

**Before the Commissioners appointed by Canterbury
Regional Council**

IN THE MATTER OF The Resource Management Act
1991

AND

IN THE MATTER OF 78 Applications to Take and Use
Water in the Ashburton River and
Valetta Groundwater Allocation
Zones.

Section 42A Officer's Report

Date of Hearing: 21 July 2008

Report of Malcolm Miller

1. My full name is MALCOLM GEORGE MILLER. I am a Senior Resource Management Planner, in the employ of Environment Canterbury, based in Timaru.
2. I acknowledge that I have read the code of conduct for expert witnesses contained in the Environment Court's Practice Note dated 31 March 2005. I have complied with it when preparing my written statement of evidence and I agree to comply with it when I give this oral evidence.

QUALIFICATIONS AND EXPERIENCE

3. I am employed by Environment Canterbury as a Senior Resource Management Planner with 18 years experience in water resource planning and regional policy development in Canterbury. I hold a Bachelor of Town Planning (Auckland). I am a Full Member of the New Zealand Planning Institute. I have been involved in the preparation of District Plans and in the preparation and implementation of Regional Plans over this time.
4. I have been directly involved in the development of the Opihi River Regional Plan and the Proposed Natural Resources Regional Plan (NRRP). My principal involvement with the Proposed NRRP has been in the preparation of Chapter 5, which addresses water quantity issues. An aspect of this has been the development of the Ashburton River / Hakatere proposed flow and allocation regime that is included in Schedule WQN1 of Chapter 5.
5. These latter projects have involved the preparation of policy options and policy development, policy advice to Council, public consultation and the analysis of submissions.

Ambit of My Evidence

6. In my evidence I look at the resource management strategies and plans, and in particular the Proposed Canterbury Natural Resources Regional Plan, that have application to these resource consents.
7. I have provided comment on
 - (a) the relationship between the Canterbury Regional Policy Statement (RPS) and the Proposed NRRP surface water / groundwater provisions;
 - (b) Proposed NRRP overview;
 - (c) allocation limits – Proposed NRRP Variation 1 and Variation 4 approaches;
 - (d) effective allocation - Proposed NRRP Variation 1 and Variation 4 approaches;
 - (e) Proposed NRRP approach to exceedence of allocation limits;
 - (f) restriction of groundwater takes – Proposed NRRP Variation 1 and Variation 4 approaches;
 - (g) Ashburton River / Hakatere proposed flow and allocation regime.
 - (h) lowland streams and drains
 - (i) water quality effects – Proposed NRRP - Chapter 4.

8. From my analysis I conclude that ...
- (a) Consistent with the Canterbury RPS, the Proposed NRRP has established Policy for allocating surface water and groundwater throughout most of the region. The Proposed NRRP has established the groundwater allocation zones that are being applied now. (paras 13 – 14)
 - (b) Allocation limits are established for each of these groundwater allocation zones and these are set out in Schedule WQN4 via Proposed NRRP Variation 4. (paras 31 – 33)
 - (c) Effective allocation has been determined for each groundwater allocation zone. For the Ashburton River groundwater allocation zone the stream depletion effect of groundwater takes has not been discounted from the effective allocation. The allocation blocks are full - the zones are “red.” (paras 34 – 40)
 - (d) There are a number of risks that arise in relation to the calculation of and application of the effective allocation. The effective allocation is not the maximum amount of water that can be taken from a zone. The method for deriving annual allocation volumes is contentious and if changed the annual volumes assigned to each take could increase and therefore the effective allocation could increase. Also climate change predictions indicate an increase in the frequency of low recharge years and of high demand years which could mean the maximum amount of water will be taken more frequently. (paras 41 – 44)
 - (e) The notion that the NRRP will unnecessarily limit abstraction when groundwater levels are above average is not well founded. (para 43)
 - (f) The Lynton Dairy Ltd. v The Canterbury Regional Council decision recognised the Proposed NRRP as a “measured and responsible approach to water allocations within the region”. The decision meant that less water was allocated to the applicant than the Proposed NRRP would have calculated, but the response of the applicant was to obtain more water from an alternative source indicating the Proposed NRRP annual volume was in the right order. (para 45 – 51)
 - (g) Applications to take water in excess of the allocation limits are non-complying activities where they only impact on the groundwater allocation regime and prohibited activities where they have a stream depletion effect that will impact on the Ashburton River / Hakatere surface water regime (unless they are to managed as a B Permit take from the surface water regime – in which case they may be a discretionary activity or non-complying activity). (para 51)
 - (h) Poor reliability may not be a reason to decline an activity but for groundwater there needs to be caution in allocating more water than the established allocation limit. The aquifer systems, their sources of water, the rates and nature of travel of water through the ground, the connectivity between different layers, the interactions with surface water, and the effects of existing abstractions operating up to their full entitlement all need to be well understood before allocating more water. (para 54)
 - (i) The seasonal restriction of groundwater takes is anticipated by the Proposed NRRP. A restriction approach is to be applied when an allocation regime is

brought into Schedule WQN3, unless an alternative regime is developed instead. Restrictions may be introduced for regimes that are set in Schedule WQN4, but this is not a given and would not be a simple process. (para 57)

- (j) The Proposed NRRP restriction approach is a different approach to that proposed by the applicants. Their proposal is to establish another layer of allocation and place restrictions on these. This adds a layer of complication that will make it more difficult to develop a Schedule WQN3 groundwater allocation regime incorporating restrictions or other measures as is intended by the Policy. (para 61)
- (k) Adaptive management is being applied by the Proposed NRRP. Development, monitoring, investigation, review will lead to progressive improvements in how groundwater is managed and allocated. Care is needed not to push development and allocation ahead of adequate understanding of the groundwater resource and of the effects of allocation up to the current limits. (para 66)
- (l) There is a flow and allocation regime proposed for the Ashburton River / Hakatere that is different from the status quo. This includes an A allocation block and a B allocation block for this surface water body. (para 72 – 83)
- (m) The amount allocated from the proposed Ashburton River / Hakatere A allocation block, exceeds the allocation limit. (para 78)
- (n) B permits are being sought and processed consistent with the proposed Ashburton River / Hakatere flow and allocation regime included in Schedule WQN1. (para 80)
- (o) The further allocation of water from groundwater where the take will reduce flow in the Ashburton River / Hakatere or its tributaries will mean more water is taken from the surface A allocation block. This will affect the reliability of supply of existing surface water permit holders regardless of whether the proposed regime or the status quo regime is adopted. No further takes should be allowed that affect the Ashburton River / Hakatere A allocation block. (para 81)
- (p) The relationship between surface and groundwater in and adjacent to the Ashburton River / Hakatere catchment is to be investigated and a Schedule WQN3 regime brought into the NRRP. There should be a precautionary approach taken to the allocation of more water from surface or groundwater resources until this regime is established. (para 83)
- (q) The lowland streams and drains flowing between the Ashburton River / Hakatere and the Hinds River while realigned, straightened and designed to facilitate drainage and flow through the historic wetland area, do flow along similar courses to the streams that were there prior to development of the area and have instream values that should be sustained. Regard should be given to the cumulative effects of abstraction on these lowland water bodies. (paras 84 – 99)
- (r) The use of water for irrigation will have effects on water quality that should be considered for any water permits if it is decided that consent can be granted to take water. (paras 100 – 102)

9. I have relied upon my experience, particularly in the development of the Proposed NRRP, in providing this evidence. I have sought comments and information from other staff involved in the monitoring and development of flow regimes for the Ashburton River / Hakatere and lowland streams in the Valetta area (Graeme Horrell, Adrian Meredith) and have provided further comment on this to help illustrate matters related to the application and implementation of the Proposed NRRP in this area. I have also cited material that helped inform the development of the Proposed NRRP Chapter 5 Water Quantity, and/or that illustrates the water allocation issues that apply in this area.
10. Such evidence is within the ambit of my expertise.

INTRODUCTION

11. There are three planning documents of relevance to these hearings. These are the Canterbury RPS, the Proposed NRRP, and the Transitional Regional Plan (TRP).
12. My evidence principally discusses the proposed NRRP. I provide an overview of the Proposed NRRP and then discuss aspects in more detail in relation to allocation limits, effective allocation, restrictions, the Ashburton River / Hakatere flow and allocation regime, and the lowland streams.

PLANNING MATTERS

Canterbury Regional Policy Statement (RPS) – Proposed Natural Resources Regional Plan (NRRP) relationship

13. The Canterbury RPS sets out objectives and policies to address sustainable management of the region's water resources. This has been prepared as required by the RMA. Methods of implementation include Regional Plans and Resource consents. The Proposed NRRP has been developed to help give effect to the Canterbury RPS. Table 1 in Appendix 1, provides a summary of the relationship between the Canterbury RPS and the Proposed NRRP principally as it applies to surface water and groundwater management relevant to these zones.
14. The Canterbury RPS has indicated that flow and allocation regimes should be set for the region's water bodies. The Proposed NRRP has established allocation limits for 29 groundwater allocation zones, and it has now established flow and allocation regimes for at least 15 rivers through Variations 1, 3, 5, 7, 8, 9 and 10. (Note there are separate plans for the Waitaki, Opihi and Waimakariri river catchments.) Provisions for implementing surface and groundwater allocation regimes are also included through the Policies, Rules and other methods. These include the determination of the amounts allocated (effective allocation), efficient use of water, restriction of takes during times of shortage, providing for domestic and stockwater as a priority use, and managing the effect of water dependent activities on water quality.

Proposed NRRP overview

15. Proposed NRRP Variation 1 was notified on 3rd July 2004, Proposed NRRP Variation 2 was notified on 26th November 2005 and NRRP Variation 4 was notified on 23 June 2007. They are now at the same procedural stage.
16. Policy WQN3 intends that flow and/or level regimes will be established for surface water bodies and for groundwater bodies that connect with surface water. The Ashburton River / Hakatere flow regime has been included in the Proposed NRRP as

per this policy. Other streams, including those in the lower Ashburton and Valetta areas are to be included progressively. The Policy recognises that groundwater abstractions can affect the surface water flow regimes that are set. There are some groundwater takes which will have a fairly immediate effect, and some which are more gradual in their effect.

17. Groundwater takes can affect surface water flow and allocation regimes. Policy WQN3(2) recognises that there can be fairly direct stream depletion effects and also cumulative effects from all groundwater takes that reduce groundwater levels and therefore stream flows. A minimum flow can be reached and surface water takes stopped but the flow can continue to recede if groundwater that normally discharges into surface streams continues to reduce in level and pressure.
18. Policy WQN3(2)(c) identifies the need to control takes from groundwater that have a more immediate stream depletion effect. (Policy WQN8 provides in more detail how stream depletion effects are to be managed.)
19. Policy WQN3(2)(d) intends that the gradual effects of groundwater abstraction are addressed by limiting all groundwater abstractions which cumulatively reduce groundwater levels and thereby cause or are likely to cause a significant increase in the frequency, duration or severity of breaches of a minimum flow or adversely affect the hydrology of a wetland. This part of Policy WQN3 cross references to Policies WQN9 and WQN14 as the principal ways for achieving this result.
20. Policy WQN3(2)(e) intends that abstraction of water should not induce a river to go dry. If a river would naturally flow the intention is to manage water abstraction from surface or ground in a manner that will ensure that it does not go dry. There is some recognition that a stream may go dry naturally even after surface water takes (including those having a high or moderate degree of stream depletion effect) have ceased. There is provision in Policy WQN19(2)(d) that groundwater takes with stream depletion effects that are required to cease in relation to minimum flow conditions, may be able to resume taking if the flow in the affected surface water body has ceased beyond a certain distance from the take. This is provided to allow access to the groundwater resource where it is not limited for other reasons. Under the Proposed NRRP approach a groundwater take of this nature will also have an annual volume fixed and be limited in accordance with the groundwater allocation regime that applies. This combination of approaches is required to manage the groundwater resource and its effects on surface water.
21. Policy WQN8 sets out the approach for managing groundwater takes that have a stream depletion effect on an adjacent surface water body. The degree of hydraulic connection is to be determined and takes are to be managed depending on this. The Ashburton River / Hakatere has a significant number of groundwater takes adjacent to it that are hydraulically connected, and some of the current applications will fall within the scope of this policy. Takes which have a high, moderate or low degree of hydraulic connection are to have their stream depletion effect counted as part of the surface water allocation block. In the case of the Ashburton River / Hakatere the A block is full.
22. Policy WQN9 aims to prevent the long-term decline in groundwater levels. Initially it is considered that this Policy can be achieved through the constraints that are or will be established by Policy WQN3(2)(d) by limiting groundwater takes that have effects on surface water flows and/or Policy WQN14 by setting sustainable allocation limits. But it is explained that there may be situations where the groundwater levels and artesian pressures are unable to be linked to specific environmental outcomes and that

continuing long-term depletion could occur. It is recognised that low recharge and the cumulative effect of abstraction may lead to short to medium term depletion but levels and pressures are likely to recover fully when a high recharge event occurs. It is the trend over 20 years or longer that will be of interest and that is to be used to manage the groundwater. In referring to this explanation to Policy WQN9 it is worth noting the point here and in relation to groundwater allocation generally, that the Proposed NRRP recognises that water management needs to be looked at over a number of years. In this discussion it is recognised that a deficit may build up over a few years but can be made up by a high recharge event and low levels of abstraction. A corollary to this is that higher recharge in one year may be what is needed to sustain supply over the next few years.

23. Policy WQN14 addresses surface and groundwater allocation regimes. This Policy is commented on in more detail in discussion of Allocation and other matters that follow. (Para 28)
24. Policy WQN16 addresses measurement and recording of water abstraction. Given the development of allocation regimes and the need for reasonable and efficient use of water, measurement and recording of water abstraction is an essential condition of any permit to take water.
25. Policy WQN17 addresses the reasonable use of water for all activities. This Policy identifies the need for efficient use of water for irrigation and links to the standards set in Schedule WQN9 for determining reasonable use of water for irrigation. My understanding is that all applications are requesting a seasonal volume that reflects the seasonal irrigation demand standards set in Schedule WQN9 (as amended by Proposed NRRP Variation 2). But it should be noted that it is this standard that is contentious and which if changed could increase the annual allocation volumes assigned to each existing water permit and therefore increase the effective allocation for the resource. (Para 42). Policy WQN18 anticipates and provides for the transfer of water permits.
26. Policy WQN19 addresses the restriction of takes during times of water shortage. It identifies approaches for restricting surface and groundwater. Alternative approaches may be established as flow and allocation regimes are incorporated into Schedules WQN1 or WQN3. Policy WQN19(4) identifies the intention to restrict groundwater takes, principally once a detailed allocation regime is incorporated into Schedule WQN3. Variation 4 introduced a change to this Policy to enable ECan to review water permits sooner if that was appropriate. This change was introduced to ensure the Proposed NRRP was not inconsistent with the Rakaia Selwyn groundwater allocation zone restorative streams programme and the proposal to review takes in that zone before establishing a Schedule WQN3 regime. I discuss this matter further in my comments on Restrictions below. (para 57)
27. Policy WQN20 addresses the management of the effects of interference between bores. This limits the effect one bore (including the cumulative effects of other bores) may have on another. It links to Schedule WQN10 which provides standards for determining the interference effects of a new bore on existing bores. Any new groundwater take needs to determine the effect that it will have on adjacent bores.

Allocation limits

28. It is the Proposed NRRP that has established the groundwater allocation zones, the allocation limits and the methods for counting the effective allocation. Setting allocation limits is in line with Canterbury RPS Chapter 9 Policies 1 and 2. Initially groundwater allocation limits were calculated by the approach set out in Schedule

WQN4 when Chapter 5 of the Proposed NRRP was notified. The Ashburton River Groundwater Allocation Zone was calculated using the first order approach (15% of annual average rainfall over the zone). The Valetta Groundwater Allocation Zone was calculated using the second order approach (50% of land surface recharge). A Water Allocation Panel (included as a method in the plan) was established to implement these. The functions of this panel included determining and reviewing groundwater allocation limits and the effective allocation for each groundwater zone. Terms of reference are included in Appendix 3.

29. However, the approach set out in Schedule WQN4 was not being consistently applied across the region by Environment Canterbury. Using this approach the allocation limit could change without any formal process and there was a question as to whether this was vires. Variation 4 was introduced to allow different methods to be applied to establish allocation limits and to set the allocation limit for each zone in the Proposed NRRP (rather than outside the Plan).
30. Policy WQN14(8) as amended via Variation 4 provides for the setting of an allocation block for each groundwater zone as follows:
 - (a) the size of the allocation block is set using a precautionary approach to protect the values in Objective WQN1 sustained by groundwater levels, such as flows and levels in rivers, lakes, springs or wetlands.
31. With Variation 4 the allocation limit is fixed for each zone. It is no longer intended that an allocation limit will move from the first order approach to the second order approach. As was the case previously, it is still intended that each groundwater zone will be further investigated and with better understanding of the groundwater resource, including its interaction with surface water, a more detailed allocation regime will be developed and brought into Schedule WQN3. This will happen by way of a plan change or variation. An element of this regime may be the restriction (reduction) of the volume of water that each consent may be able to take in a season (as is indicated by Policy WQN19(4)).
32. Variation 4 has set allocation limits and these are recorded in Schedule WQN4 of Chapter 5 of the Proposed NRRP. For the Ashburton River Groundwater Allocation Zone this is the same as before (69.5 million cubic metres). The Ashburton River Groundwater Allocation Zone was never taken to the second order approach because of uncertainties about the relationship between surface and groundwater in this area.
33. For the Valetta Groundwater Allocation Zone the allocation limit has been reduced from 108.5 million cubic metres per year to 96.6 million cubic metres per year. This reduction occurred because the boundary between the Mayfield-Hinds and the Valetta zones was changed to align with the Hinds River.¹ This change in area affected the calculation of the land-surface recharge across the changed area of the zone. The same approach was applied to determine the land-surface recharge but this applies to a smaller area because of the boundary reduction. Note that as a consequence of this change the Mayfield-Hinds Groundwater Allocation Zone area increased and the allocation limit also increased.

¹ Refer to NRRP Variation 4, Maps A-073, A-074, A-084, A-092.

Effective allocation

34. Once groundwater allocation limits are set the amount that is allocated has to be established. Policy WQN14(6) of Chapter 5 of the Proposed NRRP describes how the amount that is allocated from each groundwater zone is to be determined. This is the effective allocation. The effective allocation for the zone is derived by summing the effective allocation for each permit for taking water. For irrigation purposes Policy WQN14(6) establishes that the effective allocation is 90% of the annual volume that is allocated. In certain circumstances the annual volume of a take is to be discounted where the take is having a stream depletion effect on an adjacent river. This is intended to apportion the take between surface and groundwater sources.
35. Variation 4 has amended the approach in Policy WQN14(6) in two ways:
- (a) The first is to change how the effective allocation for takes for group or community water supply are to be determined. The effective allocation is to be 100% (rather than 90%) of the annual volume allocated or the annual volume that is determined.
 - (b) The second is to change how the effect of a groundwater take that has a stream depletion effect is to be counted or discounted between surface and groundwater regimes.
36. In relation to this second change, the approach is to discount² the annual volume of a groundwater take “where the stream depletion effect results in capturing increased surface water recharge which would otherwise not be part of the groundwater allocation zone”. This is anticipated to apply to an alpine type river or a hill type river that is permanently flowing, as pumping in these areas is likely to result in increased contributions of surface water to groundwater.
37. There is to be no discount³ “where the stream depletion effect does not result in capturing increased surface water recharge, all of the annual volume shall be allocated from the groundwater allocation regime”. This is anticipated to apply where the surface water body affected is an intermittently flowing river or stream or a lowland stream.

² By way of illustration, for a water permit with a consented volume of 1,170,000 cubic metres (sufficient to irrigate 200 hectares of pasture in a light soil, low rainfall situation) that is hydraulically connected to a river the following would apply. The continuous rate of take to extract the consented volume over 150 days would be 90.3 litres per second. If the take has a stream depletion effect of 50 litres per second this would mean that 55.4% of the amount taken is effectively being supplied by the river. Therefore the balance 44.6% of the amount taken is regarded as being taken from the groundwater resource. In this case 50 litres per second will be counted as being taken from the surface water allocation regime. And, in line with Policy WQN14(6)(b)(i), 44.6% of the annual volume (i.e. 521,820 cubic metres) will be counted as being taken from the ground. This would be adjusted to 90% to derive the effective allocation from the groundwater allocation block. Therefore the effective allocation would be counted as 469,638 cubic metres.

³ This means that in the example above, the full annual volume of 1,170,000 cubic metres would be counted as coming from the groundwater resource and the stream depletion effect of 50 litres per second will be counted as coming from the surface water block. The 1,170,000 annual volume will be adjusted to 90% to derive the effective allocation from the groundwater allocation block. Therefore the effective allocation would be counted as 1,053,000 cubic metres.

38. Determining whether to apply this provision to the Ashburton River / Hakatere is complicated. The south branch is mapped as an alpine river type in its upper reaches and then as a hill type river⁴ and it is continuously flowing. While the South Branch and main stem are continuously flowing there are significant losses to and gains from groundwater along these⁵. It would be difficult to establish whether or not groundwater takes adjacent to the south branch or mainstem capture increased surface water recharge. The North Branch typically goes dry in its middle reaches, losing water to ground. On the face of it, the North Branch is an intermittently flowing hill type river. But from the analysis of Graeme Horrell⁶ it is concluded that the North Branch is induced to go dry by abstraction. There is an aim set out in the Proposed NRRP to manage the Ashburton River / Hakatere in a manner that maintains a continuous flow in the North Branch.
39. There is no discount of the stream depletion effects from the annual volumes of takes from the Ashburton River Groundwater Allocation Zone being applied on either the north or south branch or the mainstem of the Ashburton River / Hakatere. This means the annual volumes of groundwater takes with a stream depletion effect on the Ashburton River / Hakatere are fully counted in determining the effective allocation for the Ashburton River Groundwater zone.
40. Effective allocation has been determined for the Valetta and Ashburton River groundwater allocation zones. In the Ashburton River groundwater allocation zone the effective allocation has reached the allocation limit. In the case of the Valetta groundwater allocation zone the effective allocation has exceeded the allocation limit. Effective allocation has also been determined for the Ashburton River / Hakatere surface water body⁷ and this exceeds the allocation limit. The interconnected relationship between surface water and groundwater in the Ashburton River zone makes it difficult to be confident that more water could be allocated from surface or groundwater (other than from the B block of the surface water resource) without adverse effect. The relationship between groundwater and surface water in this area is discussed in the evidence of Marc Ettema and Matt Smith.
41. As mentioned in para 34, for each groundwater zone the effective allocation is 90% of the annual volume that is allocated to each water permit for irrigation use. This is an estimate of the amount of water that is likely to be taken annually, on average over a number of years for irrigation.⁸ (Derived from a 28 year record). Therefore in seasons

⁴ Refer NRRP Planning Maps B-046, B-054, B-055, B-063 B-064, B-074, B084, B085

⁵ page 24 Figure 2.5 Horrell Graeme, Ashburton River Flow Regime. Environment Canterbury. (2001) U01/26

⁶ page 35 Horrell Graeme, Ashburton River Flow Regime. Environment Canterbury. (2001) U01/26

⁷ The method for determining effective allocation for surface water bodies is set out in Policy WQN14(3) and is the average daily rate of abstraction of each surface water take and groundwater take with a high degree of hydraulic connection, and the stream depletion effect of each groundwater take that has a moderate or low degree of hydraulic connection that exceeds the cut-off limit (5L/s for the Ashburton River/Hakatere).

⁸ This approach was taken because the groundwater allocation limits are being determined using average landsurface recharge estimates. Therefore in some years recharge will be less than average and in others it may exceed the average. There is a notion that there will be some buffering between years. But there is also potential that a dry year is followed by another dry year and therefore that

when it is dryer than average, more water might need to be taken than is represented by the effective allocation measure. When a groundwater resource is regarded as being 100% allocated (effective allocation = allocation limit) then in fact about 110% of the allocation limit could be taken if every consent is operated to its maximum volume. In the Valetta groundwater allocation zone the effective allocation already exceeds the allocation limit⁹. In this case if all existing permits take their full entitlement in a dry year they could actually take about 123% of the allocation limit. The applications subject to this hearing if granted will take the effective allocation up to 144% of the allocation limit and again if all permits sought to take their full entitlement this could amount to about 160% of the allocation limit. By way of comparison the Rakaia Groundwater Allocation Zone effective allocation will increase to 114% of the allocation limit with the issuing of the permits that were the subject of the Rakaia Selwyn Groundwater zone hearing.

42. There is a transitional phase required until the Proposed NRRP allocation approach is able to be fully applied. That is complicated by the fact that the exact approach will not be settled until the NRRP is operative. One of the transitional matters is the assignment of annual volumes to existing permits. Until the Proposed NRRP was notified ECan was not in the practice of setting annual volumes on groundwater permits. To determine the effective allocation for the zone and therefore to determine whether the allocation limit has been reached, ECan has assigned an annual volume to every consent using Schedule WQN9 - seasonal irrigation demand standards (NRRP Variation 2). This assigns an annual volume based on land use, irrigated area, soil water holding capacity, and irrigation season rainfall (beneficial rainfall that falls over the irrigation season in four out of five years). This approach is contentious and is being disputed through the NRRP hearings process. Generally more water is being sought. This could lead to more water being allocated across each zone. Until this is settled and annual volumes are fixed on all consents the effective allocation is uncertain. There is a risk that this process will increase the amount of water that is actually allocated from the zone. Allocation of more water will compound this risk.
43. The key point here is that there are risks in establishing the effective allocation. In all cases I consider that if the risks eventuate they will increase what is currently counted. And in the Valetta case the effective allocation amount is already exceeding the allocation limit. So even in a higher than average recharge year the amount of water that is allocated to existing water permits and that is taken could be significantly more than 50% of the average land surface recharge. The notion that the NRRP will unnecessarily limit abstraction when groundwater levels are above average is not well founded.
44. On the basis of the historical data used there is a range of wetter and dryer recharge years and higher and lower demand years. But there is also the prospect of climate change and more seasons of dry and warm conditions over the Canterbury plains¹⁰ which is not reflected in the historical record. High demand years will occur with more

recharge is less than average in successive years. The effect of this could be compounded by high irrigation demand drawing the full allocated amount.

⁹ Valetta GWAZ limit = 96.6 million cubic metres. Effective allocation (issued and decided) = 106.93 million cubic metres (111%). In process 32.29 million cubic metres. Effective allocation if all consented 139.22 million cubic metres (144%).

¹⁰ O'Donnell, L., report includes projections for future climate change specifically for the Canterbury Region.

frequency. This is another risk that could mean that the effective allocation will be understating the average future use.

Lynton Dairy Ltd. Decision

45. It is worth examining the *Lynton Dairy Limited v The Canterbury Regional Council*¹¹ decision in relation to this discussion of effective allocation and Schedule WQN9 annual volume requirements. The Environment Court was apprised of the Proposed NRRP approach at that hearing (including the problem with Schedule WQN9, the intention to vary it, and the use of an alternative approach of 150 days of the average daily pumping rate X 60%). In its conclusions the Environment Court recorded that, “*the plan is a measured and responsible approach to water allocations within the region*”. They commented on the Schedule WQN9 (Proposed NRRP Variation 2) approach as follows:

“[190] The PNRRP:5 addresses this issue in Policy WQN14(6)(c)(i) where the calculation method of Schedule WQN9 is to be followed. This approach recognises the importance of pasture type, water holding capacity of the soil and the demand conditions which reflect climatic factors. As such it is an advance over the 60% of the 150 day allocation method used by the Regional Council which is applied to all soil and pasture types in all demand areas. The WQN9 approach could well be adopted for all new consents and for existing consents if review conditions permit. In this way differences in irrigation demand across the Rakaia Selwyn zone could be partially met.”

46. Having said this, the Environment Court chose to apply an approach of 50% of the 150 day instantaneous take - that is they granted a maximum annual volume of 3.64 million m³. This amounted to 70% of the annual volume that would be estimated as reasonable for irrigating the 999ha area by applying Schedule WQN9. (They estimated that the WQN9 approach would provide for a seasonal irrigation demand of 505mm which corresponds to 5.05 million cubic metres per year for the 999ha area.) In preferring this approach, after commending the PNRRP:5 approach they commented as follows:

“We are thus not advocating an immediate adoption of the method set out in Schedule WQN9 as it is part of a plan which is still in its formative stages. As the plan is refined and adopted we expect the WQN9 approach to be refined and implemented. A refined plan may show more gradual transitions in soils, water holding capacity and irrigation requirements”

47. Of concern with this decision is that this allocation of water to Lynton Dairy Ltd. was not considered to be sufficient by the applicants. Lynton Dairy Ltd. (via Glenroy Community Irrigation Company Limited) has since applied for and been granted consent to take surface water from the Rakaia River. Consent CRC051802 allows a take of 560 litres per second from the Rakaia River to irrigate 999 hectares. This will provide a separate, less reliable, surface water supply to more than make up the deficit.

48. Condition 6 of this permit provides as follows:

¹¹ Environment Court 2005. *Lynton Dairy Limited v The Canterbury Regional Council*. Decision C108/2005

“Water shall not be used to irrigate any area of land shown in the attached plan “Irrigation area for consent CRC051802” at the same time that another consent to take and use water for irrigation of the same area is being exercised.”

49. Taking from this alternative, less reliable source, is quite pragmatic as the takes can be managed to complement each other. This is the type of strategy I anticipate is needed as water allocation zones become fully allocated. However it does demonstrate that more water is required for the Lynton Dairy operation than was allocated from the groundwater source by the Environment Court.
50. The Environment Court applied the 50% of the 150-day instantaneous take formula across all takes within this zone to derive a lesser, effective allocation of 195 million cubic metres. This allowed for there to be 13.5 million cubic metres available for allocation from within the allocation block that the Court accepted as being 208.5 million cubic metres. This is what allowed them to decide to allocate water to Lynton Dairy Ltd. The response by Lynton Dairy Ltd. to the amount allocated by the Environment Court decision indicates that the amount determined by applying Schedule WQN9 is more in line with the annual volume of water demanded for irrigation. If this is the case then it is appropriate that the Proposed NRRP approach be applied now for determining allocated amounts and for managing water allocation.

Excedence of allocation limits

51. I have discussed the fact that the effective allocation for each of the Schedule WQN4 Valetta and Ashburton River groundwater allocation zones, and for the Schedule WQN1 Ashburton River / Hakatere flow and allocation regime A block, is equal to or in excedence of the allocation limits that have been set in the Proposed NRRP. The makes it a prohibited activity (Rule WQN24) to take groundwater that has a stream depletion effect, where the effective allocation for the surface water body is in excess of the allocation limit set in Schedule WQN1 (Ashburton River / Hakatere). It would be a non-complying activity to take water where the effective allocation is in excess of the allocation limit set in Schedule WQN4 (Rule WQN22). In my view it would also be a non-complying activity to apply to take groundwater that has a stream depletion effect and that is to be managed as a B Permit take from the surface water regime. This is because it fails Activity 1(b) in Rule WQN20. Policy WQN14(9)(d)(iii) provides guidance for assessing these non-complying activities.
52. Takes that are seeking replacement from within the same allocation block are discretionary activities (Rule WQN19), and there may be some applications which were lodged before the notification which may also have discretionary activity status by virtue of the timing of their application and therefore the absence of allocation limits at that time. The activities that are prohibited by the Proposed NRRP are able to be considered as discretionary activity applications while the plan is in its proposed state (RMA s77C(1)(c)).
53. As I understand it the applications propose only to take water in a manner that will not compromise existing allocations. They are proposing a B type Permit which would cease taking water before there is any risk that the take will affect any of the existing “A” permits access to water over the irrigation season. This is a different approach to that envisaged by the Proposed NRRP. By my estimation the availability of this B Permit water is likely to be poor. The Proposed NRRP has addressed reliability of supply when establishing allocation regimes and allocating water. Policy WQN14(2) indicates that there could be A, B and additional allocation blocks for surface or groundwater allocation regimes. However, in the explanation it is recognised that -

“The allocation of water to a B Block may not be appropriate for groundwater because there will be years when this amount of water is not available and no abstraction will be allowed from this block, if the integrity of the A Allocation block is to be maintained.” Policy WQN14(7) indicates the proposed reliability for a groundwater A Block. This is proposed for a regime that is developed and included into Schedule WQN3. This indicates that in 8 years out of 10 there should be sufficient water for taking the full annual volume, and that in 19 years out of 20 at least 60 percent of the annual volume will be able to be taken. Policy WQN19(4) indicates that restrictions may be applied to give effect to these regimes.

54. There is an argument that poor reliability of supply is not a reason to decline an application. I can accept that, and there is provision in the Ashburton River / Hakatere surface water regime for lower reliability B permits. Some B Permits have been issued for surface water takes from the Ashburton River / Hakatere. (These are likely to be able to be exercised for some of the time in each year and are generally designed to take water into storage for later use.) But I consider groundwater needs to be treated more cautiously. Surface water is currently better understood and measured. Groundwater is less understood and less quantified. The aquifer systems, their sources of water, the rates and nature of travel of water through the ground, the connectivity between different layers, the interactions with surface water, and the effects of abstractions are all less certain than surface water regimes. And I would distinguish the Ashburton River and Valetta groundwater zones as one's which are particularly sensitive in their relationship with the Ashburton River / Hakatere and therefore needing better understanding before more water is allocated from these resources.
55. The Proposed NRRP in Policy WQN14(8) has recognised there is significant demand for groundwater for abstractive use and has allowed for the allocation of a reasonable amount of groundwater ahead of better understanding and determination of whether more (or less) water can be allocated and under what terms. The Proposed NRRP has provided Policy guidance for considering applications which seek to take water where the effective allocation exceeds the allocation limits that apply. Policy WQN14(9)(d)(iii) provides as follows:

Policy WQN14(9) To manage these allocation regimes by:

(d) authorising through resource consents:

- (iii) the taking of ground water in excess of an interim allocation block, where the groundwater allocation limit has been determined using Schedule WQN4, only where it can be demonstrated that the proposal, in combination with all other takes from the water body that are to be summed to determine the effective allocation, 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, and will not compromise the reliability of supply provided for in Policy WQN14(7)(a) and WQN14(7)(b)

56. In assessing these applications it is this part of Policy WQN14 that needs to be considered closely. Under RMA s104(b) the granting of resource consents for a non-complying activity should not be contrary to the objectives, and polices of the proposed NRRP and I would point to this part of Policy WQN14 in particular.

Restrictions on taking from groundwater

57. I have mentioned in paragraph 26 above that the Proposed NRRP does anticipate the implementation of restrictions on groundwater takes but generally this is intended to

be looked at when a groundwater allocation regime is developed and included in Schedule WQN3. Variation 4 has amended this and indicates that for Schedule WQN4 groundwater allocation limits “Environment Canterbury may review all relevant water permits in order to apply restrictions”. (Policy WQN19(4) NRRP Variation 4).

58. As it stands there are none of these restrictions applying to existing groundwater takes unless they are hydraulically connected to surface water and the actual water permit has conditions that require compliance with minimum flow provisions. Also because annual volumes have generally not been set as a condition on permits for groundwater takes issued prior to the notification of the Proposed NRRP, there is no annual volume limit to relate any restriction to. Because they are not subject to restriction, ground water takes currently enjoy 100% reliability of supply, unless they are self restricting because of physical limitations of the bore, or subject to a minimum level set to prevent effects on a neighbouring bore. It is because of the fact that there is generally no restriction on groundwater takes that no reliability of supply is set for takes from a groundwater zone that is covered by an allocation limit set in Schedule WQN4. Instead as mentioned in para 30, Policy WQN14(8)(a) refers to using a precautionary approach when setting allocation limits to protect environmental values sustained by groundwater levels.
59. The risk arising from this approach is that if there are no provisions to restrict groundwater takes then, when adverse environmental effects are apparent, it is the environment that will suffer. A problem with managing the cumulative effect of groundwater abstractions, is that if an environmental problem does become apparent, (e.g. a stream goes dry along a reach that does not normally go dry) there will be significant delay (months) before any restrictions on groundwater abstraction will benefit surface water flows. The aim of the Proposed NRRP is to anticipate this through setting groundwater allocation limits (first of all in Schedule WQN4 and subsequently in Schedule WQN3) that can be managed to prevent these sorts of effects from arising. This is expressed in Policy WQN3(2)(d), and Policy WQN14(8)(a).
60. In order to assign annual volumes on a water permit and potentially apply restrictions the Proposed NRRP (Policy WQN14(11)) indicates that a review will occur for all consents once a Schedule WQN3 regime is established. Under Policy WQN14(8)(b) the Proposed NRRP indicates that review may occur earlier. The reason for this earlier review is to improve aspects of the management of allocation limits which will help in the further understanding of the resource and its use and assist the development of allocation regimes for inclusion in Schedule WQN3. For example reviews may occur to fix allocation volumes, implement stream depletion related provisions or to require measurement of takes. Variation 4 added a new clause (v) to Policy WQN14(8)(b) which reads “(v) implement seasonal or other restrictions”. This was intended to ensure the Proposed NRRP was consistent with the review process being undertaken in the Rakaia-Selwyn Groundwater Allocation Zone as part of the restorative programme for lowland streams, which has anticipated applying restrictions.
61. I wish to make further comments on the Proposed NRRP approach to restrictions because a point I take from the applicants evidence is that the references to restricting groundwater takes in the Proposed NRRP and to the review of permits to be able to give effect to these restrictions is being used to justify more water being allocated now. I would comment that the applicants are not proposing a regime the same as is proposed by this Policy. Their proposal is to establish another layer of allocation and place restrictions on these. To me this is a layer of complication that

will make it more difficult to develop a Schedule WQN3 groundwater allocation regime incorporating restrictions or other measures as is intended by the Policy.

62. In the Rakaia Selwyn groundwater consents hearing decision, consents were granted for the additional amounts sought subject to restrictions. It is only this group of water permits that are subject to restrictions. This is what I understand the applicants to be seeking.
63. More water could be allocated now in these zones with restriction conditions that aim to prevent adverse effects on all the existing abstractors and on lowland streams etc., but this may not lead to the best management of the ground water resource. If the current allocation regime is not right and particularly if the resource is over-allocated and there are adverse effects that can arise now or in the future as some of the existing consents are exercised up to their full potential, further allocation (even with restrictions) could compound the adverse effects of the overall taking of groundwater on the environmental values that the groundwater supports.
64. Applying restrictions to new water permits and not to existing water permits adds complications to groundwater management that might be avoided by developing a more holistic approach. There is a difficulty in undoing these types of arrangements once they are put in place.
65. A difficulty for the future management of these resources, is knowing now (when people are asking for more water) whether a Schedule WQN3 groundwater allocation regime will establish that more or less water is able to be allocated and under what terms. With better understanding of the groundwater resource, its sources, rates of movement, linkages and interactions with adjacent surface water bodies, the effects of land use activities, and with monitoring of how it responds to the abstractions that are already consented, Environment Canterbury will be better able to answer this and this should lead to long-term sustainable management strategies for the resource. Gathering all this information, obtaining better understanding and revising the allocation strategy for the groundwater resource (and possibly the interconnected surface water resources) as a consequence, is what I consider is intended in the development of a Schedule WQN3 groundwater regime. It is the adaptive management approach that was envisaged when developing the Proposed NRRP. Applying a restriction rule on each group of water permit applications that exceed the current groundwater allocation regime ahead of this work adds another risk to achieving the sustainable management of surface and groundwater in this area.

Adaptive management

66. The provision to apply restrictions on new groundwater takes has been referred to as an adaptive management approach in previous groundwater hearings. I wish to discuss this in relation to the Proposed NRRP. I mentioned above that an adaptive management approach was envisaged in the development of the groundwater allocation provisions of the Proposed NRRP.
67. Aitchison-Earl (2004) et al¹² discussing groundwater allocation limits for inclusion in the Proposed NRRP commented as follows:

“Groundwater allocation internationally has often been undertaken on the basis of the ‘safe yield’ concept which conventionally allows water users to

¹² page 7 Aitchison-Earl et al (2004)

abstract no more groundwater than is naturally recharged. Sophocleous (2000) demonstrates that this is a flawed concept and argues that the sustainable yield of an aquifer must, in general, be considerably less than the recharge if adequate amounts of water are to be available to sustain groundwater dependent ecosystems such as streams, springs and wetlands. Ideally, the dynamic nature of groundwater response to development requires an adaptive management approach with ongoing monitoring, analysis and review of allocation limits. Establishing initial sustainable yield limits, is an appropriate first step in such an approach."

68. Lowry and Bright (2002)¹³ described an adaptive management process. They noted that:

"Adaptive management enables an estimate of the maximum sustainable allocation to be progressively refined as data and understanding increase." and

"Typically an increase in understanding and data will enable a transition from a simpler estimation tool to a more comprehensive tool, and to more certain estimates of the maximum sustainable allocation. The adaptive management process provides a framework for deciding what should be monitored and for determining the scope and timing of the investigations needed to move to the use of a more comprehensive tool."

69. The process for setting allocation limits in the Proposed NRRP provides for an adaptive management approach to allow further development of groundwater resources while managing the cumulative effects of groundwater abstraction. The initial approach (before Variation 4), allowed for allocation limits to be determined and adjusted as more information and understanding of the groundwater resource was developed. It meant that the allocation limit could change from time to time without much formality. Now it will follow the RMA Plan variation or change process.
70. A matter that should be considered at this time is the relationship between surface and groundwater takes and the possibility of transfer between these resources. This is something that has been raised in this area (lower Valetta) in discussions about Variation 4. Streams in the area are being restricted more frequently making surface water takes less reliable than in previous years, but it is difficult to move to groundwater sources in an area where the resource is fully allocated. Better understanding of these relationships may allow shifts from one resource to the other, or in another sense may treat groundwater and surface water as an integrated resource.
71. My point here is that the general approach being taken through the Proposed NRRP to setting and reviewing groundwater allocation limits is an adaptive management approach. Development, monitoring, investigation, review will lead to progressive improvements in how groundwater is managed and allocated. Care is needed not to push development and allocation ahead of adequate understanding of the groundwater resource and of the effects of allocation up to the current limits.

¹³ page 1 Lowry and Bright (2002)

Ashburton River / Hakatere Environmental Values and Associated Flow and Allocation provisions

72. A water management regime has been developed for the Ashburton River / Hakatere and incorporated into the Proposed NRRP Variation 1 (notified July 2004). This proposal is subject to submissions and there is a variety of changes sought by submitters. These range from retaining the status quo, through support for the Proposed NRRP proposal, to increases in the minimum flow that is proposed. Submissions on this part of the Proposed NRRP are programmed to be heard in February 2009.
73. The status quo was developed in 1983 through the Ashburton River Plan 1983 – 1990 (a non-statutory document prepared under the Water and Soil Conservation Act 1967). Surface water takes and shallow groundwater takes close to the river have been managed in accordance with this since then. The process for reviewing this was initiated in the early 1990's. It included an open working group forum where the issues were identified, investigated, reported on and discussed. At least twenty-two working party meetings were held. A series of reports were prepared and reported to the working group. These included reports on landscape, groundwater, water use, brown trout flow requirements, rainfall and river flows, naturalised river hydrology, water quality, recreational use, birdlife, stream depletion effects, flooding, fisheries and angling values, river mouth and coastal processes, tangata whenua values, effects of proposed regimes on reliability of supply, and economic impacts of flow regime options.
74. A report was prepared by Dr P Mosley summarising the flow requirements of the various instream values and indicating flow requirements for various parts of the catchment. This was reported to and commented on by the working group. All these matters were considered in deciding on the flow and allocation regime that has been incorporated into the proposed Schedule WQN1.1. ECan Report U04/36 outlines the basis for this decision.
75. The proposed flow and allocation regime includes a number of minimum flow measurement sites on reaches and tributaries of the Ashburton River / Hakatere. The aim is to maintain flows in tributary streams, in the north and south branches and in the mainstem that are in combination are sufficient to protect various identified instream values. Abstraction can occur from the river providing sufficient water is maintained instream to sustain instream values. In establishing these sites and developing the overall flow and allocation strategy for the Ashburton River / Hakatere consideration was given to the effect of the changes on existing abstractors. Stock water was a particular issue in this catchment (in particular the large amount taken relative to the actual amounts required for actual drinking by stock) and provisions have been made that will restrict the taking of excessive amounts of water for stockwater use during low flow periods (at or less than minimum flow).
76. The purpose of management for the Ashburton River / Hakatere is set out in Schedule WQN1.1 as follows:

“Purpose of management for the Ashburton River / Hakatere:

- (a) to protect and maintain the mauri of the Ashburton River / Hakatere;*
- (b) to maintain the natural character and high degree of naturalness above the lower gorge of the south branch of the Ashburton River / Hakatere by maintaining natural flows in this area;*

- (c) *to maintain the natural character throughout the entire river by maintaining minimum flows and flow variability;*
- (d) *to maintain the life-supporting capacity for salmon and trout, by maintaining adequate flows on the main stem, on the north and south branches, Taylors Stream, Bowyers Stream, O'Sheas Creek, Mt Harding Stream and Lagmhor Creek;*
- (e) *to maintain the life supporting capacity for indigenous species by maintaining adequate flows on the main stem, north and south branches, Taylors Stream, Bowyers Stream, O'Sheas Creek, Mt Harding Stream, Lagmhor Creek and Pudding Hill Stream; and*
- (f) *to provide for the taking of water for out-of-stream use providing sufficient water is retained instream to satisfy purposes (i) to (v)."*

77. Flows at the State Highway 1 Bridge have been used to determine the proposed allocation limits for this catchment. An A and B Permit system has been proposed. An allocation of 11,800 litres per second has been set for A allocation permits. Based on the historic frequency of flows at the State Highway 1 Bridge this was estimated to provide sufficient water in 6 years out of 10 as per Policy WQN14(4). (This analysis was carried out by Lincoln Environmental using flow data adjusted to reflect the naturalised flow for the Ashburton River / Hakatere at this location.)
78. The effective A Permit allocation from this catchment is estimated to be 14,500 litres per second. This is an estimate of the cumulative takes from the catchment determined as the average daily rate of take. In fact, if all consents operated at their maximum instantaneous rate of take they would be capable of taking as much as 18,000 litres per second. (This is assuming that the RDR is taking no more than 4,200 L/s.) This would mean the proposed A allocation block limit would be exceeded by 23 percent using the average daily rate of take and 53 percent using the instantaneous rate of take of all water permits from the river or groundwater (stream depletion effect only).
79. There are strategies proposed to try and reduce this exceedence. Nevertheless it may be that the Ashburton River / Hakatere water resource will remain over allocated relative to this allocation limit. If it does, the reliability of supply of existing water permit holders will be less than that estimated as required to satisfy demand in 6 years out of 10 without significant restrictions.
80. As mentioned in paragraph 77, there is provision under the proposed plan for taking water as a B Permit. This is set to occur providing the flow at State Highway 1 Bridge is 14,000 litres per second. This flow is close to what Horrell¹⁴ estimated to be the naturalised 7day MALF, that is the 7 day mean annual low flow that would occur if there were no abstraction of water from the river. But the actual flow will be affected by all the abstraction that can occur up-catchment. Horrell (pers comment) has estimated the frequency of flow exceeding 14,000 litres per second is 27% of the time in the developed catchment. This may allow for some abstraction to occur in higher flows and be put into on farm storage. There have been some applications for water to be allocated on this basis.

¹⁴ page 23 Horrell (2001)

81. Given the proposed allocation regime and the amount that is already allocated from the surface water of the Ashburton River / Hakatere, I do not consider that there is any more water available for allocation from the proposed A allocation block. If more water is allocated from this resource it is likely that the reliability of supply of existing water permit holders will be further diminished. Any additional application to take surface water, or groundwater where the take is hydraulically connected to and has a stream depletion effect on the Ashburton River / Hakatere or any tributary of the river, should not be allowed to proceed if the integrity of the proposed allocation regime is to be retained.
82. There is a question of the weighting that should be put on the Proposed NRRP, and in relation to these resource consents, the weighting that should be given to the proposed Ashburton River / Hakatere flow and allocation regime. I would comment that there will be an effect on the river and on the reliability of supply of takes from the river whether these are managed under the status quo regime or the proposed new flow and allocation regime. It should also be noted that the 1983 Plan sought to limit the allocation of water from this catchment. It was recommended that allocation for irrigation be limited to 9590 litres per second. In addition use of water for municipal supply and stockwater supply amounted to an estimated 194 and 4070 litres per second and additional demand of 80 litres per second was anticipated for municipal supply. Thus an allocation limit of 13,934 litres per second was proposed as early as 1983.
83. In his analysis of the Ashburton River / Hakatere hydrology Horrell¹⁵ observed significant interaction with groundwater along the Ashburton River / Hakatere and tributaries. There are significant losses and gains throughout the system. This has led to discussion of the how this should be taken into consideration when setting the allocation limit for the Ashburton River Groundwater Zone. A project is underway to determine relationships between surface water and groundwater in this area and it is intended that this will lead to an allocation regime that will be incorporated into Schedule WQN3 of Chapter 5. This is programmed to occur in 2009/2010. Until this happens the Ashburton River groundwater allocation limit has been maintained at the first order level. I consider a cautious approach should be taken about allocating anymore surface or groundwater from this area until this project has been completed and a new regime is established in Schedule WQN3.

Discussion of lowland streams / drains.

84. There is a question of whether streams / drains that flow in the area between the Ashburton River / Hakatere and the Hinds River are natural (including modified) or artificial water bodies and what the implications of this is in relation to the Proposed NRRP and these resource consents. The distinction may not be critical in relation to applications to take groundwater but this is discussed.
85. The RMA includes definitions of water, surface water body and river which can lead to a question of whether policies or rules apply to different classifications of water body. In particular a river means “a continually or intermittently flowing body of fresh water; and includes a stream and modified water course but does not include any artificial water course (including an irrigation canal, water supply race, canal for the supply of water for electricity power generation, and farm drainage canal)”. It is the artificial water bodies and particularly the farm drainage canal classification that creates the

¹⁵ page 24 Figure 2.5 Horrell (2001)

most room for uncertainty. I have examined maps and reports of the Hinds to Ashburton area to consider what the status of the streams and drains in this area should be.

86. Prior to European settlement much of the area between the Ashburton River / Hakatere and the Hinds River, south of the line of the main trunk railway line and State Highway 1, was wetland. It has been significantly drained. Figure 1 shows the distribution of swamps and streams in this area in 1860. This defines a number of streams flowing into and within the wetland area. None are shown as continuous watercourses. Several streams are shown flowing from the wetland area to the coast. Development of the area has seen these streams connected and realigned. They would in my view be modified water courses.
87. Significant drainage work occurred in the latter part of the 19th century. This included making a direct cut so the Hinds River could run to the sea, creating 150 kilometres of open drains and the laying of over 240 kilometres of field tiles.

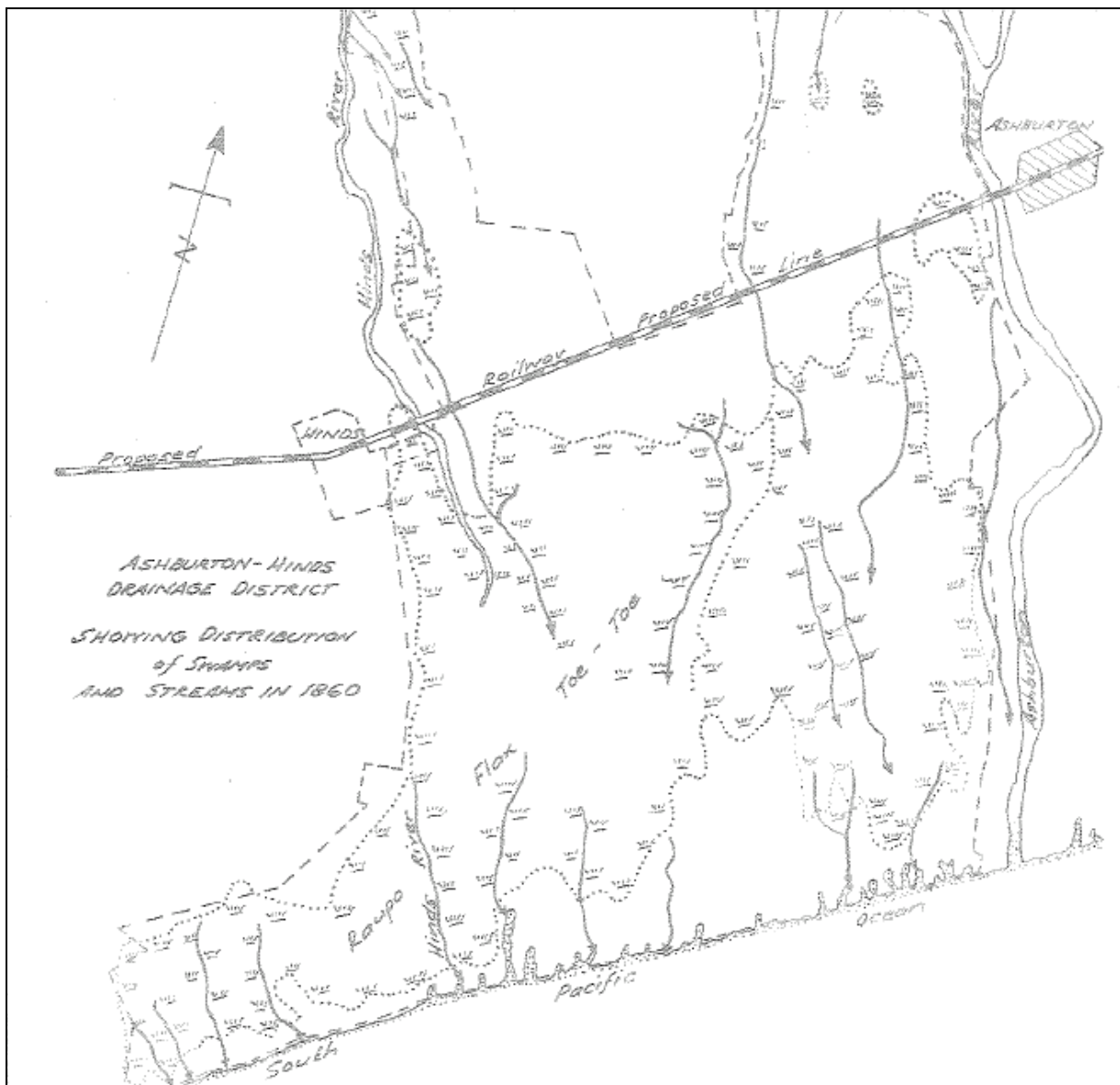


Figure 1: Map of Ashburton Hinds area 1860 (from the History of the Ashburton - Hinds Drainage District).

88. In the “History of the Ashburton - Hinds Drainage District”¹⁶, Royd (the consultant engineer charged with redesigning the drainage of the area in the 1940’s) is reported as referring to the following as natural water courses. Parakanoi, (“which was originally an important natural water course”), Lagmhor, Remmington and Brook Creeks (“three natural creeks which can be traced above the railway line”). In discussing design of the drainage scheme Royd talked of cut-off drains turning long drains or flood water courses into the rivers. Reference was made to Timaru Track, Wheatson, Mulligans and the Windermere cut-off drains. He talked of drains ranging from small farm ditch to large main drains. Long drains referred to included the Parakanoi, Home Paddock and Windermere.
89. There is also a network of stockwater races in this area some of which inter-connect with streams and drains. Where a water race is independent of any other water course it can be regarded as an artificial water course. Where it links with a stream or drain this may not be the case. Lagmhor Creek and tributaries, which has a stockwater function and has water diverted into it for this purpose, would in my view be regarded as a modified water course.
90. Proposed NRRP Chapter 5, Appendix WQN2 lists streams and drains which have minimum flows on them in the Hinds, Ashburton area. Table 2 lists these.

Table 2: Streams and drains between Ashburton and Hinds Rivers

Streams and Drains	Minimum flow
Flowing to the coast	(l/s)
Blees Drain at Lower Beach Rd,	25
Flemington Drain at Lower Beach Rd	25
Spicers Creek at Lower Beach Rd	10
Parakanoi Drain at Lower Beach Rd	30
Home Paddock Drn * at Lower Beach Rd	57
Windermere Drain at Lower Beach Road	10
Deals Drain At Lower Beach Rd	40
Dawsons Drain at Lower Beach Rd	10
Flowing to the Hinds River	
O'Shaughnessys Dn at Poplar Rd	25
Taylors Drain at cnr New Park/Hinds River Rd	25

91. In addition to those listed in Appendix WQN2, Lagmhor Creek has a minimum flow set in the Proposed NRRP Schedule WQN1.1 as part of Ashburton River / Hakatere flow and allocation regime. Adrian Meredith (pers com) has also noted the Waterton, Wheatstone (flowing into the Ashburton River / Hakatere) and Swamp Drains (flowing into the Hinds River) as significantly flowing drains/streams that should have minimum flows established to protect instream values. Also Riverside Stream and Wakanui Creek to the north of the Ashburton River / Hakatere and within the

¹⁶ page 17 Mitchell (1980)

Ashburton River Groundwater Allocation Zone area are noted by Meredith in his evidence.

92. In my view all the streams listed in Table 2 and paragraph 68 should be regarded as modified water course. They should not be regarded as artificial water course.
93. Environment Court cases *Federated Farmers of NZ (North Canterbury Province Inc) v Canterbury Regional Council (C83/2002)*, and *MacLaurin v Gisborne DC (A159/2003)* provide support for this.¹⁷
94. On-farm drains which feed into these may be regarded as artificial water courses, where they are draining soil and providing they are not fed from a spring.
95. Where water is to be taken, RMA and Proposed NRRP provisions apply to fresh water in all situations except while it is in a pipe, tank or cistern. To take water from any of the water courses identified above or from a drain feeding into these would require a resource consent, unless the take is within the permitted activity standards.
96. The Proposed NRRP refers to “surface water bodies” in Policies WQN3 and WQN14. There is an intention to establish flow and allocation regimes for all water bodies where taking, using, damming, diverting or discharging is likely to occur. The definition of water body can be interpreted to exclude “artificial water course”, but in my view if an artificial water course (e.g. a farm drainage canal) flows into a stream - natural or modified) then taking from the farm drainage canal could affect flows in the downstream water body and should be managed in relation to any flow and allocation regimes. This is reinforced by the rules which refer to “the taking or diverting of water from a surface water body or an artificial water course... “.
97. This discussion may not matter if there are no applications to take or divert from drains or with stream depletion effects on drains that are not regarded as surface water bodies.
98. It may however be relevant in relation to the management of groundwater allocation and the aim expressed in Policy WQN14(8)(a) (note this has been amended by Variation 4) “to protect the values in Objective WQN1 sustained by groundwater levels, such as flows and levels in rivers, lakes, springs or wetlands”.
99. As discussed there are many water bodies that have been realigned, straightened and managed to convey water flowing over the lower plains, and in part to facilitate drainage. However they are flowing in similar paths to pre development streams, and they are recognized as having instream values. Except where there are on-farm drains solely draining the water table, or there are stockwater races that are independent of these streams, these water bodies should be regarded as modified

¹⁷ In *Federated Farmers of NZ (North Canterbury Province Inc) v Canterbury Regional Council (C83/2002)* it was considered that a river or stream may be realigned and not be in its original bed. However, if it carries water that is sourced from above the point of modification and conveys it on through the modified area to the river downstream, it would be modified rather than artificial. In this case it was determined that the Cust River, where it flows through the man-made channel known as the Cust main drain, is still a river.

In *MacLaurin v Gisborne DC* the Environment Court were asked to decide whether a water course that received over flow from a spring that was first intercepted to supply water for domestic and other use, was a modified water body. They commented “we are satisfied, on the evidence we have heard, that the drain is a modified watercourse. Ms Freeman told us, that prior to the abstractions and modifications, there was likely to have been a natural watercourse flowing from the spring. While there has been extensive modifications and currently “it is no more than a drain” according to Ms Freeman, it is nevertheless intermittently, a body of freshwater. It therefore comes within the definition of “river” in the Act.”

water courses. They have documented instream values. Most have minimum flows set to provide some protection of these. Groundwater allocation should also be managed with regard to these.

The use of water for irrigation and the effects of the use of water for irrigation on water quality.

100. The use of water is covered by Rules WQN25 and 26. Once the NRRP is operative (and assuming it does not change through the hearings process), the use of water for irrigation will be a permitted activity if it is within the standards set in Rule WQN25, and otherwise it will be a discretionary activity. At this stage, because there is no permitted activity rule in the Transitional Regional Plan, it is a discretionary activity to use the water that is taken.
101. The effects of this use can be adverse. It can cause water quality problems through the leaching of nutrients from more intensified land use activities. Objective WQL2, Policy WQL9 and Rules WQL18 and WQL19, in Chapter 4 of the Proposed NRRP address this. Objective WQL2 sets water quality outcomes for groundwater that may be affected. Rule WQL18 addresses the loss or discharge of nitrate nitrogen that may be permitted to occur with land use and sets standards for this. However it is indicated in the Rule that this rule does not take effect until the Plan becomes operative. So while this does not apply to these applications now, it will apply to these once the NRRP is operative (in its current form or in a modified form as a consequence of the hearings process). Activities that may be authorised now will have to comply with the conditions of this Rule or obtain resource consent, once the plan is operative.
102. The effect of the use of the irrigation water on water quality can still be a matter for consideration now as part of the s104 consideration of the applications.

Conclusions

103. In this evidence I have outlined the Proposed NRRP approach and discussed its application. While the Proposed NRRP is not fully operative I do consider it is important in the management of the regions water now. In particular it establishes approaches for allocating surface water and groundwater. The allocation approach is being implemented now to provide for abstraction of a reasonable amount of water in each groundwater zone and to try and protect the environmental values that are sustained by groundwater resources. It is being used to establish allocation limits, to determine the effective allocation, to determine annual volumes where they are not included as a condition of consent on existing permits and in some cases to apply restrictions. It establishes the activity status of any resource consents that have been lodged since it was notified. It includes Policy for considering whether the resource consents can be granted as non-complying activities.
104. I consider an uncertainty is how well the environmental values that are dependent on groundwater are being protected by the proposed NRRP. The adaptive management approach identified in the plan will help answer this and lead to improved allocation regimes that are to be incorporated into Schedule WQN3. The current allocation limits enable access to a reasonable share of the groundwater resource ahead of these regimes, but they do set limits. While the proposed NRRP will evolve further through the hearing of submissions the current approach should be given reasonable weight now.
105. Refer to Paragraph 8 for further conclusions.

Appendix 1.

Table 1: Relationship between Canterbury Regional Policy Statement (RPS) and Proposed Natural Resources Regional Plan (NRRP) relevant to surface and groundwater management

Regional Policy Statement (RPS) 1998	Proposed Natural Resources Regional Plan (NRRP) - Chapters 4 and 5 – Variation 1 (2004), Variation 2 (2005) and Variation 4 (2007)		
Issues, objectives, policies	Issues and Objectives	Policies	Rules/Schedules
Issue 9.1 competing demands for water and the effects	<p>Issue WQN1 Effects of takes etc. on instream values of rivers and lakes.</p> <p>Issue WQN3 Effects of groundwater takes</p> <p>Issue WQN4 Allocation of water</p> <p>Issue WQN5 Reasonable and efficient use of water</p> <p>Issue WQN7 Water restrictions</p>		
Flow and level regimes - setting and management			
Objective 9.1 achieve quantities for use while protecting instream values & domestic use	<p>Objective WQN1 enable access to water while protecting surface water instream values, and water for domestic, & stock use</p> <p>Objective WQN3 Manage confined/semi-confined and unconfined aquifers to avoid, remedy mitigate adverse effects</p>	<p>Pol WQN3 set flow and level regimes</p> <p>Pol WQN3(2)(c) controlling stream depletion effects on sw flow regimes</p> <p>Policy WQN3(2)(e) not allowing abstraction of water to induce a stream to go dry</p>	<p>Rule WQN20 restricted discretionary</p> <p>Rule WQN21, 22 or 23 non-complying</p> <p>Rule WQN24 prohibited</p> <p>Schedules WQN1 or WQN2 (Surface water flow and allocation regimes)</p> <p>Appendix WQN2 (existing minimum flows)</p> <p>Schedule WQN7 (determination of degree of hydraulic connection ...)</p>
<p>Policy 9.1 Set water allocation and flow regimes to meet Objective 1.</p> <p>Policy 9.4 (b) establish flow, level or allocation regimes (priority incl Lake Ellesmere/Te Waihora and tributaries and associated groundwater)</p>		<p>Pol WQN3(2)(d) limiting cumulative effect of gw takes on sw flow regimes</p>	<p>Rule WQN19 restricted discretionary</p> <p>Rule WQN22 or 23</p> <p>Schedule WQN1, Schedules WQN3 or WQN4 (groundwater allocation regimes)</p>
		<p>Pol WQN8 manage stream depletion effects</p>	<p>Rule WQN20,</p> <p>Rule WQN21, 22 or 23</p> <p>Rule WQN24</p> <p>Schedule WQN7</p>

		Pol WQN9 prevent long-term decline in groundwater levels	Rules WQN13 – WQN16, WQN19 – WQN24 Schedules WQN3 or WQN4
		Policy WQN11 confined semi-confined aquifer management Policy WQN12 coastal unconfined aquifer management Policy WQN13 localised land subsidence	Rules WQN13 – WQN24 Schedule WQN3
Allocation regimes - setting and management			
<p>Policy 9.1 Set water allocation and flow regimes to meet Objective 1.</p> <p>Policy 9.4 (b) establish flow, level or allocation regimes (priorities incl Ashburton River and Catchment)</p> <p>Policy 9.2 Water allocation regime to maximize wellbeing considering use and instream values</p>	<p>Objective WQN4 Water is allocated to enable communities to maximize wellbeing. To provide reliable supply to individuals.</p>	Pol WQN14(1) establish allocation regimes	Schedules WQN3, or WQN4
		Pol WQN14(6)(a) gw allocation block limit is an annual volume	Rule WQN19 - 24
		Pol WQN14(6)(b) gw effective allocation = sum of irrigation consent volumes x 90%	Rule WQN19 - 24
		Pol WQN14(6)(c) if consent has no volume, determine using Schedule WQN9 approach	Schedule WQN9 (Seasonal irrigation demand)
		Pol WQN14(6)(d) if classified as having moderate or low degree of hydraulic connection, and depending on river type, apportion effect between surface water and ground-water allocation regimes	Rule WQN20 GW takes with stream depletion effect up to surface water and ground-water allocation block limits = restricted discretionary Rule WQN22 non-complying Rule WQN24 prohibited Schedule WQN7
		Pol WQN14(8)(a) set allocation block limit to protect environmental values in Schedule WQN4	Schedule WQN4 Rule WQN19 Rule WQN22
		Pol WQN14(9)(c) allow consents for takes up to allocation limit	Rule WQN19 gw takes up to allocation block limit = restricted discretionary

		Pol WQN14(9)(d)(iii) takes in excess of limit only where environmental values not compromised by cumulative effects and appropriate reliability of supply maintained.	Rule WQN22 Takes in excess of Schedule WQN4 allocation block limit = non-complying activity
Policy 9.5 Where no flow level or allocation regime do not preclude the reasonable exercise of existing consents		Pol WQN4 Matters to consider when setting flow and allocation regimes incl: Pol WQN4(2)(c) cumulative and long –term effect of groundwater abstractions Pol WQN4 (2)(d) the need for an absolute cap on the rate or amount of water that can be abstracted. Policy WQN14(9)(d)(iii) Policy WQN20 well interference	Rule WQN19, Rule WQN20 Rule WQN22 Schedule WQN4 Schedule WQN10 (well interference effects on adjacent bores)
Reasonable and efficient use of water			
Policy 9.3 Promote efficiency in the use of water	Objective WQN5 Achieve a high level of efficiency	Pol WQN17 reasonable and efficient use of water Pol WQN18 Transfer of water take or use.	Rules WQN19, 20 and 22 (take) Rules WQN 25 and 26 (irrigation use) Schedule WQN9
Matters for consideration when processing resource consents			
Policy 9.6 matters for consideration to take water include: max rate and usage over time actual and reasonable water needs priority for existing for term restriction priority reduction and cessation provisions	Obj WQN7	Pol WQN14(9) Pol WQN14(10) priority for existing permits and for their replacement. Pol WQN14(11) review of permits Pol WQN16 measurement and recording of water abstraction Pol WQN17 reasonable and efficient use of water Pol WQN19 restriction of water takes. Pol WN20 well interference effects	Rules WQN19, 20, 21, 22 and 23 Rules WQN 25 and 26 (irrigation use) Schedule WQN9 Schedule WQN10
Priority for domestic and stockwater use			
Policy 9.7 Priority for domestic and stock water use	Objective WQN1 Objective WQN4 Objective WQN5 Objective WQN6 Water restrictions	Pol WQN14(9)(a) small takes permitted; Pol WQN14(9)(c), Pol WQN14(9)(e) reserve water for community drinking or stock water supply; and Pol WQN14(9)(f) non-	Rule WQN13 small quantity take = permitted activity Rule WQN14 Other small quantity domestic and stockwater takes = restricted discretionary

		<p>complying provision for community drinking or stock water supply.</p> <p>Pol WQN7(1) ensure takes are reasonable for the intended end use.</p> <p>Pol WQN19 Restrictions not to prevent essential domestic and stockwater uses</p>	<p>activity</p> <p>Rules 19, 20 and 22 (take)</p> <p>Schedule WQN11 (Daily stock water requirements)</p>
Effects on water quality			
Issue 3 Land uses can adversely affect water bodies.	<p>Issue WQL1 Surface water quality can be affected by non-point sources of pollution</p> <p>Issue WQL2 Land use activities (eg irrigation) may adversely affect groundwater quality and in turn surface water quality.</p>		
Objective 9.3 enable activities that benefit from water quality subject to constraints	<p>Objective WQN5</p> <p>Objective WQL1 sets standards for surface water quality</p> <p>Objective WQL2 sets standards for groundwater quality</p> <p>Obj WQL3: Water quality of community drinking water sources</p>	<p>Pol WQN17 efficient use of water for irrigation to avoid or limit effect on water quality</p> <p>Pol WQL9 sets limits on the effects of use of water for irrigation</p> <p>Pol WQL12 controls land use activities that may affect the quality of water in community drinking water supply zones</p>	<p>Rule WQL18 (permitted activity but note it only applies when Plan Operative)</p>

Appendix 2. References:

- Aitchison Earl, P., Scott, D., and Sanders, R., 2004: *Groundwater Allocation Limits: Guidelines for the Canterbury Region*. Environment Canterbury. Report U04/02
- Horrell G., 2001: *Ashburton River Low Flow Regime*. Environment Canterbury. Report U01/26
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- Lincoln Environmental. 2004: *Reliability of supply for irrigation in Canterbury.- Part 2* Prepared for Environment Canterbury. Report U03/9
- Miller, M., 2004: *Planning Report on the Ashburton River / Hakatere water management regime recommended for inclusion in the Proposed NRRP*. Environment Canterbury U04/36
- Mosley, Dr M. P., 2001: *Ashburton River Instream and Amenity Values and flow management regime*. Prepared for Environment Canterbury. Report U01/46
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- Robb, C., and McIndoe, I., 2001: *Reliability of supply for irrigation in Canterbury*. Prepared for Environment Canterbury. Report U01/1
- Scarf F., 1983: *Ashburton River Water Management Plan* South Canterbury Catchment Board and Regional Water Board. Publication No 36.
- O'Donnell, L., 2007: *Climate Change - An analysis of the policy considerations for climate change for the Review of the Canterbury Regional Policy Statement*. Environment Canterbury R07/4 ISBN 1-86937-630-7
- Environment Canterbury, 1998: *Canterbury Regional Policy Statement (June 1998)* Report R98/4
- Environment Canterbury, 2004: *Natural Resources Regional Plan Report, Variation 1 Chapter 4* Report R04/15/4
- Environment Canterbury, 2004: *Natural Resources Regional Plan, Variation 1, Chapter 5* Report R04/15/5
- Environment Canterbury, 2004: *Natural Resources Regional Plan, Map Volume* Report R04/15/M
- Environment Canterbury, 2005: *Natural Resources Regional Plan, Variation 2, Chapter 5* Report R05/24
- Environment Canterbury, 2007: *Natural Resources Regional Plan, Variation 4, Chapter 5* Report R07/8

Appendix 3. Environment Canterbury Water Allocation Panel - Terms of Reference

1. Responsibilities of the Environment Canterbury Water Allocation Panel.

To establish and review interim allocation block limits determined for surface water catchments or groundwater allocation zones via Schedule WQN2 or Schedule WQN4 of Chapter 5 of the NRRP.

2. The panel shall have the following functions in order to manage the interim allocation limits for surface water and groundwater bodies.

- a) To receive and assess information on water allocation for Canterbury water bodies not included in Schedule WQN1 or Schedule WQN3.
- b) To determine whether interim water allocation limits shall be amended.
- c) To ensure any decision to change an interim allocation limit is recorded with reasons and explanations for the change.
- d) To ensure an accurate record of the effective allocation is established and maintained for each surface water or groundwater allocation block.
- e) To ensure that any changes are included on the web site.
- f) To advise any changes of significance to staff and Councillors
- g) To develop and apply a communications strategy to ensure the NRRP allocation policy is understood and that the interim allocation limits that are established and reviewed, in accordance with the policy, are understood.

3. Membership of the Environment Canterbury Water Allocation Panel

- a) The panel shall be comprised of the following members:
 - (i) Chief Executive
 - (ii) Director Policy and Planning ;
 - (iii) Director External Relations;
 - (iv) Director Regulation;
 - (v) Director Investigations and Monitoring
 - (vi) Director Operations;
 - (vii) Director Finance and Corporate Services.
- b) Chairperson
The Panel shall appoint a Chairperson.
- c) Quorum
 - (i) A quorum shall constitute 4 members of the Panel including the Chief Executive or his designate.

4. Record of decisions

A record of all decisions shall be kept on File.

Appendix 4. Water Allocation Group - Terms of Reference

(Updated November 2005)

OBJECTIVE

To review and formalise changes to the allocation limits and effective allocation estimates relating to ECan's surface and groundwater allocation policies that are defined in Chapter 5 of the proposed NRRP. Recommendations are to be forwarded to the Environment Canterbury Water Allocation Panel for approval.

MEMBERSHIP

Philippa Aitchison-Earl, Hydrogeologist

Bjorn Reijnen, Team Leader - Compliance Monitoring (Rural) - *optional*

Tony Boyle, River & Coastal Resources & Hazards Manager

Alternate: Suzanne Gabites – Water Resources Scientist

Kathleen Crisley, Portfolio Manager – Water (Chair)

Michael Dicker, Groundwater Resources Manager

John Glennie, Natural Resources Policy Manager

Lee Howden, Portfolio Communications & Relations Officer

Malcolm Miller, Natural Resources Planner

Paul Sullivan, Senior Consents Investigating Officer

Alternate: To be nominated by Don Rule, Consents Operations Manager when Paul is not available

Russel Sanders, Hydrogeologist

David Scott, Geohydrologist

Anna Veltman, Resource Management Planner (Deputy Chair)

Evan Walker, RMA Compliance & Enforcement Manager – *optional*

Optional members will attend when a matter on the agenda is of interest to that Section, or when their input is expressly required for an agenda item.

PROCESS AND FUNCTIONS

- A. Aspects of allocation regimes that will from time to time need reviewing in light of new information:
- i. Allocation limit – with new information either coming from
 - the Environmental Monitoring - Rivers or Groundwater Sections, or
 - an Assessment of Environmental Effects (AEE) or evidence at a hearing as part of the processing of an application for a resource consent; or
 - from information from Councillors or other outside sources;
 - ii. Consideration of proposals to take surface or groundwater from a surface water body or a groundwater allocation zone where the block or zone is already fully allocated, where:
 - specific individual applicants provide information in an AEE or as hearing evidence to substantiate that the effects will be minor without compromising Policy WQN14 / other s104 matters; or
 - technical information that may indicate further allocation in a specific location or sub-zone would be possible above the “global zone” limit without compromising Policy WQN14 / other s104 matters.
- B. In the case where the Environmental Monitoring – Rivers or Groundwater Section is currently responsible for that information, where new information comes forward that challenges these estimates, the following procedure will be followed:
- i. the scientist responsible for the allocation zone or block in question will prepare a memo as soon as possible to present at a Section meeting setting out the issue and a recommendation, including any action that will need to be taken in light of the review of the information;
 - ii. the Section members at the Section meeting will determine who will peer review this work outlined in the memo, and the review will be completed as soon as possible;
 - iii. this review will be discussed at a Section meeting and a final set of findings and recommendations will be drafted. The Section Manager will endorse the memo before it is circulated to members of the Water Allocation Group for discussion and action;
 - iv. the Water Allocation Group will itself consider the memo and formulate a recommendation that will be made to the Environment Canterbury Water Allocation Panelⁱ. The recommendation will be made by providing a memo outlining the background and issue, etc. and will likely include as an Appendix a copy of the Section memo; and
 - v. the Environment Canterbury Water Allocation Panel will make a decision.ⁱⁱ

Once the decision has been made by the Environment Canterbury Water Allocation Panel, the website will be updated and the Consents section can use this information for audit purposes. Michael Dicker and Paul Sullivan have joint responsibility to authorise updates to the public website with the oversight of the Publications Section. Each has a deputy for this task to cover instances when they are not available. (Philippa Aitchison-Earl, Sri Hall respectively)

- C. In the case of estimates for total effective allocation for groundwater abstraction and for all consented surface water abstractions (being collated by the Consents Section), a live read report from the consents database is kept and quality assured, and the website approved within Consents and updated accordingly on at least a fortnightly basis.

MEETINGS AND AGENDA ITEMS

Called by the Chair (or Deputy when the Chair is not available) as and when required when new information or administrative matters come to hand.

Any items to be added to an agenda must clearly show:

- if the issue is for decision, for discussion, or as information; and
- any changes to the classification of the groundwater zone or allocation block

Documents in support of agenda items should be circulated to members of the Group in advance of the meeting, which is preferable to tabling new information at meetings. Recommendations to the Group should be stated clearly. However, given the need to make decisions on water allocation based on the 'best available information,' tabling of information relating to allocation limits and estimated effective allocation will be acceptable.

Agendas and approved minutes of meetings will be kept on file. (TRIM code NRRP/IMPL/2002/CH5/1C)

Representatives at the Water Allocation Group are responsible for consulting with their colleagues and line management to ensure they represent their Section's views. They should have the authority to commit their Section's resources (typically staff time) to tasks relevant to the Group's recommendations to the Water Allocation Panel and implementation of allocation limits as described above in these Terms of Reference.

Quorum: The quorum for decision-making (i.e., when a recommendation to the Water Allocation Panel is required) is to be made up of one person from each of the following Sections:

- Planning
 - Environmental Monitoring – Groundwater
 - Environmental Monitoring - Rivers
 - Consents
- plus the Chair or Deputy Chair

Each Section involved in the Group is entitled to one vote when making recommendations to the Water Allocation Panel. The Chair or Deputy Chair will also have a vote. It is recognised that the Group will attempt to reach consensus on all issues but voting may become necessary when, after considered discussion, it becomes apparent that the Group will not reach consensus. Voting by email will also be allowed when the Chair or Deputy Chair have determined that there is a need to expedite a recommendation to the Water Allocation Panel. Voting by email is considered to be an option only in cases of extreme urgency.

ⁱ On 9 December 2004 Council formally delegated the function of the Water Allocation Panel to the Directorate. The terms of reference for this panel were approved at the same time. The quorum for this Panel is four; the Chief Executive or his Acting Chief Executive must be part of this quorum.

ⁱⁱ On 22 June 2004, the Directorate clarified its requirements with regard to decision-making and communication. It was agreed that:

- Directorate approval should not be required for routine or non-controversial changes (such as the updating of current allocation estimates to reflect the granting of new consents)
- Directorate should be advised when such routine changes result in a change in status in any of the zones.
- Directorate approval should be sought when significant or potentially controversial changes are proposed (e.g. upon the introduction of 2nd order allocation limits).
- A communication component is needed for all specific changes.
- The website should be amended to reflect the current status of the zones for consent auditing purposes taking account of NRRP policy and other s104 RMA matters (e.g., reflecting additional interim estimates of recharge sources). This is necessary to avoid creating the impression that ECan is continuing to grant new consents in red zones.