

# Proposed Plan Change 2 to the Waimakariri River Regional Plan

**R19/26-1**

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## How to read Proposed Plan Change 2 to the Waimakariri River Regional Plan

### Introduction

This document is included for information purposes only and does not form part of proposed Plan Change 2 (PC2) to the Waimakariri River Regional Plan (WRRP).

The following sections contain:

### Information for the Reader

This section contains general information about proposed PC2 to the WRRP. It provides an overview of key sections in the WRRP that are proposed to be amended. Readers should refer to the plan change itself, for a full description of all changes proposed by PC2.

### Legal effect of rules in Plan Change 2

This section describes the legal status of rules in the proposed plan change.

### How proposed amendments to the WRRP are shown

This section sets out how changes (ie additions, deletions and amendments) proposed by part of PC2 are indicated in the document.

### Relationship between proposed Plan Change 2 to the Waimakariri River Regional Plan and proposed Plan Change 7 to the Canterbury Land and Water Regional Plan

This section sets out the relationship between proposed PC2 to the WRRP and proposed PC7 to the LWRP.

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### Information for the Reader

Proposed Plan Change 2 proposes to remove from the WRRP, provisions that relate to the area covered by Section 8 (Waimakariri sub-region) of the Canterbury Land and Water Regional Plan (CLWRP).

The WRRP continues to apply to the main stem of the Waimakariri River, the upper catchment including its headwaters, and an area of land south of the Waimakariri River.

Operative parts of the WRRP that are not proposed to be amended by PC2 have been included to provide context for the reader. Examples include section headings and sub-headings, introductory paragraphs, notes and related rules. Content that is not amended by proposed PC2 is shown in plain text, without underline or strikethrough.

To view PC2 in its entirety please visit <https://ecan.govt.nz/wrrppc2>

## Legal effect of rules in Plan Change 2

In accordance with s 86B(3) of the Resource Management Act, all rules in proposed PC2 have immediate legal effect from the date of notification of the proposed plan change.

## How amendments to the Plan are shown

Amendments proposed as part of proposed Plan Change 2 are shown as follows:

- Proposed insertions are underlined;
- Proposed deletions in ~~striketrough~~;
- Instructions are shown in *italics* and contained in a box

*Example instructions*

## Proposed Amendments to WRRP Figures

Proposed Plan Change 2 to the WRRP proposes to amend the following figures in the WRRP to remove land that is located within the Waimakariri sub-region (defined as the area shown in Section 8 of the Canterbury Land and Water Regional Plan).

- Figure 1 - Map of the Waimakariri River and Catchment
- Figure 3 - Geography of the Lower Plains Tributaries
- Figure 4 – Waimakariri River Catchment above and below Woodstock
- Figure 5 – Waimakariri River and Plains Tributaries Monitoring Sites
- Figure 6 – Water Quality Standards of Surface Waters in the Waimakariri River Catchment

## WRRP Planning Maps

Plan Change 2 to the WRRP proposes to reduce the area covered by the WRRP. Land within the Waimakariri sub-region (as defined in the Canterbury Land and Water Regional Plan) is proposed to be removed from the WRRP, so that a single set of regional plan provisions applies to the sub-region.

A set of revised map sheets, which indicates the proposed new boundary for the WRRP is included as part of proposed PC2.

## Relationship between proposed PC2 to the Waimakariri River Regional Plan and proposed Plan Change 7 to the Canterbury Land and Water Regional Plan

Plan Change 2 to the WRRP is a necessary consequence of Part C of Plan Change 7 to the CLWRP. This is because Plan Change 7 introduces a framework to manage water quality and quantity within the Waimakariri sub-region to give effect to the Waimakariri Water Zone Committee's recommendations for managing water within its zone.

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# 1

## Introduction

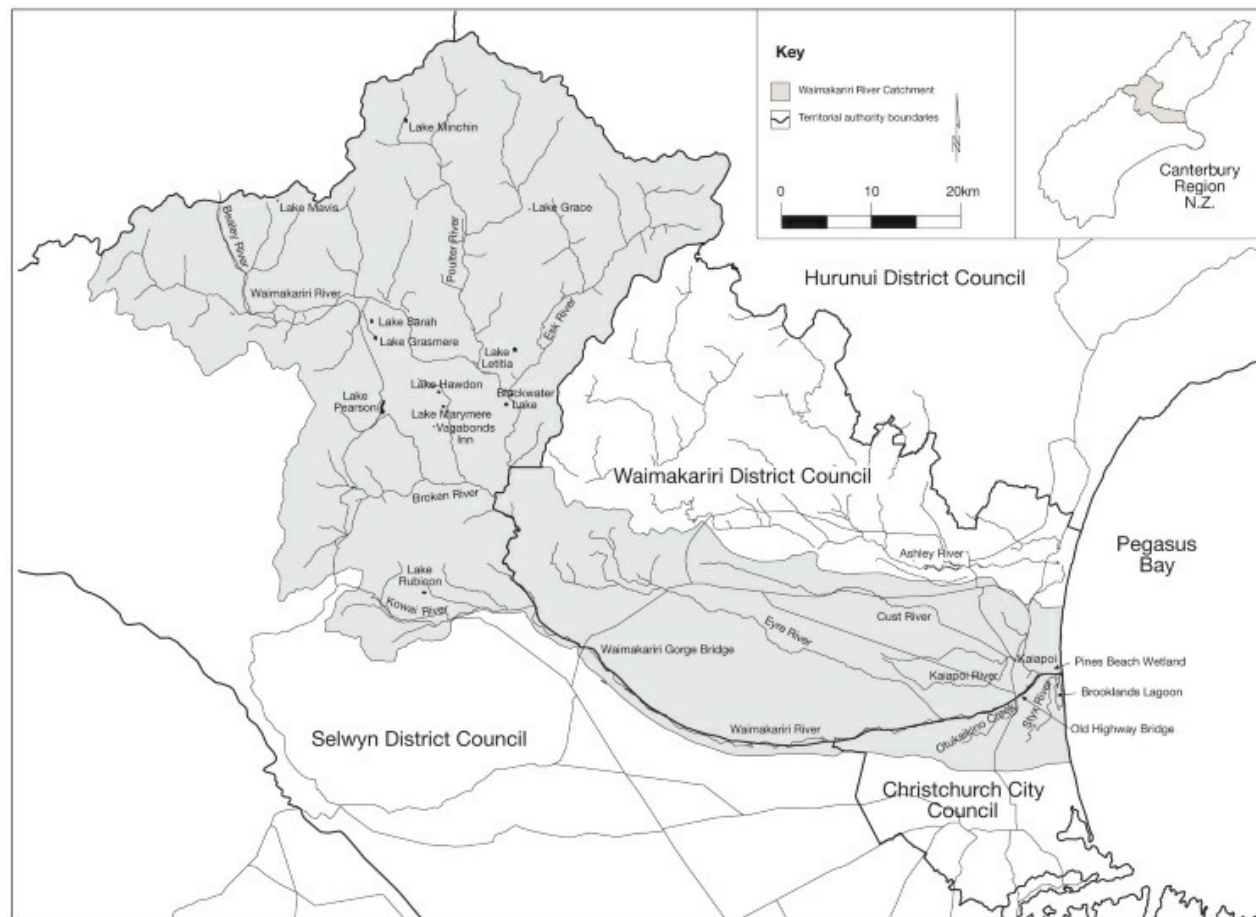
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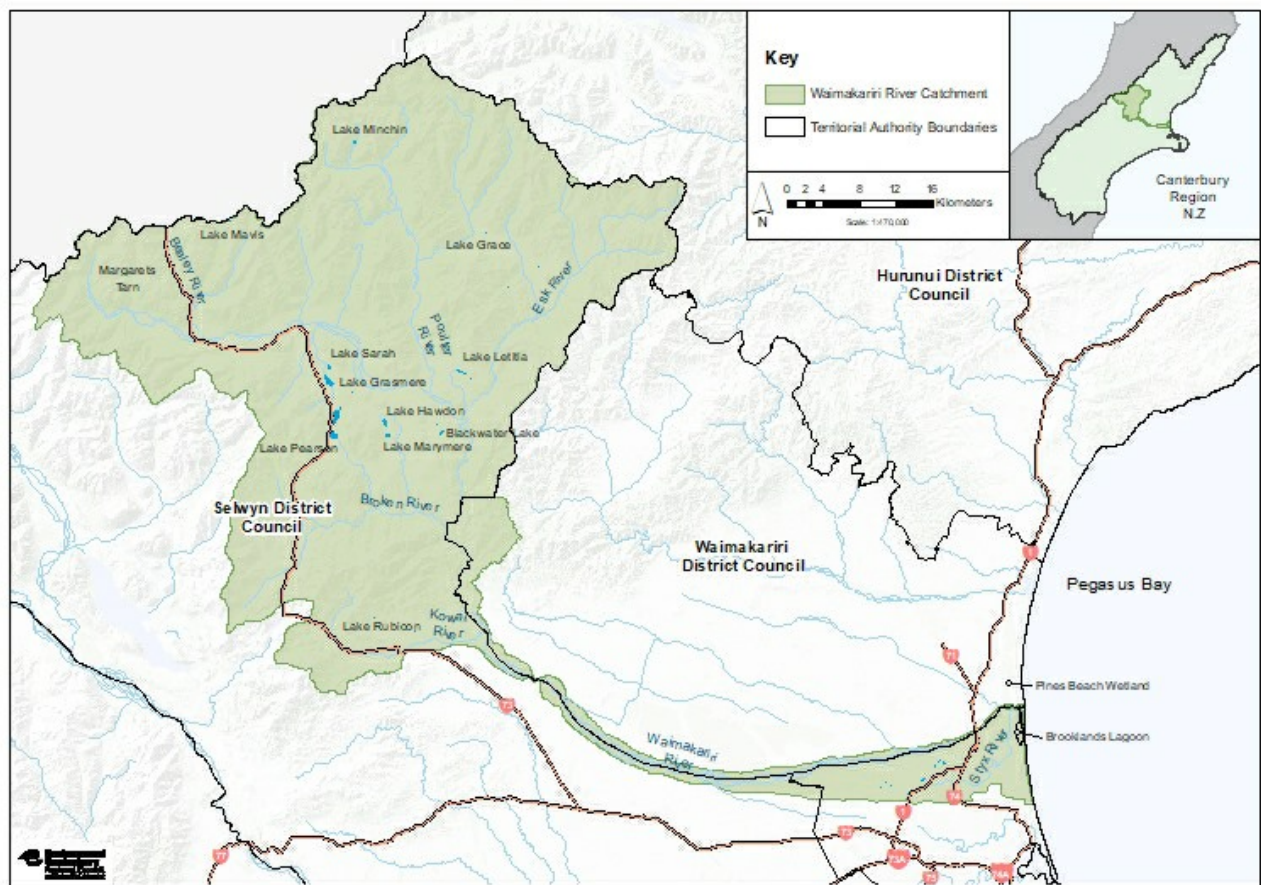
#### Area to which this Plan applies

This Plan applies to the Waimakariri River Catchment ~~It excludes the area seaward of Ferry Road, which lies within the Coastal Marine Area (Figure 2) and excludes the area within the Waimakariri Sub-region as defined in the Canterbury Land and Water Regional Plan (LWRP) (Figures 1 and 2). The Waimakariri River Catchment boundary is defined in Figure 1 Map 2. The water quality rules in this Plan do not apply in the Styx River catchment. The water quality rules in Chapter 4 of the operative Canterbury Natural Resources Regional Plan apply in the Styx catchment.~~

*Note: for the avoidance of doubt any surface water takes located within the mapped Waimakariri Sub-region (Section 8 of the LWRP) that abstract water from the main stem of the Waimakariri River are managed under this Plan. Any groundwater takes with a hydraulic connection to the main stem of the Waimakariri River, are assessed under the provisions of this Plan.*



*Plan Change 2 instructions: Delete Figure 1 above. Insert new Figure 1 below*



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## 1.4 How to Use This Plan

### Regulation of Activities

The Plan regulates the following activities within the Waimakariri River Catchment through regional rules:

- a. The taking (abstraction) of water from the Waimakariri River or its tributaries or from hydraulically connected groundwater (Chapter 5, Rule 5.1 discretionary activity, Rule 5.3 non-complying activity, Rule 5.4 prohibited activity), except where the activity occurs within the boundaries of Greater Christchurch, and is classified by
    - Rule WQL36A of the Natural Resources Regional Plan; or
    - Rules 8.5.2 or 8.5.3 of the Waimakariri sub-regional section of the proposed Land and Water Regional Plan; or
    - Rules 9.5.6 or 9.5.7 of the Christchurch-West Melton sub-regional section of the proposed Land and Water Regional Plan; or
    - Rules 11.5.1 or 11.5.2 of the Selwyn-Waihora sub-regional section of the proposed Land and Water Regional Plan
  - b. The use, diversion, discharge or damming of water in the Waimakariri River or its tributaries (Chapter 5, Rule 2 discretionary activity, Rule 5.3 non-complying activity, Rule 5.4 prohibited activity).
  - c. The discharge of contaminants into the Waimakariri River or its tributaries or onto or into land where the discharge can enter surface waters (Chapter 6, Rule 1 discretionary activity, Rule 6.2 non-complying activity), except where the activity occurs within the boundaries of Greater Christchurch, and is classified by
    - Rule WQL36A of the Natural Resources Regional Plan; or
    - Rules 8.5.2 or 8.5.3 of the Waimakariri sub-regional section of the proposed Land and Water Regional Plan; or
    - Rules 9.5.6 or 9.5.7 of the Christchurch-West Melton sub-regional section of the proposed Land and Water Regional Plan; or
    - Rules 11.5.1 or 11.5.2 of the Selwyn-Waihora sub-regional section of the proposed Land and Water Regional Plan
- The water quality rules of this plan do not apply in the Styx River catchment. ~~The water quality rules in Chapter 4 of the Canterbury Natural Resources Regional Plan apply in the Styx catchment.~~
- d. The disturbance of the beds of rivers and lakes (Chapter 7, Rules 7.1, 7.2 and 7.3 permitted activities, Rule 4 discretionary activities and Rule 7.5 prohibited activity).
  - e. The introduction or planting, and the disturbance, removal, damage or destruction of plants or habitats in river and lake beds (Chapter 7, Rule 7.2 permitted activity, Rule 7.4 discretionary activities, Rule 7.5 prohibited activities).
  - f. The use, erection, reconstruction, placement, alteration, extension, removal or demolition of structures in river and lake beds (Chapter 7, Rule 3 permitted activities, Rule 7.4 discretionary activities, and Rule 7.5 prohibited activities).
  - g. The deposition of substances in river and lake beds (Chapter 7, Rule 2 permitted activities, Rule 7.4 discretionary activities and Rule 7.5 prohibited activities).
  - h. The reclamation or drainage of river and lake beds (Chapter 7, Rule 4 discretionary activity and Rule 7.5 prohibited activity).

The rules specify the conditions, standards and terms which must be met; matters, if any, to which Environment Canterbury has restricted its discretion; the effect on existing permits; and any exemptions from the rules. Activities covered by rules fall into six types: permitted, controlled, restricted discretionary, discretionary, non-complying, and prohibited. Refer to Appendix 1 at the back of the plan to find the precise meaning of terms used.

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## 3 Resource Overview

### 3.1 Land Resources

The total land area in the Waimakariri River Catchment is 3654 km<sup>2</sup>. Thirty-three percent is arable land (Land Capability Classes I to IV), 17% is mainly tussock and bush covered hill and high country (Class VI land), 4% is riverbed and 46% is steep mountain land (Class VII and VIII land), which has severe to extreme limitations for any form of productive use.

Urban centres of population within the catchment include Rangiora, Kaiapoi, Woodend, Belfast and Oxford. Most of Christchurch City lies just outside the catchment but on the floodplain of the Waimakariri River.

Land use on the plains is diverse. The shallow stony soils which comprise most of the plains support dryland sheep farming. Cropping is mainly confined to the free-draining deeper soils along the Eyre River and fringing the wetter soils on the lower plains. On the lower plains, high water tables limit farming primarily to dairy, beef or deer farming. Orcharding and other horticultural cropping is increasing in area on the plains. Life-style farms are a significant land use. The main limitations to increased production on the plains are the shallow soils which are in the majority, and the lack of an irrigation water supply.

~~The plains contrast sharply with the upper Waimakariri River Catchment basin, where~~ The high altitudes, long cold winters, and inhospitable terrain of the upper Waimakariri River Catchment basin severely limit agricultural production. These same features, so adverse to agriculture, add to the attraction and value of this area for outdoor recreation and tourism. The upper catchment contains the last remaining significant areas of relatively undisturbed indigenous ecosystems within the catchment.

### 3.2 Water Resources

The catchment water resources (Figures 1, 2 and 3) comprise:

- a. rainfall;
- b. ice and snow, alpine bogs and streams;
- c. the flow of the Waimakariri River and tributary rivers which include:
  - Bealey River,
  - Esk River,
  - Poulter River,
  - Broken River,
  - Kowai River,
  - ~~Eyre River,~~
  - ~~Cust River,~~
  - ~~Kaiapoi River,~~
  - ~~Gam River,~~
  - Styx River, and
  - Otukaikino Creek (South Branch of the Waimakariri River);
- d. a groundwater resource beneath the Plains which feeds the ~~Cust, Gam, Kaiapoi,~~ Styx, Otukaikino Creek, and other smaller streams on the lower plains;
- e. more than twelve lakes and associated wetlands which include:
  - Blackwater,

- Grace,
- Grasmere,
- Hawdon,
- Letitia,
- Marymere,
- Mavis,
- Minchin,
- Pearson,
- Rubicon;
- Sarah, and
- Vagabonds Inn
- f. Brooklands Lagoon<sup>2</sup>; and
- g. Pines Beach

The flow in the Waimakariri River<sup>3</sup> is continuously recorded at the Old Highway Bridge where between 1967 and 1994 there were some 27 years of recorded flows indicating that the river has a mean flow of 124 cubic metres per second, flood flows which can exceed 4,000 cubic metres per second, and flows as low as 25 cubic metres per second. The mean annual daily low flow is 41.5 cubic metres per second, and mean annual instantaneous low flow is 41.0 cubic metres per second. Over 90% of the river flow is derived from precipitation in the upper catchment. Winter snow and ice is stored and released in spring contributing to higher flows in the river during this part of the year. The period of lowest flows occurs in late summer. Flood flows can occur at any time.

Water leaves the river below Halkett and recharges groundwater to the north and south of the river. The estimated range of this recharge is 3-12 cubic metres per second. A considerable groundwater resource is stored in the gravels beneath the plains and feeds a number of streams on the lower plains including the Avon and Heathcote Rivers.

~~Beneath the Waimakariri-Ashley Plain is a groundwater resource of great significance to the communities which live on the plain. It provides 90% of the area's drinking water, mostly without any treatment, and with the surface streams, as at March 2004, irrigates some 4,500 hectares.~~

The Waimakariri River presents a major flood hazard to Christchurch (316,000 people) which has developed on the south floodplain of the Waimakariri River and to Kaiapoi (9,500<sup>4</sup> people), which has developed on the north floodplain. An extensive system of flood protection works has been developed on the lower river.

~~The Eyre River which drains foothills to the west of Oxford, bisects the plains between the Waimakariri and Ashley Rivers but rarely carries any surface flow in its reach across the plains.~~

Water is abstracted from the Waimakariri River for the Waimakariri Irrigation Scheme, three community stockwater schemes and for Darfield's community domestic supply. The Selwyn District Council scheme intake is at the Waimakariri Gorge. It takes water from the Waimakariri River and the Kowai River and provides stockwater to some 47,500 hectares. A second scheme at Halkett provides stockwater to some 17,000 hectares. The Waimakariri Irrigation Scheme and the Waimakariri District Council Stockwater Scheme have intakes at Browns Rock. The Waimakariri Irrigation Scheme provides water to 18000 hectares of the Waimakariri Ashley Plains. The stockwater scheme provides stockwater to some 44,000 hectares. Domestic water supply to Darfield comes from a gallery system in the bed of the Waimakariri River and to Springfield from the Kowai River.

About 20 cubic metres per second as at (Sept 2002) of the flow in the Waimakariri River is abstracted, 75% for irrigation and 25% for stockwater. The river is a potential source of water for further irrigation, groundwater recharge and part of Christchurch's urban supply. In contrast, water is abstracted from the plains tributaries mainly for irrigation. The peak abstraction allocation from the rivers in the Waimakariri River Catchment, at the time the assessment was made, is shown in Table 1.

Above the confluence of the Otukaikino Creek with the Waimakariri River there are no significant point discharges to the Waimakariri River. The Otukaikino Creek receives treated sewage effluent from the Belfast treatment system. The Otukaikino Creek flows into the Waimakariri River just above the SH 1 Motorway Bridge. At the Old Highway Bridge, the Waimakariri River receives trade waste from the Primary Producers Co-operative Society Ltd discharge. Below the confluence of the Kaiapoi River with the Waimakariri River, sewage effluent from the Kaiapoi treatment system is discharged via a small creek to the Waimakariri River.

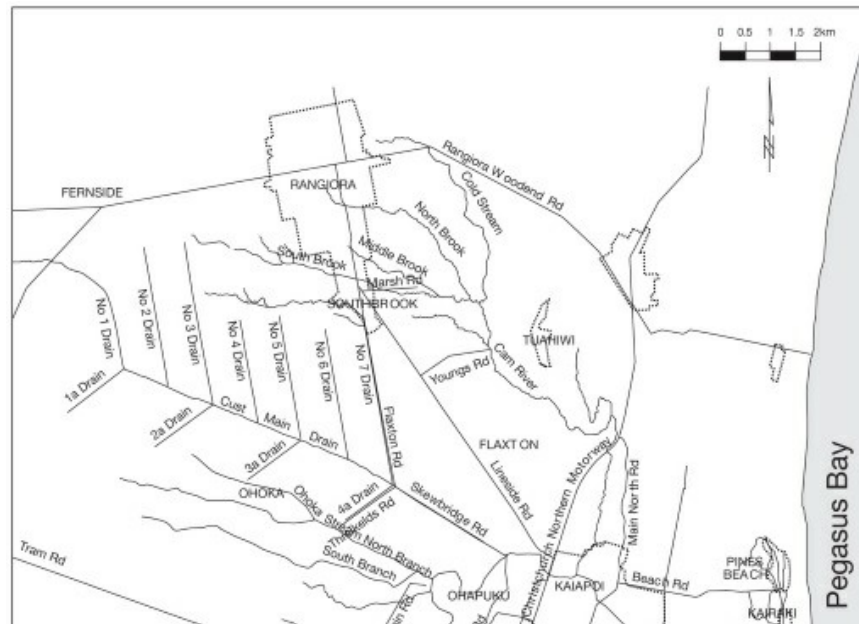
The plains tributaries (~~Kaiapoi-Cam-Cust system~~, Styx and Otukaikino Creek; see Figure 3) were once the most important sources of mahinga kai in the catchment but their use for this purpose has declined as the plains were developed and the streams altered to control flooding and improve drainage.

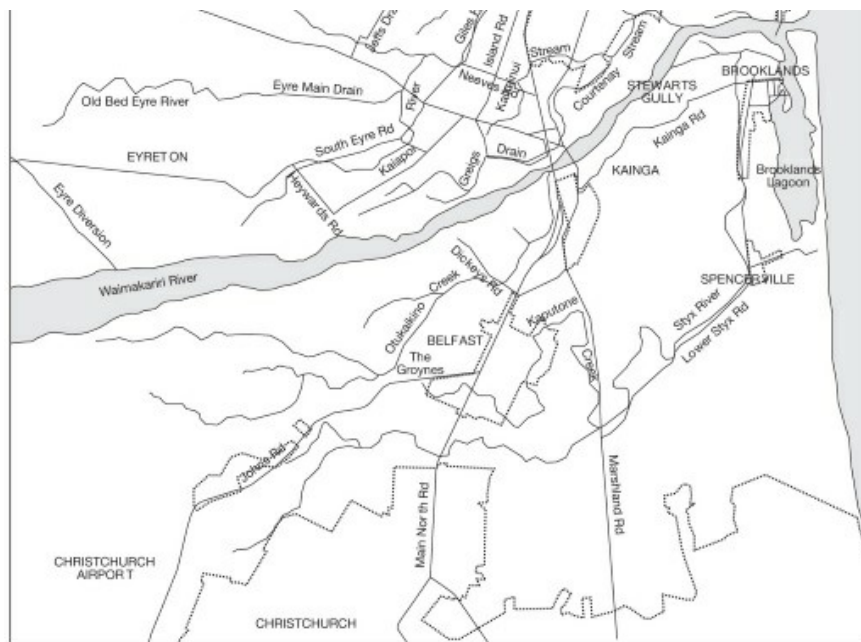
Pollutants in runoff and from direct waste discharge to these rivers and the drainage network feeding into them, devalue them as sources of mahinga kai. The community uses the plains tributaries to dispose of stormwater, treated trade wastes and treated sewage effluent.

Within the Waimakariri River Catchment, as at March 2004, there were 69 discharge permits to surface water, and 336 to land, mainly for stormwater, agricultural wastes and industrial wastes.

The Waimakariri River, primarily because of its location in relation to Christchurch, is the most heavily used river for recreation purposes in Canterbury with the possible exception of the Avon and Heathcote Rivers and their common estuary.

The Waimakariri River has potential for hydro-electric power generation, for groundwater recharge, and as a future source of water for Christchurch City. There is a small commercial eel fishery based on the river and there are opportunities for freshwater fish farming.





*Plan Change 2 instructions: Delete Figure 3 above. Insert new Figure 3 below*

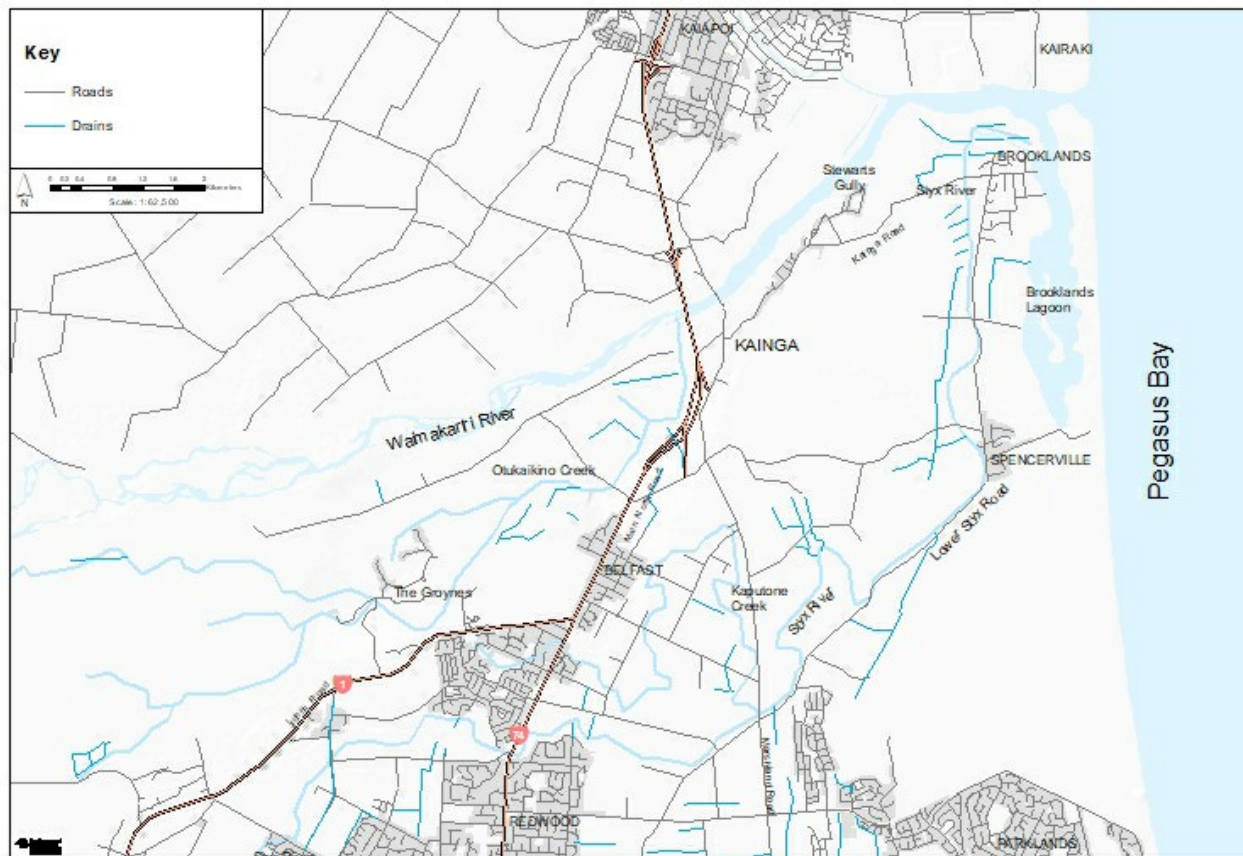


Figure 3 Geography of the Lower Plains Tributaries

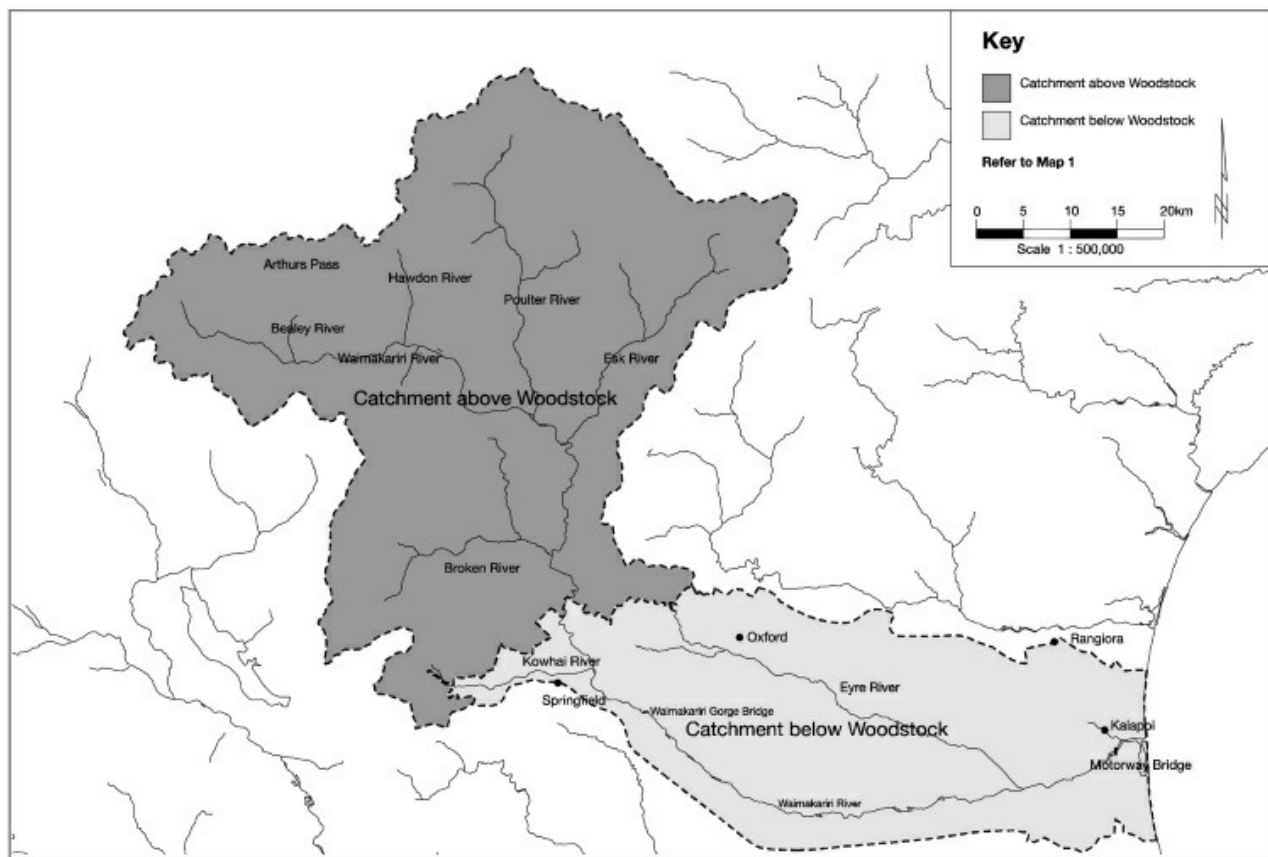
TABLE 1 WATER PERMITS FOR SURFACE WATER TAKES AND HYDRAULICALLY CONNECTED GROUNDWATER TAKES WITHIN THE WAIMAKARIRI RIVER CATCHMENT

Water Resource	Maximum rate of take by surface takes (litres per second) (as at May 1996) <sup>5</sup>	Maximum rate of surface water depletion by groundwater takes (litres per second) (as at March 1995) <sup>6</sup>	Total (litres per second) <sup>7</sup>

Waimakariri River above Woodstock	67	not assessed	not assessed <sup>8</sup>
Waimakariri River below Woodstock	6572 (19464)	20 (304)	6592 (19768) <sup>9</sup>
Styx River	273	115	388
Kaputone Creek	179	0	179
Otukaikino Creek	314	76	390
Gourtenay Stream	46	0	46
Greigs Drain	44	0	44
Kaiapoi River	130	511	641
Cust Main Drain	382 (475)	569 (215)	951 (690) <sup>10</sup>
Cust River	249	43	292
No. 7 Drain	79	51	130
Ohoka Stream	36	403	439
Cam River	535	163	698
North Brook	87	111	198
Middle Brook	29	4	30
South Brook	0	81	81
Eyre River	50	not assessed	not assessed <sup>11</sup>

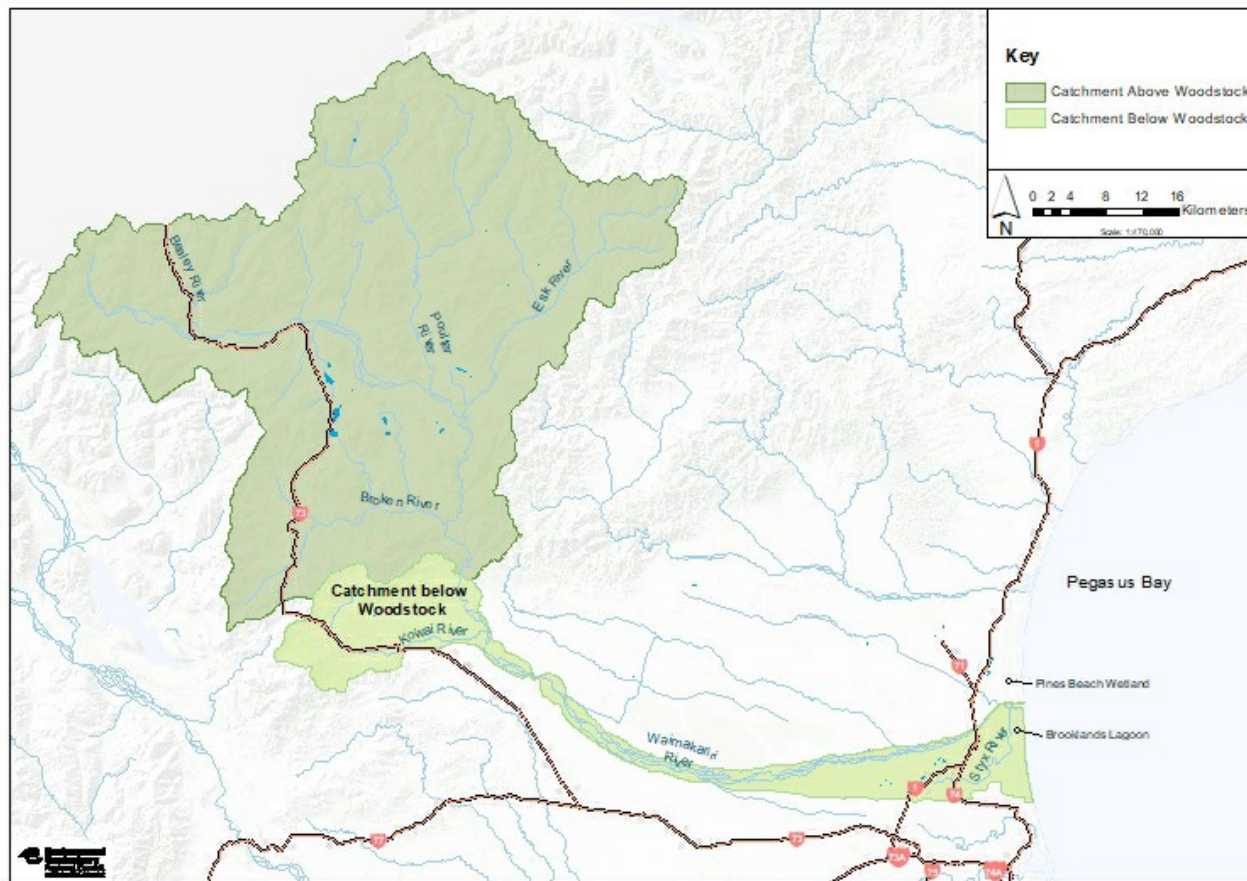
### 3.3 Other Resource Values of the Waimakariri River and Catchment

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*Plan Change 2 instructions: Delete Figure 4 above. Insert new Figure 4 below*





**Figure 4 Waimakariri River Catchment above and below Woodstock (Note: Updated by Plan Change 1 – Refer to Map 1 for accurate catchment boundary)**

(Underlined = new wording)

**Figure 4 Waimakariri River Catchment above and below Woodstock**



<sup>2</sup> Brooklands Lagoon is outside the area covered by this plan. It is dealt with in the Proposed Regional Coastal Environment Plan

<sup>3</sup> The flow of the Waimakariri River is recorded at the Old Highway Bridge which is downstream of abstractions from the Waimakariri River. Prior to notification of this Plan in 1996 abstractions for community scheme (domestic and stockwater) takes, were mainly continuous and were about 3.8 cubic metres per second in total. Prior to notification of this Plan, irrigation takes totalled about 2.8 cubic metres per second, but these only occurred in the irrigation season and varied according to the severity of the soil moisture deficit. Prior to this Plan, consent conditions required all irrigation to cease when the river flow was below 37 cubic metres per second measured at the Old Highway Bridge. None of the takes from the Waimakariri River were continuously recorded. To convert the flow record to a flow record unaffected by abstractions, 4 cubic metres per second has been added to the values of mean flow, lowest recorded flow, mean annual daily low flow and mean annual instantaneous low

<sup>4</sup> Populations usually resident in 2001.

<sup>5</sup> The maximum rate of surface takes is calculated from the Regional Council's consents database. It is the sum of the maximum rates of authorised takes of individual water permits, assuming that all are exercised concurrently at their maximum rate of take.

<sup>6</sup> The maximum rate of surface water depletion by groundwater takes is from the report "Effects of Groundwater Abstractions on Surface Water Flows in the Lower Waimakariri River and its Tributaries", Canterbury Regional Council Report R96/1, 1996. It is the sum of the estimated rate of surface water depletion, assuming that all authorised groundwater takes are exercised concurrently at their maximum rate of take.

<sup>7</sup> The total is the sum of the adjacent two columns of figures, and gives an indication of the total authorised peak allocation from each water resource.

<sup>8</sup> The total for the Waimakariri River above Woodstock is not relevant because of the very small quantity of water taken.

<sup>9</sup> Figures in brackets show the maximum rate of take in September 2002

<sup>10</sup> Figures in brackets show the maximum rate of take in October 2003.

<sup>11</sup> The total for the Eyre River is not relevant because it seldom carries any surface flow.

## Policy 5.1

1. Set and maintain water flow, water level and water allocation regimes and control the taking, use, diversion, discharge and damming of surface water, and the taking of water from hydraulically connected groundwater, while achieving (a) to (h) of Objective 5.1, so that:
  - i. the range or rate of change of levels or flows of water in or entering lakes Blackwater, Grace, Grasmere, Hawdon, Letitia, Marymere, Mavis, Minchin, Pearson, Rubicon, Sarah, and Vagabonds Inn are preserved in their natural state;
  - ii. the natural flows, including flow patterns and variability, in the Waimakariri River and tributaries are protected;
  - iii. the natural water levels in wetlands are protected;
  - i. the braided character of the Waimakariri River, aquatic ecosystems and habitats, wetlands, amenity based on the river, and groundwater recharge from the river, are protected;
  - ii. the aquatic ecosystems and habitats, wetlands and amenity based on the ~~Kaiapoi-Cam-Cust~~, Otukaikino Creek, Styx, and Kowai and upper Eyre River systems, are protected.
    - a. above Woodstock (Figure 4 and Map 1):
    - b. below Woodstock (Figure 4 and Map 1):
2. Maintain water flow and water allocation regimes that are consistent with Policy 5.1(1) by<sup>13</sup>:
  - i. Requiring the taking or diverting of surface water from the Waimakariri River, including its tributaries, or the taking of hydraulically connected groundwater, to be in accordance with the flow and allocation regimes specified in Table 2, unless Objective 5.1 would be achieved.
  - ii. Prohibiting the taking or diverting of surface water from the Waimakariri River, including its tributaries, or the taking of hydraulically connected groundwater, where the taking or diverting would occur at or below the “A” permit minimum flow for the water resource specified in Table 2, unless the taking or diverting is part of an “AA” allocation block specified in Table 2.
3. Ensure that any new water permit (i.e., a water permit that did not exist at the time that the Waimakariri River Regional Plan - Plan Change 1 became operative and is not an exact replacement or transferred permit in terms of the instantaneous rate of take and annual volume taken) does not reduce the reliability of water availability associated with any existing water permit.
4. Recognise that the achievement of Objective 5.1 may be assisted through taking or diverting water for storage while complying with the flow and allocation regimes specified in Table 2.
5. Require the installation and maintenance of water-measuring, recording and data transfer systems, including real-time telemetry, for all takes and diversions greater than 5 litres per second, unless the take or diversion returns the same amount of water to the same water body at or about the location from which it was taken or diverted and there is no significant delay between the taking or diverting and returning of the water.
6. Require the cessation or significant reduction of water permit takes and diversions, other than for permits within an “AA” allocation, during a fresh that occurs after a period of 21 days or more of river flows at or below the minimum flow specified in

**Table 2 if downstream periphyton (including cyanobacteria) biomass/coverage has reached levels that could increase and result in significant adverse effects.**

## Explanation

"Above Woodstock" and "Below Woodstock" means within those parts of the catchment defined in Figure 4 and Map 1. ~~The upper Eyre means those parts or tributaries of the Eyre River which have a continual flow of water, e.g., Coopers Creek.~~

The rivers, lakes and wetlands in the catchment above Woodstock are integral parts of the high natural values that exist there. Existing values associated with rivers and wetlands can be destroyed or devalued by taking, using, diverting, discharging and damming of water. Alterations in water levels which maintain higher or lower lake levels for periods in excess of those that occur naturally, adversely affect the margins of lakes, e.g., wetlands, lake edge vegetation, or the landscape of the lake environs.

Below Woodstock the braided character of the Waimakariri River and the recreational, fisheries and ecological values are outstanding features of the river. Taking, using, damming, diverting and discharging water has the potential to adversely affect the natural character and the instream values of the river. Below Halkett the river recharges groundwater to the north and to the south of the river. Groundwater is the source of Christchurch's water. Taking, damming and diversion have the potential to adversely affect this recharge.

The fishery and birdlife habitat associated with the plains tributaries would be adversely affected by excessive abstraction from these rivers.

Taking water from the groundwater near rivers where the groundwater has a hydraulic connection to the river, under certain conditions, has a similar effect on low flows as a direct take from the river.

Setting minimum flows will protect instream values of rivers. Setting water levels or controls on altering inflows and outflows to lakes will help protect the natural state of lakes.

Policy 5.1(2)(a) specifies quantitative water flow and water allocation regimes.

Policy 5.1(2)(b) establishes a prohibited activity status that prevents the taking or diverting of water below the "A" permit minimum flows set out in Table 2, unless the take/diversion is provided for in the "AA" allocation.

Table 2 also recognises the relocation of the low flow monitoring site from the Old Highway Bridge site to the Otarama site. This provision is complemented by a provision that requires ongoing investigations into the relationship between flows at the Old Highway Bridge and the Otarama sites to check the established relationship before the Otarama low flow monitoring site is considered for application to existing water permits.

Policy 5.1(3) recognises the principle of 'first in, last out' or 'non-derogation', and establishes a policy framework for water permits to ensure that the reliability of water availability for earlier water permits is not adversely affected by the granting of subsequent water permits. This would be reflected in water permit conditions that define flow "bands" within which water can be abstracted.

Policy 5.1(4) recognises that in certain circumstances taking water for storage could have significant benefits for a wide range of water uses and values. For example, water could be taken and stored during high river flows, avoiding the need to abstract during low flows.

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- Policy 5.1(5) highlights the need for water-metering, recording and data transfer systems including telemetry to ensure that accurate timely information is available on abstractions and to facilitate cooperation between consent holders.
  - Policy 5.1(6) identifies the need for water permit takes and diversions to cease or be significantly reduced during a fresh that occurs after a period of prolonged low flow to prevent periphyton building up to levels that would have significant adverse effects.
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### 5.3 Methods

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#### Rule 5.1 Standards and Terms

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■ **Minimum Flow** is the unmodified mean river flow recorded for the 24 hour period ending at noon, at the minimum flow monitoring site specified in Table 2, as estimated by the Canterbury Regional Council. ~~In the case of the Cust River and Cust Main Drain, the "minimum flow" does not include any water augmenting the river.~~

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**"Unmodified flow"** is the mean river flow for the 24 hour period ending at noon at the minimum flow monitoring site estimated by the Canterbury Regional Council based on the recorded flow plus the following abstractions occurring upstream of the minimum flow monitoring site:

1. actual real time telemetered takes and diversions, and
2. where no real time telemetered abstraction data is available, an estimate of takes and diversions shall be made by the Canterbury Regional Council based on relevant information that can include the proportion of other similar actual authorised takes or diversions.

In the case of the Cust River, the "unmodified flow" shall be estimated to exclude any water augmenting the river that is exempted in accordance with (Link, 14192, Rule 5.1 Standards and Terms (f)(v)).

**Water Users Group** is as defined in Method 5.3.2

**Water Resource** is defined as follows (see also Figure 5):

**Waimakariri River** is the mainstem of the Waimakariri River "below Woodstock", the Kowai River and its tributaries and groundwater which is hydraulically connected to these surface waters, but excluding the Eyre River and its tributaries and groundwater which is hydraulically connected to these, and Saltwater Creek and its tributaries.

(Note: The Eyre River and Saltwater Creek are excluded because the taking of water from these rivers has no effect on flows in the mainstem of the Waimakariri River.)

**Styx River** is the mainstem of the Styx River, its tributaries (but excluding Kaputone Creek), and groundwater which is hydraulically connected to these surface waters.

**Kaputone Creek** is the mainstem of the Kaputone Creek, its tributaries, and groundwater which is hydraulically connected to these surface waters.

**Otukaikino Creek** is the mainstem of the Otukaikino Creek, its tributaries, and groundwater which is hydraulically connected to these surface waters.

**Courtenay Stream** is the mainstem of the Courtenay Stream, its tributaries (but excluding Greigs Drain), and groundwater which is hydraulically connected to these surface waters.

**Greigs Drain** is the mainstem of Greigs Drain, its tributaries, and groundwater which is hydraulically connected to these surface waters. The most downstream point of the mainstem of Greigs Drain is defined to be at its Minimum Flow Site. Downstream of this Site the surface waters are the Courtenay Stream.

**Kaiapoi River** is the mainstem of the Kaiapoi River, its tributaries (but excluding the Cam River, Courtenay Stream, Cust Main Drain and Ohoka Stream), and groundwater which is hydraulically connected to these surface waters.

**Cust Main Drain** is the mainstem of the Cust River downstream of the Cust River Minimum Flow Site until its confluence with the Kaiapoi River, its tributaries (but excluding No. 7 Drain), and groundwater which is hydraulically connected to these surface waters.

**Cust River** is the mainstem of the Cust River upstream of its Minimum Flow Site, its tributaries, and groundwater which is hydraulically connected to these surface waters.

**No. 7 Drain** is the mainstem of the No. 7 Drain, its tributaries, and groundwater which is hydraulically connected to these surface waters:

-

**Ohoka Stream** is the mainstem of the Ohoka Stream, its tributaries, and groundwater which is hydraulically connected to these surface waters:

-

**Cam River** is the mainstem of the Cam River, its tributaries (but excluding North Brook, Middle Brook and South Brook upstream of their Minimum Flow Sites), and groundwater which is hydraulically connected to these surface waters:

-

**North Brook** is the mainstem of North Brook upstream of its Minimum Flow Site, its tributaries, and groundwater which is hydraulically connected to these surface waters:

-

**Middle Brook** is the mainstem of Middle Brook upstream of its Minimum Flow Site, its tributaries, and groundwater which is hydraulically connected to these surface waters:

-

**South Brook** is the mainstem of South Brook upstream of its Minimum Flow Site, its tributaries, and groundwater which is hydraulically connected to these surface waters:

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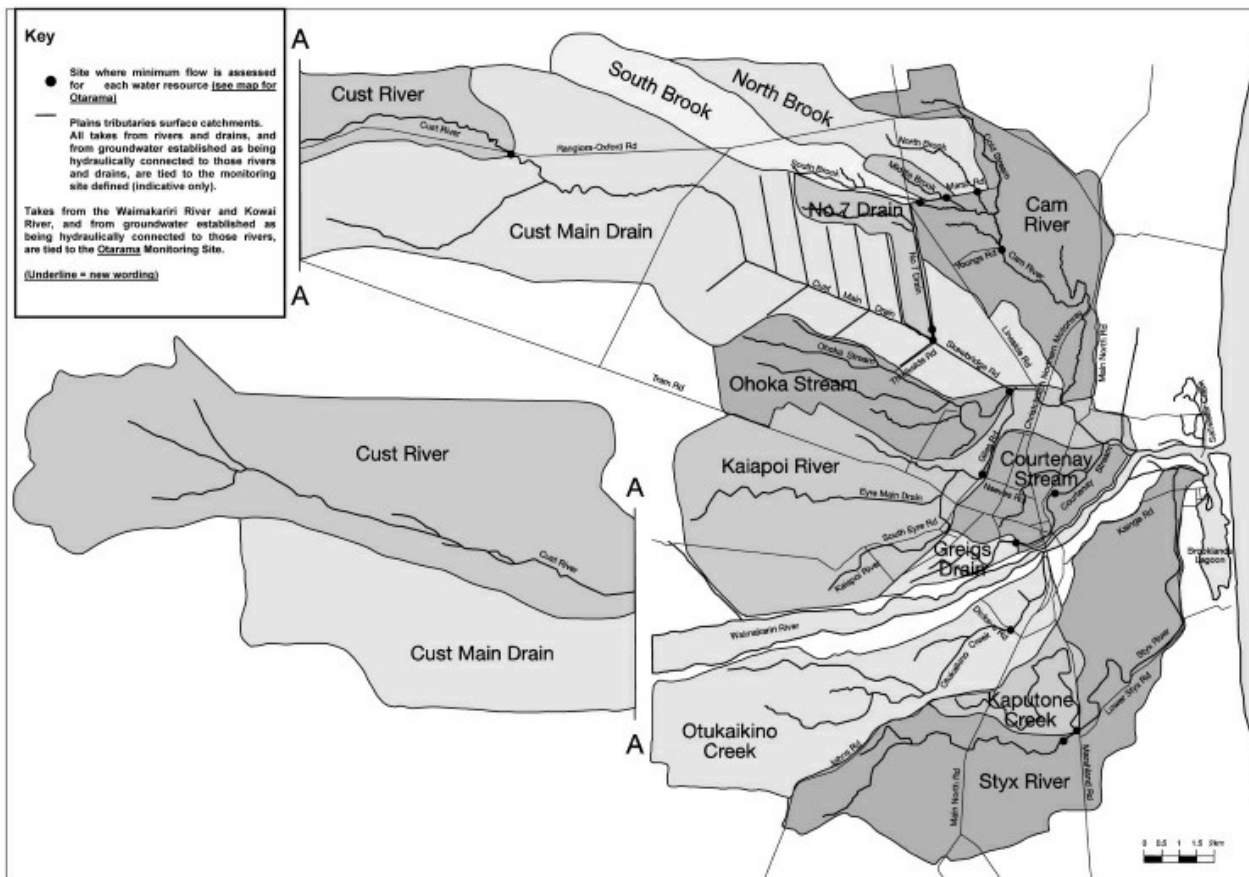
#### Effect of Rule 5.1 (includes Plan Change 1) on Existing Resource Consents

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Table 2 Minimum flows and allocation limits within the Waimakariri River Catchment

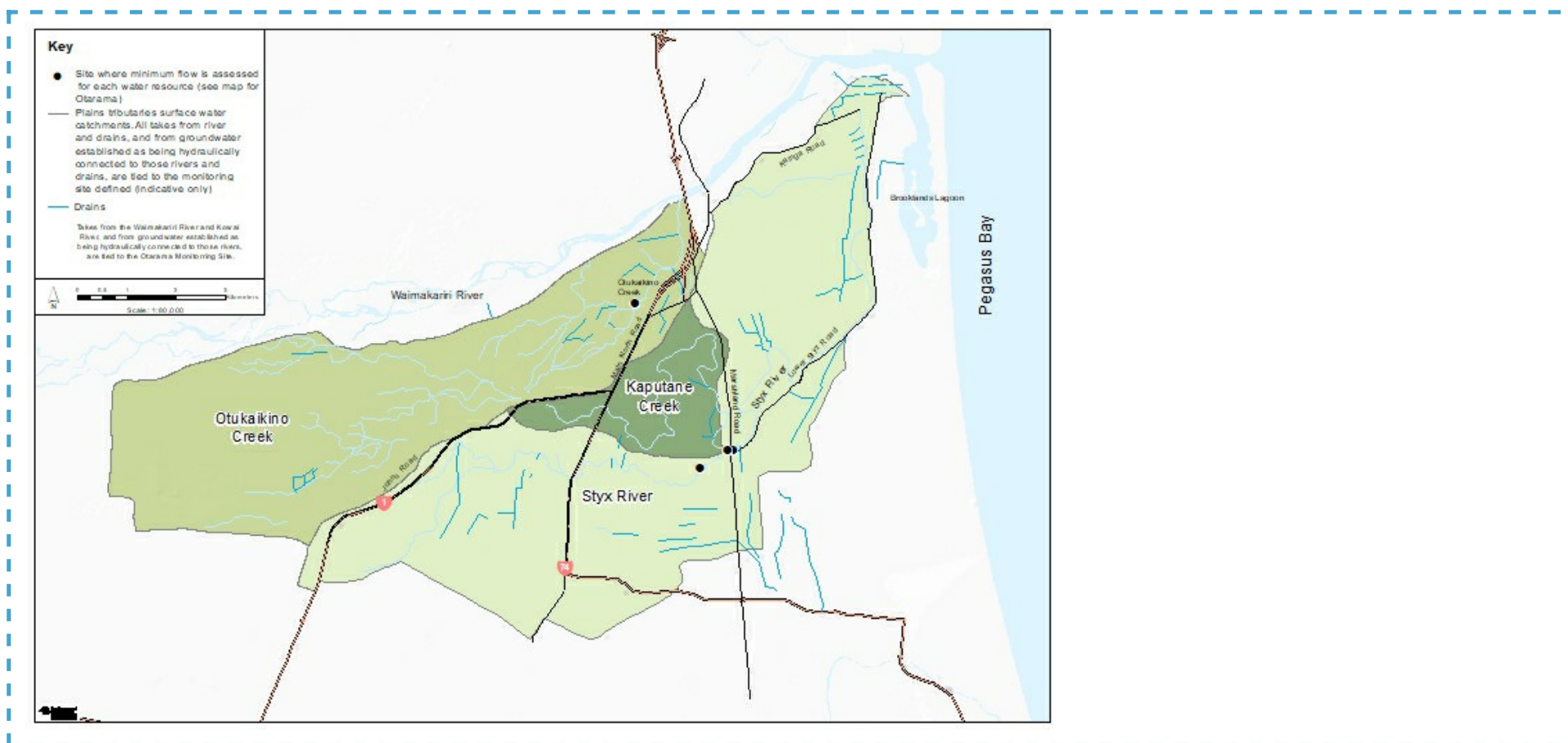
Water Resource	Allocation limit in litres per second for "AA" Permits	Minimum flow in litres per second for "A" Permits	Allocation limit in litres per second for "A" Permits	Minimum flow in litres per second for "B" Permits	Allocation limit in litres per second for "B" Permits	Minimum flow monitoring site (see Figure 5 and Map 1 Sheet 3)	Map reference of minimum flow monitoring site (NZMS 260)
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Waimakariri River (including the Kowai River) "below Woodstock"	5000	46000	17000	68000	27000 1:1 flow sharing	Otarama	L34:244-717
Styx River	N/A	1200	800	2000	No limit	Radcliffe Road	M35:817-491
Kaputone Creek	N/A	150	180	330	No limit	Confluence with Styx River	M35:824-495
Otukaikino Creek	N/A	2000	1000	3000	No limit	Dickeys Road	M35:804-524
Gourtenay Stream	N/A	260	140	400	No limit	Main North Road	M35:813-560
Greigs Drain	N/A	150	70	220	No limit	Greigs Drain Road	M35:805-548
Kaiapoi River	N/A	600	1000	1600	No limit	Neeves Road	M35:796-568
Gust Main Drain	N/A	230	690	920	No limit	Threlkelds Road	M35:783-606
Gust River	N/A	20	290	310	No limit	Rangiora- Oxford Road	M35:661-660
No. 7 Drain	N/A	60	130	190	No limit	Main Drain Road Culvert	M35:781-608
Ohoka Stream	N/A	300	500	800	No limit	Confluence with Kaiapoi River	M35:803-591
Cam River	N/A	1000	700	1700	No limit	Youngs Road	M35:801-633
North Brook	N/A	530	200	730	No limit	Marsh Road	M35:795-649
Middle Brook	N/A	60	30	90	No limit	Marsh Road	M35:782-647
South Brook	N/A	140	100	240	No limit	Marsh Road	M35:779-647



Plan Change 2 instructions: Delete Figure 5 above. Insert new Figure 5 below





**Figure 5 Waimakariri River and Plains Tributaries Monitoring Sites**

**Use, Diversions, Damming and Discharges of Water**

Appendix 4 lists the relevant Permitted Activities specified by the Canterbury Natural Resources Regional Plan for the use, diversion, damming and discharges of water. In particular, the Transitional Regional Plan provides for the diversion and discharge of natural water. These activities are not controlled by the rules in the Waimakariri River Regional Plan.

...

<sup>13</sup> This policy does not apply to water taken or used for an individual's reasonable domestic needs; or the reasonable needs of an individual's animals for drinking water, provided that the taking or use does not, or is not likely to, have an adverse effect on the environment, because under section 14(3)(b) of the RMA, such takes or uses do not require specific authorisation via a regional plan or resource consent.

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## 6

## Water Quality

### 6.1

### Introduction

This chapter addresses surface water quality issues throughout the Waimakariri River Catchment, excluding the Styx River catchment where water quality management is covered by the Natural Resources Regional Plan, Chapter 4 Water Quality.

Residents of Christchurch and surrounding areas, are fortunate to have a major river catchment nearby, which, with the exception of the reach downstream of the Otukaikino Creek confluence (Motorway Bridge) and some of the plains tributaries, has high water quality.

In the catchment above Woodstock (Figure 4) the water quality is generally very high. However, the increasing popularity of various recreational activities in the upper catchment areas and the associated waste produced, e.g., human sewage, oil leaks and spill from vehicles, represents a potential threat to water quality.

In the mainstem of the Waimakariri River below Woodstock down to its confluence with the Otukaikino Creek, and in the Otukaikino Creek, the water quality is also generally high. Abundant birdlife in parts of the river are a source of contaminants. Bird faeces can add significant quantities of faecal coliform indicator bacteria to the river. This makes water quality interpretations difficult, because the significance of these indicator bacteria for water contact recreation is not fully understood.

The Waimakariri River immediately below the Old Highway bridge is unsuitable for water contact recreation, primarily because it is the mixing zone for agriculturally-based industrial discharges. Water quality downstream of the mixing zone is sometimes not suitable for water contact recreation because of the combination of micro-biological contaminants from the industrial discharge and a range of other sources upstream of the industrial discharge. Nevertheless, it is used for a wide range of activities including contact recreation. It is popular because of its undeveloped state and its close proximity to Christchurch. The recreation experience may be adversely affected by poor water quality.

The plains tributaries are affected by point and non-point source discharges. The catchments of the plains tributaries are experiencing steady growth in urban areas and growth in settlement of rural areas. In addition, there is increasing intensity of land use in their catchments and, perhaps more importantly, adjacent to rivers and drains.

The plains tributaries are not generally used for swimming except for the Groynes picnic area. This area does not meet accepted water quality guidelines for contact recreation because of stock and wildlife sources of faecal coliforms.

Tāngata whenua consider discharges to surface water bodies should not be allowed. The discharge of sewage to water bodies is particularly offensive to Tāngata whenua. The Waimakariri River and the plains tributaries were once important sources of mahinga kai (fish and birds) for Tāngata whenua. Eel, which are widespread in the catchment, were the most important fish species. The plains tributaries were the most important sources of mahinga kai. However, as a result of past and present discharges, the plains tributaries and the lower Waimakariri River are considered by Tāngata whenua to have been devalued.

### 6.2

### Issue Resolution

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#### **Policy 6.1**

**Set and maintain water quality standards for, and control the discharge of contaminants into, surface water bodies in the Waimakariri River Catchment, excluding the Styx River catchment, as outlined in Figure 6 and defined in Map 2 to:**

- a. **protect the natural state of the water in lakes and rivers upstream of the confluence of the Waimakariri River with the Otukaikino Creek;**
- b. **ensure water quality is suitable for drinking water for animals, contact recreation, fisheries, fish spawning, aquatic ecosystems and is not altered in those characteristics that have a direct bearing upon the aesthetic values of water or Tāngata whenua cultural values, in the mainstem of the Waimakariri River downstream of the confluence of the Waimakariri River with the Otukaikino Creek;**
- c. **ensure water quality is suitable for drinking water for animals, fisheries, fish spawning, aquatic ecosystems and is not altered in those characteristics that have a direct bearing upon the aesthetic values of water, in the Kaiapoi River, Otukaikino Creek downstream of the Groynes picnic area, and their its tributaries; and**
- d. **ensure that, in the Otukaikino Creek and its tributaries at, and upstream of, the Groynes picnic area:**
  - i. **water quality is suitable for drinking water for animals, fisheries, fish spawning, and aquatic ecosystems;**
  - ii. **the natural water quality with respect to organisms of public health significance is maintained; and**
  - iii. **water quality is suitable aesthetically and visually for contact, and other forms of, recreation.**

#### **Explanation**

The water quality of the Waimakariri River including all tributaries and lakes upstream of the confluence of the Waimakariri River with the Otukaikino Creek, should retain its natural characteristics, in keeping with the present very high natural values of these water bodies.

In the remainder of the Waimakariri River mainstem down as far as the Coastal Marine Area boundary (Figure 6), the quality of the surface waters should be upgraded so that it is suitable for drinking water for animals, contact recreation, fisheries, fish spawning, aquatic ecosystems and is not altered in those characteristics that have a direct bearing upon the aesthetic values of water or Tāngata whenua cultural values.

In the Otukaikino Creek, the Kaiapoi-Cam-Cust river system and most of the tributaries of these three river systems, a contact recreation and cultural standard of water quality is generally unobtainable because of non-point, and to a lesser extent point-source discharges. These water bodies should be maintained suitable for drinking water for animals, fisheries, fish spawning, aquatic ecosystems and aesthetic purposes. In addition, in the Otukaikino Creek at and upstream of the Groynes picnic area, Environment Canterbury does not want to compromise the possible future attainment of water quality suitable for contact recreation.

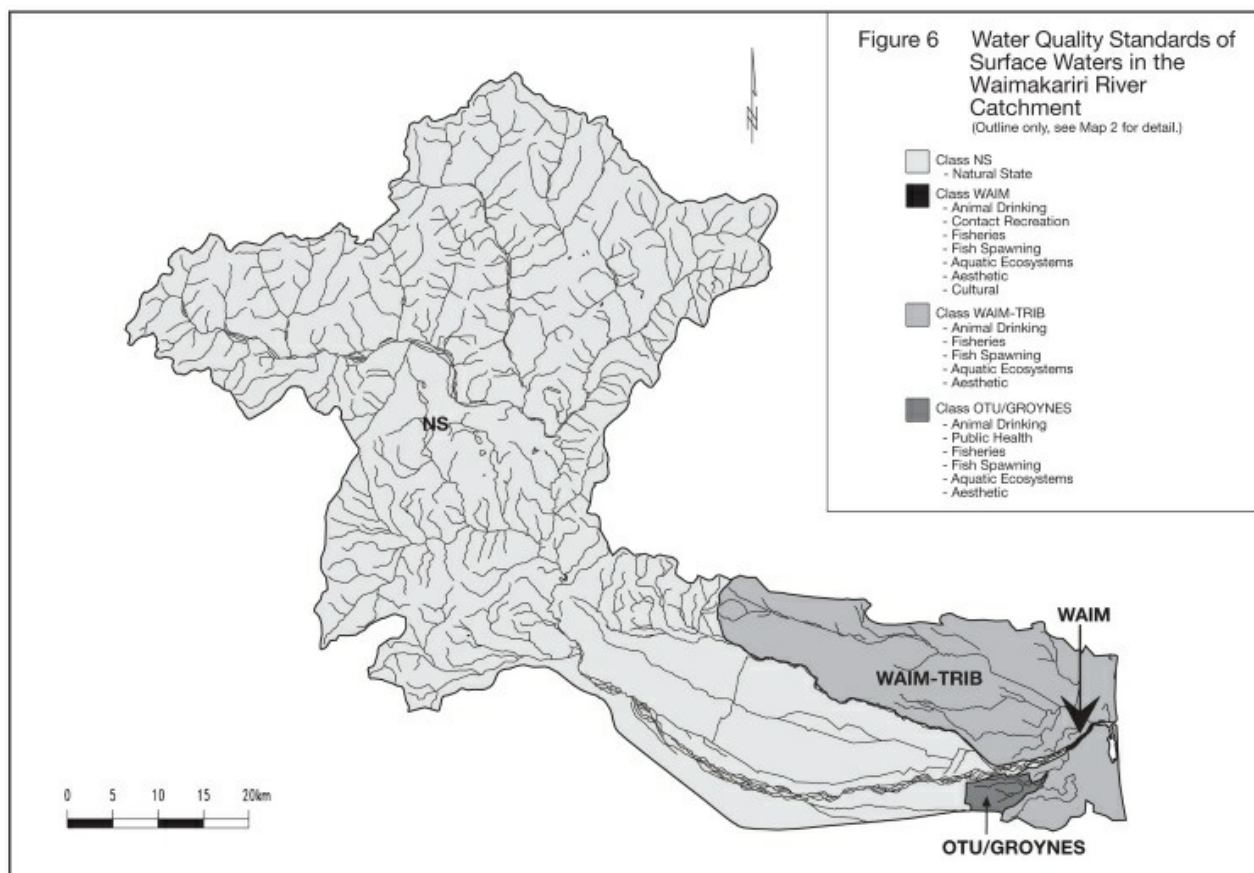
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### **6.3 Methods**

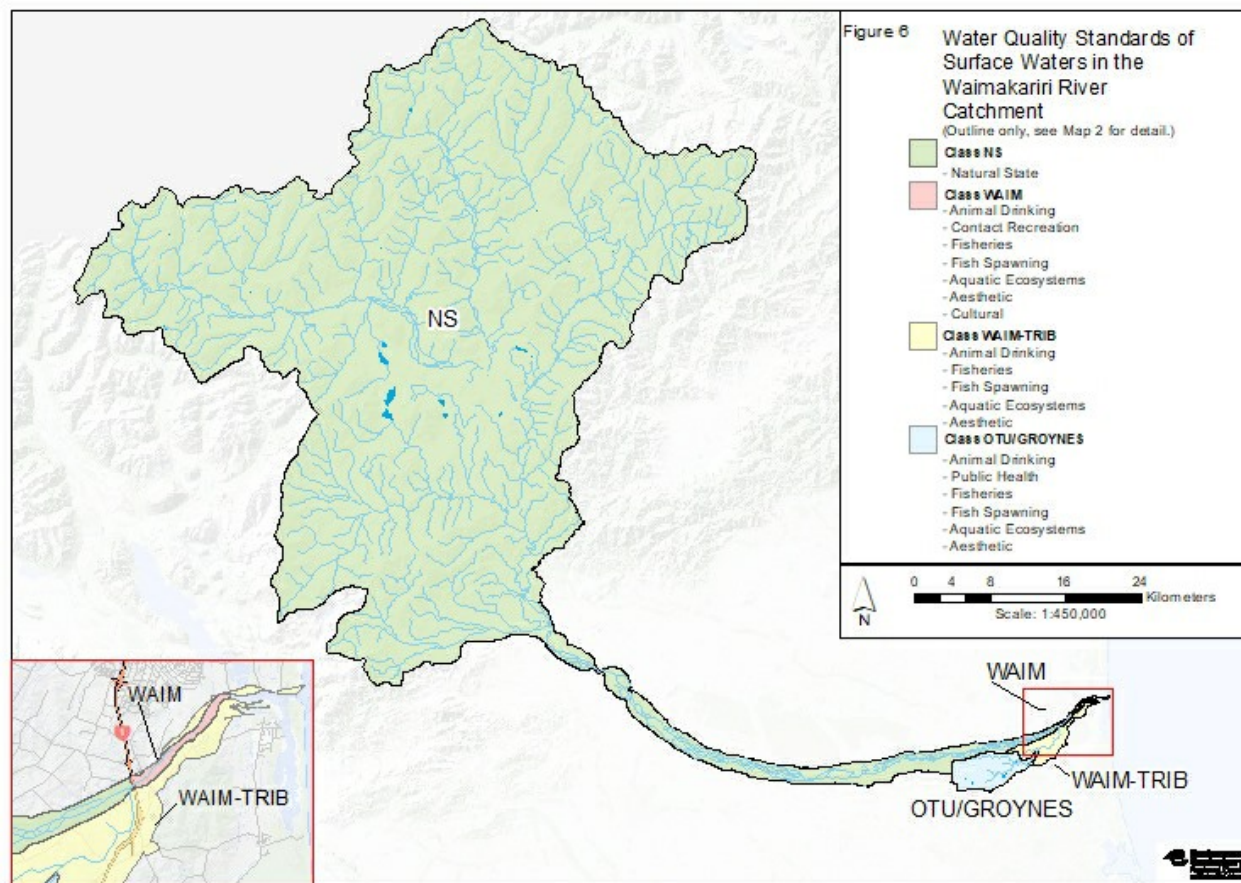
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#### **6.3.4 Regional Rules**

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*Plan Change 2 instructions: Delete Figure 6 above. Insert new Figure 6 below*



**Figure 6 Water Quality Standards of Surface Waters in the Waimakariri River Catchment**

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## 6.4

### Environmental Results Anticipated

Implementation of the above water quality policies and methods is expected to have all of the following environmental results:

1. Water retained in its natural state in all surface water bodies upstream of the confluence of the Waimakariri River with the Otukaikino Creek.
2. Water in the Waimakariri River mainstem downstream of the confluence of the Waimakariri River with the Otukaikino Creek, suitable for drinking water for animals, contact recreation, fisheries, fish spawning, aquatic ecosystems, aesthetic, and cultural purposes.
3. Water in the ~~Kaiaipo River~~, Otukaikino Creek downstream of the Groynes picnic area, and ~~their~~ its tributaries, suitable for drinking water for animals, fisheries, fish spawning, aquatic ecosystems, and aesthetic purposes.
4. Water in the Otukaikino Creek and tributaries at, and upstream of, the Groynes picnic area, suitable for drinking water for animals, fisheries, fish spawning, aquatic ecosystems, public health, and aesthetic purposes.
5. Discharges of contaminants to water are provided for where appropriate standards are met and where practicable alternatives to direct discharges are not available.

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## 7 River and Lake Beds

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### 7.3 Methods

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#### Rule 7.1 Permitted Activities

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The following activities, except as provided for in Rules 7.2(a), 7.3(a), 7.3(b), 7.3(c), 7.3(d), 7.3(f), and 7.3 (g), are permitted activities:

- a. the disturbance of the bed<sup>19</sup> of the mainstem of the Waimakariri River;
- b. the disturbance of the bed of any tributary river upstream of the Waimakariri River Gorge Bridge near Sheffield;
- c. ~~the disturbance of the bed of the Eyre River;~~

provided that:

- i. the quantity of bed material disturbed is less than 10 cubic metres per week per person, and less than 50 cubic metres per annum per person;
  - ii. the disturbance does not occur within 50 metres of any structure located in the riverbed, other than flood protection works<sup>20</sup> as provided for in (iv) below;
  - iii. the disturbance does not occur under flowing water or in, on, under or over any wetland in the bed;
  - iv. the disturbance does not occur within 5 metres of the banks of the river or any flood protection works; and
  - v. the disturbance does not occur within 100 metres of colonies of birdlife, nesting or rearing their young in riverbed gravels from 1 September to 31 January of the following year, or physically disturb any indigenous bird's nest currently in use.
-



<sup>19</sup> The disturbance of the bed includes, excavation, drilling, tunnelling, or other disturbance of the bed. Note that the term excavation includes removal of gravel from the bed.

<sup>20</sup> Flood protection works are physical features intended to provide flood protection or to maintain or increase the flood carrying capacity or stability of a river channel, including: stopbanks, permeable and non-permeable groynes, rockwork or concrete blocks used for bank protection, tree and vegetation plantings and anchors, floodgates and culverts and their support structures, berm drains, gauges, roads and tracks.

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## 9.2

## Monitoring Anticipated Environmental Results

The following tables outline the environmental monitoring that Environment Canterbury will undertake to assess whether anticipated environmental results are achieved. One or more of the environmental indicators may be used to monitor any particular anticipated environmental result.

**TABLE 3 SURFACE WATER QUANTITY ANTICIPATED ENVIRONMENTAL RESULTS AND ASSOCIATED MONITORING AND REPORTING**

Anticipated environmental results	Environmental indicator(s) <sup>24</sup>	Method of monitoring/ investigation	Frequency of monitoring/ investigation	Reporting
1. Preservation of the natural flows and levels of rivers, lakes and wetlands in the catchment "above Woodstock"	Lake and wetland water levels and river flows and levels	Two river flow measurement sites and gaugings in accordance with the surface water monitoring programme  Lake levels only if necessary	Continuous a n d a s required	Five yearly
2. Protection of the braided character of the Waimakariri River, where it exists "below Woodstock", and of groundwater recharge from the river	Braided character of the river  River flows	Surveys of braiding pattern and extent in relation to flow  River flow gauging to determine groundwater recharge in accordance with surface water monitoring programme	Five yearly  Ongoing	Five yearly  Five yearly
3. Sufficient depth of water and sufficient flow to maintain the fisheries, wildlife, and recreation associated with rivers in the catchment.	The state of aquatic ecosystems and associated wildlife	<del>Eighteen</del> River flow measurement sites and gaugings in accordance with the surface water quantity monitoring programme	Continuous a n d a s required  Ongoing	Annually  Fiver yearly

		Liaison with Fish and Game Council and the Department of Conservation		
4. The reasonable needs of people for water including domestic, stock, irrigation and industrial supply and effluent disposal satisfied.	Trends in the total abstraction of water relative to its reliability of supply	Analysis of water permits and river flow information	Ongoing	Five yearly
5. Lake level and river flow requirements for mahinga kai, wahi tapu and Wāhi taonga satisfied	Abundance and quality of mahinga kai	Liaison with Tāngata whenua	Ongoing	Annually
6. Efficiency in the use of water	Adoption of efficient methods of using water	Liaison with water permit holders. Survey water use methods	Ongoing Five yearly	Five yearly Five yearly
All anticipated environmental results	Environmental incidents reported to Environment Canterbury in relation to water quality	As reported	As reported	Approx. six weekly for Environment Canterbury Committee

**TABLE 4 WATER QUALITY ANTICIPATED ENVIRONMENTAL RESULTS AND ASSOCIATED MONITORING AND REPORTING**

Anticipated environmental results	Environmental indicator(s) <sup>25 26</sup>	Method of monitoring/ investigation	Frequency of monitoring/ investigation	Reporting
1. Water retained in its natural state in all surface water bodies upstream of the confluence of the Waimakariri River with Otukaikino Creek	The biological, chemical and physical water quality of surface water bodies	Three water quality monitoring sites in the mainstream of the Waimakariri River above Otukaikino Creek  Water quality monitoring at three takes in the upper catchment	Quarterly for indicator bacteria, dissolved reactive phosphorus, total phosphorus, forms of dissolved inorganic nitrogen, total nitrogen, pH, conductivity, dissolved oxygen, turbidity, and chlorophylla and temperature.  Once in spring and autumn each year for turbidity, pH,	Annually  Annually

			conductivity, dissolved reactive phosphorus, total phosphorus, dissolved inorganic nitrogen, and total nitrogen and temperature.	
2. Water in the Waimakariri River mainstem downstream of the confluence of the Waimakariri River with the Otukaikino Creek, suitable for drinking water for animals, contact recreation, fisheries, fish spawning, aquatic ecosystems, aesthetic and cultural purposes		Three water quality monitoring sites on the Waimakariri River mainstem	Fortnightly for dissolved oxygen, pH, biochemical oxygen demand, suspended solids, ammonia nitrogen, total grease, and indicator bacteria and temperature.	Annually
3. Water in the Kaiapoi River, Otukaikino Creek downstream of the Groynes picnic area, and <del>its</del> <u>their</u> tributaries, suitable for drinking water for animals, fisheries, fish spawning, aquatic ecosystems, and aesthetic purposes		Benthic invertebrate sampling (biological sampling) at ten sites on the lower plains tributaries  <del>Six water</del> <u>Water</u> quality monitoring sites on the plains tributaries	Twice yearly  Quarterly for indicator bacteria dissolved reactive phosphorus, total phosphorus, forms of dissolved inorganic nitrogen, total nitrogen, pH, conductivity, dissolved oxygen, turbidity and temperature.	Annually  Annually
4. Water in the Otukaikino Creek and tributaries at and upstream of the Groynes picnic area, suitable for drinking water for animals, fisheries, fish spawning, aquatic ecosystems, public health, and aesthetic purposes		Two sites on the Otukaikino Creek	Weekly from December to February for indicator bacteria until sources of contamination better understood	Annually
5. Discharges of contaminants to water are provided for where appropriate standards are met and where practicable alternatives to direct	Trends in authorised discharges.	Analysis of discharge authorisations.	Ongoing	Five-yearly

discharges are not available.				
All anticipated environmental results	Environmental incidents reported to Environment Canterbury in relation to water quality	As reported	As required	Approx. six weekly for Environment Canterbury Committee

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<sup>24</sup> The environmental indicator(s) may apply to one or more of the anticipated environmental results.

<sup>25</sup> The Environmental Indicator(s) may apply to one or more of the anticipated environmental results. Refer to Table 5 for aquatic ecosystem, wildlife and mahinga kai monitoring programmes

<sup>26</sup> The Environmental Indicator(s) may apply to one or more of the anticipated environmental results. Refer to Table 5 for aquatic ecosystem, wildlife and

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# Appendix 1 - Definition of Terms

The use of italics in this Appendix indicates meanings taken from Section 2, 3, 5 or 77c of the RM Act.

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<u>Waimakariri River Catchment</u>
<u>Is the area defined in Figure 1 and excludes the area seaward of Ferry Road which lies within the Coastal Marine Area.</u>

...

### Appendix 3 - Overview of the Main Waimakariri River Catchment Aquatic Values

River system	Outstanding natural feature or landscape (based on their scenic settings)	Ecosystem values		Level of development	Tāngata whenua values	Amenity values
		Significant fauna and significant indigenous vegetation	Significant habitat			
Waimakariri River above Kowai confluence	1. All lakes 2. Mainstem of the Waimakariri River, particularly the Waimakariri Gorge between the Esk confluence and Woodstock 3. All water bodies in Arthurs Pass National Park	<b>Indigenous</b>		High level of naturalness free from significant interference by human practices	Historical source of food on greenstone expeditions to the West Coast  Lake Pearson of statutory significance	Scenic Canoeing Jetboating Rafting Angling Tramping Hunting Lake boating
		Longjawed galaxias, alpine galaxias and blue duck	Fast flowing alpine streams with forest margins			
		Eel and other native fish	All water bodies			
		Crested Grebe	Lakes and margins			
		Paradise duck	Wide river valleys			
		Wrybill Plover Black-fronted tern	Braided bare shingle rivers			
		Wetland indigenous vegetation in the margins of lakes	Wetland indigenous vegetation in the margins of lakes			
		<b>Exotic</b>				
		Salmon	Stable streams for spawning			
		Trout	Lakes, pools and			



			riffles			
		Canada geese	Wide river valleys and lakes			
<b>Waimakariri River below Kowai confluence</b>	Waimakariri Gorge	<b>Indigenous</b>		Stockwater and irrigation diversions		Canoeing
		Wrybill Plover Black-fronted tern	Braided bare shingle river beds	Darfield water supply		Jetboating
		Eel	Pools	Shingle abstraction		Rafting
		Other native fish	Margins of streams	Highly modified settings with river control works		Angling
		Kowhai	Margin of Waimakariri River and Kimberley	Below motorway bridge one industrial discharge and Kaiapoi sewage discharge		Picnicking
		<b>Exotic</b>				Swimming
		Salmon	Salmon passage to spawning water			Whitebaiting
		Trout	Pools and riffles			Duck shooting
<b>Kaiapoi River including Greigs Dam and Courtenay Stream</b>		<b>Indigenous</b>		Numerous drains	Mahinga kai	Kaiapoi Port (historic)
		Eel, whitebait and other native fish	All	Stopbanks in lower reaches		Boating
		<b>Exotic</b>		Water takes		Angling
		Duck	All			Whitebaiting
		Trout	All			Duck shooting
		Salmon	Gravel bed spawning			
<b>Cust River</b>		<b>Indigenous</b>		Highly modified	Mahinga kai	Angling

including <del>Gust Main</del> <del>Drain and No</del> <del>7 Drain</del>		Eel, whitebait and other native fish	-All	settings		
		<b>Exotic</b>		Stopbanks		
		Trout	-All	Drainage		
<del>Gam River</del> including <del>South, North</del> <del>and Middle</del> <del>Brooks</del>		<b>Indigenous</b>		Water takes	Mahinga kai	Angling  Whitebaiting  Duck shooting
		Eel, whitebait and other native fish	-All	- Highly modified settings		
		<b>Exotic</b>		Stopbanks in lower reaches		
		Trout	-All	Drains		
		Duck	-All	Rangiora sewage discharge		
		Salmon	Gravel bed spawning	Water takes		
Otukaikino Creek		<b>Indigenous</b>		Highly modified settings	Mahinga kai  Wāhi taonga	Swimming and picnicking at the Groynes  Angling  Otukaikino Wetland
		Eel, whitebait and other native fish	All	Stopbanks in lower reaches		
		<b>Exotic</b>		Drains		
		Trout	All	Belfast sewage discharge		
		Duck	All			
		Salmon	Gravel bed spawning			
<b>Styx River</b>		<b>Indigenous</b>		Highly modified	Mahinga kai	Trout fishing

including Kaputone Creek		Eel, and other native fish	All	settings	Wāhi taonga	Angling  Whitebaiting
		<b>Exotic</b>		Flood gates and stopbanks in lower reaches		
		Trout	All	Drains		
		Duck	All	Water takes		

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*When making a submission on changes proposed by PC2 to the Planning Maps, please provide the following details in your submission:*

- 1. A description of the change requested*
- 2. The Map Sheets to be amended (e.g. Map Sheet 1, Map Sheet 2).*

***Plan Change 2 to the WRRP Map 1 and Map 2 Instructions:***

*Delete all map sheets within the Map 1 and Map 2 series and replace with the proposed Plan Change 2*

*Map 1 and Map 2 series*