

Plan Change 1 to the Waimakariri River Regional Plan

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Introduction

The need for a plan change to the Waimakariri River Regional Plan (WRRP) has arisen as more pressure is placed on accessing large quantities of water from the mainstem of the Waimakariri River for large scale developments. In addition, there has been some historical ambiguity and difficulty in interpretation of some of the WRRP provisions relating to daily water availability as flows reduce to the minimum flow.

Technical reports by NIWA on bed sediment movement and water allocation have been peer reviewed and published. These reports provide the technical basis for addressing the issues relating to maintaining instream values and indicate what amendments to the flow and allocation regime may be required to meet the stated objectives in the WRRP.

The Existing WRRP

The hydrological investigations and plan development work that was done for the WRRP identified the river as a relatively unreliable source of water for major run of river irrigation schemes, especially if dairying was a significant land use. This is because the river commonly has low flows during the February-March period and often is unable to meet full demand for the “A” Block provided for in the WRRP.

The WRRP currently provides for:

- A minimum flow of $41\text{m}^3\text{s}^{-1}$ (41,000 litres per second) measured at the Old Highway Bridge;
- An “A” block of $22\text{m}^3\text{s}^{-1}$;
- A “B” block with no upper limit on the size of the “B” block; and
- No gap between the “A” and “B” blocks

This regime was in part based on an assumption that river flows, and particularly the “B” block, was so unreliable that a run of river large irrigation scheme would not be economic. A large irrigation scheme founded on takes into storage at higher flows, such as the Central

Plains Water Enhancement Scheme (CPW), was not contemplated during plan preparation. With CPW, and potential other requests to take water, it is timely to consider what the limits should be on allocation, and what flow regime requirements might be needed to appropriately manage the effects on instream values of different allocation scenarios.

The minimum flow and allocation regimes for Waimakariri River have been assessed by NIWA through the two technical reports mentioned previously:

Duncan, M. And Bind, J., Waimakariri River Bed Sediment Movement for Ecological Resetting, Environment Canterbury Report No R08/94

This study determined the flood flow at which the median flow river bed is disturbed sufficiently to remove excess algal growth, fine particles etc in order to maintain the health and productivity of the river. The frequency of occurrence of the flood flow before and after abstraction was then assessed to determine the effect of large irrigation abstraction and/or proposed allocation frameworks on the frequency of disturbance.

Duncan, M., Waimakariri River: B/C Block Allocation Review, Environment Canterbury Report No 08/67

This study assessed the environmental effects of different sizes of the “B” and potentially a “C” allocation blocks and the appropriate flow regime required to minimise these effects. The study determined that the critical issue is the need to have flows in the range $55-96\text{m}^3\text{s}^{-1}$ during September to December for riverbed nesting bird breeding and to have flow in the range $60-100\text{m}^3\text{s}^{-1}$ during December to April for salmon angling. In addition, the review identified the need to ensure the flow and allocation regime allows certain freshes and large floods to pass without take.

Major Components of the Change:

The Proposed Plan Change consists of the following major components:

1. A new $5.126\text{m}^3\text{s}^{-1}$ “AA” block be established for the Waimakariri River that allocates water for community and stock water requirements;
2. An allocation limit be placed on the Waimakariri River “B” Block of $40\text{m}^3\text{s}^{-1}$;
3. The minimum flow at which “B” Block abstraction may commence being raised to $93\text{m}^3\text{s}^{-1}$ for the Waimakariri River, which will result in a $30\text{m}^3\text{s}^{-1}$ “gap” being established between the A and B allocation blocks;
4. A new “C” Block of $10\text{m}^3\text{s}^{-1}$ be established for the Waimakariri River;
5. Provision for summer freshes and floods in the Waimakariri River to pass without take after a period of low flow (21 days) or if nuisance algal or weed growth occurs to maintain ecological values;
6. Shift the flow measurement point from the Old Highway Bridge to Otarama, which is above the point of take for the majority of abstractions – this will require some adjustment of the minimum flow value to account for measured losses/gains between the Old Highway Bridge and Otarama (no change other than this “calibration” to ensure equivalency between the measurement points is envisaged);
7. The term “unmodified flow” in Rule 5.1(d) is problematic to interpret and enforce. The movement of the monitoring point to Otarama will make this term redundant and it can be removed;

8. Improve the ability to consider cumulative effects by removing the restriction on discretion to considering only the effects “near the point of take”;
9. Change the monitoring requirement so that all takes are to be continuously measured and unmodified data made available to ECan via telemetry;
10. The status for activities that do not meet Rule 5.1 are clarified as non-complying activities in Rule 5.3; and
11. Alter the planning maps to correct the shown catchment boundaries of the “below Woodstock” area.

The Proposed Flow Regime

The alterations to the flow regime affect the Waimakariri River mainstem only – the various tributaries are subject to a separate review which is currently underway.

New “AA” Block Allocation for Community and Stock Water Use

The total stock water and domestic community water supply take from the Waimakariri River is currently approximately $4.896\text{m}^3\text{s}^{-1}$. The stock water and domestic community water supply takes are currently exempted (up to specified amounts) from the “A” block minimum flow restrictions.

When the WRRP was notified in 1996, the quantity of stock and community water supply taken totalled approximately $3.8\text{m}^3\text{s}^{-1}$. At the time the plan was drafted, it was envisaged that there were unlikely to be significant applications for further stock and community water supply takes. However, in the intervening 10 years, the amount consented has increased by over 25%. If the total take exempted from restriction continues to increase, the Waimakariri River minimum flow restriction could be compromised.

The majority of the presently consented $4.896\text{m}^3\text{s}^{-1}$ is used for stock water race systems. There is uncertainty about the ultimate use of the water in these systems, the management of the takes and potential for efficiency gains within the present allocation. Some of these uncertainties have been created by the present WRRP, which treats stock and community water supply as being outside of the allocation mechanism set out in the Plan and subject to far fewer restrictions.

In the NRRP, Policy WQN14(9)(e) allows for provision to be made to reserve water for future community stockwater and drinking water supply. Where there are opportunities to consider the reserving of water for such purposes as part of other processes, Environment Canterbury is considering doing so. This is now occurring as part of the environmental flow review processes for surface water catchments throughout the region.

This plan change process also provides such an opportunity. The Waimakariri River is bounded by the three local authorities - Selwyn, Waimakariri and Christchurch City. The existing allocation includes takes by both Waimakariri and Selwyn districts. At this point in time Christchurch City does not access water from the Waimakariri River for community supply purposes.

The advantage in creating an allocation block for community and stock water purposes is that it provides a means for ensuring that water is clearly reserved for that purpose, and cannot be permanently transferred to other uses.

In the WRRP, Policy 5.3 provides for 230 litres per second to augment the Cust River to protect and enhance its instream values even when the flow in the Waimakariri River is at or below the minimum flow set in the plan. This allocation could also be included in the same block as a means of more clearly providing for it. As that take is not subject to the minimum flow under the plan, it can be treated in the same way from an allocation point of view.

Based on the above, it is recommended that a new “AA” block be established that includes the existing allocation for community and stock drinking water of $4.896 \text{ m}^3\text{s}^{-1}$ and $0.230 \text{ m}^3\text{s}^{-1}$ for augmentation of the Cust River. Thus the “AA” block would be $5.126 \text{ m}^3\text{s}^{-1}$.

At this time there is no recommendation to allocate more for the community and stock water as this existing allocation is thought to be used for other purposes as well, and where it is used for stockwater, there is considered an opportunity to increase the efficiency of that use. However, if it can be justified that more water should be reserved for such future use at this time, this allocation volume may need to be increased, and consideration would need to be given as to the effects of that on the low flows in the river.

Under the existing standards and terms, water that is taken for stock and community drinking water is not required to cease at the minimum flow, but is required to restrict the taking of water for only essential uses as set out in (f) (page 29 WRRP). Given this, there is a need to include the size of the block as part of the plan change and ensure the exemption from restrictions is provided for as set out in Standards and terms (f).

“A” Block Allocation

The current “A” block size of $22\text{m}^3\text{s}^{-1}$ is fully allocated and includes the $5.126 \text{ m}^3\text{s}^{-1}$ identified above for inclusion in an “AA” block allocation for community and stockwater use. With the suggested transfer of the existing community and stockwater takes into an “AA” block, this means the A block size should be changed to $17\text{m}^3\text{s}^{-1}$ to include the remaining current allocation in the “A” block. This change will not affect any of the existing “A” block consent holders.

“B” Block Allocation

The “A” block currently has an allocation limit of $22\text{m}^3\text{s}^{-1}$ with a minimum flow before takes can commence of $41\text{m}^3\text{s}^{-1}$. Because the A block is fully allocated, new abstractors can only be accommodated within the “B” block. Abstractors from a “B” block are required to cease abstraction at a higher cut-off limit to protect the reliability of supply to the “A” block abstractors. Currently, the “B” block has a minimum flow equal to the sum of the “A” permit minimum flow and the “A” allocation block ($63\text{m}^3\text{s}^{-1}$).

With the “A” and “B” blocks running consecutively, there is a substantial risk of abstractions taking all the water above the minimum flow for extended periods, an effect commonly referred to as ‘flat-lining’ the river.

By providing a gap between the “A” and “B” blocks, flushing flows that are important in washing algal growth¹ and sediment from the riverbed, and variability of flow for instream river users can be maintained. It can also provide for future upward movement of a minimum flow for the “B” block should monitoring data show that Objective 5.1 values are not being achieved. For these reasons, a gap between the “A” and “B” blocks of $30\text{m}^3\text{s}^{-1}$ is proposed.

In addition, the recent demands for “B” block water, primarily for storage, have identified that the present flow and allocation regime in the WRRP, which does not provide any limit on the amount of water that can be taken, is not appropriate. In preparation of the WRRP, it was envisaged that approximately $8\text{m}^3\text{s}^{-1}$ of “B” block water might be sought over the life of the WRRP. Already, over five times this amount has been applied for. On this basis, it is appropriate for the WRRP to provide an upper limit to the amount of water that may be taken from the “B” block for the Waimakariri River, in order to protect the values identified in Objective 5.1, and this is proposed to be $40\text{m}^3\text{s}^{-1}$.

“C” Block Allocation

The purpose of a “C” Block would be to give access to water to consent holders who are still to apply for consents and give the “B” Block consent holders some certainty about access to their allocation.

The “C” Block would provide the opportunity for small users to gain access to some water should the “B” Block allocation be allocated to a single entity or just fully allocated. However, the “C” Block would be quite unreliable and hence would generally only be suitable for storage. Water could only be taken at $10\text{m}^3\text{s}^{-1}$ approximately 20% of the time.

Additional environmental flow requirements – protection of freshes and floods

Floods control the form and overall dimensions of the river channel. A flood is a large event (over $700\text{m}^3\text{s}^{-1}$) that is sufficient to rework the gravel bed. Floods rework gravel bars and cause branch channels to cut laterally into banks and bars. Floods are needed to maintain the braided character of the Waimakariri River and to remove vegetation growing in the riverbed so that open shingle habitat can be maintained. This habitat is important to the bird species present.

In between the infrequent floods, freshes, especially those in summer, perform a vital role in cleansing the river of much of its excessive algal growths. This helps maintain habitat for invertebrates, and hence the food supply for fish and birds. A fresh is a period of higher flow, usually marked by dirty water that is sufficient to remove algal growths and move fine sediment. Duncan and Bind (2008) suggest that long filamentous algae would be flushed from the minimum flow channel at a flow of approximately $82\text{m}^3\text{s}^{-1}$ and from the median flow channel when the flow is approximately $130\text{m}^3\text{s}^{-1}$.

After a flood has turned over and cleaned the gravel, algal growths slowly build up, coating the stones and providing food and shelter for aquatic organisms, which themselves build up in abundance and provide food for fish and birds. The composition of the species making up the algal community changes over time. If the period between freshes and floods is long

¹ “Algal growths” refers to a variety of algal and bacterial growths, technically referred to as “periphyton”

enough, and there are sufficient nutrients in the water, some forms of algal growths start to grow at an exponential rate.

These large algal growths, often seen as mats and long green filaments, change the stream habitat and water chemistry, particularly the pH and oxygen content. This reduces the diversity and abundance of aquatic organisms. In addition to reducing the life-supporting capacity of the river, these undesirable algae degrade other instream values, e.g. its mauri, natural character, and amenity. The next flood or fresh cleanses the river of algal growths, refreshes the gravels, and the cycle begins again.

Abstractions are likely to reduce the magnitude and frequency of small freshes capable of flushing sediment and algal growths. In order to mitigate this effect, Duncan and Bind (2008) suggests that the frequency of freshes of over $80\text{m}^3\text{s}^{-1}$, and preferably over $130\text{m}^3\text{s}^{-1}$ should be maintained after a period of low flow of sufficient duration to potentially allow the algal growths to reach nuisance levels. Thus during periods of low stable flows when algal growths reach nuisance levels after about 21 days (Biggs, 2000), freshes occurring after 21 days of minimum or low flow should be allowed to flow untapped until the flow has exceeded $130\text{m}^3\text{s}^{-1}$, or after two days, whichever is the sooner.

The draft Plan Change has established an environmental flow regime to promote algal growth and fine sediment flushing and to maintain channel forming flows. This is achieved by both establishing a “gap” between the “A” and “B” allocation blocks and requiring specific restrictions for abstractions that allows freshes and floods to pass without takes occurring after a sustained period of low flows.

In addition, an amendment to Method 5.3.3 is recommended. This is to include an additional monitoring project to specifically measure the effectiveness of the new environmental flow and allocation regime for the water resource of the Waimakariri River (including the Kowai River) “below Woodstock” in meeting the requirements of Objective 5.1. In this way, the technical modelling work on which the flow regime is based can be validated by on the ground measurement and observation. If such a project identifies any issues with the regime, this will help provide the technical basis for any further change.

New Measurement Site at Otarama and “Unmodified Flow”

Environment Canterbury has recently installed a new flow measuring site with telemetry at Otarama. This Plan Change seeks to change the minimum flow site for measuring the Waimakariri River mainstem from the Old Highway Bridge to Otarama.

Having the flow measured at an upstream site such as Otarama has several advantages, including:

1. The measurements are taken before any significant abstraction occurs, thereby measuring “natural” flows;
2. There is a likelihood of “B” Block abstraction points being located upstream of “A” Block abstraction points, adding to the difficulty of managing flows; and
3. The Old Highway Bridge Site is affected by tidal flows.

However, concerns are likely to be raised regarding the impact on existing permit holders due to losses/gains between Otarama and the Old Highway Bridge. To address this concern, Environment Canterbury has undertaken a study to find the relationship between the flows of the Waimakariri River at Otarama site and the flows at the Old Highway Bridge site. The site at Otarama had a water level recorder in the 1960s but was subsequently closed. The site was re-established in May 2008 and flow gaugings have been carried out. At present there is no rating at this site, but with subsequent gaugings a rating will be established in the near future.

Currently, there are 11 gauging measurements undertaken at the Otarama site, four of these were done concurrently with the Old Highway Bridge site. There is a rated water level site at the Old Highway Bridge, which has been operating since 1969. These two data sets were combined to identify a relationship between the two sites. Using “naturalised” flows at the Old Highway Bridge shows that a flow at the Old Highway Bridge of $41\text{m}^3\text{s}^{-1}$ equates to a flow at Otarama of $45.04\text{m}^3\text{s}^{-1}$.

For the purpose of this draft Plan Change, the flow relationship between Otarama and the Old Highway Bridge site is viewed as an interim relationship. This interim relationship will be reviewed once additional information on the flow relationship between Otarama and the Old Highway Bridge site has been established.

A further significant advantage of the movement of the flow measuring point is the ability to dispense with the “unmodified flow” terminology in the Plan. The current Standards and Terms in Rule 5.1 refers to “A” Permits ceasing to take when the “Unmodified Flow” is at or below the “Minimum Flow” specified in Table 2 ($41\text{m}^3\text{s}^{-1}$). This requires estimation by Environment Canterbury of the amount of water being abstracted, and adding this to the measured flow to identify the “Unmodified Flow”. This estimation is difficult in the absence of real-time data on abstractions. These difficulties and uncertainties can be avoided when the flow is measured upstream of abstraction points.

A consequential amendment is the updating of Figure 5, which shows the measurement points, to delete the Old Highway Bridge and insert Otarama.

Improved Assessment of Cumulative Effects

Currently, Rule 5.1 of the WRRP restricts the exercise of the Council’s discretion on the effects of a surface water take on river flow and aquatic, community and recreational values to “near the point of take”. While uncertain, the term discourages the assessment of effects on the wider river values downstream of the point of take and of the cumulative effects of a water take in conjunction with other water takes.

The Plan Change proposes to delete this terminology, so that there is no restriction on the Council’s ability to consider the values identified in Objective 5.1(a) to (h).

Measurement of Takes and Telemetry Data

Improvements to the requirements to measure the water takes and in the methods available to provide the data to Environment Canterbury are proposed within this Plan Change.

The information obtained from measuring water takes can be used to support many aspects of water resource management, including:

- Real time management during periods of water shortages;
- Quantifying and enabling access to any unused water;
- Collective management of takes by groups of water users;
- Monitoring compliance with resource consent conditions;
- Improved understanding of water resources and ecosystem responses (based on actual amounts taken);
- Informing planning for future economic growth for communities.

The Ministry of Environment (MfE) has proposed a National Environmental Standard for Water Measuring Devices (NES). The proposed NES seeks to prescribe minimum requirements for water measuring devices, installation and maintenance of the equipment, and data recording and data transfer to regional councils.

The proposed NES outlines a series of minimum requirements for all new pipe water measuring devices:

- Be capable of continuous measurement
- Measure volume in cubic meters
- Have data storage capability
- Have an accuracy standard of $\pm 5\%$
- Be capable of recording daily volume
- Be fit for purpose
- Be tamper-proof and sealed.

The additional requirements proposed in this Plan Change are substantially the same as the requirements in the Proposed Natural Resources Regional Plan, with addition of an option for Environment Canterbury to require the provision of the recorded data by telemetry. The requirements also meet the minimum standards of the proposed NES as it is currently drafted. As the suggested amendments are substantial, and technical in nature, it is considered more appropriate to include the technical detail in a schedule at the back of the plan, and refer to this schedule in the standards and terms.

Non-Complying Activity Status

Currently, there is no upper limit on “B” block allocation. A resource consent application can be made to take water in the “B” block allocation as a restricted discretionary activity and if the proposed take does not meet the standards and terms under Rule 5.1, then it is treated as a discretionary activity under section 77C of the RMA.

However, with the proposed introduction of a “B” block allocation of $40\text{m}^3\text{s}^{-1}$ and a “C” block of $10\text{m}^3\text{s}^{-1}$, the current rule framework implies only a relatively small difference in activity status should a resource consent application be made to take water over and above the allocation block limits.

It is proposed to amend Rule 5.3 Non-complying Activities to include the taking of water from the Waimakariri River, including surface or from hydraulically connected groundwater within the area of the Waimakariri River Catchment “below Woodstock” when Rule 5.1 is not

complied with. It is intended that this will make it clear that allocation of water in excess of the allocation block limit is generally discouraged.

Policy 5.1 Explanation

As a consequence of the amendments to the plan suggested above in relation to the more comprehensive flow and allocation regime for the water resource of the Waimakariri River (including the Kowai River) “below Woodstock”, that includes setting allocation block sizes and new minimum flows for these, some additional explanation for Policy 5.1 will assist in plan interpretation.

At this time, any activity that does not meet these flow and allocation regime requirements, by either exceeding the allocation block limits, or by breaching the minimum flow requirements would be considered to be inconsistent with Policy 5.1.

An additional paragraph in the explanation to this effect will provide clarity on this matter.

Planning Maps

Figure 4 and Planning Map 1 of the Plan will be amended to show the correct catchment boundaries of the “below Woodstock” area. The present Figure 4 and Planning Map 1 show some catchment boundaries on the centre-line of rivers, rather than the relevant ridgelines. The amended Map will show the catchment boundaries as the line separating the drainage patterns of adjacent rivers and streams networks, as was always intended.

The changes to Figure 4 and Planning Map 1 are of a technical nature to correct an error, rather than being a substantive change to the administration of water resources.

The draft Plan Change:

Deletions are marked as ~~strikethrough~~.

Additions are marked as underline.

1. Rule 5.1 Discretionary Activity for which Environment Canterbury has restricted its discretion

Within the area of the Waimakariri River Catchment “below Woodstock” defined in Figure 4 and Map 1, the taking of water from:

- (i) any surface waters of the Waimakariri River or its tributaries; or
- (ii) hydraulically connected groundwater¹;

is a discretionary activity for which Environment Canterbury has restricted its discretion.

This rule does not apply to:

- (a) the taking of water specified as a permitted activity in the Transitional Regional Plan; or
- (b) abstractions from hydraulically connected groundwater where it can be established, using the "Jenkins" method or other scientifically accepted hydrological calculations that the surface water depletion resulting from a 30 day pumping period will not exceed 5 litres per second.

Standards and Terms

The activity shall comply with the following standards and terms:

- (a) Fish shall be prevented from entering the water intakes.
- ~~(b) The taking of water, other than that exempted from the cessation and restriction provisions in paragraph (f) below, shall cease for periods of up to 48 hours upon notice by Environment Canterbury, to allow measurement of the natural water flow, or groundwater levels.~~
- ~~(c) On the written request of Environment Canterbury, the rate of take shall be measured to within an accuracy of 10% and a log kept of the hours of take and the rate of take. A~~

¹ Hydraulically connected groundwater is groundwater that is laterally connected to a river, with a stream depletion factor less than 100 days calculated using the method published by Jenkins, C T (1977) Computation of rate and volume of stream depletion by wells, in Techniques of Water Resources Investigation of the United States Geological Survey, Chapter D1, Book 4, 3rd Printing. (Note that the taking of groundwater which is not defined as hydraulically connected, and therefore is not affected by the rule, may still need to be authorised by another regional plan or by a resource consent.)

~~copy of the records shall be provided to Environment Canterbury on request by Environment Canterbury.~~

- (b) The minimum standards and terms for water measuring and recording devices set out in Schedule 1 shall apply to all new and existing abstractions and out-of-stream diversions authorised by water permits.
- (c) For "AA" Permits, the taking of water, downstream of Woodstock, from the Waimakariri River or its tributaries, or from hydraulically connected groundwater shall:
- (1) only be for:
- (a) reticulated water supplies servicing municipal and urban areas, rural-residential and residential subdivisions, including all commercial and industrial premises and schools and other educational facilities located within the reticulated area;
- (b) stock water distribution systems;
- (c) augmentation of the Cust River from the mainstem of the Waimakariri River and discharged upstream of Bennetts Road, by up to 230 litres per second, at any time the flow in the Cust Main Drain at Threlkelds Road is at or below 230 litres per second.
- (2) whenever the flow is at or below the "Minimum Flow" for "A" permits specified in Table 2, be reduced to no more than provided for in (f) below.
- (d) For "A" Permits, the taking of water, downstream of Woodstock, from the Waimakariri River or its tributaries, or from hydraulically connected groundwater shall:
- (1) cease whenever the flow "unmodified flow" is at or below the "Minimum Flow" for "A" permits specified in Table 2; and
- (2) whenever the flow "unmodified flow" is above the "Minimum Flow" for "A" permits and at or below the "Minimum Flow" for "A" permits plus the "Allocation Limit" for "A" Permits ~~for "B" permits that are~~ specified in Table 2, be reduced to no more than the proportion of the maximum allowable rate of take determined by the following formula:
- The flow "unmodified flow" minus the "Minimum Flow" for "A" permits, divided by the "Allocation Limit" for "A" permits.
- (e) For "B" Permits, the taking of water, downstream of Woodstock, from the Waimakariri River or its tributaries, or from hydraulically connected groundwater shall:
- (1) cease whenever the flow is at or below the "Minimum Flow" for "B" permits specified in Table 2; and.
- (2) if an "Allocation Limit" for "B" permits is specified in Table 2 then whenever the flow is above the "Minimum Flow" for "B" permits and at or below the "Minimum Flow" for "B" permits plus the "Allocation Limit" for "B" permits specified in Table

2, be reduced to no more than the proportion of the maximum allowable rate of take determined by the following formula:

The flow minus the "Minimum Flow" for "B" permits, divided by the "Allocation Limit" for "B" permits.

(ee) For "C" permits, the taking of water, downstream of Woodstock, from the Waimakariri River or its tributaries, or from hydraulically connected groundwater shall:

(1) cease whenever the flow is at or below the "Minimum Flow" for "C" permits specified in Table 2; and-

(2) if an "Allocation Limit" for "C" permits is specified in Table 2, then whenever the flow is above the "Minimum Flow" for "C" permits and at or below the "Minimum Flow" for "C" permits plus the "Allocation Limit" for "C" Permits that are specified in Table 2, be reduced to no more than the proportion of the maximum allowable rate of take determined by the following formula:

The flow minus the "Minimum Flow" for "C" permits, divided by the "Allocation Limit" for "C" permits.

(f) The cessation and restriction provisions in paragraphs (d), (e) and (ee) shall not apply to the taking of water for:

(i) an individual's needs for the purpose of providing drinking and cooking water and for hygiene purposes, of up to 250 litres per person per day; or for the reasonable needs of an individual's animals for drinking water;

(ii) a municipal or rural reticulated water supply for the purpose of providing drinking and cooking water and for hygiene purposes, of up to 250 litres per day for every person served by that water supply. For a surface take from the mainstem of the Waimakariri River or where a groundwater take is restricted by virtue of its hydraulic linkage to the mainstem of the Waimakariri River, 350 litres per person per day shall be exempted from restriction rather than 250 litres per person per day. Where a take from a water resource is restricted, but is only one in a number of separate takes servicing a network, then the daily volume of that take which is exempted from restriction, shall be calculated according to the following formula:

$P \times E \times T / TT$ (where P is the population served by the network, E is the per person per day exemption from restriction, T is the maximum daily volume authorised for that take and TT is the sum of the maximum daily volumes authorised for all of the takes servicing the network);

(iii) Darfield's and Springfield's municipal reticulated water supplies, of up to 27% of the maximum daily volume of take authorised by resource consents held by Selwyn District Council; and-

- (iv) a reticulated water supply for the purpose of providing drinking water for animals; and
 - (v) augmentation of the Cust River from the mainstem of the Waimakariri River and discharged upstream of Bennetts Road, by up to 230 litres per second, at any time the flow in the Cust Main Drain at Threlkelds Road is at or below 230 litres per second.
- (g) ~~For "A" permits,~~ In the case of abstractions from hydraulically connected groundwater, the cessation and restriction provisions in paragraphs (d), (e) and (ee) above, apply only above the specified rate of take that would have a calculated effect on the surface water depletion rate, resulting from a 30 day pumping period, that is greater than 5 litres per second.
- (h) ~~For "A" permits,~~ The restrictions in paragraphs (d), (e) and (ee) above, may be achieved by reallocating available water within a "Water Users Group", that limits the combined abstractions from water permit holders in accordance with the restrictions. Where Environment Canterbury has determined there to be a water sharing regime for all water permit holders in a defined catchment or part catchment, then the taking of water in accordance with that determination shall be deemed to be in compliance with paragraph (d) above. Whenever agreement amongst all the permit holders in a catchment or part catchment to operate within a water user group cannot be achieved, then the restrictions on individual takes shall be in accordance with paragraph (d) above. Environment Canterbury will encourage the formation of a "Water Users Group" to implement the water sharing regime.
- (i) The taking of water from the Waimakariri River, other than that exempted from the cessation and restriction provisions in paragraph (f) above, shall cease:
- (1) upon notice from Environment Canterbury for a specified period of up to 48 hours to allow measurement of the natural water flow, or groundwater levels;
 - (2) upon notice from Environment Canterbury for a specified period of up to 48 hours to enable floods and freshes to pass without take after a period of low flows which have resulted, in the opinion of the Chief Executive of Environment Canterbury, in nuisance or ecologically harmful algal or weed growth; and
 - (3) for a period of 24 hours when:
 - (i) after a period of 21 days within which the flow of the Waimakariri River has not exceeded 80,000 litres per second for a duration of more than 48 hours or 130,000 litres per second for a duration of more than 24 hours; and
 - (ii) at the commencement of the 24 hour period the flow exceeds 130,000 litres per second.

Interpretation of the Standards and Terms (including Table 2)

Minimum Flow is the flow in the river, as recorded at noon each day and published by Environment Canterbury, below which the taking of water from those water bodies defined by "Water Resource" shall cease. In the case of the Cust River, the "minimum flow" shall be calculated to exclude any water augmenting the river that is exempted in accordance with paragraph (f)(v) of the Standards and Terms.

Site is the location on the river of the gauging site maintained by Environment Canterbury at which the "Minimum Flow" is assessed (see also Figure 5 which indicates the location of the Sites).

"AA" Permits are water permits which are granted to take water until the sum of the individual takes from the "Water Resource" equals the "Allocation Limit" for "AA" permits. No "AA" permits are to be granted above this limit. An "AA" permit remains an "AA" permit on the transfer in whole or part of the permit, provided the same "Allocation Limit" applies to the permit. New permits that are granted as replacements for an "AA" permit on its expiry or review, remain as "AA" permits, where the sum of the rates of take and the allocated volumes of the new permit or permits are not more than that of the original "AA" permit, and provided the same "Allocation Limit" applies to the permits.

"A" Permits are water permits which are granted to take water until the sum of the individual takes from the "Water Resource" equals the "Allocation Limit" for "A" permits. No "A" permits are to be granted above this limit. An "A" permit remains an "A" permit on the transfer in whole or part of the permit, provided the same "Allocation Limit" applies to the permit. New permits that are granted as replacements for an "A" permit on its expiry or review, remain as "A" permits, where the sum of the rates of take and the allocated volumes of the new permit or permits are not more than that of the original "A" permit, and provided the same "Allocation Limit" applies to the permits.

Allocation Limit is the total flow rate of water to be allocated via "AA", "A", "B" and "C" permits. In the case of abstractions from hydraulically connected groundwater, the "Allocation Limit" applies only to the calculated stream depletion flow rate, not to the whole rate of groundwater abstracted from the bore or well.

“B” Permits are water permits which are granted to take water once the “Allocation Limit” for “A” permits has been reached and are granted to take water until the sum of the individual takes from the “Water Resource” equals the “Allocation Limit” for “B” permits. No “B” permits are to be granted above this limit. A "B" permit remains a "B" permit on the transfer in whole or part of the permit, provided the same "Allocation Limit" applies to the permit. New permits that are granted as replacements for a “B” permit on its expiry or review, remain as "B" permits, where the sum of the rates of take and the allocated volumes of the new permit or permits are not more than that of the original “B” permit, and provided the same "Allocation Limit" applies to the permits.

“C” Permits are water permits which are granted to take water once the “Allocation Limit” for “B” permits has been reached, and are granted to take water until the sum of the individual takes from the “Water Resource” equals the “Allocation Limit” for “C” permits. No “C” permits are to be granted above this limit. A "C" permit remains a "C" permit on the transfer in whole or part of the permit, provided the same "Allocation Limit" applies to the permit. New permits that are granted as replacements for a “C” permit on its expiry or review, remain as "C" permits, where the sum of the rates of take and the allocated volumes of the new permit or permits are not more than that of the original “C” permit, and provided the same "Allocation Limit" applies to the permits.

Flood is a large event that is sufficient to rework the gravel bed. Floods rework gravel bars and cause branch channels to cut laterally into banks and bars. Floods are needed to maintain the braided characteristic of a river and to remove vegetation growing in the riverbed so that open shingle habitat can be maintained.

Fresh is a period of higher flow, usually marked by dirty water that is sufficient to remove periphyton algae and move the sediment. A fresh helps maintain habitat for invertebrates, and hence the food supply for fish and birds.

"Unmodified flow" is the rate of flow in the river calculated by Environment Canterbury as if there was no taking occurring. ~~In the case of the Cust River, the "unmodified flow" shall be calculated to exclude any water augmenting the river that is exempted in accordance with paragraph (f) (v) of the Standards and Terms.~~

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.

Matters restricting exercise of discretion

Environment Canterbury will restrict the exercise of its discretion when deciding to grant or refuse a resource consent, and in imposing any conditions, to the following matters:

- (a) The reasonable need for the quantities of water sought, and the ability of the applicant to abstract and apply those quantities.
- (b) The availability and practicality of using alternative supplies of water including alternative public or community reticulated supplies.
- (c) In the case of takes from hydraulically connected groundwater:
 - (i) the effects the take has on surface water flows including the cumulative effects of the combined take from a person's bore field;
 - (ii) the effects the take has on neighbouring bores; and
 - (iii) the effects the take has on other authorised takes.
- (d) For surface takes:
 - (i) the effects the take has on river flows, and consequential effects on those values identified in (a) to (h) of Objective 5.1, ~~near the point of take~~;
 - (ii) the effects the take has on other authorised takes.
- (e) The collection, recording, monitoring and provision of information concerning the exercising of the consent in accordance with Section 108(4) of the RM Act.

Notification

In accordance with Section 94D(2) of the Act, an application for a resource consent required by this rule does not need to be notified, and in accordance with Section 94D(3) of the RM Act, notice of such an application does not need to be served.

In deciding whether or not to notify an application for a resource consent required by this rule, the Council will take into account all relevant considerations, including (but not restricted to):

- (1) the volume of the proposed take relative to the allocation regime set out in Table 2~~minimum flow~~;
- (2) the ecological sensitivity and/or values of the water body concerned;
- (3) the number, volume, and effects on reliability of supply of existing permits; and

(4) possible cumulative effects.

Effect of Rule 5.1 on Existing Resource Consents

This rule shall affect, under section 130 of the RM Act, the exercise of existing resource consents below Woodstock for the taking of water from surface waters of the Waimakariri River or its tributaries or from hydraulically connected groundwater.

When this rule becomes operative, Environment Canterbury may serve notice, under Section 128 of the RM Act, on the holders of all such resource consents of its intention to review the conditions of their resource consent, where in Environment Canterbury's opinion, it is appropriate to do so in order to enable the standards and terms set by the rule to be met.

The holders of resource consents shall comply with the standards and terms of this rule from the date at which the new conditions on their resource consent commence under Section 116 of the RM Act.

For a municipal or rural reticulated water supply scheme, that cannot immediately meet standard and term (f)(ii), the imposition of restrictions may be staged in accordance with a plan provided to Environment Canterbury by the scheme providers to upgrade the scheme, so that it complies within 10 years of this Plan becoming operative.

2. Policy 5.1 Explanation

Add a new paragraph at the end of the explanation for Policy 5.1 as follows:

“Any activity for the taking or diverting of water that does not meet the flow and allocation regime requirements set out in Table 2, by either exceeding the allocation block limits, or by breaching the minimum flow requirements, would be considered to be inconsistent with Policy 5.1.”

3. Method 5.3.3 Investigations

Add a new paragraph to the methods investigations as follows:

“In conjunction with the water user group and other interested stakeholders, Environment Canterbury will instigate a project of environmental monitoring to specifically measure the effectiveness of the new environmental flow and allocation regime for the water resource of the Waimakariri River (including the Kowai River) “below Woodstock” in meeting the requirements of Objective 5.1. Particular emphasis will be placed on determining whether

the regime does ensure periphyton growth is removed sufficiently to protect the life-supporting capacity of the river.

Table 1

MINIMUM FLOWS FOR “A” AND “B” WATER PERMITS WITHIN THE WAIMAKARIRI RIVER CATCHMENT AND ALLOCATION LIMITS FOR “A” PERMITS 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 in litres per second for “C” Permits | Allocation limit in litres per second for “C” Permits | Site where minimum flow assessed (see Figure 5) | Map reference of site |
|-----------------------------------------------------------------|--------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------|-------------------------------------------------|----------------------------------------------|
| Waimakariri River (including the Kowai River) “below Woodstock” | <u>5126</u> | 41000 | 22000 <u>17000</u> | 63000 <u>93000</u> | <u>40000</u> | <u>133000</u> | <u>10000</u> | Old Highway Bridge Otarama | M35:818-547 <u>L34:244-717</u> |
| Styx River | Nil | 1200 | 800 | 2000 | No Limit | N/A | Nil | Radcliffe Road | M35:817-491 |
| Kaputone Creek | Nil | 150 | 180 | 330 | No Limit | N/A | Nil | Confluence with Styx River | M35:824-495 |
| Otukaikino Creek | Nil | 2000 | 1000 | 3000 | No Limit | N/A | Nil | Dickeys Road | M35:804-524 |
| Courtenay Stream | Nil | 260 | 140 | 400 | No Limit | N/A | Nil | Main North Road | M35:813-560 |
| Greigs Drain | Nil | 150 | 70 | 220 | No Limit | N/A | Nil | Greigs Drain Road | M35:805-548 |
| Kaiapoi River | Nil | 600 | 1000 | 1600 | No Limit | N/A | Nil | Neeves Road | M35:796-568 |
| Cust Main Drain | Nil | 230 | 690 | 920 | No Limit | N/A | Nil | Threlkelds Road | M35:783-606 |
| Cust River | Nil | 20 | 290 | 310 | No Limit | N/A | Nil | Rangiora-Oxford Road | M35:661-660 |
| No. 7 Drain | Nil | 60 | 130 | 190 | No Limit | N/A | Nil | Main Drain Road Culvert | M35:781-608 |
| Ohoka Stream | Nil | 300 | 500 | 800 | No Limit | N/A | Nil | Confluence with Kaiapoi | M35:803-591 |

| | | | | | | | | | |
|--------------|-----|------|-----|------|----------|-----|-----|-------------|-------------|
| | | | | | | | | River | |
| Cam River | Nil | 1000 | 700 | 1700 | No Limit | N/A | Nil | Youngs Road | M35:801-633 |
| North Brook | Nil | 530 | 200 | 730 | No Limit | N/A | Nil | Marsh Road | M35:795-649 |
| Middle Brook | Nil | 60 | 30 | 90 | No Limit | N/A | Nil | Marsh Road | M35:782-647 |
| South Brook | Nil | 140 | 100 | 240 | No Limit | N/A | Nil | Marsh Road | M35:779-647 |

Note: The total authorised peak allocation from each water resource at the date of preparing this Plan is shown in Table 1.

Rule 5.3 Non-complying Activities

(1) Within the area of the Waimakariri River Catchment “above Woodstock” defined in Figure 4 and Map 1:

- (a) the taking of water from the Waimakariri River or its tributaries, including lakes, or from hydraulically connected groundwater;**
- (b) the “use” of any water in tributaries, including lakes and wetlands, of the Waimakariri River;**
- (c) the diversion of water from, or the discharge of water into, the Waimakariri River or its tributaries, including lakes and wetlands;**

is a non-complying activity.

(2) Within the area of the Waimakariri River Catchment “below Woodstock” defined in Figure 4 and Map 1, the taking of water that does not meet the standards and terms for Rule 5.1 and is not listed as a discretionary activity is a non-complying activity.

ThisThese rules does not apply to:

- (a) taking, “uses,” diversions or discharges which are specified as permitted activities in the Transitional Regional Plan; or**
- (b) activities prohibited by Rule 5.4 in Chapter 5 of this Plan.**

Effect of Rule 5.3 on Existing Resource Consents

This rule does not affect the exercise of existing resource consents for the taking “use”, diversion, or discharge of water.

Schedules

Schedule 1 **Standards and terms for water measuring and recording devices**

(1) Minimum requirements for all water flow measuring devices:

(a) All water flow measuring devices shall:

- (i) have an international accreditation or equivalent New Zealand calibration endorsement for use with an electronic recording device;
- (ii) be capable of continuous measurement;
- (iii) measure rate in litres per second, and cumulative volume in cubic metres, of the entire flow with no fittings or obstructions that may create turbulent flow conditions;
- (iv) have the capability to be connected to a data storage device such as a datalogger;
- (v) be installed and maintained in accordance with the manufacturer's instructions, and maintained in accordance with industry best practice at all times;
- (vi) be capable of running reliably on alternative power sources, where mains power is not available;
- (vii) be capable of operating in 0 to 95% relative humidity, -15 to +50 0C, and be sealed to prevent condensation;
- (viii) be secure against data loss from lightning strike or power surge;
- (ix) be tamper-proof and sealed, and designed to show signs of tampering and malfunction;
- (x) be accessible to Environment Canterbury staff or representatives at all times for inspection.

(b) In addition to the standards and terms in (1)(a), all water measuring devices where water is conveyed via a pipe shall:

- (i) have a straight rigid length of pipe at least 10 times the diameter of the pipe on the intake side of the measuring device, and at least five times the diameter of the pipe on the discharge side of the measuring device, Where this requirements cannot be met, these pipe lengths may be reduced to five and two times the diameter of the pipe respectively, where it can be independently verified that the measuring device can comply with the requirements of (1)(a) and (1)(b)(ii);

- (ii) be capable of measuring the rate and volume of water taken precisely to within an accuracy of +/- 5% under field conditions at a location that will ensure the total take of water is measured;
 - (iii) be recalibrated if necessary to accord with (1)(a)(i) whenever:
 - a. parts are replaced;
 - b. requested by Environment Canterbury; and
 - c. within five years of installation or any previous recalibration test.
- (c) In addition to the standards and terms in (1)(a), all water measuring devices where water is conveyed via an open race, drain or stream shall:
 - (i) continuously and precisely measure water levels to within an accuracy of +/- 3 mm for takes and out-of-stream diversions via a stilling well type of recorder that are more than minor, and/or for which telemetry capability is required immediately or in the future, and +/- 5 mm for all other takes and out-of-stream diversions, in conjunction with a control structure and bed control unless determined otherwise;
 - (ii) be capable of precisely measuring the net take or out-of-stream diversion to within an accuracy of +/- 10% under field conditions;
 - (iii) be maintained in accordance with the original standards established when the device was first installed; and the consent holder shall also:
 - (iv) maintain a rating curve to convert water levels to flow in accordance with current best practice;
 - (v) provide Environment Canterbury with reasons in writing where any gauging do not fall within 8% of the rated flow, and in addition, have a suitably qualified and experienced person undertake a site review to determine if the rating has changed where such variation occurs on a regular basis;
 - (vi) provide Environment Canterbury with a copy of the rating curve, including any changes, and all gauging cards, with all data having been processed by a suitably qualified and experienced person, at the frequency specified in any consent conditions, or as notified in writing by Environment Canterbury, but of no lesser frequency than every 12 months;
 - (vii) fit a data logger in accordance with (2) to store the water-level data;
 - (viii) inspect the measuring site at least monthly, to ensure that the device is functioning as intended, and is not being affected by the build-up of

weed, debris or natural materials, and record in a log kept for the purpose details of the date and time of such inspections, and any action taken that may affect the accuracy and precision of the measurements.

(d) In addition to the standards and terms in (1)(a) and (c), where water is conveyed via an open race, drain or stream, but measured in a pipe or culvert, the consent holder shall:

(i) have the measuring device installed so that it measures the depth of water in the structure being the entire flow of water in the watercourse;

(ii) have the flow of water exiting the pipe or culvert gauged by a suitably qualified person at a stable site immediately downstream at the frequency specified in any consent conditions, or as notified in writing by Environment Canterbury, but of no lesser frequency than is sufficient to ensure that the flow is being precisely measured within the accuracy specified in (1)(c)(ii);

(iii) ensure that the suitably qualified person measuring the flow in accordance with (1)(d)(i) verifies that the flow device depth offset calibration is checked to ensure that the depth of water is being precisely measured within the accuracy specified in (1)(c)(ii);

(e) In addition to the standards and terms in (1)(a) and (c), where water is conveyed via an open race, drain or stream, but measured using a pre-calibrated control structure such as a weir or flume, the consent holder shall:

(i) have the device installed so that the entire flow passes over or through the structure;

(ii) have the flow of water over the control structure gauged by a suitably qualified person at a suitable site in the immediate vicinity (generally downstream), at the frequency specified in any consent conditions, or as notified in writing by Environment Canterbury, but of no lesser frequency than is sufficient to ensure that the flow is being precisely measured within the accuracy specified in (1)(c)(ii);

(f) In addition to the standards and terms in (1)(a) and (c), where water is conveyed via an open race, drain or stream, but measured using a natural control or un-calibrated control structure, the consent holder shall:

(i) have the device installed so that the entire flow passes over the structure;

(ii) have the flow of water over the control structure gauged by a suitably qualified person at a stable site immediately downstream at the time of installation, and then at the frequency specified in any consent conditions, or as notified in writing by Environment Canterbury, but of no lesser frequency than is sufficient to ensure that the flow is being precisely measured within the accuracy specified in (1)(c)(ii).

(2) Minimum requirements for all water recording devices

All water recording devices shall:

- (a) record or log the pulse totals at the period specified in the consent conditions, but not less than once every 15 minutes for surface water takes and out-of-stream diversions, and not less than once every 60 minutes for groundwater takes;
- (b) be set to wrap the data from the measuring device(s) such that the oldest data will be automatically overwritten by the newest data (i.e. cyclic recording);
- (c) store at least 12 months of data which shall not be deliberately changed or deleted;
- (d) be accessible to Environment Canterbury staff or representatives at all times, and able to be retrieved;
- (e) record data in accordance with any consent conditions, or as requested in writing by Environment Canterbury;
- (f) be installed and maintained in accordance with the manufacturer's instructions, and maintained in accordance with industry best practice at all times;
- (g) be capable of running reliably on alternative power sources, where mains power is not available;
- (h) be capable of operating in 0 to 95% relative humidity, -15 to +50 0C, and be sealed to prevent condensation;
- (i) be secure against data loss from lightning strike or power surge;
- (j) be tamper-proof and sealed, and designed to show signs of tampering and malfunction;
- (k) be connected to a telemetry system which collects and stores all of the data continuously with an independent network provider who will make that data available in a commonly used format at all times to Environment Canterbury and the consent holder, when required in accordance with any consent conditions, or when requested in writing by Environment Canterbury