A Review of Water Allocation Options for the Waimea Water Augmentation Project

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1. Background

This report assesses the water allocation issues and policy context for implementation of a water augmentation dam being investigated for the Waimea Water Augmentation Committee's feasibility study for a water storage scheme to augment the summer water resources of the Waimea Plains.

The report reviews options for encouraging water use efficiency, summarises existing water allocation policies and rules, and suggests possible changes to existing policy and rules to accommodate water releases from a storage dam if built in the upper catchments of the Waimea Basin. Commentary is provided based on the presumption that the most likely scheme will be a dam built in the upper Lee River and releasing augmented flows into the river during the irrigation season.

2. Review of Relevant Existing Water Allocation Policies and Rules

This section summarises the current water allocation policies and rules relevant to the Waimea catchment in TDC's Tasman Resource Management Plan, Part V, chapters 30–32 including updates to water allocation rules notified in Variation 52 on 13 January 2007 which are intended to limit re-allocation of water until water augmentation is implemented. The potential influence of these policies and rules on approvals needed for the water augmentation scheme is commented upon. Section 5 then comments on potential changes needed to policies and rules to accommodate the water augmentation scheme.

2.1 History

Part V of the TRMP contains policies and rules developed and refined from the early Waimea water management plans (Nelson Catchment and Regional Water Board 1981; Nelson Catchment and Regional Water Board 1986; Nelson Marlborough Regional Council 1991) which applied the results of geohydrological studies and modelling to progressively set water allocation limits for the three aquifers and interconnected rivers across the Waimea Basin.

By 1996, with the Delta Zone water allocation limit being reached, all water management zones within the Waimea catchment were fully allocated. In the Wai-iti Zone, the river and groundwater resource had been over-allocated since 1983. 'Over-allocated' means that the flows allocated under water permits exceed water available as expressed in water allocation limits, even after allowing for a security of supply target of 65% of allocations being available during a 10-year drought (Tasman District Council, 2001).

In the Wai-iti Valley, water allocations for extraction exceeded assessed resource availability during a 5-year drought by about 70% (Fenemor et al., 1999). The Kainui Dam – the Wai-iti water augmentation scheme - has been built to relieve the over-allocation in the Wai-iti Zone. The current proposal to construct a dam in the upper Lee tributary of the Waimea River is intended to bring similar relief and allow expansion of irrigation, urban and other water uses for the rest of the Waimea Plains.

Water allocation remains a highly visible issue, as evidenced by responses to the TDC's 2005 Rural Futures questionnaire sent to rural ratepayers (TDC 2006):
The Flyer responses considered the allocation and management of water as the top principal issue for rural areas in the near future. Respondents requested a review of the frameworks for managing scarce resources, particularly water. Suggestions included moving from the 'first in first served principle' to an approach which protects the resource for key use-values.

In the context of the Waimea Water Augmentation project, the community opinions canvassed in the ESR study (Winstanley et al., 2005) suggest initiatives on water use efficiency should be developed as part of the water storage project.

2.2 TRMP Water Allocation Policies

Policies (chapter 30, TRMP) relevant to water allocation from the Waimea WAC project address

- the effects of water takes on water bodies and flows (30.1),
- the competition for water among different users and types of use (30.2), and
- encouragement of water augmentation (30.3).

Policies relevant to the Waimea catchment have been extracted in Appendix 9.1.

In summary, the management objectives identified for Waimea catchment rivers and aquifers under Issue 30.1 (Schedule 30.1, refer Appendix 9.1) will be better achieved through provision of water augmentation than through not proceeding with it. Objectives such as maintaining minimum flows, preventing saltwater intrusion and maintaining an acceptable security of supply for water users will be most easily achieved through water augmentation. Achieving objectives for instream values in the lower part of the Waimea River affected by significant summer flow losses will be clearly demonstrable. However, achieving the objectives for instream values in other parts of the river system, is at this first stage of the investigations less clear. Water quality, recreational uses, fishery habitat, and cultural, spiritual and landscape values will all be affected to some extent by the modified flow regime and quality of water released below the dam, especially in the Lee River from the dam to the Wairoa confluence. Whether these changes will be beneficial or potentially adverse and to what extent, and over what timeframe, is yet to be confirmed.

Proposed policies 30.1.30 and 30.1.31 have been added in Variation 52, 13 January 2007, to avoid further stress being placed on water resources connected to the Wairoa-Waimea river and to formalise Council's responses to low flows until water augmentation is provided for the catchment. Similarly, a change to policy 30.2.10 relating to 'bona fide' reviews of allocations on water permits seeks to limit any increase in actual water usage in water management zones connected to the Wairoa-Waimea rivers. These policies will be able to be relaxed when an augmentation scheme is in operation.

Other policies relating to competition for water (30.2) address equitable water allocation, security of supply and efficient water use. Policy 30.2.14 establishes a minimum security of supply standard of a 35% reduction in allocation during a 10-year drought, although recent irrigator experience of drought indicates that a higher level of security is desirable as irrigation becomes more integral to sustained crop production. Policies in 30.2 can be addressed through design of the scheme water allocation framework, and are taken into account in this report. Water augmentation is encouraged under policy 30.2.15 as a way to improve security of supply, and policy 30.2.18 enhances the options for transfers of water

permits when the supply has been augmented. The augmentation scheme can be set up to implement both of these policies.

Policies relating directly to water augmentation (30.3) encourage and support development of water augmentation schemes. The proposed scheme is clearly consistent with this policy direction. Policy 30.3.3 states the criteria under which the level of support for a water augmentation scheme is to be determined; these nine criteria are a useful guide for completion of the AEE for the project and for design of questionnaires for evaluating the level of support for a scheme.

2.3 TRMP Water Allocation Rules

Water allocation rules relevant to the Waimea catchment have been extracted in Appendix 9.2. The main water allocation rules (chapter 31, TRMP) relevant to the Waimea catchment are those setting allocation limits for each of the water management zones in Figure 31.1E (extracted below). All these water management zones are currently fully allocated:

WATER MANAGEMENT ZONES	ALLOCATION LIMITS (LITRES PER SECOND)
Wai-iti Zones	
Wai-iti Dam Service Zone following commencement of the discharge from the Wai-iti Community Water Augmentation Scheme, provided the scheme is in operation.	515 l/sec
Wai-iti Zone (not including the Wai-iti Dam Service Zone.)	Subject to condition (c)
Waimea Zones	
[1]~~Reservoir~~	~~826~~
Upper Catchments (Wairoa, Lee and Roding Rivers)	3
~~Waimea West~~	~~178~~
Hope and Eastern Hills	97
~~Golden Hills~~	~~113~~
~~Delta~~	~~1000 [subject to condition (c)(ii)]~~
~~Upper Confined Aquifer~~	~~147~~
Lower Confined Aquifer	230

Notes:
(1) Allocation limits are for the period November to April. They are calculated as sum of weekly permit allocations, and refer to surface or groundwater takes, but do not include takes from storage

In addition, Rule 31.1.2 allows as a permitted activity, but subject to conditions, the taking of up to 5 m^3/day without a consent and hence without needing to be within the relevant allocation limit.

It is important to understand that the allocation limits in Fig 31.1E apply in conjunction with a series of three water rationing steps imposed under Rules 31.1.3 (renewals of water permits as a controlled activity), 31.1.4 (new applications for water permits within allocation limits as

[1] Since this report was first drafted, TDC on 13 January 2007 notified Variation 52 to the TRMP which removes allocation limits for some Waimea zones to avoid re-allocation of water which could exacerbate the security of supply problems during dry summers. As of March 2007, further submissions have yet to be received, and following that, Council will hold a hearing of all submissions.

a controlled activity) and 31.1.6 (new applications within allocation limits as a discretionary activity). Rationing steps apply to water permits when drought triggers are reached and to maintain minimum flows extracted from Schedule 31.1C below. The rationing steps are 20% then 35% then 50% cuts of the weekly allocation on each water permit, with lower cuts of 10%, 17.5% then 25% applying to permits for community water supply

The design and operation of allocation limits and rationing restrictions have been reviewed in a separate report for TDC (Fenemor, 2006). An allocation limit represents the maximum sustainable rate of water take able to be allocated in that zone when the take is not under restriction. So it is the sum of weekly allocations on water permits for that zone, lawfully able to be taken during a normal irrigation season, not during a drought.

When considered in conjunction with the rationing steps in Rule 31.1.3, the allocation limit during a 10 year drought corresponds to the end of Step 1 (a 20% cut) and is therefore 20% less than the limits stated in Fig 31.1E above. What is not stated in the TRMP is the frequency of drought at which the 35% and 50% cuts (Step 2 and 3 rationing) would be imposed. Because the minimum flows have been reached so rapidly in the two recent droughts (2000/01 and 2002/03 – 23 and 6 year return periods respectively), these 35% and 50% cuts in allocation have occurred much earlier than water users had expected. The current security of supply does not meet the Council's target and this alone justifies consideration of the need for water augmentation. It is arguable that even the TDC's targeted security of supply level (35% cut in a 10 year drought) is now unacceptable to Waimea water users. This is borne out in the survey work carried out by ESR in which over 60% of a focus group of water users said they wanted full supply in at least a 20 year drought (Winstanley et al., 2005, Table 3).

A recent review of the basis for the allocation limits set in the Waimea Basin suggests that the allocation limits previously set in the TRMP for a normal year are about right (Fenemor, 2006). However, given that larger than expected rationing cuts in allocations are needed during dry summers, the Waimea Basin can be said to be over-allocated during those events, as stated by TDC (TRMP Chapter 30, pp30/7 and 30/10).

The poor security of supply is brought about by the increased rate of flow decline in the Waimea River. The history of the low flow triggers which introduce the 20%, 35% and 50% water rationing steps is important, both to understand why the triggers have changed and how they are intended to operate. As an example, Minimum Flow is now defined in the TRMP as follows:

Minimum Flow - *means the flow regime that is required as set out in the policies and rules of this Plan, as a minimum, to maintain or provide for the specified uses and values identified for that river, but which, during severe droughts may be further reduced through a combination of reduced water flows and water abstraction.*(TRMP, chapter 2)

While Minimum Flows are specified for some rivers in Table 1 below, the current definition of Minimum Flow makes it clear that this is a target flow which may be breached during severe droughts. Whether this flexibility should be retained for an augmented river will need further consideration in subsequent phases of the Waimea water augmentation investigations, as releases of water from a reservoir provide more ability to always achieve such a minimum flow.

TABLE 1 (EXTRACTED FROM SCHEDULE 31.1C) MINIMUM FLOWS AND TRIGGERS FOR RATIONING				
Water Management Zone	**Location**	**Minimum Flow (l/sec)**	**Trigger for First Rationing Step**	**Trigger for Consultation (l/sec)**
Waimea Zones				
Reservoir Zone Upper Catchments Zone Waimea West Zone UCA Zone	Waimea River flow anywhere	[2]~~500 (Nov–Apr)~~ ~~1000 (May–Oct)~~	2500 l/sec in Wairoa Gorge at Irvines Site No. 52751	2800 in Wairoa River at Irvines
Roding River	NZMS 260:N27: 2529896 5981652	100 as from 2008	2500 l/sec in Wairoa Gorge at Irvines Site No. 52751	2800 in Wairoa River at Irvines
Wai-iti Zone and Wai-iti Dam Service Zone	At Livingstone Road	None (Nov–Apr) 400 (May–Oct)	100 l/sec	
Delta Zone	Pearl Creek	~~96~~	0.4 millisiemens per centimetre in any used bore	2800 in Wairoa River at Irvines
	Waimea River flow anywhere	~~500~~	2500 l/sec in Wairoa River at Irvines Site No. 52751	
UCA Zone LCA Zone Golden Hills Zone Hope and Eastern Hills Zone	Waimea River flow anywhere		Step 1 rationing introduced when Step 2 introduced for Reservoir Zone	

When the Water Chapter of the TRMP was first notified in November 2001, the minimum flow in the Waimea River was raised to 500 litres per second from the 225 l/sec historical (March 1983) measured minimum first set in the 1986 Waimea Water Management Plan. This higher flow was an estimate at that time of the minimum flow needed to "provide reasonable levels of instream habitat for most species of native fish and for juvenile trout in the three reaches, and better, although far from optimal, levels of habitat for adult trout and fast-water native fish species" (Hayes, 1998). The 500 l/sec flow was at that time the estimated 'natural' 50 year low flow at Challies Island, just above the Appleby Bridge (TDC, 1999). Hayes (1998) also stated that to ensure free passage of trout throughout the entire Wairoa-Waimea mainstem, a minimum flow of at least 650 l/sec would be required. Note that a range of parties contested the proposed minimum flow and that as of March 2007 submissions on this issue have not been heard.

In the minimum flow assessment carried out for the WWAC project, Hay and Young (2005) of the Cawthron Institute recommend that maintenance of adult brown trout habitat be

[2] Variation 52, 13 January 2007, deleted minimum flows shown here as crossed out, and also raised rationing trigger flows shown in this table.

adopted as the critical instream management goal for minimum flow decision making in the lower Wairoa/Waimea Rivers. They present three minimum flow options: the Mean Annual Low Flow (1300 l/sec) as ideal; 80% of the habitat available at MALF (800 l/sec) and 70% (500 l/sec). Application of the '100 Rivers Model C' suggests that the 800 l/sec option would result in a 12% reduction in adult brown trout numbers compared with the MALF, and for the 700 l/sec case an 18% reduction (Hay and Young, 2005).

Returning to Table 1 above, the Wairoa Gorge flow at which consultation about rationing commences (2800 l/sec) and the trigger for the first rationing step (2500 l/sec) are increases on the flows proposed in 2001 (2500 and 2000 l/sec respectively). These flows allow some lead-in time for rationing to be formally implemented and to have an early effect in reducing the flow recession, especially the depletion of storage in the aquifers. This early action recognises that Step 1 rationing, the 20% cut in allocations, has little effect on many users as many are not using more than 80% of their allocations at that stage.

As explained in s31.1.7 of the TRMP, progression from one rationing step to the next under Rule 31.1.3 would not normally happen at an interval of less than two weeks. There is also provision under s329 of the RMA for the TDC to issue a Water Shortage Direction requiring cuts exceeding 50% (Step 3) if the formal steps have not had sufficient effect, and this has been used once, with 60% cuts imposed between 26 March and 3 April 2001 in the Upper Catchments, Reservoir, Waimea West, Upper Confined Aquifer, Golden Hills and Delta zones.

Changes to Rule 31.1.3 in January 2005 removed any irrigation application rate limits in the Waimea Water Management Area. It was understood that the intention was only to remove the varied rates for different soil types to leave a maximum allowable application rate of 35mm/week (350 m^3/ha/week) – however, setting a maximum allowable application rate is now dealt with solely as a matter under Rule 31.1.3 when Waimea water permits are being renewed.

The renewal of existing water permits is provided for by Rule 31.1.3 subject to the ability of Council to reduce the allocation if previous ('bona fide') usage has been lower and there is no demonstrable reason why the allocation should be kept as high as originally. The 'bona fide' test is usually based on an assessment of whether the irrigable area specified on the permit has been irrigated or with existing irrigation equipment can be irrigated. However, where irrigators are paying for the water they use, such as from the Kainui Dam in the Wai-iti, the bona fide test will not be applied. Instead, users are encouraged to transfer their unused allocations to those who could use them. A similar system is an option for the Waimea WAC augmented flow.

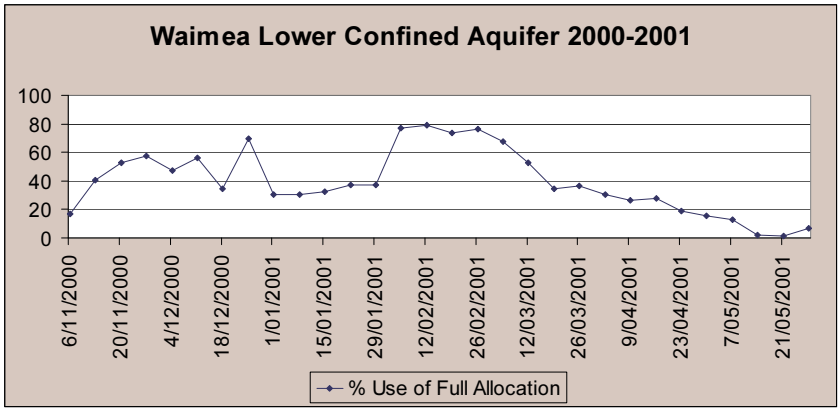
Finally, if a water permit application is within the zonal allocation limit but does not comply with any of the other restrictions (such as the irrigation application rate of 35mm/week, the 'bona fide' usage test, or the water is to be used outside the November-April period) rule 31.1.6 makes that a discretionary activity, which TDC may grant or decline. Any application which would breach the zonal allocation limit is non-complying, in which case the TDC can only grant a permit if the effects are shown to be minor, or not contrary to the TRMP objectives and policies, usually a difficult task.

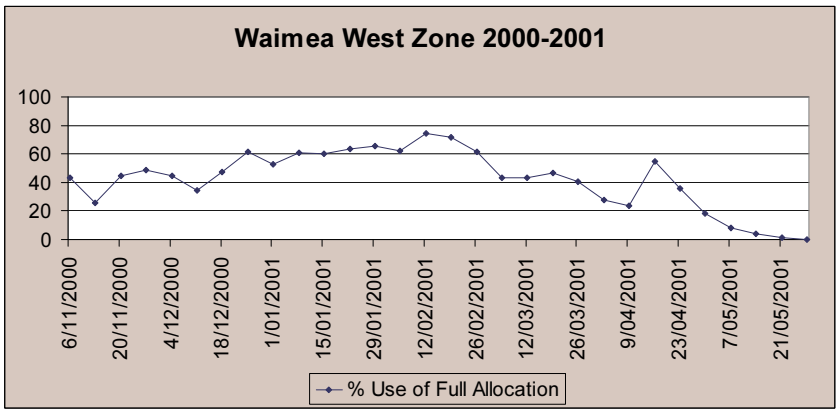
3. Options for Improving Water Use Efficiency and Flexibility

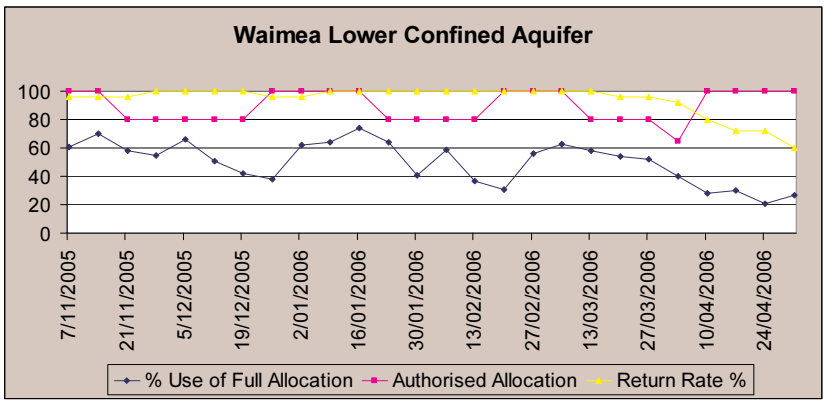
In TDC's discussions with Waimea water users over the years, and in the ESR evaluation of community values and water management options for this project (Winstanley et al., 2005) it has been acknowledged that tackling increasing water demand requires a dual approach: water augmentation alongside using the existing water more efficiently (e.g. section 2.2.3 in TDC, 1997). In the following subsections ways to achieve greater efficiency of water used are discussed.

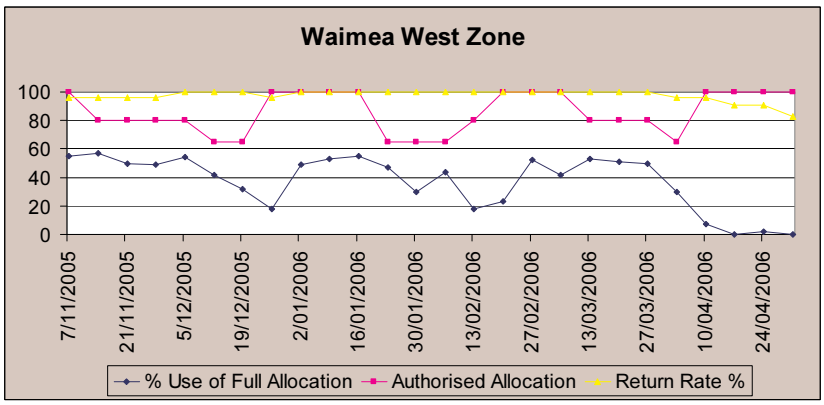
3.1 Water usage compared to current allocations

One element of efficiency is allocative efficiency – how much of the allocated water is actually used? TDC has good water usage data from metering in the Waimea zones. In the 2000-01 drought, a 23 year event based on 7-day river flows, TDC data (Daryl Page, pers. comm.) shows 79% peak weekly usage against full allocations for the Lower Confined Aquifer, and 75% for the Waimea West Zone both in February, in both cases before rationing was implemented. In 2005-06, usage in these zones reached 74% and 57% of aggregated allocations respectively. Even under rationing, for example 35% cuts in allocation plotted below for 2005-06, actual weekly water usage never exceeded 80% of the allocation limit in force. See charts below.









Usage is unlikely ever to match allocations across a zone because of the range of crops grown, their stage of growth and efficiency of water use. However, the difference is at least partly an indicator of the efficiency of the allocation system, and Council efforts should continue to ensure that allocations during peak water use weeks closely match aggregated total usage. Unused water can be viewed as an inefficiency in the system, although it does in fact provide a buffer; for the environment, this buffer is saved water storage in the case of a groundwater system, or added flow to maintain instream values in river systems and springs, and for water users, the buffer is a higher security of supply.

One question which needs addressing on allocative efficiency is whether the Council expects 100% of the allocated flow rate to be used. In a constrained system, such as operates at present without water transfers, an assumption of about 80% maximum usage of aggregated allocations across the Waimea Plains is probably reasonable. Under a more flexible system where leases or permanent transfers of water permits are allowed, or where groups of permit holders operate under an aggregated water permit, it should be assumed that usage will over time more often reach 100% of allocations.

3.2 Why seek to improve water use efficiency?

As irrigation constitutes about 82% of water use in the Waimea catchment (TDC, 1999), the biggest potential efficiency savings lie with irrigation. Approaches to improving irrigation efficiency group broadly into economic incentives, regulatory requirements, and educating users on why and how to ‘do the right thing’.

Improving irrigation efficiency is a priority both because of the increasingly limited new water available for allocation, and the increasing energy and equipment costs for applying water to land.

Irrigation efficiency is relevant to the water augmentation scheme because efficient use of the augmented supply will enable more revenue to be generated, reduce the environmental impacts of use of that water, and potentially a wider range of users will be able to utilise and therefore pay for the scheme.

3.3 Barriers to improved efficiency

Barriers to improving water use efficiency include

- the sunk investment in existing pumps and irrigation equipment, which may need to be upgraded to implement the efficiencies
- the economics of irrigated agriculture and horticulture affecting affordability of improved equipment and monitoring,
- the intermittency of water use for many irrigated land uses, affecting affordability
- poor uniformity of application of water by some irrigation methods and equipment,
- lack of information about how to reduce wastage and/or maximise efficiency,
- lack of awareness of how much water is wasted (for example through infiltration and leaching right through the soil profile),
- lack of awareness of the consequences of wastage, including fertility leached away and 'downstream' effects on water quality, and
- lack of financial or regulatory incentives to improve
- rigidity and transaction costs of Council administrative processes for water allocation and management of effects of water take and use.

It has also been argued at one of the ESR workshops for this project (Winstanley et al., 2005, p32) that water augmentation could itself be a barrier to efficient water use as it may lead to an expectation of better availability, more land able to be irrigated and a consequential future shortage. This shows the need for care in putting in place the allocation regime for the augmented scheme.

3.4 Options

Some ideas for improving water use efficiency are listed below for consideration by WWAC and TDC in conjunction with promotion of the augmentation scheme:

- when water permits are applied for, requiring users to develop a farm irrigation plan ('property plan') to demonstrate how water will be used efficiently and how this efficiency will be monitored (circumstances when these might be required have been discussed in a recent report to Council (TDC, 2007))
- defining and prescribing efficiency standards which must be met for a water permit to be able to be granted
- reduced annual TDC water permit charges for uses meeting prescribed efficiency standards, for example through demonstrated use of soil moisture monitoring, use of efficient irrigation scheduling, efficient equipment (and conversely increased charges for inefficient uses, after a grace period to adjust)

- incentives such as rates rebates, equipment discounts or reduced water charges for users (including users of a water augmentation supply) using efficient water use technologies, implementing water saving devices or capturing stormwater runoff for reuse
- a scale of scheme charges favouring more efficient water uses, for example charging for water volumes actually used
- publication in TDC newspaper ads and website of soil moisture monitoring and hence water required on a weekly basis for a range of soil and crop types, to guide users on when they should start and stop irrigating, how much water to apply, and the savings achieved through deficit irrigation
- facilitate or directly fund a soil moisture monitoring service for water users
- identify irrigation equipment meeting acceptable standards for uniformity of water application, in the same way that wood fires are certified for emissions
- encourage a 'warrant of fitness' scheme for irrigation systems to identify parts that need repair or upgrade to meet specified efficiency standards, and training to ensure irrigators can monitor the variable performance of their system
- encourage or require design of irrigation systems which takes account of variability of application rates needed within irrigation blocks, so that water applied is better linked to soil and crop needs
- financial support such as favourable loans or deferred payment of scheme fees to encourage transition to more efficient irrigation equipment (this could be included in the design of the funding regime for the water augmentation scheme)
- provision of better information about actual security of supply available to users, including potentially real-time projections of likely augmented flows available through the current irrigation season
- ensuring that water supply contracts (for example, TDC contracts with industrial and commercial water users, and irrigation company contracts with their users) incorporate efficiency incentives, and obligations for users to save water when drought triggers are reached
- facilitate sharing of information among users at water management zone level, by assisting Water User Committees to convene workshops, science discussions, and supplier demos on water use efficiency, efficient equipment and scheduling.
- preparation and distribution of information sheets on efficiency, and mechanisms available to encourage efficiency.

While most of these suggestions relate to irrigation water use, many can be applied to other forms of water use such as industrial and domestic water use. An evaluation process for these options needs to be developed taking into account the cost, the administrative requirements, the extent to which a 'carrot or a stick' approach is sought, and consistency with other water allocation methods being implemented. The social consequences of the package of options implemented must also be considered, for example users' ability to pay.

3.5 Responsiveness of Allocation System

Alongside the efficiency question is that of the responsiveness (flexibility) of the allocation system to the changing economic values of different water uses. The most obvious difference in economic value of water is the value of (and ability to pay for) a cubic metre of water for urban household use compared to its much lower value for irrigation.

The flexibility of the system is important when no further water is available for allocation, and some system is needed to allow water uses to be moved to higher valued uses. This is the re-allocation challenge. It is even more important for a water augmentation scheme where potential water users need a way to recoup or divest their investment in the scheme if they no longer want the water.

In the Wai-iti Water Augmentation Scheme, water users supported TDC's implementation of rules allowing transfers of water allocations (in water permits) within the scheme area (Fenemor and Sinner, 2005). We suggest this approach be adopted also for water uses from the Waimea Water Augmentation Scheme. A properly designed transfer regime should enhance water use efficiency by more explicitly assigning an economic value to the water.

4. Policy Options for Allocating Newly Available Water

Some of the ideas listed above for improving water use efficiency would need to be implemented by regulatory means through the TRMP. This section also presents some ideas for allocating water from the augmentation scheme, some of which have been discussed at TDC and research fora already. A comment is made on whether each option is considered applicable or worth examining further for the WWAC project.

4.1 Soil and crop-based irrigation application rates

Approach: In addition to reinstating rates of irrigation application based on broad soil types contained in TRMP Fig 31.1D, allocations under new or reviewed water permits could be further tailored to the broad type of crop being irrigated. Categories could be as broad as permanent crops (including pipfruit, kiwifruit, berries, grapes, olives, pasture) versus semi-annual crops (including market gardening, and arable crops).

Comment: The main reason why the TDC has not adopted crop-based allocations to date is the inflexibility and administrative overheads of regular revision of water permits required when landowners change crop types. With rapid and widespread availability of the Internet, it should now be easier to make such changes. However, regular changes to farm-scale water allocations would make it difficult to maintain allocation limits within each zone, as total allocations would be changing rapidly. Irrigation management plans prepared and implemented at farm scale could achieve a similar outcome.

Recommendation: Soil-based allocations are supported but adding crop-based allocations to water permits is not recommended because of administrative complexity and cost.

4.2 Seasonal allocations

Approach: Water permits currently specify allocations in terms of instantaneous, hourly and weekly rates of take. In Australian river systems dominated by flow releases from storage dams, users are able to order their water from the dam operator in advance. Seasonal limits apply depending on storage available in the dam(s). A benefit of having seasonal allocations on permits is that this tailors allocations more explicitly to seasonal need, and potentially to particular crop and soil needs, so TDC is able to allocate water more widely.

Comment: The difference for the WWAC scheme is that dam releases will add to the natural flows, and extraction by users will generally be from aquifers linked to the river system. Compliance would add administrative costs. This option was discussed at a water user stakeholder workshop run jointly by Landcare Research's ICM programme and Ecologic's ISD research programme in March 2006, which included some Waimea water users, but it received little support (Sinner and Fenemor 2006).

Recommendation: This option is not currently recommended because of administrative cost.

4.3 Uniform per hectare irrigation allocations

Approach: This is effectively the current system as under current water allocation rules, every hectare of irrigated land in the Waimea catchment is eligible for an allocation rate of 35 mm/week (350 m^3/ha/week). Allocations operate on a first in, first served basis up to the filling of the allocation limits for each zone.

Comment: As most water users have been through a 'bona fide' review to ensure they have a demonstrated need for their nominated number of hectares of irrigation, this approach is equitable for the group of users who already have allocations, and is a fair starting point for a more flexible permit transfer regime. In terms of allocative efficiency, it is a relatively inefficient approach, as some water allocations will never be fully used (e.g. grapes which require 18mm/week vs kiwifruit with 35mm/week). However the opportunity for transfers should see allocations being transferred over time to higher valued uses. Irrigation management plans would in the meantime provide information to water users on their actual soil and crop water needs.

Recommendation: Maintain the current 35mm/week basis allocation for irrigation in conjunction with introduction of flexibility to transfer allocations when the augmentation scheme is operational.

4.4 Web-based transfer regime

Approach: There have been discussions among Waimea Catchment water user committees and with TDC staff about ways in which water users can improve their flexibility for accessing their allocations, especially during periods of rationing. One heavily debated proposal has been that of TDC facilitating transfers of water permits, particularly on a leasing (non-permanent) basis.

Comment: At the Landcare Research/Ecologic workshop mentioned above, water users saw merit in being able to transfer water allocations between users, especially for short-term leases between users. With improved Internet access, the opportunity exists for such transfers to be relatively automated, subject to environmental and third party effects being codified in the TRMP, or even tested via an interactive river-groundwater model. In the longer term, automation of water meters and pump valves could conceivably even allow remote control of actual water used, by shutting off supply when a user's allocation limit was reached.

Recommendation: Provision for transfers of water permits should be incorporated into scheme planning, along with removal of the 'bona fide' reviews, as done for the Wai-iti scheme.

4.5 Aggregated water permits

Approach: This option involves groups of water users holding a single shared water permit in the same way that the Waimea East Irrigation Company is able to operate. The advantage is that when rationing is required, the larger entity can decide among its members where the water is most needed and thereby reduce water stress on the most vulnerable crops. The approach has been recognised in a guidance note drafted by Neil Tyson and Joseph Thomas at TDC in 2005.

Comment: This approach allows users more flexibility than at present to respond to periods of water shortage, and has the added benefit of building shared understanding and collaboration around water management, thereby strengthening water user committees' effectiveness. A disadvantage is that aggregation could encourage more water use because it frees up allocations within a larger area. If adopted, this approach would require amalgamation of existing water permits but would probably not need any changes to TRMP rules. The improved flexibility will potentially have the effect of increasing aggregate usage within the rationing limits, but this is likely to be minor.

Recommendation: This possibility warrants further work, although it is peripheral to the allocation issues for WWAC.

4.6 User-driven Water Management Plans

Approach: This approach devolves more responsibility to a group of water users in a water management zone or small catchment to manage their collective response to drought. It is an extension of the water sharing concept practised by the Riwaka water users group when rationing is implemented. The idea was canvassed at the Landcare Research/Ecologic water user stakeholder workshop in March 2006 and received more support from water users and community development representatives than environmental interests: "It was noted that flow sharing requires leadership from TDC and community involvement, that environmental limits need to be well understood, and that provisions could be needed to prevent undue pressure being put on individuals to share water." (Sinner et al., 2006). There was more support for user-driven water management plans if they also included water quality targets.

Comment: There are various ways in which this idea could be implemented ranging from the simple Riwaka model to formally delegating functions to a designated water management group, and potentially the aggregating of zonal water permits into a single permit managed by the group as discussed above. The success of this approach will depend on the willingness and capacity of water users to work together, and the provision of technical and administrative support to these groups by the TDC.

Recommendation: This possibility also warrants further work, including design options and legal issues for implementation.

4.7 Priorities for water use specified in TRMP

Approach: TDC could decide through a consultation process with WWAC how much of the augmented water was reserved for categories of use – irrigation, urban supply, industry, environmental benefits.

Comment: As the WWAC's objective is to meet all potential affordable water demand, and a larger dam should mean lower unit cost per m^3 of water supplied, our recommendation would be to allow the market to make adjustments between categories of use as economics dictates. However, priorities of use during drought will still be relevant as in Rule 30.2.1.

Recommendation: Not recommended.

4.8 Enabling physical access to augmented water

Approach: This option differs from those above because it concerns water availability rather than efficiency of water used. However, it is a challenge for the WWAC scheme – how can water paid for actually be made available, particularly for users distant from the river, such as from the Hope aquifers? In the Wai-iti, the answer is to allow users to move wells closer to the river and if necessary take their allocations directly from the river. This is impractical in the Waimea as many users are distant from the river.

Comment: Reliance must be placed on the groundwater model to estimate the recharge effects of increased river flows, so that water available after augmentation in each zone is assessed for allocation. It may be necessary to consider building weirs in the Wairoa-Waimea rivers to enhance groundwater recharge, and/or build wellfields to reticulate water towards the eastern hills. Options open to investigation include expanding the Waimea wellfield upstream of the Appleby Bridge, expanding this wellfield to supply Nelson City, expanding the Waimea East Irrigation Company reticulation, and constructing recharge wells for the Lower Confined Aquifer. Alternatively, TRMP policy and the charging regime could allow for adjustments to allocations and charges in the event water is not available in the quantities and with a minimum level of security of supply determined by the scheme.

Recommendation: That limits to access to augmented water be evaluated as a priority in the Phase II water augmentation study, using the IGNS groundwater model, and that infrastructure solutions such as weirs and further reticulation across the plains be assessed where access to augmented water is likely to be limited.

5. Potential Changes to Existing Policy and Rules

This section identifies areas in the TRMP where current policies and rules may need changing if the water augmentation scheme is proceeded with. There may also be changes necessary if no scheme is proceeded with, to otherwise address the present security of supply issues.

5.1 Context

Changes will be needed in Part V of the TRMP to accommodate the WWAC scheme, in the same way that changes were made for the Wai-iti (Kainui) scheme.

It is not considered appropriate (nor probably necessary) to seek to change existing water allocation policies, apart from the more administrative issues.

Policy changes may be needed to:

- formally recognise the status and ownership of the augmentation scheme,
- update interim policies aimed at preventing increased water allocation
- make any changes to the security of supply targets for the scheme.

Changes to rules will be needed to reflect the new information on appropriate minimum flows that can be achieved and the new hydrological regime that the scheme will deliver. This gives the ability to enhance the values of the river. Specific changes will be to:

- implement the increased minimum flow in the Waimea River,
- increase allocation limits, and
- link allocation to payments for the scheme.

5.2 TRMP policy changes

The following options are identified for TRMP policy changes relating to water allocation, if the WWAC scheme is implemented:

- Update Schedule 30.1 with any new Uses and Values identified for Waimea water bodies through the WWAC project
- Remove interim policies 30.1.30 and 30.1.31 added in Variation 52, 13 January 2007
- Consider whether the WWAC has changed the priorities for water use, including those for community supplies, in policies 30.2.1 and 30.2.3
- Add new policy to supplement policy 30.2.14 to reflect the higher security of supply target specifically adopted for the Waimea Plains through the WWAC scheme and adjust 30.2.14 accordingly.
- Consider whether approaches recommended by WWAC to improve efficiency of use of augmented water require changes to policy 30.2.17.

5.3 TRMP rule changes

Changes to rules are likely to be more extensive:

- Changes to permitted activity use of water under Rule 31.1.2 are probably unnecessary but TDC's own share of the scheme costs needs to recognise that future subdivisions without reticulated water will bring an expectation of access to natural waters such as groundwater, which will have benefited from the scheme. The current restriction on takes within the coastal margin of the Delta Zone may also be able to be relaxed with an increased minimum Waimea River flow

- In rule 31.1.3, Figure 31.1C will need updating to recognise the method and levels of rationing agreed for the WWAC scheme. Schedule 31.1C needs new minimum flows wherever the Waimea River is listed, and an increased minimum flow beyond the previous 96 l/sec needs to be derived for Pearl Creek.

New allocation limits will be needed in Figure 31.1E to re-implement limits for each water management zone taking into account the flow release regime for the water augmentation scheme.

Clause (da) which regulates renewals of water permits in the Wai-iti Service Area could be applied to the WWAC Service Area; note that one indirect effect of this rule is to limit transfers for irrigation to no more than the soil needs specified in Schedule 31.1C (though this currently appears then to be over-ridden by clause (daa).

Consider whether clause (daa) should be reviewed and in any case reword it to make it clear that no more than a maximum irrigation allocation rate of 35mm/week should be granted.

Review the need for the bona fide provisions (7A) included among the matters to be considered when granting water permits.

Update Schedule 31.1D Table 2 with agreed allocations provided for by the WWAC for the community water schemes, including Wakefield, Hope-Brightwater, Richmond, Waimea. TDC could also specify allocation limits for the various end users, a more specific way to reserve water longer term for community water supplies.

- Options for accommodating increased water provided through the WWAC scheme are:
  1. Increase water allocation limits in rule 31.1.4 based on projected demand and groundwater modelling of improved availability, or
  2. Distinguish released flows from natural flows and allocate released flows based on new allocation limits in rule 31.1.4 for released water

  Which of these options is chosen depends on the charging regime adopted for the scheme. If all existing users become 'shareholders' in the scheme as in the Wai-iti, there will be no need to distinguish augmented volumes from naturally occurring water, and option (1) is preferred.

- An amended rule 31.5.1 regulating site-to-site transfers of water allocations in water permits will be needed for the Waimea water management zones, if the WWAC scheme is to include the flexibility for 'shareholders' to transfer or sell their share of the scheme cost to other water users.

- Payment for the Wai-iti water augmentation scheme is made by water users through a TDC rate on the weekly water allocation on their water permit; for irrigators, this corresponds to a charge per hectare of water allocation for irrigation, as all users have the same per hectare allocation in the Wai-iti. Existing Wai-iti water permit holders are to be rated at $280 (incl GST)/ha/year – increasing in years 4-30 to $315 - while new water users will pay this rate plus an up-front single capital contribution of $1060/ha. These costs will repay a 30-year loan for scheme costs, plus the ongoing Operating & Maintenance costs.

  If the option of charging for the WWAC scheme in the same way as for the Wai-iti scheme is adopted, an appropriate rating scheme will need to be set through TDC's Annual Planning process, and this will need to be scheduled alongside the amendments to the TRMP mentioned here.

Changes to policy and rules take time to implement because of the drafting, consultation and formal submission and hearing processes involved. When the augmentation scheme is approved to proceed to the consenting stage, these TRMP changes should also be notified, in tandem. If scheme funding is to be achieved through a rating mechanism, as it was for the Wai-iti scheme, the draft rating provisions should also be progressed at that time.

6. Conclusions and Recommendations

The Waimea Water Augmentation project seeks to release water from a storage dam to improve the security of supply for existing water users on the Waimea Plains, make available additional water for irrigation and urban uses, and in the process improve the environmental flows in the lower Wairoa and Waimea rivers.

This report reviewed and explained the TDC's current policies and rules for water allocation in the Waimea Basin contained within Part V of the Tasman Resource Management Plan.

Options for improving water use efficiency and flexibility have also been reviewed. In terms of allocative efficiency, water metering data for the 2000-01 drought (a 23-year event based on 7-day river flows) before rationing was implemented showed that the highest zonal water usage reached 79% of full allocations in the Lower Confined Aquifer Zone and 75% in the Waimea West Zone. In the absence of active transfers of water permits, which are likely to result in increased usage of existing allocations, an assumption of 80% maximum usage against zonal allocation limits seems reasonable. However an assumption that 100% usage will occur at times provides a buffer for the uncertainties in the policy settings for allocation limits and security of supply.

Among the policy options identified for improving water use efficiency are regulatory requirements including farm irrigation plans and prescribed efficiency standards. Financial options include reduced annual water permit fees for users meeting efficiency standards, rates rebates or discounts on scheme charges for implementation of efficient water use measures. Education and advocacy options include providing soil moisture information for irrigators, information sheets on water use efficiency and presentations and data on the hydrology of the Waimea water resources.

As these water resources are currently fully allocated, provision should also be made to encourage re-allocation within the system. Providing for site-to-site transfers including temporary leases of water allocations, as implemented already in the Wai-iti water augmentation scheme, is recommended in conjunction with formal removal of conditions on permits allowing 'bona fide' adjustments of users' allocations.

Eight policy options for allocating newly available water are discussed. In general, the current policy settings are an appropriate balance between water allocated and administrative costs of the water allocation system. The main opportunities for changes appear to be in the areas of user-driven water management plans, and re-allocation of water through transfers, particularly through leasing of allocations. One policy and physical challenge for the scheme which needs investigation in Phase II investigations is how to ensure physical access to augmented water for users distant from the river.

If the scheme is built, the main changes needed to TRMP policies will be to formally recognise the status and ownership of the scheme, and to increase the security of supply under which water is allocated to users. Main changes to rules will involve setting a higher minimum flow regime for the Waimea River, re-setting and increasing water allocation limits for the water management zones across the Plains, and (depending on the funding option chosen) linking allocations to payments by scheme contributors.

It is recommended that drafting and consultation on the required changes to water allocation policies and rules be carried out as a part of the Phase II investigation.

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9. Appendices

Appendix 1 Waimea Water Allocation Policies, Chapter 30, TRMP (13 January 2007 edition)

The following policies are extracts from the Tasman Resource Management Plan (TRMP), as those relevant to water allocation in the Waimea catchment and to a potential water augmentation scheme.

30.1 Issue: Reduced Water Body Flows or Levels

Water Body Management

30.1.1 To maintain and enhance the uses and values of rivers, aquifers, wetlands and lakes that may be adversely affected by reduced water flows or levels including:

(a) the uses and values of water bodies identified in Schedule 30.1, particularly the internationally, nationally and regionally significant uses and values of water bodies;

(b) the customary and traditional uses and values of iwi, including wāhi tapu, and other taonga, particularly in relation to sustaining the mauri of the water;

(c) the capacity of water bodies to dilute contaminants; by taking into account the management objectives specified for each of the water bodies in Schedule 30.1.

30.1.2 To establish a minimum flow regime or minimum water level regime for rivers, wetlands and lakes where there is a threat to uses and values of the water body or a connected water body, taking into account;

(a) the range and significance of the existing and potential water body values and uses;

(b) adverse effects from existing and potential abstractive water users and land use activities affecting water quantity;

(c) natural flow characteristics;

(d) practical monitoring and enforcement needs;

(e) contributions to water flows and levels from dams.

Waimea Catchment Extracts from Schedule 30.1:

WATER BODY USES AND VALUES AND WATER MANAGEMENT OBJECTIVES		
Water Body	**Values/Uses Adversely Affected by Reduced Flows or Levels**	**Management Objectives**
(1) All groundwater (All groundwater may have any of these uses and values)	**In Situ Uses and Values**	
	• Contribution to river and spring flows. • Phreatic communities	• Prevention of seawater intrusion. • Maintenance of aquifer pressures (abstraction rates to match recharge rates). • Maintenance of contribution to river or spring flows.
	Other Uses and Values	
	• Human consumption. • Irrigation supply. • Community water supply. • Stock and farm water supply. • Industrial supply.	• Protection of water supply needs of stock and domestic users (provided there is full penetration of any alluvial aquifer). • Maintenance of water users' security of supply at an acceptable level.
Specific Uses and Values of Aquifers		
(2) Upper Confined Aquifer (3) Delta Zone Aquifer (4) Lower Confined Aquifer	**In Situ Uses and Values**	
	• Contribution of flow to the Waimea River. • Contribution of flows to Neiman and Pearl Creeks.	• Maintenance of Waimea River minimum flow. • Maintenance of Pearl Creek minimum flow and flows in Neiman Creek. • Prevention of seawater intrusion. • Maintenance of aquifer pressures (abstraction rates to match recharge rates).
	Other Uses and Values	
	• Human consumption. • Irrigation supply. • Community water supply. • Stock and farm water supply. • Industrial supply.	• Protection of water supply needs of stock and domestic users. • Maintenance of water users' security of supply at an acceptable level.
(8) All surface water bodies (All surface water may have any of these uses and values)	**Instream Uses and Values**	
	• Aquatic ecosystems, wildlife and aquatic plant habitat. • Contact and non-contact recreation activities. • Cultural and spiritual values. • Landscape values. • Contribution to lowland spring flows.	• Maintenance of minimum low flows for instream aquatic values including fisheries values. • Protection of contact and non-contact recreation activities. • Protection of landscape cultural and spiritual values.
	Other Uses and Values	
	• Human consumption. • Irrigation supply. • Community water supply. • Stock and farm water supply. • Industrial supply.	• Maintenance of water users' security of supply at an acceptable level. • Protection of supplies for stock and domestic users.

Specific Uses and Values of Rivers and Wetlands		
(9) Waimea River	**Instream Uses and Values**	
	• Aquatic ecosystems, wildlife and aquatic plant habitat. • Contact and non-contact recreation activities. • Cultural and spiritual values. • Landscape values. • Contribution to lowland spring flows. • Instream native and trout fisheries values and trout passage. • Contribution to Neiman and Pearl Creek spring flows.	• Increased minimum low flows to protect native fish and juvenile brown trout habitat and limited brown trout passage during low flows. • Maintenance of Neiman and Pearl Creek flows. • Protection of recreational activities. • Protection of cultural, spiritual and landscape values.
	Other Uses and Values	
	• Human consumption. • Irrigation supply. • Community water supply. • Stock and farm water supply. • Industrial supply.	• Maintenance of users' security of supply at an acceptable level.
(10) Neiman and Pearl Creeks	**Instream Uses and Values**	
	• Native fish habitat, including the nationally significant native fishery of Neiman and Pearl creeks. • Regionally significant wildlife habitat in Neiman and Pearl creeks.	• Maintenance of minimum flows to protect instream and wild life habitats.
	Other Uses and Values	
	• Stock and farm water supply.	
(11) Wai-iti River	**Instream Uses and Values**	
	• Trout spawning. • Contribution to Waimea River flows. • Contribution to groundwater levels.	• Protection of trout spawning values. • Maintenance of contribution to Waimea River flows and groundwater levels.
	Other Uses and Values	
	• Human consumption • Irrigation supply. • Community water supply. • Stock and farm water supply.	• Maintenance or improvement of users' security of supply to an acceptable level.
(12) Wairoa, Roding and Lee Rivers	**Instream Uses and Values**	
	• Native fish and trout habitat. • Contribution to Waimea River flows. • Contact and non-contact recreation. • Cultural, spiritual and landscape values.	• Protection of instream values including fisheries and natural values. • Protection of recreation activities in the Lee and Roding Rivers. • Maintenance of contribution to Waimea River flows. • Protection of landscape, cultural and spiritual values.
	Other Uses and Values	
	• Human consumption. • Irrigation supply. • Community water supply. • Stock and farm water supply.	• Maintenance of users' security of supply at an acceptable level.

30.1.4 To establish the sustainable yield of aquifers taking into account:

(a) depletion of aquifer yields;

(b) reduction of connected surface water flows, including coastal springs and wetlands;

(c) potential for compression of the aquifer;

(d) potential contamination of the aquifer by seawater intrusion;

(e) potential for excessive drawdown of groundwater levels;

(f) presence and significance of living organisms naturally occurring in the aquifer;

(g) effect of land use activities on recharge of the aquifer; to avoid:

(i) long term aquifer depletion;

(ii) drying up of surface waters;

(iii) compression of the aquifer;

(iv) irreversible seawater contamination of the aquifer;

(v) over-allocation of water from the aquifer.

30.1.5 To maintain minimum river flow regimes or groundwater levels by establishing trigger levels for initiating rationing regimes for water management zones (as shown on the planning maps).

30.1.6 To ensure that the water allocation limits take into account effects of other activities and events on availability or yield of water, including:

(a) potential water yield reduction effects arising from land cover changes such as changes to tall vegetation or urbanisation;

(b) climate change including changes to drought frequency;

(c) effects of dams and other water augmentation or storage schemes;

(d) effects of gravel extraction.

Water Takes

30.1.7 To manage the allocation of water taken from water bodies so that the cumulative effect of water takes does not exceed;

(a) the stated flow or water level regime;

(b) any allocation limit for that water body;

(c) the sustainable yield of the aquifer; provided that harvesting water during times of high flow may be considered, if adverse effects can be avoided, remedied or mitigated.

30.1.8A To ensure that the connections between groundwater and river flows are fully accounted for when setting and reviewing water allocation limits and minimum flow regimes, and when deciding on applications to take or divert water, in relation to both rivers and their connected groundwater systems.

30.1.14 To avoid excessive localised reductions in bore yields, provided that potentially affected neighbouring bores in alluvial aquifers fully penetrate the aquifer, taking into account the:

(a) sustainable yield of the aquifer *(see 30.1.4)*;

(b) depth to the aquifer;

(c) permeability of the aquifer;

(d) distance from other bores;

(e) costs of full penetration;

(f) effects on connected surface water bodies;

(g) other uses of the water.

In times of low flows, to use rationing regimes, including rostering, as mechanisms to avoid, remedy or mitigate the adverse effects of water takes.

Water Damming

30.1.17 To avoid, remedy or mitigate the adverse effects of water damming either by itself or cumulatively with other dams, including adverse effects on:

(a) the flow regime or water levels in rivers, lakes and wetlands;

(b) passage of fish and eels;

(c) other water users;

(d) aquatic ecosystems and riparian habitat;

(e) water quality;

(f) groundwater recharge; and

(g) adverse effects of dam failure on (a) to (f) above.

(See also 30.3.2)

Investigations and Monitoring

30.1.30 To avoid, remedy or mitigate the adverse effects of taking water in the Upper Catchment, Reservoir, Waimea West, Golden Hills, Delta and Upper Confined Aquifer zones by:

(a) declining any new resource consent application to take water, except where water is taken at times of high flow;

(b) declining any application for site-to-site transfer of water permits or parts of water permits in circumstances that result in an increase in irrigated areas;

(c) reducing allocations of water wherever possible;

(d) co-ordinating and supporting development of a water augmentation scheme;

and to review this management regime when an augmentation scheme is in operation or within 10 years of these provisions becoming operative.

30.1.31 To mitigate adverse effects of droughts on instream values and water users by adopting a drought management regime for any takes of water from the Reservoir, Waimea West, Golden Hills, Delta and Upper Confined Aquifer zones that:

(a) maintains flows in the Waimea River at times when river flows are declining to avoid risk of seawater intrusion and to maintain flows in Pearl Creek;

(b) manages the decision to impose rationing and management of progressive rationing steps in consultation with the Dry Weather Task Force;

(c) imposes rationing steps in these zones at the same time;

(d) makes most efficient use of abstracted water according to established priority.

30.2 Issue: Allocation of Fresh Water Between Competing Water Users

Equitable Water Allocation

30.2.1 During times of low flow beyond the provisions of any rationing or rostering regime or when implementing a water shortage direction under Section 329 of the Act, Council will give priority to the following uses, whether they are authorised by a permit or through a rule in the Plan (in order of priority from highest to lowest) in requiring reduction or greater restrictions, including cessation for authorised takes:

(a) water for the maintenance of public health;

(b) prevention of significant long term or irreversible damage to the water resource or related ecosystems or specified significant instream values;

(c) water necessary for the maintenance of animal health;

(d) uses for which water is essential for the continued operation of a business, such as irrigation of horticultural crops or water essential to industrial activities;

and the following uses will not be authorised during such a drought:

(e) irrigation and other uses not associated with commercial production such as irrigation of amenity plantings;

(f) non-essential uses such as recreational use, e.g. swimming pools and car washing.

30.2.3 To recognise and provide for the existing and potential future water needs of communities by:

(a) taking into account the effects of future community growth on available or potentially available water supplies, within the limits of any applicable allocation limit,

especially in the Waimea Water Management Zones, and the Hau, Marahau and Moutere Surface Water Zones when making decisions on resource consent applications for subdivision or Plan changes to zoning;

(b) assigning priority for available water to the water supply needs for the maintenance of public health during times of drought;

(c) reserving water within any allocation limit for future expected community growth;

(d) investigating and adopting, if appropriate, according to Policy 30.3.3, other options, including water augmentation, water use reduction, and water re-use and recycling, for ensuring water demand for future growth is able to be met.

(e) declining applications for subdivision or zoning change if sufficient reliable and potable water is not available;

(f) taking into account the potential effects of severe drought in the stated level of service objectives in the Council's asset management plan for water supply.

30.2.4 To continue to allocate water on the basis of priority in time for any application for a water permit where there is still water available for allocation.

30.2.5 To reserve water within the sustainable allocation limits of the water body for the following uses:

(a) irrigation needs in respect of Maori perpetual lease lands under perpetual leasehold terms (where Maori landowners are unable to directly influence authorised access to water for irrigable land through lease arrangements); and

(b) community water supply needs, taking into account expected demand until 2026; and to allow temporary use of the reserved water by other users until it is required for the reserved purpose.

30.2.6 In water management zones where there is no water available for allocation, to establish waiting lists to guide the re-allocation of any water that may become available in that zone.

In establishing waiting lists, priority for potential water users is assigned according to the following criteria in descending order of priority:

(a) whether there is 'priority in time', that is, whether the potential water user is on a previously established waiting list;

(b) whether water has been reserved under Policy 30.2.5(a).

Where no 'priority in time' can be determined, then priority will be assigned according to:

(c) whether a need for water can be demonstrated;

(d) whether there is compliance with relevant Plan rules;

(e) new users before existing permit holders;

(f) underground takes (which will normally be preferred over takes from surface waters);

(g) priority uses as listed in Policy 30.2.1;

(h) any remaining registrations assigned priority by chance.

30.2.7 To regularly review rates of water use specified on water permits, including those that are deemed permits under Section 386 of the Act, to ensure that levels, flows, rates or standards established for any water body or management zone will be met.

30.2.8 To set a common expiry date for water permits to take water in each water management zone, to ensure consistent and efficient management of the resource.

30.2.9 To take into account, when assessing any application to take water, any:

(a) provisions that may exist for the reservation of water;

(b) effects on other water users;

(c) measures taken for water conservation and to ensure efficient water use including monitoring water use;

and for any application to take water for irrigation;

(d) the soil water holding characteristics of the soil being irrigated;

(e) the influences of climate on crop water demand;

(f) measures to monitor soil moisture levels and water application rates.

(See also 30.1.9)

30.2.10 To regularly review permits to ensure the allocation authorised by the permit reflects what is actually needed by:

(a) encouraging permit holders to relinquish permits or, if relevant, to transfer the point at which water is taken, and/or lease or permanently transfer permits wholly or in part to another person if the water allocated is no longer being used, except in over-allocated zones where the transfer is likely to lead to an increase in irrigated area or amount of water used; or

(b) reducing allocations to reflect bona fide use.

30.2.11 To require water meters to be used by water permit holders:

(a) to ensure compliance with permit allocations or allocation limits; or

(b) when there is full allocation of water in a zone; or

(c) when there is a need for water use data to assess effects of abstraction on a water resource or in relation to an allocation limit; or

(d) in any zone where there is a rationing trigger.

Security of Supply

30.2.14 To seek to maintain or establish a minimum security of supply for all abstractive water users by establishing allocation limits and trigger levels for rationing whereby, for all except community water supplies, a reduction in 35 percent of the allocated amount is expected during a 10-year drought for permits to take water from surface or ground water bodies during summer periods.

30.2.15 To encourage taking of water for storage during high flow and to acknowledge that some water users can improve their security of supply above the minimum level through the storage or augmentation of water.

Efficient Water Use

30.2.17 To promote, encourage and require, as appropriate, water conservation practices in the use of water through:

(a) water use practices which minimise losses of water;

(b) water use practices that use water more efficiently;

(c) encouraging water users to use less water;

(d) encouraging the re-use of water;

(e) requiring the storage of water for any new dwelling not connected to a reticulated water supply.

30.2.18 To regulate the site-to-site transfer of water takes and changes to conditions on water permits according to the potential for adverse effects arising from the transfer or change, taking into account:

(a) the level of knowledge about the water body;

(b) the monitoring of water use;

(c) whether the transfer is within the same water management zone;

(d) the level of allocation within the zone;

(e) whether water has been reserved for any purpose in the zone in which the water is being transferred;

(f) whether the transfer of water facilitates access to water that is augmented from a water augmentation scheme.

30.3 Issue: Freshwater Augmentation

30.3.1 To encourage augmentation schemes such as water harvesting in dams and reservoirs, which avoid, remedy or mitigate adverse effects on water availability downstream or on values and uses of the river, especially in zones where there is an over-allocation of water.

30.3.2 To recognise the beneficial effects of water augmentation, including harvesting in dams and reservoirs when considering water permit applications, including beneficial effects on:

(a) aquatic habitat and ecosystems;

(b) increased water availability;

(c) downstream water bodies;

(d) other water users.

(See also 30.1.17 - Water Damming)

30.3.3 To support investigation and construction of water augmentation schemes, including water reticulation schemes where there is public benefit and to establish the level of support according to the following criteria:

(a) The extent to which a water supply is augmented or the level to which the security of supply for water users is enhanced.

(b) The nature or extent of benefits for habitat values of aquatic organisms.

(c) The nature or extent of benefits for recreational uses.

(d) The extent of any public health benefits.

(e) The extent to which adverse effects of water or land use activities can be mitigated.

(f) The extent to which there are other community benefits such as beneficial effects on landscapes, tourism, etc.

(g) The extent of any benefits for increasing knowledge or understanding of the nature or extent of a water resource.

(h) The extent to which adverse effects of water allocation policy on water users need to be mitigated.

(i) The scale of the proposal, especially in relation to benefits and costs of any alternative option.

30.3.20 Methods of Implementation

(b) Works and Services

(i) Support of water augmentation schemes according to the established criteria.

(ii) Co-ordination of, and financial and technical support for, the Waimea Water Augmentation project.

Appendix 2 Waimea Water Allocation Rules, Chapter 31, TRMP (13 January 2007 edition)

The following rules are extracts from the TRMP, as those relevant to water allocation in the Waimea catchment and to a potential water augmentation scheme.

31.1.2 Permitted Activities (Coastal Water and Freshwater Take, Diversion or Use)

The taking, diversion or use of water, including freshwater, coastal water or water stored in a dam, for any purpose, including for domestic water supply, is a permitted activity that may be undertaken without a resource consent, if it complies with the following conditions:

(a) The amount taken and used for stock drinking water is not limited.

(b) Where water is taken and used for any domestic water supply within any water management zone, during periods of water rationing in that zone there is no watering of lawns or other decorative plants.

(c) Except as provided for in conditions (d) and (e), the amount of water taken or diverted and used per property is in accordance with Figure 31.1A.

(d) There is no new take occurring after 3 November 2001 from:

(i) the coastal margin of the Delta Zone;

Figure 31.1A: Maximum Permitted Water Takes or Diversions in All Zones and of Inshore Coastal Water

WATER MANAGEMENT ZONE	MAXIMUM PERMITTED QUANTITY OF WATER PER PROPERTY (CUBIC METRES PER DAY)
Waimea Zones	
All zones [except as provided in (d)(i)]	5
Note: New bores in the Marahau Zone and in the coastal margins of the Delta and Hau Plains zones are also not permitted.	

(ea) The taking or diversion of water does not cause any stream or river flow to cease.

(f) Fish and eels are prevented from entering the reticulation system.

(g) The taking or diversion of water does not prevent any other individual from taking water for their domestic or stock drinking water supply needs.

(k) The taking, using or diversion of water does not cause erosion of land or the bed or banks of any river.

31.1.3 Controlled Activities (Water Take, Diversion or Use from Rivers, Aquifers and Inshore Coastal Water)

The taking, diversion or use of water from surface water, aquifers or inshore coastal water that does not comply with the conditions of Rule 31.1.2 is a controlled activity, if it complies with the following standards and terms:

(a) The water take is authorised by a water permit that is due for renewal.

(b) Except as provided in condition (c), for any rationing of consumptive water uses required to maintain minimum water flows or levels specified in Schedule 31.1C, reduction in usage comprises a series of cuts in authorised usage from the maximum weekly authorised as shown in Figure 31.1B:

Figure 31.1C: Rationing Steps

WATER MANAGEMENT ZONE	RATIONING STEPS
All water management zones except for the Riwaka Zone	Step 1 – Allocation less 20% = (quantity) m^3 per week Step 2 – Allocation less 35% = (quantity) m^3 per week Step 3 – Allocation less 50% = (quantity) m^3 per week
Wai-iti Zone	Rationing in the Wai-iti Dam Service Zone will be through rostering implemented by the Wai-iti Zone Water User Committee in accordance with the trigger and low flow specified in Schedule 31.1C
Note: If minimum water flows or levels given in Schedule 31.1C decrease beyond the provisions of these rationing steps, the Council may issue water shortage directions in accordance with Policy 30.2.1.	

Progression from steps 1 to 3 are at the discretion of the Council during times of low water flows or levels, in consultation with current water user committees. Step 1 rationing may be introduced once the specified trigger for rationing *(see Schedule 31.1C)* is reached. The need for steps 2 and 3 will be subject to the extent and duration of the low flow period.

(c) For any taking and use of water for community water supply, any rationing required to maintain minimum water flows or levels specified in Schedule 31.1C, comprises the following series of cuts in authorised usage from the maximum weekly authorised;

Step 1: Reduce usage to 10 percent less than the actual average monthly amount used in the same month in the most recent year that no rationing was imposed.

Step 2: Reduce usage authorised after implementing Step 1 by a further 7.5 percent.

Step 3: Reduce usage authorised after implementing Step 2 by a further 7.5 percent.

(d) Except as provided for in (da) or (daa), the amount taken and used for irrigation of field crops is the least of:

(i) the relevant rate given in Figure 31.1D; or

(ii) any lesser rate applied for; or

(iii) the level of bona fide use; or

(iv) the sustainable yield of the bore; or

(v) the quantity specified on the permit being renewed.

Figure 31.1D: Irrigation Rates

SOIL TYPES	RATE (CUBIC METRES/HA/WEEK)	RATE (MILLIMETRES/WEEK)
Braeburn	250	25
Dovedale	300	30
Mapua and Rosedale	190	19
Waimea	300	30
Richmond and Wakatu	270	27
Riwaka, Maori, Sherry	300	30
Ranzau, Motupiko and Hau	350	35

Up to 20 percent more than the rate specified may be allocated provided there is acceptable scientific evidence provided with the application that the crop and soil type being irrigated requires the higher amount. This evidence must include analysis of the soil's water holding capacity; information on the nature and scale of soil variability over the property, including depth of soil, stoniness etc.; crop water requirement information, including rooting depth and cover; climate information relevant to the property; and water metering data. The 20 percent allowable increase will only apply to crops already being irrigated as at 29 January 2005.

(da) The amount taken in the Wai-iti Dam Service Zone following commencement of the discharge from the Wai-iti Community Water Augmentation Scheme, and provided the scheme continues to be in operation, is:

(i) no more than the quantity able to be yielded from the bore where the take is from groundwater; and

(ii) no more than the quantity specified on the permit being renewed; and

(iii) no more than the relevant rate given in Figure 31.1D for irrigation use takes;

or

(iv) any lesser rate applied for.

(daa) Condition (d) does not apply in the Waimea water management zones (except the Wai-iti Zone and the Wai-iti Dam Service Zone).

(e) For any taking and use of water for community water supply, the amount taken is the least of:

(i) the level of bona fide use; or

(ii) any lesser rate applied for; or

(iii) the sustainable yield of the bore; or

(iv) the amount specified on the permit being renewed;

or if an increase in the amount specified on the permit being renewed is sought then it is:

(v) provided for in Schedule 31.1D and subject to provisions of any waiting list; and

(vi) is no more than the amount needed to satisfy the likely water demand for the duration sought for the consent.

Schedule 31.1D: Reservation of Water

TABLE 2
RESERVATION OF WATER: COMMUNITY SUPPLY

Water Reticulation Scheme/Supply	(A) Amount Currently Allocated	(B) Total Required (Calculated) in 2026		(C) Amount Reserved	
	(l/sec)	(l/sec)	m^3/day	(l/sec)	m^3/day
Reservoir Zone (Waiting list applies to new takes)					
Groundwater – Hope and Brightwater reticulation	32.4	41	3540	8.6	743
Wai-iti Zone					
Groundwater – Wakefield reticulation	15	19.3	1670	4.3	370
LCA Zone					
Groundwater – Richmond	84.1	130.15	11245	46.05	3980
Delta Zone (Waiting list applies to new takes)					
Groundwater – Waimea Domestic/Industrial/Irrigation	178.2	189.8	16400	11.6	1000

(f) For uses other than those provided for in (d) and (e), the amount taken and used is the least of:

(i) the level of bona fide use; or

(ii) any lesser rate applied for; or

(iii) the sustainable yield of the bore; or

(iv) the amount specified on the permit being renewed.

A resource consent is required, and may include conditions on the following matters over which Council has reserved control:

(1) The quantity, rate and timing of the take not otherwise specified above, including rates of take, rostering or rationing steps required to implement conditions (b), (c) and (d), and any other requirements to maintain any minimum flow or level given in Schedule 31.1C.

(2) The location of the point of take or yield of any bore, including taking into account required spacing between bores *(see Schedule 16.12A)* and aquifer characteristics such as depth, permeability, yields required, and yields available in existing adjacent bores.

(3) The effects of the take on other uses or values of the water body or coastal water, including those given in Schedule 30.1.

(4) The effects of the take on other water users.

(5) The need for backflow prevention for any takes from groundwater.

(6) The effects of the take either by itself or in combination with other existing takes on aquatic and riparian ecosystems, including fish and eel habitat and flows in rivers or coastal streams affected by takes from groundwater.

(7) Except in relation to any take in the Wai-iti Dam Service Zone, a reduction in allocation where a bona fide review shows that water use is less than the amount of water allocated.

(7A) The amount taken and used in any Waimea water management zone (except the Wai-iti Zone and the Wai-iti Dam Service Zone) in relation to:

1. bona fide use,
2. relevant rates given in Figure 31.1D,
3. sustainable yield of the bore,
4. the rate applied for,
5. the quantity specified on the permit being renewed, and

the likelihood of a water augmentation scheme designed to service the relevant zone, proceeding.

(8) Installation of water meters as provided for in Schedule 31.1B or in Policy 30.2.11.

(9) Information to be supplied and monitoring requirements.

(10) Measures to achieve efficient water use or water conservation including sealing of artesian bores, preparation of property water management plans, and measures to monitor water use.

(11) Except as provided in (g) above, the duration of the consent as provided for in Schedule 31.1A (Section 123 of the Act), timing of reviews and the purposes of reviews (Section 128 of the Act).

(12) Financial contributions, bonds and covenants in respect of the performance of conditions and administration charges (Section 108 of the Act).

Notes:

This rule does not apply in situations where a resource consent application is made after a permit has expired.

The exception given in matter (7) applies only as long as the Wai-iti Community Water Augmentation Scheme is in operation.

31.1.4 Controlled Activities (Water Take, Diversion or Use within Allocation Limits)

The taking, diversion or use of water that does not comply with the conditions of Rule 31.1.2 or the standards and terms of Rule 31.1.3 is a controlled activity, if it complies with the following standards and terms:

(a) The water is taken or diverted in a water management zone with an allocation limit specified in Figure 31.1E.

(b) Subject to condition (ba), the amount of water taken or diverted on its own or in combination with other authorised takes does not exceed the relevant allocation limit specified in Figure 31.1E.

(ba) Where the water was being taken or diverted and used for farm dairy wash-down and milk cooling purposes before 3 November 2001 in any water management zone, the relevant allocation limit specified in Figure 31.1E does not apply.

Figure 31.1E: Allocation Limits for Freshwater Takes

WATER MANAGEMENT ZONES	ALLOCATION LIMITS (LITRES PER SECOND)
Wai-iti Zones	
Wai-iti Dam Service Zone following commencement of the discharge from the Wai-iti Community Water Augmentation Scheme, provided the scheme is in operation.	515 l/sec
Wai-iti Zone (not including the Wai-iti Dam Service Zone.)	Subject to condition (c)
Waimea Zones	
~~Reservoir~~	~~826~~
Upper Catchments (Wairoa, Lee and Roding Rivers)	3
~~Waimea West~~	~~178~~
Hope and Eastern Hills	97
~~Golden Hills~~	~~113~~
~~Delta~~	~~1000 [subject to condition (c)(ii)]~~
~~Upper Confined Aquifer~~	~~147~~
Lower Confined Aquifer	230

Notes:
(1) For any zone or water body within a zone not listed here, Rule 31.1.6 applies.
(2) Allocation limits are for the period November to April. They are calculated as sum of weekly permit allocations, and refer to surface or groundwater takes, but do not include takes from storage (*see Rule 31.1.5)*.

(c) The water is not taken during November to April (inclusive) from:

(i) the coastal margin of the Hau Plains Zone;

(ii) the coastal margin of the Delta Zone;

(iii) the Wai-iti Zone.

(d) The amount of water taken on its own or in combination with other authorised takes is available after the quantities specified in column (c) of both Tables 1 and 2 of Schedule 31.1D have been allocated for the purposes specified.

(e) Conditions (b), (c), (d) [other than (d)(iii)], (da) and (e) in Rule 31.1.3.

A resource consent is required, and may include conditions on the following matters over which Council has reserved control:

(1) The quantity, rate and timing of the take not otherwise specified above including rates of take, rostering or rationing steps required to implement condition (f) and any other requirements to maintain any minimum flow given in Schedule 31.1C.

(2) The location of the point of take or yield of any bore, including taking into account required spacing between bores (*see Figure 16.12A)* and aquifer characteristics such as depth, permeability, yields required, and yields available in existing adjacent bores.

(3) The effects of the take on other uses or values of the water body, including those given in Schedule 30.1.

(4) The effects of the takes on other water users.

(5) The need for backflow prevention for any take from groundwater.

(6) The effects of the take either by itself or in combination with other existing takes on aquatic and riparian ecosystems including fish and eel habitat and flows in rivers or coastal streams affected by takes from groundwater.

(7) Except in relation to any take in the Wai-iti Dam Service Zone, a reduction in allocation where a bona fide review shows that water use is less than the amount of water allocated.

(8) Installation of water meters as provided for in Schedule 31.1B or in Policy 30.2.11.

(9) Information to be supplied and monitoring requirements.

(10) Measures to achieve efficient water use or water conservation, including sealing of artesian bores, preparation of property water management plans, and measures to monitor water use.

(11) Except as provided for in (e) above, the duration of the consent as provided for in Schedule 31.1A (Section 123 of the Act), timing of reviews and the purposes of reviews (Section 128 of the Act).

(12) Financial contributions, bonds and covenants in respect of the performance of conditions and administration charges (Section 108 of the Act).

Note: The exception given in matter (7) applies only as long as the Wai-iti Community Water Augmentation Scheme is in operation.

31.5.1A Controlled Activities (Site-to-Site Transfer of Water Take in the Wai-iti Dam Service Zone)

The transfer to another site of all or part of the interest in any water permit to take or use water is a controlled activity, if it complies with the following standards and terms:

(a) Both the point of take to be transferred and the new point of take are within the Wai-iti Dam Service Zone.

(b) The sum of any new quantities authorised as a result of the transfer does not exceed the original amount authorised to be taken.

(c) There is no more than 0.25 metre additional drawdown in groundwater level for any adjacent authorised groundwater take. This requirement need not apply provided the owner of any affected bore agrees in writing to some other drawdown effect.

A resource consent is required. Consent may be refused or conditions imposed, only in respect of the following matters to which Council has restricted its discretion:

(1) Compliance with relevant rules concerning the setback requirements between bores and the quantity, rate and timing of the take not otherwise specified above, including provisions for rostering, and rationing.

(2) Any relevant conditions on the original permit.

(3) The effects of the take either by itself or in combination with other existing takes on flows and water body values of the Wai-iti River and effects on other users.

(4) Installation of water meters.

(5) Information to be supplied, and monitoring requirements.

(6) Measures to achieve efficient water use or water conservation, including sealing of artesian bores, preparation of water management plans, and measures to monitor water use.

(7) The duration of the consent (Section 123 of the Act), timing of reviews, and the purposes of reviews (Section 128 of the Act).

(8) Financial contributions, bonds and covenants in respect of the performance of conditions and administration charges (Section 108 of the Act).

Note: Rules 16.12.2 and 16.12.3 apply to construction of any new bores.

31.5.1 Discretionary Activities (Site-to-Site Transfer of Water Takes)

The transfer to another site of all or part of the interest in any water permit to take or use water is a discretionary activity, if it complies with the following standards and terms:

(a) Where water is to be transferred to an area where rules specify different rates of use, then the different rate will apply to the transfer, provided that the sum of any new quantities authorised does not exceed the original amount authorised to be taken.

(b) The transfer is not in the Moutere Surface Water Zone, the Reservoir, Waimea West, Golden Hills, Delta and Upper Confined Aquifer zones except where the total area irrigated before and after the transfer does not increase.

(c) The transfer is not out of a water management zone.

A resource consent is required. Consent may be refused or conditions imposed, only in respect of the following matters to which Council has restricted its discretion:

(1) Compliance with relevant rules concerning the setback requirements between bores and quantity, rate and timing of the take, including provisions for rostering, rationing and rates of take.

(2) The need or appropriateness for the transfer, including any changes of use.

(3) Other water supply options for water users in the affected zones.

(4) Whether the water body from which the water is to be taken is changed.

(5) Whether water has been reserved for specified purposes in the zone.

(6) Any relevant conditions on the original permit.

(7) The effects of the take on other users or values of the water body.

(8) The effects of the take either by itself or in combination with other existing takes, on aquatic and riparian ecosystems, including fish and eel habitat, and flows in rivers, wetlands or coastal springs affected by takes from groundwater.

(9) A reduction in allocation where a bona fide review shows that water use is less than the amount of water allocated.

(10) Installation of water meters as required in the relevant zone and shown in Figure 31.1D.

(11) Information to be supplied, and monitoring requirements.

(12) Measures to achieve efficient water use or water conservation, including sealing of artesian bores, preparation of water management plans, and measures to monitor water use.

(13) The duration of the consent (Section 123 of the Act), timing of reviews, and the purposes of reviews (Section 128 of the Act).

(14) Financial contributions, bonds and covenants in respect of the performance of conditions and administration charges (Section 108 of the Act).

31.5.2A Non-Complying Activities (Site-to-Site Transfer of Water Takes)

The site-to-site transfer of a water take that does not comply with the standards and terms of Rule 31.5.2 is a non-complying activity.

A resource consent is required. Consent may be refused or conditions imposed.