Water quality*

The quality of most many<sup>7</sup> rivers and lakes in the Region has declined to the point that ecological values are compromised and contact recreation such as swimming) is considered unsafe. The principal causes of this degradation are:

- (a) nutrient enrichment caused by run-off and seepage leaching<sup>7</sup> from agricultural land, discharges of treated wastewater, and septic tanks
- (b) high turbidity and sediment loads caused by land erosion, river channel erosion, run-off from agricultural land and discharges of stormwater
- (c) pathogens from agricultural run-off, urban run-off, discharges of sewage, direct stock access to water bodies and discharges of agricultural and industrial waste\*.

Shallow groundwater in areas of intensive rural subdivision and horticulture in the Horowhenua and Tararua districts has elevated nitrate levels in excess of the New Zealand drinking water standard. However, the quality of groundwater in the Region is generally suitable for stock needs and irrigation, and there has been no evidence of deteriorating groundwater quality during the past 15 years.

#### Issue 6-2: *Water quantity and allocation*

The use of both surface water and groundwater is important to the economic, social and cultural well-being of the region. The use of the region's water can also have national benefits, e.g. in relation to electricity generation. Our water use has increased dramatically during the last decade. The demand for surface water in the Ohau, Oroua and parts of the upper Manawatu catchments already exceeds supply, and other catchments are experiencing marked increases. This increased demand has the potential to have adverse effects on both instream values and the natural character of streams, rivers and wetland and lakes, if not managed.<sup>8</sup> The amount of groundwater is generally capable of meeting demand within the Region, although there is a need to actively manage effects between *bores\** at a local level, the effects of bores\* on surface water,<sup>8</sup> and to be vigilant about the risk of saltwater intrusion along the west coast.

#### Issue 6-3: *River and lake beds*

The demand for flood and erosion control to protect many types of land use has led to significant modification of the Region's waterways bodies.<sup>9</sup> Structures required to be located within the beds of rivers and lakes, including bridges, culverts, water intake and discharge pipes and hydroelectricity structures, also affect the natural character of waterways bodies. These types of uses and developments, in conjunction with gravel extraction which while having beneficial effects in terms of community well-being, e.g. through flood mitigation<sup>9</sup> and electricity generation, have modified, and continue to modify the physical characteristics and ecology of many of the Region's waterways bodies.<sup>9</sup>

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<sup>7</sup> Water officers report – recommendation WTR 13

<sup>8</sup> Water officers report – recommendation WTR 14

<sup>9</sup> Water officers report – recommendation WTR 15



## 6.3

### Objectives

#### Objective 6-1: *Water*<sup>^</sup> management values

Surface water *bodies*<sup>^</sup> ~~are is~~ managed in a manner which ~~sustains safeguards~~<sup>10</sup> ~~their its~~ life-supporting capacity and ~~recognises and provides for which avoids, remedies or mitigates adverse effects on~~ the values set out in Schedule ~~DBa by 2030~~.

#### Objective 6-2: *Water*<sup>^</sup> quality

- (a) Surface *water*<sup>^</sup> quality is managed to ensure that:
- (i) *Water*<sup>^</sup> quality is maintained ~~or enhanced~~ in ~~those rivers water bodies~~<sup>^</sup> ~~where the existing water quality is sufficient to at a level which supports the values of the river water bodies~~<sup>11</sup>
  - ~~(ii) water quality is enhanced in those rivers where the existing water quality is not sufficient to support the values of the river~~<sup>11</sup>
  - (iii) accelerated eutrophication ~~or and~~<sup>11</sup> sedimentation of *lakes*<sup>^</sup> in the Region is prevented or minimised
  - (iv) the special values of *rivers*<sup>^</sup> protected by *Water Conservation Orders*<sup>^</sup> ~~and local water conservation notices~~<sup>11</sup> are maintained.
- (b) Groundwater quality is managed to ensure that ~~the existing~~ groundwater quality is maintained ~~to preserve its existing and future uses and values~~<sup>11</sup>.

#### Objective 6-3: *Water*<sup>^</sup> quantity and allocation

Water *quantity* is managed to enable people, industry (~~including renewable energy generators~~) and agriculture to take and use water to meet their reasonable needs while ~~ensuring that providing for the following~~:

- (a) For surface water:
- (i) Minimum flows and allocation regimes are set for the purpose of maintaining ~~or enhancing~~ the existing life-supporting capacity of ~~rivers waterbodies~~ and providing ~~appropriately~~ for other ~~identified~~ values of ~~rivers as necessary waterbodies~~.
  - (ii) In times of water shortage, takes are restricted to those that are essential to the health or safety of people, communities or stock ~~for drinking water~~, and other takes are ceased.
  - (iii) The amount of water taken from lakes does not compromise their existing life supporting capacity.
  - (iv) The requirements of *Water Conservation Orders* ~~and Local Water Conservation Notices~~ are upheld.
- (b) For groundwater:
- (i) Takes do not cause a significant ~~adverse~~ effect on the long-term groundwater yield.
  - (ii) Groundwater takes that are hydrologically connected to rivers, lakes or wetlands are managed within the minimum flow and allocation regimes established for those waterbodies, or to protect their life-supporting capacity.

<sup>10</sup> Water Officer's Report – recommendation WTR16

<sup>11</sup> Water officers report – recommendation WTR17

- (iii) The effects of a groundwater take on other groundwater takes are managed and shall not reduce the amount of water that would otherwise be available for electricity generation
  - (iv) ~~Sal~~Seawater intrusion into coastal aquifers, induced by groundwater takes, is avoided.
- (c) In all cases, water is used efficiently.

#### **Objective 6-4: River^ and lake^ beds^**

All ~~significant~~<sup>12</sup>significant values of the beds^ of rivers^ and lakes^ ~~beds~~ are recognised and provided for, including enabling future use and development of the beds^ of rivers^ and lakes^ ~~beds, provided other values of the river^ or lake^ are not compromised.~~

## **6.4 Policies**

### **6.4.1 Water Mmanagement framework Zones and Values<sup>13</sup>**

#### **Policy 6-1: Water management framework zones and values<sup>13</sup>**

~~For the purposes of managing water quality, water quantity, and activities in the beds of rivers and lakes, the rivers and lakes waterbodies in the Manawatu-Wanganui Region have been divided into the water management sub-zones shown in Schedule D. The rivers and lakes waterbodies shall be managed in a manner which recognises and provides for the values identified in Schedule D for each water management sub-zone. The values and their associated purposes are set out in Table 6.2.~~

For the purpose of safeguarding the life-supporting capacity of water bodies^ and to avoid, remedy or mitigate adverse The environmental effects^ of activities on water^ quality, water^ quantity and the beds^ of rivers^ and lakes^, water bodies^ in the Manawatu-Wanganui Region shall be managed in accordance with the following framework:

- (i) The Water Management Zones\* and Water Management Sub-zones\* and Groundwater Management Zones defined in Schedule Ba, Part Ba1 shall be used as one of the units for ~~integrated management of describing the values of water bodies and establishing the status of activities which effect water bodies^~~
- (ii) The environmental effects of activities on water bodies will be assessed at the scale appropriate to the proposal, including specific sites and reaches within a water-bodies, the water management sub-zones and catchment- or region-wide;
- (iii) Water bodies^ shall, where appropriate, be managed in a manner that recognises and provides for the surface water^ management values defined in Schedule Ba, Part Ba2;
- (iv) Surface water^ quality shall, where appropriate, be managed according to the standards set in Schedule D, which provide for the values defined for each Water Management Sub-zone\*;

<sup>12</sup> Water officers report – recommendation WTR 19

<sup>13</sup> Water officers report – recommendation WTR 23



(v) Surface water<sup>^</sup> allocation shall, **where appropriate**, be managed according to the minimum flows and allocation limits set in Schedule B, Table B1, for each Water Management Sub-zone\* and groundwater shall, **where appropriate**, be managed according to the allocation limits set in Schedule C for each Groundwater Management Zone'

**Table 6.2** Water Management Values and Purposes

Value Group	Individual values		Management Objective
<b>Ecosystem</b>	NS	Natural State	The <i>water_body^</i> is maintained in its natural state
	LSC	Life-supporting Capacity	The <i>water_body^</i> supports healthy aquatic life/ecosystems
	SOS-A	Sites of Significance - Aquatic	Sites of significance for native aquatic biodiversity are maintained or improved
	SOS-R	Sites of Significance - Riparian	Sites of significance for native riparian biodiversity are maintained or improved
	NFS	Native Fish Inanga <sup>1</sup> Spawning	The <i>water_body^</i> sustains healthy native fish inanga spawning and fry egg development <sup>1</sup>
<b>Recreational and Cultural</b>	CR	Contact Recreation	The <i>water_body^</i> is suitable for contact recreation
	AM	Amenity	The amenity values of the <i>water_body^</i> and its margins are maintained or improved
	NF	Native Fishery	The <i>water_body^</i> sustains populations of native fish that can be harvested in a sustainable manner
	MAU	Mauri*	The mauri* of the <i>water_body^</i> is maintained or improved
	SG	Shellfish Gathering	<del>The <i>waterbody^</i> is suitable for shellfish harvesting</del>
	SOS-C	Sites of Significance - Cultural	Sites of significance for cultural values are maintained
	TF	Trout Fishery	The <i>water_body^</i> sustains healthy rainbow and/or brown trout fisheries
	TS	Trout Spawning	The <i>water_body^</i> meets the requirements of rainbow and brown trout spawning and larval and fry development
	AE	Aesthetics	The aesthetic values of the <i>water_body^</i> and its margins are maintained or improved
<b>Water Use</b>	WS	Water <sup>^</sup> Supply	The <i>water_body^</i> is suitable as a raw drinking water <sup>^</sup> source for human consumption
	IA	Industrial Abstraction	The <i>water_body^</i> is suitable as a water <sup>^</sup> source for industrial abstraction
	I	Irrigation	The <i>water_body^</i> is suitable as a water <sup>^</sup> source for irrigation
	S	Stockwater	The <i>water_body^</i> is suitable as a supply of drinking water <sup>^</sup> for livestock
<b>Social/Economic</b>	CAP	Capacity to Assimilate Pollution	The capacity of a <i>water_body^</i> to assimilate pollution <del>is not exceeded</del> without compromising the ecosystem, recreational, cultural and water <sup>^</sup> use values. <sup>1</sup>

Value Group	Individual values		Management Objective
	FC	Flood Control <u>and</u> <u>Drainage</u> <sup>1</sup>	The integrity of existing flood and riverbank erosion protection <u>structures</u> ^ is not compromised
	D	Drainage	The integrity of existing drainage <u>structures</u> ^ is not compromised
	EI	Existing <u>Infrastructure</u> ^	The integrity of existing <u>infrastructure</u> ^ is not compromised

## 6.4.2 Water Quality

### 6.4.2.1 Surface Water Quality

#### ~~Policy 6-2: Water quality standards~~

~~Water quality standards relating to the values described in Policy 6-1 have been developed for each water management zone\*, as shown in Schedule D. The water quality standards in Schedule D shall be used for the management of surface water quality in the manner set out in Policies 6-3, 6-4 and 6-5.~~<sup>13</sup>

#### **Policy 6-3: Ongoing compliance where water^ quality standards are met**

- (a) In each case where the existing water^ quality meets the relevant water^ quality standard within a Wwater Mmanagement Ssub-zone\*, as shown in Schedule ~~D~~B, activities shall be managed in a manner which ensures that the water^ quality standard continues to be met, as far as reasonably practicable, or otherwise any adverse effects are appropriately remedied, mitigated or off-set to ensure no net loss in relation to water quality.
- (b) For the avoidance of doubt, subsection (a) applies:
  - (i) in circumstances where the existing water quality of a Wwater Mmanagement Ssub-zone\* meets all of the water^ quality standards for the Ssub-zone (in which case subsection (a) applies to every water^ quality standard for the Ssub-zone)<sup>1</sup>
  - (ii) in circumstances where the existing water^ quality of a Wwater Mmanagement Ssub-zone\* meets some of the water^ quality standards for the Ssub-zone\* (in which case subsection (a) applies only to those standards met).<sup>1</sup>

#### **Policy 6-4: Enhancement where water^ quality standards are not met**

- (a) In each case where the existing water^ quality does not meet the relevant water^ quality standard within a Wwater Mmanagement Ssub-zone\*, as shown in Schedule D, activities shall be managed in a manner which as far as reasonable practicable, maintains or enhances existing<sup>14</sup> water^ quality in order to meet the water^ quality standard for the Wwater Mmanagement Ssub-zones\* shown in Schedule D.
- (b) Where it is not reasonably practicable to maintain or enhance existing water quality, any significant adverse effects on water quality shall be appropriately remedied, mitigated or off-set to ensure no net loss in relation to water quality.
- (c) For the avoidance of doubt, subsection (a) applies:

<sup>14</sup> Water officers report – recommendation WTR 266

- (i) in circumstances where the existing water quality of a Wwater Mmanagement Ssub-zone\* does not meet any of the water quality standards for the sub-zone (in which case subsection (a) applies to every water quality standard for the sub-zone)<sup>1</sup>
- (ii) in circumstances where the existing water quality of a Wwater Mmanagement Ssub-zone\* does not meet all of the water quality standards for the sub-zone (in which case subsection (a) applies only to those standards not met).<sup>1</sup>

**Policy 6-5: Management of activities in areas where existing water quality is unknown**

- (a) In each case where there is insufficient data to enable a comparison of the existing water quality with the relevant water quality standard as shown in Schedule D, activities shall be managed in a manner which:
  - (i) as far as reasonably practicable maintains or improves enhances<sup>15</sup> the existing water quality
  - (ii) where it is not reasonably practicable to maintain or enhance existing water quality, any significant adverse effects on water quality shall be appropriately remedied, mitigated or off-set to ensure no net loss in relation to water quality.
  - (iii) has regard to the likely effect of the activity on the values identified for the relevant Wwater Mmanagement Ssub-zone\*
  - (iv) has regard to relevant information about the existing water quality in upstream or downstream Wwater Mmanagement Ssub-zone\*, where such information exists.
- (b) For the avoidance of doubt, subsection (a) applies:
  - (i) in circumstances where there is insufficient data to enable a comparison of the existing water quality with any of the water quality standards for a Wwater Mmanagement Ssub-zone\* (in which case subsection (a) applies to every water quality standard for the sub-zone)<sup>1</sup>
  - (ii) in circumstances where there is insufficient data to enable a comparison of the existing water quality with all of the water quality standards for a Wwater Mmanagement Ssub-zone\*<sup>1</sup> (in which case subsection (a) applies only to those standards with insufficient data).

**6.4.2.2**

**Groundwater Quality**

**Policy 6-6: Maintenance\* of groundwater quality**

- (a) Discharges and land-use activities shall be managed in a manner which maintains ~~the existing~~ groundwater quality to preserve its existing and future uses and values
- (b) Groundwater takes in the vicinity of the coast shall be managed in a manner which avoids saltwater intrusion.
- (c) On-site wastewater systems shall be designed to minimise potential adverse effects on the groundwater quality, particularly within areas with degraded groundwater quality.<sup>16</sup>

<sup>15</sup> Water officers report – recommendation WTR 27

<sup>16</sup> Water officers report – recommendation WTR 28

### 6.4.2.3

## Discharges and Land<sup>^</sup> use Activities Affecting Water<sup>^</sup> Quality

### Policy 6-7: Land<sup>^</sup>-use activities affecting surface water<sup>^</sup> quality

#### (a) Nutrients

- (i) Intensive farming land<sup>^</sup> use activities shall be regulated in targeted W-water Mmanagement Ssub-zones\*.<sup>1</sup>
- (ii) For the purposes of subsection (a)(i), targeted W-water Mmanagement Ssub-zones\* shall be those sub-zones where, collectively, intensive farming land<sup>^</sup> use activities are the predominant cause of elevated nutrient levels.<sup>1</sup>
- (iii) Those persons carrying out intensive farming land<sup>^</sup> use activities in the W-water Mmanagement Ssub-zones\*<sup>1</sup> targeted in subsection (a)(i) shall be required, amongst other things, to prepare a nutrient management plan for the purposes of:
  - (1) establishing the measures required to achieve the target contaminant<sup>^</sup> loading rates for the relevant W-water Mmanagement Ssub-zones\*<sup>1</sup>, as specified in Schedule DBa
  - (2) identifying best management practices
  - (3) establishing programmes for implementing any required changes.

#### (b) Faecal contamination

- (i) Intensive farming land<sup>^</sup> use activities shall be regulated in targeted W-water Mmanagement Ssub-zones\*.<sup>1</sup>
- (ii) For the purposes of subsection (b)(i), targeted W-water Mmanagement Ssub-zones\* shall be those Sub-zones where, collectively, intensive farming land-use activities are causing elevated faecal contamination levels.<sup>1</sup>
- (iii) Those persons carrying out intensive farming land-use activities in the W-water Mmanagement Ssub-zones\* targeted in subsection (b)(i) shall be required, amongst other things, to<sup>1</sup>
  - (1) prevent stock access to water bodies<sup>^</sup>
  - (2) mitigate against faecal contamination from other entry points (e.g. race run-off)
  - (3) establish programmes for implementing any required changes.

#### (c) Sediment

- (i) In those W-water Mmanagement Ssub-zones\* where agricultural land-use activities are the predominant cause of elevated sediment levels, non-regulatory *Whole Farm Business Plans*\* shall be prepared and implemented for the purpose of reducing soil erosion, as described in Chapter 5.<sup>1</sup>

### Policy 6-8: Point source discharges<sup>^</sup> to water<sup>^</sup>

- (a) The management of point source discharges<sup>^</sup> into water<sup>^</sup> shall recognise and provide for the strategies for surface water<sup>^</sup> quality management set out in Policies 6-3, 6-4 and 6-5 after *reasonable mixing*\*, while having regard to:
  - (i) the degree to which the activity will adversely affect the values identified for the relevant W-water Mmanagement Ssub-zone(s)\*<sup>1</sup>

- (ii) whether the *discharge*<sup>^</sup>, in combination with other *discharges*<sup>^</sup> including non-point source discharges<sup>17</sup>, will cause the *water*<sup>^</sup> quality standards set in Schedule D to be breached
  - (iii) the extent to which the activity is consistent with best management practices
  - (iv) the need to allow reasonable time to achieve any required improvements.
- (b) The Regional Council may make an exception to subsection (a) where:
- (i) in the case of *discharges*<sup>^</sup>, the *discharge*<sup>^</sup> is of a temporary nature or is associated with necessary *maintenance*<sup>^</sup> work and the *discharge*<sup>^</sup> cannot practicably be avoided
  - (ii) adverse *effects*<sup>^</sup> can be fully offset by way of a financial contribution in accordance with Chapter 18
  - (iii) it is appropriate to adopt the *best practicable option*<sup>^</sup>
  - (iv) other exceptional circumstances apply
- and it is consistent with the purpose of the RMA to do so.

### **Policy 6-9: Point source *discharges*<sup>^</sup> to *land*<sup>^</sup>**

*Discharges*<sup>^</sup> of *contaminants*<sup>^</sup> onto or into *land*<sup>^</sup> shall be managed in a manner which:

- (a) ensures that ~~there is no significant degradation of the~~ existing groundwater quality is maintained<sup>18</sup>
- (b) does not result in pathogens or other toxic substances accumulating in soil or pasture to levels that would render the soil unsafe for agricultural or domestic use
- (c) recognises and provides for the strategies for surface *water*<sup>^</sup> quality management set out in Policies 6-3, 6-4 and 6-5, as necessary
- (d) maximises the reuse of nutrients and *water*<sup>^</sup> contained in the *discharge*<sup>^</sup> to the extent practicable
- (e) ensures that adverse effects<sup>^</sup> on rare habitats<sup>^</sup>, threatened habitats<sup>^</sup> and at risk habitats<sup>^</sup> are avoided, remedied or mitigated.<sup>18</sup>

### **Policy 6-10: Options for *discharges*<sup>^</sup> to surface *water*<sup>^</sup> and *land*<sup>^</sup>**

When applying for consents and making decisions on consent applications for *discharges*<sup>^</sup> of *contaminants*<sup>^</sup> to *water*<sup>^</sup> or *land*<sup>^</sup>, the opportunity to utilise alternative treatment and<sup>19</sup> *discharge*<sup>^</sup> options or a mix of *discharge*<sup>^</sup> regimes, for the purpose of avoiding or<sup>19</sup> mitigating adverse *effects*<sup>^</sup> ~~where practicable~~<sup>19</sup>, shall be considered, including but not limited to:

- (a) discharging *contaminants*<sup>^</sup> onto *land*<sup>^</sup> ~~in preference to~~ rather than<sup>19</sup> discharging *contaminants*<sup>^</sup> into *water*<sup>^</sup>
- (b) withholding from discharging *contaminants*<sup>^</sup> into surface *water*<sup>^</sup> at times of low flow
- (c) adopting different treatment options for *discharges*<sup>^</sup> to different receiving *environments*<sup>^</sup> or at different times (including different flow regimes in surface *water\_bodies*<sup>^</sup>).

<sup>17</sup> Water officers report – recommendation WTR 30

<sup>18</sup> Water officers report – recommendation WTR 31

<sup>19</sup> Water officers report – recommendation WTR 32

### **Policy 6-11: Human sewage discharges<sup>^</sup>**

Notwithstanding targets for *water<sup>^</sup>* quality and other policies in this chapter:

- (a) all new *discharges<sup>^</sup>* of treated human sewage shall be applied onto *land<sup>^</sup>*, or flow overland, or pass through a rock filter or *wetland<sup>^</sup>* treatment system or alternative system that mitigates the effects<sup>^</sup> on the mauri\* of the receiving before entering a<sup>20</sup> surface water body<sup>^</sup>
- (b) all existing direct *discharges<sup>^</sup>* of treated human sewage into a surface *water body<sup>^</sup>* shall change to a treatment system described under subsection (a) by the year 2020.

## **6.4.3**

### **Water Quantity and Allocation**

#### **6.4.3.1**

### **Policies applying to both Surface *Water<sup>^</sup>* and Groundwater**

#### **Policy 6-12: Reasonable and justifiable need for *water<sup>^</sup>***

The amount of *water<sup>^</sup>* taken by resource users shall be reasonable and justifiable for the intended use. In addition, the following specific measures for ensuring reasonable and justifiable use of *water<sup>^</sup>* shall be taken into account when considering consent applications to take *water<sup>^</sup>* for irrigation, *public water supply\** or industrial use, and during reviews of consent *conditions<sup>^</sup>* for these activities.

- (a) For irrigation, *resource consent<sup>^</sup>* applications shall be required to meet a reasonable use test in relation to the maximum daily rate of abstraction, the irrigation return period and the seasonal or annual volume of the proposed take. When making decisions on the reasonableness of the rate and volume of take sought, the Regional Council will:
  - (i) consider *land<sup>^</sup>* use, crop *water<sup>^</sup>* use requirements, on-site physical factors such as soil water-holding capacity, and climatic factors such as rainfall variability and potential evapo-transpiration
  - (ii) assess applications either on the basis of an irrigation application efficiency of 80% (even if the actual system being used has a lower application efficiency), or on the basis of a higher efficiency where an application is for an irrigation system with a higher efficiency
  - (iii) link actual irrigation use to soil moisture measurements in consent *conditions<sup>^</sup>*.
- (b) For industrial uses, *water<sup>^</sup>* allocation shall be calculated where possible in accordance with best management practices for *water<sup>^</sup>* efficiency for that particular industry.
- (c) For *public water supplies\**, the following shall be considered to be reasonable:
  - (i) an allocation of 300 litres per person per day for domestic needs, plus
  - (ii) an allocation for commercial use equal to 20% of the total allocation for domestic needs, plus
  - (iii) an allocation for industrial use calculated, where possible, in accordance with best management practices for *water<sup>^</sup>* efficiency for that particular industry, plus
  - (iv) any allocation necessary to cater for the reasonable needs of livestock or agricultural practices that are connected to the *public water supply\** system, plus
  - (v) an allocation necessary to cater for growth, where urban growth of the municipality is zoned and is reasonably forecast, plus

<sup>20</sup> Water officers report – recommendation WTR 33



- (vi) an allocation for leakage equal to 15% of the total of subsections (i) to (v) above.

Where the existing allocation for a *public water supply*\* exceeds the allocation calculated in accordance with subsections (i) to (vi) above, the Regional Council will establish, in consultation with the relevant Territorial Authority, consideration will be given to a timeframe by which the existing allocation ~~shall~~ can<sup>21</sup> be reduced to the calculated amount.

### **Policy 6-13: Efficient use of water<sup>^</sup>**

Water<sup>^</sup> shall be used efficiently, including by the following measures:

- (a) requiring water<sup>^</sup> audits and water<sup>^</sup> budgets to check for leakages and water<sup>^</sup>-use efficiency
- (b) requiring the use of, or progressive *upgrade*\* to, *infrastructure*\* for water<sup>^</sup> distribution that minimises use and loss of water<sup>^</sup> to the level set out in Policy 6-12<sup>22</sup>
- (c) enabling the transfer of *water permits*<sup>^</sup>
- (d) raising awareness about water<sup>^</sup> efficiency issues and techniques
- (e) undertaking water<sup>^</sup> use monitoring, including by<sup>22</sup> installing water<sup>^</sup> metering and telemetry ~~to monitor water<sup>^</sup> use.~~<sup>21</sup>

### **Policy 6-14: Consideration of alternative water<sup>^</sup> sources**

When making decisions on consent applications to take surface water<sup>^</sup>, the opportunity to utilise alternative sources such as groundwater or water<sup>^</sup> storage, including harvesting during periods of high flow in a water body<sup>^, 23</sup> shall be considered where it is reasonable to do so and where existing consent holders will not be adversely affected.

## **6.4.3.2**

### **Policies for Surface Water<sup>^</sup>**

#### **Policy 6-15: Overall approach for surface water<sup>^</sup> allocation**

- (a) The requirements of W<sup>^</sup>ater C<sup>^</sup>onservation O<sup>^</sup>rders<sup>^</sup> shall be given effect under this Plan.
- (b) ~~The provisions of this plan will not be inconsistent with the intent of local water conservation notices.~~<sup>24</sup>
- (c) Core allocations of surface water<sup>^</sup> from *rivers*<sup>^</sup> shall be determined in accordance with Policies 6-16 and 6-17. Takes that comply with the relevant core allocation, when assessed in combination with all other takes, shall be allowed.
- (d) Supplementary allocations of surface water<sup>^</sup> from *rivers*<sup>^</sup> shall be determined in accordance with Policy 6-18.
- (e) Takes, uses, dams, diversion for hydro-electricity purposes will be subject to site-specific assessment and will be considered on their merits (and as such are excluded from core allocation and minimum flow requirements).

<sup>21</sup> Water officers report – recommendation WTR 34

<sup>22</sup> Water officers report – recommendation WTR 35

<sup>23</sup> Water officers report – recommendation WTR 36

<sup>24</sup> Water officers report – recommendation WTR 37

- (f) Takes from *rivers* shall be apportioned, restricted or suspended in times of low flows in accordance with the provisions of Policy 6-19.
- (g) Takes of *water* from *lakes* shall comply with Policy 6-20.

**Policy 6-16: ~~Core~~ Water allocation and minimum flows**

- (a) The taking of surface *water* shall be managed in accordance with the minimum flows and core allocations set out for each Water Management Sub-zone<sup>\*1</sup> in Schedule B.
- (b) The minimum flows and core allocations set out in Schedule B shall be assessed after any takes lawfully established at the time the Plan becomes operative for hydroelectricity generation have been taken. ~~The only exception to this will be the hydro electricity takes from Zone Whau 3c.~~<sup>25</sup> Any new hydro electricity generation proposals will be assessed by way of a resource consent application process and, where it is proposed to amend any minimum flows and/or core allocations on the basis of detailed investigations undertaken, a concurrent plan change process is expected so that the merits of both the application and any plan change may be considered together.

**Policy 6-17: Approach to setting minimum flows and core allocations**

- (a) Where good hydrological information, such as a specific *water* resource study or a long-term flow record, is available it shall be used to set minimum flows and core allocations in Schedule B.
- (b) Where information described in (a) above is not available, the minimum flows and core allocations set out in Schedule B shall generally be a minimum flow equal to the estimated or calculated one-day mean annual low flow, and a core allocation equal to a percentage of the minimum as specified in Schedule B.
- (c) It is recognised that where good hydrological information subsequently becomes available (such as through a resource consent process), the detailed studies may show that minimum flows lower than those specified in Schedule B may be appropriate in particular situations.

**Policy 6-18: Supplementary *water* allocation**

In addition to the core allocations set out in Policy 6-16, a supplementary allocation from *rivers* may be provided:

- (a) in circumstances where *water* is only taken when the *river* flow is greater than the median flow, and the total amount of *water* taken by way of a supplementary allocation does not exceed 10% of the natural flow in the *river* at the time of abstraction, or<sup>26</sup>
- (b) in circumstances where it can be shown that the supplementary allocation will not:
  - (i) increase the frequency or duration of low flows or lead to a significant departure from the natural flow regime, including frequency of flushing flows.<sup>26</sup>
  - (ii) cause any adverse *effects* on the values of the *water body* as set out in Schedule DBa

<sup>25</sup> Water officers report – recommendation WTR 38

<sup>26</sup> Water officers report – recommendation WTR 40

- (iii) limit the ability of anyone to take or use water under a core allocation.

### Policy 6-19: Apportioning, restricting and suspending takes in times of low flow

During times of low flow, takes from *rivers* shall be managed in the following manner:

- (a) **Permitted takes** – Takes that are permitted by this Plan (surface *water* and groundwater takes) or are for fire-fighting purposes shall be allowed to continue regardless of *river* flow.
- (b) **Essential takes** – The following ~~core water allocation~~ takes shall be deemed essential and shall be managed in the manner described.
- (i) ~~(iv)~~ takes greater than permitted by this Plan (and therefore subject to *resource consent*) that are required to meet an individual's reasonable domestic needs or the reasonable needs of an individual's animals for drinking water shall be allowed to continue regardless of *river* flow. Reasonable needs shall be calculated as follows:
- a. up to 250 litres per person per day for domestic needs
- b. up to 70 litres per animal per day for stock drinking *water*<sup>27</sup>
- (ii) ~~(v)~~ takes required to meet the reasonable needs of hospitals, other facilities providing medical treatment, marae, schools or other education facilities, defence facilities<sup>27</sup> or correction facilities shall be allowed to continue regardless of *river* flow
- (iii) ~~(vi)~~ takes which were lawfully established at the time of this Plan becoming operative which are<sup>27</sup> required for the *operation* of industries which, if their take were to cease, would significantly compromise a community's ability to provide for its social, economic or cultural well-being or for its health or safety, shall be allowed to continue regardless of *river* flow, but shall be required to minimise the amount of *water* taken to the extent reasonable
- (iv) ~~(vii)~~ *public water supply*\* takes shall be restricted to a total public *water* consumption calculated as follows:
- (A) an allocation of 250 litres per person per day for domestic needs, plus
- (B) an allocation for commercial use equal to 20% of the total allocation for domestic needs, plus
- (C) an allocation which meets the reasonable needs of those facilities and industries listed under subsections (b)(ii) and (b)(iii) where such facilities and industries are connected to the *public water supply*\* system, plus
- (D) any allocation necessary to cater for the reasonable needs of livestock that are connected to the *public water supply*\* system, plus
- (E) an allocation for leakage equal to 15% of the total of subsections (A) to (D) above.
- ~~(v)~~ takes for hydro-electricity undertaken in accordance with the conditions of resource consents.
- (c) **Non-essential takes** – Other core *water* allocation takes, including irrigation takes but excluding the essential takes described under subsection (b), shall be managed in the following manner:
- (i) *water* takes shall be required to cease when the *river* ~~drops~~ is at or below<sup>27</sup> its minimum flow, as set out in Policy 6-16
- (ii) *water* takes shall be allowed to recommence once the *river* flow has risen above its minimum flow.

<sup>27</sup> Water officers report – recommendation WTR 41

- (d) **Meaning of 'core water<sup>^</sup> allocation take'** – For the purposes of this policy, a core water<sup>^</sup> allocation take means a take that has been granted consent in accordance with a core water<sup>^</sup> allocation made under Policy 6-16, or in accordance with a previous core water<sup>^</sup> allocation regime.

#### **Policy 6-20: Surface water<sup>^</sup> allocation – lakes<sup>^</sup>**

Decisions on resource consent<sup>^</sup> applications to take water<sup>^</sup> from a lake<sup>^</sup> shall ensure that there are no significant adverse effects<sup>^</sup> on the values of the lake<sup>^</sup>, as shown in Schedule DBa.

### **6.4.3.3**

#### **Policies for Bores\* and Groundwater**

##### **Policy 6-21: Overall approach for bore\* management and groundwater allocation**

- (a) New bores\* shall be constructed and managed in accordance with Policy 6-22.
- (b) Total groundwater allocations shall comply with the annual allocable volumes for Ggroundwater Mmanagement Zzones set out in Policy 6-23.
- (c) The measured and/or modelled effects<sup>^</sup> of a proposed groundwater take on other groundwater users, surface water\_bodies<sup>^</sup> and saltseawater<sup>28</sup> intrusion shall be managed in accordance with Policies 6-24, 6-25 and 6-26.

##### **Policy 6-22: Bore\* construction development and management**

- (a) New ~~b~~Bores\* shall be sited to ensure adequate separation from existing bores\*, and to avoid an over-concentration of bores\* in a particular area, wherever practicable, so as to avoid or mitigate effects<sup>^</sup> on the reliability of supply of properly constructed existing bores\*. A bore\* that is constructed in general accordance with (a)-(d) of this Policy, and is recorded on Horizons' groundwater database, shall be considered to be a properly constructed bore\*.<sup>29</sup>
- (b) New ~~b~~Bores\*<sup>29</sup> shall generally be constructed, and bore\* logs and other records prepared, in accordance with the NZS 4411:2001 Environmental Standard for Drilling of Soil and Rock.
- (c) New ~~b~~Bores\*<sup>29</sup> shall be designed to ensure a high degree of efficiency with respect to bore\* development, bore\* depth and diameter, and screen depth and length. A high degree of efficiency is achieved where:
- (i) the bore\* adequately penetrates the aquifer from which water<sup>^</sup> is being drawn at a depth sufficient to enable water<sup>^</sup> to be drawn all year (i.e. the bore\* depth allows for the placement of a pump below the depth of seasonally low groundwater levels with sufficient allowance for drawdown requirements),
  - (ii) the bore\* is adequately maintained,
  - (iii) the bore\* is of sufficient diameter and the bore\* has a pump capable of drawing water<sup>^</sup> to the land<sup>^</sup> surface.

Measurement of the yield and drawdown characteristics of a bore\* should be used to indicate its efficiency.<sup>29</sup>

<sup>28</sup> Water officers report – recommendation WTR 48

<sup>29</sup> Water officers report – recommendation WTR 44

- (d) ~~New~~ ~~b~~Bores\*<sup>29</sup> shall be sited, constructed and used in a manner that prevents:
- (i) ~~contaminants~~ from entering the bore\* from the land<sup>^</sup> surface
  - (ii) the wastage of water<sup>^</sup> in artesian conditions<sup>^</sup>.
- (e) Bores\* that are no longer required shall be decommissioned in general accordance with the NZS 4411:2001 Environmental Standard for Drilling of Soil and Rock.

### Policy 6-23: Groundwater Management Zones

The ~~total amount annual allocated volume~~<sup>30</sup> of groundwater taken from each ~~Groundwater Management Zone~~\* mapped in Schedule ~~C~~ Ba<sup>1</sup> shall ~~not exceed~~ ~~comply with~~<sup>30</sup> the annual allocable volume specified in Schedule ~~C~~ Ba.<sup>1</sup>

### Policy 6-24: Effects of groundwater takes on other groundwater takes

- (a) Consent ~~applicants wishing applications~~<sup>31</sup> to take groundwater shall ~~be required to include generally be required to undertake~~<sup>31</sup> pumping tests and hydrogeological assessments in order to determine ~~the likely~~<sup>31</sup> impact on existing groundwater takes in the vicinity.
- (b) Consent ~~conditions~~<sup>^</sup> restricting the rate and/or duration of pumping shall be imposed on new takes of groundwater where this is necessary to avoid significant drawdown impacts ~~on existing groundwater takes from good quality bores\* in the vicinity. A groundwater take is considered to be from a good quality bore\* in circumstances where the bore\* penetrates the aquifer from which water is being drawn at a depth sufficient to enable water to be drawn all year (ie., the bore\* depth is below the range of seasonal fluctuations in groundwater level), the bore\* is adequately maintained, the bore\* is of sufficient diameter and is screened to reasonably minimise drawdown, and the bore\* has a pump capable of drawing water from its base to the land surface. Significant drawdown impact occurs where drawdown of more than 0.5 m within a 100-day period that, in combination with drawdown effects<sup>^</sup> greater than 0.5 m within a 100-day period from all other abstractions, would cause a more than minor reduction in the reliability of supply from any existing lawful groundwater take from a properly constructed bore\* in the vicinity of the proposed take. A properly constructed in the vicinity bore\* is a bore\* constructed in accordance with policy 6-22 which is within 3 km and in the same Groundwater Management Zone.~~<sup>31</sup>
- (c) Consent ~~conditions~~<sup>^</sup> specifying short-term restrictions on the rate and/or duration of pumping may also be imposed on new takes of groundwater where this is necessary to avoid ~~significant~~ drawdown impacts ~~that cause a more than minor reduction in the reliability of supply of~~ ~~an~~ existing bores\* that are not ~~of a good quality properly constructed in accordance with Policy 6-22~~<sup>31</sup>, in order to allow sufficient time for such bores\* to be ~~upgraded~~<sup>\*</sup> or replaced.
- (d) The Regional Council may encourage consent ~~applicants~~<sup>^</sup> to consider the option of providing water<sup>^</sup> to neighbouring properties in circumstances where this would be more practical than meeting the requirements of ~~subsections~~ (b) or (c).

<sup>30</sup> Water officers report – recommendation WTR 45

<sup>31</sup> Water officers report – recommendation WTR 46

**Policy 6-25: Effects of groundwater takes on surface *water\_bodies*<sup>^</sup>**

The effects of groundwater takes on surface *water\_bodies*<sup>^</sup>, including *wetlands*<sup>^</sup>, shall be managed in the following manner:

- ~~(a) An appropriate scientific method shall be used to calculate the likely degree of connection between the groundwater and surface water at the location of the groundwater take.~~
- ~~(b) To the extent justified by the calculation under subsection (a), the groundwater take shall be assessed and managed as if it were a surface take from the water management zone(s) to which it is connected.~~
- (a) The *effects*<sup>^</sup> of a groundwater abstraction on surface *water*<sup>^</sup> shall be assessed according to the Guidelines for the Assessment of Groundwater Abstraction Effects on Stream Flow prepared by Pattle Delamore Partners Ltd and Environment Canterbury (Environment Canterbury Report R00/11, ISBN 1-86937-387-1, First Edition, June 2000).
- (b) Consent applications for new groundwater abstractions, lodged after the date that this Policy becomes *operative*<sup>^</sup>, shall have their surface *water*<sup>^</sup> depletion *effects*<sup>^</sup> classified and managed as per Table 6.2a:<sup>32</sup>

Table 6.2a – Surface *water*<sup>^</sup> depletion

<u>Classification of Surface Water<sup>^</sup> Depletion Effect<sup>^</sup></u>	<u>Magnitude of Surface Water<sup>^</sup> Depletion Effect<sup>^</sup></u>	<u>Management Approach</u>
Riparian	Any groundwater abstraction located within the geologically recent river <i>bed</i> <sup>^</sup> strata of a surface <i>water body</i> <sup>^</sup> .	The groundwater abstraction is subject to the same restrictions as a surface <i>water</i> <sup>^</sup> abstraction, unless there is clear hydro-geologic evidence that demonstrates that the <i>effect</i> <sup>^</sup> of pumping will not impact on the surface <i>water body</i> <sup>^</sup> .
High	Calculated as greater than or equal to 90% of the groundwater pumping rate after seven days of pumping, or greater than or equal to 50% of the average groundwater pumping rate after 100 days of pumping or, in those catchments containing downstream hydro-electricity generation storage reservoirs, greater than or equal to 20% of the groundwater pumping rate after 730 days (two years).	The groundwater abstraction is subject to the same minimum flows and allocation limits as in Schedule B.
4Medium	The surface <i>water</i> <sup>^</sup> depletion <i>effect</i> <sup>^</sup> is calculated as less than 50% and greater than or equal to 20% of the groundwater pumping rate after 100 days of pumping.	The calculated loss of surface <i>water</i> <sup>^</sup> is included in the surface <i>water</i> <sup>^</sup> allocation regime, but no minimum flow conditions are imposed on the groundwater abstraction.
Low or Negligible	The surface <i>water</i> <sup>^</sup> depletion <i>effect</i> <sup>^</sup> is calculated as less 20% of the groundwater pumping rate after 100 days of pumping.	No surface <i>water</i> <sup>^</sup> management <i>rules</i> <sup>^</sup> required because the <i>effect</i> <sup>^</sup> is small and delayed.

<sup>32</sup> Water officers report – recommendation WTR 47



## Policy 6-26: ~~Salt~~ Seawater<sup>33</sup> intrusion

~~Salt~~Seawater intrusion along the coastal margins of the Region arising from groundwater takes shall be managed by the following measures:

- (a) Consent *applicants*<sup>^</sup> wishing to take groundwater within 5 km of the coastal mean high *water*<sup>^</sup> spring line shall be required to carry out pumping tests and hydrogeological assessments ~~in order~~ to determine the level of drawdown ~~at the coast~~ and the ~~likelihood of inducing salt contribution of that drawdown to increasing the risk of seawater intrusion.~~<sup>33</sup>
- (b) ~~In cases where saltwater intrusion might occur,~~ The consent application may be declined or the amount of *water*<sup>^</sup> that can be taken shall be limited to an amount that ~~restricts~~ lessens the ~~likelihood~~ risk of ~~salt~~ seawater intrusion.<sup>33</sup>
- (c) In addition, consents to take groundwater within 5 km of the coast shall contain *conditions*<sup>^</sup> relating to the monitoring of groundwater levels and<sup>33</sup> electrical conductivity, and the restriction or suspension of takes if specified electrical conductivity thresholds are reached or exceeded. These monitoring requirements and electrical conductivity thresholds will be determined on a case by case basis.
- (d) Wherever possible, groundwater abstractions shall be managed to avoid critical pumping rates that could draw seawater towards the pumping bore\*. Groundwater pressures along the coastal margin should be maintained above mean sea level by an amount that is one-fortieth (1/40) of the depth of the base of the aquifer system. This is defined in metres below mean sea level.<sup>33</sup>

### 6.4.4

## River<sup>^</sup> and Lake<sup>^</sup> Beds<sup>^</sup>

### Policy 6-27: General management of river<sup>^</sup> and lake<sup>^</sup> beds<sup>^</sup>

Activities in, on, under or over the *beds*<sup>^</sup> of *rivers*<sup>^</sup> and *lakes*<sup>^</sup> shall generally be managed in a manner which:

- (a) recognises and provides for the values identified in Schedule D Ba<sup>1</sup> for the W~~w~~ater M~~m~~anagement S~~s~~ub-zone(s)<sup>\*1</sup> in which the activity takes place, in the manner described in Policies 6-28, 6-29 and 6-30
- (b) avoids or mitigates the risk of flood hazards arising from<sup>34</sup> any significant reduction in ability of a *river*<sup>^</sup> to convey flood flows, or significant impedance to the passage of floating debris
- (c) avoids or mitigates<sup>34</sup> any significant adverse *effects*<sup>^</sup> on the stability and function of existing *structures*<sup>^</sup> including flood and erosion control *structures*<sup>^</sup>
- (d) avoids any significant reduction in the habitat diversity, including the morphological diversity, of the *water body*<sup>^</sup> and its bed<sup>34</sup>
- (e) manages *effects*<sup>^</sup> on natural character and public access in accordance with the relevant policies in Chapter 7
- (f) provides for the safe passage of fish both upstream and downstream
- (g) ensures that the existing nature and extent of navigation of the *water body*<sup>^</sup> are not obstructed

<sup>33</sup> Water officers report – recommendation WTR 48

<sup>34</sup> Water officers report – recommendation WTR 50

- (h) ensures that access required for the *maintenance*<sup>\*</sup>, *upgrade*<sup>\*</sup> and *operation* of ~~essential works and services – infrastructure~~<sup>34</sup> is not obstructed.

**Policy 6-28: Activities in *water bodies*<sup>^</sup> with a Value of Natural State, Sites of Significance - Cultural, or Sites of Significance - Aquatic**

In those *W*water *M*management *S*sub-zones<sup>\*</sup> with a Value of Natural State, Sites of Significance - Cultural, or Sites of Significance - Aquatic, as shown in Schedule ~~D~~ *Ba*, activities in, on, under or over the *beds*<sup>^</sup> of *rivers*<sup>^</sup> and *lakes*<sup>^</sup> shall be managed in a manner which:

- a) ~~avoids or mitigates~~<sup>35</sup> ~~adverse effects~~<sup>^</sup> ~~on these values~~ ensures that any more than minor adverse environmental effects are avoided as far as reasonably practicable, or otherwise remedied or mitigated;
- b) ~~any more than minor adverse effects which cannot reasonably be avoided, remedied or mitigated are offset to result in no net loss in relation to the surface water management values.~~
- (c) maintains the habitat and spawning requirements of the species identified in Schedule ~~D~~ *Ba*<sup>1</sup> as being significant within the subject *W*water *M*management *S*sub-zones<sup>\*1</sup>.

**Policy 6-29: Activities in *water bodies*<sup>^</sup> within *valued for a Flood Control or Drainage scheme*<sup>36</sup>**

In those *W*water *M*management *S*sub-zones<sup>\*1</sup> within a *water body*<sup>^</sup> *valued for*<sup>36</sup> *Flood Control or Drainage scheme*<sup>36</sup> as shown in Schedule ~~I~~ *Ba20*<sup>1</sup>, activities in, on, under or over the *beds*<sup>^</sup> of *rivers*<sup>^</sup> and *lakes*<sup>^</sup> shall be managed in a manner which:

- (a) enables the level of flood hazard and erosion control existing at the time of notification of this Plan to be maintained within *river*<sup>^</sup> and drainage schemes
- (b) maintains other values associated with the *water body*<sup>^</sup>, unless functional constraints make this impractical, in which case adverse *effects*<sup>^</sup> on other values shall be mitigated ~~or~~ *and may be*<sup>36</sup> offset or compensated by way of a financial contribution in accordance with the policies in Chapter 18.

**Policy 6-30: Activities in *water bodies*<sup>^</sup> with other values**

In those *W*water *M*management *S*sub-zones<sup>\*1</sup> not valued for Natural State, Sites of Significance - Cultural, Sites of Significance - Aquatic, or ~~within a Flood Control or Drainage scheme as shown in Schedule I~~<sup>37</sup>, activities in, on, under or over the *beds*<sup>^</sup> of *rivers*<sup>^</sup> and *lakes*<sup>^</sup> shall be managed in a manner which:

- (a) avoids, remedies or mitigates significant adverse *effects*<sup>^</sup> on these other values, ~~or (b) provides consent applicants with the option of making a~~ *A* financial contribution *may be considered in order*<sup>37</sup> to offset or compensate for adverse *effects*<sup>^</sup> in accordance with the policies in Chapter 18.

<sup>35</sup> Water officers report – recommendation WTR 51

<sup>36</sup> Water officers report – recommendation WTR 52

<sup>37</sup> Water officers report – recommendation WTR 53

### Policy 6-31: **Essential Existing<sup>38</sup>** and beneficial activities

Notwithstanding Policies 6-27 to 6-30, activities in, on, under or over the *beds*<sup>^</sup> of *rivers*<sup>^</sup> and *lakes*<sup>^</sup> that are **essential existing<sup>38</sup>** or result in an environmental benefit shall generally be allowed, including:

- (a) the use and *maintenance*<sup>\*</sup> of existing *structures*<sup>^</sup>, including works designed to maintain or improve the stability and functionality of existing *structures*<sup>^</sup>
- (b) the removal of derelict, unlawful or non-functional *structures*<sup>^</sup>
- (c) the restoration or enhancement of natural habitats.

### Policy 6-32: Gravel extraction

- ~~(a) — The annual volume of gravel available for extraction from those *rivers*<sup>^</sup> and reaches with certain allocations, listed in Table 6.3, shall be limited to the quantities stated in the table.~~
- (b) The annual volume of gravel available for extraction from those *rivers*<sup>^</sup> and reaches ~~with estimated allocations,~~ listed in Table 6.4, shall generally be limited to the quantities stated in the table, unless ~~better information is available~~ there is a demonstrable *river*<sup>^</sup> management need to exceed this volume or where the extraction is necessary to decrease the risk of flooding or damage to structures.
- ~~(c) — In other rivers or reaches, where there is no annual extraction limit, gravel extraction shall not exceed the natural rate of replenishment except where extraction is necessary to decrease the risk of flooding or damage to *structures*<sup>^</sup>.~~

**Table 6.3** — ~~Annual allocable volumes of gravel — certain allocations~~<sup>39 40</sup>

River or Reach	Volume (m <sup>3</sup> )
Lower Manawatu River	
• <del>Manawatu Gorge to Karere Rd</del>	10,000
• <del>Karere Rd to Hamiltons Line</del>	10,000
• <del>Hamiltons Line to Oroua confluence (Yrs 2007-2009)</del>	200,000
• <del>Hamiltons Line to Oroua confluence (Yrs 2009 onwards)</del>	20,000
Oroua River upstream of <del>Boness Rd</del>	5,000
Oroua River downstream of <del>Boness Rd</del>	50,000
<del>Makino from confluence with Oroua River to the bend 800m upstream of Reids Line</del>	3,000
<del>Mangahao River confluence to Tararua Rd bridge</del>	10,000
Mangatainoka River	55,000
South East Ruahine Streams	
• <del>Mangapapa</del>	2,000
• <del>Mangaatua</del>	5,000
• <del>Raparapawai</del>	15,000
• <del>Oruakeretaki</del>	15,000
• <del>Otmarahu</del>	1,000
• <del>Kumeti</del>	3,000

<sup>38</sup> Water officers report – recommendation WTR 54

<sup>39</sup> Water officers report – recommendation WTR 57 and WTR 58

<sup>40</sup> Black strikeout indicates content has moved to Table 6.4; Green strikeout indicates it has been deleted

River or Reach	Volume (m <sup>3</sup> )
• Otamaraho	2,000
• Rokaiwhana	<del>15,000</del>
• Tamaki	<del>30,000</del>
• Mangatowaiiti	2,000
• Mangatowainui	<del>6,000</del>
• Mangatera	500
Upper Manawatu River	
• From 1km upstream of Ngawapurua bridge to source	20,000
• 1 km upstream to 2.5 km downstream of Ngawapurua bridge	no extraction
• 2.5 km downstream of Ngawapurua Bridge to Ballance bridge	15,000

**Table 6.4** Average Annual allocable volumes of gravel ~~–estimated allocations~~<sup>41</sup>

River or Reach	Volume (m <sup>3</sup> )
Kawhatau River	35,000
<u>Makino Stream</u>	<u>3,000</u>
Makuriiti Stream	<del>6,000</del> <u>3,000</u>
<u>Manawatu River</u>	
• <u>From 1 km upstream of Ngawapurua Bridge to source</u>	<u>20,000</u>
• <u>1 km upstream to 2.5 km downstream of Ngawapurua Bridge</u>	No extraction
• <u>2.5 km downstream of Ngawapurua Bridge to Ballance Bridge</u>	<u>15,000</u>
• <u>Manawatu Gorge to Karere Rd</u>	<u>50,000</u>
• <u>Karere Rd to Hamilton's Line</u>	<u>300,000</u>
• <u>Hamilton's Line to Oroua confluence [2007 to 2009]</u>	<u>20,000</u>
• <u>Hamilton's Line to Oroua confluence [2009 onwards] the 2 km aggrading reach between 39 Miles (S24 212 832) and Benchmark 643 (S24 226 830)</u>	<u>350,000</u>
• <u>Hamilton's Line to Oroua confluence [2009 onwards] the 2 km aggrading reach between BM 604 (S24 206 833) and BM 622 (S24 207 826)</u>	<u>700,000</u>
<u>Mangahao River</u>	<u>15,000</u>
Mangatainoka River	55,000
Ohau River	
• Upstream of a point 1 km above SH 1 bridge	<del>2,000</del> <u>5,000</u>
• Downstream of a point 1 km above SH 1 bridge	10,000
Oroua River	
• <u>Upstream of Menzies Ford</u>	<u>10,000</u>
• <u>Downstream of Menzies Ford</u>	<u>55,000</u>
Pohangina River	<del>30,000</del> <u>25,000</u>

<sup>41</sup> Black underline indicates content has moved from Table 6.3 to Table 6.4; Green strikethrough indicates deletion from Table 6.4; Green underline indicates new wording

River or Reach	Volume (m <sup>3</sup> )
Rangitikei River	
• Makahikatoa Stream to Mangarere Road bridge	15,000
• Mangarere Road bridge to Rewa	25,000
• Rewa to 7 km downstream of SH 1 bridge	<del>40,000</del> 50,000
• 7 km downstream of SH 1 bridge to mouth	100,000
<u>South East Ruahine Streams</u>	
• <u>Kumeti</u>	3,000
• <u>Mangaatua</u>	5,000
• <u>Mangapapa</u>	2,000
• <u>Mangatera</u>	500
• <u>Mangatewaiiti</u>	2,000
• <u>Mangatewainui</u>	4,000
• <u>Oruakeretaki</u>	5,000
• <u>Otamaraho</u>	2,000
• <u>Otamarahu</u>	1,000
• <u>Rokaiwhana</u>	10,000
• <u>Raparapawai</u>	3,000
• <u>Tamaki</u>	20,000
Turakina River	3,000
Whangaehu River	8,000
Whanganui River	7,000
• <del>Whakapapa Island to Pipiriki</del>	<del>4,000</del>
• <del>Pipiriki to mouth</del>	<del>2,750</del>

## 6.5

### Methods

The taking of surface *water* and groundwater, discharging to surface *water* and to *land*, and the undertaking of activities that disturb the *beds* of *rivers* or *lakes*, are largely regulatory activities. Part II: Regional Plan contains *rules* relating to the activities described in this chapter.

Project Name <u>Method 6-1</u> <sup>3</sup>	Large Water Abstractors
<b>Project <sup>3</sup>Description</b>	<p>The aim of this <u>project method</u> is to provide assistance to large water abstractors to identify options for improving the <i>water</i> abstraction, distribution and use components of their operations. It is expected this <u>project method</u> will reduce the abstraction pressure on the groundwater and surface water resources, while providing abstractors with financial benefits and their business/customers with greater certainty of supply.</p> <p>The emphasis will be on working with large abstractors to identify and implement opportunities for increasing <i>water</i> use efficiency, reducing distribution network leakages, agreeing priority of use</p>

Project Name Method 6-1 <sup>3</sup>	Large Water Abstractors
	within distribution networks, and consideration of alternative <i>water</i> <sup>^</sup> supply and storage options.
Who	<del>Horizons</del> The Regional Council, <del>Territorial Authorities</del> <sup>^</sup> District Councils, industry and large irrigators will work together to develop, fund and implement this programme.
Links to Policy	This <del>project method</del> links to Policies 6-12, 6-13 and 6-14.
Target	All major abstractors in the Region have been contacted and assistance provided where requested by 2016.

Project Name Method 6-2 <sup>3</sup>	Sewage Treatment Plant Upgrades*
<del>Project</del> <sup>3</sup> Description	The aim of this <del>project method</del> is to work with <i>Territorial Authorities</i> <sup>^</sup> to seek central Government funding for sewage treatment plant <i>upgrades</i> <sup>*</sup> , given that they are a significant contributor of <i>contaminants</i> <sup>^</sup> to <i>waterways bodies</i> <sup>^</sup> during low flows. <del>Horizons</del> The Regional Council will work with <i>Territorial Authorities</i> <sup>^</sup> to analyse their treatment and disposal options and to develop a package to present to Government with the aim of securing capital works funding to reduce the environmental impact of these <i>discharges</i> <sup>^</sup> .  An ongoing <del>project</del> . <del>Horizons</del> The Regional Council extended an invitation to all <i>Territorial Authorities</i> <sup>^</sup> to actively engage with the Regional Council as part of this <del>project method</del> in 2006.
Who	<del>Horizons</del> Regional Council, <i>Territorial Authorities</i> <sup>^</sup> <del>district councils</del> , Ministry of Health <del>and</del> , local health agencies (e.g. MidCentral Health) <del>and iwi authorities</del> <sup>^</sup> . <sup>42</sup>
Links to Policy	This <del>method project</del> links to Policies 6-2, 6-8, 6-10 and 6-11.
Targets	<ul style="list-style-type: none"> <li><del>Horizons</del> The Regional Council to extend an invitation in 2008 to all <i>Territorial Authorities</i><sup>^</sup> to actively engage with the Regional Council on this matter, and</li> <li>central Government funding applications completed for <i>upgrade</i><sup>*</sup> of sewage treatment plants as required.</li> </ul>

Project Name Method 6-3	On-site Wastewater System Forum
<del>Project</del> Description	The aim of this <del>project method</del> is to facilitate implementation of the Regional Council's Manual for On-site Wastewater Systems – Design and Management.  <del>Horizons</del> The Regional Council will establish a forum to aid understanding and implementation of the manual and will undertake regular reviews of new types of on-site treatment and disposal systems.
Who	The forum will comprise, as a minimum, representatives from the Regional Council, <i>Territorial Authorities</i> <sup>^</sup> , consulting engineers and system installers.
Links to Policy	This <del>project method</del> links to Policies 6-2 and 6-9.
Target	Two meetings per year.

<sup>42</sup> Water officers report – recommendation WTR 61



Project Name Method 6-4	Human Sewage Discharges to Water
<b>Project Description</b>	The Regional Council will provide assistance to <i>Territorial Authorities^ district councils</i> to <i>upgrade^</i> existing sewage treatment systems that directly <i>discharge^</i> treated human sewage to the Region's <i>waterways bodies^</i> .  <i>Horizons The</i> Regional Council to work with <i>Territorial Authorities^</i> to reduce <i>water^</i> volume, explore <i>land-use disposal treatment</i> <sup>43</sup> options and assist with funding opportunities.
<b>Who</b>	<i>Horizons The</i> Regional Council <i>and^</i> <i>Territorial Authorities^ and iwi authorities^</i> . <sup>43</sup>
<b>Links to Policy</b>	This <i>project method</i> links to Policies 6-2 and 6-11.
<b>Target</b>	To stop direct human sewage discharges to <i>water^</i> by 2020.

Project Name Method 6-5	Stormwater System Discharge Upgrades*
<b>Project Description</b>	The Regional Council will provide assistance to <i>district councils Territorial Authorities^</i> <sup>44</sup> wanting to <i>upgrade^</i> the treatment of their existing urban stormwater system <i>discharges^</i> , where these are into <i>waterways bodies^</i> .  <i>Horizons The</i> Regional Council to work with <i>Territorial Authorities^</i> to reduce <i>water^</i> volume, explore <i>land-use disposal treatment</i> <sup>44</sup> options and assist with funding opportunities.
<b>Who</b>	<i>Horizons The</i> Regional Council <i>and^</i> <i>Territorial Authorities^ and iwi authorities^</i> . <sup>44</sup>
<b>Links to Policy</b>	This <i>project method</i> links to Policies 6-2 and 6-8.
<b>Target</b>	To reduce the number, and improve the quality, of urban stormwater <i>discharges^</i> by 2016.

Project Name Method 6-6	Trout and Native Fish Spawning Habitat
<b>Project Description</b>	The Regional Council and other agencies will work with landowners to protect and enhance <i>waterways bodies^</i> and parts of <i>waterways bodies^</i> that serve as spawning <i>sites^</i> for brown and rainbow trout <i>and native fish</i> . <sup>45</sup> Resources will be directed towards the most significant <i>sites^</i> .  <i>Waterways body^</i> owners will be provided with advice and financial/project management assistance to carry out enhancement and protection measures including fencing, planting, <i>replacement of perched culverts providing fish passage</i> <sup>45</sup> and pest (plant and <i>pest animal</i> ) control. The Regional Council will seek funding from third parties to assist with this <i>project method</i> .  The effectiveness of the protection and enhancement works will be monitored.  The <i>project method</i> will include publicity to increase public awareness about the importance of trout <i>and native fish</i> . <sup>45</sup>

<sup>43</sup> Water officers report – recommendation WTR 63

<sup>44</sup> Water officers report – recommendation WTR 64

<sup>45</sup> Water officers report – recommendation WTR 59

<b>Project Name</b> <u>Method 6-6</u>	<b>Trout and Native Fish Spawning Habitat</b>
<b>Who</b>	The Regional Council, <i>Territorial Authorities</i> <sup>45</sup> , Fish and Game and funding agencies including He Tini Awa Trust, <u>Department of Conservation, landowners</u> . <sup>45</sup>
<b>Links to Policy</b>	This <u>project method</u> links to Policies 6-2, 6-27 and 6-30.
<b>Target</b>	<u>The top 30 of the top</u> trout spawning habitat sites <u>and native fish habitat spawning sites</u> <sup>45</sup> are actively managed, including protection and/or enhancement measures, within 10 years of this Plan becoming <i>operative</i> <sup>45</sup> .

<b>Project Name</b> <u>Method 6-7</u>	<b>Water Quality Improvement</b>
<b>Project Description</b>	<p>The Regional Council and other agencies will work with landowners to protect and enhance the <i>water</i><sup>45</sup> quality of the Region's <i>waterways bodies</i><sup>45</sup>. Landowners in those <i>Water Management Sub-zones</i><sup>45</sup> where the nutrient management (non-point source discharge) control <i>rules</i><sup>45</sup> are to be introduced will receive the highest priority for assistance. This project represents an expansion of Horizons' existing <i>water</i><sup>45</sup> quality improvement programme, which focuses almost entirely on dairy farmers as part of the Dairying and Clean Streams Regional Action Plan for Manawatu-Wanganui Region.</p> <p><i>Waterways body</i><sup>45</sup> owners will be provided with advice and financial/project management assistance to carry out enhancement and protection measures including fencing and planting of riparian margins. The Regional Council will seek funding from third parties to assist with this <u>project method</u>.</p> <p>The effectiveness of the protection and enhancement works will be monitored.</p>
<b>Who</b>	Regional Council, <u>Excel Dairy NZ</u> , Fonterra and <i>Territorial Authorities</i> <sup>45</sup> and funding agencies including the He Tini Awa Trust and Nga Whenua Rahui.
<b>Links to Policy</b>	This <u>project method</u> links to Policies 6-2, 6-4 and 6-7.
<b>Targets</b>	<ul style="list-style-type: none"> <li>• The targets of the Dairying and Clean Streams Regional Action Plan for Manawatu-Wanganui Region are achieved by the due dates</li> <li>• Advice and assistance is offered to all landowners affected by the nutrient management (non-point source discharge) control <i>rules</i><sup>45</sup></li> <li>• All landowner requests for advice and assistance regarding <i>water</i><sup>45</sup> quality improvement are responded to promptly.</li> </ul>

<b>Project Name</b> <u>Method 6-8</u>	<b>Education in Schools – Water</b>
<b>Project Description</b>	The aim of this <u>project method</u> is to raise awareness amongst the youth of the Region of the significance of <del>our</del> <u>the</u> water (quantity and quality) resource, the threats to it, and what they can do to protect/restore it. This will be achieved through various environmental education programmes/initiatives – for example, Green RIG, Enviroschools and Trees for Survival.
<b>Who</b>	<del>Horizons</del> The Regional Council <u>and</u> various national and local environmental education providers <u>and the Youth Environment forum</u> . <sup>46</sup>

<sup>46</sup> Water officers report – recommendation WTR 67

Project Name Method 6-8	Education in Schools – Water
Links to Policy	This <a href="#">project method</a> links to Policy 6-2.
Targets	The Regional Council develops and delivers a <i>water</i> ^ related environmental education programme.

Project Name Method 6-9	Water (Fluvial Resources, Quality and Quantity) Research, Monitoring and Reporting
Project Description	The aim of this <a href="#">project method</a> is to develop an integrated research, monitoring and reporting programme. <del>that</del> The focus <del>of this project</del> will be to <a href="#">define the current state of the natural character of the Region's river</a> ^ by analysing the habitat and morphological diversity. <a href="#">This may include: Planform/ channel morphology classification; fairway width; sinuosity; barforms; percentage of pool, riffle, run, habitat; gravel resources, level of entrenchment, and location and extent of riparian and wetland</a> ^ areas. The method will also seek to <a href="#">measure departure from natural state and changes in natural character, including habitat and morphological diversity</a> . The <a href="#">outcomes will link into monitoring undertaken by the River Works Environmental Code of Practice and supports</a> delivery and refinement of existing policies, <a href="#">objectives</a> and methods. <del>The</del> <a href="#">outcomes will also</a> guides implementation planning and allows implementation effectiveness to be assessed. <sup>47</sup>
Who	Predominantly <a href="#">the Horizons</a> Regional Council, with assistance from research institutes, universities <del>and</del> non-Government agencies <del>and</del> <a href="#">Fish and Game</a> , community groups <del>and</del> <a href="#">iwi authorities</a> ^ as required. <sup>47</sup>
Links to Policy	This <a href="#">project method</a> links to Policies 6-2, 6-15, 6-17, <a href="#">6-27 6-28, 6-29, 6-30, 6-31 and 6-32 and 7-8</a> . <sup>47</sup>
Targets	A research, monitoring and reporting programme <del>that supports delivery and refinement of existing policies and methods and guides and assesses implementation that defines the current state of rivers</del> ^ and departure from or degradation to natural state, including habitat and morphological diversity. <sup>47</sup>

## 6.6 Anticipated Environmental Results

Anticipated Environmental Result	Link to Policy	Indicator	Data Source
<p>During the life of this Plan, <i>water</i>^ quality and quantity maintain <a href="#">or exceed</a> <sup>48</sup> the values set in this Plan.</p> <p>In <a href="#">Wwater Mmanagement Ssub zones</a>^*<sup>1</sup></p> <ul style="list-style-type: none"> <li>where <i>water</i>^ quality standards are met prior to this <a href="#">Pplan</a> becoming operative^, they continue to be met</li> <li>where <i>water</i>^ quality standards are not met prior to this <a href="#">Pplan</a> becoming operative, they are either met where targeted for action or,</li> </ul>	<p>Water Policies: 6-1, 6-2, 6-3, 6-4, 6-5, 6-7, 6-8, 6-9, 6-10, 6-11, 6-12, 6-13, 6-14, 6-15, 6-16, 6-18, 6-20, 6-21, 6-25, <a href="#">6-27</a>,<sup>48</sup> 6-29, 6-30, 6-31, 6-32</p> <p>Land Policies: 5-1, 5-2, 5-3, 5-4 and 5-5</p>	<ul style="list-style-type: none"> <li>Measured <i>water</i>^ quality compared to <a href="#">Wwater Mmanagement Ssub-zone</a>^*<sup>1</sup> standards, especially measures for “muddy <a href="#">waterways-bodies</a>^”, “safe swimming”, “safe food gathering”, and “aquatic ecosystem health” in priority catchments</li> <li>Incidents where surface <i>water</i>^ quality is confirmed as unfit for use</li> </ul>	<ul style="list-style-type: none"> <li>Horizons’ <a href="#">Sstate</a> of <a href="#">Eenvironment</a> <i>water</i>^ quality monitoring programme</li> <li>Horizons’ incidents database</li> <li>Ministry of Health raw water monitoring</li> </ul>

<sup>47</sup> Water officers report – recommendation WTR 68

<sup>48</sup> Water officers report – recommendation WTR 69

Anticipated Environmental Result	Link to Policy	Indicator	Data Source
where not targeted for action, they are no worse than prior to this <a href="#">Plan</a> becoming <i>operative</i> .	Living Heritage Policies: 7-1, 7-2, 7-3, 7-4, 7-5 and 7.8	<ul style="list-style-type: none"> <li><a href="#">Water</a> quantity and flows of surface <a href="#">water</a> are managed in accordance with the allocation and minimum flow regime outlined in this <a href="#">Plan</a>.<sup>49</sup></li> </ul>	
By 2017, the natural, physical and cultural qualities of the <a href="#">beds</a> and banks of <a href="#">river</a> management zones are suitable for specified <a href="#">W</a> water <a href="#">M</a> management <a href="#">S</a> sub-zones* <sup>1</sup> values at all times.	Water Policies: 6-1, <a href="#">6-27</a> , <sup>48</sup> 6-29, 6-30, 6-31, 6-32	<ul style="list-style-type: none"> <li>Confirmed incidents of damage to the <a href="#">beds</a> and banks of <a href="#">river</a> management zones</li> <li>Consents granted for activities in <a href="#">beds</a> of <a href="#">rivers</a> and <a href="#">lakes</a> beds</li> </ul>	<ul style="list-style-type: none"> <li>Horizons' incidents database</li> <li>Horizons' consents database</li> </ul>
By 2017, the amount of groundwater used does not exceed replenishment rates and its quality is the same as or better than that measured prior to this <a href="#">Plan</a> becoming <i>operative</i> .	Water Policies: 6-6, 6-9, 6-12, 6-13, 6-21, 6-22, 6-23, 6-24 and 6-26	<ul style="list-style-type: none"> <li>Groundwater levels <a href="#">R</a>region-wide, but with a focus on Opiki and Himatangi areas</li> <li>Groundwater quality <a href="#">R</a>region-wide, but with a focus on nitrates in Horowhenua and Tararua districts and conductivity along the Foxton-Tangimaona coast</li> <li>Confirmed incidents where groundwater sources become unavailable (i.e., dry up) or <a href="#">water</a> quality is unfit for use</li> </ul>	<ul style="list-style-type: none"> <li>Horizons' <a href="#">S</a>state of <a href="#">E</a>environment groundwater monitoring programme</li> <li>Horizons' compliance monitoring programme</li> <li>Horizons' incidents database</li> <li>Ministry of Health raw water monitoring</li> </ul>

## 6.7 Explanations and Principal Reasons

The [Horizons](#) Region has been divided into [W](#)water [M](#)management [S](#)sub-zones\* for the purpose of managing water quality and quantity. Water bodies within these [W](#)water [M](#)management [S](#)sub-zones\* have been assigned values which represent the ecosystem, recreational, cultural and social and economic values of the water body (Objective 6-1, Policy 6-1). Standards have been assigned to [protect recognise and provide for](#) these values (Policies 6-2 to 6-5).

### Discharges to water and land

The water chapter deals with discharges to land and water holistically. This is because discharges to land have the potential to adversely affect ground[water](#) and surface water quality if not managed well. Four types of discharges of concern have been identified; point source discharges to land (including *domestic wastewater*), point source discharges to water (including industrial discharges and treated sewage) and non-point source discharges to land (from agricultural land uses). All these types of discharges will be managed to meet the objectives and policies for water quality (Objective 6-1, 6-2, Policies 6-2 – 6-5), including discharges to land (6-9).

Agricultural land uses contribute to ~~our~~ waterways [bodies](#) not meeting ~~our~~ the [Region's](#) standards for nutrients, faecal contamination and sediment levels. These need to be targeted for control in problem catchments and through ~~our~~ the [Regional Council's](#) Sustainable Land Use Initiative ([SLUI](#)) (Policy 6-7). Control will centre around using best practice management techniques and requiring nutrient management plans.

<sup>49</sup> Water officers report – recommendation WTR 70

Point source discharges to water need to be managed to achieve water quality standards (Policy 6-8). Sometimes this may mean that it is appropriate to consider alternatives to discharging to water to meet these water quality standards. This may include considering alternative treatment options for all or part of the year, to achieve water quality standards at critical times of the year (Policy 6-10). In all cases, point source discharges to water of untreated human sewage are culturally unacceptable, and direct discharges of treated human sewage should be changed to involve land treatment before discharge (Policy 6-11).

### **Surface Water Quantity**

Water will be used and allocated in a way which enables water to be used for the wellbeing of peoples and the community wellbeing, while providing for other values to be maintained (Objective 6-3, Policy 6-15). Water allocation limits are set for each Water Management Sub-zone\* and water will generally be managed to maintain these limits (Policies 6-16, 6-17, and 6-20). When water use needs to be restricted, life sustaining and essential water takes have first priority (Policy 6-19). Water harvesting and alternative sources of water to surface water are also encouraged and provided for (Policies 6-18 and 6-18). Efficiency of use is an important consideration, and will ensure that water is available to the maximum number of users and is not wasted (Policies 6-12 and 6-13).

### **Groundwater**

Groundwater quality and quantity is connected to that of surface water and this is recognised in this chapter, while providing for its management separately. Bores\* will be managed to ensure that they are of good quality properly constructed and do not lead to contamination of groundwater, wastage of water or unnecessary effects on other bores\* or surface water bodies (Policies 6-22, 6-24, and 6-25). Groundwater management zones have been established and sustainable allocations set, groundwater takes will be managed within these allocations (6-234). Groundwater quality within the Region is good and is not declining, but maintaining this good quality will be a consideration when managing discharges (Policy 6-9).

### **Beds of Rivers and Lakes**

The use of the beds of the Region's rivers and lakes is important to community wellbeing. However, equally the physical nature of ~~our~~ the Region's rivers and lakes is important to maintaining the values assigned to them. Management of activities in the beds of rivers and lakes will be undertaken in order to maintain these values, and other important physical attributes (Objective 6-27, Policy 6-31). Some values are treated differently. Important aquatic biodiversity sites, cultural sites and natural state areas would be negatively and potentially permanently harmed by some activities and consequently an emphasis has been placed on avoiding more than minor adverse effects on such values as far as reasonably practicable are given a high level of protection (Policy 6-28). Flood control and drainage schemes have damaged water values in some areas, but also provide valuable protection services to the community. Maintaining this level of service is important, while ensuring that other values are not further compromised (Policy 6-29). While recognising the values, ~~we~~ acknowledgement is also needed that some activities, such as river restoration, are beneficial and should be allowed to occur (Policy 6-31).

Gravel extraction is an important activity in river beds both, for the benefit the gravel resource provides, and the flood protection benefit of having it removed from the river. However, if not well managed, too much extraction, or extraction in an inappropriate manner can damage our river values. Gravel extraction needs to be managed to ensure that extraction volumes are sustainable (Policy 6-32).

