

# **Draft Natural Resources Regional Plan Groundwater Allocation Policy Implementation – Analysis And Implications**

Report No. U04/18

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## **Report U04/18**

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## **Foreword**

This report was presented to the Regional Planning Committee on 18 February 2004, together with Report U04/02 - "Groundwater Allocation Limits: Guidelines for the Canterbury Region".

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## **1. INTRODUCTION**

The October 2001 consultation draft Natural Resources Regional Plan (NRRP) Chapter 5 Policy 12(h)(i) specified that allocation blocks for groundwater should be determined as a proportion of annual average recharge. Method WQN12 identified the need to investigate whether the plains aquifers could be divided into zones within which abstractors would be given a seasonal allocation and allow for a reduction in particular seasons based on such factors as groundwater levels at the start of spring, and the amount of winter recharge that has occurred as a proportion of long term average annual recharge.

During the process of evaluating submissions and reporting back to Regional Planning Committee during 2003, NRRP planning staff worked closely with Environmental Monitoring groundwater scientists to refine the policies and rules relating to groundwater allocation. A necessary part of this was to analyse the effect of the application of the policy and rules, and how they would be implemented. The results of the analysis are attached, and will become Report U04/02.

Concurrent with the analysis, planning staff brought a number of refinements to the Regional Planning Committee such that there is alignment between the December 2003 groundwater allocation provisions of Chapter 5 and the content of Report U04/02. In December 2003 Council approved Chapter 5 in principle.

## **2. PURPOSE OF REPORT**

The purpose of this report is

- (a) To outline the results of an analysis using the policies and rules for the setting of groundwater allocation limits in Chapter 5 (approved in principle December 2003 by Council).
- (b) To identify the most appropriate approach for processing consent applications to abstract groundwater in highly allocated zones between now and when NRRP rules prohibiting additional allocation are operative.

## **3. SUMMARY AND EXPLANATION OF THE POLICY FRAMEWORK FOR GROUNDWATER ALLOCATION IN DRAFT CHAPTER 5 WATER QUANTITY NOVEMBER 2003 DRAFT (APPROVED IN PRINCIPLE DEC 2003)**

The following discussion refers to first order, second order and third order approaches to setting allocation limits. The first order reflects a lower level of understanding about recharge sources, whereas with the third order approach, the groundwater system and sources of recharge are well understood. Therefore there is a lower level of certainty about the amount of groundwater that can be allocated with a first order approach. It is necessarily precautionary to reduce the risk of adverse environmental effects resulting from high allocation. With greater knowledge the second and third order approaches can be applied and in general are likely to result in an increase in the amount of groundwater available.

Allocation limits that are determined based on either of the approaches set out in Schedule WQN4 (i.e. first order approach – 15% of average annual rainfall; second order approach – 50% of land-surface recharge and recharge from intermittent streams) will be referred to as **interim allocation limits**, while allocation limits that are set by the third order approach and incorporated into Schedule WQN3 will be referred to as **allocation limits**. Thus the first and second order approaches identify interim groundwater allocation limits.

- (a) The Council has approved NRRP Chapter 5: Water Quantity policy in principle.
- (b) Groundwater allocation within water management regimes is covered by Objective 4 and Policy WQN14 – Water Allocation. This part of the policy approach is being referred to as “The Cake” (see Fig WQN3 in NRRP Chapter 5 Water Quantity) i.e. the quantity of water available for allocation without adversely affecting environmental values associated with water bodies.
- (c) **Policy WQN14(1)**  
The policy directs that allocation regimes for all water bodies from which water is taken or is likely to be taken, be established and applied.
- (d) **Policy WQN14(2)**  
Allocation regimes are to be set in allocation blocks (A, B, C, etc.).

(Note: within the NRRP it is acknowledged that the allocation of groundwater from a B block may not be appropriate because there will be years when this B block allocation will not be available and thus no abstraction would be allowed from the B block, if the integrity of the A allocation block is to be maintained)

- (e) For groundwater bodies specifically,
  - **Policy WQN14(4)(a)**  
The size of each allocation block will be set as an annual allocation volume.
  - **Policy WQN14(4)(b)**  
The total amount actually allocated within an allocation block is to be determined as the sum of the annual volume allocated to each take, being based on an efficient and reasonable use (as per Policy WQN17).
- (f) The setting of an allocation limit for a groundwater body is to be carried out on the basis of the following approach:
  - **Policy WQN14(6)**  
Where there is good hydrogeological knowledge, the A allocation block size is to be determined by the level of reliability that will provide on average the full seasonal allocation 8 years in 10, and 60% or more of the full seasonal allocation 19 years in 20.

Note: This third order approach can only be determined with any confidence through investigations and modelling, and secured by inclusion of an allocation regime in Schedule WQN3.

- **Policy WQN14(7)(a)**

Where there is a lack of such knowledge, and as a means of protecting environmental values sustained by groundwater levels such as flows and levels in lakes, rivers, springs or wetlands, and ensuring saltwater intrusion does not occur at the coast, an interim allocation limit will be set on the following basis:

- **Schedule WQN4(a)**

Where there is sufficient data, determine the annual land-surface (rainfall and irrigation return) recharge for each year for the period of record and calculate the average annual recharge. This second order interim allocation limit is 50% of the sum of the average annual average land-surface recharge and the recharge component contributed by intermittent streams; or

- **Schedule WQN4(b)**

If there is insufficient data to allow determination of annual land-surface recharge, determine the annual rainfall series from available information and the interim allocation limit is 15% of the average annual rainfall (first order approach).

- On the basis of the above approach, where there is very limited information, the first order interim allocation limit first set will be precautionary in favour of the environment (using the Schedule WQN4(b) approach – 15% of average annual rainfall). However as further information becomes available, the interim allocation limit will be recalculated using the “50%” formula, with the likely result being the increasing of the interim allocation limit (second order approach).

(g) **Policy WQN14(4)(b)**

The total amount actually allocated is to be determined as the sum of the annual volume allocated to each take.

**Policy WQN14(4)(b)**

Where consents have an annual allocation volume already specified, this is to be used for determining the total amount actually allocated.

Where consents do not expressly specify an annual allocation volume (i.e. nearly all water permits granted prior to NRRP notification), then the amount allocated shall be determined either on the basis of:-

- **Policy WQN14(7)(b)(i)**

The actual average annual monitored usage where available; or

- Where no actual monitored usage data is available,

- i. **Policy WQN14(7)(b)(ii)**

for irrigation use, a seasonal volume based on the appropriate seasonal irrigation demand indicated in Schedule WQN9;

- ii. **Policy WQN14(7)(b)(iii)**

for public water supply use, based on the maximum daily volume authorised multiplied by 365;

iii. **Policy WQN14(7)(b)(iv)**

for commercial or industrial use, based on the maximum weekly volume authorised multiplied by 52.

- (h) The groundwater allocation regimes are to be managed by a mix of regulatory and non-regulatory methods:

**Rules** which:

(i) **Policy WQN14(8)(a) via Rules WQN12, WQN14 & WQN16 (Permitted Activities)**

provide for small rates or amounts where singly/cumulatively such amounts are so small they do not need to be included in any allocation regime.

(ii) **Policy WQN14(8)(b) via Rule WQN21**

provide for the taking of a rate or amount to be excluded from an allocation block, providing these avoid or mitigate any effect on the block.

(iii) **Policy WQN14(8)(c) via Rules WQN18 & WQN19 (Restricted Discretionary Activity), and WQN21 (Non-complying Activity)**

authorise through resource consents the taking of water up to the allocation limit.

(iv) **Policy WQN14(8)(d) via Rules WQN18 & WQN19 (Restricted Discretionary Activity), and WQN21 (Non-complying Activity)**

authorise through resource consents the taking of water in excess of the allocation limit where the resource consent sought is for an existing water permit that is expiring and the amount is reasonable.

(v) **Policy WQN14(8)(e) via Rule WQN22 (Prohibited Activity)**

except for all of the above, prohibit the taking of water where the amount being sought, when in combination with all other existing authorised takes in the same allocation block, is in excess of the allocation limit, irrespective of whether it is a first, second or third order assessment of available allocation.

**Note:**

Following the recent amendment to the RMA, a new provision (s77C(1)(c)) states that *“an application for a resource consent for an activity must, with the necessary modifications, be treated as an application for a resource consent for a discretionary activity if... a rule in a proposed plan describes the activity as a prohibited activity and that rule has not become operative”*.

This means that until Rule WQN22 is operative, all applications to take groundwater in zones determined to be fully allocated, irrespective of the “order” of the allocation assessment, must be processed as a discretionary activity.

- (vi) **Policy WQN14(9)**  
specifies that all water permits within a particular allocation block shall retain that priority for the full period of the permit and may be replaced with the same priority (subject to meeting requirements of efficient and reasonable use test).
- (vii) **Policy WQN14(10)**  
when an allocation regime in Schedule WQN3 becomes operative, consents will be reviewed for reasonable use and an annual allocation volume reflective of that use will be incorporated into the consent; where the total amount allocated in the A allocation block is in excess of the allocation limit, the over-allocation will remain but will reduce whenever a water permit expires and is not replaced; where the total amount allocated exceeds the A allocation limit, new permits (issued after 1 January 2002) will be placed in a B allocation block.

**Non-regulatory plan implementation methods** that include:

- (i) **Method WQN14(a)**  
maintaining a publicly available database showing allocation status for each groundwater allocation zone for which an allocation regime has been set; the total amounts of water allocated from each; and a register to facilitate water permit transfers.
- (ii) **Method WQN14(b)**  
investigating whether there is a more appropriate way to allocate the groundwater resource than that specified in Policy WQN14(7) i.e the Schedule WQN4 interim allocation setting formulae, including dividing the plains aquifers into further sub-zones on the basis of detailed hydrogeological information.

**Note:**

This can only be determined with any confidence through investigations and modelling, and secured by inclusion of an allocation regime in Schedule WQN3.

#### 4. EXTRACTS FROM DRAFT GROUNDWATER ALLOCATION REPORT U04/02

The text in italics is drawn directly from Report U04/02.

- (a) **Determination of new groundwater allocation zones**  
In determining new groundwater allocation zones, first consideration was given to previous work, before it was decided that a more comprehensive approach was needed –

*“3.1 Previous zones in Canterbury*

*Previous work on groundwater zones has been ad-hoc, considering groundwater resources alone and not treating the region as a whole. There are detailed groundwater zones for the following areas: Waipara (Lloyd, 2002); Ashley-Waimakariri (Sanders 1997); Christchurch-West Melton (PDP & CRC, 1997), and Central Plains (Taylor et al., 1996, Brooks, 1998). These zones are all based primarily on hydrogeological criteria.*

*The Canterbury Strategic Water Study (Morgan et al., 2002) also divided Canterbury into a number of allocation zones. These zones considered groundwater and surface water resources together, and are based largely on surface water catchment areas. However a more comprehensive, region-wide, groundwater-focused approach is now required.”*

The approach taken was to divide the region into 29 groundwater allocation zones as illustrated in Figure 1 below. This figure is Figure 3.1 in Report U04/02, and has been incorporated as “Figure WQN12 Groundwater allocation zones” in NRRP Chapter 5: Water Quantity.

The rationale for determining the zones as represented on the map is given in Section 3.2 of Report U04/02 as:

*“primarily determined to represent areas of similar hydrogeology and recharge sources and, where possible, have followed previous groundwater zonations set by Environment Canterbury for other groundwater management purposes (e.g. Christchurch/West-Melton zones).*

*Zone boundaries were determined using the following criteria:*

- *The inland extent of groundwater zones was considered to be the extent of the Quaternary geology (being gravels of glacial outwash and fluvial origin, which the majority of Canterbury groundwater is sourced from). The extent of the Quaternary gravels was taken from a line available in Environment Canterbury’s GIS called ‘Simple Geology’ (location Q:\nat\_res\gwater\simplegeol.shp) which was prepared for Environment Canterbury, as part of the ‘Groundwaters of Canterbury’ document (Brown, 2001).*
- *Major rivers have been used to divide zones. The boundary has been determined to be: the district boundary (where this coincides with a river e.g. the Waimakariri or Rangitata); or a line drawn down the centre of the river using a topographic basemap of the NZMS 1:50,000 series (e.g. the Ashley River).*
- *Roads have been used to divide zones where possible, and where there are insufficient roads to approximate a defensible boundary on hydrogeological grounds, land-parcels have been used. The locations of both the roads and land-parcels have been determined from the layers available within Environment Canterbury’s GIS system.*

*To reflect the regional, coarse approach to estimating allocation limits, zones were kept as large as possible.”*

(b) **Approaches to estimating groundwater recharge**

While two approaches to estimating groundwater interim allocation limits are proposed – the “15% of average annual rainfall” and “50% of land-surface recharge”, only the more conservative first order approach, i.e. the “15% of average annual rainfall” approach was able to be estimated at the time of writing the report. The “50% of land-surface recharge” second order approach could not be estimated because -

*“...Concerns regarding the accuracy of evapotranspiration estimates have to be resolved before land-surface recharge values can be adopted for groundwater allocation limit setting.”*

The first order approach that has been used, i.e. “15% of average annual rainfall” was carried out on the following basis:

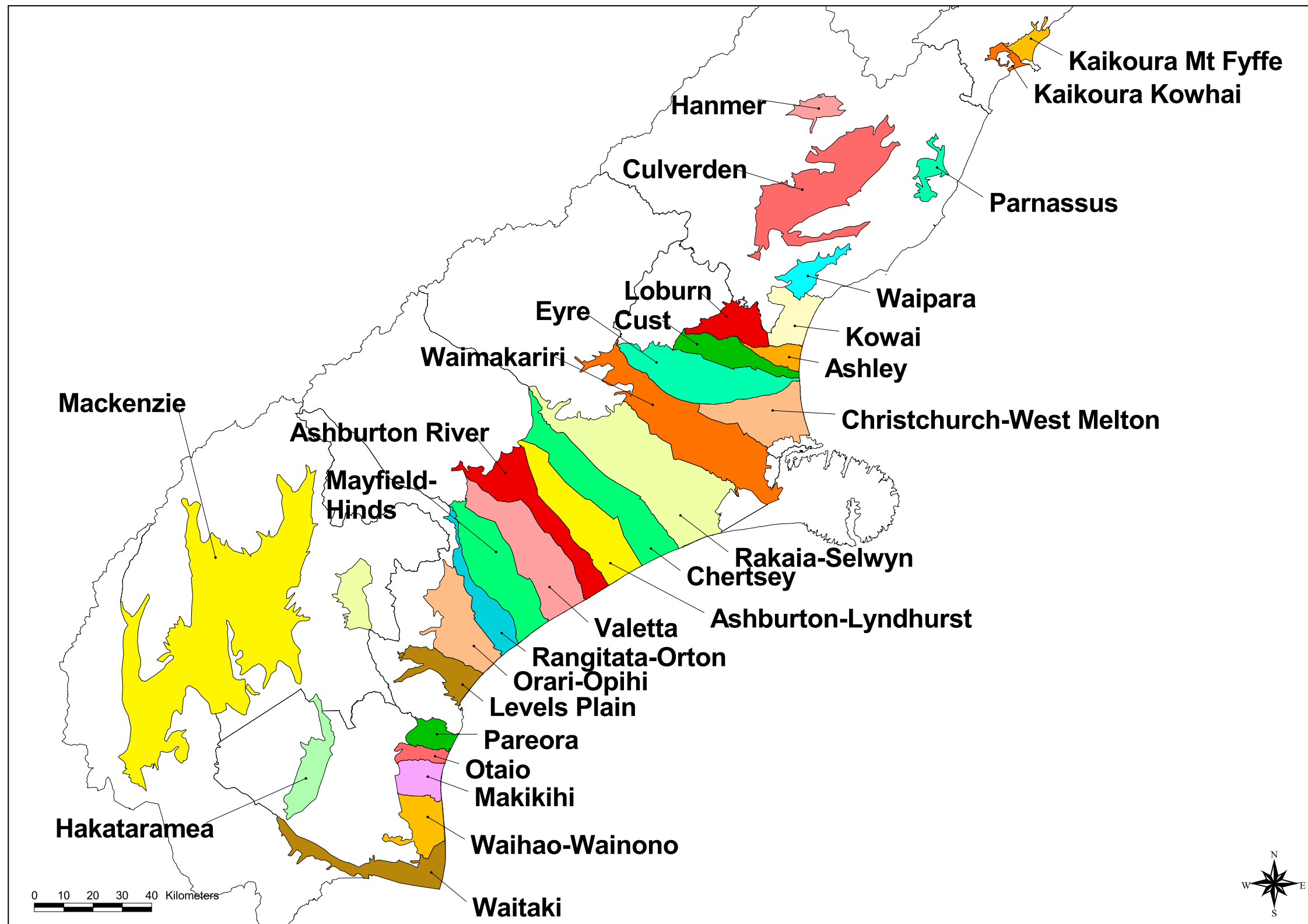
*“To estimate average annual rainfall, the groundwater allocation zones were categorised into low, medium and high rainfall zones, using mean annual rainfall isohyets available within Environment Canterbury’s GIS system (available under Q:\gisdata\nat\_res\swater\raincont). ... Areas of groundwater zones that fell below the 700mm isohyet were classified as a low rainfall zone, areas between the 700 and 900mm isohyet were classified as medium, and areas above the 900mm isohyet were classified as high. The values of assumed annual rainfall were based on the following justification:*

- *There were no isohyets of <700mm, so a 650mm value was chosen for the low zone*
- *The 850mm value is taken to represent all the area between the 700 and 900mm isohyets (the medium zone)*
- *1000mm was chosen as representative of the High zone, as the maximum isohyets ranged up to 1300mm at the top of the plains, but this represented a small proportion of the total area at >900mm.*

*The area within each zone was multiplied by the appropriate annual rainfall (in metres). These figures were summed for each zone, to give a rainfall total in m<sup>3</sup>/year, and 15% of this figure taken as the primary allocation block.”*

Note:

The “primary allocation block” referred to here is the first order interim allocation limit and is not the same as an “A” allocation block that would be determined under Policy WQN14(6).



(c) **Estimation of amount actually allocated**

In Report U04/02, it states that for the preliminary (first order) approach

*“it was decided to assess public supply and other uses considered to be year-long, over a 365 day period at 100% of the consented daily volume. For irrigation takes, a 150 day season was assumed (as a typical maximum period), and 60% of the consented daily volume was considered to be actually used. This figure was chosen based on the maximum average usage in a dry season (1997/98)”*

The rationale for this was stated earlier -

*“Monitoring of groundwater takes has shown that actual groundwater usage is generally less than the consented volume. Sanders (1997 – 2003) in a series of groundwater use reports using metered data concluded that in a dry irrigation year (such as 1997-98) irrigation usage was on average 60% of the consented volume (over a 120 day long irrigation season).”*

The report does suggest there are other methods to determine actual use but that those methods are currently unable to be used -

*“There is the potential to use specific monitoring data (if available) or to assess a volume based on a seasonal allocation to estimate actual use. Daveron (2003) outlines a method to determine seasonal water demand (refer to **Appendix E**). This method depends on defining soils into categories of ‘light, shallow’, ‘medium’ and ‘deep’. Information on this categorisation has not yet been provided, hence this approach has not been undertaken as part of this report.”*

(d) **Current groundwater allocation limits**

Combining the data obtained from (b) and (c) above, a preliminary assessment of interim allocation limits and consented volumes has been made, and is summarised in Report U04/02 in Table 6.1 which is shown below:

The Report states that

*“Comparison between Rainfall Allocation Limit and Total Allocated Amount in Table 6.1 shows that 7 zones (marked in red) are highly allocated (>100%) and 3 zones are more than 80% allocated.”*

Values of additional recharge inputs (predominantly the recharge component contributed by intermittent streams or recharge from irrigation schemes within the zones) have been added to the interim allocation limits in Table 6.1, to produce a revised interim allocation limit which is shown in Table 6.2 in the report and this table is also included below. This indicates that 4 zones are highly allocated (>100%) and 4 zones are more than 80% allocated.

In relation to Table 6.2, the report states that *“Additional areas exceed or approach the allocation limit if groundwater use is considered as 100% of consented volume for irrigation takes instead of 60%. These additional zones are shown by figures marked by \* in the ‘Consented Use’ column of Table 6.2. A trend towards greater use of the consented volume within existing consents, would lead to an allocation block filling even if no new consents were granted.”*

In addition, the report emphasises a number of points in relation to the estimates shown in Tables 6.1 and 6.2. –

*“It must be emphasised that the allocation limit for each zone treats all aquifers as one, and ignores any localised aquifer depletion. A zone may be shown to not be fully allocated, yet there may be sub-areas within the zone that are currently experiencing groundwater decline owing to increasing use. Alternatively, there may be areas within a fully allocated zone where there are no observed groundwater declines and the system could potentially support increased allocation. Further refinement of allocation limits is always possible, but depends on the level of information available. It is intended that these allocation limits will be revised progressively using more detailed approaches.*

*In addition, if a groundwater take has stream depletion effects, part of the water will be sourced from the stream, not the groundwater system. No consideration of stream depletion effects has been undertaken as part of this assessment, due to the sheer scale of such an undertaking. As a result the allocation figures will tend to be over-estimates.*

*The Christchurch/West Melton groundwater allocation zone has not been included in this assessment. Greater hydrogeological understanding and the existence of a groundwater model in this zone mean that groundwater allocation limits may be set using different criteria than proposed in this report.*

**Table 6.1 Preliminary allocation limits (Using 15% of rainfall approach only)**

Zone	Allocation Limit			Allocated Amount			
	Area (m <sup>2</sup> )	Annual Average Rainfall (x 10 <sup>6</sup> m <sup>3</sup> /year)	15% of Rainfall Allocation Limit (x 10 <sup>6</sup> m <sup>3</sup> /year)	Public Commercial and Industrial Usage (assume 365 day usage) (x 10 <sup>6</sup> m <sup>3</sup> /year)	Irrigation Usage (assume 150 day usage/year) (x 10 <sup>6</sup> m <sup>3</sup> /year)	Irrigation Usage (assuming 60% actual use) (x 10 <sup>6</sup> m <sup>3</sup> /year)	Total Allocated Amount (x 10 <sup>6</sup> m <sup>3</sup> /year)
Ashburton Lyndhurst	633018258	509.8	76.5	10.5	140.9	84.5	95.0
Ashburton River	535072266	463.6	69.5	7.1	66.9	40.1	47.2
Ashley	104621204	70.3	10.5	15.4	10.0	6.0	21.4
Chertsey	709762022	594.7	89.2	2.6	139.8	83.9	86.4
Culverden	920202467	727.7	109.2	2.4	36.7	22.0	24.4
Cust	269543147	218.6	32.8	6.1	14.2	8.5	14.7
Eyre	667935961	541.8	81.3	16.8	55.5	33.3	50.1
Fairlie	197412087	173.7	26.1	0.0	4.1	2.5	2.5
Hakataramea	270948443	177.7	26.7	0.0	0.5	0.3	0.3
Hanmer	106627163	106.6	16.0	0.0	0.6	0.4	0.4
Kaikoura Kowhai	42370406	42.4	6.4	0.0	2.5	1.5	1.5
Kaikoura Mt Fyffe	83618590	83.6	12.5	0.3	1.2	0.7	1.0
Kowai	238720373	182.5	27.4	4.4	4.8	2.9	7.3
Levels Plain	235039896	150.7	22.6	13.0	32.1	19.3	32.2
Loburn	239121395	222.2	33.3	0.1	0.8	0.5	0.6
MacKenzie	2949227277	2308.1	346.2	2.2	6.2	3.7	5.9
Makikihi	184736776	123.7	18.6	0	12.5	7.5	7.5
Mayfield Hinds	626100815	527.6	79.1	0.3	73.6	44.2	44.4
Orari Opihi	472863885	390.0	58.5	15.5	58.8	35.3	50.8
Otaio	85635196	56.9	8.5	0.0	3.4	2.0	2.0
Pareora	133449114	86.7	13.0	6.2	8.1	4.9	11.1
Parnassus	107004254	85.6	12.8	0.7	8.1	4.9	5.6
Rakaia Selwyn	1358345154	1056.9	158.5	12.1	364.0	218.4	230.4
Rangitata Orton	278036255	219.6	32.9	1.5	79.2	47.5	49.1
Valetta	701049992	582.8	87.4	19.5	134.2	80.5	100.1
Waimakariri	983106014	779.1	116.9	21.7	167.1	100.2	121.9
Waihao-Wainono	248299387	165.2	24.8	2.7	10.4	6.3	8.9
Waipara	142251438	99.7	14.9	0.1	6.3	3.8	3.8
Waitaki	363785913	236.5	35.5	2.9	16.0	9.6	12.5

Highly allocated (>100%)

> 80% allocated

**Table 6.2 New Allocation limits including non-rainfall components**

Zone	Rainfall only allocation limit (from Table 6.1, column 4) (x 10 <sup>6</sup> m <sup>3</sup> /year)	Additional Recharge <sup>1</sup> (from Appendix F) (x 10 <sup>6</sup> m <sup>3</sup> /year)	Revised Allocation Limit (x 10 <sup>6</sup> m <sup>3</sup> /year)	Assessed Use <sup>2</sup>		Consented Use <sup>3</sup>	
				(x 10 <sup>6</sup> m <sup>3</sup> /year)	% of Revised Allocation Limit	(x 10 <sup>6</sup> m <sup>3</sup> /year)	% of Revised Allocation Limit
Ashburton Lyndhurst*	76.5	35.0	111.5	95.0	85.2	151.4	135.8
Ashburton River*	69.5		69.5	47.2	67.9	74.0	106.4
Ashley	10.5	15.0	25.5	21.4	83.6	25.3	99.2
Chertsey*	89.2		89.2	86.4	96.9	142.4	159.6
Culverden	109.2		109.2	24.4	22.3	39.0	35.8
Cust	32.8		32.8	14.7	44.7	20.3	62.1
Eyre	81.3		81.3	50.1	61.7	72.4	89.0
Fairlie	26.1		26.1	2.5	9.5	4.1	15.8
Hakataramea	26.7		26.7	0.3	1.2	0.5	2.0
Hanmer	16.0		16.0	0.4	2.5	0.6	4.0
Kaikoura Kowhai	6.4	3.7	10.1	1.5	15.0	2.5	24.7
Kaikoura Mt Fyffe	12.5	6.7	19.2	1.0	5.0	1.4	7.5
Kowai	27.4		27.4	7.3	26.7	9.2	33.7
Levels Plain*	22.6	7.8	30.4	32.2	105.9	45.0	148.1
Loburn	33.3		33.3	0.6	1.9	0.9	2.8
MacKenzie	346.2		346.2	5.9	1.7	8.4	2.4
Makikihi	18.6		18.6	7.5	40.6	12.5	67.6
Mayfield Hinds	79.1	44.0	123.1	44.4	36.1	73.9	60.0
Orari Opihi*	58.5	12.6	71.1	50.8	71.5	74.3	104.6
Otaio	8.5	2.2	10.7	2.0	18.9	3.4	31.5
Pareora	13.0	7.7	20.7	11.1	53.6	14.3	69.2
Parnassus	12.8		12.8	5.6	43.7	8.9	69.0
Rakaia Selwyn*	158.5	50.0	208.5	230.4	110.5	376.0	180.3
Rangitata Orton*	32.9		32.9	49.1	149.0	80.8	245.2
Valetta*	87.4	12.0	99.4	100.1	100.6	153.8	154.7
Waimakariri*	116.9	15.0	131.9	121.9	92.5	188.7	143.1
Waihao-Wainono	24.8	2.1	26.9	8.9	33.2	13.1	48.7
Waipara	14.9	1.9	16.8	3.8	22.8	6.3	37.6
Waitaki	35.5		35.5	12.5	35.3	18.9	53.3

Highly Allocated >100 % allocated

>80 % allocated

<sup>1</sup> Additional recharge includes irrigation sourced recharge and intermittent streams

<sup>2</sup> Assessed Use is identical to that outlined in Table 6.1

<sup>3</sup> Consented Use assumes 100% of consented volume is used over 150 days for an irrigation consent . A 365 day use consent remain the same as in Table 6.1 (i.e Column 7 + Column 6 in Table 6.1)

\* Zone that would exceed the allocation limit if Consented Use was considered instead of Assessed Use

## 5. DISCUSSION OF THE APPLICATION AND TESTING OF THE NRRP GROUNDWATER ALLOCATION POLICY

- (a) The application of the groundwater allocation policy documented in Report U04/02 provides interim allocation limit estimates (in Table 6.1) that are based on the more precautionary formula provided for in Policy WQN14 (Schedule WQN4(b)). This is because of a lack of more detailed information, and for that reason, should be considered as the first order approach for the setting of interim allocation limits. This means that after further investigations and the application of the second order approach, there is a strong possibility that the interim allocation limit will be increased.

In estimating the amount actually allocated, the approach set out in Schedule WQN4(c) (details of which are derived from Policy WQN14(7)(b)) has not been used because there was insufficient specific monitoring data, and currently there are difficulties in accessing the relevant data to use the seasonal irrigation demand standards otherwise referred to in Schedule WQN4(c).

In the absence of the relevant data being available, simplifying assumptions have been made (e.g. for irrigation, for each take, the annual water allocation is 60% of the consented volume over 150 days and for public and industrial water use 100% of consented volume over 365 days). Nevertheless they do provide a realistic application of Policy WQN14 for determining how much of the first order interim groundwater allocation limits have effectively already been allocated for all zones in Chapter 5 Figure WQN12.

- (b) Based on this application of the NRRP groundwater allocation policy, there are seven zones where all of the first order interim allocation limit has already been allocated (“red” zones), and three others that have more than 80% of the first order interim allocation limit already allocated (see Table 6.1).
- (c) On this basis, if Rule WQN22 was able to be applied, no more groundwater would be allocated from the “red” zones until such time as further information is available to determine an interim allocation limit based on the second order interim approach (Schedule WQN4(a)).

If the allocation limit has been set on the basis of first or second order interim approaches, and if Rule WQN22 was operative, no further account could be taken of any technical information that may indicate a localised area within the allocation zone could sustain further allocation with little risk of adverse environmental effects occurring.

- (d) Table 6.2 gives an indication of how applying the second order approach will affect the interim allocation limits. The intermittent river recharge figures are rough estimates only, and the interim allocation limits estimated in Table 6.2 do not include all of the land-surface recharge components specified in the second order approach set out in Schedule WQN4(a).

Thus Table 6.2 still probably underestimates the interim allocation limits based on the second order approach for determining interim allocation limits. However the exercise shows that even with an expanded amount available for allocation, four zones are already highly allocated.

- (e) It is anticipated that progress will be made in identifying and applying more detailed data which will allow for the determination of the interim allocation limits using the second order approach i.e. “50%” formula (Schedule WQN4(a)), and to derive the total amount actually allocated using the approach set out in Policy WQN14(7)(b).

It is hoped that estimates for some zones at least will be available when NRRP is notified in May. This will mean that the second order approach will be able to be applied in those zones from the time of notification of NRRP.

- (f) The analysis concluded that the criteria used in the formula proposed for determining interim groundwater allocation limits are *“as technically well founded as they can reasonably be in light of present knowledge”*, and no changes are considered necessary to the wording already approved for Schedule WQN4.

## 6. MANAGEMENT IMPLICATIONS

### 6.1 Amendments to draft Chapter 5 Water Quantity

As a result of the technical work and further consideration of the application of Chapter 5, staff have identified several amendments that should be made. While the changes are identified here, staff will report back with specific changes to a subsequent RPC meeting.

It is considered that the prohibited activity rule is too restrictive for interim allocation limits determined using the first or second order approach set out in Schedule WQN4.

In addition, because the prohibited activity rule must be treated as a discretionary activity until such time as the rule becomes operative, for first or second order areas, it would be better to exclude activities in these areas from the prohibited activity rule and replace it with a non-complying activity rule. This is because:

- A non-complying activity rule places a higher threshold test than possible if processed as a discretionary activity, but does allow a consent to be granted where it is shown further allocation will not result in adverse environmental effects (whereas under a prohibited activity rule, this couldn't be done).
- S77C would no longer apply, but the non-complying activity rule would apply from the time the NRRP is notified.

The suggested changes to the existing draft policies and rules are as follows:

- (a) Amend Rule WQN22 (Prohibited Activity) so that it only pertains to the taking of groundwater from an allocation block that is fully allocated, **where the allocation limit for the block has been determined on the basis of Schedule WQN3** (that is, a third order assessment where we have a good understanding of the resource).
- (b) Create an additional rule for a non-complying activity for the taking of groundwater from a groundwater allocation block that is fully allocated, **where the allocation limit for the block has been determined on the basis of**

**Schedule WQN4** (that is, it is an interim first or second order assessment, as we still have a limited understanding of the resource)

- (c) Amend Policy WQN14(8)(d) to provide for circumstances where anomalous areas exist within any of the groundwater allocation zones depicted in Figure WQN12. The proposed wording change is set out below. The part in italics is from the approved in principle version, while the recommended changes are underlined.

*“To manage these allocation regimes by....(d) authorising through resource consents:*

- (i) *the taking or diversion of water in excess of the A allocation limit, where the resource consent sought is for an existing water permit which is expiring or has expired by no more than six months at the time the resource consent is lodged, and the amount is reasonable (see Policy WQN17); or*
- (ii) the taking or diversion of water in excess of an interim allocation limit where the groundwater allocation limit has been determined using Schedule WQN4; and it can be demonstrated that the proposal will not compromise the environmental values sustained by groundwater levels, such as flows and levels in rivers, lakes springs or wetlands, or seawater intrusion of coastal aquifers, or the reliability of supply provided for in Policy WQN14(6)(a) and (b)”;

In zones where the interim allocation limit is already fully allocated, if the above changes are adopted and the policy is operative, consent applications would be processed and should be declined, unless there is information available indicating further taking of groundwater would not result in adverse environmental effects.

## 6.2 Approach to dealing with consent applications to take water in “red” zones

There are a number of factors that must be taken into consideration in identifying the appropriate approach.

- (a) Once a plan is notified, the consent authority must have regard to any relevant provisions of a proposed plan.
- (b) The consent authority must have regard to any other matter the consent authority considers relevant and reasonably necessary to determine the application. Therefore it is not possible to ignore report U04/02 or the proposed NRRP.
- (c) Any application to take water in a “red” zone is currently treated as a discretionary activity. This means that (a) and (b) above apply. On the basis of current information, this should lead to consents being declined in “red” zone areas unless it can be demonstrated that the effects on the environment will be minor, or second or third order calculations can be made which show a greater allocation limit.

- (d) Rule WQN22 is a prohibited activity rule and therefore does not take full effect until it is operative. Applications to take groundwater in zones determined to be fully allocated by any of the three approaches (i.e. first, second or third order approaches) will have to be processed as discretionary activities. However, staff are recommending that RPC amend the prohibited activity rule so that it doesn't apply to the first and second order interim allocation limits, and create a non-complying rule to apply to those areas where the interim allocation limit has been determined using either a first or second order approach. A non-complying rule applies from notification. This will create a high threshold test and should result in applications being declined unless they can demonstrate that the effects on the environment will be minor or the activity will not be contrary to the objectives and policies of the proposed NRRP (Section 104D RMA).
- (e) Council cannot place a moratorium on the consenting of new groundwater takes from groundwater zones where the allocation is considered full. This is because it is not *vires* given all the relevant sections of the RMA relating to regional policy statements and plans, and applying for and processing of resource consent applications. All of these mechanisms have their own specific requirements and processes for their implementation. It is only when a prohibited activity rule becomes operative that consent applications are so constrained.

**6.3 Requirements for further work to be undertaken to ensure groundwater allocation limits can be effectively implemented and there can be a progression from a first order approach through to a third order approach in reasonable timeframes**

There are a number of tasks and/or investigations that will need to be undertaken so that the groundwater allocation regime set out in the NRRP Chapter 5 can be effectively implemented. These tasks will be the responsibility of a number of the Directorates within Environment Canterbury, and are outlined below:

**(a) Regulation**

- (i) The need to ensure that the existing council databases are modified so that it is possible to have a running "live" record of both:
  - the allocation limits for the various allocation zones, and
  - the total amount currently allocated.

Currently the "Consents" database does operate the facility to keep a running "live" record of allocation for surface water catchments. This same facility is not, at this stage, available for dealing with groundwater allocation zones. Such a facility will be needed to implement the groundwater allocation regimes.

- (ii) As a result of the above requirements, it will also be necessary to ensure consent conditions align to the proposed groundwater allocation regime requirements.

- (iii) In order to be able to accurately establish current actual water usage and to provide further information requirements for the undertaking of groundwater investigations including modelling, particularly in those zones under pressure (“red” zones), there will be a need to review existing consents in a particular zone to require installation of water meters and require the recording of water usage.

**(b) Investigations and Monitoring**

- (i) Where the groundwater investigations work such as developing groundwater models is already programmed and operating, there may be the need to prioritise that work for areas experiencing pressure.
- (ii) For pressure areas where there is no groundwater investigation work currently programmed, there is the need to programme and prioritise that work.
- (iv) The need to carry out desktop investigations applying the proposed NRRP stream depletion approach to identify those groundwater abstractions that may be hydraulically connected to a surface water, so that a re-evaluation of the amount of water allocated to ground and surface water allocation blocks can be made.
- (v) There is a need to complete the “plainsoils” layer on the GIS database to include soil Profile Available Water (PAW) data for areas south of Rangitata and north of Waipara.

**(c) External Relations**

- (i) There is the need to develop a communications strategy to inform the public of the recent findings in terms of NRRP policy development and application, with the findings recorded in Report U04/02.

In particular, there will be a need to communicate the implications in terms of

- how the information contained in this report and Report U04/02 may affect the potential to apply for and be granted a consent to take groundwater in any of the “red” zones;
- the Council should publicly articulate that in fully allocated first and second order situations, consent applicants will need to demonstrate that additional water is available and the Section 104D tests can be met;
- an allocation limit set on the basis of a first order approach, as opposed to a third order approach.

**(d) Policy and Planning**

- (i) Investigate whether there is a legally robust means by which a policy provision could be drafted to establish an order of priority for those interested in obtaining allocation in a groundwater allocation zone, that is currently determined to be fully allocated, where following further investigations, the allocation limit is increased.

## **7. RECOMMENDATIONS**

- (a) That the Regional Planning Committee receives further advice from staff on changes needed to the groundwater allocation provisions in NRRP Chapter 5 to reflect the content of this report in Section 6.1, in particular:
  - (i) to amend the prohibited activity Rule WQN22 so that it does not apply to interim allocation limits calculated using the first and second order approaches;
  - (ii) to develop a new non-complying rule for interim allocation limits calculated using the first and second order approaches.
  
- (b) That the Regional Planning Committee recommends to the Council that it adopt the approach and matters set out in Sections 6.2 and 6.3, in particular:
  - (i) that when considering any application to take groundwater in a “red” zone (determined in Report U04/02) regard shall be had to the information in Report U04/02 and the analysis in this paper, which should lead to consents being declined unless it can be demonstrated that the effects on the environment will be minor, or second or third order calculations can be made to justify a greater allocation limit;
  - (ii) that Council publicly articulate that in fully allocated first and second order situations, consent applicants will need to demonstrate that additional groundwater is available, otherwise applications should be declined;
  - (iii) that in those zones under pressure (“red” zones determined in Report U04/02), all existing groundwater take consents be assessed to determine the need for water usage recording for compliance and groundwater management purposes.

## **8. COUNCIL ADOPTION OF RECOMMENDATIONS**

The Regional Planning Committee approved the above recommendations on 18 February 2004, and moved that the recommendations be approved by Environment Canterbury at their Council meeting on 19 February 2004.

Environment Canterbury approved the recommendations in full without change at the Council meeting on 19 February 2004.