



# WATER

# MATTERS

## Kapiti Coast District Sustainable Water Management Strategy

November 2002

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## Introduction

This documents sets out Kapiti District Council's vision for water management in the district over the next fifty years.

That vision recognises that water is ultimately a finite resource.

It recognises that this finite resource needs to be shared between the district's natural ecosystems and human systems, if both are to remain healthy. It recognises that the health of the natural systems, especially the rivers, streams, aquifers and coastal waters, is essential to people's health and pleasure in their world, and to a large extent, is essential to the local economy.

The rebalancing of human and ecosystem needs has been underway in the Waikanae River catchment for some time. The adjustment has not been easy and it is fair to say that the process of rebalancing was initially driven by external regulation. This strategy now takes this process to its very heart and makes the issue of ecosystem capacity a key driver in future development decisions. In a sense, water supply and water use management are being re-connected to the local environment.

This vision also recognises that of the water use by residents needs to be balanced being able to use water for economic development. Where that balance lies depends very much on the community's vision about the nature of their towns, community and economy. If Kapiti Coast's future lies as a series of residential settlements, with relatively low local employment and high levels of commuting, then the demands of residents may be more important. If the vision for the future is of more local employment, there may need to be more constraints on residential use.

This Strategy does take a position on this issue and works to a vision of balanced community development, which retains a key relationship with Wellington but seeks a stronger local economy. It is built on a vision of more holistic and rounded development and a vision of communities that have more choice about where they work.

It also makes a distinction between the kinds of economic development which might locate within each catchment. The Otaki catchment, with its horticultural activities may have different water needs and therefore a different balance between residential and business development needs, than that which might be found in the Waikanae catchment.

This Strategy while factoring in a future vision which incorporates economic development, does not support a vision of unconstrained business sector use of water. New business activities that use large amounts of water will not be encouraged and every effort will be made to reduce any excessive consumption by existing businesses. This still leaves a wide open field for investment and for businesses with a sense of environmental and civic responsibility.

This Strategy also recognises the implications of shifting water from one catchment to another as the limits on water supply in one catchment are reached. Tangata whenua question such an approach for a range of reasons, all of which need to be given serious consideration by the wider community. Equally, the borrowing of water from one

catchment for another also effectively borrows the development potential of one catchment for another. This needs to be and debated in terms of the future picture or vision for the district, rather than as merely a response to problems of supply.

This Strategy does not dismiss the potential for borrowing from across catchments in the future, should future communities decide to do so. This particular community vision, for the next fifty years takes careful note of tangata whenua and community concerns. It takes note of the need for further exploration of the development vision for each catchment and therefore whole district.

It adopts a series of principles which allow local communities to design their systems within the capacity of their local catchment first. This means understanding the final capacity of each catchment to provide water and then managing the combination of supply, storage and demand to provide the maximum 'headroom' for development within the finite constraints. The willingness of each community to manage demand will ultimately decide how each of their local areas will develop.

This Strategy states that the possibilities of cross catchment water supply will be considered but within a context of local responsibility for managing supply and demand within a catchment as a first principle. These cross-catchment options may include regional supply options in the future. The intention is to debate and explore this wider picture once more is known about local need, growth pressures and economic development possibilities. In effect, there is a shift away from water supply decisions shaping overall water management, to an approach that balances supply management with a wider community vision, demand management and community and iwi partnerships.

Central to this Strategy is the belief that there is considerable room within each catchment within the next fifty years for any further development, should that development be desired. That potential is only there if demand for water is reduced and there is careful management of water storage. None of the communities are likely to reach the final capacity of their catchment within the fifty years of this Strategy – if they make a conscious effort to reduce demand. However, by the end of the fifty year period, at current population growth levels and with a stringent demand management regime in place, Waikanae will have come close to the capacity of natural systems to deliver water. If the community fails to adapt its levels of water use then the limits will be reached much earlier. If that happens, the desired balance between residential growth and supporting local economy may not be as achievable.

In effect, the key long term issue is that of demand management. The Strategy takes the view that the community's role via the Council, is to support basic water needs and some lifestyle use - within the capacity of natural systems. This Strategy, therefore is built on the principle that a key role for community investment in water management, is to reduce demand levels in high consumption catchments.

Supply will be secured within this framework of demand reduction. This is very different from an approach that sees demand management and water conservation as an addition to the normal focus on securing supply. The level of demand for which the community will take direct responsibility, provides for basic needs and some lifestyle activities that have been a traditional focus for some communities on the coast.

In the end, the balance between immediate lifestyle and long term economic opportunity will be decided in each catchment – according to the willingness of the community to adapt to what are changing circumstances. Future communities and future strategies may well take an even more restricted view of the Councils role, perhaps confining supply responsibilities to basic needs and fire fighting only. This Strategy, which has a fifty year horizon, takes the view that the Kapiti Coast needs to fundamental change the way it manages water supply. Each person and household will need time to adjust and will need help to do so. Past community water supply decisions and management made it easy for people to forget that there were ultimate limits to the ability of their environment to supply water. It is only appropriate that there be a shared and equitable responsibility for making a change back again.

The Strategy also seeks to shift from a reactive approach to water management to one of leadership. Management and allocation of freshwater resources has been signalled by the central government as a major focus for the future. This strategy takes up this leadership challenge by attempting to develop a more cohesive, comprehensive and holistic approach to water management. This ranges from issues of supply and demand management, to an emphasis on the adaptability and flexibility of housing stock and infrastructure over time, to a new emphasis on partnership with community and iwi around water.

The remainder of this document is divided into two broad parts. The first identifies the overall principles and framework for water management across the district. The second sets out draft water management plans for Otaki, Te Horo and Hautere, Waikanae, Paraparaumu and Raumati, and Paekakariki. Each of these plans is developed to varying levels. This reflects the extent to which water issues have been explored for each area in the past. Some are more advanced than others and in some cases, the plans focus more on process than detailed action. The water plans can be added to over time as each community explores its water management future.

## Executive Summary

- On the 18 September 2002, the District Development Committee adopted a process for the final development of the district's water management strategy. These final stages built on the earlier submissions process and Citizens Group discussion that occurred earlier in 2002.
- From discussions and deliberations during October and November 2002, and drawing on earlier submissions, the Council has developed a draft water management strategy for a final stage of consultation during December 2002, and January and February 2003.
- Discussion was progressed as a series of 'layers', beginning with principles that provide an overall framework for water management. These were then used to guide discussion of water management for each local community. The ideas developed for each of these communities were taken to varying degrees of detail. This reflected the level of historic and recent scrutiny of water issues for each of these areas. The Waikanae, Paraparaumu and Raumati areas had received the greater scrutiny and therefore the principles 'drilled down' into more detail.
- In addition, it was noted that further work being undertaken to identify the 'worst case costs' for the bores and the possible storage ponds. By this is meant the costs if all technical features had to be provided. This is discussed further below.
- The conclusions that now form this draft strategy are:
  - **water management is an issue for all the Kapiti Coast communities to address.** This is a significant change from the past focus on the Waikanae, Paraparaumu and Raumati supply issues. Even though there are fewer immediate pressures on the other communities, in order to avoid a crisis management approach, each community needs to begin to think about water management;
  - **water management must be a partnership** between Council and iwi, who have a kaitiaki (guardian) role and with local communities.
  - **water management must take account of the natural capacities of local environments.** This was adopted as a general principle but it was agreed that more information is needed. The greatest amount of information available is for the Waikanae, Paraparaumu and Raumati areas, reflecting the scrutiny that area had received. It was agreed that more work was needed to understand natural capacity for Otaki, Te Horo and Hautere. This was an essential precursor to understanding the development potential of each area and from there, understanding the degree to which this catchment might provide water to the rest of the district.

The long term community and iwi vision for the restoration of the Otaki and Waikanae river corridors and in-river habitats and fisheries was also identified as essential to understanding natural capacity.

The need to understand more about the Waikanae and Paekakariki aquifers and river and stream capacity was also acknowledged.

- **development futures must be understood and managed in relation to this natural capacity.** This is a general theme running through the strategy. There are two areas where more understanding is needed:
  - **residential growth:** are existing assumptions about where residential growth might go consistent with emerging information about catchment capacity? For example, what are the constraints on the Waikanae, Paraparaumu and Raumati areas? Should these be managed over time? Should there be more focus on demand management to provide more headroom for development? What are the implications for the Otaki area? What are the impacts of rural residential blocks on water supply and natural capacity?
  - **economic development:** has past emphasis on residential growth and associated water demand left sufficient room for economic development? This is particularly important given the district's long term vision for more local employment opportunities. The lack of information about possible economic growth and water use implications was raised.

The following was agreed:

#### **Otaki, Hautere and Te Horo:**

- undertake more analysis of the potential for economic development and associated water needs;
- undertake more work on district wide residential growth issues and review these in relation to economic development opportunities in this area;
- review this work against improved understanding of natural capacity in the area and water consumption figures.

#### **Waikanae, Paraparaumu and Raumati**

- continue to review the economic development implications for water use;
- review the residential development/population growth implications – available land and water consumption figures;
- this work needed to be undertaken but would not delay dealing with immediate supply issues. The latter would take account of the need to provide some 'headroom' for development while the wider long term growth issues were explored.

## **Paekakariki**

- need to review infrastructure improvement issues (national pressures) in relation to potential growth pressures.
- **efficiency of water use systems: future adaptability.** It was agreed that apart from any immediate issues of supply or capacity, there was a need to take a longer term view. This includes ensuring that the physical building stock, and water reticulation systems are efficient. A second focus area is on working with the community to develop non-potable supply 'systems' that reduce unnecessary reliance on the more expensive potable supply systems.
- **Level of Service: Personal Water Use:** It was agreed as a basis for discussion with the community that people needed to work to reduce the level of water consumption overall, and potable water consumption in particular. Past planning standards (mainly developed in relation to the Waikanae had been based on a peak demand standard of 650 litres per person per day (lpd) and a 435 lpd average demand). This included in the case of Waikanae, Paraparaumu and Raumati about 80 lpd water loss. There was agreement that:
  - communities should work towards a standard of 400 lpd peak demand (not including water loss). This would be made up of 250 lpd for essential use and 150 lpd for non-essential use.
  - Council would adopt this district wide goal but would work with each community to set local targets and timelines. It would review performance on a regular basis relative to the wider picture and local risk and management issues.
  - It was agreed that each community was at a different stage in setting targets for water consumption. **For Otaki**, there was a need to understand total use, who was using the water (residential or business) and the level of water loss from the system. It was agreed that this should be done over the next two years. **For Te Horo and Hautere**, it was agreed that there was a need to understand the implications of future development potential, to tease out levels of water use between properties under the system of water units for the Hautere rural supply and to link this to natural capacity before targets could be set. Any new capacity would be designed to the draft standards.
  - **For Waikanae, Paraparaumu and Raumati**, the consensus was that targets needed to be set to achieve the new standards. A target of reaching this new consumption level by 2013 was set.
- **Levels of Service: Planning for Drought Years:** It was agreed that the planning for storage/supply to offset the loss of supply from the river in periods of low flow should be as for the new standard. This may have some



short term risks if demand for water is not reduced immediately but if the storage and rate of demand reduction is tied together this is unlikely to be an issue.

- **Levels of Service: Businesses.** The level of service for business would be to provide certainty of supply, provided that any increase in system capacity to support new economic development was within the capacity of local communities to pay for that investment.
- **Levels of Service: Access to Non-potable supply.** It was agreed in general and for each area water plan that there was a need to equip each community so that the reliance on the more costly potable supply was reduced. **For Otaki, Hautere and Te Horo**, where there was considerable existing complexity, it was agreed that a review of existing systems and conditions should be carried out, along with discussions with the community and assessment of demand for non-potable water for economic development. **For Waikanae, Paraparaumu and Raumati**, where it was considered there were more immediate pressures, a series of draft targets were set. These have a ten year timeframe.
- **Funding:** There was consideration of both general principles and funding options for each area. The following was agreed:
  - water supply systems would continue to be rates funded with costs for each community system borne by the local community;
  - it was agreed that the possibility of essential supply (250 lpd) being funded district wide and non-essential supply (150 ld) being locally funded would be explored further and discussed with the community.
  - Council would continue to work to the current timeframe of introducing meters in 2008-10 when meters would be installed across the district, unless community consumption targets are already met;
  - there was a need for further exploration of mechanisms to create incentives to reduce water use. This might include water consumption charging but each method needed to be reviewed in terms of equity impacts, social impacts and effectiveness. This review would occur within the next two years.
  - consultation with the community on the best funding methods to achieve demand reduction would occur during 2003/04.
  - if charging by volume was to be introduced, essential water use would not be included in that charge. It would either be paid for from rates or via stepped charges for non-essential use. Average household use would be assessed to arrive at an equitable base level of household use.

- the possibility of voluntary water metering and user pays to allow those who had invested in water conservation and meters to take advantage of any water reduction would be reviewed for the 2003/04 annual plan process.
- **Demand Management:** In addition to the setting of consumption targets, important initiatives are:
  - recognition of demand management as an essential water management tool, and not merely as a water supply crisis management tool;
  - requirements for a district wide demand management plan and initiatives – first stage to be developed for the 2003/04 annual plan;
  - requirements for local demand management sections in local water plans – including targets and clear initiatives;
  - improved understanding of water consumption and water loss;
  - long term monitoring of all communities;
  - identified steps for each community to review its water consumption performance. For Otaki, Hautere and Te Horo this included improved information and initial analysis;
  - emphasis on water loss management and minimisation across the district;
- **Water supply management:** It was agreed that the early focus would be on:
  - solving the Waikanae, Paraparaumu and Raumati water supply issues within a framework of reduction to 400 lpd consumption by 2013;
  - the preferred option to deal with immediate security of supply issues in Waikanae, Paraparaumu and Raumati in dry years, is to work to develop the bore network to the maximum yield from the aquifer, to be supported by exploration of storage ponds and river recharge options;
  - improving the Otaki water quality risk grading – with associated improvements to supply capacity (either storage or new bore supply);
  - reviewing issues associated with the Hautere rural supply, provided that this was integrated with the wider natural capacity and development capacity work in the area – and with the Otaki supply management issues;

- exploring initiatives to improve water supply grading for the Paekakariki area – to be linked to wastewater management issues.
- There was also consensus that as an initial principle, in-catchment decisions should be developed, provided that these solutions were tested against out-of-catchment options if these were raised. This approach was taken with the Waikanae, Paraparaumu and Raumati supply issues
- It is acknowledged that the idea of district wide supply systems needed to be debated. It was proposed that this debate, subject to decisions for the immediate supply issues, should be held within the next two years, once the issues of catchment natural capacity and development capacity had been explored in more detail. If this was to occur, the methodology for analysis was to be agreed with iwi and the community and was to take account of amenity and spiritual concerns as well as pure expenditure and physical risk impacts.

It was noted and agreed that in the future, communities are likely to maximise use of in-catchment water, whether or not there are district wide solutions already in place. This merely reflects that communities, whether in the immediate or far future, will seek to make full use of resources available. This means that in-catchment solutions will not foreclose on district wider solutions in the future. It was agreed that investment in catchment based supply at any point in time should be seen as providing building blocks for a cross catchment system, should that be considered appropriate.



Part A:

District Wide Principles  
and Framework

# 1. Context for Water Management and Services

These principles were adopted as the basic foundation upon which the various building blocks of the sustainable water strategy could be built.

## The Natural Resource

### 1.(a) Water is a finite resource

This is the most important principle that drives Kapiti Coast's water strategy. It may seem an obvious statement but it is one that is rarely an explicit part of water service planning for New Zealand communities.

There is only a certain amount of rain that falls on the hills and coastal plain in the district. It is this rainfall that dictates the total potential resource available to the natural environment and the Coast's human community. This rain either flows down into river and stream catchments and out to sea, or it percolates through the soils and is stored in underground aquifers. Natural water storage systems do exist, such as lakes, underground aquifers and to a limited level wetlands. But each of these will be finite. Some will have limits because they support ecosystems which need a basic level of water to survive. Others will have effective limits because the rate of recharge may be slower than the rate of water take – for example underground aquifers. These systems provide a finite amount of water to a community.

The natural resource consists of:

- **the main streams and rivers:** the Waiotihu, Otaki River, the Mangaone, Waikanae River, the Wharemauku and Wainui Streams (Smith's Creek);
- **the aquifers:** Waiotihu, Otaki, Hautere, Coastal, Waikanae and Paekakariki aquifers;
- **rainfall:** at varying levels – the higher rainfall across the Tararuas (see Map 1).

Engineering solutions will allow water to be captured and stored, or mined from natural water storage systems. They will enable water to be drawn off from river flows and to be transported across catchments. This allows a community to maximise its access to the water resource but it cannot extend that resource beyond what has entered the local environment via rainfall.

Kapiti Coast District has not yet reached that absolute limit within any of its catchments although the parts of the water system are under pressure. If the community is prepared to manage the demand for water and the way growth occurs, there is room for continued development towards a sustainable environment, a sustainable economy and sustainable settlement.

Explicitly recognising that water is a finite resource brings a discipline to bear on development decisions. It means continually checking present decisions to ensure they do not foreclose on the future the community wants.



**Limits**  
residual flows



**Limits**  
recharge  
salt water  
ground impacts



**Limits**  
what can be captured

**1 (b) The amount of water available for the Kapiti Coast community's use is that which remains after sufficient water is reserved to maintain the basic life supporting capacity and amenity of river, stream, lake, wetland and estuarine ecosystems.**

If the principle of water as a finite resource is to be a central driver of the District's water strategy, then the next most important principle is that water is a resource that must be shared between human needs and natural systems. Again, this is probably a concept that is recognised by many people but is not one that is often explicitly recognised as a guiding principle for water services and water management.

Natural systems need water to survive. Adaptation is possible but at some point the capacity of the ecosystem to support life will be jeopardised. For land based ecosystems, the amount of water will dictate the amount and nature of the vegetation and wildlife. This is a function of both rainfall and groundwater availability. For freshwater ecosystems, the amount of water will dictate whether there is habitat and therefore aquatic animals. The key issue is the flow of water and the seasonal volumes of water in lakes and wetlands.

As noted in the introduction, the rebalancing of human demands with ecosystem needs has been underway in the Waikanae catchment for some time. The adjustment has not been easy and it is fair to say that the process of rebalancing was initially driven by external regulation (e.g. standards for residual water flows).

Making this principle an explicit part of the strategy does not prevent debate about what the actual limits are for each river or aquifer.

**1 (c) The Kapiti Coast District community, including members of hapu and iwi, value the district's natural ecosystems especially its rivers, streams, lakes and remaining wetlands, the food sources found in these waterways and the contribution these waterways make to the wellbeing and amenity of the district.**

Clearly the community places high value on the district's water ecosystems and resources. The statement makes clear that all people place a cultural value on water, although there may be different ways of valuing the resource. Council is increasingly involved in wetland and river edge restoration. The issue here is the extent to which Council wishes to make the link between water management and natural environment management as part of its draft water management strategy.

## **Development Issues and Choices**

**1 (d) The amount of water available for human use defines the remaining development potential available to communities within each catchment.**

This may seem an obvious statement but it is not one that is often made in operationally based water and urban development management programmes. It is linked to the concept of water as a finite resource but is focused on the idea that the amount of water available really translates in the long term (sometimes the very long term), into the amount of residential and economic development that is possible in an area.

Often urban development decisions are focused on whether there is sufficient infrastructure and water storage in place to accommodate growth pressures. It is assumed that water can be transported over longer and longer distances when growth occurs. This is entirely possible but there are ultimate limits to this and costs will rise the further afield the water supply.

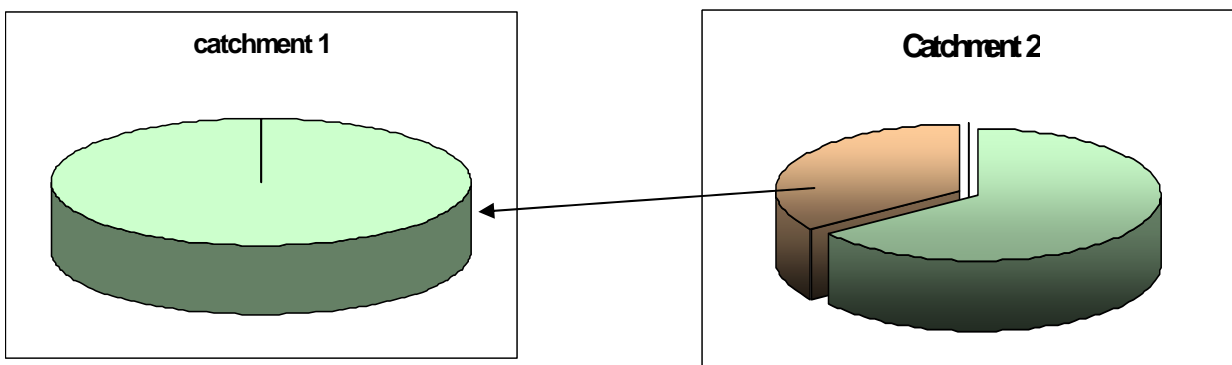
Explicit recognition of these principles in a strategy means the community will need to think about what it wants to be like when that limit is reached. It makes a link between resource capacity, growth and the nature of that growth.

**1(e) If water is shifted across catchments then a portion of the development potential of one catchment will be moved to the other catchment.**

This is a logical ‘follow-on’ from the previous point. Each catchment has a finite water resource and therefore final capacity for development. Water can be moved across catchments but in doing so the amount of final development capacity is moved.

This may well be acceptable to the community. But such an action would need to be thought through in terms of how the local and district wide benefits are shared.

Explicit recognition of this principle, will focus attention on the link between development (urban and economic), community vision and the water resource. It places operational decisions within the context of wider development issues and goals.



*If a portion of the water resource is shifted from Catchment 2 to Catchment 1, the development capacity of Catchment 1 will increase. The development capacity of Catchment 2 will be reduced.*

**1 (f) Levels of water consumption are choices about:**

- the environmental quality of the district;
- the kinds of services the community will receive at any one time;
- how soon the development potential of the district will be used up;
- what kind of development there will be.

**1 (g) The kinds of water supply system that are chosen are choices about:**

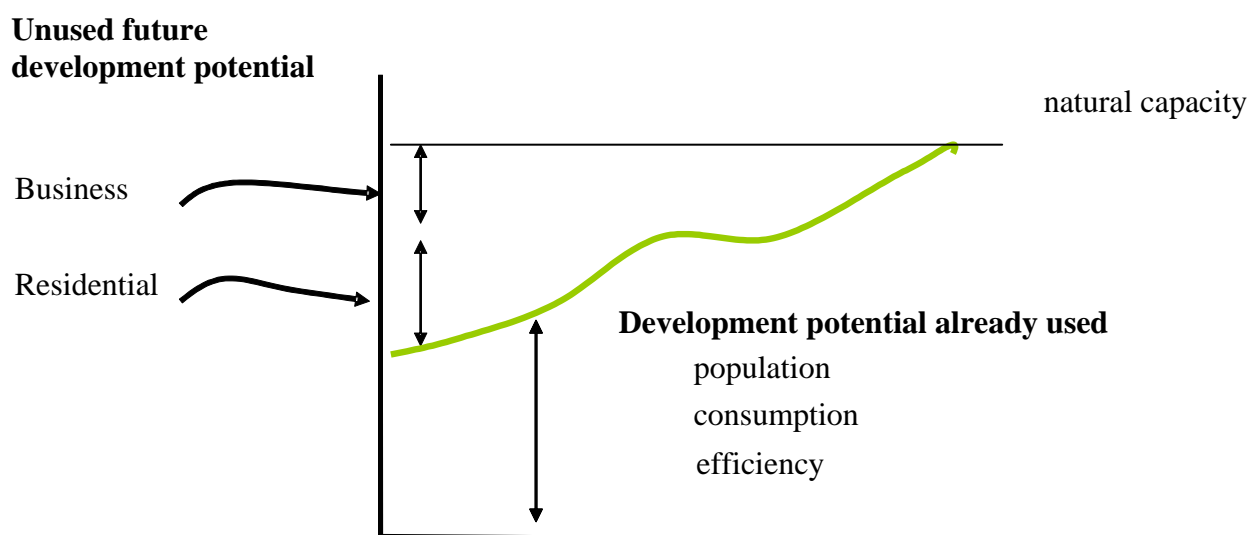
- the environmental quality of the district;
- where development will happen in the district.
- the kinds of public health and safety risks that people consider acceptable;
- cultural attitudes to water and water management.



Again these principles may seem self-evident but they are not always acknowledged as part of water management. Often the issue of water consumption for lifestyle purposes is seen as a right. Modifying any level of consumption is seen as interfering with rights. However, high levels of consumption require investment of community wealth in infrastructure. If it was not used to respond for water supply infrastructure, this money could be invested in other facilities such as libraries or recreation, or roads. These choices and trade-offs need to be transparent.

Similarly, given that there will be limits on the available water resource, if it is primarily consumed via residential demand, this will limit the level of economic development.

Investment in water infrastructure to service relatively high levels of consumption may be appropriate. Adoption of these statements does not automatically mean restriction of consumption but it does focus attention on the issue of how, and when, the development potential of the district is ‘used up’.



## Working with Iwi

**1 (h) Council has a statutory duty under the Resource Management Act to explore the concept of kaitiakitanga with iwi as it relates to water and other matters. It must do so in a way that that has regard for the principles of the Treaty of Waitangi.**

**1 (j) Hapu and iwi have a role in water management as kaitiaki of the environment. This kaitiaki (guardian) responsibility is paralleled by a role of care or manaakitanga towards the wider community. How these roles unfold in relation to water will be a matter for discussion between hapu, iwi and Council over time.**

The first statement refers to requirements under the Resource Management Act (Ss 7(a) and S 8). Inclusion makes it clear that Council recognises these responsibilities. The second point notes that there are parallel concepts that sit within or alongside the concept

of kaitiakitanga that remain to be explored – both generally and as part of any statutory responsibility.

**1 (l) From the perspective of Ngati Raukawa, Te Atiawa and Ngati Toa, protection of the mauri of the waterways is a significant concern. This concern encompasses but is not confined to, issues of ecosystem health and potential harm to the spiritual kaitiaki that protect the waterways.**

This statement makes it clear that the tangata whenua perspective on water, especially the concept of mauri and the spiritual dimension to the environment, are accepted as a matter of fact. These views are a foundation on which other water management decisions are to be made.

The effect is to require consideration of these cultural views in water management as a matter of course, rather than them being raised as a case by case response to particular resource consents. It does mean any option would always be developed and assessed against those concerns. The detail of any effect would be assessed case by case.

Explicit adoption is intended to send a signal on the overall approach to working with iwi. What this means in terms of actual actions and initiatives is explored below.

The next sets of principles are focused on the role of Council in water management. They are set out as statements which can be endorsed, rejected or modified through discussion.

## **2. Water Management: The Overall Role**

**2 (a) Council's overarching role in relation to water is to manage access to and use of a finite and variable water resource.**

**2 (b) Council will focus on seven areas of water management:**

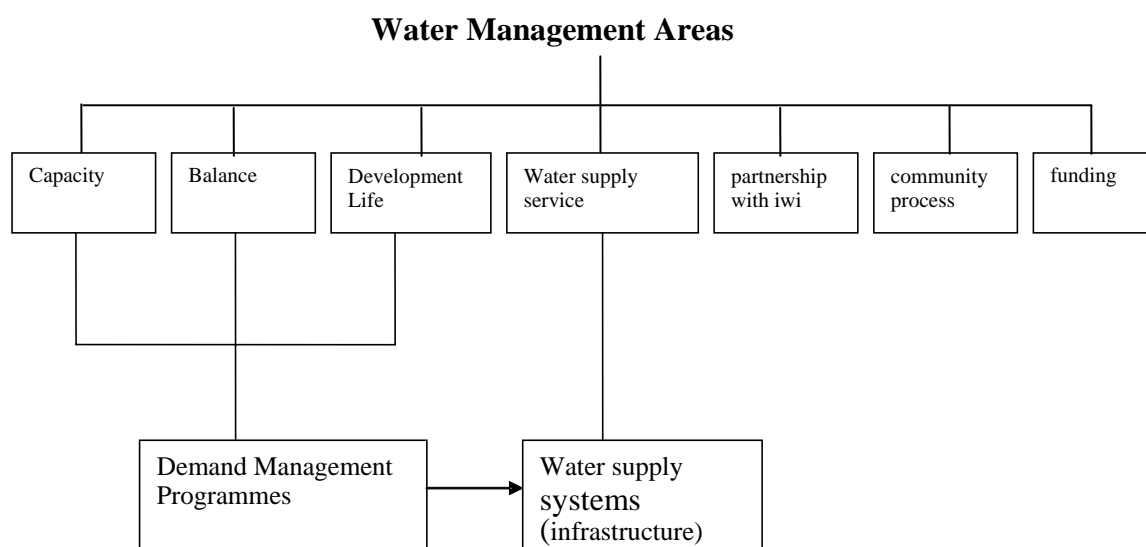
- **managing water use within the capacity of the freshwater resources and the ecosystem needs of each catchment;**
- **balancing residential water demand with economic development opportunity to ensure sustainable development of each community and the whole district;**
- **maximising the ability of households, businesses and the community to use the water resource efficiently and increasing what is available to current and future members of the Kapiti Coast community;**
- **ensuring households and businesses have access to a safe, reliable, water supply;**
- **developing a partnership in water management with iwi**
- **developing a community driven water management process;**
- **working with the community to fund water services in a sustainable way.**

These statements identify a possible significant shift in Kapiti Coast District Council's role in water management. Traditionally, the focus has been on securing adequate potable/reticulated supply. Wider issues of water resource capacity and long term management of its use, both in terms of environmental impacts and development, have not been a major focus.

Developing and maintaining a successful community process and a fruitful process with iwi has not been a direct water management consideration; Council has tended to interact with iwi on water matters via resource consent processes. There has been a shift in this approach in the last year with the desire to work with iwi to develop an overall strategy.

These principles, if adopted would shift away from a more operational focus to an integrated overall water management role. This would not necessarily mean increased costs but would require a greater linking within Council of related water issues.

Some of these water management areas will drive the practical demand management (water conservation) and supply management programmes. This relationship is shown below:



**2 (c ) A primary concern will be to take a ‘systems’ approach to water management, rather than just the central focus being water supply services. This means that Council’s long term concerns include:**

- ensuring adequate skills and understanding are in place to be able to integrate water use with natural systems;
- ensuring that there are flexible and adaptable structures and processes that reduce or disperse risk;
- avoiding locking the community into physical infrastructure or solutions that cannot be easily adapted to changing circumstances.

**2 (d) Council recognises that in explicitly taking up this role it will need to:**

- monitor the environmental impact of community water use and work with the Wellington Regional Council to identify ecosystem capacity for water take;
- manage the type, size and distribution of growth across the district as it relates to the overall water resource;
- work to enable people to use water in a sustainable way as part of their everyday lives;
- encourage people to fit their lifestyle to the district’s water resources and to the community’s aspirations over time;
- manage, in conjunction with Wellington Regional Council, the level of use of water resources via private systems;
- manage the level of use of water via any collective and publicly provided and managed reticulation network;
- work directly with iwi and hapu on water management.

## Exploring Each Management Area

### 2.1 Management Area 1: Concept of capacity

**2.1 (a) Council will give priority to understanding the relationship between the available water resource and development capacity.**

**2.1 (b) Catchment development capacities will be used as a central factor in managing urban development and economic growth.**

**2.1 (c) Council will regularly review its urban and economic development strategies in relation to district and local trends in water consumption and the capacity of natural systems to provide water.**

**2.1 (d) Natural systems capacity will be recognised as a significant driver in managing demand for water within the district.**

There is very little information about what is the ultimate development capacity of each catchment within the district and in total. An understanding of freshwater capacity would be the total predicted water available from:

- in-river flows:
  - minus basic ecosystem needs (residual flows)
  - plus total potential storage – ponds, dams, reservoirs;
- sub-surface river flows – such as the Otaki wellfields
- confined aquifers – at a rate consistent with re-charge
- rainfall
  - general rainfall levels available to pasture and horticulture
  - ability to capture rain from roofs and hard surfaces
- availability of re-used greywater

Development capacity can be obtained at a simple level by dividing total available resource by levels of consumption. Taking this kind of approach does not require a high level of detailed data once the natural capacities are known. It does mean a shift in thinking. It can be a significant in achieving a shift away from a reactive approach to growth pressures, to one that shapes growth to achieve a desired end.

Considerable work is needed to establish natural capacities. The Freshwater Plan identifies sustainable yields from rivers and aquifers. For rivers this is managed in two ways. A residual flow standard is set which means that a certain amount of water must be left in the river at all times. In addition, an amount of water can be allocated to users with some reductions on the total amount being allowed when water levels begin to drop over a season.

A total amount that can be taken on a daily basis is estimated for the aquifers based on an assessment of how rapidly the aquifer is recharged from surface water or leakage from other aquifers. For the coastal aquifers, it is also based on whether the 'saline interface' intrudes into the aquifer as freshwater is removed.

While this is the way the standards are set, there are issues with the standards set in the Freshwater Plan. First, the September 2001 Otaki Pipeline decision raised the possibility that the residual flow standards for the Otaki River could be regarded indicators of potential environmental effect only. Rather than it being assumed that flows near but above the residual flow had an acceptable environmental effect, the standard would act as a guide to a threshold possibly being breached. In other words, the environmental effect of any proposal to take water from the river must be investigated and proven along the river as an ecosystem.

Secondly, the Pipeline decision identified that there was community and iwi interest in the rehabilitation of the river. This included improvements to the river edges, improved flow and restoration or improvement of fish and invertebrate habitat in the river itself. This goal was set out in the iwi management plan of Nga Hapu o Otaki and Ngati Raukawa. This vision had to be developed and factored into assessments of the reasonable take from the river.

Finally, the decision indicated that the effects of any take needed to assess the impacts on the wider community environment. This included impacts on social and economic circumstance. The issue of a requirement to use the resource efficiently and to assess local need before transferring water across catchments was raised.

These decisions have implications for understanding 'natural capacity' and where thresholds exist. There is a need for more work to understand the residual flow implications for both the Otaki and Waikanae Rivers. In addition, there is a need to understand the residual flow standards along the river and not just at points of water take. More work will be undertaken during 2003 to progress these issues.

In terms of the aquifers, the Wellington Regional Council has indicated that it has limited understanding of the Kapiti Coast aquifers. It relies on other agencies and private individuals providing bore information and has a limited programme for developing understanding of the aquifers. This major implications for water use planning on the coast. Because the regulatory body has limited understanding and a limited forward programme to increase that understanding, the Council must make decisions with limited data. It is forced to use the resource consent process to test impacts rather than rely on clear guidance from the Regional Council. A precautionary approach is needed.

While decisions on a preferred approach to water use can continue to be made, there are some inherent risks. To that end Council has also adopted the following draft principle.

<p><b>2.1 (e) Council will undertake discussions with the Wellington Regional Council on the need to manage the allocation of the water resource within the context of the overall development vision for the district.</b></p>
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## **2.2 Management Area 2: Balanced Development**

**2.2 (a) Council will give priority to understanding the implications of the economic development strategy for water use. In particular, Council will focus on investigating::**

- **water use needs associated with residential and economic development scenarios within the Otaki and Te Horo areas;**
- **water use needs of potential expansion of food processing businesses across the district;**
- **other water use needs associated with business development in the Waikanae and Paraparaumu areas.**

**2.2 (b) Council will manage water use, and the relationship between water use and urban development, in a way that retains sufficient flexibility and capacity to deliver on the district wide and local economic development vision for the community over time.**

**2.2 (c) In balancing water use by residential users with economic development opportunities, Council will give priority to accommodating low water use businesses and/or businesses that have effective water reuse and conservation programmes as part of their service or production processes.**

**2.2 (d) Balancing of residential growth and economic development opportunities in association with residential and business water consumption will be a major focus of demand management.**

The key message of these statements is that planning for water services and supply within the district has tended to focus on estimating and servicing residential water demand. Most local authorities design water supply capacity around estimated population growth and consumption levels. Future economic growth is rarely understood or factored in.

Kapiti Coast District Council has an economic development strategy which is seeking to shift away from an economy that is heavily reliant on population growth and low-skill servicing of that growth. It also emphasises valued added, niche market development, based in part around farming and high value horticultural crops. If that is to be achieved, some attempt needs to be made to balance residential demand with the future water needs of business development. This is more than the current emphasis on reliability of supply.

There is need to understand the implications for each catchment.

Adoption of these statements signals a clear role for Council of trying to balance residential growth and economic development opportunities.

## **2.3 Management Area 3:**

### **Maximising the Ability to Conserve Water**

**2.3 (a) Council acknowledges a responsibility of present generations to pass on to future generations:**

- the maximum ability to use water efficiently;
- the maximum flexibility to achieve the balance of activities around the water resource that each generation sees as appropriate to its needs;
- the maximum ability to invest community wealth in a range of services other than water infrastructure.

**2.3 (b) Council will focus on the design of physical structures and infrastructure systems over time as the key mechanism for extending the development life of the water resource. Central to this will be:**

- the design and effectiveness of the reticulated water system in terms of water loss;
- the design of water systems within new buildings;
- the design of structures and systems using water in production processes;
- the level of community investment to assist in retro-fitting inefficient water systems in existing housing stock;
- the design of local areas to maximise reuse of water.

If a house has inefficient plumbing and loses a lot of water through leaks for example, then a household will find it difficult to use water efficiently. The present community has inherited housing and subdivision design that tends to be inefficient; it is difficult and expensive to ‘retrofit’ this building stock. If physical systems are built which force inefficient use of water, then this reduces the future choices and development potential of an area. Similarly, if a community does not maintain its water infrastructure it will lose water.

The first statement signals that the community accepts some responsibility for the choices around water use that are passed on to future generations. It would mean for example, that designing efficient and flexible systems, or introducing demand management initiatives, would be as much a matter of ‘best practice’, as a means of simply deferring investment in supply infrastructure.

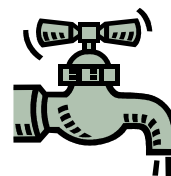
The second statement indicates the breadth of physical design issues that need to be considered if the community is to have access to ‘best practice’ physical stock and infrastructure. It also recognises the links between urban form and subdivision design and efficient water use.





## **2.4 Management Area 4:**

### **Providing a Water Supply: Levels of Service.**



#### **2.4 (a) Households and businesses should have access to:**

- **potable water sufficient for basic human needs (drinking, cooking, bathing, washing and household cleanliness);**
- **a reliable supply of water to assist where necessary in the transportation of wastewater (the extent depending on the nature of the wastewater systems);**
- **a reliable supply of water for business development, within the capacity of the community to invest in water supply systems at any one time;**
- **reliable supply of water for fire-fighting;**
- **access to non-potable water, in a way that minimises use of potable water for non-potable purposes over time.**

This section makes a distinction between an overall water management role, which involves reconciling a number of management issues, and a water service role which is concerned with ensuring people's access to water.

A community via its Council develops and provides a water service to households and businesses. Investment in water pipes and the provision of a connection to a house does not automatically mean a particular kind of service. In the past, the level of service provided on the Kapiti Coast has been demand led. This means that water supply has been added as demand has grown. The focus has been on providing a safe potable water supply system (water for cooking, drinking and washing). This supply system has also been used for transporting human waste or sewage via a flush toilet and for other purposes such as watering the garden or washing the car.

This statement makes clear that Council sees itself as having a more complex water service role, than just provision of a potable supply. It also makes a distinction between a potable and non-potable supply. This is important given that provision of treated potable water will become more expensive as population and demand increases. Providing the community with or enabling choice about what kind of water can be used is identified as an important service role. This involves making a distinction between water for potable uses and water for transportation of wastes. While using potable water for transportation of waste now may be the only available choice, this could change in the future.

Creation and management of a non-potable supply system can be seen as a way of reducing reliance on the traditional reticulation of potable water. The non-potable supply system on Kapiti Coast is fragmented and extremely limited. This situation is common, given the emphasis on using potable water for most purposes at present.

A system that provides non-potable water does not necessarily mean a parallel system of pipes. For example, it can mean a combination of roof tank systems, reuse of stormwater, such as on parks, or reticulated bore water in some areas.

**2.4 (b) Council will ensure the following is available to households and businesses:**

- **potable water for essential needs (cooking, bathing, washing and sewage transportation) a level of 250 litres per person per day (lpd) peak demand per day;**
- **a reliable supply of water for non-residential users, where the volumes available for such uses are determined by the overall community vision for the area and the ability of the community at any one time to invest in supply systems and storage capacity.**

This statement sets out a standard which would act as a trigger for Council intervention. This level of service statement does not necessarily mean direct Council provision but it does indicate a clear point for Council intervention if these levels cannot be achieved in other ways.

It identifies what is considered the essential water needs for a person – clean, potable water for basic human needs and reliability of supply for business. However, the amount of certain supply for business is not open ended. It is uncertainty of supply that is a trigger for Council intervention.

This idea of essential water use is a shift from the idea of averaging out current demand led levels of use as the standard for the community. It is important to note that the standard is per person. and a four person household of say two adults and two children would have access to about 1,000 litres of water a day for essential needs. This is as much water as some households in the district on restricted supply receive for all needs.

This standard of 250 lpd is still generous. The Parliamentary Commissioner for the Environment identified a range for water use when looking at Kapiti Coast's water usage.

<sup>1</sup> For example:

Christchurch City	150 lpd (internal use)
Waitakere City	200 lpd
Auckland City	190 lpd

Discussions at the workshops during October identified that the standard for essential water use was relatively high and it was agreed that this would be explored further. It was also noted that the standard is also considerably lower than previous targets used and that it nonetheless signalled a major shift in both approach and the planning standard.

The standard adopted allows each person to continue to provide for the normal cooking, bathing and washing standards and wastewater needs. However, it will focus greater scrutiny on why overall water use is so high in the district. If the community wishes to have some flexibility to use potable water for non-potable purposes people will need to look more closely at how and how much water is used.

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<sup>1</sup> Office of the Parliamentary Commissioner for the Environment, 'Whose Water Is It The Sustainability of Urban Water Systems on the Kapiti Coast', May 2001, p. 18

**2.4 (c) Where reticulated supply is provided, the system will be designed and managed in a way that allows for non-essential household water uses to a level of no more than 150 litres per person per day peak demand, provided that in any situation where potable supplies for basic services are at risk this level of extra water use will not be provided.**

**This level of service will be introduced in a staged manner to allow communities approaching thresholds to adjust to changes in service levels.**

This effectively identifies the trigger for Council intervention. For example, Council will not intervene directly if there is inadequate supply for recreational use. It will if basic health needs are affected, or business faces uncertain supply.

This above statement indicates that where the community, via Council, does intervene and build a reticulated supply, some supply for life style needs will also be built in to the final capacity. The 150 litres per person per day would allow each person in the house to run the garden hose for about 12 minutes a day. A household of four people could water the garden for about fifty minutes every day and about an hour and a half every second day.

For a one person household, of course, this means less total water available but given that the essential supply standard is relatively high, there would be room for people to make a trade-off, and still have a safe and healthy access to potable water. In addition, households can conserve water and introduce non-potable water supply for the garden – such as roofwater storage or groundwater storage. The latter will need to be managed with caution because if there is an increasing number of households using the sand aquifer for water there may be unacceptable effects. This remains to be explored by the Wellington Regional Council.

Overall the water consumption standard that has been adopted by Council is as follows:

essential use:	250 litres per person per day peak demand
non-essential use:	150 litres per person per day peak demand
<hr/>	
overall use	400 litres per person per day peak demand

This does not mean that by adopting this standard Council will restrict water to households by putting restrictions on the amount of water supplied each day. It does this for some households that lie outside the urban water supply areas – they are identified as being on restricted supply. It does not do this within the urban supply areas although it is technically possible to do so.

The standards are adopted as targets and will guide the amount of investment there will be in new supply and water storage in an area. The later water plans take this standard into account for example. The standards will also guide the demand management programme. Council has adopted the position that it prefers to work with each community to identify how it will reach the targets in the short term. However, it will monitor achievements and will act to manage the level of risk to each community over time, if the targets are not reached.

It must be remembered that the level of consumption provided for households will dictate the time at which the threshold for development in the catchment is reached. It will also dictate the level of flexibility to balance economic development with residential use.

It is **essential** for designers of future systems to know what is considered to be the acceptable level of service for non-essential water use from a reticulated system. The 650 l/p/d standard used in recent planning for water supply in the Waikanae River catchment was derived from taking current population growth projections and working out how much demand needed to be reduced (from approximately 1300 l/p/d peak demand), in order to fit the residual flow standards for the Waikanae River.



The problem with this approach is it assumes the level of residential growth and demand **is** the community's vision for its future. It does not explore design of system capacity to service economic development. It is important that the standard is set from the perspective of an acceptable level of service, not fitting current trends to constraints. This will also give those responsible for monitoring and advising on growth management issues a clear indication of where the thresholds are.

**2.4 (d) Council will plan for securing supply in times of drought or restricted river flow using the standard of 400 lpd peak demand.**

Following from the previous principles, if the overall standard is 400 lpd (250 lpd essential and 150 lpd non-essential), then this should be the standard applied for ensuring security of supply.

This distinction between on-going supply and security of supply is important. Security of supply relates to those times of risk when there may be limits on what can be supplied to the community. This has been a key issue for the Waikanae River catchment area and its associated settlements and is discussed later. The effect of the new standard for that catchment's security of supply issues has been to reduce the amount of new water supply or water storage needed, provided that a rigorous demand management programme is introduced. If it is successful, it will also extend the general development capacity of the area.

## **2.5 Management Area 5: Partnership with Hapu and Iwi**

Detailed water issues remain to be discussed with each iwi group. Nonetheless Council wishes to signal the partnership approach it wishes to develop with iwi around water management.

### **2.5 (a) Council recognises that hapu and iwi have kaitiaki responsibilities that include:**

- **consideration of the impact of water management systems on waterways;**
- **concern to ensure the wider community is adequately served with a safe supply of water.**

### **2.5 (b) Council wishes to pursue a partnership approach with iwi in water management issues. To that end it will seek to explore the following with iwi:**

- **the way in which hapu and iwi kaitiaki responsibilities and Council water management responsibilities can mutually support and complement each other to achieve the best possible water management for the district;**
- **the potential for joint development of area based water management plans;**
- **developing a clear process to discuss the breadth of any analytical work on strategic water issues, prior to commissioning of work;**
- **a clear process for discussing potential water management related resource consents, prior to lodging of consents;**
- **reporting via the Council annual plan and iwi formal reporting process as to the success of any partnership initiatives.**

Council and iwi relationships can be significantly affected by water issues. Water is of primary importance to both Maori and the wider community and it is central point around which ideas about management and partnership will play themselves out. Council is of the view that in addition to any legal requirements which it has to work through with iwi and hapu, it wishes to develop a partnership approach generally, and around water management issues in particular.

## **2.6 Management Area 6:**

### **A Community Driven Water Management Process**

**2.6 (a) Council will review, develop and report against its water management strategy and area water management plans in conjunction with the formal community planning processes, as set out under the Local Government Act.**

**2.6 (b) Long term water management investment decisions will be developed as part of the on-going process of development of area water plans. Any modifications to expenditure that may be proposed through the annual plan process will be considered in relation to the area plans and discussed via the relevant community board processes.**

## **2.7 Management Area 7: Funding of Water Management and Services**



**2.7 (a) Council will continue to fund water services on a local basis.**

**2.7 (b) Council will explore and consult on a ‘systems management’ funding basis as follows:**

- **water systems monitoring and strategic analysis (district wide),**
- **district wide funding of that portion of supply infrastructure capital expenditure and water supply operational expenditure needed to deliver water for essential uses;**
- **local funding of that portion of supply infrastructure, water supply opex and demand management initiatives that delivers water for non-essential needs.**

**2.7 (c) Services will continue to be rates funded in the meantime. Local communities will set their water use targets and Council will monitor success in reaching those targets. Council may intervene to introduce water consumption charging if these targets are clearly not being reached.**

**2.7 (d) If water consumption charging is introduced, there will be no direct charging for essential water use. Non-essential water use will be charged for on a stepped basis.**

Funding policy decisions must pass through the formal funding policy process as set out in the Local Government Act. However, for this water strategy process, it is important to give the community some indication of the approach to funding Council wishes to explore. Understanding the possible funding approach will make it easier for other issues to be debated.

The approach is to maintain the funding status quo at present but to begin community wide discussion of the possibility of district wide funding for some aspects of water services. The possibility of district-wide funding is linked to the distinction between essential and non-essential water use.

The question of creating incentives to reduce demand for water remains to be developed in detail. These principles begin with a voluntary community approach to reducing water demand. However, they indicate that the reduction in demand is so important that Council may intervene to introduce incentives if the targets are not being met. What form these incentives may take requires community debate, and will need to be worked through in the next year. If Council chooses to introduce different funding regimes to create further incentives to reduce water use, it will then be clear what that regime will be. The major innovation is to link funding decisions directly to demand management performance.

The principles also set out clearly that if direct charging is introduced, then there will be a distinction between essential and non-essential use.

**2.7 (e ) Council will undertake further analysis of mechanisms for funding assistance to households introducing water conservation systems.**

**2.7 (f) Council will assist with the funding of on-site and local non-potable water supply infrastructure and systems, provided that an overall concept plan, costings and risk management plan for the non-potable system has been developed in the relevant area water management plans.**

These principles support community led commitment to reducing water use. Council will have a role in supporting households and the community to make adjustments. If people are to reduce water demand, then they need to have the tools to do so. A significant number of submitters on water during 2002, raised the issue of Council support for the installation of roof water tanks, for example. A demand management programme will be developed for the 2003/04 annual plan process and this needs to be accompanied by a review of the way any initiatives can be funded.

**2.7 (g) Reticulated water services developed via community investment will be retained in community ownership.**

This is a very important principle as there are often community fears that any changes to charging regimes for water may be a first step in the privatisation of water services. This principle makes Council's commitment to retaining water infrastructure and water services in community ownership very clear. This will be reinforced by the new Local Government Act which when it is passed will prevent privatisation of water services. Legislation aside, it remains a clear commitment of this Council to retain direct ownership and management of water services.



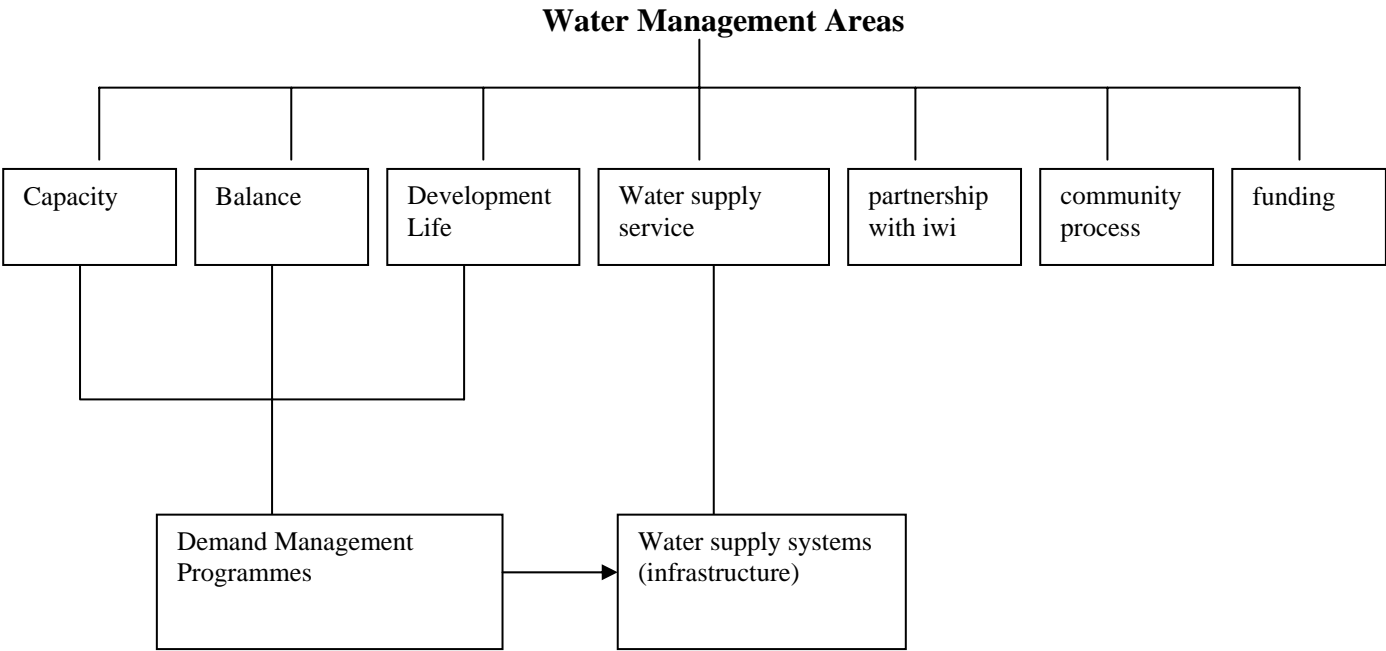
### 3. Demand Management Programmes and Supply Infrastructure

The previous discussion focused on seven areas of water management that might be adopted by Council and the principles or framework which might drive each area. These translate down into two key action areas: demand management and provision of water supply infrastructure and systems.

The diagram which was also used earlier shows the relationships. First, it shows that the demand management programme is driven by three key management areas, as well as the traditional focus of using demand management to defer supply infrastructure investment.

This distinction is important because demand management has a great deal to do with influencing long term development in an area, and the rate at which that development potential is taken up. Nonetheless, the role of demand management in managing supply investment is significant. The one way arrow attempts to show that demand management decisions, such as the rate and nature of the demand management initiatives, should drive the timing of water supply investment in an ideal situation. In other words, if a community was to build an effective, efficient water system, it would begin with establishing mechanisms that would allow it to manage demand when necessary.

However, we are in a situation the world over of ‘catch-up’ which means that demand management investment can be delayed while supply investment occurs, in order to stave off immediate supply crisis or limits. This is the situation Kapiti Coast is in at present.



This section focuses on the following areas:

demand management

- how to begin introducing demand management tools at a time when supply systems need to be improved;
- what those tools would be.

supply systems and infrastructure

- the general framework for designing/ developing supply systems;
- priorities for investment;
- potential actions for expanding the non-potable supply system.

Specific demand management and supply system options for each catchment are discussed in each of the water plans.

### **3.1 Demand Management Programme**

**3.1 (a) Council will develop a detailed demand management programme for subsequent inclusion in the draft strategy. It will be reviewed as part of the 2003/04 annual plan process and the long term financial strategy. That programme will set out any district wide initiatives and will bring together the various demand management initiatives, targets and timing that will be developed within each area management plan.**

**3.2 (b) The district wide component of the demand management programme must address the following:**

- review of the Code of Practice for Subdivisions;
- development of information about water efficiency initiatives;
- processes for facilitating efficient water use within businesses;
- the current timing for the introduction of water meters (2008/09);
- if appropriate, the timing of introduction of funding incentives, including water consumption charging;
- education programmes;
- summarised water consumption targets across the District and their implications for supply system investment;
- a water use monitoring programme.

**3.3 (c) Each area water management plan will include a demand management section that will:**

- detail the specific actions to be used and the timing for their introduction;
- identify the water use and consumption targets for the community over the next fifty years;
- identify and explain the relationship between the demand management programme and the supply systems and investment decisions.

These statements equate to a considerably enhanced profile for demand management in the wider water management process. In the past it has been confined to management of water use at times of water shortage. The links with developing opportunities and choices and with infrastructure investment do not currently exist. In part, this is because of the lack of clarity about the community's long term intentions around water management.

Review of the Code of Practice for Subdivision is underway. More work is needed on the development of initiatives around introduction of water saving devices, funding initiatives and education. The full detail of this programme will be brought to the 2003/04 annual planning round; the decisions from that process will be incorporated into the strategy.

Each area water plan will include the detail of the demand management programme for that area.

## **3.2 Supply Systems**

**3.2 (a) A water supply system is the sum of the various components of natural systems, public and private infrastructure, household, business, on-site and reticulated systems.**

This statement illustrates the idea that the water supply system is more than just the reticulated water network. The system as a whole consists of natural, non-reticulated and reticulated components. It is suggested that successful water management in the district will not occur unless the full system is understood and managed. This does not mean assumption of direct responsibility, funding or day to day management for all aspects of a system. For example, the Wellington Regional Council has direct responsibility for protection of the natural parts of the water supply system.

**3.2 (b) Council recognises that the overall water supply system has two broad components:**

- a potable, (generally) reticulated supply system;
- a non-potable supply system.

**Water supply management will include consideration and development of both systems.**

**3.2 (c) Council management of water supply systems will focus on the following components:**

- the availability, security and life of natural water sources;
- the long term capacity and flexibility of centralised treatment systems;
- site-based potable water supply systems;
- the efficiency and effectiveness of reticulated potable water transport systems;
- minimising risk to potable water systems;
- encouraging the development of on-site, local and (potentially) reticulated non-potable water re-use and transport systems.

This is a significant shift in the way thinking about water supply management might occur. It gives a status to the development of non-potable supply systems. There are three reasons for considering this. These are:

- it has the potential to relieve pressure on the demand for water from the potable supply system;
- it can expand the availability of water for development beyond the limits traditionally set by the potable system;
- it can diversify the source of water and reduces uncertainty for businesses – without being constrained by the community's ability to fund extended potable supply systems. In effect, it provides a more sustainable supply system by increasing flexibility and adaptability.

Generally past focus on non-potable supply has been concerned with relieving pressure on potable systems. Submissions from the community reveals a variety of reasons for

developing non-potable supply sources. Nonetheless there was a clear message that alternatives to reliance on potable systems were sought.

A non-potable supply system does not have to be a reticulated system. Nor does its development necessarily involve Council in major expenditure increases. The level and rate of investment may well be dictated in the short term by the need to relieve pressure on potable systems.

These statements emphasise the potential breadth of water supply management. It does not necessarily bring increased costs but signals a significant shift in monitoring, analysis and design of systems. If adopted, it would also signal that alternatives to a potable reticulated supply system are important in achieving flexibility, a spreading of risk and maximum development potential. This goes beyond the traditional focus on relieving pressure on the potable supply system.

### **3.2.1 Potable supply systems**

- 3.2.1 (a) Priority will be given to reducing risks to the potable supply systems across the district within the next five years. This will include as a matter of priority:**
- **securing a diversity of natural supply sources within each catchment;**
  - **removing those risks to the quality of supply via reticulated supply services that have been identified in Ministry of Health grading.**

Risk management is a priority for any supply system. Kapiti Coast District has achieved a high standard of risk management for the actual reticulated systems themselves. Risk management plans exist for the treatment plants and the maintenance and renewal programmes for the network have been approved via formal peer review and audit processes.

The key risk issue is reliance on single supply sources; obviously this is a major issue for Waikanae, Paraparaumu and Raumati. The other main risk relates to the grading of water supply by the Ministry of Health. It must be emphasised that a low grading does not mean poor water quality. It means that there are factors that could put the continuity of supply and quality at risk.

The statement affirms the current priority is risk management rather than response to either life style demands, or broad economic development concerns. This identifies the order of community investment in water supply infrastructure, in a situation of limited resources. The wider framework clearly signals that once these immediate risk issues have been dealt with, the wider emphasis on demand management and integrated supply will come into play.

This may seem as if some communities are ‘missing out’ in the short term. It is essential therefore, that the water strategy signals a long term development programme across the district.

### **3.2.2 Non-potable supply systems**

**3.2.2 (a) Each area plan will develop a non-potable water supply section. That section will include :**

- the nature of the system, how it will be developed, timing and cost;
- the links with management of use of potable water;
- a risk management plan for managing health risks associated with non-potable supply;
- an analysis of how the supply system can be linked to assist economic development in the area and across the district.

**3.2.2 (b) Council will facilitate the development of on-site and local non-potable supply initiatives according to the following priorities;**

- use of shallow bores, provided that the area wide use takes account of and appropriately manages environmental effect;
- installation of roof tank systems;
- reuse of stormwater;
- reuse of greywater.

### **3.2.3 Design of Systems**

**3.2.3 (a) As an initial principle, the development of water supply systems will focus on catchment based solutions, provided that there will be assessment of the risks and costs of in-catchment options at each development stage against the potential (if any) for cross catchment and/or regional solutions to reduce immediate risks to security of supply.**

**The comparative risk analysis will be undertaken in conjunction with iwi and with explicit reference to impacts on the mauri of waterways, risks to the mauri, food sources and ecosystem health and iwi perspectives on the mixing of waters.**

**3.2.3 (b) The concept of a long term district wide supply system for potable water will be considered:**

- once in depth assessment of future development and associated water use needs, opportunities and scenarios has been undertaken for each affected catchment and community;
- according to a framework for analysis developed jointly by the council and iwi.

**3.2.3 (c) Council will, in conjunction with the community and iwi, seek to have a district wide discussion of the strategic implications and district wide costs and benefits, and the spiritual impacts of a district wide vision for the water supply system. This discussion will take place once the work on catchment capacities and development opportunities is completed.**

**Until this debate occurs, discussion of out-of-catchment options for any area shall also consider risks to:**

- iwi partnerships;
- community processes.

These statements address what is a significant underlying issue: whether the overall water supply system should be designed around a cross catchment reticulated system which shifts water (and development potential) from one catchment to another. This was raised by the Citizen's Group and also by some submitters. Equally, other submitters, including some participants in the Otaki pipeline process, opposed such a framework.

For iwi, the cross catchment supply issue is a significant cultural and well being concern.

For some people, resistance to a district wide system is a matter of principle. For others it is a concern about funding implications, a concern about seemingly lost development opportunities, and a resistance to providing a solution to an issue that seems to be exacerbated by high water consumption levels in another catchment. Some who support the district wide approach do so from a risk management perspective: either the potential new source of supply is less risky, or a reliable supplementary supply will offset risks within the catchment..

The above statements set out the idea that catchment based solutions need to be thought through as a first principle but also provide for on-going debate about district wide solutions. They suggest that in order to have constructive debate there is a need to understand issues of development capacity in each catchment.

The statement also suggests that this analysis needs to be joint process managed in partnership with community and iwi, and where iwi concerns are explicit in the process. This allows for debate about the issues and consideration of any risks to the wider relationship with iwi, without this process being destabilised.

One source of instability has been that debate on the issue generally occurs via individual resource consent processes. There is also no district wider analysis of capacity and development potential from the water resource that can inform the debate.

Clarification of water services funding policy may assist in simplifying the debate about district wide solutions.

Adopting this approach to resolving the issue would set a general principle. Council would then need to debate any departure from this when it considers the Waikanae, Paraparaumu, Raumati water management plan.



**WATER**

**MATTERS**

Waikanae/  
Paraparaumu/Raumati  
Water Management Plan



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# **Waikanae, Paraparaumu and Raumati Water Management Plan.**

This water management plan covers the largest relatively continuous urban area of the Kapiti Coast. It also includes the Pekapeka Beach area. The reason for combining these otherwise distinct settlements is because they largely rely on water supply from the Waikanae River. They also largely lie across the Waikanae aquifer although the Raumati area is also across the Raumati aquifer.

## **1 The Natural Water System**

The Waikanae, Paraparaumu and Raumati areas currently have 23,000 m<sup>3</sup> available to them for potable water use from the Waikanae River. The current resource consent for abstraction of water from the river, provides from January 2003 that no water can be taken from the river if residual flow falls below 750 litres per second. This exposes the communities to high risk if there is a drought or a period of low flow. A 'step down' is in place so that as flows decrease the amount of water that can be taken will also decrease.

There is an emergency bore water supply available of 3,600 m<sup>3</sup> a day from the Waikanae aquifer. The residual river flow is tested at one point just below the point of water take and it is possible that more stringent standards could be applied to achieve clear residual flow along the length of the river. Analysis of ecological impacts of different levels of water use will be undertaken during 2003.

The three existing production bores at Otaihanga and Waikanae Beach are being run at present to assess the capacity of the aquifer and the impacts of saline intrusion. Provided the current bore tests prove successful, the Freshwater Plan already allows for up to another 6,400 m<sup>3</sup> a day to be taken from this groundwater resource. However, the Regional Council has indicated that they may apply a conservative approach to whether the full 100% allocation in the Freshwater Plan will be consented. At the same time, the running of the bores suggests that the aquifer may have more than the 10,000 m<sup>3</sup> capacity. This remains to be discussed through with the Regional Council both prior to and via any consent process.

The aquifer is the main alternative source of supply, other than the Waikanae River.

There is potential to add to this resource by introducing roof tank supply for non-potable uses. Private bores currently supplement this non-potable supply. The extent to which this system is used is unknown but is being reviewed by the WRC.

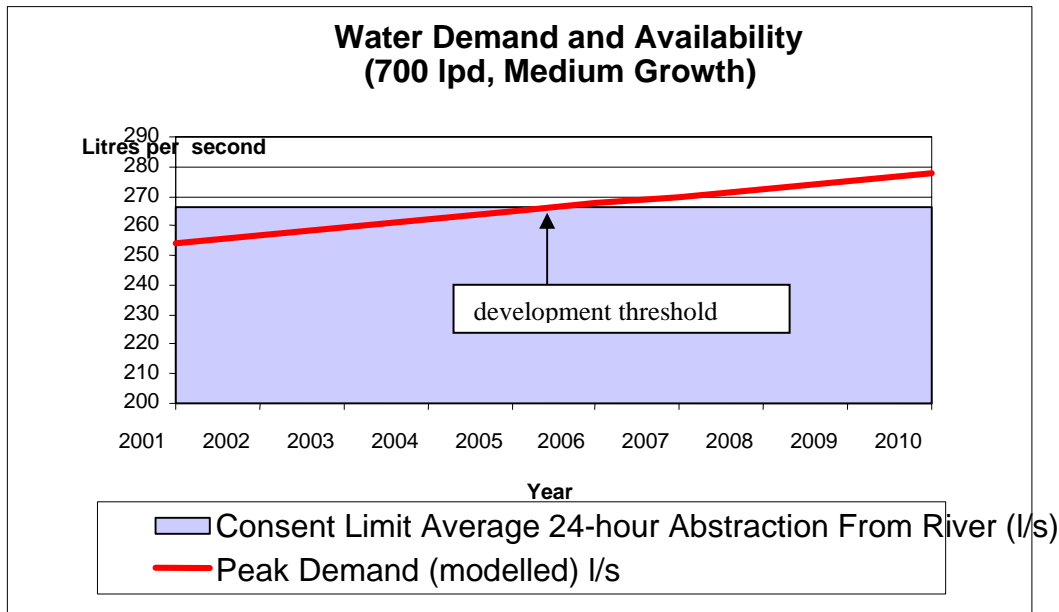
## **2 Water Management: Issues**

What does this mean for the amount of headroom the community has for development in the future? A simple model has been developed which looks at river flows, available groundwater resource, consumption levels and population growth estimates.

## 2.1 Overall Capacity

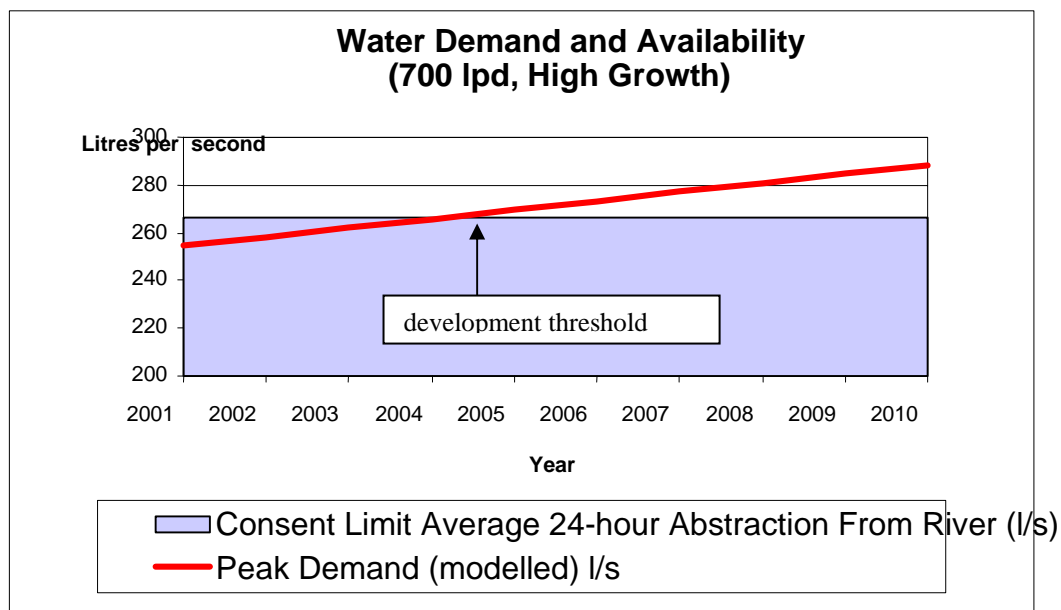
The first important result is that at current peak level consumption of 700 litres per person per day across the area, and if the community is just relying on river supply, by 2006/07 (at current projected growth levels) there will be a significant period of time when demand will exceed available supply. This is whether or not there is emergency storage for drought periods. It is important that this is understood not as a supplementary supply issue but as an issue of when growth has reached a threshold – given the availability of other catchment sources.

**Figure 1: Impacts of current demand levels on overall supply – medium growth**



If a high growth scenario the thresholds are reached a few years earlier.

**Figure 2: Impacts of current demand levels on overall supply – high growth**



These estimates are based entirely on projected residential demand. The non-residential sector consumes about 3% of total supplies potable water. If the community is to achieve its goal of greater balance between residential growth and economic development to support residents, then these thresholds could begin to bite much earlier. So if current consumption levels remain as they are the community will approach its 'natural threshold' within a few years.

Decisions made now about demand management are decisions about the rate at which the community approaches these thresholds. Finding solutions to these capacity issues is not just an issue of security of supply in times of drought. It requires a much clearer focus on demand management. Demand management now becomes a tool to realise the community vision over time, as well as a way to defer investment in supply infrastructure.

## 2.2 Population Growth

Population growth estimates and water demand figures have been based on the MERA population forecasting developed in 1998. This has been used to allow comparison of past supply and storage options that were previously developed using this scenario. For example, while storage ponds and in-river supply can be adjusted to allow for increases in storage needs, dams are usually designed for a set storage amount.

Nonetheless, new scenarios have been developed which use the high growth projection scenarios developed by MERA in 1998. Statistics New Zealand has released the 2001 population and household figures but is yet to release its future growth projections for the area. This is likely in early 2003. The Wellington Regional Council will be commissioning its own growth projections in early 2003.

The 1998 study identified high, medium and low growth scenarios across the district through to 2021, and undertook a further extension of this through to 2046 in order to provide data for water infrastructure planning. Detailed analysis was undertaken at the 'sub-district level' (based on census area units) for the medium projections only. This means detailed projections are only available for the WPR area for the medium growth scenarios.

The medium projections estimated a slowing of growth to about 1.3 % per annum between 1996 and 2001 and further slowing beyond that period to 1% per annum. This slowing is based on the gradual shift from in-migration to growth based more on natural population; there would be a gradual ageing of the population and therefore a reduction in the number of births.

The high growth scenario between 1996 and 2001 was estimated at 1.5% per annum and the medium growth scenario was identified at 1.3 and 1.2 % per annum for the district and the WPR areas respectively.

This population growth has implications for the rate at which available land is taken up. The Urban Growth Strategy identified five possible urban growth areas within the WPR area:

Table 1 – Future Growth Areas

• Airport	18 ha
• Paraparaumu North	70.0 ha
• Ngarara Road and Parata Street Extension	271 ha
• Waikanae East	13 ha.
• Peka Peka	49 ha

It would appear that some of the estimated future growth up to 2021 can be accommodated within current zoned residential areas but there will be a need to release land. The future urban growth areas are expected to accommodate this remaining growth identified through to the 2021 period. Council has also approved the exploration of higher density urban form in some parts of the district. This could also accommodate future growth.

The Council has a policy of releasing land in a way that accommodates future growth pressures although it has limited that release at present until water supply issues are solved. It is possible therefore, for Council to manage the release of land in conjunction with the other levels of supply and demand management, to ensure that development occurs within the capacity of the area to service it.

Given the differences between projected and actual growth over the last five years, and given that new projections will not be available for another three or four months, what are the implications for long term estimates of water needs? The following points need to be noted:

- the rapid increase in population means that general population growth is likely to exceed the available in-river supply within the next five years. This suggests three possible responses: immediate and rigorous demand management, an immediate review of how growth will be managed in the area, and/or an increase in alternative supply or storage. The latter needs to be run in conjunction with demand management and growth management.
- the current rapid increases are unlikely to be sustained in the very long term, as in-migration is replaced with natural growth;
- the next twenty years of projected growth can theoretically be accommodated if demand management occurs but this requires review area by area;

### 2.3 Water Demand: Implications for Security of Supply.

The previous discussion has looked at the impacts of demand and growth on overall water needs. This section reviews the level of water demand within the WPR area and the implied volume of water needed, if there is no supply once the Waikanae River falls below 750 l/s residual flow. A scenario was developed that assumes that there is no change in the amount of water consumed per head of population (retaining the average across the area of 700 lpd). In effect, this gives an idea of total storage needs if no demand management is used. A further scenario was run which considers the

supply and storage impacts if the residual flow in the river is raised to 1,000 l/s. These figures are shown in Figure 4 below:

Figure 4: Water supply storage needs to service 50 years needs: low flow/ drought

	<b>700 litres per person per day demand</b>	
	<b>low flow (cubic metres)</b>	<b>drought (cubic metres)</b>
<b>750 litres per second flow</b>	<b>813,000</b>	<b>1,470,000</b>
<b>1,000 litres per second flow</b>	<b>1,663,000</b>	<b>1,726,000</b>

The scenarios are run based on two kinds of river flow data. The lowest flow data from the 29 years of recording is used (1978 year) and a drought scenario is also factored in. This assumes a 1: 50 year drought which gives about 56 days of no flow with periods either side of declining and returning flows. Under a 1,000 l/s residual flow, this means approximately 71 days of “no-flow” period.

**2.3 (a) Council will take a precautionary approach to its water management regime by basing assessment of future need on a 1,000 l/s residual flow for the Waikanae River after water abstraction. In doing so, it will continue to assess impacts based on the 750 l/s regime as well as a possible 1,000 l/s flow.**

The least risky scenario for supply and storage planning at this stage is 1,000l/s residual flow rather than the 750 l/s. Should the latter be adopted, the supply or storage provided can be used to increase the ‘ceiling’ on overall development capacity. Should the 750 l/s be finally adopted, some 300,000 m<sup>3</sup> would be available to accommodate future development.

## **2.4 Summary of Water Management Issues**

In summary, the Waikanae, Paraparaumu and Raumati area (WPR) has the following water management issues:

### **Natural Capacity, Available Resource and Development Potential**

- the community is approaching thresholds for development under current water consumption levels;
- decisions will need to be made now about investment in supply and/ or demand management.

Note: over the last few years the discussion of supply and demand management options has focused on the issue of security of supply and has not included the wider issue of development capacity. Alternative supply has also been raised as a risk management issue – as a way to disperse risk

and remove reliance on one source – development capacity discussions have been implicit rather than explicit.

It is suggested that there are two significant decisions to be made for this water plan, as well as the development of the overall framework for the area. These are development capacity decisions as well as security of supply issues.

### **Water use**

- a significantly reduced level of water use and demand which nonetheless is still relatively high when benchmarked against wider standards of water use;
- a (draft) standard for water use of 250 lpd (essential) and 150 lpd (non-essential) which gives guidance as to long term targets and design standards for supply systems;
- a rapidly growing residential community which will continue to place pressure on the available water resource projected to grow from 43,900 - up to 12,500 more people. This is based on the MERA medium growth projections – it may be higher.
- a community desire and expressed strategic goal to achieve local communities with increased access to local employment;
- very limited information and analysis about what future demand from the business sector might be;
- a known upper threshold for the available water resource in the area.
- a building stock which, in water use terms, is inefficient.

### **Demand Management**

- a very effective system for restricting short term water use which is a leader for New Zealand;
- an absence of a demand management programme which is focused on changing long term patterns of consumption;
- the possibility that some long-term changes in behaviour have been achieved through the summer based water restrictions – not really tested until current security of supply problems are solved and people's perceptions of the problem change;
- a focus on water conservation initiatives in terms of managing water supply investment options, rather than also increasing the flexibility and adaptability of the whole water system.

## **Supply Management**

- a potable water supply system which is dependent on one source of supply – which means increased exposure to risks when that supply source has reached its threshold;
- absence of a non-potable water supply ‘system’ which would relieve pressure on the water supply system and disperse risk.

**2.4 (a) Council recognises that there are two significant water management issues facing the Waikanae, Paraparaumu and Raumati areas. These are:**

- **securing of immediate supply and/ or storage capacity to offset risks to river flows from a 1:50 year drought;**
- **development of a response to the short and long term pressures around development capacity and natural thresholds.**

**Where possible, solutions will be adopted which contribute to resolution of both concerns,**



### 3. Water Management Areas

#### 3.1 Management Areas 1 & 2:

##### Natural Capacity and Development Capacity

A previous section noted that the approximate times that various thresholds for development capacity were reached. Quite apart from security of supply issues, in about 2007 the Waikanae, Paraparaumu and Raumati communities appear to be approaching a threshold for development capacity at current consumption rates in the residential sector. There is limited room for the business sector to expand beyond existing businesses.

As with the Otaki, Hautere and Te Horo catchments, there is very limited information about the way in which economic development might unfold in the Waikanae, Paraparaumu and Raumati areas. It is possible that issues with security of supply have affected business investment and it is difficult to understand what improvements in security will mean in terms of water demand and economic growth. The main difference from the other areas is that the kind of development is likely to be service focused with some processing, tourism, entertainment and educational activities. If productive activities in the northern areas grow, there may be a spin off in the WPR area.

There is a need to know more and to estimate impacts on demand for water. This is especially important in an area where the natural capacities (without demand management) exist within the life of this fifty year strategy.

**3.1 (a) It is desirable that more work is done on assessing the future capacity of the catchment and the impacts of economic development on water demand. The economic review will necessitate looking south to the wider region to understand the implications of transport and regional growth decisions on the area. This work needs to be undertaken over the next few years, in order that the implications can be included in the review of the success of voluntary demand management.**

#### 3.2 Management Area 3: Maximising the Ability to Conserve Water

The wider strategy for improving the efficiency of housing stock and infrastructure will be applied to the Waikanae, Raumati and Paraparaumu areas.

### **3.3 Management Area 4: Levels of Service**

**3.3 (a) The WPR water plan acknowledges the long term goal of bringing water use to a level of 250 lcd (essential use) and 150 lcd (non-essential use).**

**The community adopts a goal of achieving that level of use within ten years. The targets are as follows:**

- **650 lcd peak demand – by June 2006/07**
- **400 lcd peak demand – by June 2011/12**

**Council will monitor performance against these goals annually. It will formally review achievement at each interim target date and consider the effectiveness of the methods in reaching the goals.**

Unlike the other water management plans, a clear draft target has been established for this area. This reflects the significant issues that exist, not just in terms of security of supply in times of drought but also in terms of overall development thresholds. Even if there is no further residential growth, the ability to achieve balanced development and local employment will be severely constrained. The rigorous standard for water consumption does present challenges for the community. It will need to move to achieve those targets if it is to preserve future flexibility. This need exists whether or not significant new supply sources are added to the area. While this might extend the current development life, from a systems approach, the community will continue to be vulnerable to limits on and costs of supply, if demand is not managed.

Adoption of this service level clearly signals the preferred approach to water consumption for the area in this water plan.

**3.3 (b) Council will plan for securing supply in times of drought or restricted river flow using the standard of 400 lpd peak demand.**

This follows naturally from the previous principles in that if the overall standard is 400 lpd (250 lpd essential and 150 lpd non-essential), then this should be the standard applied for ensuring security of supply. It is a general principle of the wider strategy.

### **3.4 Management Area 5: Funding of Water Services**

The funding framework will follow the broad funding decisions set out in the overall water management strategy. The main points are:

- rates funding of water services in the meantime;
- continued local funding of water services;
- exploration and consultation on the possibility of:
  - district wide funding of that portion of any service delivering on essential water needs;
  - local funding of remaining services for non-essential water needs;

- linking of the analysis of funding methods to achieving reductions in water use;
- community debate about methods to increase incentives for water conservation, including debate about water consumption charging;
- a clear statement that is water consumption charging

### **3.5 Management Area 6: Developing a Partnership with Iwi**

The overall strategy has identified that Council recognises the kaitiaki role of iwi and that it wishes to work in partnership with iwi, in conjunction with the community. Council wishes to develop this partnership around water with Te Atiawa ki Te Whakarongotai.

#### **3.1 (a) Council is committed to developing a collaborative or partnership approach to water management with Te Atiawa ki Te Whakarongotai.**

This principle continues to extend the concept of partnership across all the district's communities.

### **3.6 Management Area 7: Developing a Community Process**

The overall strategy recognises the idea of a community driven water management process, with a particular focus of that process being the development of area based water management plans. This would retain Council responsibility for approval and investment in capital works etc but would focus on a community driven process for developing the framework, timing for changes in levels of service, demand management goals and the overall thinking behind supply systems.

How this is progressed needs to be worked through and discussed with the community. The best structure may include members of the community board and councillors, or it may involve an advisory group. Whatever the structure, it will operate as part of the collaborative process with iwi that was discussed in the previous section.

It is envisaged at this stage that the overall sustainable water management strategy would include the concept of area water management plans. Obviously, to keep true to the idea of community driven plans and the notion of a collaborative approach with iwi, then this process currently underway needs to take account of the development of a longer term process.

To that end, the ideas in this water plan are developed based on input to date. They will be reviewed as part of the post November 19<sup>th</sup> consultation process. In addition, many of the ideas for action do not involve specific investment decisions. The focus is more on achieving better understanding of the area, of community aspirations and desired levels of service. The exception is the discussion of water quality issues. This has been well debated in the past.

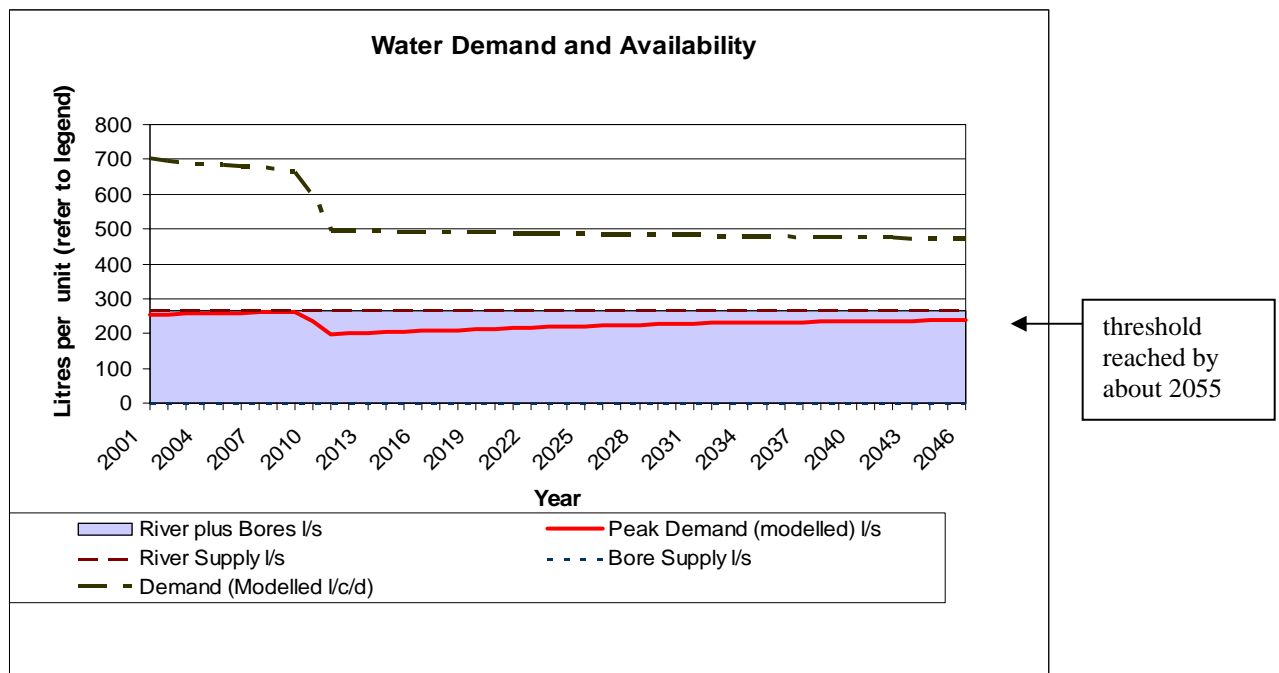
#### **3.2 (a) Council wishes to work directly with the Waikanae, Paraparaumu and Raumati communities to develop the water management plan.**

**It will seek discussions via the community forum after November 19<sup>th</sup> as to how this may proceed.**

## 4. Demand Management and Non-Potable Supply Systems

The concept of working towards the reduced water demand has already been signalled as an overall principle strategic direction. Demand management and encouragement of non-potable water use can have the following effect on long term development thresholds and security of supply issues. Figure 5 shows the impact of demand management on long term development thresholds, using the draft targets. It has the effect of extending thresholds by some 50 years. Figure 6 sets out the security of supply needs. The effect of demand management is to significantly reduce the amount of storage needed.

Figure 5: Impacts of demand Management on Development Thresholds



Under this scenario, the community would reach the natural capacity of the river system in about 2055 (assumes the back-up storage for drought years was in place). However, it can also be seen that throughout the period the margins between the river flows needed even with demand management and the actual river flows is relatively small.

Figure 6 is shown on the next page.

Figure 6: Water supply/ storage needs to service Year 50 needs: low flow situation (1978) and drought situation

		<b>700 lpd peak constant</b>		<b>475 lpd peak within 10 years</b>		<b>400 lpd immediate</b>	
		<b>low flow</b>	<b>drought (56 days)</b>	<b>low flow</b>	<b>drought</b>	<b>low flow</b>	<b>drought</b>
		<b>m3</b>	<b>m3</b>	<b>m3</b>	<b>m3</b>	<b>m3</b>	<b>m3</b>
<b>750 l/s</b>	<b>813,000</b>	<b>1,470,000</b>		<b>689,000</b>	<b>926,000</b>	363,000	754,000
<b>1,000 l/s</b>	<b>1,663,000</b>	<b>1,726,000</b>		<b>1,399,000</b>	<b>1,399,000</b>	863,000	1,000,000

**4 (a) Council is committed to the long term introduction of demand management and alternative supply infrastructure in the Waikanae Paraparaumu and Raumati areas in order to ensure that future communities have the ability to manage demand (and water supply investment costs) to the desired community level. The focus is on increasing community control over the impacts of water supply on community wealth and community choice.**

Adoption of this principle would clearly indicate that the community recognises that it has a two-fold task – to deal with immediate supply issues but to also position itself to manage water use in the future. A distinction is made here between the establishment of the physical infrastructure and systems and any initiatives to influence behaviour.

The emphasis on the introduction of demand management infrastructure, is based on the idea that if people are to achieve change, they need to be provided with tools to do that. One of the challenges is to find ways that enable people to be ‘water conservationists’ as part of their everyday lives – without having to think about it is a special or ‘crisis’ situation.

**4 (b) Demand management infrastructure will be introduced steadily over a ten year period. The focus is on achieving long term structural change and increasing the choices available to the community to manage water use.**

The length of this time period identified may seem long. While the time chosen can obviously be changed, it is suggested that what is being introduced with these principles is a fundamental shift in approach. It is easy enough to argue that a community should shift to more deliberate demand management but that shift requires both a change in attitude and funding. It usually occurs at a time when funding of new supply needs to be considered.

Because people are used to investing in supply (reluctantly), investment in demand management can be seen as a burden, even if people acknowledge the long term benefits. Until demand management is seen and understood as an equal partner in water management, it is suggested that incremental change is more likely to succeed than major investment at once.

This principle needs to be read alongside the next principle, to get a flavour of what that ‘steady introduction’ of demand infrastructure might include.

**4 (c )**

**Priority will be given to the following:**

- **encouraging 80% of all houses have alternative non-potable supply systems in place by 2013/14**
- **all new subdivisions developed after 2004 have household water efficiency systems in all houses and stormwater reuse for non-potable purposes;**
- **all new businesses established in the Waikanae, Paraparaumu and Raumati area after 2004 have a water efficiency plan in place and make use of the latest available water efficiency devices and processes relevant to their businesses;**
- **encouraging the retrofitting of existing houses – target - 60% of all existing houses have a dual flush toilet and plumbing systems which use the latest water efficiency devices in place by 2013;**
- **by 2013 each suburb has two stormwater reuse systems in place which allows local community use for non-potable purposes.**

The possibility of water consumption charges as a demand management tool will be considered through a separate process. Council, after reviewing performance from voluntary initiatives, may intervene if targets are not being met. .

Adopting targets sends a clear signal of community goals and Council intentions. The cost implications of these targets will need to be discussed. Before this can happen, Councillors have indicated that they wish to look more closely at its role in support funding for these kinds of initiatives. A key concern was ensuring equity for householders who had already invested in meters.

Any actual expenditure decisions would be considered via the annual plan and long term financial planning processes. The overall strategy endorsed the development of a wider demand management programme and costings for consideration as part of the annual plan process for 2003/04. Adoption of these targets at this stage would provide guidance for developing costs to be brought back on the 19<sup>th</sup> November in conjunction with the wider discussion of funding.

The current investment in meters remains in the Long Term Financial Strategy as being introduced in 2008-10.



## 5 Water Supply: Strategic Approach

**5 (a) Water supply planning will be designed around the (draft) levels of service standards for water use of 250 lcd (essential uses) and 150 lcd (non-essential uses).**

This confirms the use of the broad levels of service standards as the guiding standard for supply planning. The key issue discussed here is the need to find a solution to the security of supply issues currently affecting the area. The focus on security of supply rather than development capacity, reflects the decisions already discussed to factor in a rigorous demand management regime. This eases the development capacity issues and reduces the total storage/ supply need for the low flow/ drought situations.

### 5.1 Supplementary Supply for Security Needs

This section discusses options to solve the immediate security of supply issues for the Waikanae Paraparaumu Raumati areas. These issues arise because at 750 litres / second flow in the river there will be no water that can be abstracted for the public water supply.

A 'worst case scenario' of a 1 in 50 year drought has been established as the standard against which Council should planning its supply services. The 1 in 50 years does not refer to the frequency of the drought but it's severity. The drought could occur at any time and it would be likely to mean at least 56 days of the year where there no water that can be taken from the river. Also there will be about a 106 day total period which is made up of three parts. First there will be a 'lead in' time of declining rainfall and declining river flows. The amount of water which can be taken will be stepped down over that time. There will be the 56 days more or less of no river supply and then a period of recovery. The modelling of supply needs set up a profile as follows:

**Figure 7: Schematic of River Flow Process**

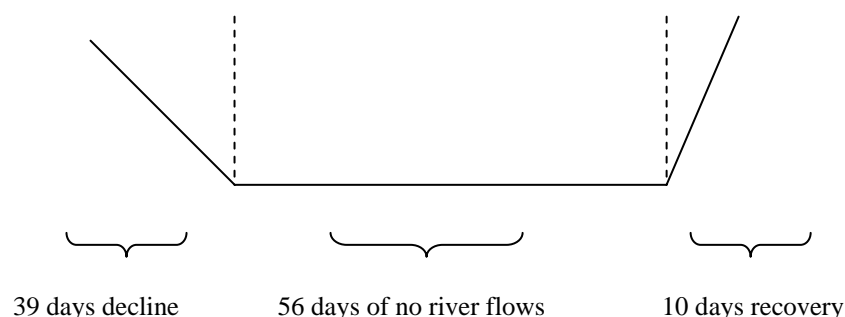


Figure 8: Standards Used in Assessing Security of Supply Needs

	<b>non-peak demand</b>	<b>peak demand</b>
past planning standard	435 lpd (average demand)	650 lpd
new standard	250 lpd (essential) 150 lpd (non-essential)	400 lpd plus 75 lpd water loss

It is important to understand the shift in thinking and how it fits with the issue of securing supply during drought years. The current planning standard does not measure what people are using water for. It measures how much they are using in times that might be considered to be 'off-peak'. It can be for essential and non-essential purposes. The workshop standard to date focuses on making a distinction between reasonable essential use and other uses. It really brings average demand closer to essential use. This is the kind of thinking which is used in parts of the district which are on restricted supply. Adoption of the 250 lcd and the 150 lcd, by coincidence brings the urban areas more in to line with the other areas which are provided with reticulated water but are on a restricted system. It develops the idea of reasonable use.

**5.1 (a ) Council's preferred option for securing reliable supply for the Waikanae, Paraparaumu and Raumati areas during periods of drought or low flows below 750 l/s is:**

- to seek maximum yield from the bores;
- to explore supplementing any remaining need from storage ponds of river recharge.

This conclusion is based on an assumption at this stage of a 1,000 l/s residual flow in the river. The idea of maximum yield refers to the maximum environmentally acceptable yield that is consented. The background to the different options considered by Council in arriving at the preferred option is set out on the following pages. The following should be noted:

- Council seeks feedback on the preferred option, and on any other option;
- the bores continue to be tested. Initial information suggests that the yield would be higher than the 10, 000 m3 currently allowed for under the Freshwater Plan;
- the costings for the storage ponds and bores are worst case and are likely to be less than the figures presented, depending on the actual location of sites.

The capacity of the aquifer is being assessed at present by running the existing bores at a high rate. This tests whether there will be infiltration of seawater into the aquifer as water is removed, and whether there is an impact on the shallow groundwater system.

## Summary of Water Supply Technical Options and Scenarios Considered in Arriving at the Preferred Option

### 5.1.1 Detailed Discussion of Technical Options

The technical options available to solve the immediate security of supply issues and the long term development capacity issues are:

#### in-catchment

bores

dams

storage

river recharge

#### out-of-catchment

Otaki pipeline

Wellington Regional Council pipeline

**Bores:** At present, Council has a consent to extract 3,900 m<sup>3</sup> a day from the aquifer. Past planning has looked at the possibility of extracting up to 10,000 m<sup>3</sup> a day and it may be possible to extract more than that amount. There will be a process of negotiation about allowable yield once the running of the bores is complete and application made (should this be the preferred option). The Regional Council has relatively limited information about the Kapiti Coast aquifers. The maximum yield is for 10,700 m<sup>3</sup> a day from the aquifer at 40 metres depth. The Wellington Regional Council has queried whether it will make a full allocation initially. One advantage is that the aquifer is not allocated for anything but the public water supply at present. The attitude of the Wellington Regional Council to even higher extraction is yet to be established. They are also waiting for information from the testing of the bores.

Previously, the proposal had been to directly inject water into the reticulation system when needed. Variations in water chemistry between bores made this difficult. This has now been modified to a scheme where the water is transported to the Water Treatment Plant, where it is treated in a separate plant, blended and then passed through the final stages of the main treatment process.

Costs provided at workshop three were broad estimates only. Since then, detailed costings have been developed for three scenarios: 10,000 m<sup>3</sup>, 15,000 m<sup>3</sup> and 20,000 m<sup>3</sup> yield from the bores. These are shown below. It should be noted that further assessment of whether separate treatment at the Treatment Plant will be needed. If not, this will reduce cost further.

Figure 9 – Potential Bore Costs

	<b>10,000 m3 per day</b>	<b>15,000 m3 per day</b>	<b>20,000 m3 per day</b>
<b>Preliminary and general</b>	292,000	373,000	435,000
<b>Additional boreholes</b>	195,000	481,000	829,000
<b>Pumps and pipework</b>	1,597,000	1,782,000	1,763,000
<b>Miscellaneous</b>	281,000	347,000	436,000
<b>Contingencies</b>	390,000	497,000	581,000
<b>Sub total</b>	2,755,000	3,480,000	4,044,000
<b>Project Overheads</b>	292,000	373,000	435,000
<b>Total Capex with upper cost of +/- 25% margin</b>	3,808,750	4,816,250	5,598,750

<b>Annual Opex</b>	43,000	52,000	60,000
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Costs are significantly lower than those previously estimated. It is important to note that this provides a ‘worst case’ cost. For example, the line of bores is set as much as possible along roads and road re-instatement costs have been included. Some options may include use of drainage reserves etc and these reinstatement costs may therefore reduce. The upper cost of a +/- 25% margin of error has also been included; costs may be less than this.<sup>1</sup>

Bore water presents some problems with water quality, which is overcome by treatment.<sup>2</sup> In addition, while the extent of an aquifer can be estimated it cannot be guaranteed and there may be unanticipated problems over time with capacity. The testing of the bores will give some certainty as to capacity.

A key issue for the existing bores will be the saline interface and the extent to which it may move inland with extraction. Obviously any investigation additional bores will

<sup>1</sup> Costing has included the following assumptions: the average delivery from a bore will be 1500 m3 a day; where possible the pipeline route will follow roads; the boreholes will be able to pump directly to the Treatment Plant; the groundwater supply will be required for 20 hours a day over a three month period; the water will be pre-treated by either oxygen injection or dosing; the cost of power is 8 cents a kilowatt hour; the discount rate for determining net present value is 5%; the life of the scheme is 20 years; 50% of bores drilled will not be usable.

<sup>2</sup> In June 1995 Kapiti Coast District Council received a report from Industrial Research Limited “Review of Copper Corrosion in Potable water”. The study identified the corrosion mechanism appropriate to water from the Waikanae River and Treatment plant and concluded that copper corrosion was in part related to transient changes to water chemistry. The report recommended that inhibitor dosing be used if high chloride ground waters (containing more than 150 mg/litre chloride ion concentration) were to be used because the mixing of high chloride ground waters and low chloride surface waters was expected to significantly increase the propensity of corrosion damage. The report recommended that simple field testing should be undertaken to validate any mixed water treatment strategy. The most likely inhibitors are sodium hexametaphosphate or sodium silicate.

need to look at locations further inland as well as across the aquifer. This factored into the bores scenario.

**Storage Ponds:** The storage ponds option provides for ‘out-of-river storage’ where water is pumped from the river in winter months or periods of high flow and stored in a series of ponds adjacent to the river. The water is then pumped when needed to the Treatment Plant for treatment and entry into the reticulation system. Environmental impacts are expected to be minor.

Further work has been undertaken to cost a ‘worst case’ storage pond option. This means that all possible technical requirements were factored in. This provides an upper limit cost that could be considered as for any site. Some sites may allow some technical requirements to be dispensed with – for example, pond liners may not be required in all situations.

Council has also received proposals for storage ponds through the submissions process – one from Ngarara Ltd and subsequently from Water Level Ltd. A further site to the east of SH1 near the Treatment Plant has also been identified as a possible site. These proposals have not had some costings done: but they provide estimates that are considerably lower than the worst case scenario.

Figure 10 – Worst Case Costs: Pond Storage

	500,000 m3 capacity	1,400,000 m3
<b>preliminary and general</b>	250,000	300,000
<b>land</b>	1,400,000	2,300,000
<b>earthworks</b>	2,073,750	3,513,000
<b>liner</b>	2,601,000	4,200,000
<b>underdrainage</b>	1,341,000	2,780,000
<b>pumps</b>	620,000	620,000
<b>pipe</b>	2,452,000	2,540,000
<b>intake/ aeration</b>	250,000	350,000
<b>landscaping</b>	330,000	450,000
<b>contingency/ minor items</b>	1,000,000	1,500,000
<b>Professional services</b>	1,539,718	2,000,000
<b>Total Capital costs accounting for upper cost of +/- 20%</b>	<b>\$16,628,900</b>	<b>24,663,360</b>
<b>if variable costs not necessary</b>	<b>14,696,900</b>	<b>22,255,300</b>

The main point to note is that as volume is added to the initial unit, overall unit costs reduce significantly. A smaller initial unit size will reduce initial costs to some extent. The storage pond option is on a par with some of the estimated dam projects. This kind of option becomes more affordable as volume is added.

It is possible for the storage ponds to be adopted as an option that would provide for the full 50 year storage needs. It is also possible to build the storage in modules over time, provided that the land is secured. There may, of course, be greater efficiencies gained in doing the earthworks at one time.

There are risks associated with algae bloom, similar to the risks found with some storage dams. It is worth noting that the Wellington Regional Council accepts risks from algae bloom with the Te Marua lakes. To date, these risk issues have been able to be managed. The Wellington Regional Council has no plans to decommission its storage lakes and sees them as an essential part of bulk water supply although it acknowledges the risks. It is considering an approach of blending supplies from river, aquifers and river to reduce risks.

The Water Level Ltd proposal provided a total cost for 1.4 to 1.5 million m<sup>3</sup>. The proposal included five ponds at about 300,000 m<sup>3</sup> each. These total costs are shown below in the right hand column. If the same ratio of costs spread across 500,000m<sup>3</sup> units this will allow comparison with the worst case scenario.

Table 11 (a) – Water Level Ltd Projected Costs

	500,000 m <sup>3</sup> capacity	1,400,000 m <sup>3</sup>
Pre –development feasibility		<b>\$400,000</b>
Land (current GV)		<b>\$1.5 million</b>
Physical works		<b>\$10.2 million</b>
Professional fees		<b>\$ 2.6 million</b>
Finance Costs		<b>\$500,000</b>
<b>Total Capital costs</b>	<b>\$12,500,000</b>	<b>\$15,200,000</b>
<b>Operating Costs</b>		<b>\$100,000</b>

**Table 11 (b) –Ngarara Management Ltd: Projected Costs**

	600,000 m3 capacity	1,200,000 m3
Pre –development feasibility	\$80 -100,000	
Land (current GV)	\$1.5 million	
Physical works	\$9.65 million	
Professional fees	included in costings	
Finance Costs	included in costings	
<b>Total Capital costs</b>	<b>\$11,250,000</b>	<b>\$12,450,000</b>
<b>Operating Costs</b>		

## **Dams**

Over the last ten years seven dam options have been explored in varying levels of detail. These are listed below:

	estimated upper costs	if river used as transport
Maungakotukutuku (lower)	\$19.5 million	\$17.1 million
Maungaktukutuku (higher)	\$21.3 million	\$17.4 million
Reikorangi	\$19.7 million	\$16.8 million
Ngatiawa	\$19.6 million	\$16.9 million
Rangiora	\$15.6 million	\$12.4 million
Kapakapanui	\$11.9 million	\$11.9 million

operating costs for above estimated at \$27,000 per year

Water Treatment Dam	\$14.4 million	\$14.4 million
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operating costs estimated at \$80-\$100,000 per year – extra pumping costs

These options are unlikely to be available as an alternative to the bores within the timeframe. They would need to be considered for the next stage of investment should this kind of approach be taken. Costs are approximate only and would need to be firmed up via feasibility investigations. The exceptions are for Kapakapanui and the Water Treatment Plant site.



**River Recharge:** The previous technologies are relatively well known and understood. The river recharge option has been raised in various contexts since 2000 and was put forward again through the May 2002 submissions process. The proposal has been refined over time and has the following broad characteristics:

- water would be returned to the river at certain points to ensure that residual flows would remain above the 750 l/s along the length of the river. This would allow water to be extracted at a constant rate. Pumping points and pipelines would re-circulate the water at various stages, gradually bringing flows back up to 750 l/s at the Treatment Plant intake.
- The source of this water would be:
  - groundwater: this would be extracted from a number of bores adjacent to the river. Estimates are for two bores but this could be increased. The proposers are of the view that consultant cost estimates of a 50% failure rate for putting down bores is too conservative: they assume a greater success rate.

Note: the use of treated wastewater was originally considered for the system. This is not now part of the proposal for recycling the water but treated wastewater would be used to supplement the river at below the lowest recharge point above the estuary.

- to a lesser degree, stored river water as the tidal changes pushes freshwater back up the river.

**Costs:** the proposal costs are at a similar level to the bores proposal – approximately \$4.3 m (bores approximately \$3.8m).

The proposers are of the view that it could accommodate the projected demand of the earlier Kapiti Coast District Council standards. It can undoubtedly satisfy the projected demands under the new draft standards that have been used to estimate demand for the other proposals. There has been some debate about whether the conservative estimates used for bore drilling success rates are valid. This is important when comparing the relative costs and benefits of the both bores and recharge with other options. External consultants have argued that a conservative approach needs to be taken in terms of risk management. This is likely to be an unresolved point of debate with the proposers but at this stage, the more conservative approach is applied to both bores and recharge. This reflects the lack of certainty about the aquifer and the need to take a fairly conservative approach to what it can deliver.

Previous reviews have considered the proposal relative to the risks and costs of the Otaki pipeline. The reviews have focused on relative costs and the apparent relative complexity of the proposal. The process does require fairly constant calibration but from an engineering point of view is feasible and achievable.

The issues with the recharge option that remain to be resolved are:

- **ecological impacts.** All options involve some environmental impact. The impact of a dam footprint and resulting river flows are probably most obvious. The impacts of groundwater take is less obvious but can range from issues of subsidence and drawing from other aquifers, to effective take from the river itself when there is leakage between aquifers.

A recharge process which continually recycles river water raises questions about the cumulative impacts on water quality. In addition, there is potential for increased saline intrusion. Although the lower recharge points lie within an area of saline influence, increased volumes may have an unacceptable impact.

This does not necessarily mean that the process will produce unacceptable impacts. It indicates that this is a risk. Because this is a relatively new area, it is not necessarily an issue of commissioning a review that can answer these issues immediately. Rather, this is identified as an emerging problem, which may suggest a precautionary approach in the short term.

In effect, the recharge process creates a much more confined water cycle, if not a closed system. This in itself is not necessarily a problem but is perhaps counter intuitive to a sustainable management framework, which does emphasise the importance of interacting ecosystems.

Concerns about impacts on algae bloom have been raised in the past by the Public Health authority. A response from the proposers was to set up more pumping and recycling stages, to avoid some of the impacts of cumulative effect.

On the positive side, the proposers argue that the injection of water back into the river would go some way to restore natural flow levels that have been depleted over the years.

An important problem is that while there is information about residual flows, there is limited information about the ecological health of the river. The problem of understanding the impacts of residual flows has already been acknowledged. There is a need to model the ecological impacts of a recharge system.

**Cultural Impacts:** The main impact is the idea of the river as a highly managed, relatively artificial system.

The river is already not natural in the sense that the channel has been highly modified and water is taken for supply. Within these existing interventions, it has a natural flow process. Given the desire of the community to restore the riparian margins to some 'natural state', the question remains about attitudes to increasing the artificiality of the system. This has not been directly consulted on.

Perception and a sense of ease with the idea will be an important issue. Consultation and analysis will need to consider these intensely personal rather than just quantifiable cost/benefit concepts as legitimate considerations.

**Process:** The proposal has worked its way through a process that has raised cumulative questions around cost, engineering and ecological effect, and now the need for consultation on ecological cultural effect. The issues about the impacts of a relatively closed system may appear as another impediment.

This lengthy discussion of the ecological and cultural issues has been provided because they have tended to be lost under a focus on cost and engineering viability. This may seem unbalanced given that the summary of environmental and cultural effects has been brief for the other options. This emphasis does not

downplay the environmental and cultural impacts of these other options. The emphasis is on the fact that the specific concerns relating to the recharge proposal are an issue that have not yet been thoroughly explored by Council.

Council made a previous decision not to explore the option. It would be beneficial now to review the option to achieve a definitive position on the ecological impacts and community acceptance. There is also a need to understand the Wellington Regional Council position on the fact that river flows would fall below 750 l/s at the points of intake and pumping. This could be minimal. The absence of this comprehensive review remains an issue when considering the relative costs, benefits and risks in terms of timing of each option. It may be a disadvantage in a situation that requires an immediate decision. The relative risks will need to be taken into account when choosing the preferred option.

Irrespective of whether the proposal is chosen as a preferred option at this stage, it is suggested that a review of the ecological impacts, linked to the proposed ecological analysis of the river, should be undertaken. There should also be clear and transparent consultation on the cultural impacts. This information would allow Council to establish a comprehensive position if the option is raised in the future. The methodology would need to be developed in conjunction with the proposers, community and iwi, given the significance of cultural as well as ecological impacts.

Figure 12 : Summary of Risks and Impacts

	<b>Bores</b>	<b>Dams</b>	<b>storage ponds</b>	<b>Otaki pipeline</b>	<b>Regional option</b>
<b>Environment</b>	medium* – groundwater impacts under assessment	medium to high high impact if dam fails – low probability immediate impacts of dam	low	medium *– ecological impacts remain to be tested	low
<b>System risk</b>	low –some uncertainty about bore yields	low – proven technology	low	low	low
<b>Process risks (timeframe)</b>	low	high	low	high – potential ecological review/ consenting issues	medium – potential opposition
<b>Process risks (wider strategy)</b>	low	low	low	high while district wide review not yet complete	high while district wide review not yet complete

<b>Public Health and Safety</b>	low	medium risk – algal bloom	medium risk algal bloom	low	low
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\* in both these situations the level of impact is yet un-quantified so a conservative assessment is made. Bore impacts will be known by mid November. Pipeline impacts would require review during 2003.

<b>Strategic Implications</b>	significant contribution to development capacity issues  base assumption in security of supply options	consistent with strategy to date	consistent with strategy to date	unknown	unknown
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### **5.1.2 Possible Solutions: In-catchment Options**

This section begins with a discussion of the planning process and timeframes and then considers the range of supply options available to Council.

**Planning Timeframe.** Council has adopted a 50 year planning period for water management. This is a commendable emphasis on the long term. However, the planning process to date has emphasised this 50 year period more as defining the size of the engineering solution that needs to be put in place now. The idea of the 50 year period being a time over which a problem is defined and solutions structured has been less of a consideration.

A staged approach has the potential to smooth investment out by accepting that investment does not have to be all in 'Year 1'. Provided that a long-term strategic programme is adopted that stages investment over time, risks can be managed and desired storage needs provided for. This kind of strategic thinking would require an active demand management programme, regular monitoring and a planned rather than crisis driven investment programme.

The question of whether there is benefit in staging investment in supply in a series of steps was explored. It was concluded that there is little real benefit because the population increases are relatively small. This is illustrated in the table below:

Figure 13 – Changes in storage needs over 50 year period.

<b>Supply Needs under River Flow Scenarios</b>	<b>Supply needed if 15 year staged provision to cover up to 2017 demand</b>	<b>Further supply needed after 2017 to provide for demand between 2017 and 2047</b>
750 l/s residual flow	777,000	149,000
1,000 l/s residual flow	1,174,000	225,000

This suggests that the main issue is whether the planning now is for a 750 l/s residual flow scenario or a 1,000 l/s residual flow. The way in which costs rise as volume increases will be a key to that decision.

**Demand Management:** A draft demand management programme has been adopted via the workshops along with water consumption targets. This programme has the effect of extending the development capacity of the area by at the least another sixty years. The focus of the following discussion therefore is on the issue of security of supply. It assumes a level of investment in demand management of \$5m over the next ten years or so within the area. The precise programme is to be brought back to the Committee via the annual plan process.

### **In-catchment solutions: Preliminary Consideration**

#### **Bores as a Sole Source of Supplementary Supply:**

It may be possible to use the bores as a sole solution. This will depend on how much the bores can deliver and how much consented yield the Wellington Regional Council will agree to in a situation where there is limited long term aquifer data.

The following table show the level of yield needed to service a 50 year scenario. Under a 750 l/s residual flow situation 10,000 m<sup>3</sup> would cover off most of the supply need but some requirements still remain. If the bores delivered around 15,000 m<sup>3</sup> daily yield there is relatively little remaining requirement for supply. Further effort to reduce demand a little further would solve the remaining supply problem.

However, under a 1,000 l/s residual flow at least 20,000 m<sup>3</sup> per day would be needed to fulfil supply requirements.

Figure 14 – How Bore Volumes Affect Remaining Supply Need.

<b>a 50 year provision</b>	<b>storage (m3) needed at 750 l/s</b>	<b>storage (m3) needed at 1,000 l/s</b>
<b>no bores</b>	926,000	1,399,000
<b>10,000 m3</b>	174,000	445,000
<b>15,000 m3</b>	29,000	89,000
<b>20,000m3</b>	-	1,000

The Wellington Regional Council is of the view that there are risks in depending on more than the 10,000 m<sup>3</sup> yield although this is yet to be confirmed once all data is in and analysed.

Under a 750 l/s or 1,000 l/s 50 year provision, bores are unlikely to be viable on their own at this yield. The question therefore is whether Council wishes to plan to take the risk of not obtaining the supply above 10,000 m<sup>3</sup>, or the risk of being required to meet a 1,000 l/s residual flow. The cost of the 10,000 m<sup>3</sup> is \$3.8million. A 15,000 m<sup>3</sup> yield would be \$4.8 million.

While use of bores does shift current reliance on river flow, in a situation of a cut-off and absolute restriction, the WRP area returns to reliance on a single source. This may be acceptable for the limited periods involved but Council needs to debate whether it wishes a lower risk ( and more costly solution).

**Suggestion:**

- consider bores as a possible sole solution for a 750 l/s scenario but in parallel to a lower risk option. Pursue back-up options if this is not viable. The potential yield should be better understood over the next few weeks. At that point negotiations with the WRC about permitted yield will be necessary.

**Dams**

Construction of dams within the three year period is considered to be a high risk approach in terms of timing. The costs of construction relative to other available options do not warrant risk of failure to meet the timetable. The dams become viable at a later stage – either for the next step in security of supply or to add further development capacity to the area.

**Suggestion:**

- do not consider within current timeframes
- if a staging approach adopted, factor in review of dams at the next stage.

**Storage Ponds as Sole Supplementary Supply Solution**

Storage ponds can be used as a sole solution for the fifty year period. Because they can be built as units, there is considerable flexibility.

Under a 750 l/s scenario, a storage capacity of 1,000,000 m3 would be needed. Under the 1,000 l/s situation, 1,400,000 m3 would be needed. The costs are:

Figure 15: Costs of Storage Ponds as Sole Solution

<b>Residual flow</b>	<b>Supply needed</b>	<b>Capital Cost</b>
750 l/s	1,000,000 m3	\$13.85 to \$20.6 million
1,000 l/s	1,400,000 m3	\$15.2 to \$ 24.6million

As with reliance on a single source, reliance on ponds on their own presents some risks. They can be subject to algae bloom although the Te Marua lakes have never had to be emptied for this reason. Water Level Ltd argue that if the water becomes unusable a pond can be emptied and filled within a month. This presupposes that the river flow is available to do this. At the same time, the

relative costs and the minor environmental impacts suggest there is benefit in exploring ponds as a sole supply solution.

**Suggestion:**

- consider ponds as a sole supply solution – review risk

**River Recharge:**

As noted earlier there are some unknowns with this option, in terms of ecological impact and cultural acceptability. There are potential risks in terms of challenge during the consent process, although the construction period is estimated by the proposers at about six months. The relative costs are such that Council may wish to accept those risks and proceed.

**Suggestion:**

- consider as an option for 750 l/s residual flow – (1,000 l/s unknown at this stage).
- irrespective of decision as an immediate option, undertake a comprehensive assessment of the proposal.

**Mixed Bores and Ponds Solution**

Whatever the yield from the bores, they are likely to be the most immediate and cost effective solution in a combined package. There are risks until yield is better understood, of sole reliance on bores as the long term solution. A solution is to invest in the bores and some level of storage in the short term. The relative mix will be determined by what is the final yield from the bores.

Assuming a 10,000m<sup>3</sup> daily yield from the bores, under a fifty year scenario further storage of about 430,000 m<sup>3</sup> (1,000 l/s) would be needed. About 250,000 m<sup>3</sup> would for the 750 l/s requirements over a fifty year period.

Figure 16: Mix of Bore and Pond Supply and Associated Costs

	Bores 10,00 m <sup>3</sup> yield	Storage Ponds 500,000 m <sup>3</sup>	Storage Ponds 250,000 m <sup>3</sup>	Total Cost
1,000 l/s	\$3.8 million	\$12.5 –16.9 million		\$16.3 –20.7 million
750 l/s	\$3.8 million		\$10 – 14.4 million	\$13.8 – 18.2. million

If Council was to develop this option, it would require detailed costings of the various available sites.

The bores and ponds are supported to date by iwi in principle and have received considerable support via submissions. They are likely to proceed relatively smoothly through the consent process.

If the yield from the bores is less than anticipated, then more storage volume can be added. Options can be added earlier, or increased in size.

**Suggestion:**

- that the mixed bores/ ponds option is included for consideration

**Other Matters**

It would be prudent forward planning to explore the feasibility for both storage ponds and dams during 2003/04 and to perhaps even secure land for either a dam or storage pond option, whether or not they are immediate choices. This would provide certainty in terms of long term planning but would not commit the community to all costs for the 50 year period being incurred within a two to three year period.

### **5.1.3 Possible Solutions: Out-of-Catchment Options**

**Wellington Regional Council:** The Wellington Regional Council has proposed an option which would see a pipeline constructed from the south that would provide Kapiti Coast with access to the southern joint water supply.

Regional Council staff have clearly stated that this would effectively give Kapiti Coast unlimited access to the southern supply in addition to in-district sources. The option is not a supplementary risk management regime but a regionalisation of the Kapiti Coast supply system. This requires an assessment of strategic implications for the whole district rather than simply as a way of solving the Waikanae, Paraparaumu and Raumati supply options.

The project would incur \$26.4 million in capital costs for the pipeline and about \$4 million for a reservoir at Otaihanga. The Wellington Regional Council have indicated that they would fund just over \$2 million of these costs. The reservoir is already factored into the Long Term Financial Strategy but must be seen as a necessary component of capital costs for the project. The project would provide the community with reliable emergency supply fully treated, including fluoridation. The extent to which the area used the supply for other year round needs would be entirely a Kapiti Coast decision.

Wellington Regional Council bulk water costs (capital costs aside) are approximately 40 cents a cubic metre, about 12 cents more than current Kapiti Coast District Council bulk water costs. This reflects the costs of infrastructure and operating costs to supply the full needs of the southern areas. Wellington regional Council officers see that there is benefit to their existing customers of spreading fixed costs across a wider client base. They have indicated that a caveat on being able to complete the project within the three year period is the willingness of existing southern customers to have Kapiti Coast join the system. They consider that the possibility of spreading fixed costs across a wider population would be a significant incentive to these clients.

One of the benefits to Kapiti Coast is access to relatively unlimited supply. Wellington Regional Council officers have noted that there is sufficient supply



to about 2020-30 but that there are well planned supply options available beyond that. Any new capital investment in response to regional need will incur some increased costs for Kapiti Coast customers at that point. This is not quantified at present and therefore cannot be compared with the 50 year timeframes for the in-catchment options.

The other benefits that have been identified are:

- a relatively simple consent process;
- perception that there will be less impact on communities than the Otaki pipeline;
- would give protection against risks of increased standards for Waikanae River flows;
- reduce long term uncertainty to 2025-30, at which time regional investment in infrastructure is likely to be needed;
- Wellington Regional Council may put the debt on their balance sheet. This would reduce the level of indebtedness but would not avoid the need to pay for the system.

Wellington Regional Council staff are of the view that there is unlikely to be demand within their 35 year planning timeframes to reverse supply and pump water south. Only extreme emergency situations would make this cost effective. It was indicated that the possible future use by the wider region of the Otaki River has not been formally discussed with elected members. It remains a possibility.

The attitude of iwi to the proposal is unknown.

**Strategic Implications:** There are a number of district-wide strategic implications embedded in this proposal. These are:

- **concept of natural capacity and management:** the focus of the water strategy discussions to date has included the concept of local communities working within local capacities as a first principle. Adoption of this proposal would effectively move some of the responsibility for local water issues out of the district. This may have attractions for decision-making.

However, the proposal would also make it less likely that local communities would continue to take that same level of responsibility. This is the case with the southern regional communities, where the dispersed costs of supply make it easier to defer consideration of long term capacity issues.

Conversely, the proposal allows the Kapiti Coast to import a significant level of development potential into the area with the new resource. This can have benefits to the area but will not defer the need for the community to review its urban growth assumptions over time.

- **effectiveness of demand management:** the proposal will insert a large amount of capacity into the area in one ‘lump’. This is likely to reduce people’s responsiveness to calls for demand management. While this reduced pressure to control demand may be welcome in the short term, in the long term (within the 50 year period) there are likely to be significant external pressures to manage demand. Central government has signalled that it will be taking a major role in reviewing the management of the use and allocation of freshwater.

The regional option unpicks the current structural incentives to manage water use. The current Wellington regional Council bulk water pricing regime provides only very short term incentives to reduce water use. The ability of Council to influence water use will be significantly lessened.

- **funding:** The proposal would require Paekakariki to be on permanent southern supply. This raises issues about who should incur the capital payments in the short term, given that the regional option is being explored at this stage as a response to local needs. Consideration of district-wide scenarios is scheduled for about two years hence once fuller understanding of natural capacities and risks.
- **community processes:** the discussion of the water strategy to date has focused on developing effective community and iwi partnership processes. To an extent, the adoption of the proposal would negate this kind of process as the broad level supply decisions would lie outside direct community control. This may be acceptable to the community relative to the effort of community involvement but would require clear and transparent debate. The opinion of iwi on this also needs to be sought.
- **leadership:** Kapiti Coast District has shown leadership in insisting on developing a 50 year comprehensive water strategy for the district. Given that central government has identified the importance of the freshwater management for the future, there is considerable potential for a partnership role with government in developing the strategy further. This will be less achievable with the Wellington Regional Council supply option.
- **new Local Government legislation:** the proposed Local Government Bill includes principles that will require local authorities to consider wider sustainable development concepts. This is not a requirement as yet and this may be an incentive to make decisions about a regional option before these kinds of decisions are mandatory. Conversely, Council may wish to consider the regional option within this context, prior to the legislation being passed.

If the regional option is chosen, it will be necessary to revisit the draft principles dealing with overall management principles and community processes, to adjust them to the new context.

Council may conclude that although the regional option is a significantly higher cost, the consequent certainty and the passing of significant water management concerns to the regional supply agency, is of greater benefit. It is important that these strategic issues are debated however. They may seem less concrete than cost and immediate risks issues but they are extremely important in terms of long term strategic direction for the district. Positioning the district for long term water management is a significant issue.

**Suggestion:**

- given that it has not been debated to date, that the option is considered
- if not adopted as a preferred option, that it is included in the wider district-wide analysis and debate to be held 2004/05

**Otaki Pipeline**

An application for consent to take water via the Otaki Wellfield from the Otaki River and to construct a pipe line to supply water to the Waikanae, Paraparaumu and Raumati areas was made in January 2001. The proposal provided for the abstraction of water from the Otaki River when 'daily demand for treated water from the Waikanae Water Treatment Plant exceed' the permitted take from the Waikanae River under the Waikanae consent'.<sup>3</sup>

There is some ambiguity with this in that there is currently an absolute limit of 23,000m<sup>3</sup> daily take with a step down when river flows decline. There is a cut off at 750 l/s, intended from January 2003. The wording suggests that it would be possible to take water from the Otaki River when demand exceeded the absolute take, and not just when there were no river flows. Some submitters expressed concern that without a clear demand management regime, there would be limited guarantee that use would only be made in periods of no flow. The proposal was designed to allow greater take if the consumption targets were not met.

The proposal has been well canvassed to date and the technical issues are not discussed here. The option would cost \$12 million. It is one of the lower cost options and would provide good quality, certain water supply. However if a no take when Waikanae river flows are available is assumed the option provides no extra development capacity. A combined option needs to be considered – in this case factoring in a bores supply. This brings costs to \$15.8 million. This is consistent with Councils desire to extend development capacity.

The three main arguments advanced in the hearings by the commissioners for not approving the application were:

- **environmental impacts** – the residual flow standards were seen as an insufficient guide as to the impacts of the proposal. They were to be used as a trigger point for considering effects but could not be a substitute for understanding actual impacts. This understanding of effects needed to take into account community and iwi aspirations for the restoration of the River.

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<sup>3</sup> Report of Hearing Commissioners, Otaki Pipeline, September 2001

- **cultural impacts** – in particular for iwi.
- **economic/ social impacts** – the link between water use and development opportunities was made. The commissioners took the view that the impacts on the Otaki community needed to be better understood and provided for.

In addition, the commissioners noted the lack of demand management, particularly for the Waikanae, Paraparaumu and Raumati areas.

The draft principles discussed to date do take some first steps in developing a demand management plan. The ecological impacts are yet to be explored and this would need to be carried out over the next year. The community and iwi river restoration goals also remain to be explored. Done properly, this could take a year or more as signalled in the principles developed to date for the Otaki water management plan. The need for more analysis of local water use, natural capacity, and development opportunities and pressures were identified as a major focus for the Otaki, Hautere and Te Horo areas.

From a technical and risk management aspect, the Otaki pipeline has been thoroughly investigated and offers minimum risk. The main risks derive from the potential impacts on community process and iwi partnership development. There is likely to be challenges in any formal consent process although given Council's wider aspirations to build a relationship with community and iwi, this should not be the main focus.

#### **Suggestion:**

On the basis of significant risk to community and iwi partnerships, and because of potential further challenge in the consent process, it is suggested that:

- the option is not considered further in this current process;
- the option is considered in the district-wider debate to be held 2004/05.

#### 5.1.4 Summary of Options Considered: Costs, Risks, Benefits, Rates Impacts

##### **A: Residual Flow of 750 l/s**

(a) Storage Ponds (1,000,000 m3)	\$13.85m to \$20.6m (worst case)
(b) Bores plus Storage Pond (250,000m3)	\$13.8 m to \$20.7m (worst case)
(c ) Bores (15,000 m3 per day)	\$4.8 million (back up)
(d) River recharge	\$4.3 million (back-up - review)
(e) WRC Pipeline	\$28.2m (includes Otaihangā reservoir)
(f) Otaki Pipeline	\$12m

##### **B: Residual Flow of 1,000 l/s\***

(a) Storage Ponds (1,400,000 m3)	\$15.2m to \$24.6m (worst case)
(b) Bores plus Storage Pond (500,000m3)	\$16.3m to \$20.7m (worst case)
(c) WRC Pipeline	\$26.2m
(d) Otaki Pipeline	\$12m

It is important to note that the final costings for the ponds are likely to be less than the worst case scenario.

The tables set out in Appendix 1 identify the detailed costs for each option. Scenarios include payback of loans over a 20, 50 and 80 year period. The 20 year scenario is set out on the first page and shows the initial rates impact per household for each option. The second page shows the average impact over the whole period while the third page shows indicative costs for the second stage, if the staging approach is adopted.



**WATER**

**MATTERS**

# Otaki Water Management Plan

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# **Otaki Water Management Plan**

The Otaki water management plan is concerned with the settlements of Otaki Town, Otaki Beach and the surrounding rural area of the Waitohu plateau. Otaki Town is a mixture of residential and some small businesses with adjacent horticultural activities and then further outlying farms. The Beach settlement is a mixture of permanent and seasonal residents. The township traditionally serviced the surrounding rural area but until recently also had some larger industries, such as the meatworks.

## **1 The Natural Water System**

The settled areas lie across two stream and river catchments and across two aquifers. These are described briefly below.

### **1.1 Otaki River and Catchment.**

The river drains a central portion of the Tararua Ranges and has a total area of 348 km<sup>2</sup>. The main tributaries are:

- Waitawaewae River
- Waiotauru Stream
- Pukehinau Stream
- Pukeatua Stream (Roaring Meg)
- Kahiwiroa Stream
- Penn Creek
- Whatiuru Creek
- Rahui Stream

The complete catchment lies within the rohe of Ngati Raukawa, more specifically within the area of the Nga Hapu o Otaki which comprise Ngati Huia ki Katihiku, Ngati Maiotaki, Ngati Pare, Ngati Koroki, Ngati Kapu. Eighty percent of the river system lies within the Tararua State Forest Park which is managed by the Department of Conservation. The coastal plain is comprised of outwash, alluvial fan and shallow marine deposits. Wind blown materials have also been deposited and sequences of sand dune have been built up. Considerable areas of wetland and salt marsh existed closer to the coast but this has been extensively drained. The river system has been extensively modified since the 1930s below State Highway 1 to become a straight relatively narrow channel.

Ngati Raukawa in the Ngati Raukawa Otaki and Catchment Iwi Management Plan which was prepared by Nga Hapu O Otaki noted the significant modification over the years. In particular, they note the removal of forest and riparian vegetation, the loss of birds and bird habitat, the marked loss of fish and fish habitat, the 'river system dismembered and stressed' and the river stone scattered across New Zealand. Other river users perceive a fragility of habitat, stress on the fisheries, and a loss of amenity.

There is currently no water taken directly from the Otaki River. Water is taken from the associated groundwater zone. There is a relationship between the unconfined aquifer that lies between approximately 4 metres and 11 metres depth.



## **1.2 Otaki Groundwater Zone**

The groundwater zone extends along the length of the Otaki River. It is bounded in the north by Tasman Road, Mill Road and Rahui Road. The southern boundary runs from the sea to Lethbridge Road, Addington Road and Otaki Gorge Road.

There are three aquifers within the Otaki groundwater zone. These are:

- the unconfined aquifer lying between 4 and 11 metres. The water level in this aquifer is directly affected by the level of water in the river.
- semi confined aquifers lying between 19 and 35 metres in depth. The water levels in these layers are also affected by the level of the Otaki River.

The groundwater quality is generally high and therefore suitable for most uses, including domestic supply) without further treatment. (Note: discussion of risk issues occurs later) 1993 investigations did note that high nitrate nitrogen levels occur in some groundwater from the 4-11 metre unconfined aquifer. The Otaki unconfined aquifer is vulnerable to contamination from various landuses, including pesticides use on the horticultural blocks and local disposal of treated effluent to the west of Otaki. The Wellington Regional Council estimates a recharge to groundwater from the Otaki river of approximately 10, 500 m<sup>3</sup> per day between the Otaki Gorge and SH1 and 10,900 m<sup>3</sup> per day below SH1. The Regional Council also notes that the interaction between yield from the groundwater zone and the river flow needs to be considered as par of the overall allocation of the groundwater and surface water resource.

The groundwater zone also lies within the rohe of Ngati Raukawa as a whole and Nga Hapu o Otaki.

Otaki Town is served by two bores located at Rangiuru Road and Tasman Road, which draw on the Otaki groundwater zone. It is possible that the Tasman Road bore also draws from the Waiohau groundwater zone.

## **1.3 Waiohau Stream.**

The stream drains the western foothills of the Tararua Ranges north of Otaki River and has a total area of 54 km<sup>2</sup>. There is limited information about the condition of the stream. During prolonged dry spells some reaches of the stream dry up between SH1 and the Otaki Golf Course. The stream is used to supply the Waiohau Plateau area for both domestic and other uses.

## **1.4 Waiohau Groundwater Zone**

The zone lies east of Waiorongomai Road and north of Tasman, Mill and Rahui Roads. The main use for the water is for horticultural irrigation, stock water, dairy shed and domestic supply.

There are five separate aquifers in this zone:

- an unconfined aquifer which lies 2-10 metres below ground level and is formed by river gravels close to the Waiohuhu Stream;
- a semi-confined aquifer lies 20-30 metres below ground level;
- a confined aquifer lying 50-60 metres below ground level;
- a low-yielding layer of poor quality water about 40-45 metres below ground;
- a low yielding aquifer overlaying basement rock at 60-75 metres below.

The unconfined aquifer lying 2-10 metres below is recharged from the Waiohuhu stream and rainfall. Safe yield from this aquifer is dependent on the water level and flow in the Waiohuhu Stream. The semi-confined aquifer is probably recharged by downwards leakage from the Waiohuhu stream, rainfall and run-off from the eastern foothills.

## **2 The Available Water Resource**

The Wellington Regional Council's Freshwater Plan sets a framework for the take of water from the river and groundwater systems. This has the following characteristics:

### **Rivers**

- an understanding of the 'normal' or regular flow of a river;
- a minimum flow which is deemed necessary to maintain the ecological health and amenity of the river or stream;
- a core allocation of water that should generally be available from the system;
- the level of river flow needed if more water is to be taken above the core allocation;
- a 'step down concept' which means that as a river approaches the minimum flow the level of allowable take will be reduced as well. Various thresholds are set around this concept.

### **Groundwater**

- an understanding of volume of water in the aquifer and the rate at which it is recharged. Where there is a relationship between nearby river flow and the amount of water recharging the aquifer, this needs to be factored in;
- an estimate of a safe total yield;
- a division of that yield between bores and property owners.

The Freshwater Plan identifies the following minimum standards and core allocations for each of the water systems.

<b>System</b>	<b>Yield</b>	<b>Core allocation</b>	<b>Comment</b>
Otaki River	minimum flow 2,550 litres/ second	2,120 litres per second	There is no water currently taken directly from the Otaki River
Otaki ground water Zone	4- 11 metres	18, 250 m3 per day	capacity available from the unconfined aquifer
	19-35 metres	12, 470 m3 per day	This resource is fully allocated
Waiotihu Stream	minimum flow 140 litres per second	57 litres per second	This resource is fully allocated
Waiotihu groundwater zone	2-10 metres 20-30 metres 50-60 metres	8,020 m3 per day 4,390 m3 per day 5,150 m3 per day	This overall resource is significantly allocated

The 2001 decision in relation to the Otaki pipeline raised some significant issues about the way in which these minimum flow and minimum yield standards are to be interpreted or used. The Commissioners were of the view that the

“ core allocation ( in relation to the minimum flow) is indicative and is intended to guide decisions about individual applications for resource consent which have to consider a number of factors including the effects on the river of the particular proposal”.

In effect, the minimum flows and core allocations were to be considered as guidelines and indicators of a point of significant stress in the system. They were to be the trigger points for a rigorous management of allocation of water. More work is needed to understand the ecological impacts along the length of the river. This position has not been tested to date.

### **3. Water Management: Principles, Issues and Direction**

#### **3.1 Management Area 1: Concept of Capacity**

The natural capacity of the various water systems sets the thresholds for potential development and change within an area. Of course, other environmental thresholds might constrain development earlier. An example of this is flood risks although to a degree, this threshold can be modified through flood management works. Community aspirations and vision may well seek to limit growth earlier. Nonetheless, assuming none of these factors set constraints, the availability of water sets a final and absolute constraint.<sup>1</sup>

**3.1 (a) The overall development vision for the Otaki area and the links to the available water resource is not well understood. Understanding this capacity will be central to allocating the water resource.**

**3.1 (b) Council recognises community and iwi aspirations for the restoration of the area's streams and the Otaki River. It will work with both groups to identify the potential for restoration and the implications of this for the level of water resource available for community development.**

The wider draft water management strategy states that priority should be given to understanding the relationship between the available water resource and development capacity. The need to understand the relationship between the minimum river flows and ecological impact was noted above. If the full development capacity of the natural water systems, which Otaki and its surrounding areas is dependent on, is to be understood, more work is needed in this area.

As noted earlier, although there are minimum flow and core allocation standards for the Otaki River, a requirement now exists to establish the ecological impacts of any proposed level of abstraction. This work will need to be done before the total information can be translated into an understanding of the relationship between available resource and development potential. This understanding needs to be built up out of the following:

- projected natural population growth;
- a review of any possible population increase as a result of wider district and region development decisions;
- the current level of water use;
- a clear understanding the appropriate retention of a base resource for ecological bottomlines – either based on minimum flows or an assessment of effects;
- an understanding of the relationship between river restoration goals and the available water resource.

There is limited information on much of this and a comprehensive exploration with the community and iwi is needed. Within this framework, work is needed to clarify iwi and community aspirations for the restoration of the Otaki River. A key guide for the iwi perspective is the iwi management plan.

**3.1 (c )**

**The analysis of river capacities will include:**

- **clarifying the environmental impacts of various scenarios about levels of abstraction around minimum residual flow levels for the Waiotihu Stream and the Otaki River;**
- **identifying community and community aspirations as to the restoration along the reaches of the Otaki river;**
- **identifying the relative impacts on available water for community development under these scenarios.**

**3.1 (d)**

**Council will work with iwi and the community to review the implications of current levels of water consumption/ future demand management goals on restoration aspirations and the development opportunities of the area.**

## **3.2 Water Management Area 2: Balanced Development**

The wider draft water management strategy identified that:

- catchment development capacities need to be used as a central factor in managing urban development and economic growth.
- regular review of the urban and economic development strategies need to be undertaken in relation to the capacity of natural systems to provide water

Estimates for population growth have been developed for a twenty year period (1998) and then extrapolated to give figures for a fifty year period. Three scenarios were developed, - low, medium and high. The medium growth scenario was adopted. These figures were developed based on 1996 census data. Comparison with 2001 census figures shows that the Waikanae, Paraparaumu and Raumati areas grew at a rate closer to the high scenario. Otaki and the surrounding area grew slightly faster but closer to the medium growth scenario. The population is estimated to grow by about 1,100 by about 2046.

This projected growth for Otaki is small but there are district wide issues that might affect this projection:

- review of the relationship between development and the available water resource in the Waikanae, Paraparaumu and Raumati catchment may establish some upper limits on growth over the fifty year period. This might have the effect of pushing growth further north.
- if Transmission Gully happens, there is likely to be significant impacts on growth patterns;
- the Te Horo future urban development area was identified as a potential response to growth pressures from Transmission Gully;
- The WRC review of flood risks in Otaki suggests that there is potentially significant room for development in that area. This needs to be reviewed in conjunction with the wider community;
- the economic development strategy identifies a focus on intensive, value added, horticultural and food processing development. this raises a question about review of the future urban growth area.

This suggests that further work is needed to understand the impacts of development scenarios on the water use and available water. This is also an important step in any district wider debate about supply systems.

**3.2 (a) Council will, under the umbrella of the process/ structure for the development of the Otaki water plan, develop a process with the community and the wananga to explore:**

- **potential development opportunities for the Otaki town and hinterland;**
- **water use implications**

**3.2 (b) Use and allocation of the Otaki water resource needs to occur within an overall development vision for the area, rather than just on a “first in first served” principle. Council will undertake discussions with the Wellington Regional Council on this issue.**

Council has identified a need to better understand the nature of future possible residential growth and economic development and the implications for shared water use in Otaki. It was suggested that the focus of much water services planning was on residential growth and residential water demand. There was little information about economic development implications, beyond the need to ensure a certain and reliable water supply.

This is a critical issue given that the district has a vision of more balance between residential growth, local employment, service and productive activities. By adopting the general principles Council has signalled a clear role in trying to balance these demands.

Council has specifically recognised the need to understand the water use needs associated with residential growth and economic development within the Otaki

and adjacent Hautere and Te Horo area. It also recognised the need to better understand the potential for intensive horticulture and associated food processing.

### **3.3 Management Area 3: Maximising the Ability to Conserve Water**

Otaki does not have an immediate water management problem in the sense that there is a water supply crisis. However, Section 3.4 below does point to a high level of water use in the area. How this water is being used and whether there are high water leakages from the system is unclear. In the long term, a major issue for the community will be its ability to manage water use. The area has a long history and has an older building stock. There is benefit in looking at how efficient that building stock is over time and moving slowly and gradually to increase its efficiency. A first step is to understand more about the condition of the building stock and what this means for water management.

**3.3 (a) Council will undertake an analysis of the impacts of physical infrastructure building stock design and quality on overall water consumption. This will involve an assessment of:**

- the amount of water loss from the public reticulation system;
- the amount of water loss from private systems.

### **3.4 Management Area 4: Levels of Service**

The overall water management strategy identifies three water use standards which could be understood to act as triggers for investment in water supply infrastructure to ensure adequacy of supply (this is apart from water quality issues). These were:

- a measure of water consumption per capita for basic necessary human use 250 litres per capita per day;
- a measure of the level of water use for non-essential uses which council would factor in to the design of water supply systems 150 litres per capita per day, provided that if supply for basic needs was threatened then this non-essential use would not be provided for. This figure effectively defines the upper limit for peak demand of 400 litres per capita per day;
- certainty of supply for non domestic or basic need, provided that the extension of supply for economic development would be timed according to the community's ability to achieve investment.

It was agreed that there would be a report back on the benchmarking of the basic needs figure at a later date.

The Otaki area has a relatively high overall water demand as follows:

	1996/97	1997/98	1998/99	199/00	00/01
Average flows	580 lcd	581	688	837	800
Peak flows	1,236	1,029	1,067	1,178	1,160

This does not equate directly to the concept of use for minimum basic need and non-essential uses. Obviously, there will be peak usage for both essential and non-essential purposes. There is a need to understand how much of this use is for essential and non-essential usage.

If the figures are separated out to include some concept of essential use and the remainder to be assumed as non-essential use the figures can be understood as follows. (The essential standard used is based on the relatively generous figure of 250 lcd adopted in the workshop). The figures also include an allowance of approximately 80 litres per household loss of water from the reticulation system. This amounts to about 30 litres per person per day. This is very approximate and is simply an attempt to factor in a level of loss based on information derived from the Waikanae, Paraparaumu, Raumati area. The totals with water loss figures factored are shown in brackets.

	1996/97	1997/98	1998/99	199/00	00/01
essential use	250 lcd	250	250	250	250
average non essential use	230 (200)	231 (201)	438 (408)	587 (557)	550 (520)
peak non-essential use	986	959	817	928	910

The level of use is high and is certainly higher than the figures that have been achieved over the last five years or so in the Waikanae catchment.

A number of issues need to be resolved about this information:

- what is the real level of water loss from the system?
- to what extent is the non-essential demand being used for horticulture and other non-domestic uses?
- what is the real level of use for basic needs?
- all things being equal, why is demand so high?
- why is it rising? is this an increase in essential or non-essential demand?



What does this mean for the approach to levels of service and community intervention to ensure supply in the Otaki area? It should be noted that the discussion on funding and the introduction of metering and possible user charges came to the following conclusions:

- continued local funding of water services with the possibility of a mixed systems approach was noted for further exploration;
- council would review the introduction of water consumption charging for non-essential uses
- Council would review each community's achievement of the consumption targets.

This clearly signals that Council wishes each community to address the issue of demand management, and to develop a programme that will clearly shift consumption to those targets – in a way and at a rate that is acceptable to that community. On review, Council will assess whether there has been change and whether more rigorous demand management initiatives will be needed.

There is no immediate pressure forcing the Otaki community to adopt a programme to reduce water consumption. The issues for the community really are:

- to what degree does it wish to manage the risks now so that there is a manageable process of addressing security of supply?
- how soon does it want to use up development potential?

Equally it is suggested that the community needs to understand the causes of the high consumption levels better before it can move to manage them.

In terms of the water services standards, the following principles are proposed for discussion.

**3.4(a) The long term goal of 250 lcd for essential use and 150 lcd for non essential use is acknowledged. This goal will be used as the basis for assessing future development potential for the area.**

**The level of consumption for non-residential use will be managed to fit the most effective and practicable conservation techniques available at the time.**

**3.4 (b) Council agrees that more information is needed about Otaki consumption and the reasons for it before any interim goals and timelines for the water supply service can be discussed and established.**

**3.4 (c ) The targets and timeline for the Otaki water supply service should be established by mid 2004.**

**Council will review the level of success the community has achieved within three years of the establishment of the targets and timeline.**

**3.4 (d) Council will work with the community to model the impacts and costs of different consumption targets over time, to assess impacts on development opportunities and the implications for restoration of the river system.**

**3.4 (e) The level of consumption for new population will be assumed at 250 lcd for essential use and 150 lcd for non-essential use.**

The main focus of this section is on gaining a better understanding of how and how much water is used in the Otaki area. A major issue here is the level of water loss. It is known to be relatively high but it is not known whether the losses are occurring from the public or privately owned parts of the system. Until there is better understanding of whether how the associated horticultural activities are using water and how much is residential demand, there is little benefit in setting water consumption targets. However, the proposed water management plan does take the position that more active water management is needed. The first step is to find out more about water use and then to set water consumption targets. To that end, the draft plan suggests that late 2004 as a goal for setting water targets.

### **3.5 Management Area 5: Funding of Water Services**

The funding framework will follow the broad funding decisions set out in the overall water management strategy. The main points are:

- rates funding of water services in the meantime;
- continued local funding of water services;
- exploration and consultation on the possibility of:
  - district wide funding of that portion of any service delivering on essential water needs;
  - local funding of remaining services for non-essential water needs;
- linking of the analysis of funding methods to achieving reductions in water use;
- community debate about methods to increase incentives for water conservation, including debate about water consumption charging;
- a clear statement that if water consumption charging was introduced, it would not apply to water used for essential needs.

### **3.6 Management Area 6: Partnership With Iwi**

Workshop 1 identified that Council clearly recognised the kaitiaki role of Ngati Raukawa and the hapu of the Otaki area. This included recognising their particular role in relation to the Otaki River but also the associated role of managing the water resource to ensure adequate provision for the wider community.

The workshop also identified that Council would wish to explore the following with iwi:

- the potential for joint development of area water management plans;
- the methods by which the mutual responsibilities of the hapu and iwi and Council can complement and support each other in the task of achieving the best possible water management for the district;
- developing a process to discuss and advance analytical work prior to the commissioning of any work;
- a clear process for discussing water related resource consents prior to lodging of consents;
- reporting processes.

The Ngati Raukawa Otaki River and Catchment Iwi Management Plan identifies five significant concerns:

- the undermining of their role as kaitiaki of the river and its surrounding areas;
- the significance of the river and its associated groundwater systems as a taonga;
- the environmental degradation of the river;
- the status of the Otaki community and town as a lower income community with a strong community perception of inadequate public investment in the community;
- the significance of the water resource to the future development of the whole Otaki town community and the wider area.

The iwi management plan identifies two central areas of action:

- development of a restoration programme with all the key agencies involved with the river;
- development of a joint management structure which focused first on the restoration of the Otaki river and second on managing water use within that overall goal.

The iwi management plan proposes a number of actions that would need to be considered within these wider goals:

#### **Collaborative Management**

- all external agencies with management responsibilities in the Otaki River to consider and adopt a collaborative approach to management.

The 'Raukawa model' is recommended for adoption. This model considers that a partnership needs to be constructed in a way that encompasses both Maori **and** Pakeha values. This partnership is seen as the cornerstone of collaborative management. A process for negotiating the framework

would be needed. The iwi plan identifies the need for MOU with Ngati Raukawa for each agency.

**Implication:** Council has over the years endorsed a partnership approach to management of the river but this has not transferred with any degree of success to the idea of a collaborative approach to water management as a whole. This is an increasing risk for Council as it tries to work through detailed development projects. It is also inconsistent with what is a genuine desire to move beyond minimum compliance with statutory requirements.

There is undoubtedly a lack of wider community appreciation of these statutory requirements to address issues of kaitiakitanga, and not just issues of specific environmental effect. This perception may need to be acknowledged and specific initiatives to increase understanding developed.

### **Kaitiakitanga**

- The iwi plan identifies the need to increase people's understanding of kaitiakitanga and sets out a number of internal iwi actions that would advance this. In addition, it identifies a number of pilot projects that need to be advanced. These are:
  - preparation of an ecological corridor and riparian management strategy with WRC, KCDC, MoF and DoC;
  - a scoping study of the rehabilitation requirements for inanga and their habitat on the river. (The health of the inanga fishery is adopted as the key indicator for measuring river health).

### **Implications**

These priorities are consistent with the need identified earlier to understand not just the issue of minimum flows but ecological effect within that 'trigger' point'. Such work will be essential whatever the detailed supply decision made for this catchment or any other catchment.

A project brief for a joint ecological study was developed some years ago but was not advanced.

### **Role of the Wananga**

- The iwi plan identifies an extended role for the wananga in the area of research and education on water management and river management issues. The relevant issues to this workshop are:
  - development of improved models for indigenous sustainable resource management;
  - sustainable food production;
  - use of Information Technology to support the kaitiakitanga role. This includes methods for storing data;
  - environmental mediation and dispute resolution methods.

### **Implications**

The wananga has the potential to make a significant contribution to the development of thinking around environmental management. As legislation requires greater collaboration and regard for both Maori and government resource management thinking, the presence of an academic institution within the district which is exploring these issues is invaluable. The adoption of an innovative partnership approach and the development of associated research have the potential to increase the focus on what that institution can provide and bring to the wider district.

### **Environmental Management**

- The iwi plan identifies that there is a need for the iwi members to be involved in day to day water management beyond the governance role envisaged in the 'collaborative management structure. It highlights two important aspects:
  - the transfer of powers and functions associated with environmental monitoring. This would give the responsibility to the iwi but would of course require them to consult with and work with other agencies. Resources would transfer with the function.
  - the development of a resource management consultancy under the kaitiakitanga portfolio of Te Runanga o Raukawa.

### **Implications**

This concept of transferring of functions is not unknown in New Zealand. While the functions might be transferred, there would still be the need for protocols and agreements so that the quantitative data traditionally collected would continue. There are various models for this that could be explored. Ultimately the skills for this kind of work could be progressed through the wananga.

The development of a consultancy service is of course an iwi concern. The key implication for Council would be to ensure that in calling for registrations of interest or proposal, it would need to ensure that the consultancy was included in a timely way. This would allow them to seek partners in any proposal.

The iwi management plan was developed in 2000 with assistance from Kapiti Coast District Council and other agencies. It offers concepts and ideas that have a consistency with Council's wider thinking on partnership ( a joining of Maori and Pakeha values) and offers some practical ideas that can be discussed and negotiated through.

Council is required by law to have regard for iwi management plans. The plan identifies that until the runanga has developed clear environmental management principles, a precautionary approach to development along the Otaki river and involving Otaki water will be taken.

Since 2000, ideas on a partnership and collaborative approach have not been explored, as Council has focused on the specifics of the security of supply issues for the Waikanae, Paraparaumu areas.

**3.6 (a) Council is committed to developing a collaborative or partnership approach to water management with Nga Hapu o Otaki and Te Runanga o Raukawa., and will approach the Wellington Regional Council to consider working together to develop the partnership relationship.**

**3.6 (b) Council will seek an ecological assessment of the river in conjunction with iwi.**

**3.6 (c) Council will support exploration of transfer of environmental monitoring functions but will also support community involvement in those processes where possible.**

These statements make it clear that Council supports a more active role for iwi in managing water. At the same time, it is of the view that community involvement in monitoring the environment is important, no matter who has overall responsibility for environmental monitoring. To that end it will work with Nga Hapu o Otaki to review the transfer of functions but will also support associated mechanisms for community involvement in monitoring. Council will seek discussions with Nga Hapu o Otaki and Te Runanga o Raukawa and the community about community involvement in environmental monitoring.

### **3.7 Management Area 7: Developing a Community Process**

The overall strategy emphasises a community driven water management process, with a particular focus being the development of area based water management plans. This would retain Council responsibility for approval and investment in capital works but would focus on a community driven process for developing the framework, timing for changes in levels of service, demand management goals and the overall thinking behind supply systems.

How this is progressed needs to be worked through and discussed with the community. The best structure may include members of the community board and councillors, or it may involve an advisory group. Whatever the structure, it will operate as part of the collaborative process with iwi that was discussed in the previous section.

It is envisaged at this stage that the overall sustainable water management strategy would include the concept of area water management plans. Obviously, to keep true to the idea of community driven plans and the notion of a collaborative approach with iwi, then this process currently underway needs to take account of the development of a longer term process.

To that end, the ideas in this water plan are developed based on input to date. They will be reviewed as part of the post November 19<sup>th</sup> consultation process. In addition, many of the ideas for action do not involve specific investment decisions. The focus is more on achieving better understanding of the area, of community aspirations and desired levels of service. The exception is the discussion of water quality issues. This has been well debated in the past.

**3.7 (a) Council wishes to work directly with the Otaki community to develop the Otaki water management plan.**

**It will discuss with the Otaki Community Board a possible process for developing the Otaki water management plan.**

## 4. Demand Management Programme

The wider water strategy adopted the idea of requiring each area plan to include a demand management programme which covered:

- water use and consumption targets for the next fifty years (assuming a final goal of 250 and 150 lcd)
- the specific actions to be taken and the timing for their introduction (including whether or not water meters and/ or user pays is to be introduced);
- identifying the relationship between demand management programme, supply systems and investment decisions;

Otaki currently has no demand management programme. Nor does it have a summer management programme as in Waikanae, Paraparaumu and Raumati. This reflects the relative certainty of supply at this stage.

Given the lack of information about water consumption in Otaki it is suggested that the demand management programme begins with improving understanding and information, with the goal of setting consumption targets by late 2004. The approach so far can be summarised as follows:

capacity management	focus on understanding capacity and development opportunity focus on understanding impacts of consumption on the ecology of the river and stream systems developing scenarios for impacts of different levels of consumption reviewing long term urban development plans and implications for water use
balancing uses	increasing understanding of the water needs of the economic development sector developing scenarios around the balance between residential and economic development
maximising development life	need to understand efficiency of the reticulation network – water loss otherwise rely on any district wider initiative at this stage
water supply service targets	develop targets by late 2004 concentrate in the short term on increasing understanding make any water quality and supply investment decisions based on current demand levels.

In effect, this provides a short term programme until the community is better equipped to make decisions about demand management and supply investment. At that point a detailed demand management programme can be introduced.



## **5. Supply Management**

Otaki Town has an on demand water service drawing on the Otaki groundwater zone. There is no storage facility and the water is delivered straight to the treatment plant. This supply can be augmented by the Waiohau Stream supply. The key water service issues are:

- a high dependence on one source of supply (groundwater);
- concern about contamination risk in the sense of being a non-secure supply – current D grading;
- limitation on the ability to meet high instantaneous demand such as for fire flows ( due to bores pumping directly into the reticulation system);
- no service storage
- reticulation system relies on pumping to maintain system pressures.

There are no immediate issues to do with security of supply in the sense of reaching absolute thresholds or storage limits. It is likely that by about 2012 there will be issues about the capacity of the current bore system to service peak demand without storage.

The surrounding Waiohau Plateau (part urban and part rural) receives water from the Waiohau stream, from private bores and from roof tanks. The groundwater zone is allocated to capacity. The key issues from a water supply service point of view are:

- the need for greater capacity and security of supply
- greater storage capacity or greater instantaneous flow capacity
- adequate head and flows to all customers.

The overall strategy stipulates that each water management plan needs to have two parts: a potable supply system section and a section of non-potable supply.

### **5.1 Potable supply**

The overall strategy gives priority to managing risks to the potable supply systems across the district. This had two aspects: securing a diversity of natural supply sources within each catchment and removing those risks to the quality of supply that have been identified by the Ministry of Health in its grading system.

The Otaki supply systems are classified as ‘ordinary’ systems. This means that the supply is demand led (i.e. no daily restriction on supply) but a certain level of peak demand is assumed and designed into the system. This past standard has been 650 litres per person per day (lppd) peak demand, a figure derived from a standard set to ensure that the take from the Waikanae river fell below the residual flow standards. The new general standard does indicate an expectation of reduced demand.

Because no demand management programme currently exists, there is no clear indication of how this consumption standard would be achieved. The adoption (to

date) of the 250 and 150 lcd and the requirement to introduce a detailed series of targets and timelines should help with this issue.

### **Otaki System**

The Otaki Town community (except for the Waiotihu Plateau) is serviced by two bores into the Otaki groundwater zone. The allowable take is 7,172 m<sup>3</sup> from the Tasman bore and 4,061m<sup>3</sup> from the Rangiuru Road bore over a 24 hour period. The consent expiry is 26 March 2008. The treatment plant is graded at D – a measurement of risk not water quality.

The 2000/01 figures of 1067 lpd peak demand translates into 4,776 m<sup>3</sup> per day. This is well below the total allowable take over 24 hours mentioned above. However, because this is over 24 hours and because there is no storage, the system is approaching the limits of its ability to service peak demand.

Based on current projected population growth and even assuming the past standard of 650lcd for peak demand, the current system has the ability to service demand, assuming a level of storage. The issue even in the long term therefore, is one of building storage into the system.

The options for improvement to water quality and storage are:

#### Water Quality

- EITHER provide the necessary level of treatment to the water before the water enters the reticulation system.
- OR provide water from a different source.

At this stage, Council is exploring the water treatment issue and is waiting for the results of the Ministry of Health review of UV treatment. This will have a significant effect on treatment costs.

#### Water Availability

- EITHER increase the ability to respond to instantaneous demand by increasing the availability of water
- OR increase storage capacity. There are issues about where this can happen in the area.

<b>5.1 (a) Council will give immediate priority to improving the water quality grading for the Otaki water supply.</b>
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<b>5.1 (b) Council will work with the community to develop a potable water supply risk management plan as part of the wider Otaki water management plan. .</b>
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This work involves:

- identification of the best treatment regime for Otaki water supply (early 2003 – depending on assessment of ultra-violet treatment methods);
- analysis of long term risks and development of a potable supply water risk management plan for the area
- a treatment upgrade project (2002/03 financial year).

## **5.2 Non potable Systems**

The overall strategy requires area plans to each have a section on non-potable water supply. The section would include:

- a description of the nature of the system, how it would be developed, timing and cost (not necessarily public cost);
- the links with the management of use of potable water;
- a risk management plan for managing health risks;
- an analysis of how non-potable supply can assist economic development in the area.

This is a significant issue for an area which already has horticultural activity within its area. At this stage, given that an overall focus of the plan is to understand future development needs and the impacts of those, it is suggested that in the short term the primary focus needs to be on gaining a broad understanding of the relationship between this demand and non-potable use. Other than that, it is suggested that if Council decides to support development of alternative non-potable supply, that the community review how it might take advantage of any initiatives.

### **5.2 (a) Council will:**

- **review the potential for non-potable supply in the area and factor this into the wider analysis of demand and capacity;**
- **subsequently review the community approach to the development of a non-potable supply system.**

### **5.3 Design of Supply Systems**

The overall strategy sets up a process to ensure that cross-catchment supply decisions are factored into any review of the supply system or when significant supply investment decisions are to be considered.

Solutions can be found within the Otaki and Waiotihu Plateau systems. There is also an opportunity to consider links to the Hautere and Te Horo areas. There is benefit in considering the systems together at some stage, especially if the wider economic development and urban growth issues are to be modelled in as well. This needs to be assessed within the wider issue of understanding residential and economic development water needs, growth assumptions, consumption levels and consumption targets.



**WATER**

**MATTERS**

# Te Horo & Hautere Water Management Plan

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# **Te Horo and Hautere Water Management Plan**

The Te Horo and Hautere water management plan is concerned with the settlements of Te Horo, Te Horo Beach and the surrounding rural areas, including the Hautere area. The area is a mixture of low density rural residential living and housing associated with horticulture and farming, a cluster housing at Te Horo on SH1 and the beach settlement.

## **1 The Natural Water System**

The settled areas lie across one stream catchment and across two groundwater systems. These are described briefly below.

### **1.1 Mangaone Stream**

The river drains the foothills of the Tararuas and has a total catchment area of 53 km<sup>2</sup>. It is predominantly covered in pasture, scrub and regenerating bush.

The hydrology of the Mangaone Stream on its floodplain is confused. This is mainly due to the Mangaone irrigation scheme and the water race system, and the numerous takes and discharges.

### **1.2 Coastal Groundwater Zone**

The groundwater zone extends from the terrace running alongside the Otaki River in the north to Peka Peka and Hadfield Road in the south. In the east, it follows the line of the high terrace marking the western edge of the Hautere groundwater zone. The eastern boundary crosses SH1 at Mary Crest and extends southwards to Hadfield Road.

The zone contains four aquifers as follows:

- an unconfined aquifer between 5 – 30 metres in depth. It becomes more confined the deeper it goes;
- a confined aquifer 35- 56 metres below ground level;
- a second confined aquifer 65-110 metres below;
- a third confined aquifer 164- 172 metres down.

Groundwater quality is very variable both across the system and at different depths. Numerous domestic supplies are produced from shallow well point systems (also known as sand trap systems). Larger volumes for farming are obtained from the gravel aquifers more than 35 metres deep. The 65 – 110 sand aquifer is also used. There are high levels of iron and manganese, which can cause problems for users. Many wells have been abandoned for domestic use and many are used for stock only. There are some issues with contamination from septic tank systems.

Recharge of the unconfined aquifer is from rainfall, springflow when ground water levels are low and through flow from the Hautere groundwater zone. It is estimated that about 24% of incident rainfall recharges the top unconfined aquifer. The area recharged is approximately 28 km<sup>2</sup> and the amount recharged is equivalent to about 17,800 m<sup>3</sup> per day. Some rainfall percolates to the 35-56 metre aquifer.

A number of springs discharge at the eastern boundary of the zone. The average daily discharge from the springs ranges from 600m<sup>3</sup> a day to 7,000 m<sup>3</sup> a day. These drain towards the coast via the Mangaone stream and other drains in the north of the Coastal groundwater zone. In the south of the zone, there is a wetland between Te Horo Beach Road and Peka Peka Road.

### **1.3 Hautere Groundwater Zone**

The Hautere Groundwater zone includes most of the Hautere Plain. It extends from SH1 to the Tararua foothills. The zone consists of three aquifers, which appear to have significant vertical leakage between the layers. The layers are:

- top confined aquifer 10-30 metres below ground level – has high nitrate/nitrogen levels;
- middle confined 40 –70 metres below – high iron levels;
- lower 90-150 metres below ground – has high boron levels.

The aquifers are characterised by increased mineralisation with depth. Very high manganese and iron levels are found in the 40-70 metre aquifer and several reticulation systems have problems with discolouration and deposition in pipes and fittings.

The upper aquifer is recharged from rainfall while the lower aquifers are recharged from rainfall and leakage from the overlying aquifers.

## **2 The Available Water Resource**

The Wellington Regional Council's Freshwater Plan sets a framework for the take of water from the river and groundwater systems. This has the following characteristics:

### **Rivers**

- an understanding of the 'normal' or regular flow of a river;
- a minimum flow which is deemed necessary to maintain the ecological health and amenity of the river or stream;
- a core allocation of water that should generally be available from the system;
- the level of river flow needed if more water is to be taken above the core allocation;



- a ‘step down concept’ which means that as a river approaches the minimum flow the level of allowable take will be reduced as well. Various thresholds are set around this concept.

### **Groundwater**

- an understanding of volume of water in the aquifer and the rate at which it is recharged. Where there is a relationship between nearby river flow and the amount of water recharging the aquifer, this needs to be factored in.
- an estimate of a safe total yield;
- a division of that yield between bores and property owners.

The Freshwater Plan identifies the following minimum standards and core allocations for each of the water systems.

<b>System</b>	<b>Yield</b>	<b>Core allocation</b>	<b>Comment</b>
Mangaone Stream	minimum flow 22 litres/ second	25 litres per second	This stream is fully allocated.
Coastal Groundwater Zone	5-30 metres 35-56 100-107 164-172	6,630 m3 per day 4,750 m3 per day 4,740 m3 per day 2,840 m3 per day	
Hautere Groundwater zone	10-30 metres 40-70 90-150	7,380 m3 per day 5,430 m3 per day 5,430 m3 per day	

### **3 Water Management: Principles, Issues and Direction**

#### **3.1 Management Area 1: Concept of Capacity**

The issue of natural water capacity is relevant to the Te Horo/ Hautere area. The water resource has its limitations and parts of it are fully allocated. The Hautere area draws on the Otaki groundwater zone unconfined aquifer, which is fed from leakage from the Otaki River.

Total capacity for development is not well understood. The existing reticulation system for the Hautere area, which was built as a rural supply system for a set farming resource, links the Hautere area to the wider question of the future use of the Otaki River and groundwater resource. To a large extent decisions about possible urban growth in the Te Horo area has assumed adequate supply from the Otaki river system.

There is a need to know more about natural capacity in the area and the relationship with development expectations.

**3.1 (a) Growth expectations in the Te Horo/ Hautere area are likely to place increased pressure on the Otaki river resource as well as groundwater. There is a need to link the wider development issues to the programme of work already identified in the Otaki draft plan. This does not assume that the decision to further link consumption on the Hautere plateau and the Te Horo area to the Otaki river resource is made.**

**3.1 (b) Council will undertake the natural capacity review for the Otaki area in conjunction with the Hautere and Te Horo areas.**

#### **3.2 Management Area 2: Balanced Development**

This is a complex issue for the area. Current development can probably be separated into six broad categories:

- the Te Horo Beach settlement, which is effectively constrained by wastewater and water infrastructure systems. There appears to be little or no desire to change this;
- traditional farming – which in some areas is experiencing some limits on available water as life style blocks expand;
- rural residential development;
- small horticultural blocks focusing on intensive projects;
- an identified future urban development area which may be affecting how people release their land;
- some small amounts of downstream processing.

The development picture is confused and is further complicated by some overlap between economic development and urban growth aspirations or thinking. The identified urban growth area is west of SH1 on the poorer quality soils and to that extent reflect a desire to ensure the productive value of the eastern soils is not lost.

However, the cumulative impacts on the available water resource is not known. The complexities of the Hautere reticulation system are potentially shifting the focus to residential uses in the area. The reticulation system was built to deliver a certain amount of water to the participants in the system. The volume was estimated by the number of cows that would be carried on a hectare of land. As such, the size of pipes in the most distant part of the system are relatively small, and restrict the capacity of the system. The total units of water delivered were divided across the landowners.

In recent years, a great deal of the land has been subdivided into small lots, some of which have been settled as lifestyle blocks and some used for intensive horticulture. The available units have been tagged for the smaller blocks, leaving the remaining larger blocks with limited water. This must effect the viability of some rural activities and may have the effect of pushing development towards residential uses.

It is not known whether the size of smaller blocks can deliver an economic unit for more intensive horticulture and associated activities. It is far from clear that there is sufficient water via the reticulation system for intensive horticulture and food processing. It is also unclear what the effect horticultural demand for water would have on natural systems.

The current moratorium on connections to the Hautere supply does provide some breathing space while these issues are reviewed. Obviously however, there is a need for certainty about the water use vision for the area. There is also a need to resolve the status of the Hautere system and the implications for any extension of the system for original and subsequent property owners who developed the system.

To that end, there is a need to develop a similar view of the mix of urban development and economic development opportunities in this area. There are obvious implications and linkages with the Otaki area. This would suggest that if elected members identify a wish to explore the development/ capacity/ balance issues for Otaki, this work should be extended to include the Hautere/ Te Horo area.

<b>3.2 (a) Council will undertake a review of the growth pressures and economic development issues for the Te Horo and Hautere areas in conjunction with the similar Otaki review.</b>
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The review of the potential for horticultural development will consider the applicability of the “Crops for Southland’ model. This included a process where landowners and horticultural business, with associated experts reviewed the physical capacity of the area for a range of crops. This will be expanded to include analysis of food processing opportunities and the overall implications for water use.

### **3.3 Management Area 3: Maximising the Ability to Conserve Water**

The overall strategy identified that the issue of maximising the flexibility of the building stock infrastructure and subdivision design was going to be a key to the ability of the community to reduce water use over time. For the Hautere/ Te Horo areas, an important issue is the current limitations of the Hautere supply system and the on-site water supply systems. There are a significant number of households that use private bores and roof water tank systems. It is a community that has a greater than usual range of methods for gathering water at their disposal. What is unclear is whether these kinds of systems would be retained if there was an extension of the reticulated network. This needs to be assessed although it is suggested that it is not a priority at this stage, when compared with the wider development and capacity issues.

**3.2 (a) Council will review the impacts of any scenarios for future water supply, and wastewater system decisions on the current level of adaptability and flexibility of the building stock and on-site supply.**

### **3.4 Management Area 4: Levels of Service**

The Te Waka Road area currently receives no reticulated service and is dependent on roof tanks and bores. Te Horo has the same non-reticulated system. The Hautere area is supplied by the rural system, which is currently over allocated. There are also questions about who owns the system and whether Council is managing it on behalf of the landowners. The remaining area east of SH1 uses either bores or roof tank water.

The implications of this is that the community is either consuming very low levels of water (if using private on-site systems), or are on restricted supply in the Hautere area. What this means for consumption levels in the Hautere area is unclear, as the distribution of water units has been somewhat random, depending on what is available to the original landowner.

If the currently unreticulated areas were to be placed on to some sort of reticulated system, there would be three possible paths taken in relation to the level of service. These are:

- assume current consumption levels – reticulation is concerned with managing water quality risks only;
- set consumption levels at the level of the adjacent water source;
- endeavour to deliver on the standards set for existing urban reticulated systems (250 lcd and 150 lcd (non- essential)) by drawing from a wider supply source.

Local communities will pay for any increased level of service and they will decide whether they wish to bear the cost of shifting to a reticulated and treated system of water at some stage. The new Drinking Water standards may force change although it may be that a community chooses to upgrade the wastewater system as a first priority.

Past planning has assumed that the Te Horo Beach and Te Waka Road areas would shift to a reticulated system, albeit one that has restrictions on total water supplied each day. This needs to be discussed with local communities.

It is suggested for debate that if such a shift occurs, that the system be not only restricted demand but the level of water provided be dictated by the natural capacity of the most immediate reliable water resource. In other words, the focus should be on providing security of supply not an increased level of service for consumption. This reflects the overall strategic focus on managing water use within natural capacity of the surrounding area.

The construction of new systems which factor in relatively unlimited supply capacity, or work against on-going demand management should be avoided.

**3.4 (a) If a community is to be connected to a reticulated water supply system, as a first principle that system should be designed to deliver a level of water use similar to that achieved via the previous on-site supply.**

**3.4 (b) Should a community insist on increasing the level of water consumption, that level should be achieved within the capacity of the most immediate water supply source, and if there is a clear demand management programme in place. Council will not provide a reticulated system that exceeds the standards or consumption goals for the wider community.**

Overall, consumption levels for the unreticulated areas are not known. The total consumption for the Hautere area, which is on restricted supply, is estimated as 393.7 litres per person per day (2001 estimate). This is based on the allocation of a 1,000 litres per day to each unit. A household may of course have access to more than one unit, based on the size of their property. There is a need to understand consumption levels in the area in more detail.

**3.4 (c) Council will:**

- **undertake a review of consumption levels in the Te Horo and Hautere areas and the reasons for them;**
- **work with the community to model the impacts and costs of difference consumption targets over time;**
- **assist the community and iwi to identify the appropriate targets and timing.**

### **3.5 Management Area 5: Funding of Water Services**

The funding framework will follow the broad funding decisions set out in the overall water management strategy. The main points are:

- rates funding of water services in the meantime;
- continued local funding of water services;
- exploration and consultation on the possibility of:
  - district wide funding of that portion of any service delivering on essential water needs;
  - local funding of remaining services for non-essential water needs;
- linking of the analysis of funding methods to achieving reductions in water use;
- community debate about methods to increase incentives for water conservation, including debate about water consumption charging;
- a clear statement that water consumption charging was introduced , it would not apply to water used for essential needs.

### **3.6 Management Area 6: Partnership with Iwi**

**3.6 (a) Council is committed to developing a collaborative or partnership approach to water management with Nga Hapu o Otaki and Te Runanga o Raukawa., and will approach the Wellington Regional Council to consider working together to develop the partnership relationship.**

See Otaki Water Management Plan for detailed discussion of Council's partnership goals with Ngati Raukawa and Nga Hapu Otaki in relation to water.

### **3.7 Management Area 7: Developing a Community Process**

The overall strategy emphasises a community driven water management process, with a particular focus being the development of area based water management plans. This would retain Council responsibility for approval and investment in capital works etc but would focus on a community driven process for developing the framework, timing for changes in levels of service, demand management goals and the overall thinking behind supply systems.

How this is progressed needs to be worked through and discussed with the community. The best structure may include members of the community board and councillors, or it may involve an advisory group. Whatever the structure, it will operate as part of the collaborative process with iwi that was discussed in the previous section.

It is envisaged at this stage that the overall sustainable water management strategy would include the concept of area water management plans. Obviously, to keep true to the idea of community driven plans and the notion of a collaborative approach with iwi, then this process currently underway needs to take account of the development of a longer term process.

To that end, the ideas in this water plan are developed based on input to date. They will be reviewed as part of the post November 19<sup>th</sup> consultation process. In addition, many of the ideas for action do not involve specific investment decisions. The focus is more on achieving better understanding of the area, of community aspirations and desired levels of service. The exception is the discussion of water quality issues. This has been well debated in the past.

**3.7 (a) Council wishes to work directly with the Te Horo and Hautere communities to develop the water management plan.**

**It will discuss with the Otaki Community Board a possible process for developing the water management plan.**

## 4 Demand Management Programme

It is proposed that a detailed demand management programme is not developed until more is known about:

- the level of water consumption in the area,
- the relationship between on-site systems and consumption levels
- the structure and impacts on demand of the Hautere supply system.

A work programme will be developed as part of the 2003/04 annual plan process.

Cumulatively the discussion to date has suggested the following overall approach. :

capacity management	focus on understanding capacity and development opportunity focus on understanding impacts of consumption on the ecology of the river and stream systems developing scenarios for impacts of different levels of consumption reviewing long term urban development plans for implication for water use
balancing uses	increasing understanding of the water needs of the economic development sector developing scenarios around the balance between residential and economic development
maximising ability to conserve water	need to understand efficiency of the reticulation network – water loss otherwise rely on any district wide initiatives at this stage
water supply service targets	develop targets by late 2004 concentrate in the short term on increasing understanding make any water quality and supply investment decisions based on current demand levels.

In effect, this provides a short term programme until the community is better equipped to make decisions about demand management and supply investment. At that point, a detailed demand management programme can be introduced.



## 5 Supply Management

The overall strategy identified that each water management plan needs to have two parts: a potable supply system section and a section of non-potable supply.

### 5.1 Potable supply

The wider strategy identified that priority would be given to managing risks to the potable supply systems across the district. This had two aspects: securing a diversity of natural supply sources within each catchment and removing those risks to the quality of supply that have been identified by the Ministry of Health in its grading system.

The Hautere system supplies a number of properties spread across the Hautere Plain with a restricted water supply. The water is sourced from two shallow bores along side the Otaki River at Chrystall's Bend about 6 km upstream of SH1. The water is pumped up to reservoirs for onward gravity distribution. Basic pH correction and disinfection treatment using chlorine is provided.

The system was installed by a co-operative consisting of the rural Council and the local community. Council now manages the scheme. The water is over –allocated. There is some doubt as to who actually owns the system. It seems likely that Council will continue to operate the system, which, after upgrading would remain on restricted supply.

The CentrePoint Water supply is owned privately and consists of a 4 metre deep bore into river gravels on the south bank of the Otaki River, to the east of the rail bridge. Water is pumped into an 88m<sup>3</sup> storage tank from where it is pumped into a single 200 mm diameter pipeline, which runs approximately 3 km to Arcus Road. There is no treatment.

The owners are interested in taking over the supply and it is possible that it could be used to supply the Te Horo School area and eventually extend down towards the beach.

#### 5.1 (a) Council will:

- review in discussion with each local community, their aspirations as to the source and method of potable supply. This would include a risk analysis of current supply systems and a consideration of the implications of new Drinking Water Standards;
- review possible systems design, including potential scenarios for reticulated systems linked to Otaki;
- review allocation system for the Hautere Rural supply and assess the degree to which any issues can be resolved outside the proposed reviews of overall natural system capacity, development opportunity and approach and wider system design.

**5.1 (b) Council will undertake a comprehensive review of both water quality and water quantity options, taking account of work on capacity and balance of sectors, and systems development, across the Otaki and Hautere/Te Horo areas.**

## **5.2 Non potable systems**

The overall area makes use of bore water for non-potable purposes but there is also reliance in the Hautere reticulation area on bore supplied potable water for non-potable purposes. There is a need to understand future needs across the Hautere Plain and the Te Horo area and to assess the impacts on the overall design of the potable supply systems. Ideally on-site systems for non-potable systems should also be retained.

**5.2 (a) Council will:**

- **review the potential and demand for non-potable supply in the area and factor this into the wide analysis of demand and capacity;**
- **subsequently review the community approach to development of a non-potable supply system.**

### **Design of Systems**

There is an opportunity to consider links between the Hautere and Te Horo areas, and Otaki. The Otaki, Hautere and Te Horo communities tend to think of these areas as linked. There is benefit in considering the systems together at some stage, especially of the wider economic development and urban growth issues are to be modelled in as well. This needs to be modelled within the wider issue of understanding residential and economic development water needs, growth assumptions, consumption levels and consumption targets.



**WATER**

**MATTERS**

# Paekakariki Water Management Plan

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# **Paekakariki Water Management Plan**

The Paekakariki water management plan is concerned with the mainly residential settlement of Paekakariki at the southern end of the district. This plan recognises the very effective water management system that is in place at present and focuses on only three issues for further discussion.

## **1 The Natural Water System**

Paekakariki is served by the Wainui Stream (Smith's Creek) which flows off the southern Tararua Ranges in an almost northerly direction. The WRC 1994 hydrology report notes limited flow data for the stream. Over the summer months the stream virtually dries up. The allowable take is 1,625 m<sup>3</sup> per day.

The area also lies over part of the Raumati/ Paekakariki ground water zone. This is the least developed resource on the Kapiti Coast. There appears to be a confined aquifer at about 5 meters to 61 metres below ground although parts of it may be unconfined.

The WRC Freshwater Plan identifies allocation limits of:

0-6 metres depth	5,900 m <sup>3</sup> per day
greater than 6 metres	7,090 m <sup>3</sup> per day

## 2 Available Water and the Water Supply System

Supply is via an in-stream in-take which feeds to a treatment plant where the water is filtered and Chlorinated before being pumped to a service reservoir. There are all year round restrictions on water use for gardening.

The level of demand is as follows:

	1996/97	1997/98	1998/99	199/00	00/01
Average flows	483 lpd	478	449	398	475
Peak flows	767	685	623	562	844

This does not equate directly to the concept of use for minimum basic need and non-essential uses. Obviously, there will be peak usage for both essential and non-essential purposes. There is a need to understand how much of this use is for essential and non-essential usage.

	1996/97	1997/98	1998/99	199/00	00/01
essential use	250 lpd	250	250	250	250
average non essential use	233	228	199	148	225
peak non-essential use	517	435	373	212	594

Except for 2001/02 the levels of water use are relatively low. Average and peak demand also seemed to be declining until 2000/01. By implication non-essential use was also declining. Whether this is a shift in consumption patterns or a one off exception is not clear.

At present density increases are constrained by the wastewater system (on-site systems), limits on the water supply system and clear community preference to limit growth. This preference is probably a mixture of lifestyle and community vision and a desire to avoid increased infrastructure costs.<sup>1</sup>

Water quality is graded as B with a current target of A. The community has been committed to remaining with one source of supply. From a strictly water supply risk management perspective, this is seen as having inherent risks. Possible bore supply is being investigated but it remains for the community preferences to be explored once this preliminary work is complete. Current supply planning does not envisage significant change or investment – in keeping with current community preference.

<sup>1</sup> The MERA population forecasts for the period 2001 to 2046 suggest an additional 100 people will be added to the population over the next forty or so years. Expansion of the Paekakariki area is clearly limited by the topography and Queen Elizabeth II park to the north. The only possible increase in population would be via increased densities. It is not at this stage limited by water supply if the groundwater is tapped.

### **3 Water Management: Principles, Issues and Direction**

The community currently has a very successful demand management regime and has a clear preference as to the overall nature of its supply system. While the question of use of bores needs to be explored once testing is complete, this is envisaged as being very much driven at this stage by community decision.

#### **3.1 Management Area 1: Partnership with Ngati Toa**

The overall strategy has identified that Council recognises the kaitiaki role of iwi and that it wishes to work in partnership with iwi, in conjunction with the community. Council wishes to develop this partnership around water with Ngati Toa and associated hapu.

**3.1 (a) Council is committed to developing a collaborative or partnership approach to water management with Ngati Toa and associated hapu.**

This principle continues to extend the concept of partnership across all the district's communities.

#### **3.2 Management Area 2: Developing a Community Process**

The overall strategy recognises the idea of a community driven water management process, with a particular focus of that process being the development of area based water management plans. This would retain Council responsibility for approval and investment in capital works etc but would focus on a community driven process for developing the framework, timing for changes in levels of service, demand management goals and the overall thinking behind supply systems.

How this is progressed needs to be worked through and discussed with the community. The best structure may include members of the community board and councillors, or it may involve an advisory group. Whatever the structure, it will operate as part of the collaborative process with iwi that was discussed in the previous section.

It is envisaged at this stage that the overall sustainable water management strategy would include the concept of area water management plans. Obviously, to keep true to the idea of community driven plans and the notion of a collaborative approach with iwi, then this process currently underway needs to take account of the development of a longer term process.

To that end, the ideas in this water plan are developed based on input to date. They will be reviewed as part of the post November 19<sup>th</sup> consultation process. In addition, many of the ideas for action do not involve specific investment decisions. The focus is more on achieving better understanding of the area, of community aspirations and desired levels of service. The exception is the discussion of water quality issues. This has been well debated in the past.

**3.2 (a) Council wishes to work directly with the Paekakariki community to develop the Paekakariki water management plan.**

**It will seek discussions via the community forum after November 19<sup>th</sup> as to how this may proceed.**

### **3.3 Management Area 3: Capacity and Development**

Although there is clear community preference for limited growth and a tightly managed level of supply capacity to fit this growth and control demand, there are a number of issues that the community will need to consider over the next few years. The issues arise from nationally set standards and requirements rather than any pressures from within the district. The issues are as follows:

- Paekakariki uses on-site wastewater systems (septic tanks);
- this kind of system sets a fundamental constraint on settlement densities;
- it is not clear to what extent current planning rules rely on this infrastructure constraint to restrain growth pressures;
- the Ministry of Health is in the process of developing Drinking Water standards which may become mandatory in the next few years;
- although Paekakariki is not on groundwater supply – there may be increasing scrutiny of these on-site wastewater systems;
- they are not well managed in all cases and there may be external pressure to upgrade the system and possibly move to centralised treatment;
- if that happens, unless the design of any system capacity is well managed, the infrastructure based density restrictions may be diluted;
- the community can consider options for more community based management of on-site systems – this would retain the infrastructure constraint on development.

In effect, in the face of possible requirements for communities to achieve mandatory drinking water standards, there is a need to consider the relationship between wastewater management, community vision for managing growth and change pressures, and water supply. Such a review needs to be community driven and should focus on the end community vision and the deployment of infrastructure decisions around it. Discussion of wastewater management issues in relation to both water supply and growth management is essential.

**3.3 (a) Council will discuss with the Paekakariki community, the development of a process to commence discussion of the links between community aspirations and infrastructure management. In doing so it seeks a holistic approach to these issues rather than separate infrastructure driven solutions.**

**Council seeks this discussion in response to changing national standards around infrastructure levels of service. It is also concerned to ensure local communities can adapt to these requirements while retaining their local vision and aspirations intact.**



Such an approach would enable Council to discharge its responsibilities to oversee how risk is addressed across the community while placing the responsibility and leadership back on the Paekakariki community to explore what are significant externally driven water (and wastewater) management issues.