Tasman District Council

Water Supply

Activity Management Plan

2015 - 2045

January 2015

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For full Quality Assurance Statement, Refer Appendix Z

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1. Activity Description

1.1 What we do

The Council provides the group of activities comprising the provision of potable water (ie, water suitable for use and consumption by people) to properties within 10[1] existing water supply areas in the Tasman district. The 15 water supply areas, which the Council owns operates and maintains, consists of 10 urban water supply schemes (known as the urban water club), three rural supply schemes and two community schemes.

The Council's network is extensive and growing rapidly. At present the network comprises approximately 807km of pipeline, 36 pumping stations, 11,600 domestic connections and 110 reservoirs and break pressure tanks with a capacity of approximately 18,710 cubic metres of water. In addition, the Council manages the Wai-iti water storage dam to provide supplementary water into the Lower Wai-iti River and aquifer. This enables sustained water extraction for land irrigation at times of low river flows.

A complete description of the assets included in the water activity is in Appendix B.

1.2 Why we do it

By providing ready access to high quality drinking water, the Council is primarily protecting public health. It is also facilitating economic growth and enabling the protection of property through the provision of an adequate fire fighting water supply. The service provides many public benefits and it is considered necessary and beneficial to the community that the Council undertakes the planning, implementation and maintenance of water supply services in the district.

Territorial authorities have numerous responsibilities relating to the supply of water. One such responsibility is the duty under the Health Act 1956 to improve, promote, and protect public health within the district.

2. Community Outcomes and our Goal

The community outcomes that the water activity contributes to most are shown in Table 2.1.

Table 2.1: Community Outcomes

Community Outcomes	How Our Activity Contributes to the Community Outcome
Our unique natural environment is healthy and protected.	All water in the Council-owned schemes is taken from the environment (groundwater and river sources). This activity can be managed so the impact of the water take does not prove detrimental to the surrounding environment.
Our urban and rural environments are pleasant, safe and sustainably managed.	The water supply activity is a service to the community providing water that is safe to drink and is efficiently delivered to meet customer needs. It also provides a means for fire fighting consistent with the national fire

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[1] Waimea is currently separate but will be merged with Richmond during 2015 with the commissioning of the new Richmond Water Treatment Plant and the Mapua system will be listed separately.

Community Outcomes	How Our Activity Contributes to the Community Outcome
	fighting standards.
Our infrastructure is safe, efficient and sustainably managed.	The water activity is considered an essential service that should be provided to all properties within water supply network areas in sufficient capacity and with adequate pressure. This service should also be efficient and sustainably managed.

2.1 Our Goal

We aim to provide and maintain water supply systems to communities in a manner that meets the levels of service.

3. Key issues for the Water Activity

The most important issues relating to the water activity are shown below in Table 3.1.

Table 3.1: Key Issues for the Water Activity

Key Issue	Discussion
Waimea Basin water source.	The Waimea Basin is a good quality but limited groundwater resource. There is a high demand for water in the area and the sustainable allocation limit is already over allocated. This is leading to an increase in the incidents of water rationing and in drought times can lead to flows in the Waimea River that drop below what is needed for environmental flows. A dam is being proposed as the potential solution to these issues. It would also deal with the wider Waimea Basin and the Council's water supply issues. If a means to resolve these issues is not found, there is the possibility of reduced water takes and constraints on growth in the Waimea and Richmond settlements.
Waimea Community Dam.	The Council decided to create a Council Controlled Organisation (CCO) to facilitate further investigation of funding to allow construction of the proposed Waimea Community Dam. The Council has limited its potential contribution to $25m (2014 dollars). The total cost of the dam is in the order of $70 million. This is the most significant and expensive capital works project being planned in the Tasman District over the coming 10 years. It is important for all members of the community to be aware of the project, the implications of proceeding with it and the implications if the project does not proceed. Due to the importance of the project, a separate section outlining details of the project is included in the Long Term Plan.
New Drinking Water Standards.	Following the introduction of the Health (Drinking Water) Amendment Act 2007 (HDWAA) it is now mandatory to comply with the Drinking Water Standards of New Zealand (DWSNZ). This change will mean that the cost of providing water will continue to increase over the coming 10 years due to the need for the Council to upgrade and operate its water supplies to meet the

Key Issue	Discussion
	standards. While most supplies in the district obtain water from good quality groundwater sources, they are not currently meeting the standards. The main reason for non-compliance is a lack of protozoa treatment at the treatment plants. The HDWAA also requires the completion and implementation of Water Safety Plans (WSPs) for all Council water supplies. These must be completed by specific dates. The Council is well advanced with a programme of WSP documentation and water treatment plant upgrade works. However adjusting to the new guidelines this issue still dominates this AMP.
Rural water supplies.	The Council's rural water supplies, including Dovedale, Redwood Valley and Eighty Eight Valley are nearly fully allocated. There are some projects planned that will provide some capacity improvements. These projects, however, will provide only minimal improvements. There is little capacity to cope with any significant additional demand. The Council has closed these water supplies to new connections.
Meeting growth needs.	There are a number of water supply projects planned that are driven fully or partially by the need to cater for future growth. The Council applies development contributions to these projects so that developers meet the cost of the growth component of the projects, rather than ratepayers. The cost of development contributions can act as a disincentive for growth and therefore balance is required. One example of the new approach is to have developers fund some works such as the temporary supply to Richmond South.
Water supply agreement with Nelson City Council and Industrial Water Users.	A new services agreement is in place between Nelson City Council and Tasman District Council for the supply of water to Nelson City ratepayers in the area of Champion Road, Garin College and the Wakatu Industrial Estate. Tasman District Council currently supplies water to these users, but under individual supply arrangements. The new agreement provides for a transition to bulk metering by Tasman District Council to Nelson City Council to be negotiated between the two councils. Further consultation on this may be needed. Nelson City Council will be responsible for the supply of water directly to its ratepayers who are currently supplied by Tasman District Council. The cost of the water supply from Tasman District Council to Nelson City Council is proposed to be the same as rating units with a metered connection in Richmond. Whilst the residential areas can transfer soon, the industrial area are subject to an agreement that will expire in 2020.

4. Operations, Maintenance and Renewals strategy

4.1 Operations and Maintenance

The day-to-day operational, inspection and maintenance of the water supply systems is carried out by Downer NZ Ltd under the maintenance contract 688. This maintenance contract is managed and administered by the Council with MWH New Zealand Ltd acting as the Engineer to the Contract. The contract will end on 30 June 2017.

The contract is primarily based on a comprehensive schedule of rates and a combination of lump sum payments. This provides all parties involved with a vested interest in optimising both pro-active and reactive maintenance requirements.

Some of the key aspects of this contract are:

- performance-based;
- emphasis on proactive maintenance;
- programme management;
- quality management;
- detailed schedule of works;
- measurement of performance;
- team approach to problem solving.

Operations and maintenance are discussed in detail in Appendix E.

4.2 Renewals

Renewal expenditure is major work that does not increase asset design capacity but restores, rehabilitates, replaces or renews an existing asset to its original capacity. Work over and above restoring an asset to original capacity is new works expenditure.

Assets are considered for renewal as they near the end of their effective working life or where the cost of maintenance becomes uneconomical and when the risk of failure of critical assets is sufficiently high.

The renewal programme has been developed by the following factors:

- Taking asset age and remaining life predictions from the valuation database (valuation data is held in Confirm), calculating when the remaining life expires and converting that into a programme of replacements based on valuation replacement costs.
- Considering the actual maintenance cost of breaks and whether continuing to maintain or replace is the more cost-effective action.
- Reviewing and justifying the renewals forecasts using the accumulated knowledge and experience of asset operations and asset management staff. This incorporates the knowledge gained from tracking asset failures through the Customer Services System, the GPS location of pipe breaks and overflows, and contract reporting structures.
- Undertaking an optimising review to identify opportunities for bundling projects across assets, optimised replacement, timing across assets – especially between pipe upgrades and roading works, and smoothing of expenditure.

The renewal programme is reviewed in detail at each Activity Management Plan (ie. three yearly), and every year the annual renewal programme is reviewed and planned with the input of the maintenance contractor.

Renewals are discussed in detail in Appendix I.

5. Effects of Growth, Demand and Sustainability

5.1 Population Growth

A comprehensive Growth Demand and Supply Model (GDSM or growth model) has been developed for Tasman District. The growth model is a long term planning tool, providing population and economic projections district wide. The population projections in the growth model have been taken from Statistics New Zealand population projections derived from the 2013 census data, using a “medium” growth rate projection for all settlement areas (see below).

The supply potential is assessed as well as demand, and a development rollout for each settlement is then examined. The ultimate outputs of the GDSM include a projection of the district’s population, and forecast of where and when new dwellings and business buildings will be built and a forecast of the number of new water connections. The development rollout from the Growth Model informs capital budgets (new growth causes a demand for network services) which feed into the AMPs and in turn underpin the Long Term Plan and supporting policies e.g. Development Contributions Policy. The 2014 growth model is a fourth generation growth model with previous versions being completed in 2005, 2008 and 2011. The Growth Demand and Supply Model is described in brief in Appendix F and in more detail in a separate model description report.

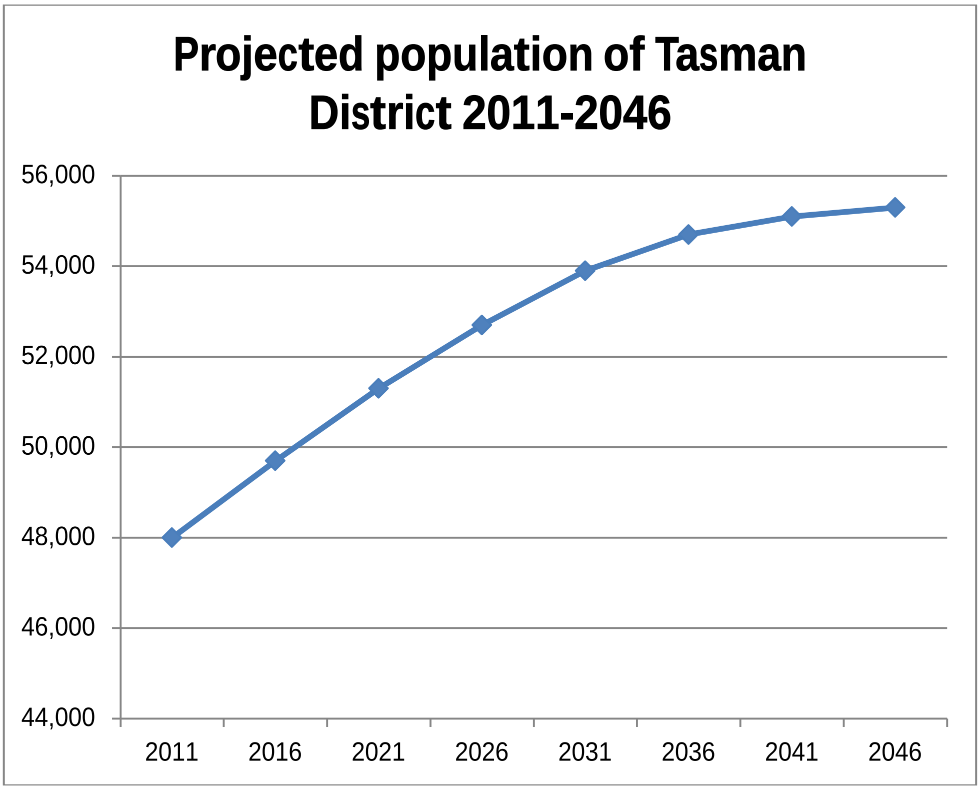


Figure 5-1: Projected Population Growth for Tasman District

5.2 Sustainability

The Local Government Act 2002 requires local authorities to take a sustainable development approach while conducting its business, taking into account the current and future needs of communities for good-quality local infrastructure, and the efficient and effective delivery of services.

Sustainable development is a fundamental philosophy that is embraced in Council's Vision, Mission and Objectives, and is reflected in Council's community outcomes. The levels of service and the performance measures that flow from these inherently incorporate the achievement of sustainable outcomes.

Many of the Council's cross-organisational initiatives are shaped around the community well-being (economic, social, cultural and environmental) and take into consideration the well-being of future generations. This is demonstrated in:

- the Council's Integrated Risk Management approach which analyses risks and particularly risk consequences in terms of community well-being;
- the Council's Growth Demand and Supply Model which seeks to forecast how and where urban growth should occur taking into account opportunities and risks associated with community well-being;

- the Council adopting a 20 year forecast in the Activity Management Plans and the 30 year plus Infrastructure Strategy, to ensure the long term financial implications of decisions made now are considered;
- the adoption of a Strategic Challenges framework and work programme that includes consideration of natural hazards, financial sustainability and growth in the district.

At the activity level, a sustainable development approach is demonstrated by the following:

- Securing the long term water needs of the Waimea Basin by pursuing the Waimea Community Dam which will allow for the current and long term community and business water supply and irrigation needs whilst enhancing the in-stream environmental values of the Waimea River. This will also mitigate the effects of climate change.
- Planning to construct the Coastal Pipeline and Coastal Tasman Area reticulation water supply to provide for the long term water needs of a water short area where there is demand for rural residential development. The Council has considered the best long term water resource to service this water, included water re-use in design guidelines and the challenge of funding the infrastructure in advance of development.
- The demand management planning that the Council is advancing, especially the water metering and volumetric charging, and the adoption of water demand targets to reduce depletion of the water resources.
- Planning to construct a new water source for Richmond away from the coastal margin to safeguard the water supply from the long term impacts of sea level rise.
- An education programme for general public and targeting schools, including promotion of water efficient fixtures and appliances.
- Paying careful attention to the importance of fully complying with resource consent conditions to ensure natural water sources are protected and conserved.
- Ensuring that the district’s likely future water supply requirements are identified at an early stage and that they, and the financial risks and shocks, are competently managed over the long term without the Council having to resort to disruptive revenue or expenditure measures (ie. financial sustainability).

6. Level of Service and Performance Measures

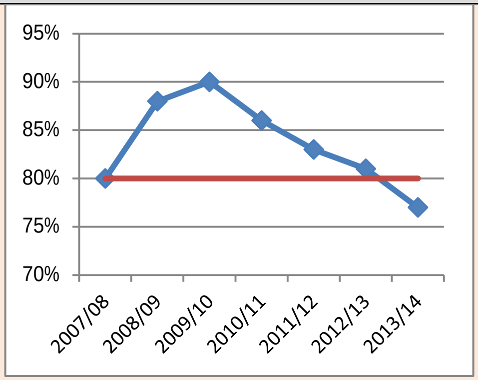
Table 6.1 summarises the levels of service and performance measures for the water activity. Development of the levels of service is discussed in detail in Appendix R. The shaded rows indicate those Levels of Service and performance measures which are included in the Long Term Plan.

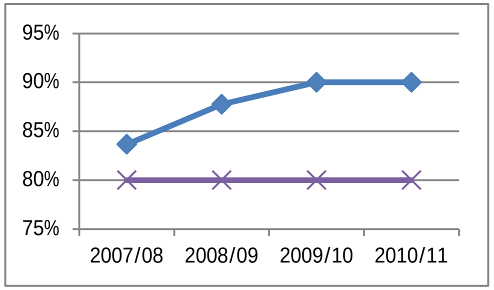
Table 6.1: Levels of Service

ID	Levels of Service	Performance Measures	Current Performance	Future Performance Y1-3			Future Performance Y10
	(we provide)	(We will know we are meeting the level of service if…)		Year 1	Year 2	Year 3	(targets)
				2015/16	2016/17	2017/18	2024/25
Community Outcome: Our unique natural environment is healthy and protected.							
1	**Our water takes are sustainable.**	All water takes have all necessary resource consents. Details are held in NCS.	**Actual = 100%** A current resource consent is in place for each water take. No abatement notices have been received for breach of resource consent conditions.	100%	100%	100%	100%
2		Compliance with water resource consents is achieved, as measured by the number of; · abatement notices · infringement notices · enforcement orders, or · convictions issued.	Actual = Not fully recorded. No abatement notices have been received for breach of conditions. This is a new measure, performance will be recorded in NCS.	≤1 0 0 0	≤1 0 0 0	≤1 0 0 0	≤1 0 0 0
3		Our percentage of real water loss from the network is less than the target. As calculated: Total water provided less water metered less non revenue water = total real water loss. Then % = L real loss divided by average L usage per connection. (Mandatory measure 2)	Actual = NA This is a new measure, performance will be recorded in the AMP.	120 L/connection	120 L/connection	120 L/connection	100 L/connection
4		The average consumption of drinking water per day per resident is less than the target. (Mandatory measure 5)	Actual = NA This is a new measure, performance will be recorded in the AMP.	<300 L/person/day	300 L/person/day	300 L/person/day	300 L/person/day

ID	Levels of Service	Performance Measures	Current Performance	Future Performance Y1-3			Future Performance Y10
Community Outcome: Our urban and rural environments are pleasant, safe and sustainably managed.							
5	**Our use of the Water Resource is efficient.**	Water Demand Management Plans are in place for each water scheme	**Actual = 5/15** Plans are in place for Richmond/Waimea, Brightwater/Hope, Wakefield, Mapua/Ruby Bay and Kaiteriteri/Riwaka.	8/15	9/15	10/15	15/15
6		The weighted average of metered residential consumption across the district reduces. As measured through Council's district-wide Water Demand Management Plan.	**Actual =** 196 l/capita/day	<250l/capita/day	<250l/capita/day	<250l/capita/day	<250l/capita/day
7		The weighted average of measured water loss across the district reduces. As measured through Council's district-wide Water Demand Management Plan.	**Actual =** 239 l/connections/day	<235l/connection/day	<230l/connection/day	<225l/connection/day	<175l/connection/day
8	**Our water is safe to drink.**	Number of temporary advisory notices issued to boil water - as issued in consultation with the Ministry of Health	**Actual = 0 in 2014** There is a permanent notice in place at Dovedale, which is not covered in the targets as it is permanently in place.	0	0	0	0
9		We comply with part 4 (bacteria compliance criteria) of the drinking-water standards As measured by bacterial water sample results. (Mandatory measure 1)	**Actual = 99.7%** Zone – 640 E.coli samples were taken over the year. Of these, four transgressions were recorded for E.coli = 99.4% Plant – 595 E.coli samples were taken over the year. Of these, no transgressions were recorded for E.coli = 100% compliance Performance will be recorded in the National Water database (WINZ).	99%	99%	99%	99%
10		We comply with part 5 (protozoal compliance criteria) of the drinking-water standards As measured by number of schemes with compliant protozoa treatment determined by the Drinking Water Assessor)	Actual = 1 of 15 Not all schemes need to comply yet and the number of schemes will reduce with planned changes. Performance will be recorded in the National Water database (WINZ).	2 of 15: Upper Takaka, Richmond	3 of 15 Tapawera	3 of 14 (Hamama retired)	14 of 14

ID	Levels of Service	Performance Measures	Current Performance	Future Performance Y1-3			Future Performance Y10
		(Mandatory measure 1)					
11		WSPs are in place, approved and being implemented for each water supply. As measured by approval by Ministry of Health.	**Actual = 5/15** WSPs approved for Tapawera, Upper Takaka and Motueka, Waimea, Richmond Two further ready for submission (Wakefield, Brightwater) and one in appeal (Collingwood).	10/15	13/15	14/15	15/15
12	**Our water supply systems provide fire protection to a level that is consistent with the national standard.**	Our water supply system's meet the FW2 standard as per the Code of Practice for Fire Fighting Water Supplies - measured through hydraulic modelling, and field testing revised biennially.	**Actual = 90%.** 9/10 urban systems fully comply with fire fighting capability. The vast majority of Richmond complies, with the exception of Cropp Place. Rural water supplies and community supplies do not provide fire fighting capacity so are not covered by this performance measure. However, Takaka has a reticulated fire fighting scheme for the central business area and Motueka has a network of fire wells which provide a limited fire fighting service.	90%	90%	90%	100%
13		Planned service interruptions do not exceed 4 hours. As measured through the maintenance contract.	**Actual = 0** No planned service interruptions have exceeded four hours.	0	0	0	0
14		Flow from hydrants meets fire fighting standards. As measured by random annual spot checks of hydrants.	**Actual = This is not currently being measured.** Budget assigned in AMP to undertake programme of hydrant spot checks.	100%	100%	100%	100%
15		No system shall be down for longer than two hours per week. As measured through the Maintenance contract.	**Actual = 0** No system has been interrupted for more than two hours in any one week	0	0	0	0
16	**Our water supply activities are managed at a level that the community is satisfied with.**	% of customers are satisfied with the water supply service - as measured through the annual residents' survey.	**Actual = 77%**	80%	80%	80%	85%

ID	Levels of Service	Performance Measures	Current Performance	Future Performance Y1-3			Future Performance Y10
							
17	**Our systems are built, operated and maintained so that failures can be managed and responded to quickly.**	Complaints per 1000 connections are less than the target - relates to clarity, taste, odour, pressure or flow, continuity of supply and Council response to these issues. - as recorded through Council's Confirm database (Mandatory measure 4)	Actual =NA This is a new measure, performance will be recorded in Confirm.	<20	<20	<20	<20
18		Median resolution times are within targets for urgent call-outs (1 day) (Mandatory measure 3)	Actual = 99% This is a new measure, performance will be recorded in Confirm. More detailed response timeframes are monitored through contract 688	<24 hours	<24 hours	<24 hours	<24 hours
19		Median response times are within targets for urgent call-outs (2 hours) (Mandatory measure 3)	Actual = 99% The operations and maintenance contractor is required to meet a target of 90% of faults to be responded to and fixed within specified timeframes. The figure reported here relates to completion within the final completion timeframe. More detailed response timeframes are monitored through contract 688.	<2 hours	<2 hours	<2 hours	<2 hours
20		Median response times are within targets for non-urgent call-outs (72 hours) (Mandatory measure 3)	Actual =NA This is a new measure, performance will be recorded in Confirm. More detailed response	<72 hours	<72 hours	<72 hours	<72 hours

ID	Levels of Service	Performance Measures	Current Performance	Future Performance Y1-3			Future Performance Y10
			timeframes are monitored through contract 688				
21		Median resolution times are within targets for non-urgent call-outs (7 working day) (Mandatory measure 3)	Actual =NA This is a new measure, performance will be recorded in Confirm. More detailed response timeframes are monitored through contract 688	<8 Working days	<8 Working days	<8 Working days	<8 Working days
22		Hydraulic models are in place for key urban water supplies. As measured through professional services contracts.	**Actual = 6 hydraulic models are in place** for Richmond, Waimea, Brightwater, Wakefield, Mapua, Motueka.	6 / 10	6 / 10	6 / 10	8 / 10
23		Critical assets are identified and included in the Activity Risk Register.	**Actual = Critical assets are identified and assessed for Risk** Where mitigations measures are required, they have been included for action in the AMP.	In Place	In Place	In Place	In Place
24		Water supply systems have the following storage: Urban: - one day at average annual demand Rural: - six hours at average annual demand As measured through annual demand figures vs actual storage.	**Actual = 12 of 12 schemes have the required storage** Recent construction of reservoirs in Richmond have allowed this scheme to comply	12/12	12/12	12/12	12/12
25		Assets are operated, maintained and repaired to a high standard. As measured through contract audits	**Actual = 90.6%** 	80%	80%	80%	80%

7. Changes Made to Activity or Service

Table 7.1 summarises the key changes for the management of the water activity since the 2012 Activity Management Plan.

Table 7.1: Key Changes

Key Change	Reason for Change
Waimea Basin urban water supply options developed	The extreme shortage of water supply for the Waimea basin has resulted in TRMP change 45-48 which will have an impact on the availability of water for urban areas. The Waimea Community Dam is the Council'ss preferred solution to these issues and is included throughout the AMP, however if the dam does not proceed, alternative solution have been developed as discussed in Appendix AA.
Deferral of major projects: · Coastal Tasman Area Pipeline · Motueka Reticulation	Both of these projects have been deferred in this AMP due to affordability concerns. The Coastal Tasman Area pipeline would not support enough growth to pay for its installation cost in a reasonable timeframe. The Council was unsuccessful in gaining central government subsidy for the reticulation of Motueka and hence this project is currently not able to be delivered at a reasonable cost to the community.
Level of service changes	The Council has adjusted its level of service statements to incorporate the new National Reporting measures.

8. Key Projects

Table 8.1 details the key capital and renewal work programmed for years 2015 to 2025. A full list of capital and renewal projects for the 20 year period is included in Appendix F and I respectively.

Table 8.1: Significant Projects

Project ID	Project Name	Description	Year 1 ($)	Year 2 ($)	Year 3 ($)	Years 4 to 10 ($)	Project Driver[2]
150018	Brightwater – Treatment Upgrade.	Upgrade the existing treatment plant to meet DWSNZ.				700,000	LoS/G
150023	Collingwood – Treatment Upgrade.	Upgrade the existing treatment plant to meet DWSNZ.	83,400	472,600			LoS
150051	Kaiteriteri – Treatment Upgrade.	Upgrade the existing treatment plant to meet DWSNZ.	102,673	752,935			LoS/G
150053	Mapua – Aranui Road Main Replacement.	Replacing the existing watermain down Aranui Road.				955,569	R
150078	Motueka – Thorp Street Replacement.	Replacing the low grade class B pipe down Thorp Street.				1,767,682	R
150115	Richmond – Fauchelle Avenue, Darcy Street and Florence Street.	Renewing failing watermains.	1,032,052				R
150123	Richmond – Lower Queen Street Replacement.	Upsizing and replacing the existing 100mm main down Lower Queen Street.	84,999	722,491	42,499		R/LoS
150129	Richmond – Queen Street Main Replacement.	Replacing the 300mm truckmain down Queen Street within the CBD.		100,000	1737285		R/LoS
150184	Wakefield – New Source and Water Treatment Plant.	Construct a new treatment plant to meet DWSNZ. This involves a new source.		400,000	3,400,000	200,000	LoS/G
150189	Wakefield – Re-zoning.	Re-zoning the Wakefield and 88 Valley Zone. Involves pump stations and reservoirs.				2,634,391	LoS/G

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[2] Project Drivers – LoS = increasing Levels of Service, G = Growth, R = Renewals

Project ID	Project Name	Description	Year 1 ($)	Year 2 ($)	Year 3 ($)	Years 4 to 10 ($)	Project Driver[2]
150207	Richmond Rezoning.	Upgrading pipelines within Richmond and adjusting the zonal boundary between Waimea and Richmond.				1,094,874	LoS/G/R
150193	Waimea Community Dam Share Purchase	Via CCO for construction of a new dam.			12,071,827	8,063,818	LoS/G
150195	Richmond Meters	Meter renewals.	698,750	698,750	698,750	1,447,500	R
150128	Richmond Pipes & Ridermains	Pipeline renewal programme.	150,000	150,000	150,000	2,100,000	R
150125	New Groundwater Source	New wellfield and new main to Richmond WTP.				1,960,830	LoS/G
150299	Renewals Contingency	Renewals.	150,000	150,000	150,000	1,050,000	R
150159	Telemetry Upgrade	New control panels and telemetry and renewals of existing sites	105,000	105,000	75,000	900,000	LoS/G/R
150065	Fearon Street Mains Replacement	Main needs to be lowered, currently has 480mm cover and suffers from bursts.				743,225	R
150231	Relocate Fearons Bush WTP to Parkers Street WTP	Relocate Fearons Bush WTP to Parkers Street WTP extend mains in Jocelyn and Parker Streets.	25,000	631,875		-	LoS/G/R
150259	Pump Station Programme	Pump renewals.	100,000	100,000		400,000	R
150023	Treatment Upgrade	Upgrade treatment to meet DWSNZ.	83,400	472,600		-	LoS/G
150196	Motueka Meters	Meter renewals.	552,500			-	R
150027	Dovedale Pipes	Pipeline renewal programme.				500,000	R
150235	Reservoir Seismic Strengthening	All except Richmond as per report - maybe delete in favour of 150317.				500,000	LoS/G

9. Management of the Activity

9.1 Management

The strategic approach to the management of the coastal structures activity is diagrammatically presented below in Figure 9-1.

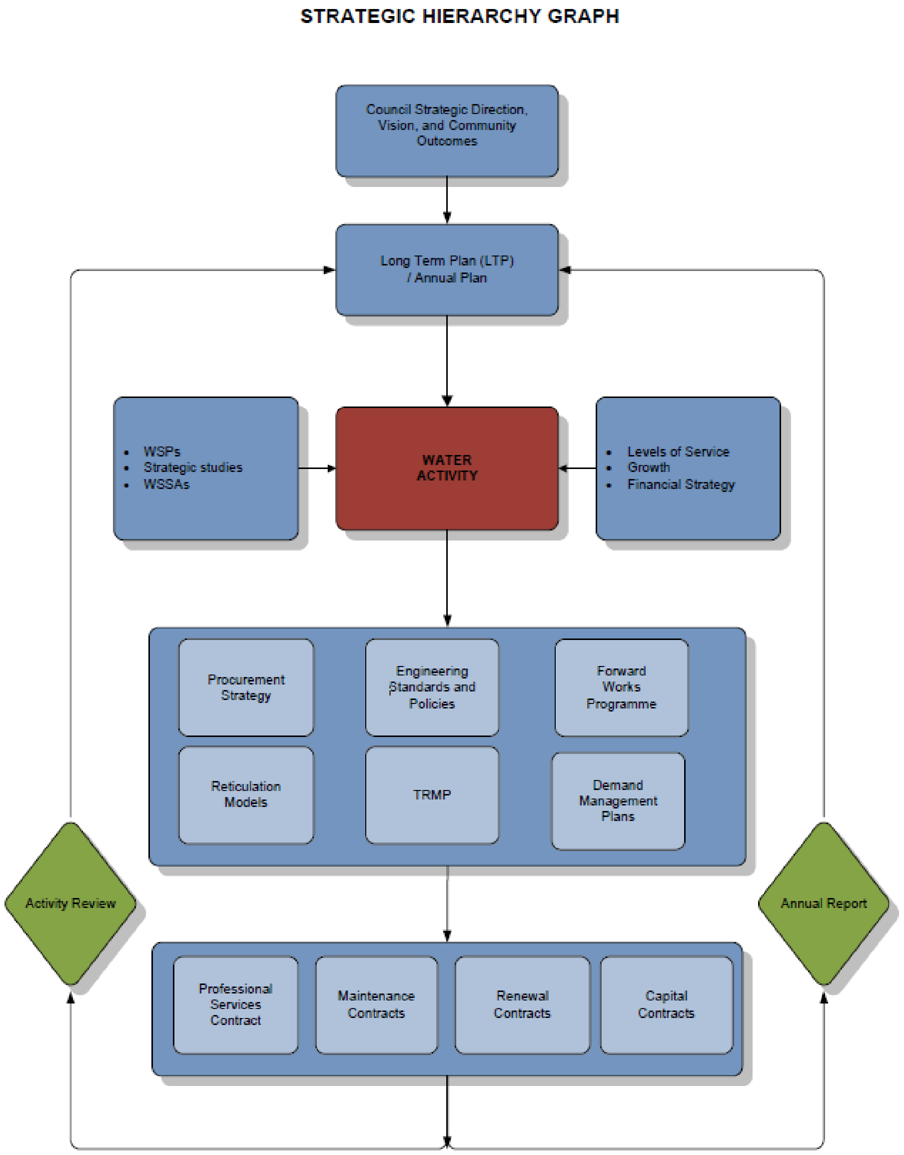

Figure 9-1: Management Strategic Context

9.2 Service Delivery Review

Section 17A of the Local Government Act 2002 requires all local authorities to review the cost-effectiveness of its current arrangements for delivering good quality local infrastructure, local public services, and performance of regulatory functions at least every six years.

The Council engaged Morrison Low to review its delivery of services provided by its Engineering Department in 2012. The review recommended a re-organisation of the department to reduce the proportion of asset management services that were provided by external consultants. The re-organisation was implemented during 2013 and has provided cost savings to the Council, an increase in asset knowledge, and greater interaction with customers.

In addition to this review, the Council reviews how it procures and delivers its stormwater services at the time of renewing individual maintenance and renewal contracts. These reviews include consideration of the maintenance specification, how work is packaged together e.g. the size and shape of contact areas. For example, the current operation and maintenance contract for the three water assets expires on 30 June 2017. Prior to tendering for a replacement contract the Council will go through a process to determine:

- which assets to include;
- whether a single or multiple contracts is appropriate;
- the most suitable contract model, performance based, prescriptive, or other;
- which conditions of contract to use;
- what is the most suitable contract term.

The Council is also aware of other opportunities to maximise efficient delivery of services, for example combined contracts or partnerships with Nelson City Council.

9.3 Demand Management

The objective of the Water Demand Management Plan (WDMP) is to provide a framework and action plan to continuously improve efficient use of water and water demand management across Tasman District Council water supplies, targeting the highest demands/water loss first, to achieve a level of water demand management that is consistent with good performance in New Zealand.

By doing this the Council will ensure its use of the water resource is efficient which is one of the levels of service that contributes to the community outcome “our unique and special natural environment is bountiful, healthy, clean and protected” (refer Levels of Service Appendix R).

The Council has set level of service performance measures for residential water consumption (250 l/capita/day) and water loss (235 l/connection/day dropping to 175 l/connection/day by year 10) that it will report on (refer Appendix R, performance measures 3 and 4, Figure 9-1). These are weighted averages of the performance of all water supplies for which Demand Management Plans have been completed.

These targets can be compared against performance in other water supplies in New Zealand in the following graphs (note not many Councils have or publish this data and those that do are likely to be the best performers).

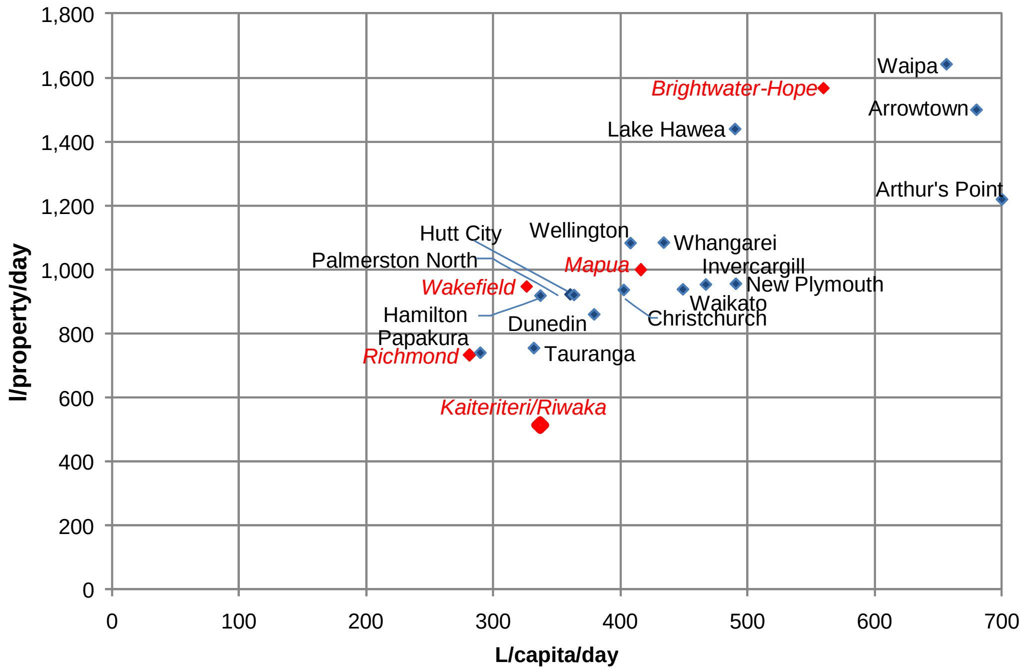

Figure 9-2: Benchmarking Metered Residential Consumption against other New Zealand Supplies

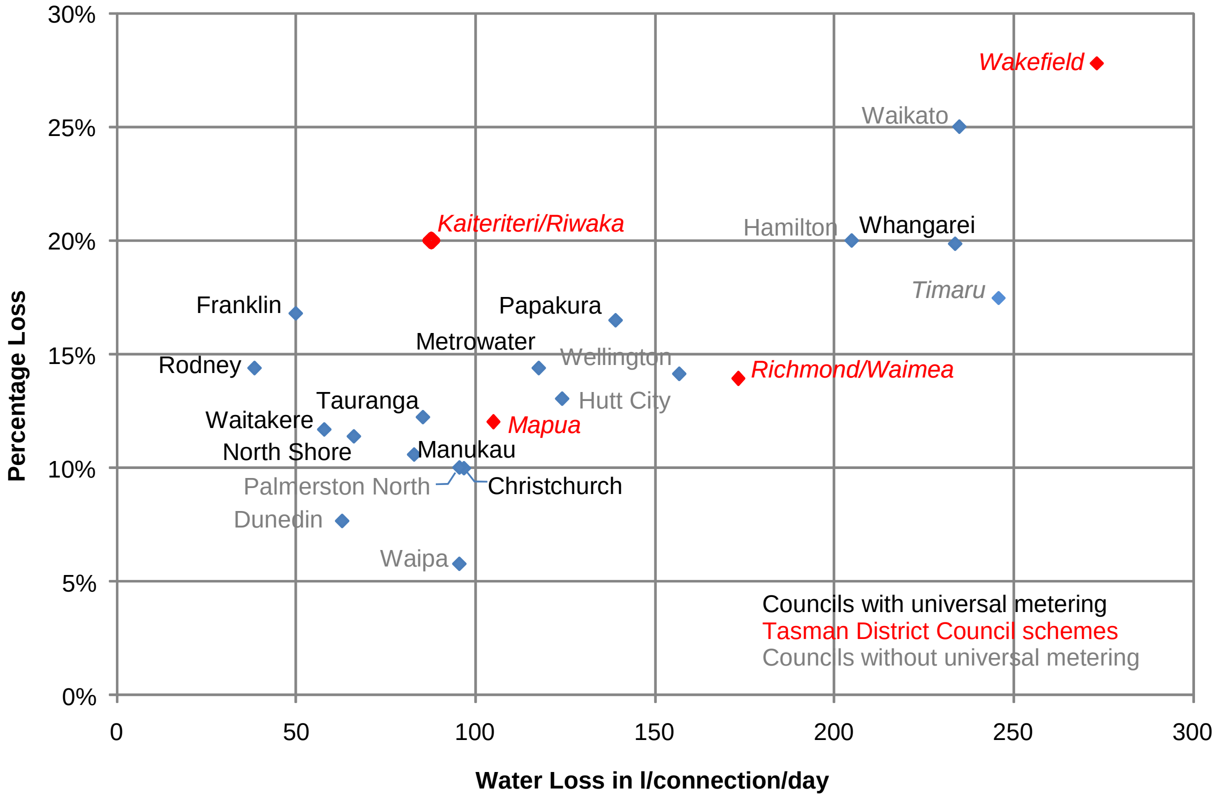

Figure 9-3: Benchmarking Water Losses against other New Zealand Supplies

The priority for the Council is to bring down the water losses in Wakefield. The demand management programme is therefore focused on night flow monitoring, leak detection and repairs. Some focus will also go on Richmond water losses. Further completion of demand management plans has been spread over the period but the focus will be on the above priorities.

9.4 Significant Negative and Positive Effects

The significant negative and significant positive effects are listed below in **Error! Reference source not found.** and Table 9-1 respectively.

Table 9.1: Significant Negative Effects

Effect	Description	Mitigation Measure
Construction of future schemes	**Social** - Installation of water schemes do cause a disruption to the local community. The works can impact on traffic flow, and cause noise, dust and visual impacts. Shutdowns may result in residence not receiving water during the day. **Economic** - This may result in customers avoiding the works and therefore nearby business may suffer. Shutdowns may result in businesses not receiving water during the day. **Environmental** - Construction of water contracts typically creates noise, dust and mud. The TRMP and specific resource consents must be followed. Projects can involve acts such as de-watering, which requires the water to be discharged. Potential risk to the environment.	Public consultation. Notifying the public of the works through various forms of the media. Standard construction controls cover time of operation, noise and dust mitigation. In some cases visual impacts are mitigated.
Water Restrictions	**Social** - Typically effects people who use the water for washing cars or watering the garden. This can frustrate the local community. **Economic -** This can have a larger impact on businesses that rely on water for irrigation. This can cause a negative effect on these businesses.	The Council is supporting the Waimea Community Dam project and has made allowances in the AMP for new water sources. The Council has made allowances for improving demand management which will assist with making water usage more sustainable.
Spillage of Chemicals Stored at Water Treatment Plants	**Social -** The rate payer expects the council to handling all chemicals in the correct manner. **Economic -** Businesses which rely on nearby watercourses may not be able to operate until the chemical spill is resolved**.** **Environmental** - Tasman region is an environmentally sensitive area, any chemical spill will have a notable effect on the environment.	Appropriately trained staff and contractors. All chemicals are stored in the correct manner.

Effect	Description	Mitigation Measure
Water Abstraction	Water is abstracted from surface water and groundwater sources. **Social** - The removal of water from the natural environment results in the water being unavailable for other uses such as irrigation or recreational. **Economic**. The removal of water from the natural environment results in the water being unavailable for other uses such as irrigation or recreational. **Environmental.** The removal may add strain on a river system which is already very low and can significantly impact the ecology.	The Council introduces water rationing during times of drought. Demand Management will assist with reducing the volume of water abstracted from the water source. Investigating new water sources and educating the public on water usage. Resource consents are in place, so the Council cannot exceed a certain limit.
Historic and Wahi Tapu Sites	**Cultural –** Construction of water supply assets can potentially affect historic and wahi tapu sites.	Council undertakes consultation with stakeholders prior to undertaking works. The Council also maintains a record of known heritage sites.

Table 9-1: Significant Positive Effects

Effect	Description
Economic Development	Provision and maintenance of water supplies allows for the development of commercial businesses, industry and residential use, therefore, contributing to economic growth and prosperity in the district. The Council's management of the water supply activities uses best practice and competitive tendering to provide value for money for ratepayers and provides jobs for contractors.
Public Health	Safe drinking water supplies provide critical public health benefits related to sustenance and sanitation.
Safety and Personal Security	The majority of the Council's urban water supply network is built to accommodate fire fighting requirements and supports protection of life and property.

9.5 Assumptions

The Council has made a number of assumptions in preparing the Activity Management Plan. These are discussed in detail in Appendix Q.

Table 9-2 lists the most significant assumptions and briefly outlines the impact of the assumption.

Table 9-2: Significant Assumptions

Assumption Type	Assumption	Discussion
Financial assumptions	That all expenditure has been stated in 1 July 2014 dollar values and no allowance has been made for inflation.	The LTP will incorporate inflation factors. This could have a significant impact on the affordability of the plans if inflation is higher than allowed for, but the Council is using the best information practically available from Business and Economic Research Limited (BERL).
Asset data knowledge	That the Council has adequate knowledge of its assets and their condition so that the planned renewal work will allow the Council to meet the proposed levels of service.	There are several areas where the Council needs to improve its knowledge and assessments but there is a low risk that the improved knowledge will cause a significant change to the level of expenditure required.
Growth forecasts	That the district will grow as forecast in the Growth Demand and Supply Model (refer to Appendix F).	If the growth is significantly different it will have a low impact. The reason being population growth in the district does not directly affect the demand for river services.
Timing of capital projects.	That capital projects will be undertaken when planned.	The risk of the timing of projects changing is high due to factors like, resource consents, funding and land purchase. The Council tries to mitigate this issue by undertaking the consultation, investigation and design phases sufficiently in advance of the construction phase. If delays are to occur, it could have significant effects on the level of service.
Funding of capital projects.	That the projects identified will receive funding.	The risk of the Council not funding capital projects is moderate due to community affordability issues. If funding is not secured, it may have significant effect on the levels of service as projects may be deferred. The risk is managed by consulting with the affected community and appropriate distribution of targeted rates.
Accuracy of capital project cost estimates.	That the capital project cost estimates are sufficiently accurate enough to determine the required funding level.	The risk of large under estimation is low; however the significance is moderate as the Council may not be able to afford the true cost of the projects. The Council tries to reduce the risk by including a standard contingency based on the projects lifecycle.
Changes in legislation and policy.	That there will be no major changes in legislation or policy.	The risk of major change is high due to the changing nature of the government. If major changes occur it is likely to have an impact on the required expenditure. The Council has not mitigated the effect of this.

Assumption Type	Assumption	Discussion
Land purchase and access.	That the Council will be able to secure land and/or access to enable completion of projects.	The risk of delays to project timing or changes in scope is high due to the possibility of delays in obtaining land. Where possible the Council undertakes land negotiations well in advance of construction to minimise delays. If delays do occur, it may influence the level of service the Council can provide.
Resource consents.	That there will be no material change in the need to secure consents for construction activities and that consent costs for future projects will be broadly in line with the cost of consents in the past.	The risk of material change in the resource consent process is low.
Network capacity.	That the Council's knowledge of network capacity is sufficient enough to accurately programme capital works.	If the network capacity is lower than assumed, the Council may be required to advance capital works projects to address congestion. The risk of this occurring is low; however the impact on expenditure could be large. If the network capacity is lower than assumed, the Council may be able to defer works. The risk of this occurring is low and is likely to have little impacts.
Disaster fund reserves.	That the level of funding held in the Council's disaster fund reserves and available from insurance cover will be adequate to cover reinstatement following emergency events.	The risk of inadequate reserves and insurance cover would mean deferral of future capital projects to provide any financial shortfall required to cover reinstatement costs.
Water source quantity and quality.	That the Council will be able to find and develop new water sources of sufficient quality and quantity to meet the needs of Richmond and Wakefield.	If the proposed water sources do not have sufficient water to cope with the projected demand, the Council will need to investigate new source locations, this could have an effect on the timing and cost of the jobs. If the water quality is poor, ie. high nitrate levels, then the cost of treatment may increase.
Waimea Community Dam.	That the dam will proceed and the Council will be able to increase its water allocations on the Waimea Plains, including the allocation for water supply purposes.	If the dam does not proceed, the Council's current allocations may be reduced and the Council would need to find alternative water sources.

9.6 Risk Management

The Council's risk management approach is described in detail in Appendix Q.

This approach includes risk management at an organisational level (Level 1). The treatment measures and outcomes of the organisational level risk management are included within the LTP.

At an asset group level (Level 2), The Council has identified eight high risks and planned mitigations measures to reduce these risks to two high risks. The Council has planned controls for the remaining two high risks but even with the controls, they remain high. The Council has decided to accept these risks. These are listed in **Error! Reference source not found.**.

Table 9.4: Significant Risks and Control Measures

Risk Event	Mitigation Measures
Catastrophic failure of a network structure	**Current** · routine maintenance and inspections are included in the network maintenance contracts; · reactive inspection following extreme weather events. **Proposed** · additional seismic strengthening of reservoirs.
Premature deterioration or obsolescence of an asset	**Current** · maintenance performance measures included in the network maintenance contracts; · routine inspections. **Proposed** · increased assessment and progressive renewal of lower quality pipe materials.
Sub-optimal design and/or construction practices or materials	**Current** · Engineering Standards and Policies document and construction inspections; · contract quality plans; · professional services and construction contract specifications; · third party reviews. **Proposed** · ongoing staff training.
Ineffective stakeholder engagement eg, iwi, Heritage New Zealand, community groups	**Current** · the Council holds regular meetings with iwi; · the Council's GIS software includes layers identifying cultural heritage sites and precincts. Council staff apply for Heritage New Zealand when these known sites are at risk of damage or destruction; · project management processes and Council's consultation guidelines are followed.
Failure to gain property access	**Current** · stakeholder management; · works entry agreements; · use of the Council's property team to undertake land purchase negotiations; · Public Works Act.

The Council has also identified and assessed critical assets (Level 3), the physical risks to these assets and the measures in place to address the risks to the asset. This has led to a list of projects to mitigate the risks to acceptable levels as detailed in Appendix Q.

The specific risk mitigation measures that have been planned within the 30 year water programme include:

Asset Management Activity

- Test Emergency Management Plan.
- Review Wai-iti Dam Emergency Action Plan.
- Designs to minimise fire potential and animal incursion.
- Designs to allow for manual operation.
- Improve HAZOPs.
- Regular communication with health authorities to identify critical users.

Operational Project

- Test existing backflow protection.
- Review existing fire controls at water treatment plants.
- Leak detection programme.
- inspection of water retaining structure throughout the district.
- Wai-iti Dam safety audits.

Capital Project

- Install backflow protection where needed.
- Wellhead protection improvements.
- A programme of telemetry installation and upgrade.
- Seismic protection at key reservoirs.

Strategic Study

- Identify critical mains
- Develop policy on who owns and maintains backflow protection assets.
- Investigate new water sources for Richmond/Waimea.
- Completing WSPs for all water supply systems.
- Hydraulic modelling.

9.7 Improvement Plan

This Activity Management Plan document was subject to a peer review in its draft format by Waugh Infrastructure Management Ltd in February 2015. The document was reviewed for compliance with the requirements of the LGA 2002. The findings and suggestions will be assessed and prioritised by the asset management team and either implemented in the final version of this document or added to the Improvement Plan.

The Improvement Plan is currently under development and will be included in Appendix V in the final version of this document.

10. Summary of Cost for the Activity

A full cost summary is included in Appendix L. The graphs below represent the key financial elements for the water supply activity.

10.1 Total Expenditure

Figure 10-1 shows the total expenditure for the water activity for the first ten years.

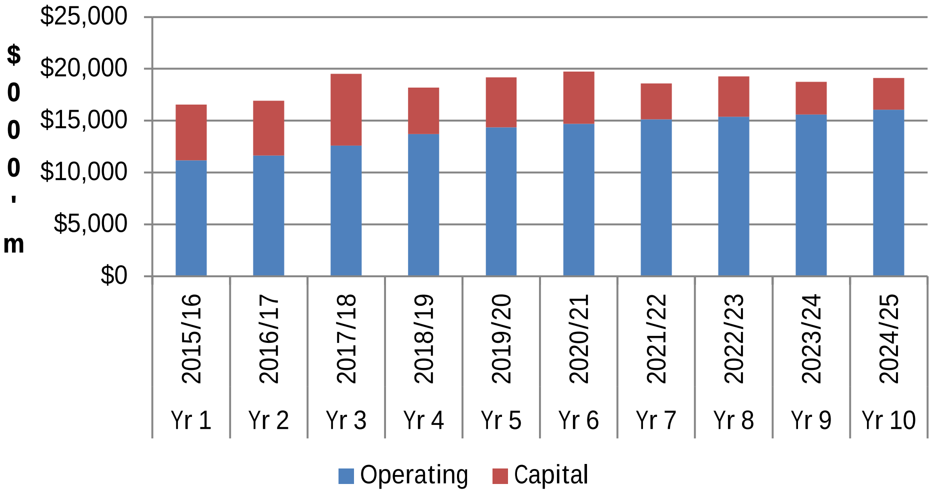

Figure 10-1: Total Expenditure

Operating expenditure increases from $11.2 to $16.1 million over the 10 year period. This is due to inflation, increased loan servicing costs and network growth.

10.2 Total Income

Figure 10-2 shows the total income for the water activity for the first ten years.

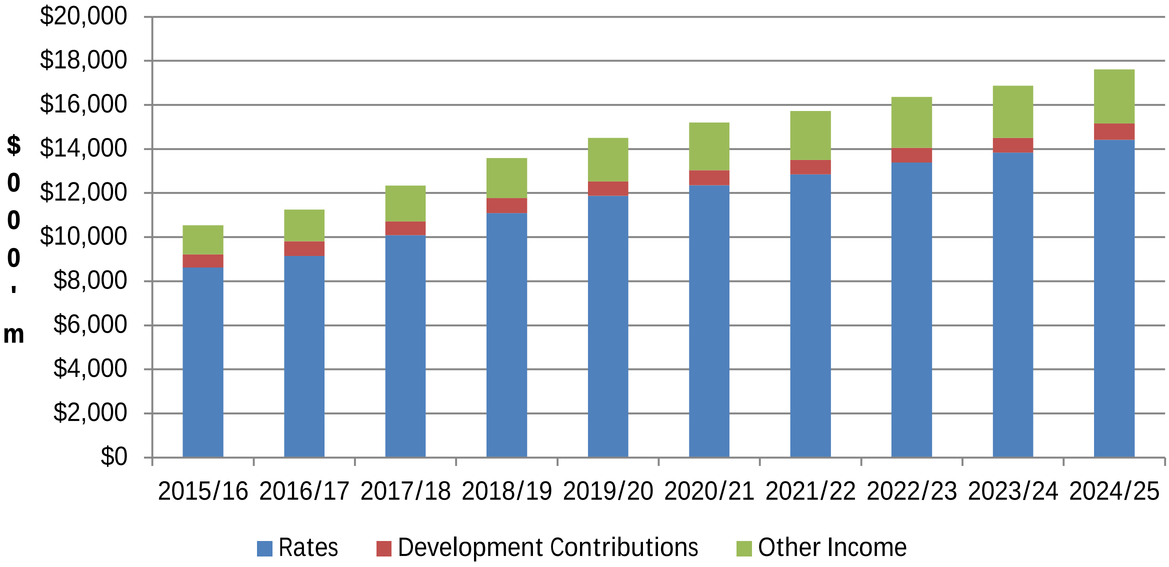

Figure 10-2: Total Income

Rate increases account for the majority of the increase in income. Debt increases are in conjunction with major capital projects.

10.3 Water Charges

Figure 10-3 shows the urban water charges for the final Ten Year Plan.

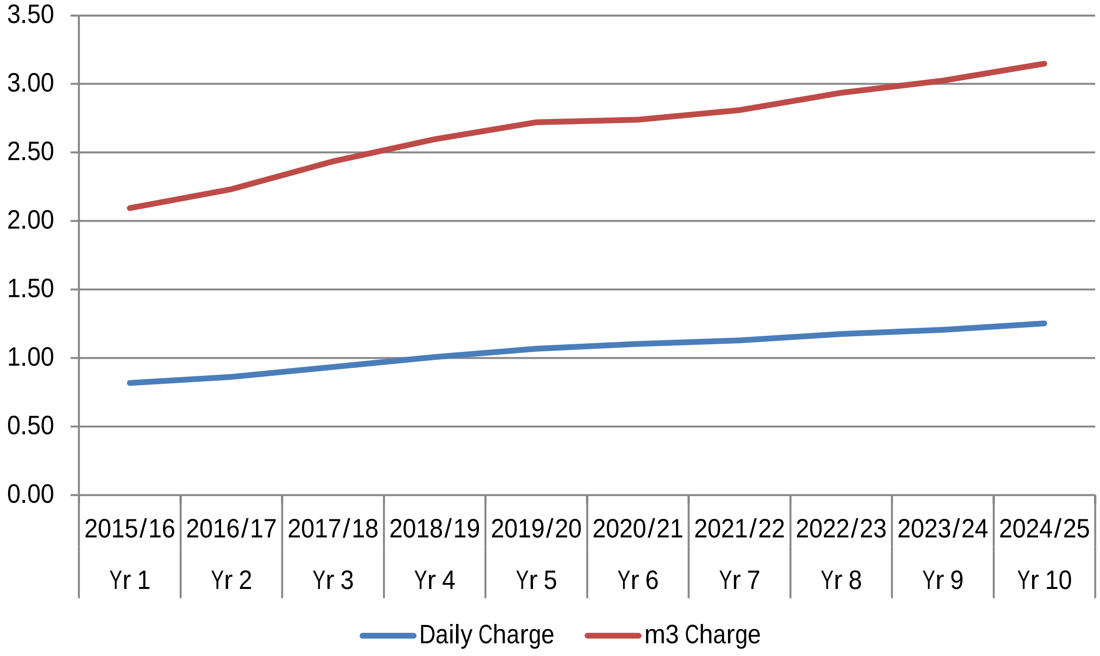

Figure 10-3: Urban Water Charges from Final Ten Year Plan ($)

The daily charge rises from $0.82 to $1.25 over the 10 year period.

The volume per cube rises from $2.09 to $3.15 over the 10 year period which will support water conservation.

10.4 Capital Expenditure

Figure 10-4 shows the capital expenditure for the water activity for the first ten years.

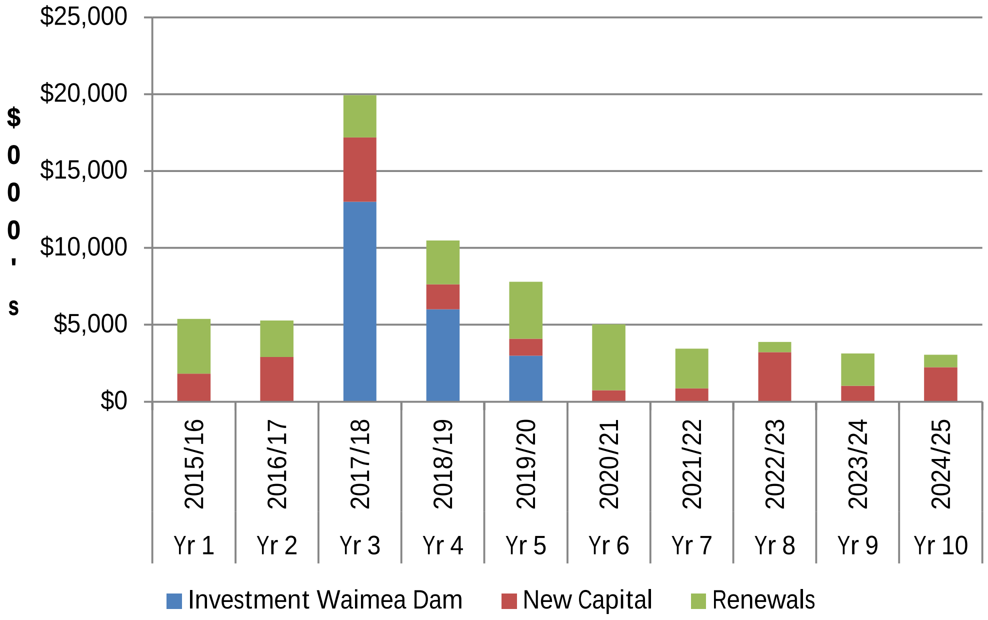

Figure 10-4: Capital Expenditure

The capital expenditure fluctuates over the 10 year period. The notable peak in year 2017/18, in addition to the dam, is due to the Wakefield Treatment Plant ($4,000,000) project.

10.5 Operations and Maintenance Expenditure

Figure 10-5 shows the operations and maintenance expenditure for the water activity for the first ten years.

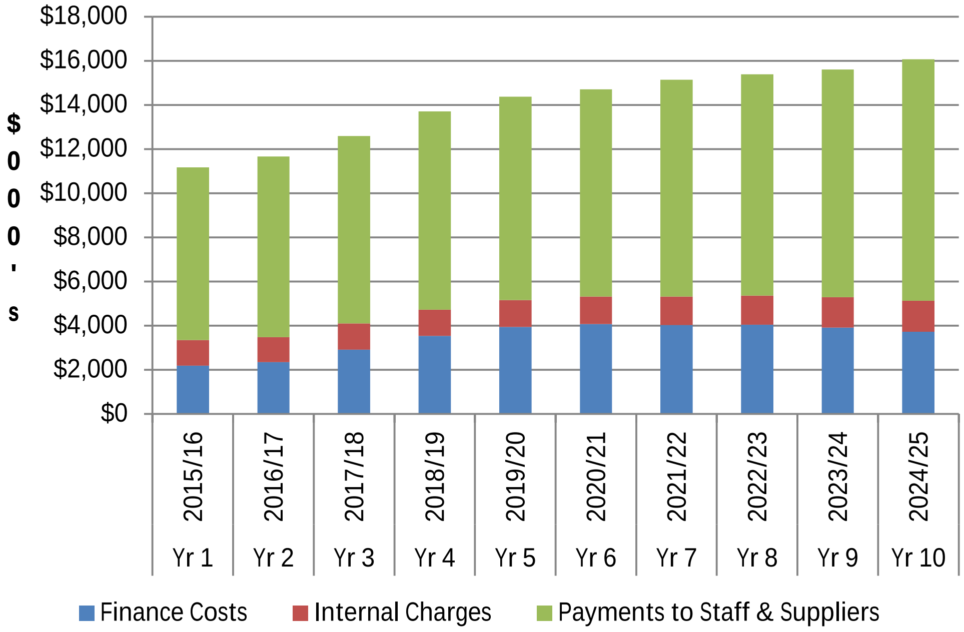

Figure 10-5: Operating Expenditure

The payments to staff and suppliers includes maintenance contract costs and professional service fees.

Finance costs increase over the next 10 years due to an increase in the level of debt shown in Figure 10-6.

10.6 Debt and Servicing Costs

Figure 10-6 shows the total debt and servicing costs for the water activity for the first ten years.

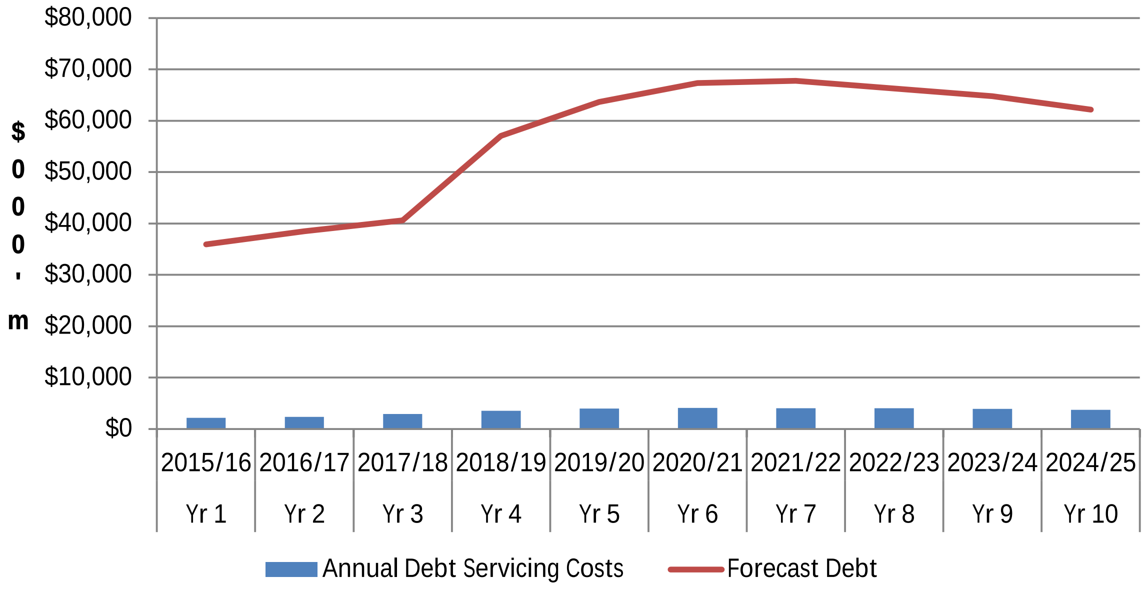

Figure 10-6: Debt

The Council's debt associated with the Water activity is forecast to increase from $35.9 to $62.2 million over the next 10 years. This will also increase the debt servicing costs as shown.

10.7 Depreciation and Investment in Renewals

Figure 10-7 compares the total cumulative investment in renewals and the total cumulative depreciation for the water activity for the first ten years.

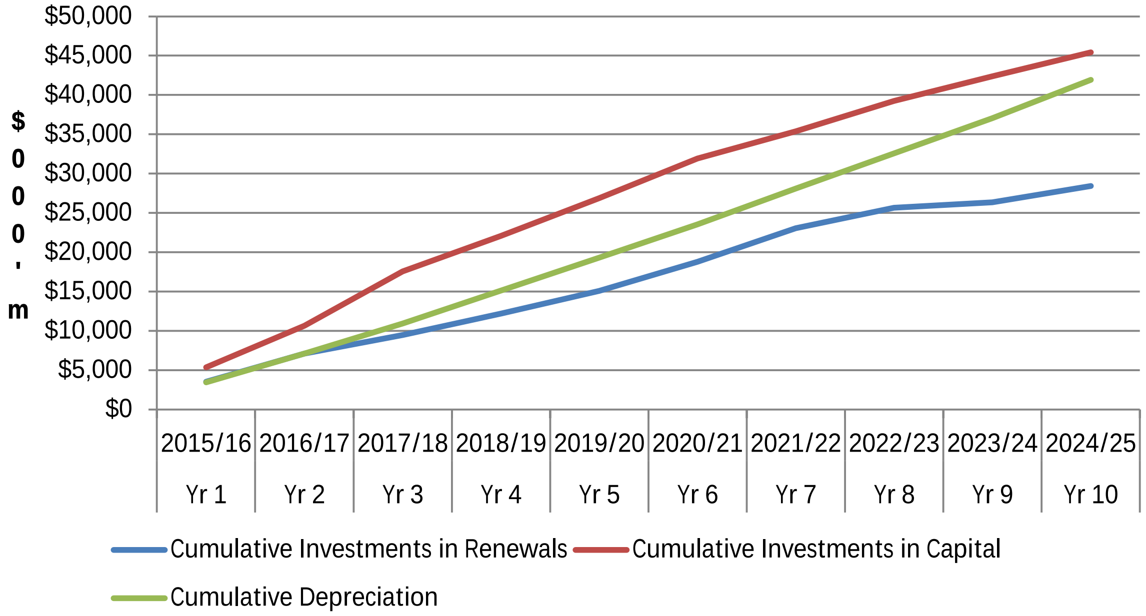

Figure 10-7: Investment in Renewals

The above figure covers a relatively short time period when compared with the useful life span of the water assets. The investment in renewals appears to be adequate for the next 10 years. There is a slight divergence apparent however the Council has mitigation measures in place to manage deferred renewals such as:

- critically assessing remaining life of pipelines with known condition problems;
- capturing asset data to reduce the high level of “unknown” pipelines;
- using a risk based approach to identifying pipeline replacement programmes;
- improving condition knowledge of some of the “high risk” pipelines, especially to identify:
  - ¾ asset condition may be worse than expected;
  - ¾ situations where remaining life is under-estimated.

APPENDIX A LEGISLATIVE AND OTHER REQUIREMENTS AND RELATIONSHIPS WITH OTHER PLANNING DOCUMENTS AND ORGANISATIONS

A.1 Introduction

The purpose of this activity management plan is to outline and to summarise in one place, the Council's strategic and management long-term approach for the provision and maintenance of its water assets.

The AMP demonstrates responsible management of the district's assets on behalf of customers and stakeholders and assists with the achievement of strategic goals and statutory compliance. The AMP combines management, financial, engineering and technical practices to ensure that the levels of service required by customers is provided at the lowest long term cost to the community and is delivered in a sustainable manner.

The provision of water supply services is considered to be a core public health function of local government and is something that the Council has always provided. The service provides many public benefits and it is considered necessary and beneficial to the community that the Council undertakes the planning, implementation and maintenance of water supply services in the district.

Territorial authorities have numerous responsibilities relating to the supply of water. One such responsibility is the duty under the Health Act 1956 to improve, promote, and protect public health within the districts. This implies that, in the case of the provision of potable water, councils have the obligation to identify where such a service is required, and to either provide it directly themselves, or to maintain an overview of the supply if it is provided by others.

This plan outlines and summarises the Council's strategic and management long-term approach for the provision and maintenance of potable water[1] supplies to properties throughout the district (excluding those that service single premises that have their own rainwater tanks or bores) - whether they be provided by public or private means.

The target audience of this AMP is the Tasman District community, Tasman District Councillors and Council staff. The appendices provide more in depth information for the management of the activity and are therefore targeted at the Activity Managers. The document is publicly available on the Council's website.

In preparing this AMP the project team has taken account of:

- **National Drivers** – for example the drivers for improving asset management through the Local Government Act 2002, and drivers for improved drinking water quality through the Health (Drinking Water) Amendment Act 2007.
- **Regional and Local Drivers** – for example the community outcomes determined through consultation with the public, and increasing scarcity of water and demand for more.
- **Industry Guidelines and Standards** – numerous standards exist and these assist in achieving consistent reliable performance.
- **Linkages** – the need to ensure this AMP is consistent with all other relevant plans and policies.
- **Constraints** – the legal constraints and obligations the Council has to comply with in undertaking this activity.

The main drivers, linkages and constraints are described in the following sections.

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[1] 'Potable water' is water that is suitable for use by humans as drinking water.

A.2 Key Legislation, Industry Standards and Statutory Planning Documents

The Acts below are listed by their original title for simplicity, however all Amendment Acts shall be considered in conjunction with the original Act, these have not been detailed in this document.

A.2.1. Acts of Parliament

The Acts below are listed by their original title for simplicity, however all Amendment Acts shall be considered in conjunction with the original Act, these have not been detailed in this document.

- The Building Act 2004
- The Civil Defence Emergency Management Act 2002 (Lifelines)
- The Climate Change Response Act 2002
- The Consumer Guarantees Act 1993
- The Fair Trading Act 1986
- The Health Act 1956 and the Health (Drinking Water) Amendment Act 2007
- The Health and Safety in Employment Act 1992
- The Local Government (Rating) Act 2002
- The Local Government Act 2002, especially
    - The requirement to consider all options and to assess the benefits and costs of each option
    - The consultation requirements (see Appendix ‘U’).
    - Part 7
    - Schedule 10.
- The Resource Management Act 1991
- The Sale of Goods Act 1908
- Utilities Access Act 2010

For the latest Act information refer to http://www.legislation.govt.nz/.

A.2.2. National Policies, Regulations, Standards and Strategies

- Drinking-water Standards for New Zealand (DWSNZ) 2005 (Revised 2008)
- The Guidelines for Drinking-water Quality Management for New Zealand 2013 - complement the DWSNZ. They explain their development and provide advice for achieving a high level of water quality management.
- The New Zealand Fire Service Fire Fighting Water Supplies Code of Practice: SNZ PAS 4509:2008 – defines flow and pressure standards for fire fighting
- The Government’s Sustainable Development Action Plan
- The National Environmental Standard Sources of Human Drinking Water
- Code of Practice for Urban Subdivision
- NAMS Manuals and Guidelines http://www.nams.org.nz
- Office of the Auditor General’s publications http://www.oag.govt.nz

A.2.3. Industry Guidelines and Standards New Zealand (refer to http://www.standards.co.nz)

The following Guidelines and Standards apply to this activity:

- NZWWA New Zealand Infrastructure Asset Grading Guidelines 1999
- NAMS International Infrastructure Management Manual 2006
- NZ Pipe Inspection Manual 2006
- Rawlinsons NZ Construction Handbook.
- NZS 4404:2010 Land Development and Subdivision Infrastructure – suggests minimum water supply pressures and flows (for both service delivery and fire fighting).
- AS/NZS ISO 31000:2009 Risk Management Principals and Guidelines
- AS/NZS ISO 9001:2008 Quality Management Systems
- AS/NZS 4801:2001 Occupational Health and Safety Management Systems
- AS/NZS 2032:2006 Installation of PVC Pipe Systems
- AS/NZS 2280:2004 Ductile Iron Pressure Pipes and Fittings
- AS/NZS 3725:2007 Design for Installation of Buried Concrete Pipes
- AS/NZS 2566.1:1998 Buried Flexible Pipe Design
- AS/NZS 2566.2:2002 Buried Flexible Pipe Installation
- NZS 3101.1&2:2006 Concrete Structures Standard
- NZS 3910:2003 Conditions of Contract for Building and Civil Engineering Construction

A.2.4. Regional and Local Policies, Regulations, Standards and Strategies

- Tasman District Council Engineering Standards and Policies 2013 http://www.tasman.govt.nz – sets out standards for the design of engineering works associated with the development of urban supplies, eg, material types, capacity of pipes;
- the Council’s Procurement Strategy;
- the Council’s Financial Strategy.

The Council has two key statutory planning documents implementing its responsibilities under the Resource Management Act 1991 being:

- Tasman Regional Policy Statement (TRPS) operative 2001 – An overview of significant resource management issues with general policies and methods to address these.
- Tasman Resource Management Plan (TRMP) – A combined regional and district plan with statements of issues, objectives, policies, methods and rules addressing the use of land, water, coastal marine area and discharges into the environment.

These documents guide the processing of resource consent applications for water abstraction from water bodies, and for some land disturbance or waterway interferences that may be associated with water supply reticulation. They may impact on the amount of water available for public supplies in various locations, the method of water abstraction and the location, design and construction of reticulation networks. The plan also specifies requirements for onsite water supply.

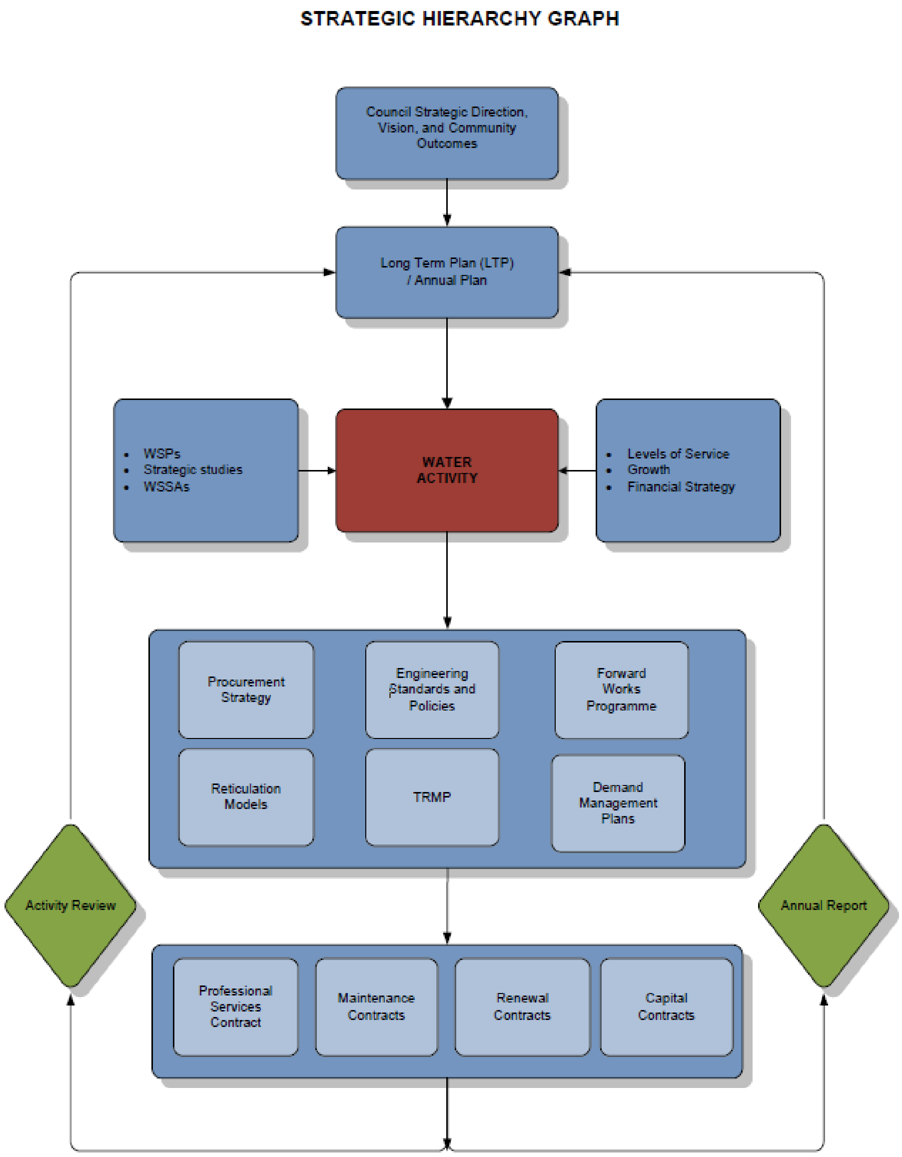
A.3 Links with Other Documents

This AMP is a key component in the Council’s strategic planning function. Among other things, this plan supports and justifies the financial forecasts and the objectives laid out in the Long Term Plan

(LTP). It also provides a guide for the preparation of each Annual Plan and other forward work programmes.

Figure A-1 following depicts the links between Council's AMPs and other corporate plans and documents.

Figure A-1: Hierarchy of Council Policy, Strategy and Planning



A.4 Strategic Direction

The Council's strategic direction is outlined in the Vision, Mission and Community Outcomes.

Vision: Thriving communities enjoying the Tasman lifestyle.

Mission: To enhance community well-being and quality of life.

Community Outcomes:

Table A-1 below describes how the water activity contributes to:

Governance

Table A1: How the Water Activity Contributes to Community Outcomes

Community Outcomes	How Our Activity Contributes to the Community Outcome
Our unique natural environment is healthy and protected.	All water in the Council-owned schemes is taken from the environment. This activity can be managed so the impact of the water take does not prove detrimental to the surrounding environment.
Our urban and rural environments are people-friendly, well-planned and sustainably managed.	The water supply activity is a service to the community providing water that is safe to drink and is efficiently delivered to meet customer needs. It also provides a means for fire fighting consistent with the national fire fighting standards.
Our infrastructure is efficient, cost effective and meets current and future needs.	The water activity is considered an essential service that should be provided to all properties within water supply network areas in sufficient capacity and pressure. This service should also be efficient and sustainably managed.
Our communities are healthy, safe, inclusive and resilient.	The water supply activity providing water that is safe to drink. Alternative sources and interconnectivity of networks support reliance of the system.
Our communities have opportunities to celebrate and explore their heritage, identity and creativity.	Key water supply assets have interpretive boards and creative facades to support community education and expression.
Our communities have access to a range of social, educational and recreational facilities and activities.	The water supply activity underpins other facilities and activities by providing safe water for human and animal needs.
Our Council provides leadership and fosters partnerships, a regional perspective and community engagement.	The water supply activity embodies this as witnessed by Agreements that we have with NCC and the Waimea Community Dam process.
Our region is supported by an innovative and sustainable economy.	The water supply activity underpins the economy by providing safe water for human and animal needs. Sustainable future supply is a key driver of our planning activities.

Table A-2 outlines the strategic documents utilised by the Council as part of the planning process.

Table A-2: Strategic Documents Used in the Planning Process

Long Term Plan (LTP)	The LTP is the Council's 10-year planning document. It sets out the broad strategic direction and priorities for the long term development of the District; identifies the desired community outcomes; describes the activities the Council will undertake to support those outcomes; and outlines the

	means of measuring progress.
Activity Management Plan (AMP)	AMPs describe the infrastructural assets and the activities undertaken by the Council and outline the financial, management and technical practices to ensure the assets are maintained and developed to meet the requirements of the community over the long term. AMPs focus on the service that is delivered as well as the planned maintenance and replacement of physical assets.
Annual Plan	A detailed action plan on the Council's projects and finances for each financial year. The works identified in the AMP form the basis on which annual plans are prepared. With the adoption of the LTP, the Annual Plan mainly updates the budget and sources of funding for the year.
Financial and Business Plans	The financial and business plans requirement by the Local Government Amendment Act. The expenditure projections will be taken directly from the financial forecasts in the AMP.
Contracts and agreements	The service levels, strategies and information requirements contained in the AMP are the basis for performance standards in the current Maintenance and Professional Service Contracts for commercial arrangements and in less formal "agreements" for community or voluntary groups.
Operational plans	Operating and maintenance guidelines to ensure that the asset operates reliably and is maintained in a condition that will maximise useful service life of assets within the network.
Corporate information	Quality asset management is dependent on suitable information and data and the availability of sophisticated asset management systems which are fully integrated with the wider corporate information systems (eg. financial, property, GIS, customer service, etc). The Council's goal is to work towards such a fully integrated system.

A.4.1. Our Goal

We aim to provide and maintain water supply systems to communities in a manner that meets the levels of service.

APPENDIX AA – IMPLICATIONS OF A NO DAM SCENARIO

AA.1 Introduction

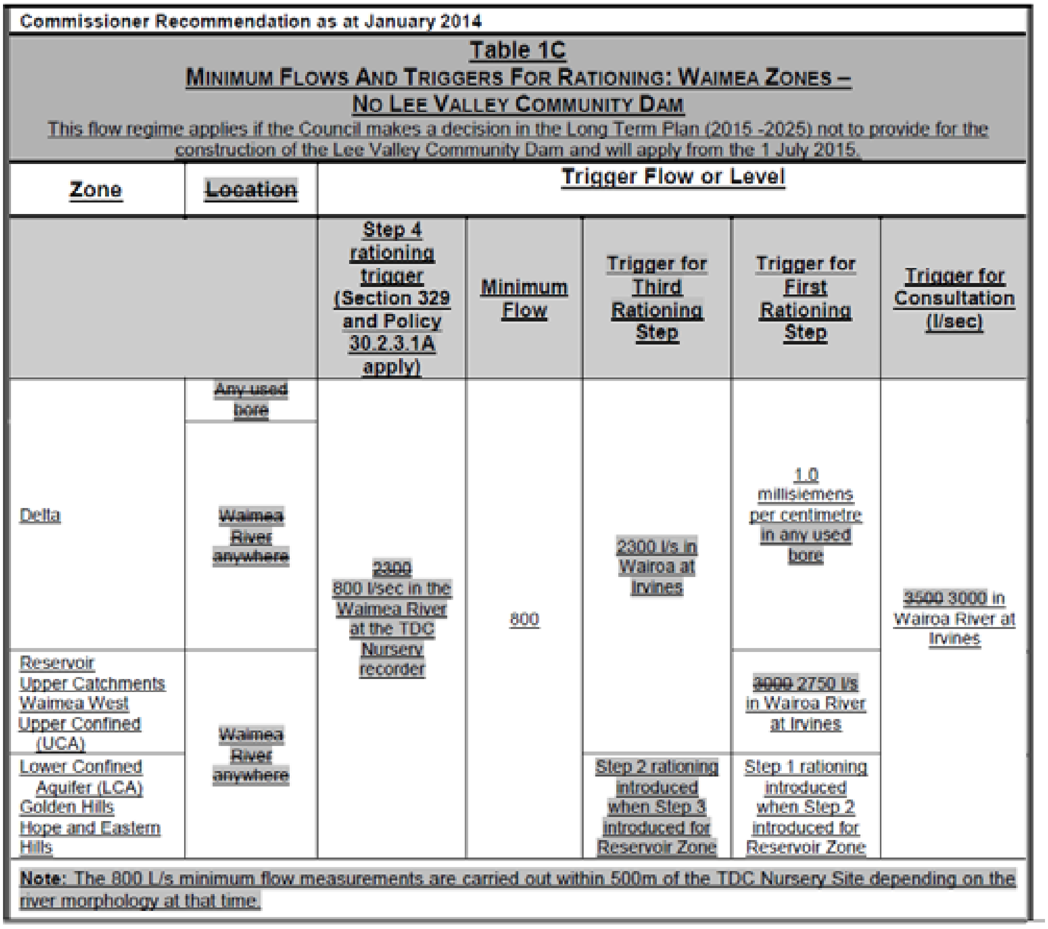
There is insufficient water on the Waimea plains during dry summers to supply the reasonable needs of urban users due to over-extraction from the rivers and groundwater. Provision of the Waimea Community Dam has been proposed to solve this problem for up to 100 years. However this project is not guaranteed and the Council needs to look for other options to supply urban water if the dam does not proceed.

Provision for the urban supply component of the dam is included in the Water AMP at a cost of approximately $9 million. This figure will be sufficient to fund an alternative water source for the needs of Richmond, Brightwater, Hope and Mapua and the Waimea area within Nelson City.

A.1.1. Why is it a problem?

During dry summers the water take consents issued under the TRMP require staged reduction in water use based on the flow in the Wairoa and Waimea Rivers. These restrictions also apply to the urban areas and this reduces the allowable take to below this desired level for the community. This will have the dual impacts of causing water restrictions to be enforced almost every year and limiting growth.

AA.2 Summary of the relevant TRMP Rules

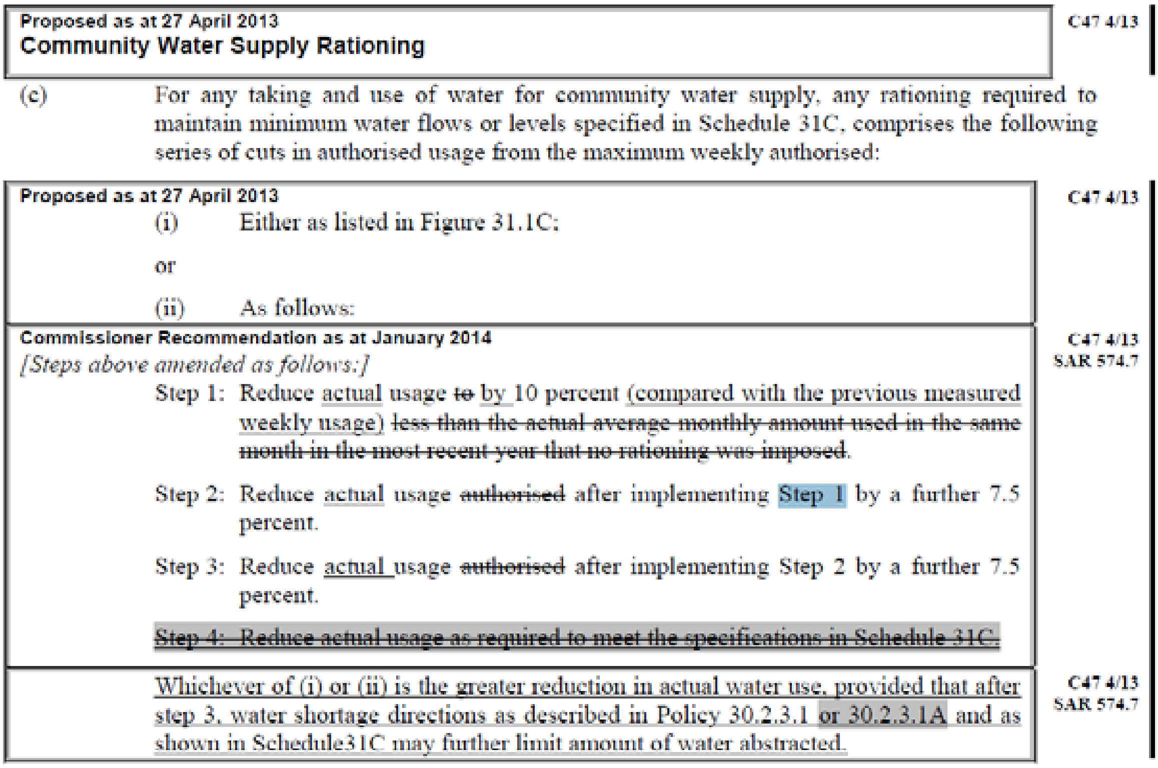


Commissioner Recommendation as at January 2014

Table 1C
MINIMUM FLOWS AND TRIGGERS FOR RATIONING: WAIMEA ZONES –
NO LEE VALLEY COMMUNITY DAM
This flow regime applies if the Council makes a decision in the Long Term Plan (2015 -2025) not to provide for the construction of the Lee Valley Community Dam and will apply from the 1 July 2015.

Zone	~~**Location**~~	**Trigger Flow or Level**				
		Step 4 rationing trigger (Section 329 and Policy 30.2.3.1A apply)	**Minimum Flow**	**Trigger for Third Rationing Step**	**Trigger for First Rationing Step**	**Trigger for Consultation (l/sec)**
Delta	~~Any used bore~~	~~2300~~ 800 l/sec in the Waimea River at the TDC Nursery recorder	800	2300 l/s in Wairoa at Irvines	1.0 millisiemens per centimetre in any used bore	~~3500~~ 3000 in Wairoa River at Irvines
	~~Waimea River anywhere~~					
Reservoir Upper Catchments Waimea West Upper Confined (UCA)	~~Waimea River anywhere~~				~~3000~~ 2750 l/s in Wairoa River at Irvines	
Lower Confined Aquifer (LCA) Golden Hills Hope and Eastern Hills				Step 2 rationing introduced when Step 3 introduced for Reservoir Zone	Step 1 rationing introduced when Step 2 introduced for Reservoir Zone	

Note: The 800 L/s minimum flow measurements are carried out within 500m of the TDC Nursery Site depending on the river morphology at that time.



Proposed as at 27 April 2013

Community Water Supply Rationing

C47 4/13

(c) For any taking and use of water for community water supply, any rationing required to maintain minimum water flows or levels specified in Schedule 31C, comprises the following series of cuts in authorised usage from the maximum weekly authorised:

Proposed as at 27 April 2013

C47 4/13

(i) Either as listed in Figure 31.1C;

or

(ii) As follows:

Commissioner Recommendation as at January 2014

C47 4/13
SAR 574.7

[Steps above amended as follows:]

Step 1: Reduce actual usage ~~to~~ by 10 percent (compared with the previous measured weekly usage) ~~less than the actual average monthly amount used in the same month in the most recent year that no rationing was imposed~~.

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

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

~~Step 4: Reduce actual usage as required to meet the specifications in Schedule 31C.~~

Whichever of (i) or (ii) is the greater reduction in actual water use, provided that after step 3, water shortage directions as described in Policy 30.2.3.1 or 30.2.3.1A and as shown in Schedule31C may further limit amount of water abstracted.

C47 4/13
SAR 574.7

Based on current rainfall and usage these rules will mean that urban areas will be subject to Step 3 water rationing of 25% in most years.

To avoid this the current needs are approximately 3300m^3/day which translates to approximately 500,000m^3 of water storage including losses.

A.1.2. Principal options to respond to these issues

The Council has undertaken a high level investigation of 13 principle options with 33 sub-options to supply the estimated current needs of the urban areas to avoid annual restrictions. From this a short listing exercise was undertaken and the following principal (1) and alternative options:

MWH report due 18th February

APPENDIX B OVERVIEW OF THE ASSETS

B.1 Introduction

Throughout the district there are three categories of water supply; Urban Supply, Rural Supply and Community Supply.

The 10 urban water supplies in the Tasman district are:

- Richmond
- Mapua / Ruby Bay
- Wakefield
- Brightwater/Hope
- Kaiteriteri
- Tapawera
- Murchison
- Upper Takaka
- Collingwood
- Pohara Valley.

The rural water supplies include:

- 88 Valley
- Dovedale
- Redwood Valley.

Rural water supplies are low flow schemes serving rural areas. Each property on the scheme draws water through a restrictor into their privately owned tank. The restrictor limits the flow to a trickle feed equal to their allocation over 24 hours. The tank provides a balancing volume for the properties domestic and, at times, stock demands.

Because the scheme is restricted, there is no peak flow to cater for. Therefore, the systems have typically small diameter pipelines that travel long distances and often cross-country. They do not provide fire fighting capability.

There is currently an embargo on any new connections to the rural water supply schemes and a waiting list is in place for future connections.

The community schemes include:

- Motueka
- Hamama.

The community schemes are on-demand schemes (ie. not restricted) that receive a very similar level of service to the urban water supplies (refer to Appendix B2). The main difference between the urban and the community schemes is that connection is voluntary in the community schemes. In the urban schemes, all properties within the water supply area have to pay a daily water charge irrespective of whether water is being used.

B.1.1. Impact of Health (Drinking Water) Amendment Act 2007

The Health (Drinking Water) Amendment Act 2007 (HDWAA) came into effect 1 July 2008. This means that compliance with drinking water standards is a legal requirement for Council. The relevant standard that Council intends to comply with is the Drinking Water Standards for New Zealand (DWSNZ) 2005 (revised 2008). Significant treatment upgrades are therefore required for supplies that are not from secure groundwater sources. Similarly, a higher level of water quality monitoring will be required.

It is a requirement to complete a Water Safety Plan (WSP)[1] ,for each water supply scheme. The timeframes for completing the WSPs is shown in Appendix F. Council must take all practicable steps to ensure that a WSP is approved within 12 months of the date specified. Council shall start to implement a WSP within a month of its approval.

Provisions have been made in the financial forecasting to upgrade all treatment plants not currently complying with the DWSNZ. However, some of these upgrades may not meet the timeframes due to monitoring, investigations required or new sources to be identified and developed. In these cases Council may be able to negotiate timeframes with the Ministry of Health (MoH) by demonstrating they are taking “all practical steps” to comply.

B.1.2. Levels of Service

A detailed summary of Council’s performance against the current levels of service (LoS) is included in Appendix R. Throughout this Appendix, the performance of each water scheme against the key level of service is summarised.

The key level of service for each water scheme has been identified as follows:

- LoS 2 – water demand management plans are in place for each water scheme
- LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ
- LoS 8 – WSPs are in place, approved and being implemented for each water supply
- LoS 9 – urban water supplies meet fire fighting standards – not applicable to rural and community supplies
- LoS 13 – hydraulic models are in place for key urban water supplies
- LoS 17 – water supply systems have the necessary storage not applicable to community supplies.

B.1.3. General Data Sources

Note that wherever DWSNZ is noted in the text, the Drinking Water Standards, NZ 2005 (revised 2008) are referred to.

P1 refers to Priority 1 determinands, whose presence can lead to major and rapid illness outbreak, such as *E.coli.*

P2 refers to Priority 2 determinands which are of public health significance. In this section, P2 refers to nitrate and lead only.

September 2014 data from the Confirm database has been used to populate the Register of Assets.

The following data sources have been used to calculate/collate the data in sections B2- B3.3:

- December 2014 restrictor check register (provided by maintenance contractor, Downer NZ Ltd (Downer).
- June 2014 metered water billing figures are used.
- WINZ database maintained by TDC.
- WSP status as of December 2014.
- Water abstraction data (from meters at treatment plants) is from July 2013 to June 2014.
- To calculate unmetered water use by restricted connections, 80% of daily allocation is assumed.
- The current population rate used to determine population density is 2.4 people per property.

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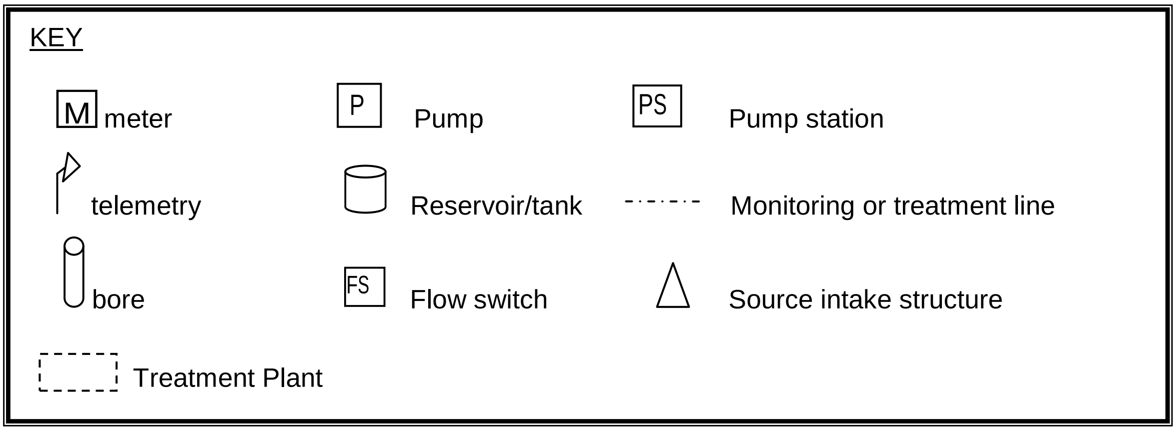
[1] Previously known as a Public Health Risk Management Plan (PHRMP).

- Annual average demand calculated from the operations and maintenance contractor weekly reading data is determined as being from about December 2013 to about December 2014 for most schemes. Approximately 365 days of consecutive data is used where possible.
- Average summer demand calculated from the operations and maintenance contractor weekly reading data is determined as being from the beginning of October 2013 to the end of March 2014.
- Average winter demand calculated from the operations and maintenance contractor weekly reading data is determined as being from beginning of April 2014 to the end of September 2014.
- Peak demand figures for each system are calculated from the seven day average of what has been determined as the point of highest demand during a particular year (2013 to 2014).

Each site has a schematic at the end of each section to show the basic processes of treatment, monitoring and reticulation. The key below details the figures used in these diagrams.



B.2 Urban Water Supplies

B.2.1. Richmond Water Supply (incorporating Stoke Residential and Industrial)

B.2.1.1 System Description

Richmond township is Tasman District Council's largest urban area with a population of approximately 11,500 people. The Richmond water scheme supplies approximately 8ML per day. The area has experienced significant growth rates, both in residential and commercial development over recent years. This in part has led to an issue with available water quantity and summer time restrictions.

A new water treatment plant was commissioned in 2015 and now sources water from bores that were previously listed under the Waimea System. The new combined system for Richmond/Stoke supply serves a mix of urban and rural lifestyle/agricultural properties. There are 4,614 metered connections (June 2014) and 48 restricted rural connections (May 2014).

Previously the Waimea Water Scheme supplied water to two main zones:

- Waimea Industrial Zone (Queen Street, Main Road Stoke, Saxton Road and Nayland Road)
- Mapua/Ruby Bay urban and rural zone including Best Island and Rabbit Island (see Section B2.2).

The source water for the Richmond water supply comes from several sources:

- four Lower Queen Street bores
- one Appleby bore
- five bore from the Delta Zone Appleby Aquifer (ex Waimea scheme)
- Roding Dam supply (Nelson City Council), up to 909 but usually only 10 m^3 per day.
- two emergency bores located near the Waimea River which can supply the Richmond zone in an emergency after treatment at the Waimea Water Treatment Plant.

Richmond System History

The original water supply scheme in Richmond operated from the beginning of the 20th century supplied by a small dam at the head of Reservoir Creek. In the early 1940s the Roding Dam water supply scheme was constructed to augment supplies in the growing district. The Reservoir Creek supply no longer operates, but the Roding Dam, now owned and operated by Nelson City Council, still supplies $10m^3$ per day to Richmond. The agreement provides for $909m^3$ per day, but due to the high cost of the water, Tasman District Council only take $10m^3$ to maintain the water right and prevent stagnation of the water within the connection pipeline. However this can be an emergency supply of water.

In the early 1970's a new scheme was constructed to further augment supplies which included four wells in Lower Queen Street and a supplementary well at Appleby, all approximately 30m deep. There are two main reservoirs at the upper end of Queen Street.

Waimea System History

The Waimea water supply was constructed in 1976 to supply the freezing works and NZ Apple and Pear Board cannery in Nayland Road, Stoke, and later the Nelson Pine Industries plant in Lower Queen Street.

The Waimea water supply is obtained from groundwater from five operational bores and two emergency bores close to the Waimea River. The bores are all located on the true right hand side of the river with the five operational bores are on the river side of the stopbank. Water is abstracted from the Delta Zone of the Appleby Aquifer. These bores are considered unsecure as they are shallow (less than 10m deep).

Originally there were nine wells in the system, but four have been decommissioned as a result of saline intrusion into the groundwater of the Waimea River and delta zone. The two additional bores for emergency use were commissioned in 2006 but have never been used.

The Richmond Scheme and Waimea Scheme are due to be mixed at a new treatment plant as of 2015. The raw water will be mixed and treated with UV and caustic soda at a new plant on the corner of McShane Road and Lower Queen Street. The reticulation will remain the same, with two sets of high left pumps supplying water to two separate zones – 'Waimea and Richmond.'

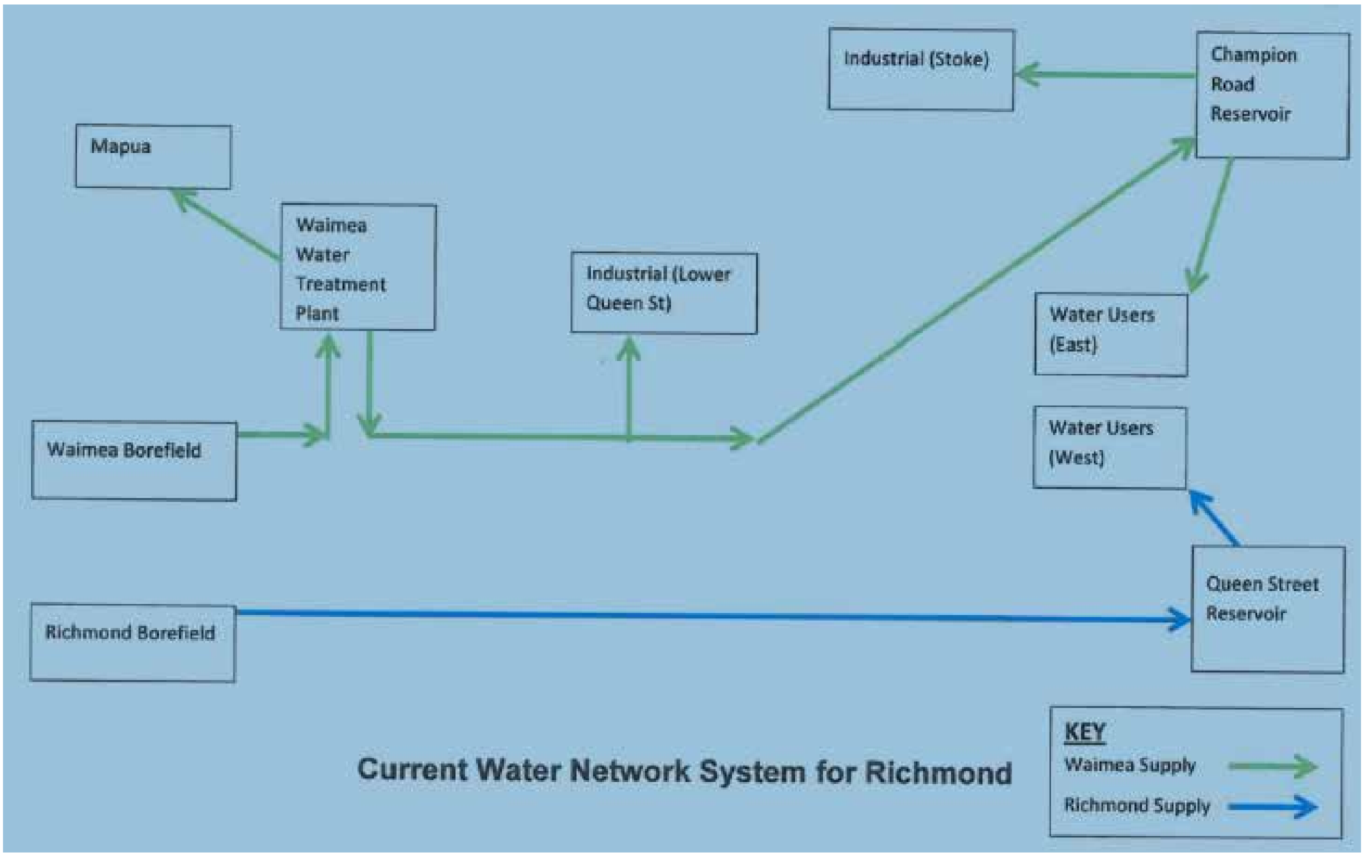


Figure B.2-1 Historical arrangement of Waimea and Richmond Water Supplies

B.2.1.2 System Operation Overview

The groundwater drawn from the four wells at Lower Queen Street is from the Lower Confined Aquifer (LCA). The aquifer is considered secure (although not yet approved by the MoH) and the water is pumped directly into the public supply with no treatment. The untreated groundwater is pumped directly into an area of reticulation known as the 'low pressure zone' (which includes the low lying areas of Richmond) and also to the lower of the two Queen Street reservoir sites.

From the lower Queen Street reservoir, water is pumped up the hill to a second reservoir site which supplies the 'high pressure zone' (above Wensley Road and Hill Street). Cropp Place and Valhalla Drive are both supplied by booster pumps with storage tanks at the top end of the zones. Rural connections in Hill St South and Haycock Road are supplied from a booster pump and storage tank on the corner of Hill Street and Hart Road, and a storage tank at Faraday Rise.

The water level in the upper of the two Queen Street reservoirs controls the operation of the pumps. A control building with electrical control circuitry exists in Lower Queen Street adjacent to the well field.

The Appleby well pump and the Roding water supply operate continuously. The Appleby well pump supplies a continuous flow of just under 10l/s. This will be abandoned when the new treatment plant is operational.

To minimise the possibility of reservoir overflow (which can happen if the Appleby supply exceeds demand) the Queen Street well pumps turn off when the reservoir is 1m below top water level.

There is a small booster pump and tank at Aniseed Valley Road.

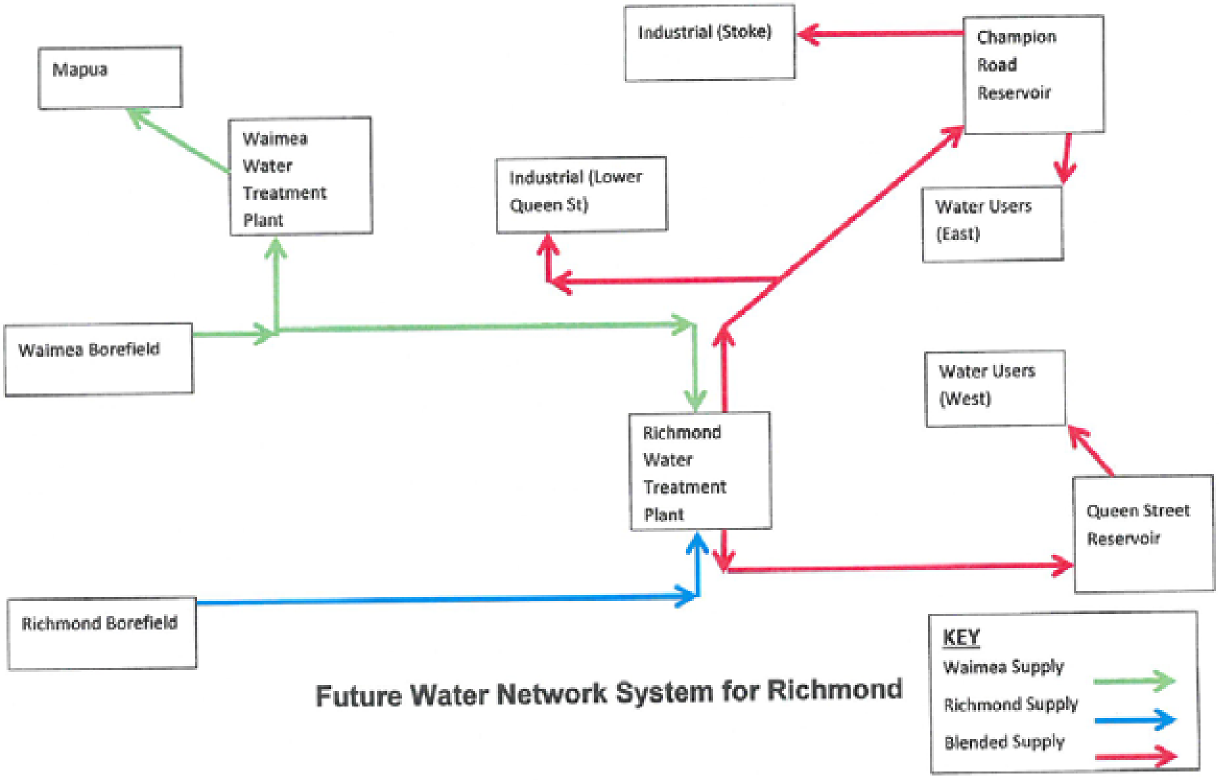


Figure B.2-2 New arrangement of Waimea and Richmond Water Supplies

Further schematic drawings of the scheme and a treatment plant plan is included at the end of this section.

B.2.1.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms section of networks identified from the Vulnerability Assessment as critical are:

- Richmond Network – at extreme risk to earthquake during and immediately after the event.
- Richmond Wells – at risk to flooding and/or inundation.
- Waimea Wells – at risk to flooding and/or inundation

B.2.1.4 Compliance with Levels of Service

LoS 2 – water demand management plans are in place for each water scheme.

- A demand management plan is in place for Richmond.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been three P1 (bacterial) non compliances in the last five years in the zone and one at the Appleby bore. There have been 19 P2 non compliances in the Richmond zone in the past five years due to high levels of nitrate.
- There have been no non-compliances for Waimea in the last five years.

LoS 8 – WSPs are in place, approved and being implemented for each water supply.

- Richmond has an approved WSP.

LoS 9 – urban water supplies meet fire fighting standards.

- The vast majority of urban Richmond complies, with the exception of Lower Queen Street, Appleby Highway, Hebberd Place, Gilbert Street, Warren Kelly Street, Sutton Street, Hill Plough Heights, Cropp Place and Appaloosa Avenue. Some hydrants in Hill Street North and Champion Road are near the reservoir.

LoS 13 – hydraulic models are in place for key urban water supplies.

- Richmond has a hydraulic model.

LoS 17– water supply systems have the necessary storage.

- Richmond has sufficient storage.

B.2.1.5 Asset Condition Overview

The system comprises:

- five bores and pumps (normal operation);
- two emergency bores and pumps;
- four high lift pumps;
- five booster pump stations (Cropp Place pump station, Valhalla Drive booster pump station, Hill Street South pump station, Queen Street reservoir booster pump station and Aniseed Valley pump station);
- High Level Pressure Zone;
- Low Level Pressure Zone;
- High Level Reservoir;
- Low Level Reservoir;
- Champion Road main reservoir and pump station;
- Champion Road high level reservoir and booster pump station;
- three micro-zone reservoirs.

The condition of most of the pipework in the system is average. There are areas of pipe which are causing problems and many of the copper laterals and old AC pipes are coming to the end of their life. There have been 14 breaks in AC mains during the past year, six in Fauchelle Avenue, two in Appleby Highway near Three Brothers Corner, and one each in Beach Road, Gladstone Road, Florence Street, Church Street, Talbot Street and Hill Street.

Some old mains and rider mains require renewal. Most pipe repairs are on old PE pipes (rider mains and service laterals and larger AC pipes from the 1960s). Many of the original PE rider mains have been renewed through the process of breakage and repair.

The previous Waimea scheme assets are generally in good condition. The condition of most of the reticulation is good, however the pH of the water is low and considered ‘aggressive’. This results in copper laterals leaking and needing replacement. This could be improved by upgrading the lime dosing system at the treatment plant. To improve security of the supply the well heads were protected from stock access in 2012. An electrical upgrade and a digital telemetry upgrade were completed in 2010. Due to a power spike at the treatment plant in 2010 (which severely damaged electrical equipment) all of the water quality monitoring equipment and some of the pump variable speed drives (VSDs) were replaced in the second half of 2010.

The construction of a new treatment plant for the blending and treatment of water from both the Waimea and Richmond sources has been identified as a strategic approach to managing issues with these water sources. Specifically, the mixing of water sources will dilute the high nitrate levels in the Richmond source and reduce the corrosiveness of the Waimea source.

B.2.1.6 Water Quality and DWSNZ Compliance

Required sampling - Richmond supplies approximately 11,200 people, making it a ‘large’ supply (>10,000 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and the distribution zone to be sampled for *E.coli* and nitrate. As the bores have not yet officially been classed as secure, monitoring compliance ‘Criterion 1’ should be used at the treatment plant which would require the plant water to be sampled every day. As the bore abstracts water from a confined aquifer (which has been aged), the monitoring criteria that is instead used is ‘secure groundwater’. This requires monitoring once a month.

Monitoring in the zone is carried out using ‘Criterion 6A’ (in compliance with the DWSNZ), which requires monitoring approximately three times a fortnight. Nitrate is monitored in the zone three times per quarter.

The treatment plants are located at the Appleby bore site and also at a site known as 'Cargill's Corner' which is downstream of the four Queen Street bores. Both of these sites have online turbidity, pH and UVT analysers which are connected to telemetry.

Historical results - Between June 2006 and June 2011, 764 samples were taken from the zone. Three of these were transgressions; however none of the follow up samples revealed any contamination. Seventy one samples were taken from the Appleby plant, one of which was a transgression. Seventy six samples were taken from Cargill's Corner, with no transgressions.

Ninety one samples were analysed for nitrate in the zone. Eighty three of these were above the maximum acceptable value (MAV). This issue will be resolved on completion of the proposed Richmond Water Treatment Plant.

B.2.1.7 Resource Consents

There is two resource consent in place for the abstraction of groundwater at both sites.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Richmond	GW	Four bores at Lower Queen Street. One bore at Appleby.	NN960432	01/09/1998	31/05/2016
Waimea	GW	Five bores and two emergency bores close to Waimea River.	RM110192	15/07/2011	31/05/2017

B.2.1.8 Current and Future Demands

The current demand for Richmond is met by the Richmond supply, but water restrictions have been imposed to some degree most summers. There is the opportunity to provide emergency supply from the Richmond scheme to Brightwater.

The Waimea Basin is short of water, this is due to over allocated water takes, insufficient water for environmental needs and water rationing.

The current demand and projected demand is summarised in the Table B-1 below.

Table B-1: Current Demand of Richmond Water Supply

Source	Resource Consent Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Average Annual Demand (m^3/d)	Maximum Daily Demand (m^3/d)
Appleby Well	7,273 Combined	901	911	911	5,737 Combined
Lower Queen Street Wells		3,772	2,662	3,096	
Nelson supply	909	10	10	10	10
Waimea	15,400	3,496	2,922	3,076	4,025

It is anticipated that in 2029 the demand in the township of Richmond is as follows:

- Average Day Demand – 8,769m^3/day.
- Peak Day Demand – 17,539m^3/day.

To manage the growing demand in the township of Richmond, Council are taking the following key measures:

- a new treatment plant where Richmond and Waimea supply are blended together and distributed across the whole town;
- potentially sourcing water from the proposed Waimea Dam;
- new water source to be used in addition to existing sources. A potential new water source has been located further inland, but would be dependent on the Waimea Community Dam;
- demand management measures - refer to Appendix N for more detail;

- upgrading and extending the network.

B.2.1.9 Strategic Studies

Various strategic studies have been undertaken to date for the Richmond water supply system. These can provide reference and background information for developing the strategic approaches to take in the future.

- Richmond Water Supply Network Model – 2011.
- Richmond and Brightwater/Hope Water Demand Management Plan – August 2010.
- Richmond Water Safety Plan – June 2010.
- Water Demand Management Plan for the Tasman District – September 2011.
- Mapua/Ruby Bay and Waimea Industrial Zone Water Safety Plan – February 2011.

B.2.1.10 Strategic Approach

For the strategic approach for the Waimea zone refer to section B.2.1.10.

B.2.1.11 Strategic Approach

The key issues for the township of Richmond are:

- The Richmond source is used to capacity at peak times while the Waimea source is only used to about two thirds of its capacity at peak times;
- Overall the Council has sufficient water allocation for Richmond, however, with projected growth, the water rationing that occurs during droughts and the increasing competition for water in the district, it is becoming more difficult to source the water;
- Significant growth is predicted for Richmond, particularly in the south and the east, and it will be expensive for Council to install water supply infrastructure to service these new areas;
- Sea level rises and saline intrusion pose a threat to the security and quality of the Lower Queen Street and Waimea bores. Once these issues are detected, the ability to supply water to Richmond will be severely constrained;
- There is a lack of storage in the high-level zone;
- The Waimea Community Dam scheme is critical for the future of the Council’s urban water supplies in the Waimea Basin;
- The resource consent will expire in 2016;
- Securing land for future reservoir sites may be difficult;
- Potentially there is a high cost for future infrastructure growth.

The strategic approaches to these issues are.

- Construct a new treatment plant to mix and treat water from both the Waimea source and Richmond source, (diluting the nitrates from one source and the corrosiveness from the other);
- Construct a supplementary or new source capable of providing sufficient output should the bores on Lower Queen Street or the Waimea bores be compromised due to saline intrusion. This development is dependent on the construction of the Waimea Community Dam;
- Amend the reticulation boundaries within Richmond to maximise the use of the reticulation capacity to meet future growth.
- Construct infrastructure to service the growth predicted firstly for Richmond East, then Richmond West and then Richmond South;
- Determine order of development, such as infill on existing zone land up to Bateup Road, Richmond West and Richmond South;
- Renegotiate water supply with Nelson City Council in areas such as Champion Road.

Table B-2: Register of Assets for Richmond Water Supply Scheme

Scheme	Source	Pumps And Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
URBAN									
Richmond	4 Bores - Lower Queen Street 1 Bore - Appleby (combined water permit = 7273m^3/day) Roding Dam Water permit = 909m^3/day	Headworks Appleby Well – Pleuger 20 hp PN63/16 Queen Street Well No 1– no pump, only flow meter Queen Street Well No 2 – Gould 8N-120-5 45 kW Queen Street Well No 3 – Gould 8N-120-5 45 kW Queen Street Well No 4 – EMU DCH 48-VII Queen Street Well No 5 – Pleuger PN83-4 30 kW Queen Street Main Reservoir Queen Street High Level No 1 – IEL VRD ¾ 55kW Queen Street High Level No 2 – Nimbus 125/100/250 45 kW Pump Stations Cropp Place PS: Pump 1 - Grundfos – CR4-80 1.5 kW, Pump 2 – details not shown in database Valhalla PS: Pump 1- Lowara SV3006F110 11kW, Pump 2 - Grundfos CR30-8/7 11 kW Hill Street South PS: 2x Lowara SV805 2.2 kW, 801 2.2 kW	New Treatment Plant 2015	Queen Street Main Reservoir 2250m^3 Valhalla Lane Reservoir: Tank 1 : 450m^3 Tank 2 : 700m^3 Cropp Place Pump Station:9m^3 Valhalla Drive Reservoir Storage Tanks: 92m^3 Faraday Rise Reservoir: 23m^3 Aniseed Hill Reservoir: 25m^3 Crop Place Lower Reservoir 4.6m^3 Aniseed High Level Reservoir: 25m^3 Champion Road High Level Reservoir 23m3 Champion Road Main Reservoir 5,700m3	**Water Mains:**	10mm 12mm 15mm 20mm 25mm 32mm 38mm 40mm 50mm 75mm 80mm 100mm 150mm 200mm 225mm 250mm 300mm 375mm 450mm **Total**	40m 1,634m 7,297m 4,398m 10,154m 639m 211m 5,877m 16,555m 1,518m 87m 30,595m 37,227m 1,044m 83m 491m 3,543m 5,848m 4,088m **131,332m**	Fire Hydrants Valves Metered Connections	611 1257 5414

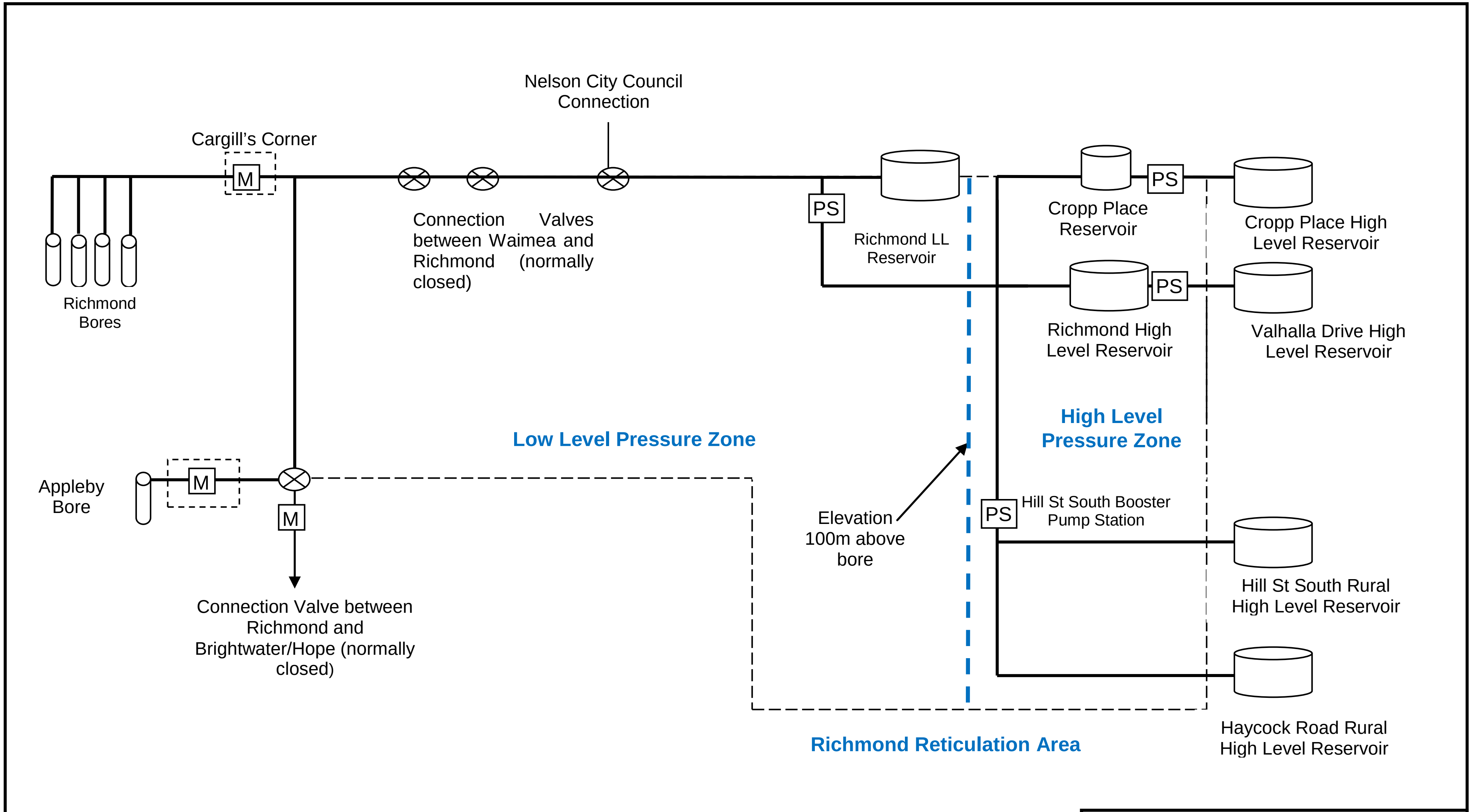
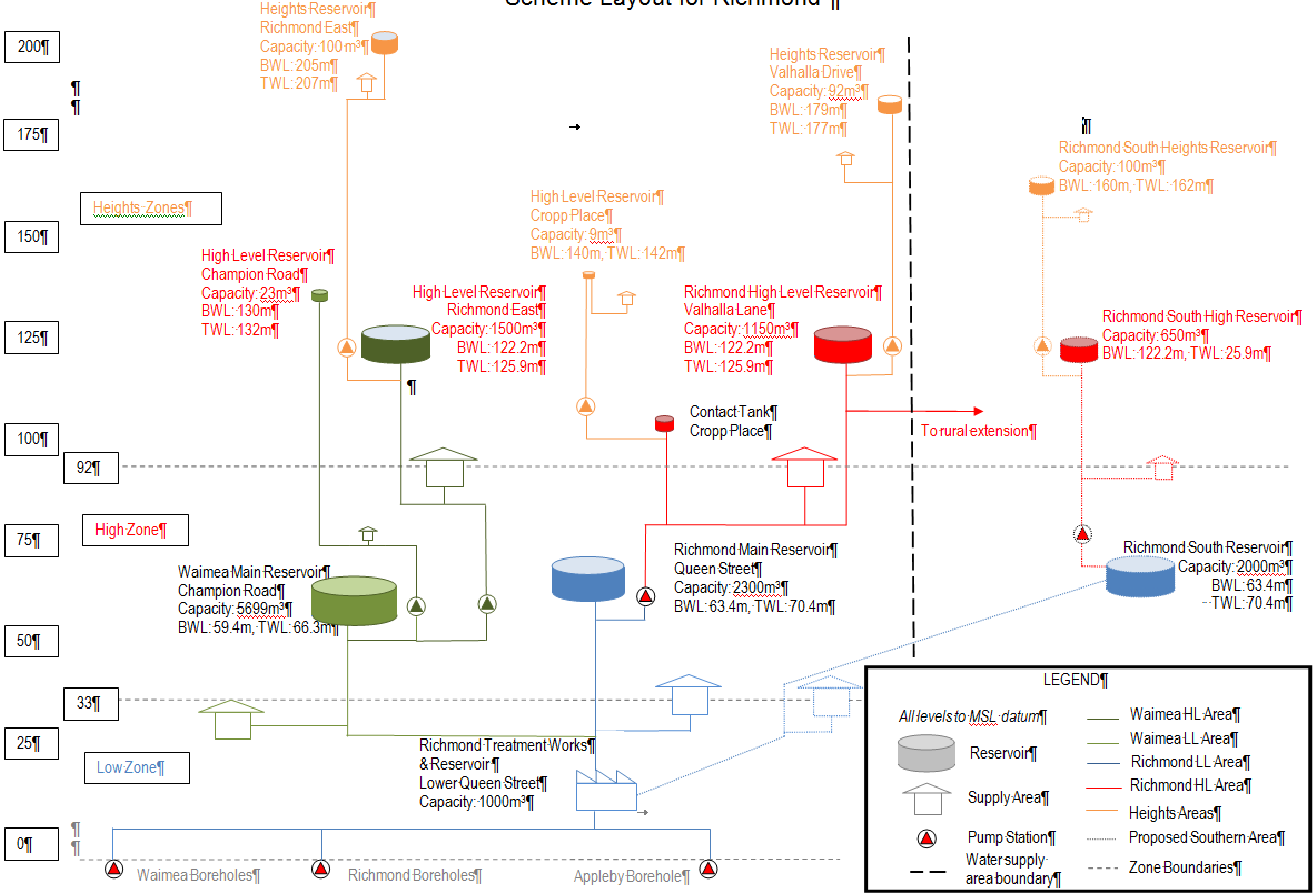


Figure B-1: Richmond Water Scheme Schematic

Scheme Layout for Richmond



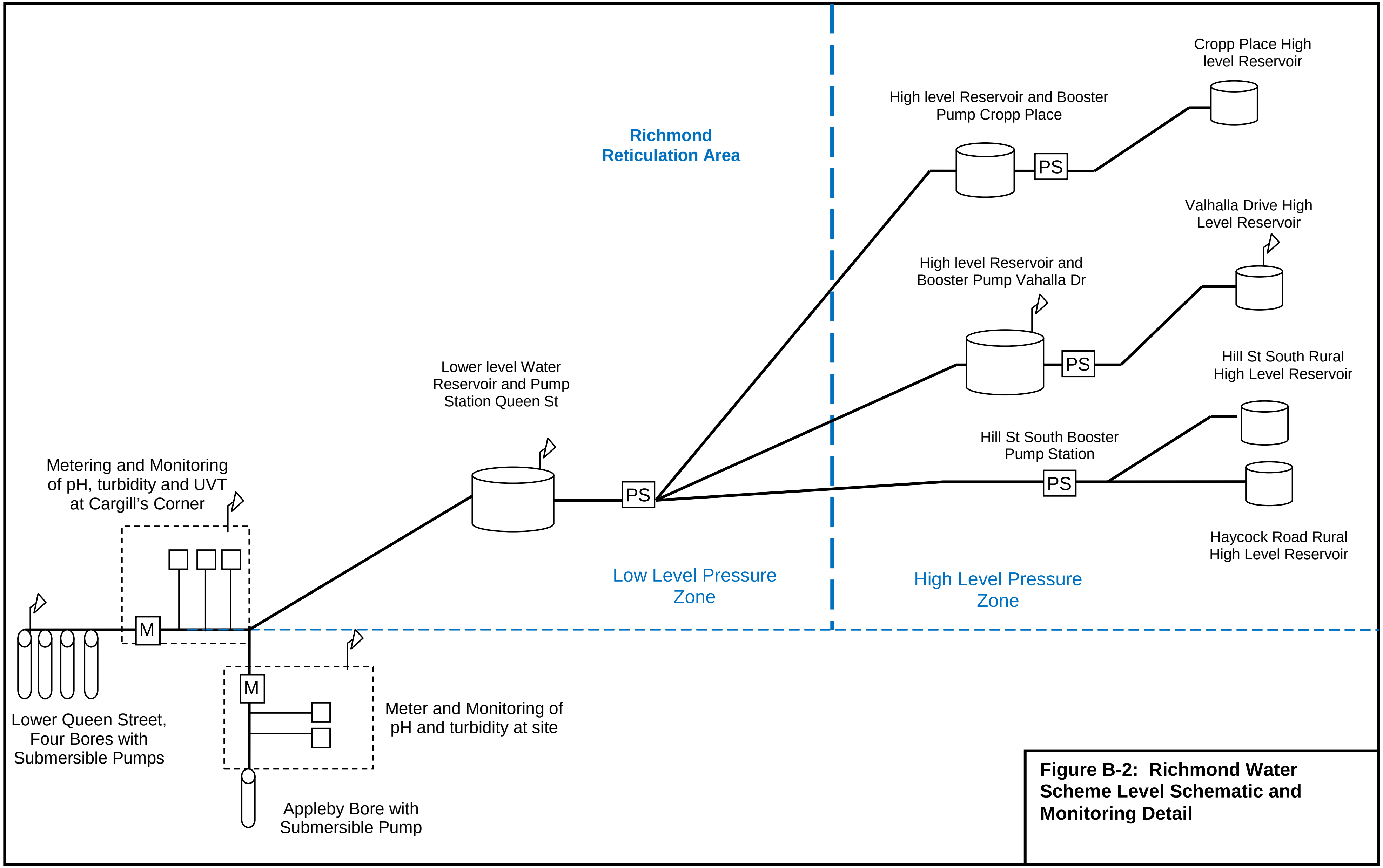


Figure B-2: Richmond Water Scheme Level Schematic and Monitoring Detail

B.2.2. Mapua/Ruby Bay Water Supply

B.2.2.1 System Description

The Mapua/Ruby Bay zone was part of the previous Waimea Water Supply but with the construction of the new water treatment plant in Richmond, the scheme have been re-configured as discussed in B2.1. Two dedicated high lift pumps at the treatment plant in Lower Queen Street extract water from the contact tank and pump it to the Pomona Road reservoirs in Ruby Bay.

The Mapua/Ruby Bay zone serves a mix of urban and rural properties with some commercial use connections. There are 720 metered connections (June 2014) and 230 restricted rural connections (May 2014), a total estimated population of approximately 2,300. This population needs to be updated in the WINZ register, which currently has a registered population of 1,500 however it will not alter the sampling required.

The Mapua/Ruby Bay zone covers the golf course on Best Island, Bell Island wastewater treatment plant, public facilities at Rabbit Island, and the urban area of Mapua and Ruby Bay. In Mapua there is a rural extension to areas of Old Coach Road, Marriages Road, Seaton Valley Road, Ruby Bay Bluff and Permins Road areas.

The system has three main supply zones, namely.

- The lower areas between the Pomona Road reservoir and the Waimea pump station. This zone has a mixture of metered connections and rural restrictors.
- The high level serviced by the Pine Hill Heights booster pumps.
- The high level and rural extensions supplied from the Pomona Road booster pump and the Old Coach Road reservoir.

B.2.2.2 System Operation Overview

In 1990, when the Mapua/Ruby Bay water supply was added to the Waimea scheme it was done so via a connection off the Waimea Industrial Zone main at the Lower Queen Street pump house. This zone is now supplied using two dedicated pumps. In 2005 a new booster pump station was installed at Mapua Wharf to increase trunk main flow and enable the reservoirs at Pomona Road to fill more quickly. Groundwater is treated at the Waimea Treatment Plant (WTP) by chlorination and lime addition.

Pine Hill Heights is supplied via a booster pump off the Mapua trunk main that pumps to a 90m³ reservoir at the top of the subdivision. At the reservoir site a pair of booster pumps operate on a VSD to maintain supply pressure.

The Marriages Road rural extension is supplied via a booster pump off the Pomona Road reservoir that pumps to a reservoir in Old Coach Road. This pump station will operate automatically to maintain reservoir storage. This reservoir is expected to provide one day’s average supply for present and future demand to the year 2025 and beyond, when little growth is expected.

A new reservoir is under construction above champion road to replace a small tank which supplies a high level area.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.2.2.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2012 confirms sections of networks identified from the Vulnerability Assessment as critical are:

- Waimea wells – at risk to flooding and/or inundation
- Waimea WTP – at risk to flooding and/or inundation.

B.2.2.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- A demand management plan is in place for Mapua/Ruby Bay.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been no non-compliances for Waimea in the last five years.
- There have been no non-compliances for Mapua/Ruby Bay in the last five years.

LoS 8 – WSPs are in place, approved and being implemented for each water supply.

- Waimea has an approved WSP.

LoS 9 – Urban water supplies meet fire fighting standards.

- The vast majority of Mapua/Ruby Bay meets the fire fighting standard except for areas around Brabant Drive.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Mapua/Ruby Bay has a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Waimea has sufficient storage.
- Mapua/Ruby Bay has sufficient storage in most cases but is vulnerable to loosing supply due to breaks and the impacts of summer flows and growth. Therefore construction of more storage is programmed..

B.2.2.5 Asset Condition Overview

The reticulation is in average condition. There are areas of poor quality, fragile pipeline in Mapua. A section of trunk main from the treatment plant to the Pomona Road corner has burst a number of times since its construction. The first kilometre section of this main has been replaced.

Daily consumption has remained at an acceptable level since the leak detection survey and repairs in November 2009.

There have been four breakages of the 200mm trunk main, two on Stafford Drive, one on Aranui Road outside the supermarket, and one at Best Island. The pipeline between Best Island and Rabbit Island was replaced in 2006.

To resolve the issue of gravel in the reticulation, a scour was installed in the trunk main at the west end of Rabbit Island in July 2000. Regular flushing has removed a considerable quantity of gravel with the quantity reducing to just a handful each month.

See Section Figure B-4 for further detail of the Waimea treatment plant.

Required sampling - Mapua/Ruby Bay supplies approximately 2,300 people, making it a ‘minor’ supply (between 500 and 5,000 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are ‘Criteria 2B’ for plant samples and ‘Criteria 6A’ for the distribution. These require as a minimum, the following sampling to be carried out in the zone:

- 13 samples per quarter
- a maximum of 11 (zone) and 13 (plant) days between samples
- five different days of the week used.

Chlorine, turbidity and pH measurements are also taken when bacteriological samples are taken.

Lead is a P2 determinand in the zone and is monitored in the reticulation three times per quarter.

Historical results - Between July 2006 and June 2011, 265 *E.coli* samples were taken from the zone. None of these samples have shown a transgression. The lead sampling results are usually at or below the limit of detection. This P2 can probably be removed from this zone if the appropriate testing is undertaken.

B.2.2.6 Resource Consents

There is resource consent in place for the abstraction of groundwater..

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Waimea	GW	Five bores and two emergency bores close to Waimea River.	RM110192	31/05/2011	31/5/2017

There is resource consent in place for the disturbance and occupation of the coastal marine area to install a duplicate pipeline across two channels within the Waimea Inlet.

Scheme	Consent type	Consent No.	Date Granted	Date Expiry
Waimea	Coastal permit	RM060492	27/06/2006	27/06/2041

B.2.2.7 Current and Future Demands

One of the key limitations for the Mapua/Ruby Bay system is the source and water availability. Currently no new connections are allowed to the Mapua system due to lack of capacity.

The daily water use is shown in Table B-5 below.

Table B-3: Current Demand of Mapua/Ruby Bay Supply

Scheme capacity (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
3,000	1,353	823	1,036	1,815

Strategic Studies

Various strategic studies have been undertaken to date for the Mapua/Ruby Bay water supply system. These can provide reference and background information for developing the strategic approaches to take in the future.

- Richmond, Wakefield, Waimea and Mapua Water Supply Network Model – January 2007.
- Water Demand Management Plan for the Tasman district – September 2011.
- Mapua/Ruby Bay and Waimea Industrial Zone Water Safety Plan – February 2011.
- Motueka Costal Community Water Supply Demand Projection – August 2011.
- Coastal Pipeline and Tasman View Road Upgrade – April 2011.
- Coastal Pipeline – Reservoir Siting Investigation – July 2010.
- Coastal Pipeline – Preliminary Hydraulic Design Report – November 2010.

B.2.2.8 Strategic Approach

The key issues with Mapua/Ruby Bay are.

- The Mapua/Ruby Bay scheme is presently supplied from Waimea bores. Supplying additional water to Mapua is not possible due to the present system being at full capacity. In light of this, no new connections to the water supply system are allowed.
- The future development of Mapua / Ruby Bay water supply in the short term is heavily based on the ability of developers to source local groundwaters. Existing developable lots are expected to be completed in about 10 years and Council proposes to then upgrade the supply line across Rabbit Island to facilitate more development.

The strategic approach for the Mapua / Ruby Bay scheme is therefore to.

- Utilise local groundwater sources
- Upgrade local storage in about 5 years.

- Upgrade the Supply to Mapua in about 10 years.
- In the long term construct the ‘Coastal Pipeline’ from Motueka to Mapua.

Table B-4: Register of Assets for Mapua/Ruby Bay Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage		Reticulation			Other Assets	
Mapua / Ruby Bay	5 Bores – Waimea River Delta Zone 2 Emergency Bores – Waimea River Delta Zone Water Permit = 15,400 m^3/day (includes Mapua)	<u>Brabant Drive Booster PS</u> Grundfos CR 30/30 4kW <u>Mapua Booster PS</u> Southern Cross Starline 100 x 65-250 37kW <u>Pinehill Reservoir and PS</u> Grundfos CR 16/30 3kW with Hydrovar VS Lower PS - Grundfos CR 30/30 4kW <u>Pomona Road Reservoir and PS</u> 2 x Lowara SV 30-08 15kW	Lime dosing for pH correction Gas chlorination with Residual control Turbidity Measurement Chlorine Measurement and Monitoring pH Measurement	Pomona Road Main Reservoir	700m^3	**Water Mains:**	20mm	14m	Fire Hydrants	103
				Temporary	1,000m^3		25mm	8m	Valves	243
				Pine Hill Heights	90m^3		50mm	465m	Metered Connections	756
				Old Coach Road	70m^3		80mm	5m		
							100mm	439m		
							150mm	767m		
							200mm	1,104m		
							250mm	10m		
							300mm	634m		
							375mm	839m		
							450mm	510m		
							Total	**4,798m**		

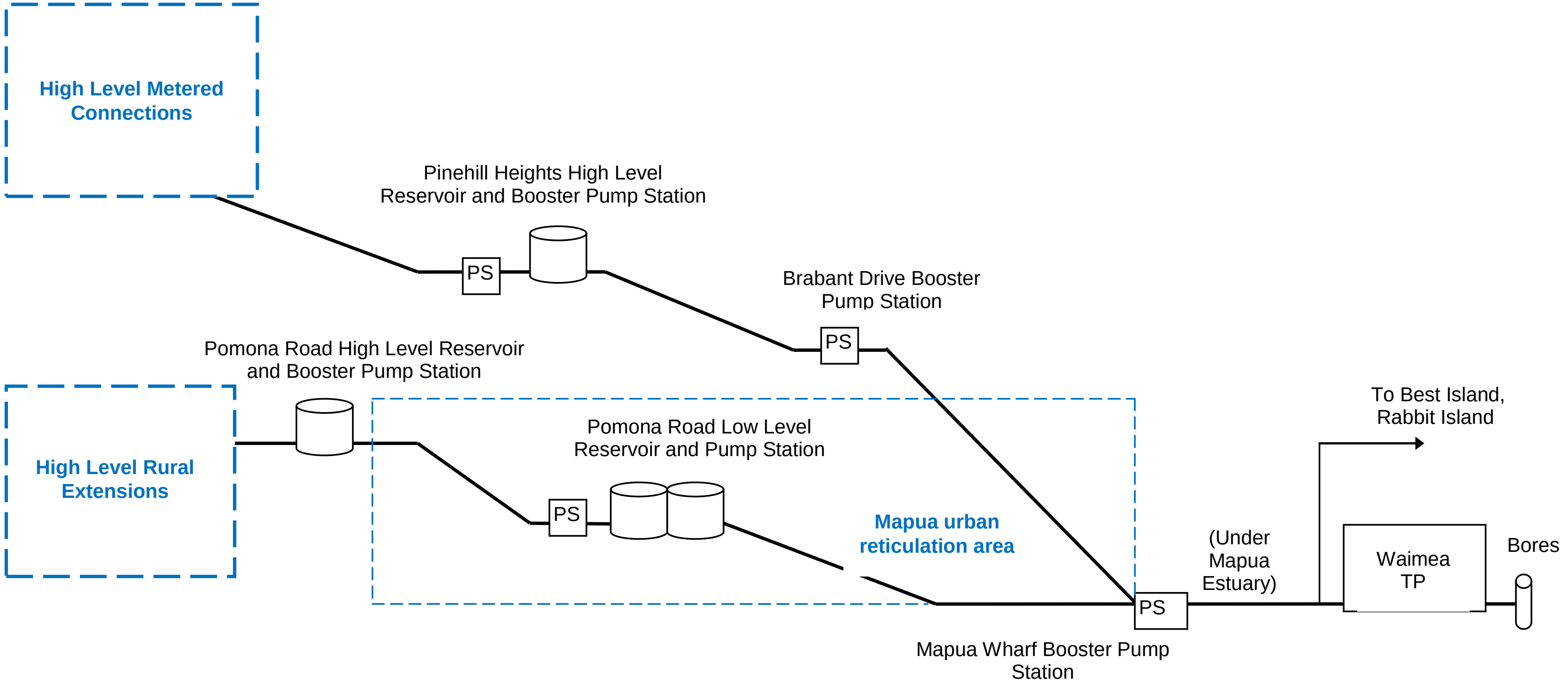


Figure B-3: Waimea - Mapua/Ruby Bay Zone Level Schematic

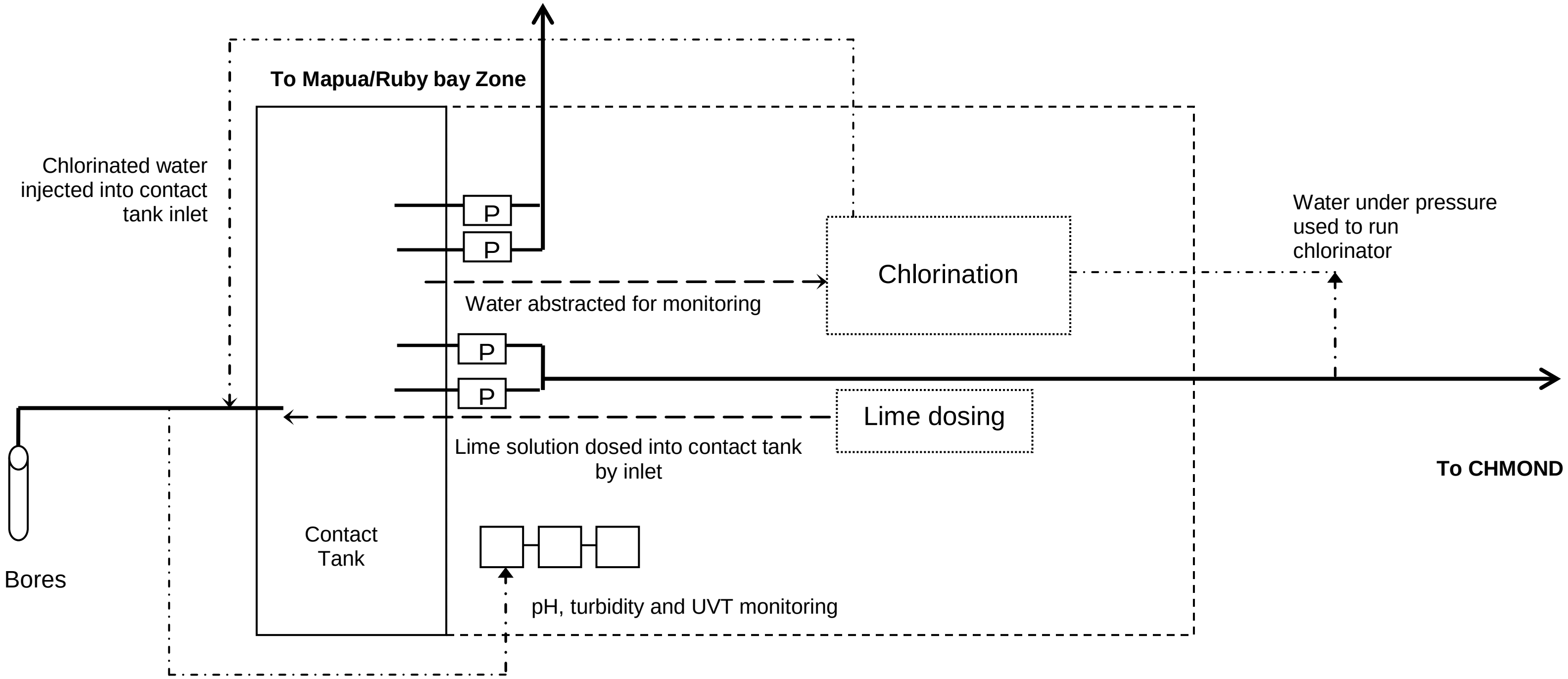


Figure B-4: Waimea Supply Treatment and Monitoring Detail

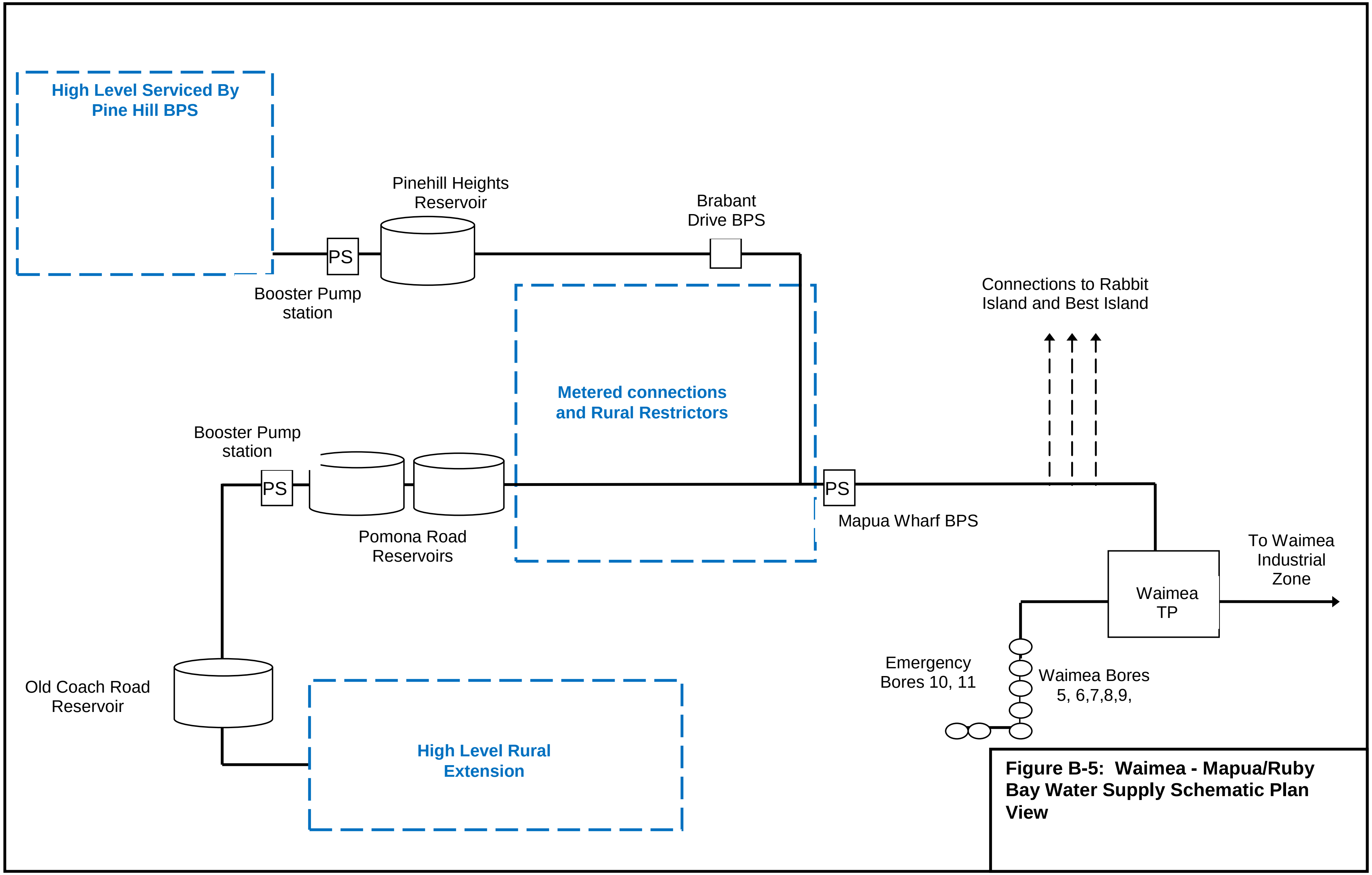


Figure B-5: Waimea - Mapua/Ruby Bay Water Supply Schematic Plan View

B.2.3. **Wakefield Water Supply**

B.2.3.1 System Description

The Wakefield supply was constructed in 1973 and serves mainly the Wakefield urban area. The Wakefield scheme also supplies the following rural extensions:

- Wakefield South
- Treeton Place
- Spring Grove
- Pigeon Valley.

Source water for the Wakefield scheme is extracted from a well with infiltration gallery close to the Wai-iti River behind the Wakefield fire station. A back up bore closer to the river has not been used for many years and is *not* kept in working order. When first established, two pumps were installed in an original well. Due to high summer demand however, and the slow recharge rate of the well, one of the pumps was relocated to a small diameter bore closer to the Wai-iti River. Subsequently an infiltration gallery, connected to the original well, was installed to intercept ground water adjacent to the Wai-iti River. This is now used as the main source of water for the Wakefield supply with a duty and standby pump.

The land on which the bores are located is owned by Tasman District Council. The general area is open to public access, with a public reserve and a turning area predominantly used by truck and trailer units adjacent to the site. An area approximately 5m by 5m around the well head and electrical cabinet is fenced off from the public and the lid of the well entry point and gate are locked with a Tasman District Council Abloy padlock.

The infiltration gallery is at a depth of approximately 4m. The emergency bore is approximately 5m deep. The gallery and wells are not considered to be secure under the DWSNZ due to their shallow depth and the influence of the Wai-iti River. The consented take for the gallery and associated wells is 100m^3/hour, 1,300m^3/day and 9,100m^3/week.

The scheme is linked to the Brightwater scheme via a pipe which runs along the old Railway Reserve with a booster pump station at Bird Road. This connection can be used for emergency supply to either township, particularly during summer high demand months when the groundwater levels are low and the Wakefield pumps have difficulty supplying the demand. The link pump from Brightwater to Wakefield is usually turned off, but can be activated manually. It can operate automatically once activated via a low level control on the Wakefield reservoir.

The Wakefield Water Supply scheme supplies a population of approximately 1,855. All 711 urban connections are metered (June 2014) and the 62 connections from rural extensions (May 2014) are restricted by a low-flow valve.

B.2.3.2 System Operation Overview

The scheme comprises:

- a bore with submersible pump
- a well with two submersible pumps
- a treatment plant with aeration tower and chlorination
- a contact tank
- two high lift pumps
- Brightwater Water Supply link pump station at Bird Road
- a booster pump station at Treeton Place with a high and low level reservoir
- two main storage reservoirs.

Submersible pumps in the well pump water to a treatment plant located on Pigeon Valley Road. At the treatment plant, the water is aerated using a tower to release some of the free carbon dioxide and increase the pH, making the water less corrosive. This is connected directly to a contact tank where the water is then disinfected inline by chlorine gas.

The concentration of chlorine in the water leaving the treatment plant is monitored continuously at the point it leaves the contact tank. Online monitoring of pH and turbidity via telemetry also occurs on the raw water but does not currently control any plant operation.

From the contact tank, two high lift pumps draw water and deliver it directly to the two system reservoirs (450m^3 and 750m^3, located in the Edward Street Reserve above the church in Edward Street) and also directly into the reticulation system and a tank at the bottom of Treeton Place. A booster pump from then transfer supply to a tank above the top of Treeton Place (access from Kilkenny Place). This system supplies warter to restricted and metered connections. The land on which the reservoirs are sited is owned by Tasman District Council.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.2.3.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms section of networks identified from the Vulnerability Assessment as critical are:

- Wakefield Network – at extreme risk to earthquake during and immediately after the event.

B.2.3.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- A demand management plan is in place for Wakefield.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been no non-compliances for Wakefield in the last five years.

LoS 8 – WSPs are in place, approved and being implemented for each water supply.

- Wakefield WSP was approved 2011.

LoS 9 – Urban water supplies meet fire fighting standards.

- The vast majority of Wakefield complies, except for Clifford Road, Martin Avenue and the Whitby Road areas.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Wakefield Bay has a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Wakefield has sufficient storage.

B.2.3.5 Asset Condition Overview

The scheme assets are in moderate condition. The well pumps, treatment plant, reservoirs and pump stations are connected to telemetry. The pumps operating on the demand of the high/low level sensors in the reservoir. This site has digital telemetry at one WTP, the main reservoirs and Bird Lane. However treeton Place has no telemetry but would benefit from this upgrade.

Pressure/flow problems are experienced in the elevated areas of Hunt Terrace and Pigeon Valley due to lack of available head. The development of booster pumps and additional reservoir storage could eliminate this problem and need to be considered in the subsequent upgrade to the scheme.

There are also areas located above the reservoir that are undergoing subdivision but cannot be suppl;ied with reticulated water eg Grossy Drive North. High leakage and unaccounted water have been on-going issues in the area. The majority of the reticulation is asbestos cement and polythene for the smaller rider mains making them unreliable with problems typical to those material pipes. Frequent repairing and replacement of copper and PE rider mains prone to leakage and breaks has helped reduce the issue. Many of the original PE rider mains have been renewed through the process of breakage and repair.

Leak detection was carried out in 2014, with 137 m^3/ day of leakage identified. Six large leaks accounted for 84% of this leakage. These leaks were subsequently fixed. Several line meters now exist to better identify leaks. Further leak detection is proposed in 2015.

Due to the proposed construction of a new treatment plant at Spring Grove, for which budget is allocated in years 2016/17, no recent improvements have been made to the well head and none are proposed. If the Wakefield supply is inundated by flood waters, resulting in contamination of the water supply beyond the current treatment capabilities, or the electrical controls fail, the community can be served from the Brightwater/Hope Scheme through the link and pump station at Bird Road.

B.2.3.6 Water Quality and DWSNZ Compliance

Required sampling - Wakefield supplies approximately 1,855, making it a 'minor' supply (between 500 and 5,000 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are 'Criteria 2B' for plant samples and 'Criteria 6A' for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone:

- 13 samples per quarter
- maximum of 11 (zone) and 13 (plant) days between samples
- five different days of the week used.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 39 samples per quarter
- maximum of four days between samples
- seven different days of the week used.

Historical results - Between July 2006 and June 2011, 268 samples were taken from the zone. Two of these were transgressions. These occurred during the 2007/2008 summer period. Two hundred and thirty eight samples were taken from the plant, with no transgressions.

B.2.3.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Wakefield	GW	Two bores/wells near Wai-iti River	NN0010212	01/01/2001	31/05/2016

B.2.3.8 Current and Future Demands

The current demand is generally met by the Wakefield supply, although during prolonged drought, the source struggles to meet peak day demand. Construction of a 750m^3 reservoir in 2010 has partly resolved the peak demand issue. The daily water is shown in Table B-7 below.

Table B-5: Current Demand of Wakefield Supply

Resource Consent Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
1,300	842[1]	632[2]	887[3]	1,059

[1] Calculated from the works weekly readings from beginning of October 2009 to the end of February 2010.
[2] Calculated from the works weekly readings from beginning of April 2014 to the beginning of August 2014.
[3] Calculated from the works weekly readings from beginning of October 2009 to the end of February 2010 and from mid-August 2010 to mid-December 2010.

It is anticipated that in 2029 the demand in Wakefield is as follows:

- average day demand – 923m^3/day.
- peak day demand – 1,845m^3/day.

To manage the growing demand in Wakefield, Council are taking the following key measures:

- sourcing water from a new source and constructing a new treatment plant
- developing a water supply plan for rural and residential growth
- improving the connectivity between Brightwater and Wakefield.

B.2.3.9 Strategic Studies

Various strategic studies have been undertaken to date for the Wakefield water supply system. These can provide reference and background information for developing the strategic approaches to take in the future.

- Wakefield Water Supply Network Model – January 2007.
- Water Safety Plan for the Wakefield Water Supply.
- Water Demand Management Plan for the Tasman district – September 2011.

B.2.3.10 Strategic Approach

The key issues for the Wakefield urban water supply are.

- The existing source does not supply adequate volume of water to serve the future demand.
- Water quality does not meet DWSNZ.
- The reticulation has a high leakage rate.
- The existing AC trunkmain from Brightwater to Wakefield has a low pressure class rating.
- Rural residential growth to the southwest of Wakefield needs to be supplied with water. This area overlaps Wakefield and 88 Valley schemes. Servicing it from either scheme has issues and as yet there is no clear plan of how this will be addressed.

The strategic approaches are to.

- Develop a water supply plan for rural and residential growth. This work will tie in with resolving issues for 88 Valley supply. This will confirm whether the source of the water supply is either Wakefield or 88 Valley.
- Construction of a new bore to meet future demands for Wakefield, with treatment plant facilities to meet DWSNZ.
- Upgrades associated with the new Wakefield supply will upsize undersized pipelines and replace much of the reticulation and existing AC trunk main from Brightwater.
- To construct facilities to improve the inter-connectivity of the schemes so that during drought times, water can be moved to where it is needed most.

Table B-6: Register of Assets for Wakefield Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets
Wakefield	Bore and Infiltration Gallery – Wai-iti River Water Permit = 1,300m^3/day	Wakefield Wells Well 1 – Grundfos SP125-1-A 7.5kW Well 2 –. Grundfos SP95-2 9.2 kW Well 3 – Ritz New Haden 5.5hp Wakefield Treatment Plant and PS 2x Ajax ZLC 20HP (60m3/hr) Brightwater Link PS Grundfos CR 60/60 (15kw) Treeton Place (Wai-iti Hills) Grundfos CR4 120 2.2 kW	Aeration for pH adjustment Gas chlorination Chlorine Measurement pH Measured Turbidity Measured	Wakefield Reservoir 450m^3 New Wakefield Reservoir750m^3 Treeton Place Upper Reservoir 23 m^3 Treeton Place Lower Reservoir 23 m^3	**Water Mains**	12mm 15mm 20mm 25mm 40mm 50mm 65mm 100mm 150mm **Total**	26m 1,633m 1,055m 5,253m 3,564m 4,547m 1,980m 3,560m 11,177m **32,795m**	Fire Hydrants 83 Valves 189 Water Meters 756

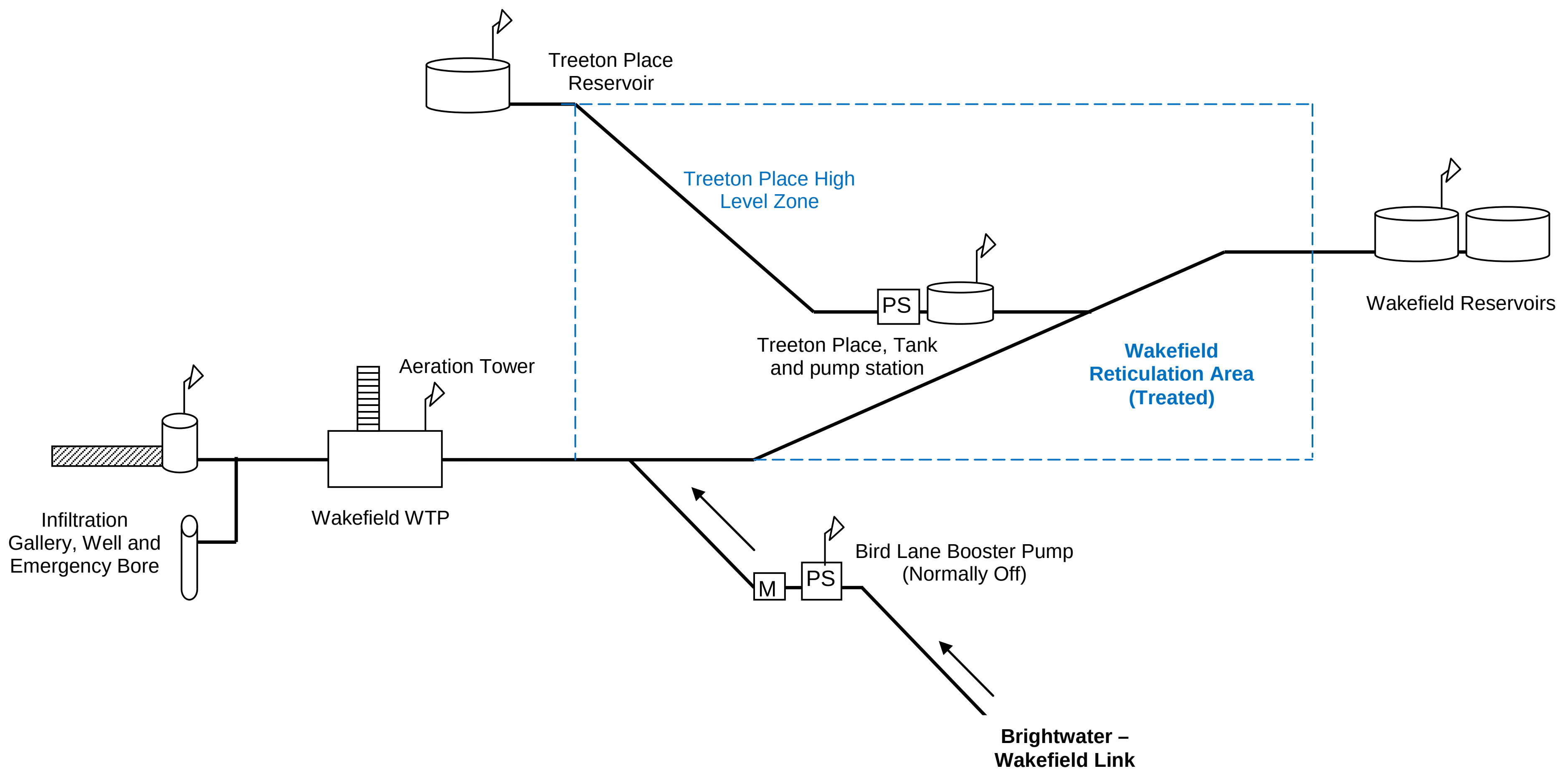


Figure B-6: Wakefield Water Scheme Schematic

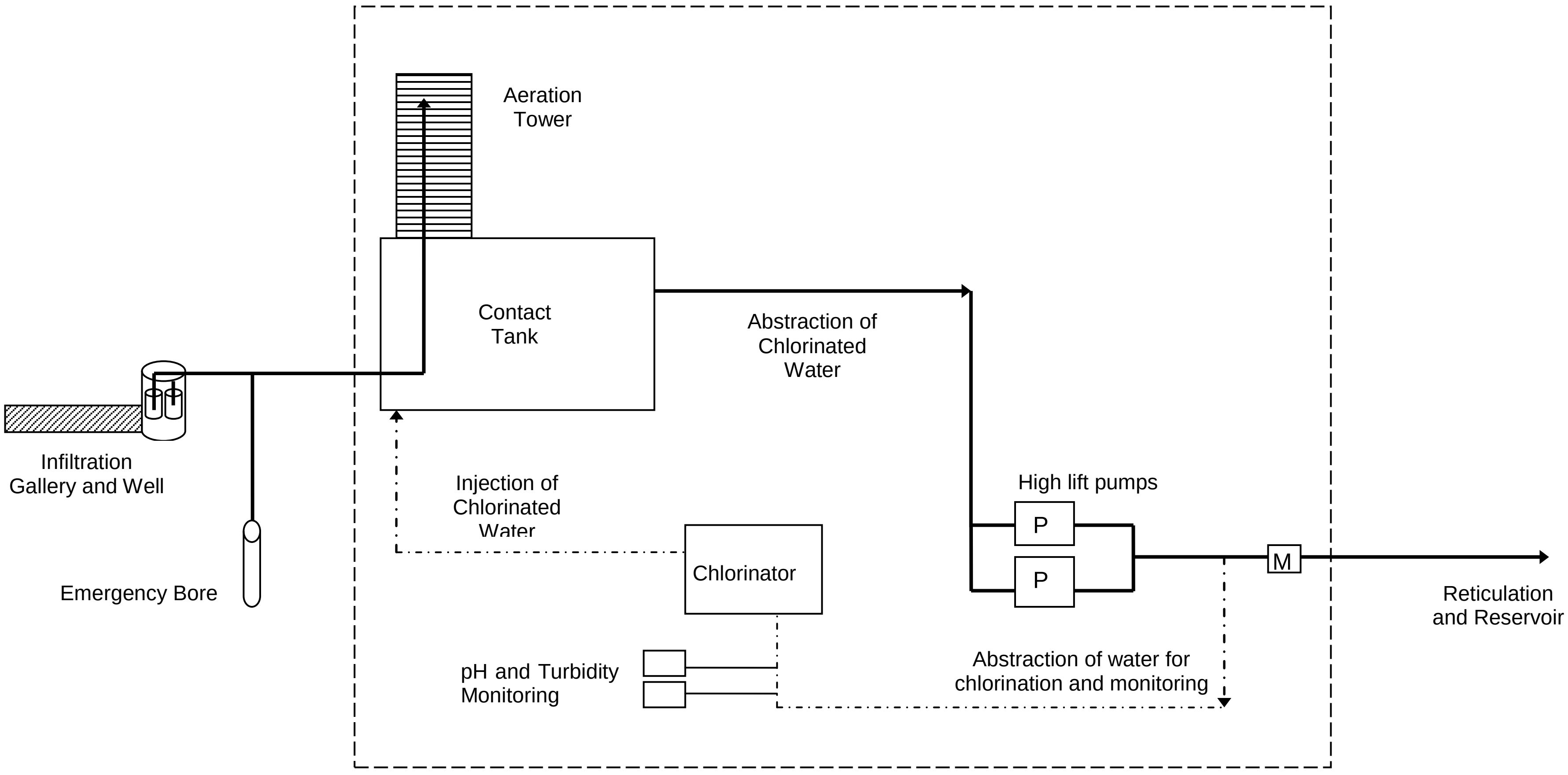


Figure B-7: Wakefield Water Scheme Treatment and Monitoring Detail

B.2.4. Brightwater Water Supply

B.2.4.1 System Description

The Brightwater supply was constructed in 1976 and serves the Brightwater urban area and the following rural extensions:

- Mt Heslington Road to the lower end of the 88 Valley Rural scheme at River Terrace Road
- Teapot Valley
- Jeffries Road
- Hope (Paton's Road and Pugh's Road) (largest extension).

The scheme takes water from three bores located in a vineyard close to the Wairoa River, just south of the Wairoa River Bridge (SH 6). The bore headworks were upgraded in 2010 to raise them above the 50-year flood plain.

In drought conditions water may be more difficult to source from the bores, however water can also be sourced from the Richmond Water Supply to offset restrictions within the reservoir zone.

The supply serves a mix of urban and rural lifestyle/agricultural properties with few commercial properties. There are 880 metered connections (June 2014) and 253 restricted rural connections (May 2014), a total estimated population of approximately 2,700.

B.2.4.2 System Operation Overview

Submersible pumps in the bores pump water to a treatment plant on the other side of the state highway (to the north-west). At the treatment plant, the water is disinfected inline by chlorine gas injection. Chlorinated water then flows into a contact tank with a residence time of at least 30 minutes. One of three high lift pumps extract water from the contact tank and pump water via a falling/rising main to the two main reservoirs and also directly into the reticulation.

The concentration of chlorine in the water leaving the treatment plant is monitored continuously at the point that it leaves the contact tank, with this data used to vary the dose. Online monitoring of pH, turbidity and UVT occurs on the raw water but does not currently control any plant operation.

The bores, treatment plant and two main reservoirs are connected to the telemetry system and most equipment at these sites can be remotely monitored and/or operated.

Normally there is a closed connection to the Wakefield scheme at Bird Road for emergency supply from Brightwater to Wakefield. There is also a closed connection from Richmond at Three Brothers Corner for emergency supply from Richmond to Brightwater.

At Teapot Valley, there are several properties at a higher elevation than the main scheme can supply. To supply these properties, a small pump station exists whereby water flows through a restrictor into a small tank and is then pumped to a high level reservoir. This then feeds numerous restricted connections. This site is not connected to telemetry, with the pumps operating on the demand of the high/low level sensors in the reservoir.

Water is also currently supplied to a small area of the 88 Valley Rural Water Supply at the end of Mount Heslington Road. This water is supplied via restrictors and accounts for a maximum flow of 51m^3 day. Unlike the other rural extensions, these properties are not technically part of the Brightwater scheme as they pay fees to the 88 Valley Rural Water Scheme.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.2.4.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms section of networks identified from the Vulnerability Assessment as critical are:

- Brightwater Network – at extreme risk to earthquake during and immediately after the event.

B.2.4.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- A demand management plan is in place for Brightwater.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There has been one transgression at the plant and one in the zone in the last five years.

LoS 8 – WSPs are in place, approved and being implemented for each water supply:

- Brightwater has an approved WSP.

LoS 9 – Urban water supplies meet fire fighting standards.

- The vast majority of Brightwater complies, except for Main Road Hope from Aniseed Valley Road to Bateup Road.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Brightwater has a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Brightwater has sufficient storage.

B.2.4.5 Asset Condition Overview

The scheme assets are generally in good condition. Many of the assets in the treatment plant have been upgraded in the last few years and the bore heads were upgraded in 2010. The telemetry was also upgraded to digital in the last few years.

A new reservoir was constructed and commissioned in 2009 to address the lack of storage.

The high lift pump set up is probably the oldest item at the treatment plant, but is not known to be causing any on-going problems. A meter on the inlet to the treatment plant (connected to telemetry) would be a useful tool for measuring flow (instantaneous and daily) and may be required to comply with new metering standards in the next few years.

Most pipe repairs are on old PE pipes (ridermains and service laterals). Many of the original PE ridermains have been renewed through the process of breakage and repair.

B.2.4.6 Water Quality and DWSNZ Compliance

Required sampling - Brightwater supplies approximately 2,700 people, making it a ‘minor’ supply (between 500 and 5,000 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are ‘Criteria 2B’ for plant samples and ‘Criteria 6A’ for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone:

- 13 samples per quarter
- maximum of 11 (zone) and 13 (plant) days between samples
- five different days of the week used.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 39 samples per quarter
- maximum of four days between samples
- seven different days of the week used.

Lead is also monitored in the reticulation three times per quarter. The treatment plant has online turbidity, pH and chlorine analysers.

Historical results - Between July 2006 and July 2011, 268 samples were taken from the zone with one transgression in 2007. One hundred and eighty five samples were taken from the plant with one transgression in 2010. Fifty-seven samples have also been taken and analysed for lead. None of these samples have shown a transgression.

B.2.4.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Hope/ Brightwater	GW	Three bores close together near Wairoa River.	NN020022	12/06/2003	31/05/2017

B.2.4.8 Current and Future Demands

The current demand is met by the Brightwater supply, however water restrictions are imposed to some degree most summers. There is the opportunity to provide emergency supply from the Richmond scheme to Brightwater to supply further properties at the Richmond end of the Hope extension. The daily water use is shown in Table B-9 below.

Table B-7: Current Demand of Brightwater Water Supply

Resource Consent Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
2,800	1,802	1,287	1,560	2,163

It is anticipated that in 2029 the demand in Brightwater is as follows:

- Average Day Demand – 2,113m^3/day.
- Peak Day Demand – 4,225m^3/day.

To manage the growing demand in Brightwater/Hope, Council are taking the following key measures:

- increase capacity source, either from a new Wakefield supply or a new allocation made available in the Waimea Plains through the construction of the Waimea Community Dam.

B.2.4.9 Strategic Studies

Various strategic studies have been undertaken to date for the Brightwater water supply system. These can provide reference and background information for developing the strategic approaches to take in the future.

- Richmond, Wakefield, Waimea and Mapua Water Supply Network Model – January 2007.
- Richmond and Brightwater/Hope Water Demand Management Plan – August 2010.
- Water Demand Management Plan for the Tasman district – September 2011.
- Brightwater Water Safety Plan – November 2011.

B.2.4.10 Strategic Approach

The key issues for the Brightwater urban water supply are.

- the current source will not be able to accommodate future growth
- the ageing reticulation system will need to be replaced in the future
- water quality does not meet DWSNZ
- high renewal cost for water meters.

The strategic approaches to these issues are.

- To upgrade the treatment to meet DWSNZ.
- To increase source capacity. This may come from the allocation Council has from the Roding supply, new capacity provided by the new Wakefield Supply or new allocation made available in the Waimea Plains through the construction of the Waimea Community Dam.

Table B-8: Register of Assets for Brightwater Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets
Brightwater / Hope	3 Bores – close to Waimea River Water Permit = 2,800m^3/day	Brightwater Well field Lightband Road Pump 1 Goulds 250 LZ07 5.8 KW Pump 2 - Aturia XB17B2 10hp Pump 3 - Grundfos SP77 5.5kW Brightwater Main PS Pump 1, 2 and 3 - Monoflow (20HP) Teapot Valley PS Lowara SV222 (3 kW)	Gas chlorination Chlorine Measurement pH measurement Turbidity Measurement UVT Measurement	Brightwater Reservoir 680m^3 Teapot Valley Reservoir 9m^3 Newly constructed reservoir 2500m^3 Teapot Lower Reservoir 4.5m^3	**Water Mains**	12mm	563m	Fire Hydrants 126 Valves 276 Water Meter...1,027
						15mm	2,208m	
						20mm	4,618m	
						25mm	13,351m	
						32mm	1,411m	
						40mm	7,187m	
						50mm	12,322m	
						75mm	179m	
						80mm	412m	
						100mm	5,263m	
						150mm	6,833m	
						200mm	5,595m	
						250mm	416m	
						Total	**60,356m**	

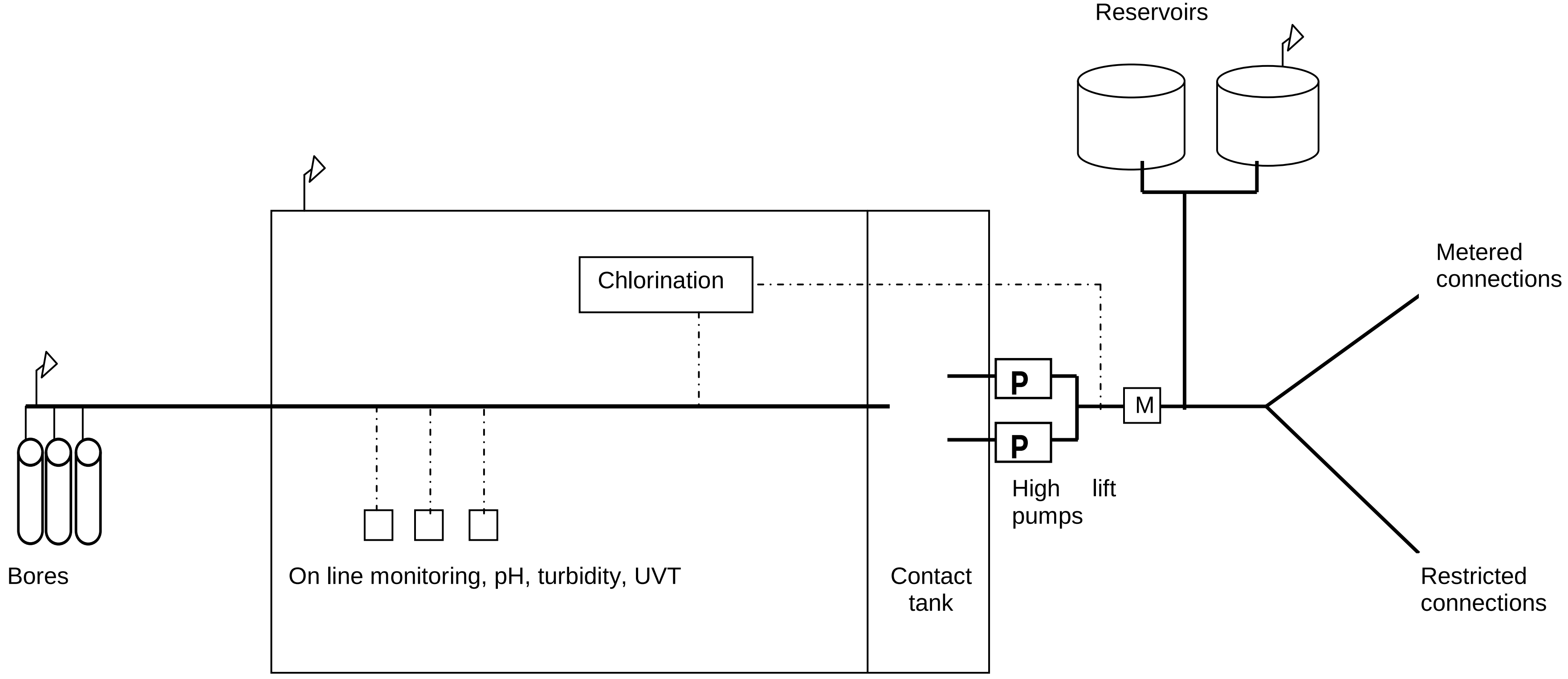


Figure B-8: Brightwater Water Supply Schematic

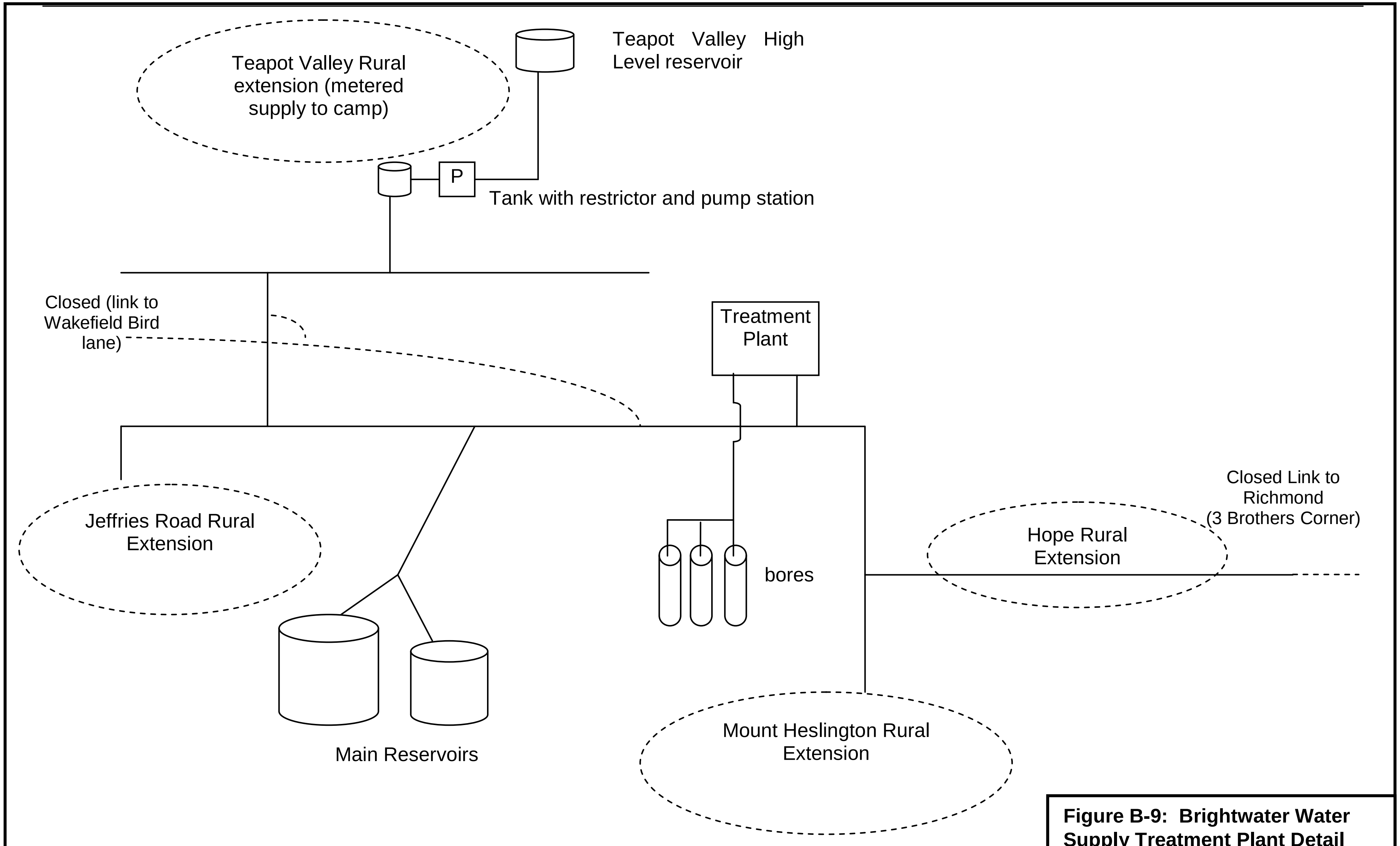


Figure B-9: Brightwater Water Supply Treatment Plant Detail

B.2.5. Tapawera Water Supply

B.2.5.1 System Description

Tapawera is supplied from two bores between the Motueka River and the village on the Tadmor Valley Road. The groundwater supply is unsecure because the bore screens are at a depth of less than 10m.

The water supply network in Tapawera was installed by the NZ Forestry Service in 1973, extended by Council in 1976, and fully handed over to Council in 1979 and further upgraded.

There are 150 metered connections on the Tapawera supply and there are no rural extensions supplied from the Tapawera scheme, although one person is supplied water through a low flow restrictor. The estimated population of Tapawera is approximately 360 people.

B.2.5.2 System Operation Overview

The system comprises:

- two bores with submersible pumps
- a treatment plant with chlorination and lime addition
- a contact tank
- two high lift pumps
- one reservoir (270m^3).

From the two bores the water is pumped to the treatment plant and then pumped into a 270m^3 concrete reservoir where it flows, by gravity into the village.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.2.5.3 Key Lifelines

The Nelson Tasman Engineering Lifelines report 2008, confirms there are no sections of the network that have been identified from the Vulnerability Assessment as critical.

B.2.5.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for Tapawera.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been no non-compliances for Tapawera for the past five years.

LoS 8 – WSPs are in place, approved and being implemented for each water supply.

- Tapawera has an approved WSP.

LoS 9 – Urban water supplies meet fire fighting standards.

- Tapawera meets the standards.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Tapawera does not have a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

Tapawera has sufficient storage for the actual household demand and under most circumstances enough to last 24 hours.

B.2.5.5 Asset Condition Overview

The majority of the reticulation is asbestos cement and polythene for the smaller rider mains with problems typical to those material pipes and may be a source of the high water loss reported. PE rider mains and copper service connections cause an on-going leakage problem. Some rider mains and copper laterals have been renewed to address this problem. Leak detection and repairs have resulted in acceptable daily water demand.

The bore headworks, reservoir power supply and telemetry system were upgraded in the 2006-8 period.

B.2.5.6 Water Quality and DWSNZ Compliance

Required sampling - Tapawera supplies approximately 360 people, making it a 'small' supply (between 100 and 500 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are 'Criteria 2B' for plant samples and 'Criteria 6A' for the distribution. These require, as a minimum, the following sampling to be carried out:

- in the zone, three samples per quarter , no more than 45 days apart on two different days
- at the plant, six samples a quarter, no more than 22 days apart, on three different days.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 13 samples per quarter
- maximum of 11 days between samples
- five different days of the week used.

The treatment plant has online turbidity, pH and chlorine analysers connected to telemetry.

Historical results - Between July 2006 and June 2011, 64 samples were taken from the zone and 72 samples were taken from the plant. None of these were transgressions

B.2.5.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Tapawera	GW	Two adjacent bores on Tadmor Valley Road.	RM040256	11/08/2004	31/05/2019

B.2.5.8 Current and Future Demands

There are no significant demand issues within Tapawera and current growth projections predict negligible increase of new connections within the 20 year period. Therefore the source and water availability is not a limitation for the Tapawera system. The daily water use is shown in Table B-11below.

Table B-9: Current Demand of Tapawera Water Supply

Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
455	242	219[1]	230[2]	317[2]

[1] Due to excessive leakage in the scheme, the winter demand for 2010 was 406m^3/day. More recent data after leakage repairs from 2011 (March to September) shows a much lower demand.

[2] From October 2010 to September 2011

Future improvements to the network will further minimise leakage within the scheme, therefore reducing further demand on the network.

B.2.5.9 Strategic Studies

The key strategic study which has been undertaken to date for the Tapawera water supply system is as follows.

- Water Demand Management Plan for the Tasman District – September 2011.

B.2.5.10 Strategic Approach

There are no significant issues which require resolving within the Tapawera system. Strategic approach to the system includes:

- repair/renewal of pipes that have a history of failures
- replace failing copper laterals
- continuation of provision of effective and efficient operations and maintenance.

Table B-10: Register of Assets for Tapawera Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
Tapawera	2 Bores – between Motueka River and Tapawera, on Tadmor Valley Road Water Permit = 455m^3/day	107 Main Rd Source / Treatment Plant Pump 1 – Grundfos SP46-2 3kW Pump 2 – Grundfos SP35/2 Pump 3 – Grundfos SP5/2 Highlift Pumps 2 x Southern Cross RGA 1 ¼ Newman11kW	Lime dosing for pH adjustment Gas chlorination Residual control Chlorine measurement Turbidity measurement pH measurement	107 Main Road Source / Treatment Plant 270m^3	**Water Mains**	12mm	94m	Fire Hydrants	23
						15mm	75m	Valves	52
						20mm	434m	Water Metres	170
						25mm	336m		
						40mm	220m		
						50mm	1,634m		
						75mm	175m		
						80mm	56m		
						100mm	3,594m		
						150mm	1,346m		
						Total	**7,963m**		

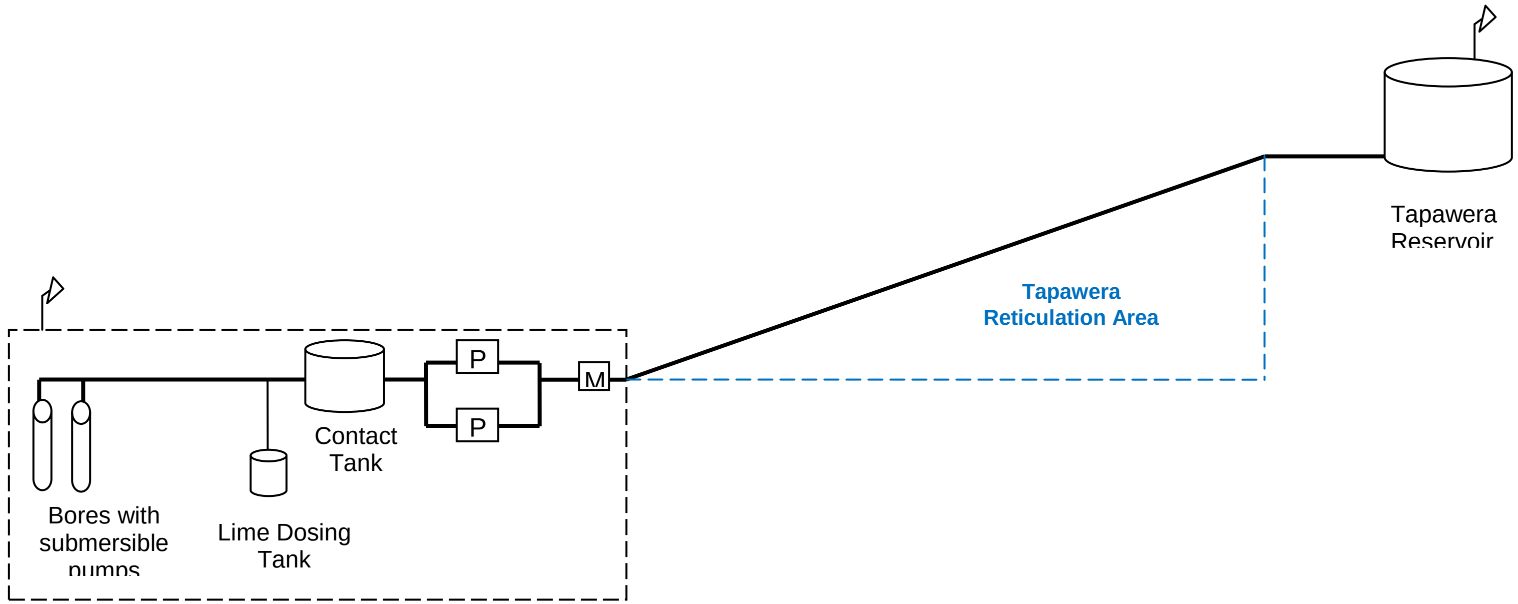


Figure B-10: Tapawera Water Scheme Schematic

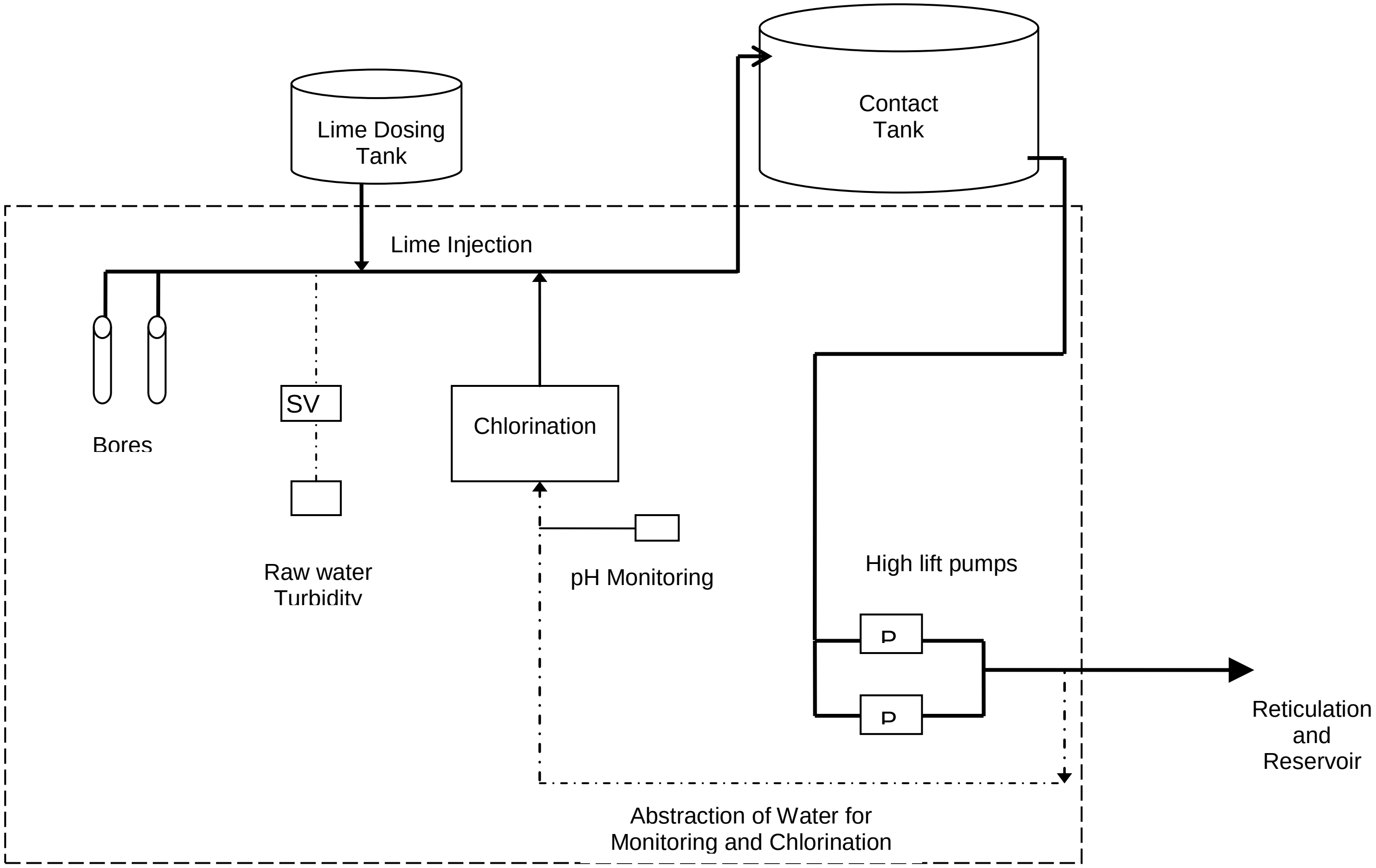


Figure B-11: Tapawera Water Scheme Treatment and Monitoring Detail

B.2.6. Murchison Water Supply

B.2.6.1 System Description

The Murchison water supply takes water from two bores situated in farmland between the main pump station and the Matakitaki River. The bores are unsecure because they are less than 10m deep. Stock graze in the paddocks where the supplies are located but the bores are protected by stock proof fencing.

The Murchison water supply services the Murchison urban area, with an extension out to Longford.

There are 281 metered connections (June 2014) and two restricted connections. The estimated population of Murchison is approximately 680 people.

B.2.6.2 System Operation Overview

The water supply scheme in Murchison was built in 1975 and comprises:

- two bores
- one treatment plant consisting of an aeration tower and gas chlorination
- two high lift pumps
- one large reservoir (270 m^3) and four smaller plastic tanks ($30m^3$ each).

Bore pumps deliver water to the treatment plant which is situated in the old Tasman District Council depot in Fairfax Street. The treated water is then pumped into the main reservoir and also directly into the reticulation.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.2.6.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from the Vulnerability Assessment as critical.

B.2.6.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for Murchison.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been no non-compliances for Murchison in the last five years.

LoS 8 – WSPs are in place, approved and being implemented for each water supply.

- Murchison does not have an approved WSP.

LoS 9 – Urban water supplies meet fire fighting standards.

- Murchison meets the standards.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Murchison does not have a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Murchison has sufficient storage.

B.2.6.5 Asset Condition Overview

The scheme assets are generally in good condition and the reservoir is in good structural condition.

The majority of the reticulation is asbestos cement and polythene for the smaller rider mains with typical problems for those material types. There has been an on-going programme to renew the PE rider mains which are coming to the end of their life.

Most of the unreliable pipes have been renewed. Recent rider main renewals and repairs following a leak detection survey in April 2008 have succeeded in maintaining a reduced daily water demand. This programme will continue as necessary.

The two source water bores/wells were replaced in July 2011.

B.2.6.6 Water Quality and DWSNZ Compliance

Required sampling - Murchison supplies approximately 680 people, making it a 'minor' supply (between 500 and 5,000 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are 'Criteria 2B' for plant samples and 'Criteria 6A' for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone:

- 13 samples per quarter
- maximum of 11 (zone) and 13 (plant) days between samples
- five different days of the week used.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 39 samples per quarter
- maximum of four days between samples
- seven different days of the week used.

The treatment plant also has online turbidity, pH and chlorine analysers connected to telemetry.

Historical results - Between July 2006 and June 2011, 265 samples were taken from the zone and 265 samples were taken from the plant. None of these were transgressions.

B.2.6.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Murchison	GW	Two bores SW of township.	RM040976	11/07/2007	31/05/2020

B.2.6.8 Current and Future Demands

There are no significant demand issues within Murchison and the current growth projection is negligible over the next 20 year period. The daily water use is shown in Table B-13 below.

Table B-11: Current Demand of Murchison Water Supply

Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
750	288	221	261	410

Council have made an allowance to replace certain sections of polythene rider mains due to leakage issues. This will further reduce the demand on the network.

B.2.6.9 Strategic Studies

The key strategic study has been undertaken to date for the Murchison water supply system is as follows:

- Water Demand Management Plan for the Tasman district – September 2011.

B.2.6.10 Strategic Approach

There are no significant issues facing the Murchison water supply scheme except the upgrades required to meet DWSNZ. There is also a history of failures and water loss which will be addressed through repair and renewal of poor quality sections of pipe.

Table B-12: Register of Assets for Murchison Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
Murchison	1 Well 1 Bore Besides the Matakitaki River Water Permit = $750m^3$/day	92 Fairfax St Main PS Pump 1 – Ritz-New Haden 5.4hp1 Pump 2 – Lowara CN50-200 11 Kw Highlift pump 1 – Ajax 2LC 20 HP Highlift pump2 - Lowara CN50-200 11 Kw	Aeration for pH adjustment Gas chlorination pH Measurement Turbidity Measurement Chlorine Measurement	Chalgrave Street Reservoir $270m^3$ $4 \times 30m^3$	**Water Mains**	15mm	762m	Fire Hydrants	47
						20mm	480m	Valves	93
						25mm	3,591m	Water Meters	301
						40mm	3,239m		
						50mm	1,696m		
						100mm	1,752m		
						150mm	5,125m		
						Total	**16,646m**		

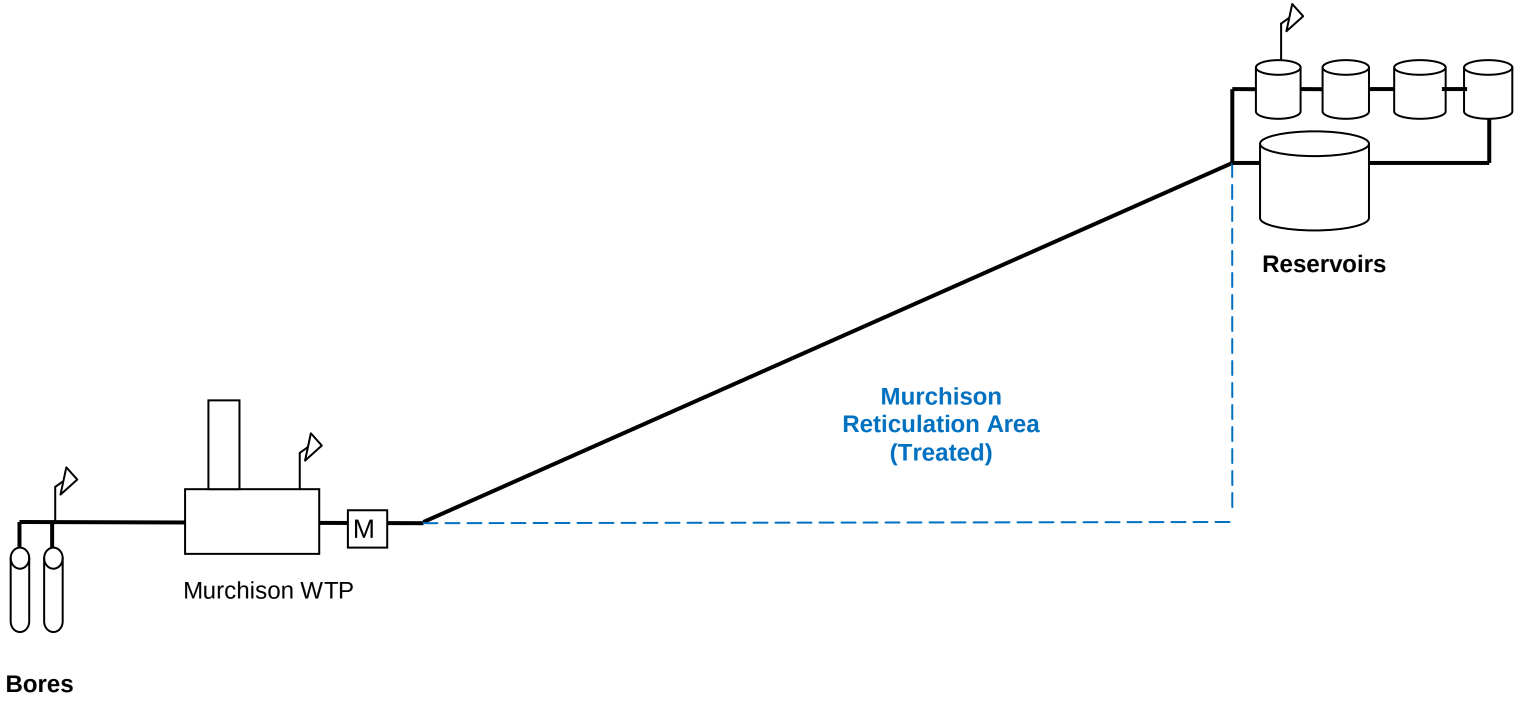


Figure B-12: Murchison Water Scheme Schematic

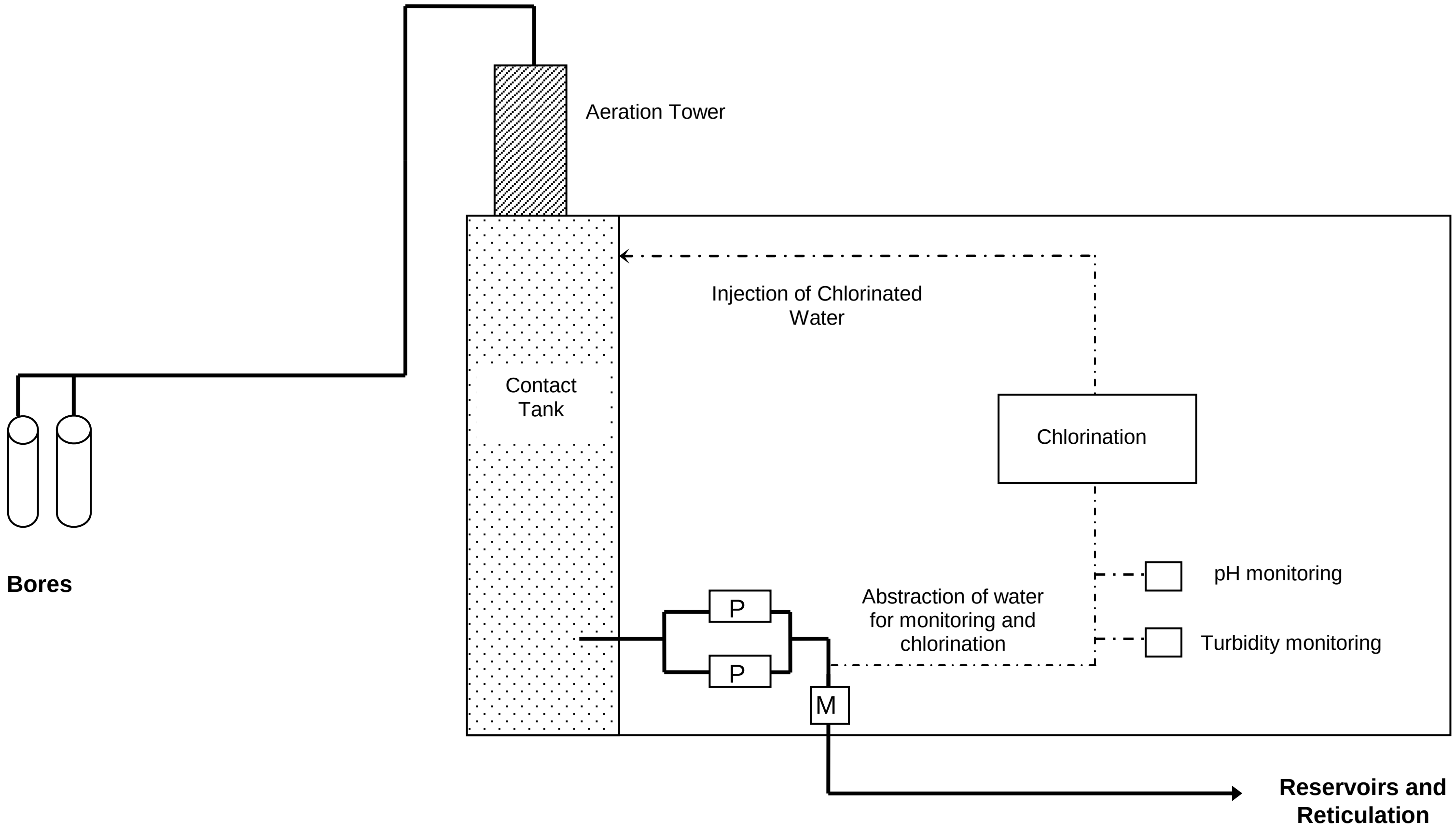


Figure B-13: Murchison Water Scheme Treatment Detail

B.2.7. Upper Takaka Water Supply

B.2.7.1 System Description

Upper Takaka supply is provided by water from Whiskey Creek. The catchment for the creek is largely an area of steep bush on the northern side of Takaka Hill.

The Upper Takaka water supply was originally built by the New Zealand Electricity Department in the 1950s and was taken over by the Tasman District Council in 1991. The system supplies untreated water to farmland that the pipeline is laid through and treated water to the Upper Takaka township.

There are 18 metered connections (June 2014) and no rural extensions off the Upper Takaka scheme. The estimated population of Upper Takaka is approximately 40 people.

B.2.7.2 System Operation Overview

The system comprises:

- surface intake
- sedimentation tank
- break pressure tank
- treatment plant
- reservoirs (2 x 48m^3).

From the intake from Whiskey Creek the water passes through a sedimentation tank close to the intake before flowing by gravity to a break pressure tank and then to a treatment plant. Two filters in series (a multimedia and a macrolite filter) filter the water (by gravity) and the water then passes through a UV disinfection unit before entering two reservoirs next to the treatment plant. The two reservoirs are located on a ridge above the village and the supply flows into the reticulation by gravity.

There are no significant issues with the water supply system other than poor quality reticulation which will require a programme of renewal. The source water quality is poor during heavy rain, however a combination of selective source usage, a large storage volume and good filtration results in a good quality treated water with good continuity of supply. The water treatment system currently meets DWSNZ and is being operated under Section 10 as a small supply.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.2.7.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from the Vulnerability Assessment as critical.

B.2.7.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for Upper Takaka.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been no non-compliances for Upper Takaka since the system was upgraded to meet DWSNZ in 2009.

LoS 8 – WSPs are in place, approved and being implemented for each water supply.

- Upper Takaka has an approved WSP.

LoS 9 – Urban water supplies meet fire fighting standards.

- Upper Takaka does not meet the fire fighting standards.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Upper Takaka does not have a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Upper Takaka has sufficient storage.

B.2.7.5 Asset Condition Overview

The majority of the reticulation is of poor quality. Most of the reticulation system is galvanised iron pipe and is reported to be in very poor condition.

Flows exceed resource consent levels due to historical agreements with property owners and some water likely being used for non-residential purposes. Investigations are on-going and projects are budgeted in the LTP to correct this.

B.2.7.6 Water Quality and DWSNZ Compliance

Required sampling – Upper Takaka supplies approximately 40 people, making it a ‘neighbourhood’ supply (between 25 and 100 people) in terms of the DWSNZ.

As the plant complies with the Section 10 requirements of the DWSNZ, monitoring of the plant is done as per the recommendations of the WSP. Currently this is three times a quarter to fit in with the required zone sampling (determined by the DWSNZ) of three times per quarter.

As the plant has UV treatment, to fully comply with the DWSNZ, the requirements of Section 5.16 of the DWSNZ must also be met. This requires that a minimum UV dose is always maintained. The treatment plant has an automatic system set up to shut off the source if the turbidity becomes too great. This ensures that the quality is always good enough for UV treatment. The UV unit also has an automatic shut off should the dose drop too low due to poor water quality or a fault with the UV unit.

The scheme has been operating as a Small Supply under Section 10 since UV was installed in mid-2009.

Historical results – Between July 2006 and June 2011, 99 samples were taken from the zone. Seventeen of these were transgressions. All transgression occurred before the upgrade, with the last transgression occurring in May 2009. Sixty eight samples were taken from the plant, with no transgressions.

B.2.7.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Upper Takaka	SW	Whiskey Creek (tributary of Takaka River).	RM100113, RM100120	16/3/2011	31/5/2034

B.2.7.8 Current and Future Demands

There are no plans to increase the water take volume to meet demand. Current growth predictions predict negligible difference over the next 20 years. The daily water use is shown in Table B-15 following.

Table B-13: Current Demand of Upper Takaka Water Supply

Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
23	28	11	17	42

There are no known leakage problems but about 80% of the reticulation needs to be renewed. There is currently no formal model of the system and knowledge of the system demand is unknown due to unmetered connections off the supply to local farmers.

Council is intending to upgrade this network in the near future.

B.2.7.9 Strategic Studies

Various strategic studies have been undertaken to date for the Upper Takaka water supply system.

- Upper Takaka Water Supply Water Safety Plan - March 2011.
- Water Demand Management Plan for the Tasman district – September 2011.

B.2.7.10 Strategic Approach

There are no significant issues with the water supply system other than poor quality reticulation which will require a programme of renewal.

The water treatment system has been upgraded with MoH funding to meet DWSNZ.

Table B-14: Register of Assets for Upper Takaka Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
Upper Takaka	Whiskey Creek Water Permit = $23m^3$/day	No pump stations.	50 Micron Amiad Screen Multimedia Filtration Macrolite Filtration UV disinfection	Upper Takaka Reservoir 2 x $48m^3$	**Water Mains**	15mm	118m	Fire Hydrants	2
						20mm	45m	Valves	11
						25mm	514m	Connections	19
						32mm	186m		
						50mm	2,179m		
						80mm	12m		
						100mm	516m		
						150mm	9m		
						Total	**3,579m**		

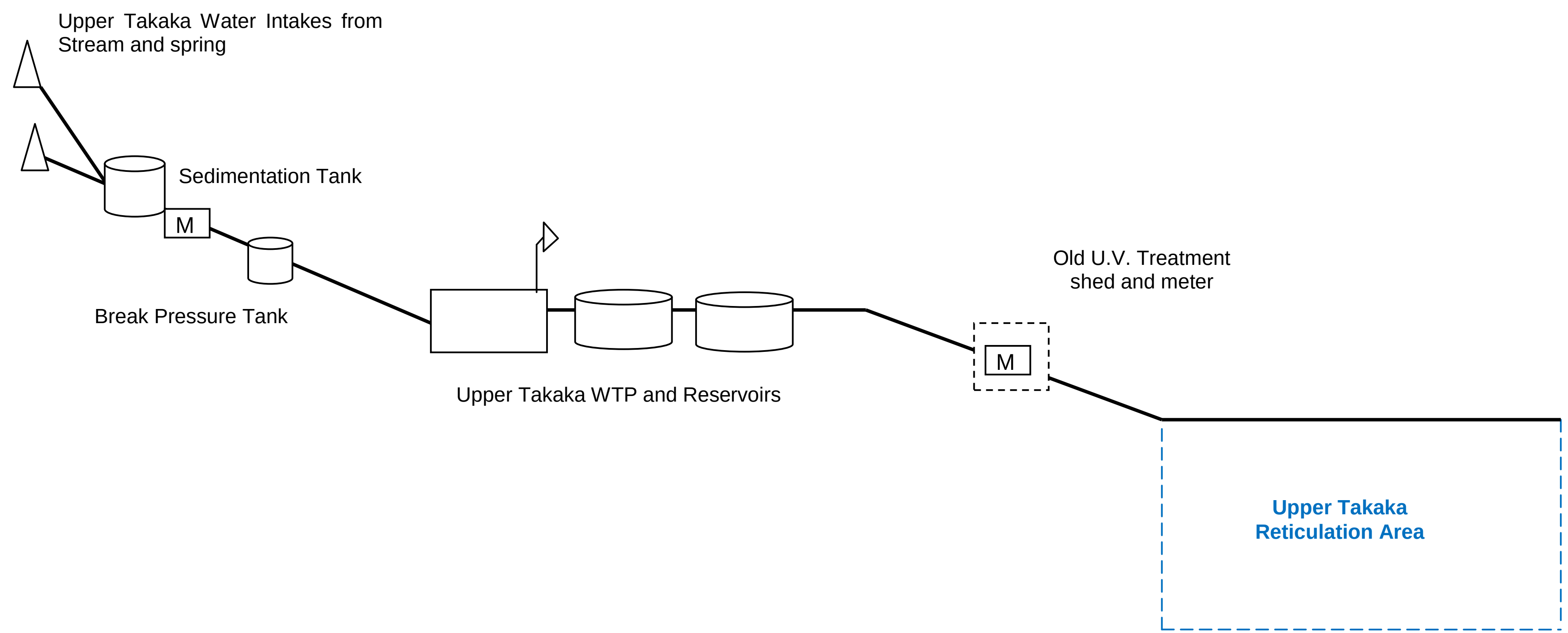
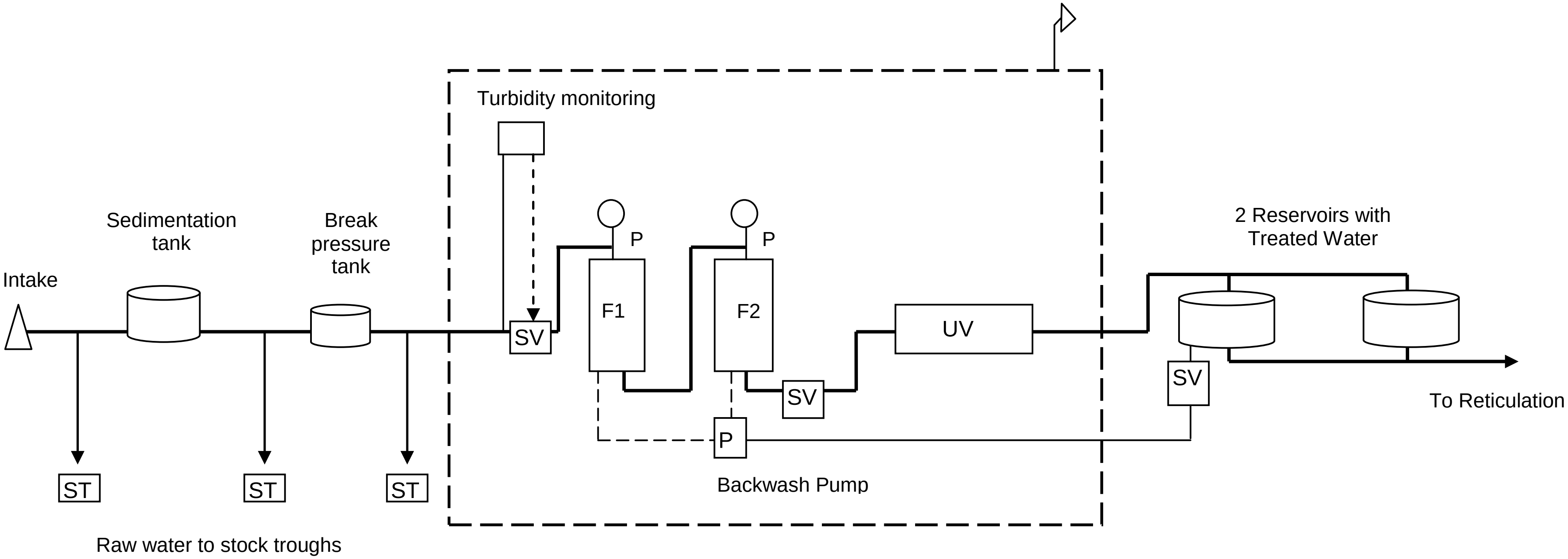


Figure B-14: Upper Takaka Water Scheme Schematic



- F1 – Multimedia Filter
- F2 – Macrolite Filter
- SV – Solenoid Valve
- ST – Stock Trough
- P – Pressure Gauge

Figure B-15: Upper Takaka Water Scheme Treatment and Monitoring Detail

B.2.8. Kaiteriteri Water Supply

B.2.8.1 System Description

The Kaiteriteri Water Supply obtains water from a bore at River Road in Riwaka, which is located in the road reserve approximately 200m from the State Highway. The Kaiteriteri source is hoped to be classed as secure groundwater but further review of monitoring compliance and hydrogeology is necessary to establish whether the source meets the standard for a secure supply.

The system has three supply zones, namely.

- From River Road to the No. 1 booster prior to the main reservoir. This includes Riwaka and Riwaka-Kaiteriteri Road to the No. 1 booster pump.
- From No. 1 booster pump to the main reservoir. This includes Tapu Bay, Stephens Bay, lower Kaiteriteri, Breaker Bay and Honeymoon Bay.
- From No. 2 booster to the high level reservoir. This includes all the high level areas of Kaiteriteri above Honeymoon Bay.

Kaiteriteri water supply was constructed in 1998. All properties at Tapu Bay, Stephens Bay, Little Kaiteriteri, Breaker Bay, and Honeymoon Bay are connected to the scheme, although not all of these properties use the water as some prefer to use their original rainwater storage supply. The supply also serves two large camping grounds which swell the population numbers using the scheme significantly in summer.

Some properties between the bore and Riwaka are connected to the scheme on a voluntary basis.

There are no difficulties with the performance of the system. Water quality is corrosive which if left unresolved may reduce the life expectance of some assets.

There is currently only one well but a spare pump is held in store at Brightwater.

There are 494 metered connections in use (June 2014) and no rural extensions off the Kaiteriteri scheme.

As Kaiteriteri is a holiday destination, most of the properties which use water are not inhabited throughout the year. This information is local knowledge, but can also be seen through the average water use and by looking at individual water meter accounts. For the six months in which the peak holiday time is not included, the average water use per property works out to be about one quarter to one third of normal water use for the district. For the six months which includes the peak holiday time, the use increases to around two thirds of normal usage. This usage is not likely to be spread evenly over the whole six months, rather most of the water will be used in the peak summer weeks between Christmas and the first week of January. The camp at Kaiteriteri becomes full and can hold 1,800 people.

If the normal off-peak water usage is only one quarter to one third of normal usage, it is probable that the normal permanent population (or temporary holiday population at any one time) is only one quarter or one third of the total number of meters using water. Therefore only approximately 124 to 163 meters or approximately 300 to 390 people are identified as the normal population. During the summer, the camp is known to be full, with holiday homes also in use, resulting in a total population of over 2,000 people in the Kaiteriteri area for around two weeks.

B.2.8.2 System Operation Overview

The system comprises:

- well source and pump
- lower booster pump station
- low level reservoir (700m^3)
- upper booster pump station
- high level reservoir (200m^3).

The water is pumped by the River Road well bore pump via a pressure line and booster pump to a 700m³ reservoir above Tapu Bay. The water then flows by gravity from this tank into the reticulation. An additional high level reservoir of 200m³ above Breaker Bay is supplied via a booster pump and services the Rowling Heights area.

A schematic drawing of the scheme is included at the end of this section.

B.2.8.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from the Vulnerability Assessment as critical.

B.2.8.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- A demand management plan is in place for Kaiteriteri/Riwaka.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There has been one non-compliance for Kaiteriteri in the last five years.

LoS 8 – WSPs are in place, approved and being implemented for each water supply.

- Kaiteriteri/Riwaka has an approved WSP.

LoS 9 – Urban water supplies meet fire fighting standards.

- Kaiteriteri meets fire fighting standards.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Kaiteriteri does not have a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Kaiteriteri has sufficient storage.

B.2.8.5 Asset Condition Overview

The condition of most of the pipework in the system is good. There are no known specific condition concerns in the assets. Most of the infrastructure is of an age where condition problems are not expected and inspections by council staff, maintenance contractors and consultants have not identified any specific problems except upgrading required to the pumping station surrounds.

B.2.8.6 Water Quality and DWSNZ Compliance

Required sampling - Kaiteriteri has a permanent population of approximately 300 people, making it a ‘small’ supply (100 to 500 people) in terms of the DWSNZ. During the summer, when the population increases, the monitoring increases to comply with the scheme being a ‘minor’ supply (500-5,000 people).

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are ‘Criteria 1’ for plant samples and ‘Criteria 6A’ for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone during most of the year:

- 13 samples per quarter from the plant with a maximum of 13 days between samples and five different days of the week used
- three samples from the zone, with a maximum of 45 days between samples and two different days of the week used.

During the peak summer period, monitoring increases at the treatment plant to twice a week and in the zone to once a week to comply in line with the population size increase.

Historical results - Between July 2006 and June 2011, 95 samples were taken from the zone with no transgressions. One hundred and eighty nine were taken from the plant, with one transgression in 2010 of an unknown origin.

B.2.8.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater:

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Kaiteriteri	GW	One bore in Riwaka.	NN000255	26/07/2000	31/05/2015

B.2.8.8 Current and Future Demands

Four of the metered connections are in the Kaiteriteri Camp. These experience extremely high usage in the summer months from an influx of tourists to the area. The daily water use is shown in Table B-17 below.

Table B-15: Current Demand of Kaiteriteri Water Supply

Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
1,840	468	192	338	842

Plans are to develop an additional bore in the vicinity of the existing supply on River Road in Riwaka as part of the treatment upgrade to improve security of supply. There are no issues with meeting future demand as only 28 new connections are predicted within the next 20 years. Significant growth is expected beyond the 20 year horizon however.

B.2.8.9 Strategic Studies

The key strategic study which has been undertaken to date for the Kaiteriteri water supply system is as follows:

- Water Demand Management Plan for the Tasman District – September 2011.

B.2.8.10 Strategic Approach

The key issue for Kaiteriteri is the water supply does not meet DWSNZ. The strategic approach is to upgrade the treatment plant with pH correction.

Table B-16: Register of Assets for Kaiteriteri Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
Kaiteriteri	1 Bore – River Road Water Permit = 1840m^3/day	River Road Well Goulds 8N 120-5 37 kW Kaiteriteri High Level Booster Pump Station Lowara SV16-06 5.5kW Kaiteriteri Lower Booster Pump Station 2 x Grundfos Premier 100x65x25 37 KW	No treatment is carried out.	Main Reservoir 700m^3 High Level Reservoir 200m^3	**Water Mains**	15mm	364m	Fire Hydrants	69
						20mm	1,719m	Valves	147
						25mm	2,764m	Water meters	587
						40mm	1,252m		
						50mm	863m		
						100mm	3,306m		
						150mm	5,627m		
						175mm	6,038m		
						200mm	1,305m		
						Total	**23239m**		

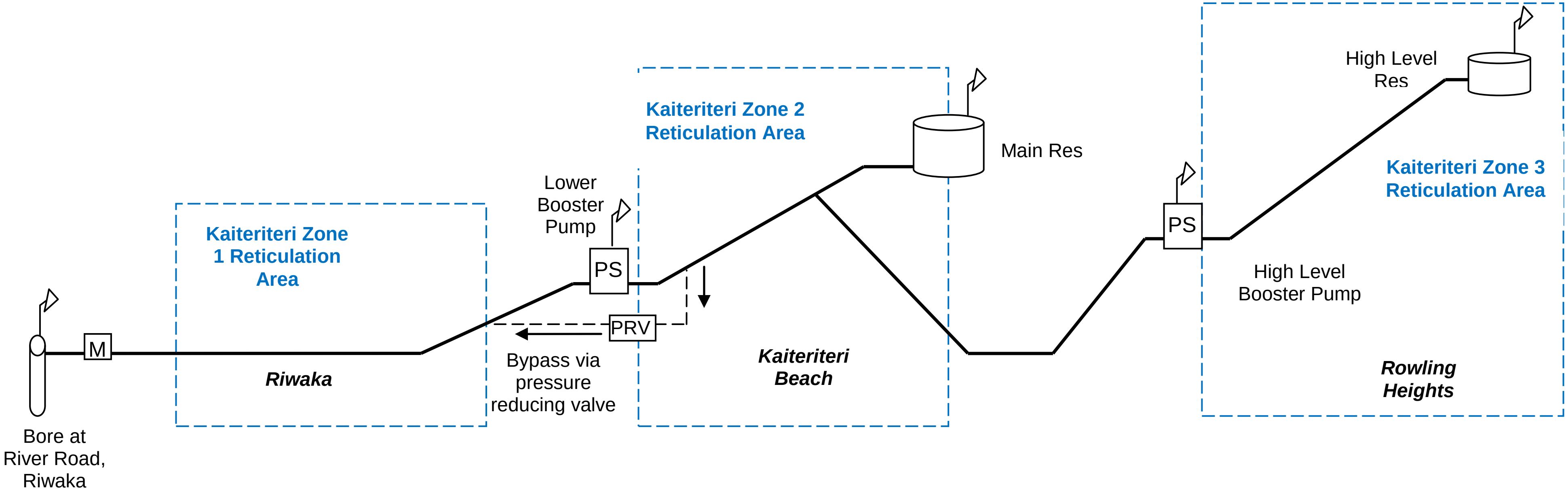


Figure B-16: Kaiteriteri Water Scheme Schematic

B.2.9. Collingwood Water Supply

B.2.9.1 System Description

The Collingwood water supply was constructed in 2003 and opened in January 2004. A shallow bore situated beside the Aorere River supplies water for the Collingwood water supply. The bore is located about 3km south of Collingwood off the end of Swamp Road. The groundwater source is considered unsecure because the bore is less than 10m deep and the bore head is subject to flooding of the Aorere River. A stout rail fence keeps stock away from the bore head and the pump controls are elevated above the 50 year flood plain.

There are 105 metered connections (June 2014) and one small rural extension at the end of Beach Road. The estimated population of Collingwood is approximately 250 people.

B.2.9.2 System Operation Overview

The system comprises:

- bore and submersible bore pump
- treatment plant consisting of aeration and lime correction
- two contact tanks
- two high lift pumps
- reservoir.

The bore pump transfers water to the treatment plant just south of the township. From the treatment plant, the water is pumped to the top of an aeration tower where it flows into a lime saturation tank. From there it overflows into two contact tanks. High lift pumps extract water from the tanks and pump it into the reservoir through a rising main. The town reticulation also feeds off the rising main.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.2.9.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from the Vulnerability Assessment as critical.

B.2.9.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for Collingwood.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There has been one non-compliance for Collingwood in the last five years.

LoS 8 – WSPs are in place, approved and being implemented for each water supply.

- Collingwood has an approved WSP.

LoS 9 – Urban water supplies meet fire fighting standards.

- The vast majority of Collingwood meets fire fighting standards except for the south end of Beach Road and the high area around Swiftsure Street.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Collingwood does not have a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Collingwood has sufficient storage.

B.2.9.5 Asset Condition Overview

Since the water supply for Collingwood has only recently been commissioned the assets are in excellent condition. The water supply scheme was designed to meet the needs of the community including the demands of any future growth.

B.2.9.6 Water Quality and DWSNZ Compliance

Required sampling - Collingwood supplies approximately 250 people, making it a 'small' supply (between 100 and 500 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are 'Criteria 2B' for plant samples and 'Criteria 6A' for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone:

- three samples per quarter in the zone with a maximum of 45 days between samples and two different days of the week used
- seven samples per quarter in the plant with a maximum of 22 days between samples and three different days of the week used.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 13 samples per quarter
- maximum of 11 days between samples
- five different days of the week used.

The treatment plant also has an online turbidity, pH and chlorine analyser.

Historical results - Between July 2006 and June 2011, 66 samples were taken from the zone with one transgression in 2007. Eighty six samples were taken from the plant with no transgressions.

B.2.9.7 Resource Consents

There is a resource consent in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Collingwood	GW	One bore close to Aorere River, NW of township.	NN020325	30/10/2002	31/05/2019

A consent also exists for associated scheme structures, including a pipeline and a slab ford in a riverbed.

Scheme	Consent Type	Consent No.	Date Granted	Date Expiry
Collingwood	Construct and maintain a pipeline in the bed of a watercourse.	RM030480	04/06/2003	31/05/2019

B.2.9.8 Current and Future Demands

Although solid growth is predicted for Collingwood, the supply is designed to meet present and future demands. The daily water use is shown in Table B-19 below.

Table B-17: Current Demand of Collingwood Water Supply

Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
400	91	57	62	230

B.2.9.9 Strategic Studies

Two key strategic studies have been undertaken to date for the Collingwood water supply system, these are as follows:

- Water Demand Management Plan for the Tasman District – September 2011
- Leak detection monitoring in May 2011.

B.2.9.10 Strategic Approach

The key issues for the Collingwood urban water supply are:

- The Water Treatment Plant does not meet DWSNZ.

The strategic approaches to these issues are:

- Treatment Plant to be upgraded to meet DWSNZ.

Table B-18: Register of Assets for Collingwood Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
Collingwood	1 Bore – besides the Aorere River Water Permit = 400m^3/day	Collingwood Bore Grundfos SP46-3 5.5 kW Collingwood PS 2 Grundfos CR 32-5 11 kW	Aeration Lime Saturator for pH correction. Gas chlorination Turbidity measurement Chlorine measurement, pH measurement.	Collingwood Reservoir 285m^3	**Water Mains**	15mm	117m	Fire Hydrants	36
						20mm	431m	Meter	210
						25mm	1,062m	Valves	64
						40mm	653m		
						50mm	2,823m		
						80mm	9m		
						100mm	2,099m		
						150mm	6,855m		
						Total	**14,050m**		

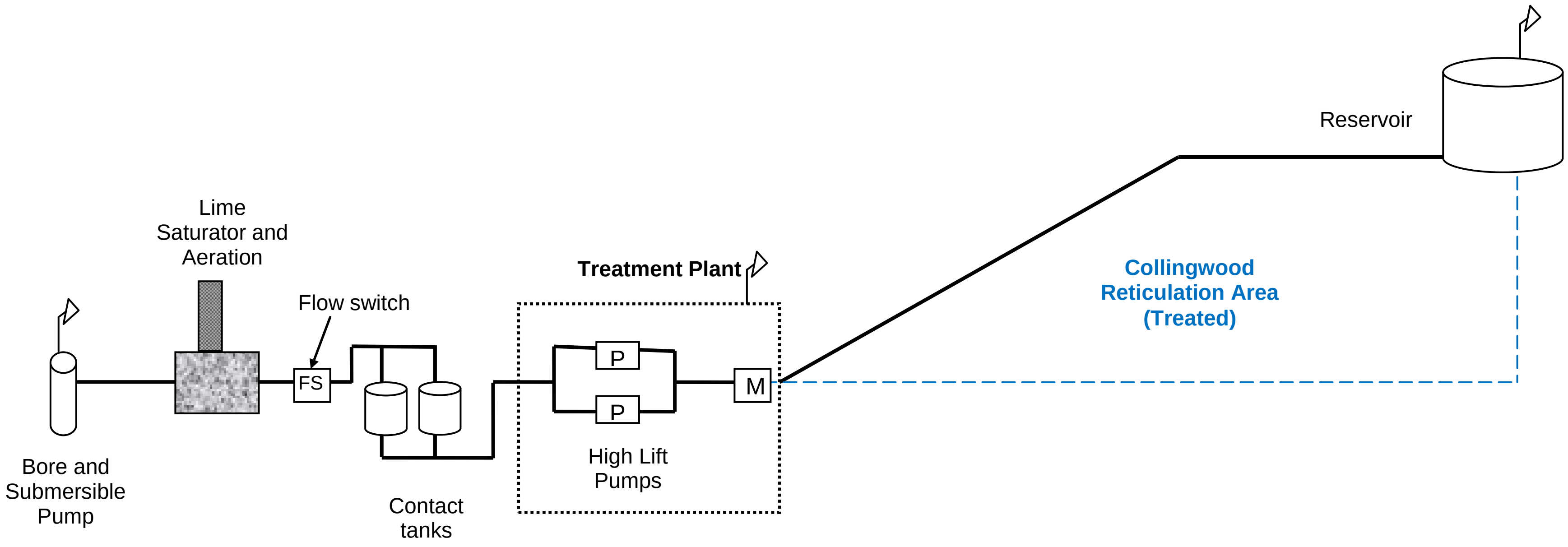


Figure B-17: Collingwood Water Scheme Schematic

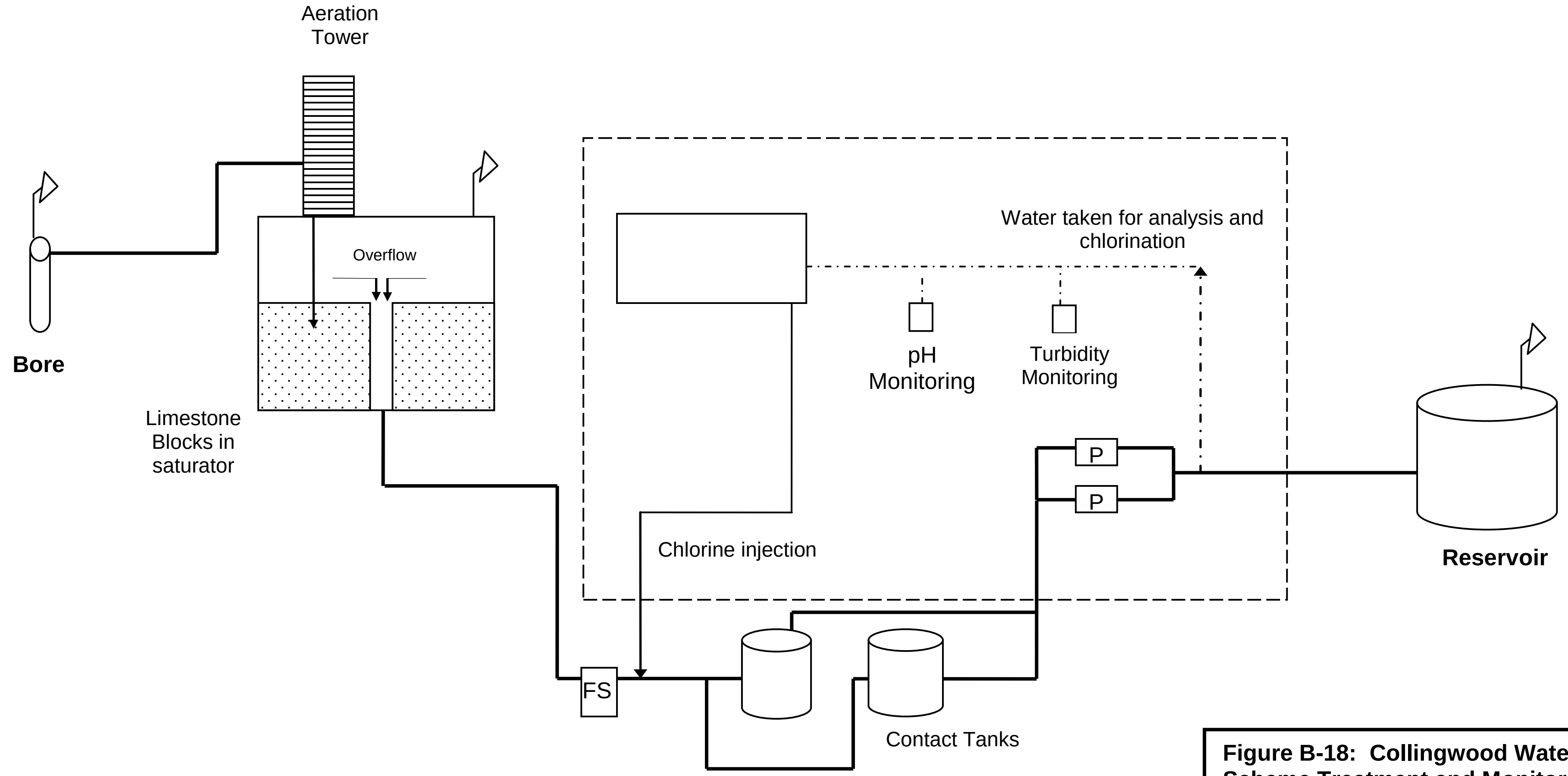


Figure B-18: Collingwood Water Scheme Treatment and Monitoring Detail

B.3 Rural Water Supplies

B.3.1. 88 Valley Rural Water Supply

B.3.1.1 System Description

The 88 Valley Rural Water Supply's source is an un-named stream locally known as Parkes Stream which is a tributary of the 88 Valley Stream. The intake is located in native bush in DoC administered land at a level of 230m above sea level. Water flows from this source by gravity to a reservoir (4 x 30,000 litre plastic tanks).

The 88 Valley Rural Water Supply serves the rural area from Parkes Stream (close to Wakefield) to Mt Heslington (mainly lifestyle blocks) further north (close to Brightwater).

The Waimea County Council constructed the 88 Valley rural scheme in 1981 with assistance from local farmers/landowners.

There is a Management Committee made up of elected local representatives which assists Council with scheme administration and reports to the Engineering Services Committee.

There are no metered connections and 167 restricted rural connections (May 2014). Based on the restrictor numbers, the maximum population of 88 Valley is likely to be 400 people. Some of the restrictors are to rural farm tanks and do not supply domestic properties.

Four hundred and sixty three units of water have been allocated within the scheme, with each unit being $1m^3$/day. Eighty four consumers have one unit or less, 37 have two units and 46 connections are for more than two units. It is likely that most one unit connections are for domestic properties. Connections above two units are likely to be for agricultural use.

B.3.1.2 System Operation Overview

The scheme comprises:

- stream intake
- chlorination at a small treatment plant reservoir.

The chlorination dosing system was upgraded in 2003 to a flow proportional system and moved to a more convenient location (with power) at a farm property known as Wantwood. This site does not yet have telemetry.

Apart from the chlorine dosing system, the scheme is a total gravity system with no pumps. Most of the reticulation is on private property.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.3.1.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from the Vulnerability Assessment as critical.

B.3.1.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for 88 Valley.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been two bacteriological non-compliances for 88 Valley plant in the last five years.

LoS 8 – WSPs are in place, approved and being implemented for each water supply.

- 88 Valley does not have an approved WSP.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- 88 Valley does not have a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- 88 Valley has sufficient storage for a rural supply.

B.3.1.5 Asset Condition Overview

The scheme assets are generally in good condition. The intake and pipe have been subjected to storm damage on several occasions and are repaired as necessary. There are no known issues with leakage, although as most of the pipes are through private rural land, leaks may go unnoticed for a long time.

B.3.1.6 Water Quality and DWSNZ Compliance

Required sampling – 88 Valley supplies approximately 400 people, making it a 'small' supply (between 500 and 5,000 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are 'Criteria 2B' for plant samples and 'Criteria 6A' for the distribution. These require as a minimum, the following sampling to be carried out at the plant and zone:

- three samples per quarter in the zone with a maximum of 45 days between samples and two different days of the week used
- seven samples per quarter in the plant with a maximum of 22 days between samples and three different days of the week used.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 13 samples per quarter
- maximum of 11 days between samples
- five different days of the week used.

The treatment plant has a turbidity, pH and chlorine analyser, however the treatment plant does not currently have telemetry.

Historical results - Between July 2006 and June 2011, 61 samples were taken from the zone, with no transgressions. Ninety one samples were taken from the plant with two transgressions.

B.3.1.7 Resource Consents

There are resource consents in place for the taking of surface water.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
88 Valley	SW	Parkes Stream (tributary of 88 Valley Stream).	RM041343 RM100828	02/12/2009 12/12/2010	30/11/2044 31/05/2016

A land use consent also exists for the existence, operation and maintenance of an existing weir, intake and pipeline in the bed of Parkes Stream.

Scheme	Consent Type	Consent No.	Date Granted	Date Expiry
88 Valley	Land use	RM061023	02/12/2009	30/11/2044

B.3.1.8 Current and Future Demands

As the scheme has only restricted connections, the demand is fairly steady across the day/week timescale. The winter demand is much less than the summer demand due to the large proportion of water being used for agricultural purposes. When assessing restricted connection use, a figure of 80% usage of each unit is generally applied. Therefore, whilst 463 units have been sold, a normal usage of only 370 is expected (as can be seen by the average summer demand). During drought conditions, however, the agricultural and lifestyle properties are expected to take their full allocation.

The scheme is fully allocated in terms of connections available and there is a waiting list of properties wishing to connect. New connections can only be made where already purchased units are split, usually during subdivision (eg. two units to one consumer split to supply one unit each to two consumers). There will be no future demand on the system as the water permit cannot be increased beyond 470 m^3/d. There are occasional supply difficulties in drought conditions where the scheme is running at full capacity. The daily water use is shown in Table B-21 below.

Table B-19: Current Demand of 88 Valley Water Supply

Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
470	367	280	325	453

There are plans to reduce the demands on the scheme in the future by supplying an area of the scheme with water from the Wakefield supply when the new source and treatment plant is constructed for this scheme. This may involve construction of new reservoirs and/or pump stations.

B.3.1.9 Strategic Studies

The key strategic studies within this water supply area are.

- Water Demand Management Plan for the Tasman district – September 2011.

B.3.1.10 Strategic Approach

The issues facing 88 Valley are.

- No new connections are allowed due to insufficient storage.
- Water quality does not comply with DWSNZ:2005 (Revised 2008) and to upgrade it to meet the standards would be expensive.
- The users of the water supply prefer to keep it simple and low cost and will resist proposals to install expensive treatment.

- The rural-residential growth south west of Wakefield is partially within the 88 Valley water supply area but cannot be supplied from 88 Valley. Therefore Wakefield and 88 Valley water supplies may in the future overlap.

The strategic approaches to these issues for 88 Valley are to.

- Depending on the strategic review for Wakefield, an upgrade of the water treatment to meet DWSNZ will be necessary. This will need to be worked through with the 88 Valley Rural Water Supply Committee.
- In the interim implement a 'boil water notice'.

Table B-20: Register of Assets for 88 Valley Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets
88 Valley	Parkes Stream Water Permit = 470m^3/day	No pumps	Coarse Strainer at Meter Gas chlorination Chlorine Measurement	88 Valley Reservoir 4 x 30,000litre plastic tanks	Water Mains	15mm	344m	Valves 60 Restrictors 167
						20mm	19,625m	
						25mm	16,399m	
						32mm	271m	
						40mm	6,184m	
						50mm	4,682m	
						80mm	5,722m	
						100mm	4,199m	
						125mm	2,169m	
						150mm	144m	
						Total	**59,739m**	

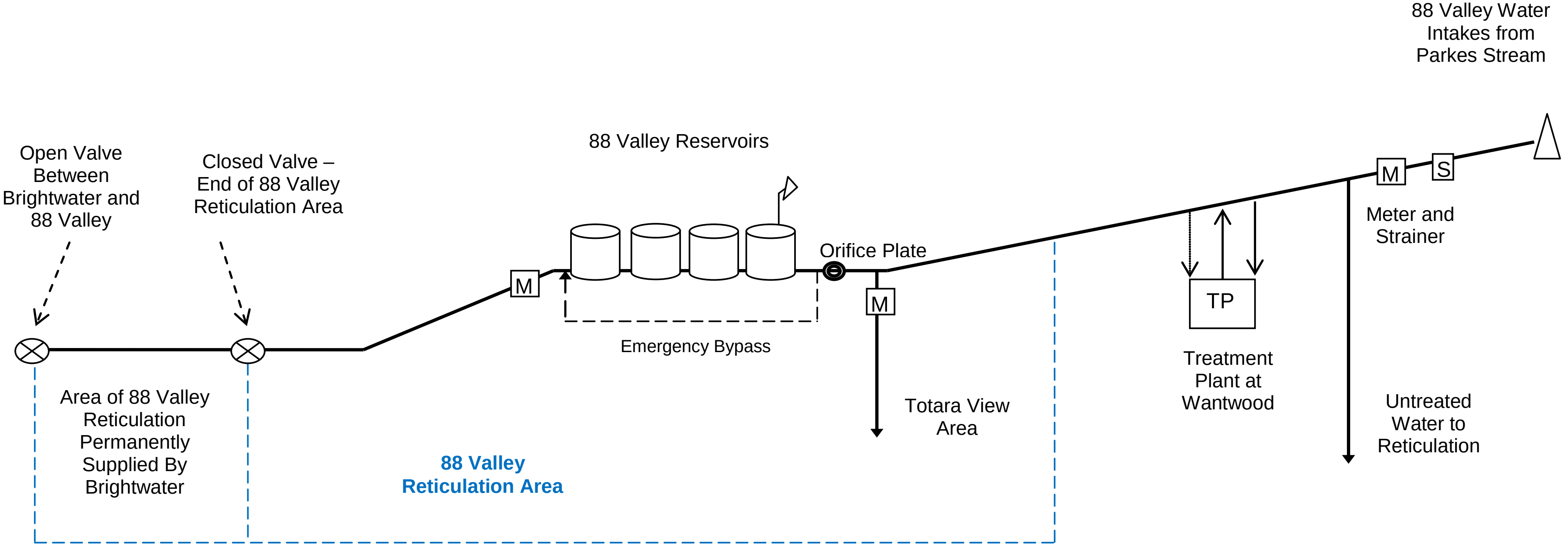


Figure B-19: 88 Valley Rural Water Scheme Schematic

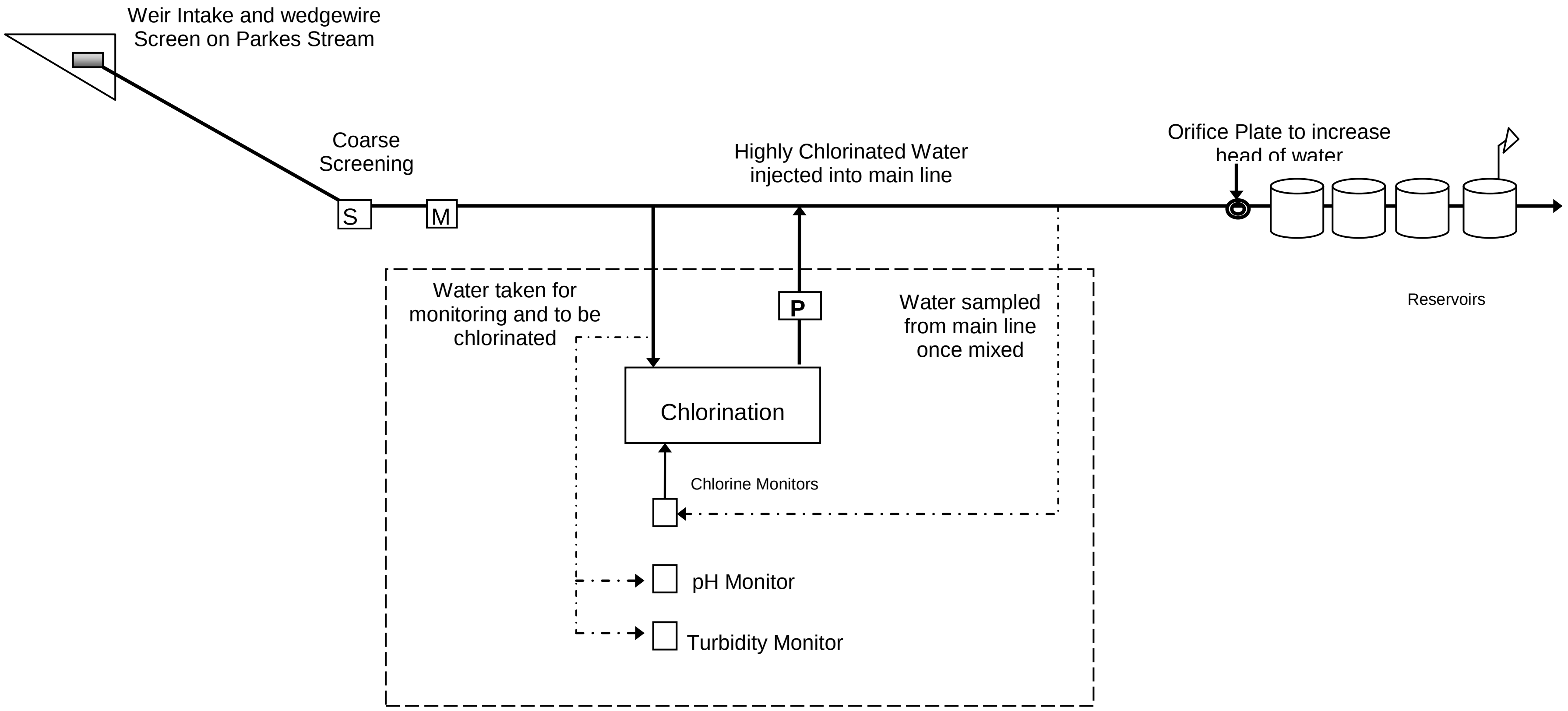


Figure B-20: 88 Valley Rural Water Scheme Treatment and Monitoring Detail

B.3.2. Dovedale Water Supply

B.3.2.1 System Description

The Dovedale Rural Water Supply is obtained from Humphries Creek, a tributary of the Dove River. There are two intakes on the stream - the ‘upper intake’ located close to the headwater of the stream and the ‘lower intake’ located fairly close to the confluence with the Dove River. The lower intake is only used during peak summer demand.

The Dovedale rural water supply covers an area of approximately 140km^2, supplying properties in the Dovedale, Rosedale and Upper Moutere areas. The physical relief of the area is made up of deep valley systems flanked by high steep ridges and spurs. By necessity, many of the supply points to farm tanks are along the ridges and spurs while many of the domestic connections to houses are on the valley floors.

The scheme was constructed in 1977 as a community supply with a 1:1 government subsidy, available at the time for providing water for farming use. Since this time, the scheme has expanded greatly. There is a Management Committee made up of elected local representatives which assists Council with scheme administration and reports to the Engineering Services Committee.

There are no metered connections and 296 restricted rural connections (May 2014). As many of the connections are to rural farm tanks, with a few also to commercial properties (jam making factory, churches, fire service, shops etc) the number of connections is not in direct relation to the estimated supplied population. The estimated population of Dovedale is approximately 450-500 people.

A permanent boil water notice is in place for the scheme and has been since 1989. This is due to the poor quality of the source water (high turbidity), especially during heavy rain.

B.3.2.2 System Operation Overview

The scheme comprises:

- two stream intakes on Humphries Creek
- sedimentation tank (upper intake only)
- treatment plant with high pressure chlorine injection
- gravity flow to Thorn’s Reservoir
- other pumping stations in Dovedale Basin
- pump to Silcock’s Reservoir.
- supply via break pressure tank to Upper Moutere area.

From the upper intake, water is partially settled before it flows down towards the treatment plant on the Dovedale-Thorpe Road. When the lower intake is in use, water from this source is pumped into the main line at the treatment plant.

To disinfect the supply, a small amount of water is taken from the raw water line, chlorinated to a high level and injected back into the line. As the intake is at such a high elevation, water is able to be supplied from the intake, several kilometers to the east to Thorn’s Reservoir by gravity alone.

The reticulation has a series of small pumps which boost water up valleys to storage tanks via a rising/falling main which supplies consumers en route. The smaller pumps are operated on timers and there are ball valves at the inlet to each storage tank which close when the reservoir is full causing the pumps to switch off on pressure.

There are two main reservoirs – Thorns (240 m^3) and Silcocks (68 m^3), four booster pump tanks – Wins (27 m^3), Knotts (14 m^3), Lower Tehepe (36 m^3), Upper Tehepe (14 m^3) in the Dovedale supply with a total of 400 m^3 storage. There are also two settlement tanks and six break pressure tanks. This is equivalent to a total of 10 hours storage.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.3.2.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from the Vulnerability Assessment as critical.

B.3.2.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for Dovedale.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been 14 bacteriological transgressions for the Dovedale supply in the last five years.

LoS 8 – WSPs are in place, approved and being implemented for each water supply.

- Dovedale does not have an approved WSP.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Dovedale does not have a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Dovedale has sufficient storage for a rural supply.

B.3.2.5 Asset Condition Overview

The majority of the reticulation in the Dovedale scheme is unreliable. There have been continual problems with PVC pipe joints and splitting of polythene pipes ever since the scheme was constructed. The main reason for polythene failure is degradation of the material, which becomes brittle with time. Some of the larger diameter pipes were constructed in AC and there have also been problems with these pipes. There is on-going pipeline renewal.

B.3.2.6 Water Quality and DWSNZ Compliance

Required sampling - Dovedale supplies approximately 450 people, making it a ‘’small’ supply (<500 people) in terms of the DWSNZ.

Even though the scheme has a permanent boil water notice in place as a precaution, it is operated and monitored as a normal supply. The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that is currently used is ‘Criteria 2B’ for plant samples and ‘Criteria 6A’ for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone:

- three samples per quarter in the zone with a maximum of 45 days between samples and two different days of the week used
- seven samples per quarter in the plant with a maximum of 22 days between samples and three different days of the week used.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 13 samples per quarter
- maximum of 11 days between samples
- five different days of the week used.

The treatment plant has online turbidity, pH and chlorine analysers.

Historical results - Between July 2006 and June 2011, 90 samples were taken from the zone, with 11 transgressions. Ninety six samples were taken from the plant and three of these were transgressions.

B.3.2.7 Resource Consents

There are three resource consents in place for the taking of surface water and the use of land for associated structures.

Scheme	Source Locations/ Consent Detail	Consent No.	Date Granted	Date Expiry
Dovedale	Water take from Humphries Creek (tributary of the River Dove).	RM100114	14/03/2011	31/05/2033*
Dovedale	Water permit to dam Humphries Creek.	RM100116	14/03/2011	31/05/2033
Dovedale	Land use consent existence and maintenance of pipes and structures within riverbed.	RM100117	14/03/2011	31/05/2033

*has review condition in 2017

B.3.2.8 Current and Future Demands

The scheme was assessed as ‘fully allocated’ in 2005, when 90% of the units were sold, with no new units sold since. Each water unit within the Dovedale supply scheme equates to 2m^3 with 484 units sold.

When subdivisions occur within the water supply area, an existing water user can reallocate their units to new properties, and these units will be split. Whilst there is an official waiting list, should units ever be rescinded, it is a condition of the resource consent that they are not reallocated. The waiting list will only be activated if the scheme’s consented take increases (eg. if a new source is developed).

According to the most recent data available, there are 296 restricted rural connections (2014) currently being used. A figure of 80% usage is applied to restricted supplies to work out normal expected usage. Eighty percent of 484 units is 774m^3/day, which is lower than the average demand suggesting a higher proportion of agricultural/commercial use, illegal connections or a large amount of leakage. The daily water use is shown in Table B-23 below.

Table B-21: Current Demand of Dovedale Water Supply

Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
1,080	886	872	881	977

Water quantity is not sufficient at the high level intake in summer as flow diminishes. Due to groundwater recharge and some small tributaries the lower intake usually has a greater flow (but is of poorer quality). The lower intake is usually run for a maximum of three months each summer, however prolonged drought can result in further usage.

Development of a new source is required to be able to provide water to those on the waiting list and allow for growth in the area. A larger water volume has been allocated in the TRMP for a new groundwater supply close to the Motueka River.

B.3.2.9 Strategic Studies

Strategic studies which have been undertaken to date for the Dovedale water supply system include:

- Water Demand Management Plan for the Tasman district – September 2011.

B.3.2.10 Strategic Approach

The key issues with the Dovedale scheme are.

- Some of the rural water supply pipes are having high failure rates. Over such a large area, such failures and leaks can be very difficult to detect and it is expensive to do so.
- The water for Dovedale is abstracted from a surface water source and therefore the water quality is variable and does not meet DWSNZ. There has been a permanent ‘boil water notice’ in place since 1989.
- The system is effectively at capacity. In order to serve any new connections, reticulation upgrades are needed and additional source capacity is needed.

The strategic approaches to these issues are to.

- Undertake an affordability check to confirm whether a new source in Motueka Valley River is to be constructed.
- Install new treatment facilities to meet DWSNZ requirements on existing supply or on new supply.
- Continue to identify pipelines that require replacement and replace them as funds allow.
- If part of the supply area is transferred on to the ‘Coastal Pipeline’ scheme, these properties will be limited to 1.5m^3/day.

Table B-22: Register of Assets for Dovedale Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets
Dovedale	Humphries Creek Water Permit = 1080m^3/day	Humphries Creek PS Grundfos CR16-40 11kW Knots PS 2 x Lowara SV2-24 3kW Lower Tehepe PS 2 x Lowara SV4-24 4kW Upper Tehepe PS Pump 1 – Grundfos CP3-160 4hp Pump 2 – Lowara SV4-18 3kW Wins PS Pumps – Lowara SV8-16 7.5kW Thorns PS 2 x Grundfos CR30-160 22kW	Sedimentation Gas chlorination with residual control Chlorine Measurement Turbidity Measurement pH Measurement	H.L. Intake 6.8m^3 2 x 30m^3 L.L. Intake 2 x 30m^3 Reservoirs Knots Reservoir 25m^3 Lower Tehepe Reservoir 14m^3 Silcocks Reservoir 68m^3 Thorns Reservoir 8 x 30m^3 Upper Tehepe Reservoir 14m^3 Wins Reservoir 2x14m^3 Break Pressure Tanks Bensemanns BP Tank 9m^3 Beuke BP Tank 14m^3 Moores BP Tank 4.5m^3 Neudorf Hill BP Tank 23m^3 Rosedale Saddle BP Tank 4.5m^3 Rose Road BP Tank Blackbird Valley BP Tank 4.5m^3 Old House BP Tank 30m^3 Pump Stations Humphries Creek PS 5000 Gallo Knots PS 5000 Gallons Lower Tehepe PS 5000 Gallons Upper Tehepe PS 5000 Gallons Thorns PS 5000 Gallons Winns PS 5000 Gallons	Water Mains	15mm 20mm 25mm 32mm 40mm 50mm 65mm 80mm 100mm 125mm 150mm 175mm **Total**	1,033m 48,211m 37,143m 8,985m 15,452m 15,493m 11,169m 4,697m 2,485m 2,940m 7,895m 170m **155,674m**	Fire Hydrants 3 Valves 149 Restrictors 296

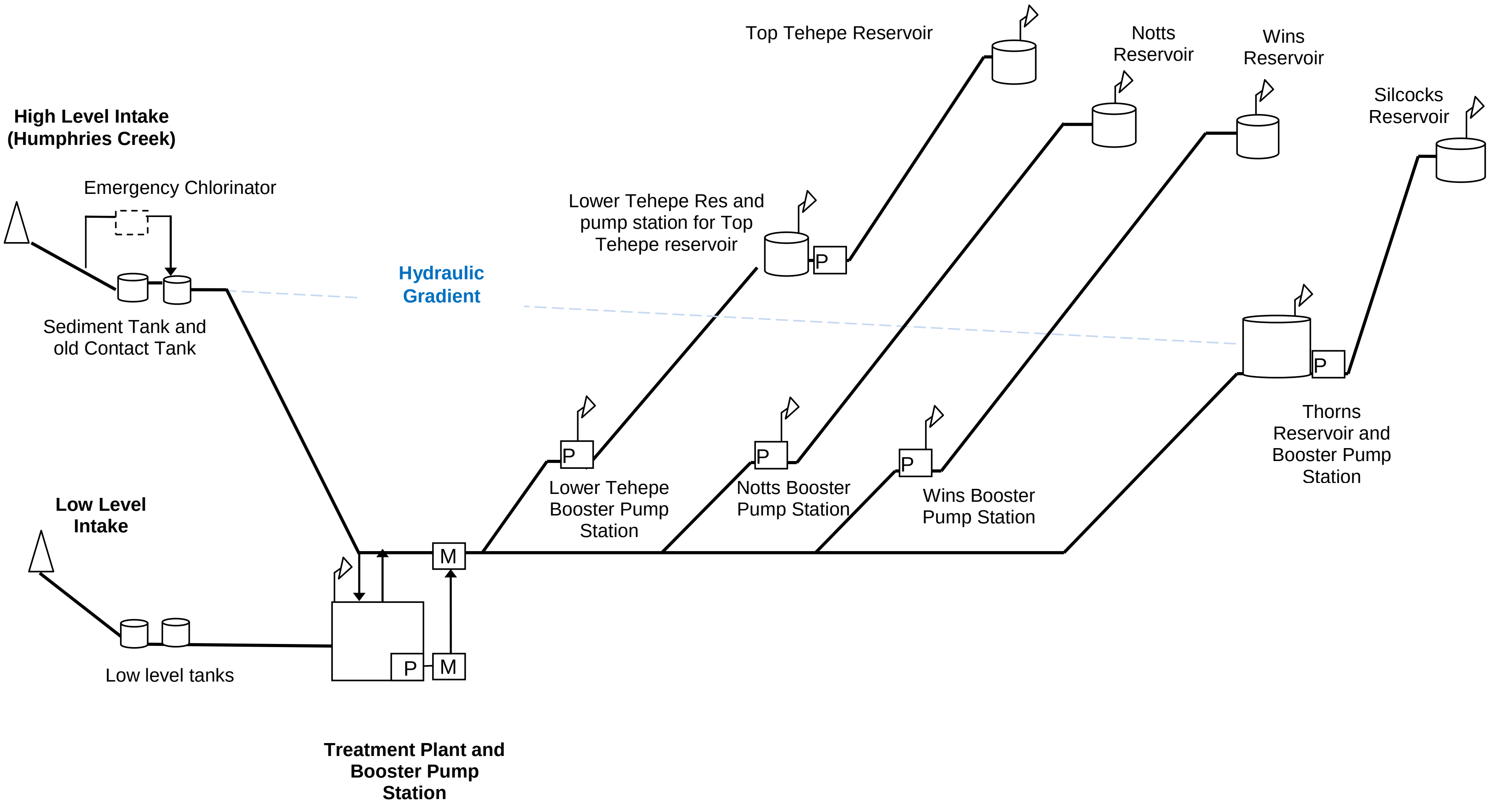


Figure B-21: Dovedale Rural Water Scheme Schematic

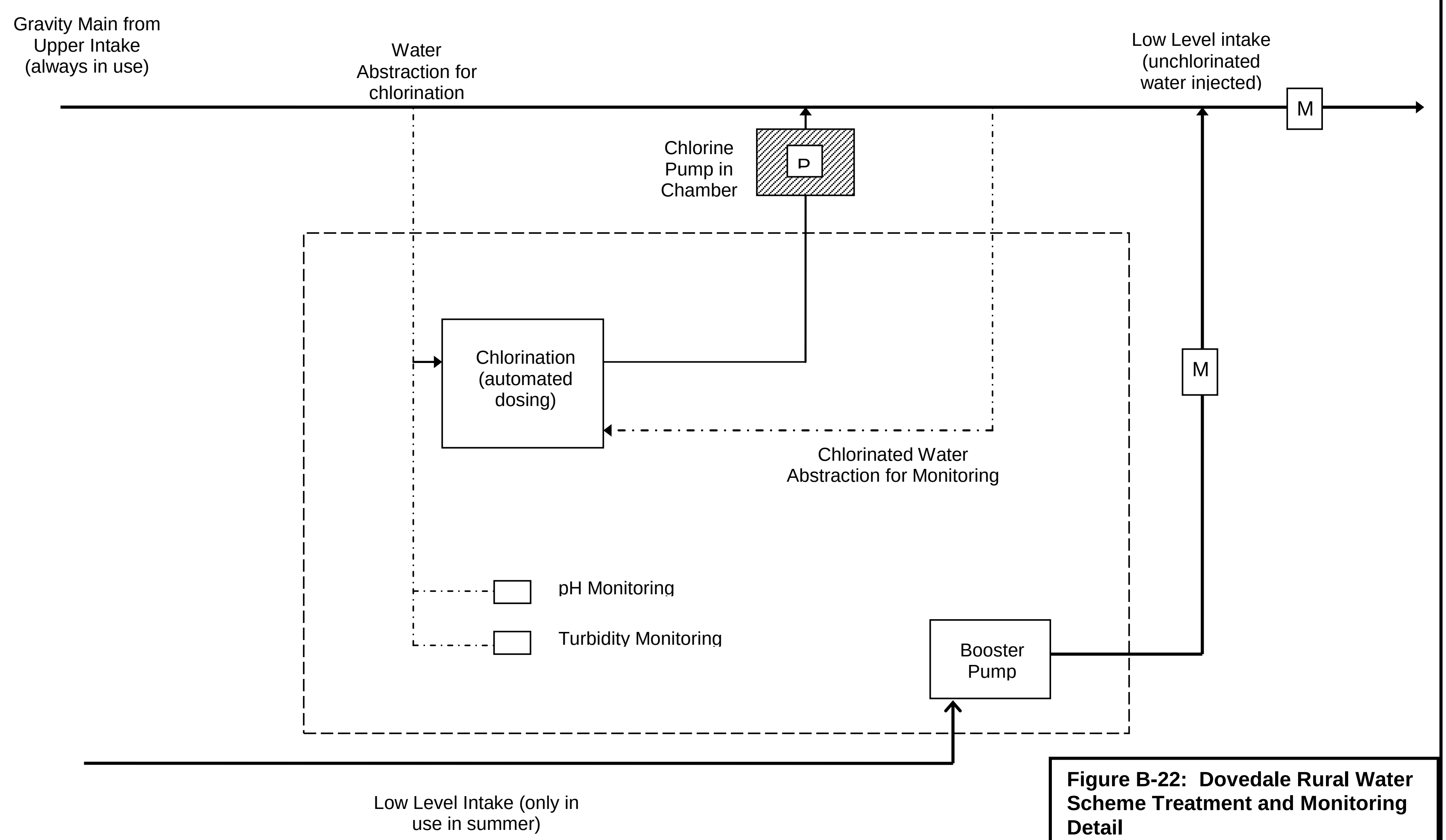


Figure B-22: Dovedale Rural Water Scheme Treatment and Monitoring Detail

B.3.3. Redwood Valley Water Supplies: Redwood Valley 1 and Redwood Valley 2

B.3.3.1 System Description

The Redwood Valley Rural Water Supply scheme service properties throughout the coastal hill country to the north west of Richmond.

The two schemes are linked via closed valves in the reticulation and they also share a source. Redwood Valley 1 services the inland Redwood Valley area between Eves Valley and Moutere Highway. Redwood Valley 2 services the coastal area between Moutere Highway and the coast. Most of the reticulation is on private property.

The Redwood Valley Water Supply Scheme originated when Waimea County Council took over and extended an existing farm scheme (owned by TNL). This mainly stock water scheme covered a large area of farmland that was subdivided into lifestyle properties. This farm scheme became Redwood Valley 1 in 1973 and was changed to a community water supply. As more sub development occurred in the area, Redwood Valley 2 was built closer to the coast in 1976 to provide water to this area separately.

Redwood Valley 1 takes water from a well at Golden Hills Road, where a treatment plant is located. Redwood Valley 2 takes water from two bores close to O'Connor Creek on the Coastal Highway, where a second treatment plant is located. A supplementary bore was installed at River Road in 1997. This bore supplies water to both Golden Hills Road and O'Connor Creek treatment plants where it is mixed with the on-site source waters during treatment.

The bores/well are considered unsecure because they are less than 10m deep.

There are no metered connections on either scheme, Redwood Valley 1 has 97 connections and Redwood Valley 2 has 265 (May 2014). Each unit in the Redwoods' scheme is $2m^3$. Not all of the connections within the schemes are to residential properties. Several are to vacant lots yet to be developed and many are to business /commercial /agricultural premises. The registered population of Redwood Valley 2 is 370 people and the registered population of Redwood Valley 1 is 180. This population should be re-assessed and re-registered if necessary.

There is a Management Committee made up of elected local representatives which assists Council with scheme administration and reports to the Engineering Services Committee.

B.3.3.2 System Operation Overview

Both Redwood Valley 1 and 2 systems comprise:

- well/bore pumps
- supplementary bore at River Road
- aeration towers
- chlorination
- contact tanks
- high lift pumps
- Redwood Valley 1 has two reservoir sites
- Redwood Valley 2 has one reservoir site (6 x $25m^3$ tanks).

Redwood Valley 1 has two pressure zones, a high level zone with a reservoir at a level of 239m (Top Reservoir) and a low level zone with a reservoir at a level of 163 m (Langs Reservoir). Redwood Valley 2 has a small high level pressure zone supplied by Maisey Road booster pump station to a small reservoir on the Moutere Highway.

The main pumps are controlled by reservoir level signals through the DATRAN control (telemetry). The smaller booster pumps are on timers and pressure switches.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.3.3.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from Vulnerability Assessment as critical.

B.3.3.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for Redwood Valley.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been no non-compliances for either Redwood Valley scheme in the last five years.

LoS 8 – WSPs are in place, approved and being implemented for each water supply.

- Neither Redwood Valley supply has an approved WSP.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Redwood Valley does not have a hydraulic model.

LoS 17 – Water supply systems have the necessary storage.

- Redwood Valley has sufficient storage for a rural supply.

B.3.3.5 Asset Condition Overview

Some of the reticulation in the Redwood Valley scheme is unreliable. Lang’s reservoir is in poor condition and is leaking. Repairs were undertaken in 2010 to reduce this leakage. This needs to be rebuilt and may be relocated due to access issues. The associated booster pump station should also be relocated due to access difficulties. Most of the infrastructure is of an age where condition problems are occasionally expected and inspections by Council staff, maintenance contractors and consultants have not identified any specific problems. As breaks occur pipelines are repaired and sections replaced. Some of the pipelines in the poorest condition have been renewed or upgraded. This programme is on-going as long as necessary.

B.3.3.6 Water Quality and DWSNZ Compliance

Required sampling – Both Redwood Valley supplies are small supplies (100 to 500 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone, to be sampled for *E.coli.* The compliance criteria that are currently used are ‘Criteria 2B’ for plant samples and ‘Criteria 6A’ for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone:

- three samples per quarter in the zone with a maximum of 45 days between samples and two different days of the week used
- seven samples per quarter in the plant with a maximum of 22 days between samples and three different days of the week used.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 13 samples per quarter
- maximum of 11 days between samples
- five different days of the week used.

The treatment plant has online turbidity, pH and chlorine analysers.

Historical results - Between July 2006 and June 2011, 62 and 63 samples were taken respectively from the Redwood Valley 1 and Redwood Valley 2 zones. Eighty six samples were taken from both plants. No transgressions were recorded.

B.3.3.7 Resource Consents

There are three resource consents in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Redwood Valley 1	GW	Golden Hills well.	NN970139	11/04/2002	31/05/2017
Redwood Valley 1 and 2	GW	River Road bore.	RM110193	15/07/2011	31/05/2017
Redwood Valley 2	GW	O'Connor Creek bore.	RM110191	15/07/2011	31/05/2017

A land use consent also exists for the construction, existence and continued maintenance of a pipeline in the bed of O'Connor Creek.

Scheme	Consent type	Consent No.	Date Granted	Date Expiry
Redwood Valley 2	Land use	RM041164	04/11/2004	31/05/2028

B.3.3.8 Current and Future Demands

According to the most recent data available, there are no metered connections and 363 restricted rural connections (rural restrictor billing information, May 2014) currently being used. The daily water use is shown in Table B-26 below.

Table B-23: Current Demand of Redwood Valley Water Supply

Source	Water Permit (m^3/d)	Average Summer demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
O'Connor Creek	350	537	396	457	364
Golden Hills	200	314	202	252	232
River Road	600	433	399	416	539
Total	1,150	1,284	997	1,125	1,135

The scheme is fully allocated in terms of connections available and there is a waiting list of properties wishing to connect. There will be no future demand on the system as the water permit cannot increase beyond the current permit.

A new bore has recently been added at O'Connor Creek to replace an old bore which has poor yield. This will allow this site to take more water (closer to its consented amount) and thus reduce the reliance on the River Road source. During dry summers the take from River Road was close to its consented amount, especially when rationing was in force.

B.3.3.9 Strategic Studies

The key strategic studies within this water supply area are.

- Redwood Valley Water Safety Plan
- Water Demand Management Plan for the Tasman district – September 2011.

B.3.3.10 Strategic Approach

Redwood Valley Rural Water Supply scheme faces a number of issues.

- The Redwood Valley Rural Water scheme extends over large areas in mostly small diameter pipes. Growth and connections to the scheme could never be forecast with certainty and while caution and control has been exercised, the development of the scheme has reached a point where there are supply problems especially in times of high demand.
- Some of the rural water supply pipes are having high failure rates. Over such a large area, such failures and leaks can be very difficult to detect and it is expensive to do so.
- Lack of capacity, therefore no new connections are allowed to the scheme.

The strategic approaches to these issues are to.

- Undertake an affordability check to confirm whether the treatment upgrade at O'Connor Creek and Golden Hills is feasible.
- If part of the supply area is transferred on to the 'Coastal Pipeline' scheme, these properties will be limited to 1.5m^3/day.

Table B-24: Register of Assets for Redwood Valley Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets
Redwoods Valley	Golden Hills well Water Permit = 200m^3/day O'Connor Creek wells Water Permit = 350m^3/day River Road well Water Permit = 600m^3/day	River Road well Lowara Z630/6 7.5kW O'Connor Creek wells Well 1 – Grundfos SP25-2 1.5kW Well 2 – Grundfos SP25-2 1.5kW O'Connor Creek PS 2 x Lowara SV30-09 1.5kW Golden Hills PS Pump 1 – Lowara DE4 (cora7-24/5) 7.5kW Pump 2 – Grundfos SP14A-5/4 1.5kW Highlift Pump 1 –Lowara SV1615F150 15kW Highlift Pump 2 – Grundfos CR16-140 15kW Redwood Booster PS 1 1 x Lowara SV4-20 F40T 4kW 1 x Lowara SV220 3kW Redwood Booster PS 2 – Maiseys Road 2 x Lowara SV212 1.5kW	Aeration for pH adjustment Gas Chlorination pH Measurement Chlorine Measurement Turbidity Measurement	Maisey Road Reservoirs 138m^3 Redwood H.L. Reservoir 23m^3 Redwood No1 Reservoir 36m^3 Redwood, Malling Road BP Tank 37m^3 Moutere Highway Reservoir 23m^3	Water Mains	15mm 20mm 25mm 32mm 40mm 50mm 65mm 80mm 100mm **Total**	256m 34,282m 16,797m 7,318m 10,375m 10,209m 689m 13,712m 4,062m **97,702m**	Valves 87 Restrictors 363

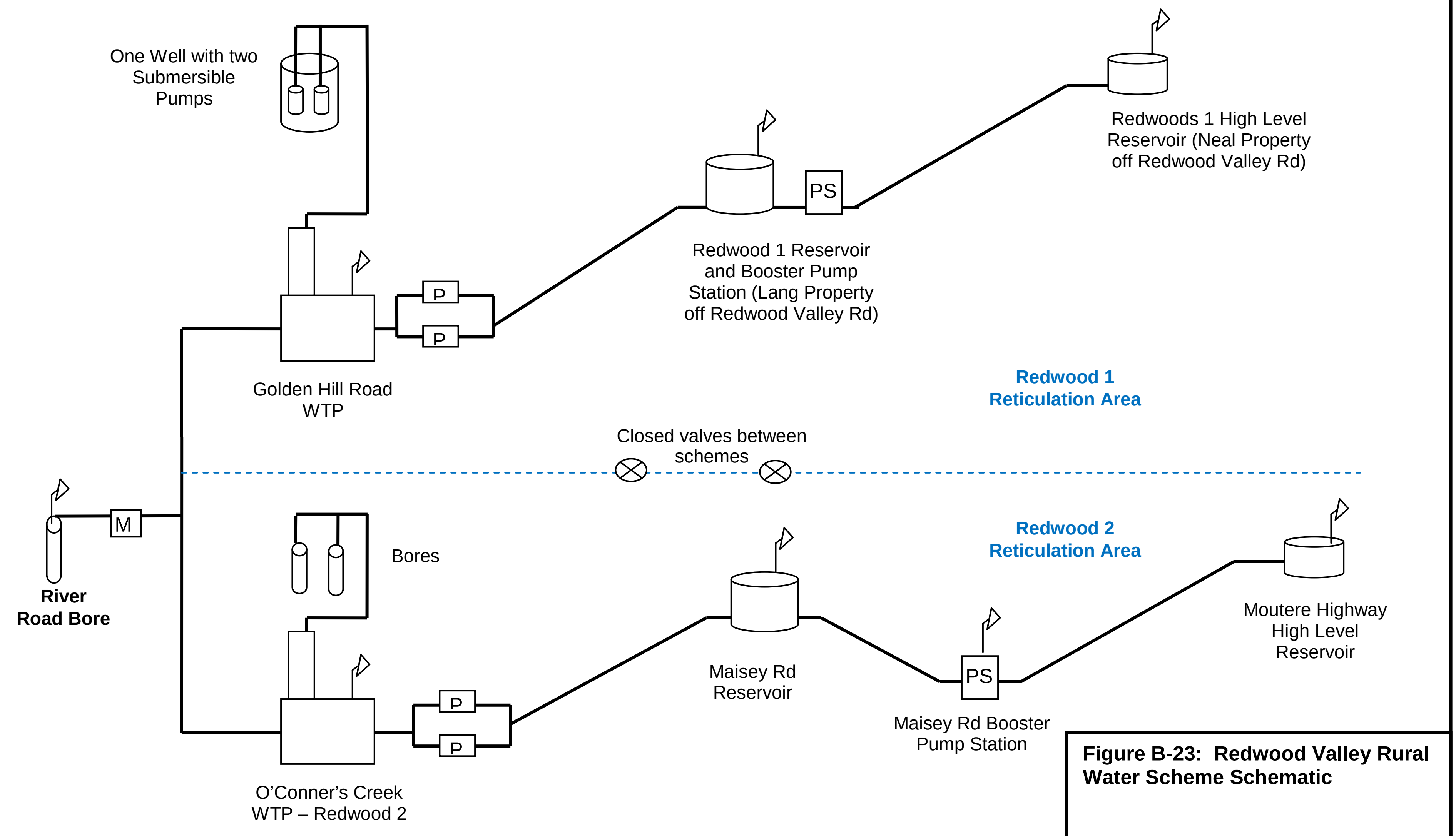


Figure B-23: Redwood Valley Rural Water Scheme Schematic

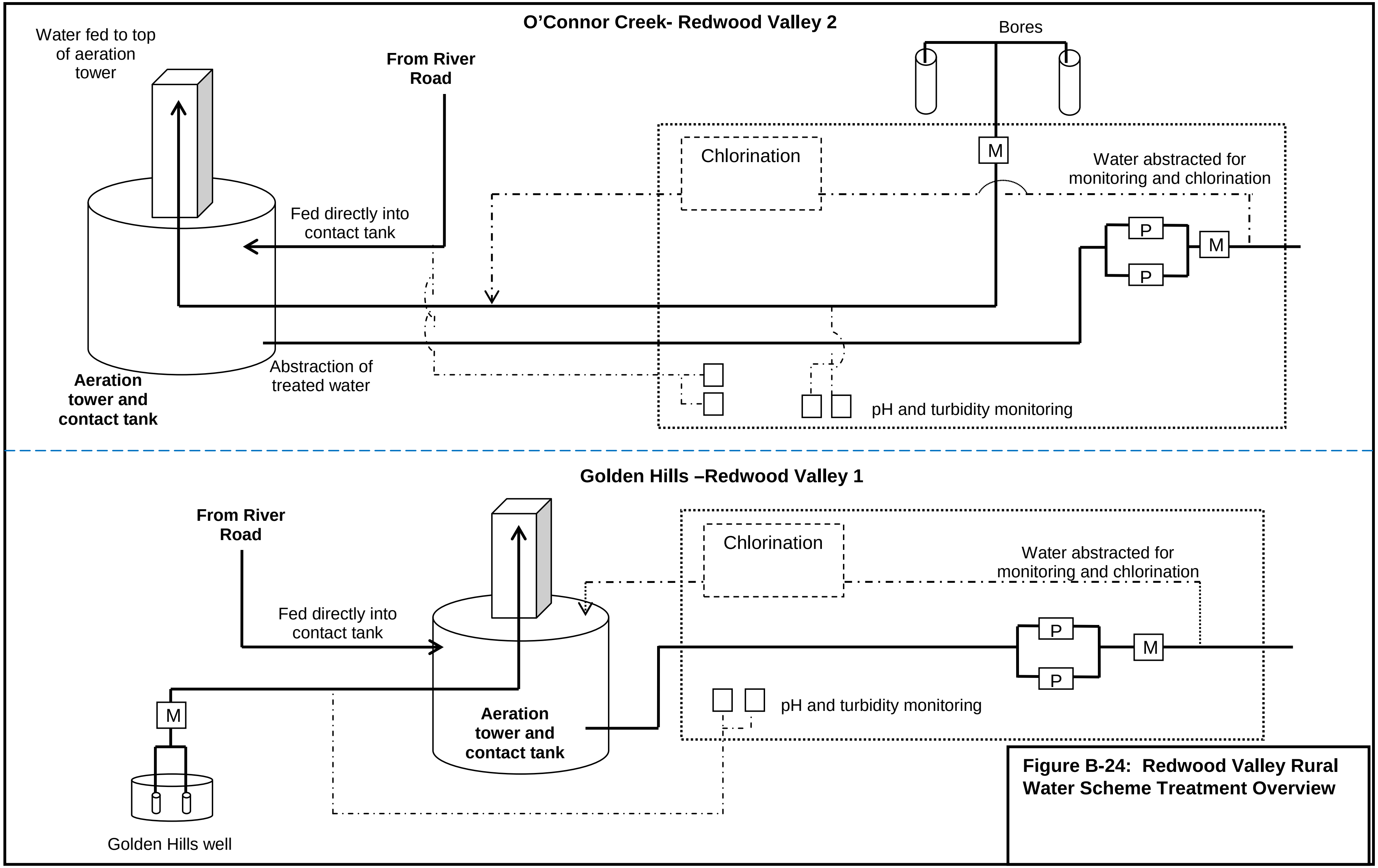


Figure B-24: Redwood Valley Rural Water Scheme Treatment Overview

B.4 Community Water Schemes

B.4.1. Motueka Water Supply

B.4.1.1 System Description

Motueka Township does not have a full urban water supply. Only parts of the urban area are reticulated and connection to this by consumers is voluntary. Where there is no reticulated water supply shallow private bores are generally used. Both hydrants on the schemes and firewells provide water for fire fighting. The supply is not treated, there is no storage and there are no rural extensions off the scheme.

The original water supply scheme, which supplied the port area, was built by the Motueka Harbour Board. The Waimea County Council took over the scheme in the 1960's and later extended it into the Motueka Borough via a bulk meter on Trewavas Street (at the Borough/County boundary).

The water is sourced from:

- a bore at the Fearon's Bush Motor Camp in Fearon Street
- a bore at the Recreation Centre in Old Wharf Road.

Whilst the bores are not considered secure they are more than 10m deep. Fearon's Bush bore is 15m deep with a casing starting at 11m and the Recreation Centre bore is 21.5m deep with a screen starting at 16m.

Motueka and Riwaka have approximately 50 fire wells and 70 fire pipes that have to be maintained for fire fighting purposes in areas where there is no reticulation.

A connection exists between the Tasman District Council main in Everett Street and Talley's supply from their well in High Street South. The link is installed with two shut valves, an RPZ backflow device and a meter. This connection enables flows to be supplied either way for emergencies only.

There are 907 metered connections (June 2014) and no restricted rural connections. The estimated population of Motueka is approximately 2,200 people.

B.4.1.2 System Operation Overview

The scheme comprises:

- two separate bores
- bore pumps
- an old contact tank at Fearon's Bush
- high lift pumps
- back-up generators at each bore site.

At Fearon's Bush there are two options for supply. One option is for the bore pump to pump water into an old contact tank from which high lift pumps extract the water and pump it into the reticulation. The other option is for the bore pump to bypass the tank and pump directly to the back of the high lifts, which then boost the flow into the reticulation. There are three high lift pumps: two large ones for normal daily operation and one small one which is on a timer and only comes on at night. This night pump is quieter and can maintain the smaller flow required at night more easily.

At the Recreation Centre there is one bore pump which supplies water directly from the bore into the reticulation.

During usual operation, the Fearon's Bush well operates during periods of normal demand, however when pressure drops below a set point the Recreation Centre well (which has a much larger capacity) switches on. This latter pump is variable speed and adjusts flow to suit demand. The system can also be run the other way round, with the Recreation Centre bore providing the primary flow and Fearon's Bush providing only emergency flows in the event of a pump failure or pipe breakage. Standby generators are installed at both Fearon's Bush and the Recreation Centre to ensure constant supply in the event of a power outage (as there is no water storage).

A schematic drawing is included at the end of this section.

B.4.1.3 Key Lifelines

The Nelson Tasman Engineering Lifelines report 2008, confirms there are no section of the network that have been identified from vulnerability assessment as critical.

B.4.2. B.3.3.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- A demand management plan is not in place for Motueka.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There have been nine bacteriological non-compliance events in Motueka in the last five years.

LoS 8 – WSPs are in place, approved and being implemented for each water supply.

- Motueka has an approved WSP.

LoS 13 – Hydraulic models are in place for key urban water supplies.

- Motueka has a hydraulic model.

B.4.2.1 Asset Condition Overview

The majority of pipeline in the Motueka supply is of poor quality with frequent mains failures. Some of the reticulation is Class B uPVC and is approximately 20 years old. There have been several problems relating to pipe breakages which are believed to be caused by low grade (Class B) pipe and the high surge pressures. This can arise when water is pumped into a closed system with no break pressure such as a tank or reservoir.

The Class B pipe is a limiting factor within the system. Areas suffering regular problems include High Street South, Fearon Street, Old Wharf Road, Thorpe Street and Central High Street.

There are issues with the water quality at the Fearon's Bush supply which started in October 2010. The supply was suspended and tests were continued to monitor the bacteria levels. The levels have continued to fluctuate and have not reached acceptable levels therefore it is unlikely it will be reconnected to the system without the development of a treatment plant.

B.4.2.2 Water Quality and DWSNZ Compliance

Required sampling - Motueka supplies approximately 2,200 people, making it a 'minor' supply (between 500 and 5,000 people) in terms of the DWSNZ.

The groundwater around Motueka is plentiful and of high quality. The shallow unconfined aquifers would not be defined as "secure" sources and therefore, require treatment to meet DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli*. The compliance criteria that are currently used are 'Criteria 1' for plant samples and 'Criteria 6A' for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone:

- at the plants, 26 samples per quarter with a maximum of five days between samples and six different days of the week used
- in the zone (two sample locations) 13 samples per quarter with a maximum of 11 days between samples and five different days of the week used.

The treatment plants have online turbidity and pH analysers.

Historical results - Between July 2006 and June 2011, 539 samples were taken from the zone. 11 of these were transgressions (eight separate occasions).

Two hundred and seventy two samples were taken from Fearon's Bush with no transgressions. Four hundred and thirty one samples were taken from the Recreation Centre with three transgressions recorded (one event).

B.4.2.3 Resource Consents

There are two resource consents in place for the abstraction of groundwater.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Motueka	GW	Recreation Centre bore Fearon's Bush bore.	NN000254 NN000256	23/06/2000 10/07/2000	31/05/2015 31/05/2015

B.4.2.4 Current and Future Demands

According to the most recent data available, there are 907 metered connections (30 June 2014). This equates to an estimated connected population of 2,200 on the Motueka scheme. The daily water use is shown in Table B-27 below

Table B-25: Current Demand of the Motueka Water Supply

Source	Water Permit (m^3/d)	Average Summer Demand (m^3/d)[1]	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)[2]	Maximum Daily Demand (m^3/d)[1]
Recreation Centre	3,500	222	26	125	460
Fearon's Bush	1,000	535	503	520	868
Total	**4,500**	**756**	**529**	**646**	**950**[3]

[1] Fearon's Bush supply was suspended from the start of October 2010 due to water quality issues, therefore normal summer data and maximum demand calculated from 2009/2010 summer

[2] Calculated Oct 2009 to Oct 2010

[3] Maximum demand at both sites does not occur on the same day. The total maximum usage is about 950m^3/day

The current Motueka water supply has limited ability to provide growth of the scheme. It does not have the capacity to serve the entire Motueka town.

It is anticipated that in 2033 the demand in Motueka, rural Motueka and Riwaka is as follows:

- average day demand – 3,937m^3/day
- peak day demand – 9,216m^3/day.

Tasman District Council are proposing a new Motueka scheme that will support the future demand in this area. This scheme will include a new source and a new treatment system.

B.4.2.5 Strategic Studies

Various strategic studies have been undertaken to date for the Motueka water supply system. These can provide reference and background information for developing the strategic approaches to be taken in the future.

- Motueka Town Water Supply Coastal Scheme Water Safety Plan - August 2009.
- Water Demand Management Plan for the Tasman District – September 2011.
- Motueka Coastal Community Water Supply Demand Projection – August 2011.

B.4.2.6 Strategic Approach

The key issues facing Motueka are:

- the town has a partial reticulation system which serves only 25% of the town
- there is no storage capacity in the current system
- the partial reticulation and fire wells provide limited fire fighting capability
- the current supply does not comply with DWSNZ
- medium population growth in the future.

The strategic approach to address these issues is:

- if Tasman District Council receives a subsidy and with consultation with the community a new source, treatment plan and network will be constructed to supply a larger area of the town
- if Tasman District Council does not receive a subsidy, consultation with the community is needed for developing a way forward to ensure compliance with DWSNZ is achieved.

Table B-26: Register of Assets for Motueka Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
Motueka	Bore – Fearon's Bush Motor Camp Water Permit = 1000m^3/day Bore – Recreation Centre, Old Wharf Road Water Permit = 3,500m^3/day	Fearon's Bush PS HLPump 1 Grundfos CR 16-50 5.5kw with Hydrovar VSD HL Pump 2 Lowara FHE40 15kw with Hydrovar VSD HL Pump 3 Lowara FHE40 15kw with Hydrovar VSD Fearon's Bush well Well Pump Goulds 7 TNHC 7.5 kw. Recreation Centre well (Old Wharf Road) Well Pump - Goulds 8N/120-4 40hp	No Treatment		Water Mains	12mm 15mm 20mm 25mm 32mm 40mm 50mm 80mm 100mm 150mm 155mm 200mm 225mm 300mm **Total**	12m 1,346m 751m 1,650m 219m 1,313m 10,935m 429m 2,779m 6,352m 534m 8,934m 570m 159m **35,983m**	Fire Hydrants Meter Valves	153 1066 312

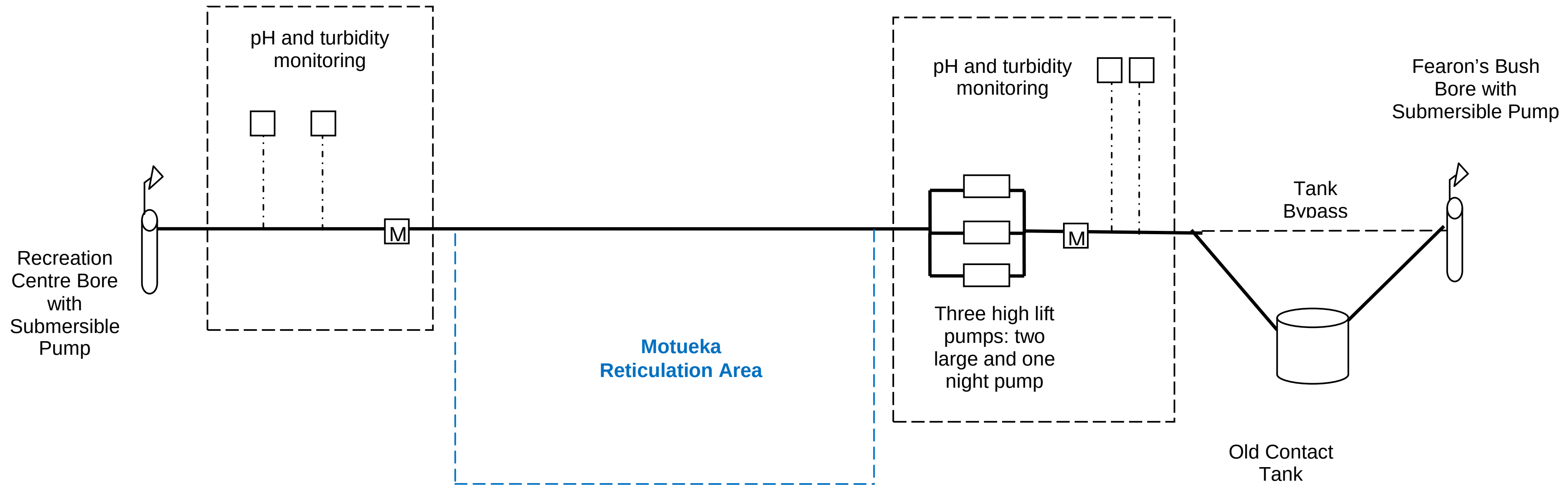


Figure B-25: Motueka Community Water Scheme Schematic and Monitoring Detail

B.4.3. Pohara Valley Water Supply

B.4.3.1 System Description

As of the 1 July 2012, the Pohara Valley water supply will be part of the Urban Water Supply group.

The Pohara Valley water supply is sourced from a surface intake at Winter Creek. This supplies water to residents in the Pohara Valley and also feeds the Pohara Camp to the west.

The Pohara Valley water supply was originally constructed by the Golden Bay Cement Company and taken over by Tasman District Council when the Golden Bay Cement Company ceased operations.

There are 49 metered connections (June 2014) and no restricted rural extension connections. The estimated population of Pohara is approximately 120 people, however as many houses in the area (possibly about 70%) are holiday homes/baches, the permanent population will be much less. The camping ground swells the population numbers using the scheme significantly in summer to over a thousand people.

Several kilometers of dry pipe have been laid in recent years to both the west and east of the current supply area in preparation for anticipated growth.

B.4.3.2 System Operation Overview

The scheme comprises:

- stream intake
- disc filter and multimedia filtration
- in line chlorination and contact tank
- high lift pump
- reservoirs (two 22m^3 plastic tanks and one 38m^3 concrete tank). Only the concrete tank is currently in general operation.

Most of the Pohara Valley reticulation is 100mm PVC mains with some hydrants. An 80mm galvanised pipe supplies water from the intake to the treatment plant with an 80mm motorised valve installed on the inlet, controlled by the level of the contact tank.

The high lift pump draws its water from the contact tank and supplies into the reticulation and on to the reservoirs. The high lift pump is controlled by the reservoir level via a control cable from the reservoir to the treatment plant.

Water quality in the scheme is generally poor. The raw water can become discoloured with high turbidity particularly during high stream flows. The current filtration is not fine enough to remove the very fine sediment that gets washed from the catchment during rain.

The small reservoir size means that during peak demand the filter is sometimes bypassed to increase the flow into the system. The reservoir filling system needs to be upgraded so that the full volume of the reservoirs can be better utilised. Currently, due to the elevation of the plastic reservoirs being much lower than the concrete reservoir, the two plastic reservoirs are not in use. This is because the extra height in the concrete reservoir is needed to supply an acceptable pressure to neighbouring properties.

A schematic drawing of the scheme and a treatment plant plan is included at the end of this section.

B.4.3.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from the Vulnerability Assessment as critical.

B.4.3.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management plan is in place for Pohara.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- There has been one bacteriological non-compliance in Pohara in the last five years.

LoS 8 – WSPs are in place, approved and being implemented for each water supply:

- Pohara does not have an approved WSP.

LoS 13 – Hydraulic models are in place for key urban water supplies:

- Pohara does not have a hydraulic model.

B.4.3.5 Asset Condition Overview

The condition of the pipework in the system is varies. Some was installed during subdivisions in the 1990, but a large part of the system is older and of poorer quality. There are not many breaks reported however, this is probably due to the low operating pressure of the system.

The intake pipeline is very poor quality and requires replacing.

B.4.3.6 Water Quality and DWSNZ Compliance

Required sampling – Pohara Valley supplies approximately 120 people making it a ‘small’ supply (100 to 500 people) in terms of the DWSNZ.

The DWSNZ requires water leaving the treatment plant and in the distribution zone to be sampled for *E.coli.* The compliance criteria that are currently used are ‘Criteria 2A’ for plant samples and ‘Criteria 6A’ for the distribution. These require, as a minimum, the following sampling to be carried out at the plant and zone:

- three samples per quarter in the zone, a maximum of 45 days apart and at least two days of the week used
- seven samples per quarter in the zone, a maximum of 22 days apart and at least three days of the week used.

As the scheme is chlorinated, the following manual chlorine, turbidity and pH measurements are also required as a minimum at the treatment plant:

- 13 samples per quarter
- maximum of 11 days between samples
- five different days of the week used.

Monitoring is increased during the peak summer period to comply with the increase in population. The treatment plant has no online analysers and is not connected to telemetry.

Historical results - Between July 2006 and June 2014, 100 samples were taken from the zone with one transgression. One hundred and twenty samples were taken from the plant with no transgressions.

B.4.3.7 Resource Consents

There is a resource consent in place for the abstraction of surface water:

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Pohara	SW	Winter Creek (flows into Golden Bay).	NN720010	30/04/1996	01/10/2026

B.4.3.8 Current and Future Demands

According to the most recent data available there are 49 metered connections. One of these connections is to the Pohara Camp. The camp connection experiences extremely high usage in the summer months from an influx of tourists to the area. The population estimate of approximately 120 people is closer to being accurate for the off peak times. The population and supply demand increases over the summer months.

Whilst the maximum day demand is not close to the consent limit, it is close to the scheme capacity, which is constrained by the reservoir capacity and the filtration unit capacity. The daily water use is shown in Table B-30 below.

Table B-27: Current Demand of Pohara Water Supply

Water Permit (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
550	203	169	192	282

Until a new town supply is constructed either at Pohara or extended from Takaka, no new connections will be permitted onto the existing Pohara water supply system.

B.4.3.9 Strategic Studies

The key strategic studies within this water supply area are:

- Water Demand Management Plan for the Tasman District – September 2011.

B.4.3.10 Strategic Approach

The key issues facing the Pohara scheme are.

- The scheme has a surface water source of poor quality and the limited treatment it receives does not meet DWSNZ.
- Not enough storage. The scheme struggles to meet demand during the summer.
- There is a large unmet water demand along the whole coast from Pohara Valley to Tata Beach. The existing source cannot meet this demand.
- Takaka has no public water supply but plentiful quality groundwater that could sustain a water scheme that services Takaka and the Pohara to Tata Beach demand.

The strategic approach to these issues is.

- Upgrade the treatment plant to meet DWSNZ standards (including better filtration and protozoa treatment).
- Increase the storage volume.
- Construct a new town supply from a groundwater source at Takaka. The new supply would feed Pohara and all coastal communities from Pohara Valley to Tata Beach.
- If the new town supply goes ahead, the existing WTP will become redundant. The timing of the new town supply dictates the necessity of upgrading the existing WTP.
- Implement a ‘boil water notice’.

Table B-28: Register of Assets for Pohara Water Supply Scheme

Scheme	Source	Pumps and Pump Station	Water Treatment	Storage	Reticulation			Other Assets	
Pohara	Stream Intake = 550 m^3/day	Pohara Valley pump station Lowara FHE 32 200/40 4kW	Coarse Screen Multi Media Filtration Gas Chlorination	Pohara Reservoir 2 x 22m^3 1 x 38m^3	Water Mains	15mm	247m	Fire Hydrants	16
						20mm	131m	Meter	49
						25mm	638m	Valves	21
						40mm	167m		
						50mm	14m		
						80mm	200m		
						100mm	4,758m		
						150mm	275m		
						Total	**6,431m**		

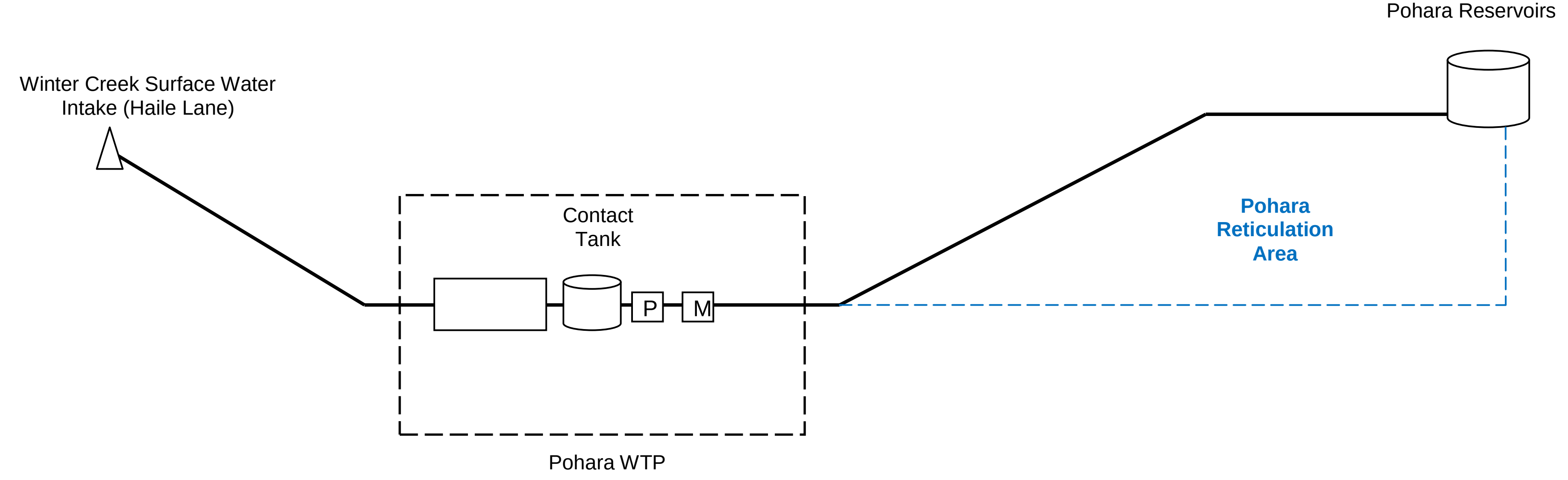


Figure B-26: Pohara Valley Community Water Scheme Schematic

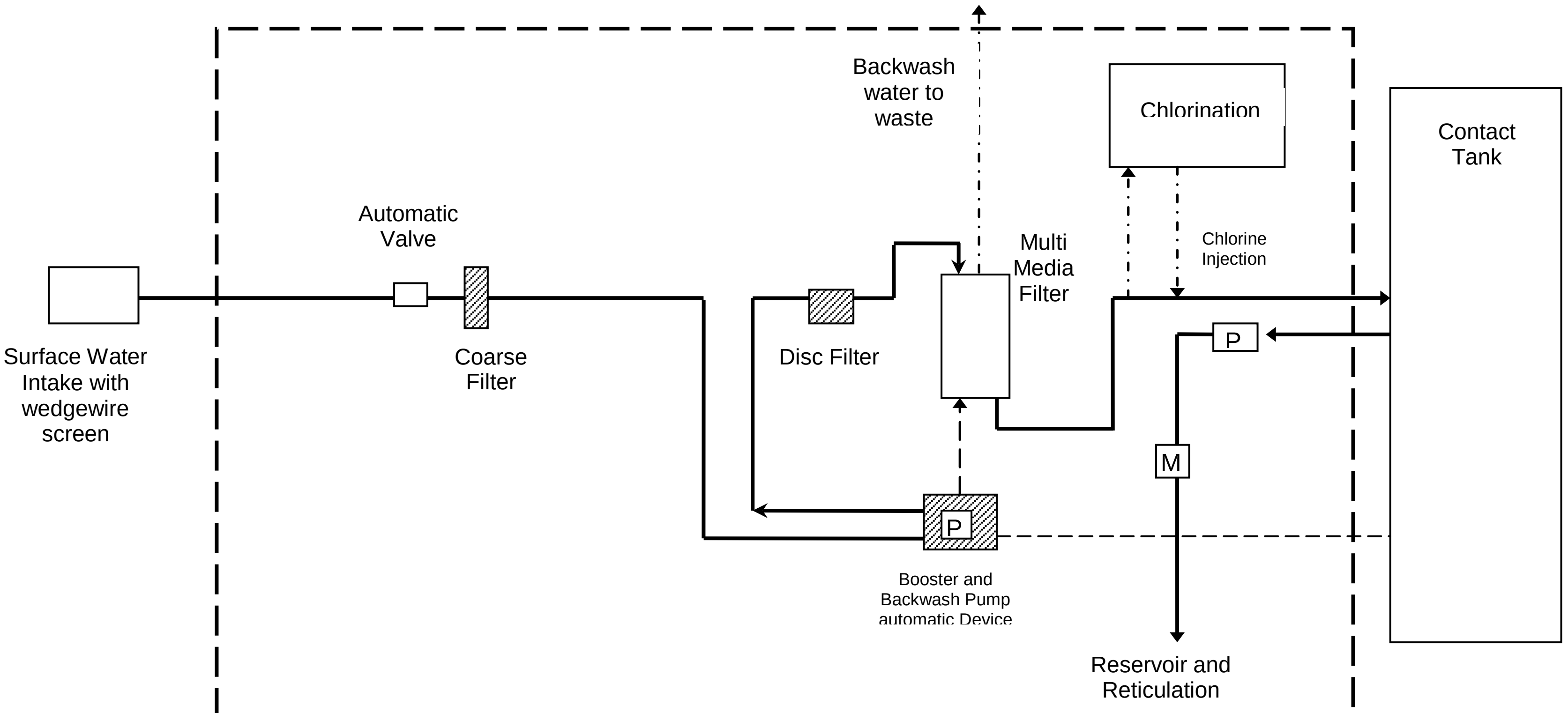


Figure B-27: Pohara Valley Community Water Scheme Treatment Detail

B.4.4. Hamama Water Supply

B.4.4.1 System Description

The Hamama system was installed, paid for and administered by a group of local farmers through Golden Bay County Council during the late 1950s. The water is not treated and has been classed as a non-potable supply, intended mainly for stock use. It is likely that numerous domestic properties are connected and the water is used for drinking. The Health (Drinking Water) Amendment Act 2007 (HDWAA) would probably quantify the scheme as a 'neighbourhood drinking water supply'. Therefore the regulations of the HDWAA and the DWSNZ would most likely apply to the scheme.

The stream catchment is an 80 hectare area of land owned by The Tasman District Council and designated as a water supply reserve area.

A user committee, under a Golden Bay County Council by-law operates the supply. The Council rate the supply area on land value to provide maintenance and operations funding for the management committee but have no direct involvement in maintaining the scheme.

The scheme was originally designed for 10 farms but demand has grown considerably with rural subdivision and now it is reported that the system operates at its maximum capacity in the dry periods during the milking season. There are currently 21 open connections registered in the Tasman District Council billing database, however the maintenance contractors database (May 2014) show 25 connections. When the road was re-laid in 2007 all of these connections were re-done, with new toby boxes and double check valves. The estimated population of Hamama is approximately 60 people.

B.4.4.2 System Operation Overview

The scheme comprises:

- stream intake
- settling tank
- reservoir
- reticulation with open connections.

The system is an unmetered, 'on demand' system with no restrictors. The mains at the top of Hamama Road are 100mm diameter concrete pipe reducing to 25mm diameter galvanised iron at the State Highway junction.

There is no schematic for the Hamama scheme currently available.

B.4.4.3 Key Lifelines

The Nelson Tasman Engineering Lifelines Report 2008 confirms there are no sections of the network that have been identified from Vulnerability Assessment as critical.

B.4.4.4 Compliance with Levels of Service

LoS 2 – Water demand management plans are in place for each water scheme.

- No demand management is in place for Hamama.

LoS 7 – P1 and P2 monitoring shows we are in compliance with DWSNZ.

- Testing is not undertaken at Hamama so this level of service is not met.

LoS 8 – WSPs are in place, approved and being implemented for each water supply.

- Hamama does not have an approved WSP.

LoS 11 – Hydraulic models are in place for key urban water supplies.

- Hamama does not have a hydraulic model.

B.4.4.5 Asset Condition Overview

The Hamama scheme is an on demand supply as there are no bulk flow meters on the scheme and no individual meters the use is unknown.

Approximately 3km of the old water main in Hamama Road (from Waingaro Road intersection, west to the last house on Hamama Road) were replaced a few years ago. The existing reservoir is in average to poor condition.

B.4.4.6 Water Quality and DWSNZ Compliance

Required sampling - Hamama supplies approximately 60 people making it a 'neighbourhood' supply (between 25 and 100 people) in terms of the DWSNZ.

There is also no treatment plant and the water quality is not tested for *E.coli* as per the DWSNZ requirements, or for any other parameters such as pH or turbidity.

B.4.4.7 Resource Consents

There is a resource consent in place for the use/take of surface water. This resource consent has been granted to the Hamama Water Supply Committee rather than Tasman District Council.

Scheme	Source (SW, GW)	Source Locations	Consent No.	Date Granted	Date Expiry
Hamama	SW	Tributary of Waingaro River.	RM031060	10/05/2004	31/05/2019

B.4.4.8 Current and Future Demands

According to the most recent data available, there are 25 open connections (May 2014). No further data is available. No future growth is expected for Hamama. The daily water use is shown in Table B-31 below.

Table B-29: Current Demand of Hamama Water Supply

Water Availability (m^3/d)	Average Summer Demand (m^3/d)	Average Winter Demand (m^3/d)	Annual Average Demand (m^3/d)	Maximum Daily Demand (m^3/d)
500	Unknown	Unknown	Unknown	Unknown

B.4.4.9 Strategic Studies

Limited studies have been undertaken to date for the Hamama water supply system. Further studies would be useful as these can provide reference and background information for developing the strategic approaches to take in the future.

- Water Safety Plan.

B.4.4.10 Strategic Approach

The key issues in Hamama are:

- it has a very limited funding base therefore it is difficult to fund improvements or upgrades.

- Even though the water is used largely for stock water there is domestic use as well and the supply requires water treatment to meet DWSNZ.

The strategic approach for Hamama is to:

- involve the scheme members as much as possible in the operation, maintenance and management.
- providing conventional water treatment would not be a cost effective solution for Hamama. One solution is to provide individual household treatment units. These have relatively low capital cost but the operational and maintenance costs may be reasonably high. Other options will be considered following approval of the WSP.

Table B-30: Register of Assets for Hamama Water Supply Scheme

Scheme	Source	Pumps and Pump Stations	Water Treatment	Storage	Reticulation			Other Assets	
Hamama	Stream intake = 500 m^3/day	No pump stations	No treatment		Water Mains	25mm	139m	Fire Hydrants	1
						32mm	558m	Connections	25
						40mm	1,612m	Valve	9
						50mm	1,701m		
						75mm	970m		
						100mm	5,227m		
						150mm	32m		
						225mm	6m		
						Total	**10,246m**		

APPENDIX C ASSESSMENT OF WATER SUPPLIES IN THE DISTRICT

Tasman District Council performed the Water and Sanitary Services Assessments (WSSA) in 2005 and evaluated all Council owned, community and some private water supplies. The WSSA documents consist of two volumes:

Volume 1:	Contained an overview of the water and sanitary services in Tasman District with recommendations and priority rankings for future improvements.
Volume 2:	Contained the detailed assessments.

The WSSA documents were made available to the public for consultation purposes and a special meeting was held to review public submissions. Council approved the WSSA documents in June 2005 in compliance with the Local Government Act 2002.

Recent changes to the Local Government Act 2002 now require Council to identify in the Long Term Plan any significant variation between the proposals in that plan and Council's assessment of water and sanitary services and its waste management and minimisation plan (clause 6 of Schedule 10 of the Act).

Sections 126 – 129 of the Local Government Act have been repealed. This means that while Council still need to undertake water and sanitary services assessments within the district, the process for undertaking the assessments and the extent of information required are no longer dictated.

An amendment to Section 125 of the Act now means that an assessment may be included in the Council’s long-term plan, but, if it is not, Council must adopt the assessment using the special consultative procedure. The majority of information in the WSSA, in respect of Council owned and operated services, is now included in Appendix B of this Activity Management Plan. Council is under an obligation to assess privately owned services from time to time. There is no guidance to the timelines associated with these assessments; however, Council has made financial provision in to carry out the next assessment in 2019/2020 and each 15 years after that most aspects are covered by the AMP and WSPs.

Key variations since the adoption of the WSSA in 2005 are noted below:

- Council decided that the Pohara water supply joins the Urban Water Club.
- Council is progressing with the upgrade of water treatment for all urban water supplies to bring the, in line with the Drinking Water Standards (DWSNZ:2003, revised 2008) and will continue to undertake improvements to Council’s systems as identified in this AMP.
- The community considered highest priority is Motueka. Council has received a water allocation consent and made provision in this AMP to allow for a modest extension to the water supply in Motueka, commencing 2015/16 however connection will still remain voluntary. Full reticulation has been deferred due to lack of funding.
- The completion of the Richmond Water Treatment Plant allows the Waimea scheme to be merged with Richmond.

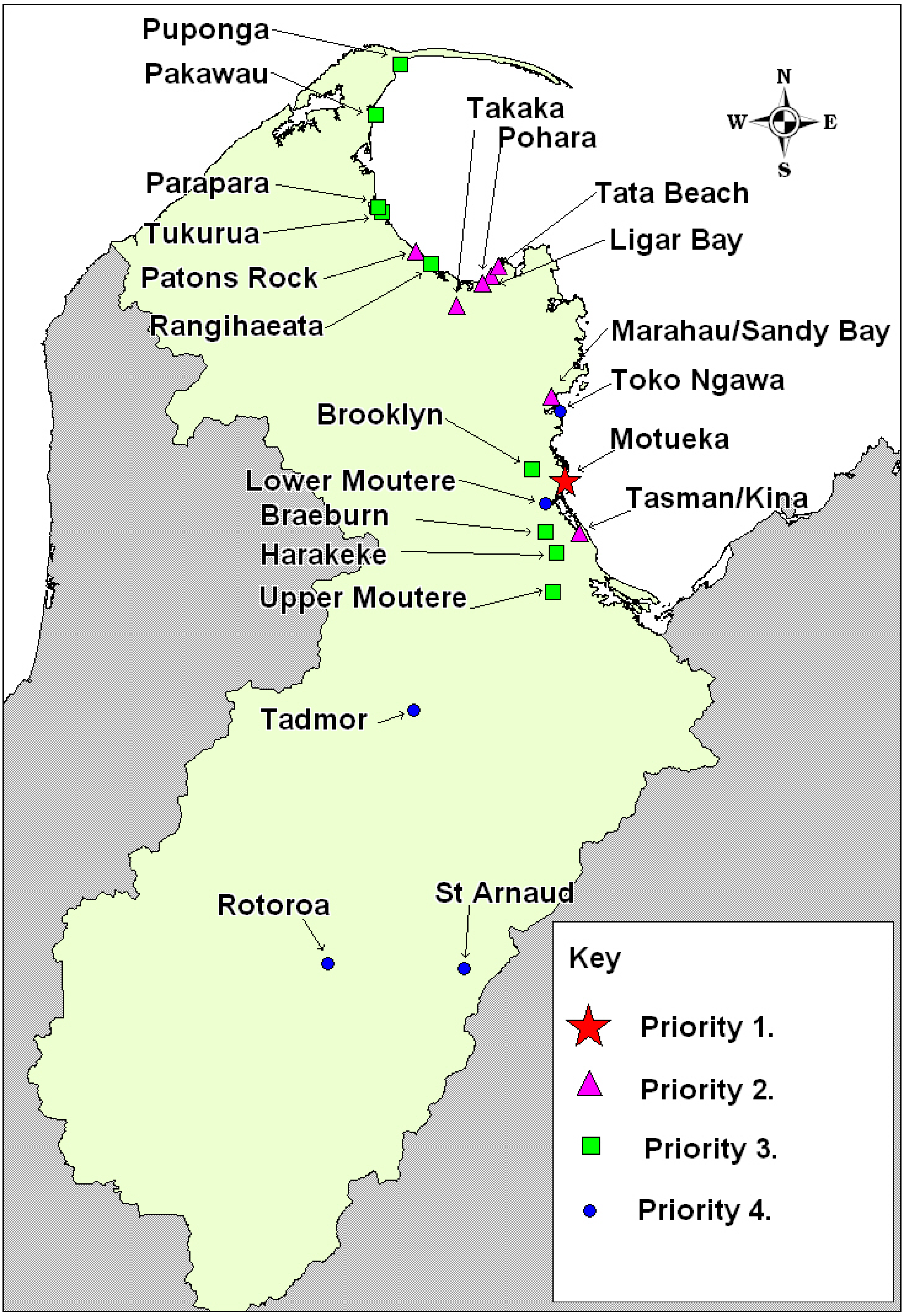
Table C-1 and Figure C-1 show the priorities for the community water schemes.

Table C-1 Priority Ranking of Tasman Community Water Supplies

Priority Categories	Community	
Priority 1	Motueka	
Priority 2	Marahau, Sandy Bay Tasman/Kina Pohara	Takaka Ligar Bay Tata Beach Patons Rock
Priority 3	Braeburn/Harakeke Brooklyn Pakawau Parapara	Puponga Rangihaeata Tukurua Upper Moutere

Priority 4	Lower Moutere Rotoroa St Arnaud Tadmor Toko Ngawa

Figure 4-1 Priority Ranking of Community Water Supplies



APPENDIX D WATER AMP APPENDIX D ASSET VALUATIONS

D.1 Background

The Local Government Act 1974 and subsequent amendments contain a general requirement for local authorities to comply with Generally Accepted Accounting Practice ("GAAP").

The Financial Reporting Act 1993 sets out a process by which GAAP is established for all reporting entities and groups, the Crown and all departments, Offices of Parliament and Crown entities and all local authorities. Compliance with the New Zealand International Public Sector Accounting Standard 17; Property, Plant and Equipment (PBE IPSAS 17) and PBE IPSAS 21 (Impairment of Non Cash Generating Assets) is the one of the current requirements of meeting GAAP.

The purpose of the valuations is for reporting asset values in the financial statements of Tasman District Council.

The Council requires its infrastructure asset register and valuations to be updated in accordance with Financial Reporting Standards and the AMP improvement plan.

The valuations summarised below have been completed in accordance with the following standards and are suitable for inclusion in the financial statements for the year ending June 2012.

- NAMS Group Infrastructure Asset Valuation Guidelines – Edition 2.0.
- New Zealand International Public Sector Accounting Standard 17; Property, Plant and Equipment (PBE IPSAS 17) and PBE IPSAS 21 (Impairment of Non Cash Generating Assets)

D.1.1. Depreciation

Depreciation of assets must be charged over their useful life.

- Depreciated Replacement Cost is the current replacement cost less allowance for physical deterioration and optimisation for obsolescence and relevant surplus capacity. The Depreciated Replacement Cost has been calculated as:

$$\frac{\text{Remaining useful life}}{\text{Total useful life}} \times \text{Replacement cost}$$

- Depreciation is a measure of the consumption of the economic benefits embodied in an asset. It distributes the cost or value of an asset over its estimated useful life. Straight-line depreciation is used in this valuation.
- Total Depreciation to Date is the total amount of the asset's economic benefits consumed since the asset was constructed or installed.
- The Annual Depreciation is the amount the asset depreciates in a year. It is defined as the replacement cost minus the residual value divided by the estimated total useful life for the asset.
- The Minimum Remaining Useful Life is applied to assets which are older than their useful life. It recognises that although an asset is older than its useful life it may still be in service and therefore have some value. Where an asset is older than its standard useful life, the minimum remaining useful life is added to the standard useful life and used in the calculation of the depreciated replacement value.

D.1.2. Revaluation

The revaluations are based on accurate and substantially complete asset registers and appropriate replacement costs and effective lives.

- The lives are generally based upon NZ Infrastructure Asset Valuation and Depreciation Guidelines (NZIAVDG) – Edition 2. In specific cases these have been modified where in our, and the Council's opinion a different life is appropriate. The changes are justified in the valuation report.
- The component level of the data used for the valuation is sufficient to calculate depreciation separately for those assets that have different useful lives.

D.2 2012 Valuation - Water

Assets are valued every three years. The water supply assets were last revalued in June 2012 and are reported under separate cover[1]. Key assumptions in assessing the asset valuations are described in detail in the valuation report.

D.3 Asset Data

The majority of information for valuing the assets was obtained from the Council's Confirm database. This is the first time the database has been used to revalue the Councils assets. In the past, asset registers based on excel spreadsheets have been used. The data confidence is detailed in Table D-1 below.

Table D-1: Data Confidence

Asset Description	Confidence	Comments
Water Supply Assets	B - Reliable	The asset registers provide all the physical assets that make up each scheme. However attribute information could be more detailed such as surface types etc.

Based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system.

D.3.1. Asset Lives

The *Base Useful Lives* for each asset type as published in the NZIAVDG Manual were used as a guideline for the lives of the assets in the valuation. Generally lives are taken as from the mid-range of the typical lives indicated in the Valuation Manual where no better information is available. Lives used in the valuation are presented in Table D-2 following.

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[1] Utilities Asset Revaluation, August 2012 – MWH New Zealand Ltd report for Tasman District Council

Table D-2: Asset Lives

Item	Life (years)	Minimum Remaining Life (years)
Pipelines		
AC, Cu, other, unknown pipe	60	5
PVC & PE pipe	80	5
DI, CI Steel pipe	80	5
Miscellaneous pipeworks and fitting associated with treatment plants and pump stations	50	5
Valves, hydrants	50	5
Water meters, restrictors	15	2
Non Pipeline Civil Assets		
Borewells	60	5
Civil pump chambers	80	5
Civil concrete structures	80	5
Civil buildings (all materials)	50	5
Civil pipework and fittings	50	5
Reservoirs (all materials)	80	5
Tanks (concrete, plastic, fibreglass)	50	5
Landscaping/fencing	20	5
Mechanical Assets		
Small plant – pumps, blowers, chlorinating/UV equipment, aerators, screens	20	2
Electrical and Telemetry Assets		
Electrical/Controls	20	2
Telemetry/SCADA	20	2

D.3.2. 2012 Valuation Results

The optimised replacement value, annual depreciation and optimised depreciated replacement value of the water assets are summarised in Tables D-3 to Table D-6 showing the asset value by Water Supply Areas.

Table D-3: Water Asset Valuation Summary 30 June 2012

	Optimised Replacement Value ($)	Optimised Depreciated Replacement Value ($)	Total Depreciation to Date ($)	Annual Depreciation ($/yr)
Water Pipes	107,014,432	69,575,297	37,439,134	1,468,561
Water Surface features	42,964,400	25,918,653	17,045,748	1,072,510
Total	**149,978,832**	**95,493,950**	**54,484,882**	**2,496,071**

The 2012 report did not update the assets by supply area so table D-4 has not been updated.

Table D-4: Water Consent Asset Valuation Summary 30 June 2009

	Optimised Replacement Value ($)	Optimised Depreciated Replacement Value ($)	Total Depreciation to Date ($)	Annual Depreciation ($/yr)
Water Resource Consents	610,000	311,786	298,214	62,647

Table D-5: 2009 / 2012 Water Valuation Comparison

	Optimised Replacement Value ($)	Optimised Depreciated Replacement Value ($)	Total Depreciation to Date ($)	Annual Depreciation ($/yr)
Water 2009	129,215,386	83,398,361	45,817,025	2,158,517
Water 2012	**149,978,832**	**95,493,950**	**54,484,882**	**2,496,071**
% Increase	16.07%	14.50%	18.92%	15.64%

Overall the water assets have increased in optimised replacement value by 16.07% since the 2009 valuations. The increase in the replacement values is due to the following reasons:

- inflation over the three year period (ie. % as calculated by the construction fluctuation adjustment);
- the addition of new assets to the utilities since 2009;
- the optimised depreciated replacement value (ODRV) has increased by 14.50%. Whilst a small proportion of this increase is due to assets now passed their original design life, the majority of the increase is attributed to increased and more accurate data stored in the Confirm database.

The 2012 report did not update the assets by supply area so table D-6 has not been updated.

Table D-6: 2009 Asset Valuation by Supply Area

	Optimised Replacement Value ($)	Optimised Depreciated Replacement Value ($)	Total Depreciation to Date ($)	Annual Depreciation ($/yr)
Brightwater/Hope	10,025,114	6,190,714	3,834,400	170,852
Collingwood	3,241,883	2,901,782	340,101	52,547
Dovedale	9,213,315	5,485,899	3,727,416	133,927
Eighty Eight Valley	3,294,764	2,238,932	1,055,833	47,803
Hamama Road	887,139	510,404	376,735	11,841
Kaiteriteri/Riwaka	5,304,379	4,370,894	933,485	87,139
Mapua/Ruby Bay	16,907,815	13,411,731	3,496,085	239,404
Motueka	9,822,599	7,416,573	2,406,027	165,237
Murchison	3,439,791	2,114,120	1,325,670	60,414
Pohara	1,523,394	1,193,739	329,655	24,203
Redwood Valley	5,395,189	3,492,974	1,902,215	82,993
Richmond	45,027,865	23,417,349	21,610,516	791,776
Tapawera	2,016,709	906,614	1,110,095	36,631
Upper Takaka	578,968	369,930	209,038	8,321
Wakefield	6,040,975	3,713,101	2,327,874	103,509
Wai-iti Dam	3,204,282	3,105,604	98,678	39,207
Not Applicable	281,277	235,517	45,760	3,530
Tasman District Non-UDA	2,399,927	2,010,698	389,228	36,536

APPENDIX E Maintenance and Operations

E.1 Maintenance Contract

The operation and maintenance of the water supply systems has been incorporated into a single performance-based contract, C688. The current maintenance contract was awarded to Downer New Zealand Ltd in 2007 and extended in 2013. It may extend to 2017 if they meet the performance requirements. Some of the key aspects of this contract are:

- Performance-based;
- emphasis on proactive maintenance;
- programme management;
- quality management;
- detailed schedule of works;
- measurement of performance;
- team approach to problem solving.

The implementation of the routine proactive maintenance work is managed in the following ways.

- The contractor prepares an annual maintenance programme that consists of a variety of programmes of all routine proactive maintenance and reporting deadlines.
- The Engineer to the Contract (Council's consultant) in conjunction with Council staff reviews the programme against the budgets and then negotiates with the contractor to agree any deferrals or amendments.
- The contractor then implements the work according to the schedules.

There are two other areas of maintenance: "Non Routine Proactive Maintenance" and "Reactive Maintenance". Budgets for these have been set based on historical spending sums and projected future system maintenance requirements.

The Non Routine Proactive Maintenance covers maintenance such as, mains flushing and checks on mechanical equipment. These are programmed and carried out annually with a report submitted to the Engineer on completion.

The Reactive Maintenance covers all water supply reticulation repairs including source, treatment plants, pipes and pump stations

The maintenance contract also covers works related to new facilities. These new facilities are usually related to minor system improvements and extensions. Exceptions occur such as Downers involvement in the Richmond Water Treatment Plant.

E.1.1 Maintenance Standards

All work is performed, and materials used, to comply with the latest edition of industry standards and the following:

- this AMP;
- Contract 688 – Water Utilities Operations and Maintenance;
- Tasman District Council Engineering Standards and Policies;

- the maintenance and operation standards for all work activities are specified in the maintenance contract, with performance measures including response times. The Asset Manager may vary these depending on changes to the level of service or budgeting constraints.

E.1.2 Deferred Maintenance

Deferred maintenance is defined as follows:

- the shortfall in rehabilitation or refurbishment work required to maintain the service potential of the asset;
- maintenance and renewal work that was not performed when it should have been, or when it was scheduled to be and which has therefore been put off or delayed for a future period.

The current budget levels are believed to be sufficient to provide the intended level of service and therefore no maintenance work has been deferred. However this is subject to the changes in levels of service and expectations of water customers.

E.1.3 Increase in Network Size through Development

When new developments such as subdivisions are constructed any new water supply assets constructed by the developer must be accepted as being built to Council standards. Once vested as Council assets they are included in the water supply network and routine maintenance is undertaken through the operations contract. The maintenance budgets have some allowance for network growth where applicable.

E.1.4 Database

Customer Service Requests (CSR) and Work Orders (WO) are sent to the contractor via the Confirm database.

The contractor receives WOs via laptops and mobile handheld devices. WOs are loaded against individual assets (where possible) and processed for payment with the monthly progress claim. All CSRs and WOs are time stamped depending on the contract timeframe. Response times and resolution times are monitored with Contractor performance as part of their monthly claim.

E.2 Engineering Studies

A number of studies have been allocated to the Operations and Maintenance Budget. These are summarised in Table 0-1.

Table 0-1: Summary of Engineering Studies included in this AMP

Study Name	Brief Description of Study
Water and Sanitary Services Assessment	The Water and Sanitary Services Assessment, is a council/community review of how the Council provide water, wastewater, stormwater, solid waste (refuse), public toilets and cemeteries and explores options for doing them more sustainably. This assessment will be completed periodically.
Modelling of Reticulation Networks	Assessing capacity and deficiencies of reticulation networks, including Motueka, Richmond/Waimea, Mapua, Brightwater and Wakefield.
Water Safety Plan (WSP)	Production of Water Safety Plans for all water supply systems. This is a requirement of the Health (Drinking Water) Amendment

Study Name	Brief Description of Study
	Act.
Implementation of WSP	Implementing WSP improvements at each scheme.
Cryptosporidium Monitoring at Waimea Supply	Monitoring to confirm the treatment requirements for the Waimea source.
Radiological Testing on all Groundwater Supplies	Radiological testing is a requirement in the DWSNZ: 2005 (Revised 2008).
Further Demand Analysis	Further analyses historical water demands in each water supply system and identifies trends and patterns in water use. Assess water supply issues for each system.
Night Flow Monitoring	Develop a night flow monitoring programme to estimate and monitor the level of leakage in each scheme.
Water Demand Management Plans	Develop water demand management plans for the remaining schemes.
Water Demand Initiatives	This work involves producing an education programme for the general public, targeting schools, including promotion of water efficient fixtures and appliances. Water audits for high use non-residential properties.
Pressure Management	Identify through hydraulic modelling the areas within the networks that have the highest potential for pressure management.
Leak Detection Programme	Develop a leak detection programme. This will link in with night flow monitoring.
Fire Hydrant Audit	Auditing fire hydrants across the district to confirm they are operational.
Meter Replacement Programme	Developing a water meter replacement programme.
Water System Operation Plans	Developing and maintaining system operation plans for each network. These plans provide guidance for operation and maintenance, contingencies during an emergency and Health and Safety.
Inspection of Significant Assets	Key reservoir sites across the district are to be reviewed to confirm the condition of these assets.
Inspection of all Water Retaining Structures	Inspecting all water retaining structures throughout the district, including rural schemes.
Easement on Rural Water Schemes	Ensuring easements are in places for Council assets within the rural schemes.

Study Name	Brief Description of Study
Water Supply Bylaw Review	In accordance with the Local Government Act 2002, this bylaw will need to be reviewed no later than 10 years after the Council last reviewed it.
Intake Flow Meter Programme	Installation of flow meters on all water source intakes. This is part of the new metering requirements.
Wai-iti Dam Surveys and Safety Reviews	The safety reviews involve a comprehensive review every five years and a general safety review every year (there is no general safety review when the comprehensive review is undertaken). Annual inspections and reporting is undertaken every year as is a deformation survey.
WINZ Data Management	Requirement of the DWSNZ to operate the WINZ database. This database allows for scheduling sampling and storing data.
Water Supply Annual Survey	Request from the Ministry of Health for Council to undertake the annual review of each water supply scheme.

2015 – 2045 Water Supply Operations and Maintenance Forecast

Thirty year forecasts for operations and maintenance costs are shown in Figure 0-1, Table 0-3 and Table 0-3.

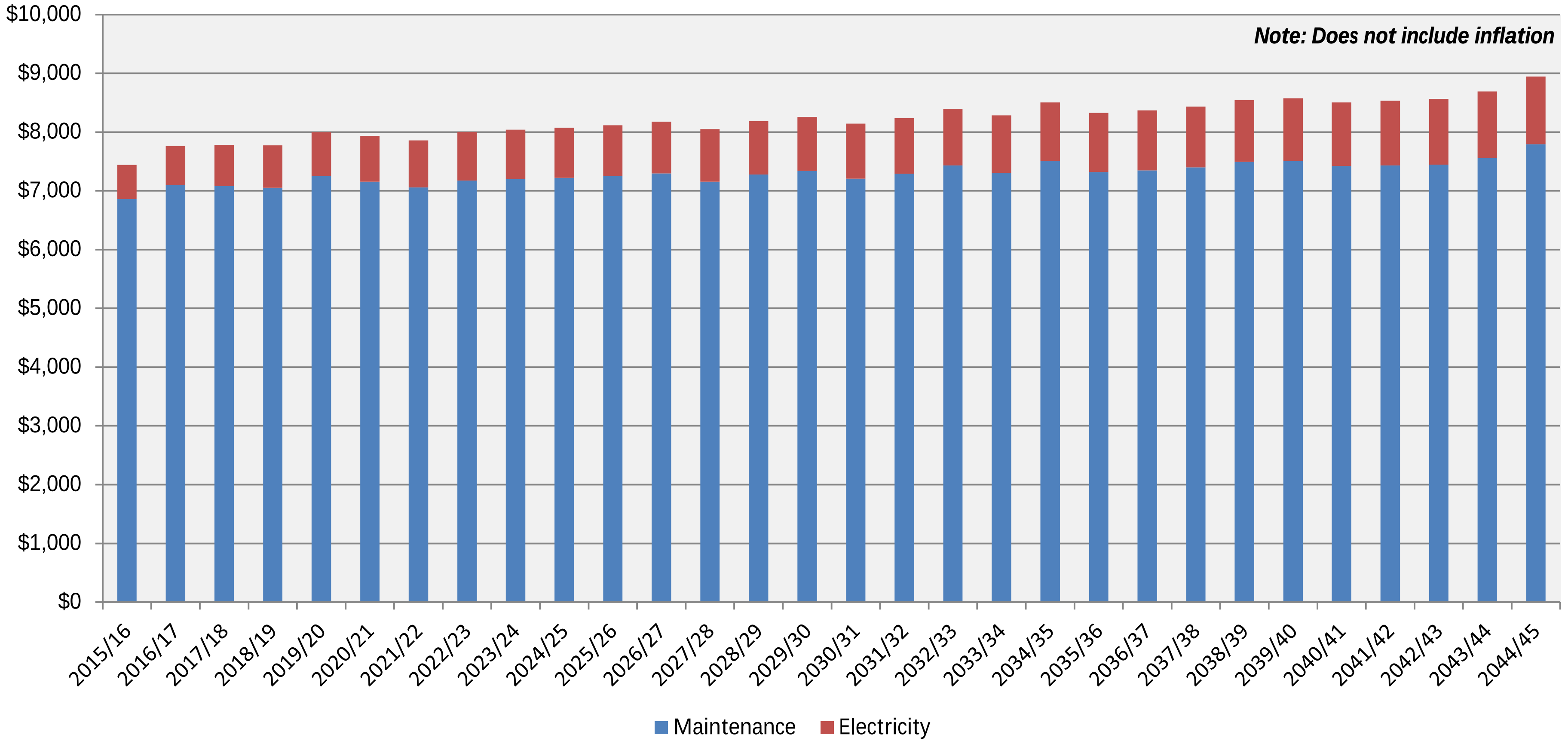

Figure E-1: 2015 – 2045 Water Supply Operations and Maintenance Forecast ($000)

Table E-2: 2015-2015 Water Supply Operations and Maintenance Forecast ($000)

ID	Project Name	Project Description	Category	GL Code	% O&M	O&M Estimate	Total Project Estimate	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21 to Year 30
								2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	
150238	Hamama Scheme Transfer	Legal costs for transfer of Scheme to Committee.	Hamama	0801220350	100%	20	20	-	5	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150247	Waimea Dam Governance	0	Waimea Basin	08512203	100%	390	390	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	130
150255	Groundwater Radiological & Cryptosporidium testing	Across district except Motueka	Asset Management	0801220354	100%	160	160	-	-	-	25	-	-	-	20	-	-	25	-	-	-	-	-	-	45	-	-	45
150260	Waimea Dam Compliance	Scheme Compliance Costs	Waimea Basin	0851240101	100%	291	291	-	-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	104
150261	Waimea Dam Operations	Scheme Operational Costs	Waimea Basin	08512401	100%	1,456	1,456	-	-	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	520
150262	Water RICHMOND MAINTENANCE	General Maintenance	Richmond	08012401	100%	25,465	25,465	775	825	830	835	840	845	850	855	855	855	855	855	855	855	855	855	855	855	855	855	8,550
150263	Water Kaiteriteri MAINTENANCE	General Maintenance	Kaiteriteri/ Riwaka	0801240101	100%	1,800	1,800	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	600
150264	Water Brightwater/HOPE MAINTENANCE	General Maintenance	Brightwater	0801240102	100%	3,630	3,630	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	1,210
150265	Water WAKEFIELD MAINTENANCE	General Maintenance	Wakefield	0801240103	100%	1,770	1,770	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	590
150266	Water TAPAWERA MAINTENANCE	General Maintenance	Tapawera	0801240105	100%	1,665	1,665	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	555
150267	Water MURCHISON MAINTENANCE	General Maintenance	Murchison	0801240106	100%	2,610	2,610	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	870
150268	Water UPPER TAKAKA MAINTENANCE	General Maintenance	Upper Takaka	0801240107	100%	840	840	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	280
150269	Water WAIMEA MAINTENANCE	General Maintenance	Waimea Basin	0801240108	100%	3,420	3,420	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	114	1,140
150270	Water MAPUA MAINTENANCE	General Maintenance	Mapua/ Ruby Bay	0801240109	100%	6,480	6,480	216	216	216	216	216	216	216	216	216	216	216	216	216	216	216	216	216	216	216	216	2,160
150272	Water DATRAN MAINTENANCE	DATRAN MAINTENANCE	Asset Management	0801240111	100%	2,048	2,048	60	60	60	61	61	62	62	63	64	64	65	66	66	67	68	68	69	70	70	71	751
150273	Water COLLINGWOOD MAINTENANCE	General Maintenance	Collingwood	0801240114	100%	1,065	1,065	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	355
150275	Water POHARA MAINTENANCE	General Maintenance	Pohara	0801240113	100%	1,500	1,500	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	500
150276	Water COASTAL PIPELINE MAINTENANCE	Pipeline Maintenance	Coastal Villages	08252401	100%	50	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50
150277	Water COASTAL TASMAN AREA MAINTENANCE	General Maintenance	Mapua/ Ruby Bay	082524011	100%	15	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
150278	Water MARAHAU MAINTENANCE	General Maintenance	Marahau	08132401	100%	25	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
150279	Water TAKAKA MAINTENANCE	General Maintenance	Takaka	08262401	100%	255	255	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	85
150280	Water MOTUEKA RETICULATION Maintenance	Reticulation Maintenance	Motueka - A	08022401	100%	3,060	3,060	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	1,020
150281	Water MOTUEKA FIRE WELLS MAINTENANCE	Fire wells Maintenance	Motueka - A	080224011	100%	615	615	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	205

ID	Project Name	Project Description	Category	GL Code	% O&M	O&M Estimate	Total Project Estimate	Year 1 2015/16	Year 2 2016/17	Year 3 2017/18	Year 4 2018/19	Year 5 2019/20	Year 6 2020/21	Year 7 2021/22	Year 8 2022/23	Year 9 2023/24	Year 10 2024/25	Year 11 2025/26	Year 12 2026/27	Year 13 2027/28	Year 14 2028/29	Year 15 2029/30	Year 16 2030/31	Year 17 2031/32	Year 18 2032/33	Year 19 2033/34	Year 20 2034/35	Year 21 to Year 30
150282	Water 88 VALLEY GENERAL MAINTENANCE	General Maintenance	88 Valley	08042401	100%	2,175	2,175	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	73	725
150283	Water DOVEDALE GENERAL MAINTENANCE	General Maintenance	Dovedale	08052401	100%	7,270	7,270	242	242	242	242	242	252	242	242	242	242	242	242	242	242	242	242	242	242	242	242	2,420
150284	Water REDWOOD GENERAL MAINTENANCE	General Maintenance	Redwoods Valley	08062401	100%	3,540	3,540	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	1,180
150285	Water HAMAMA GENERAL MAINTENANCE	General Maintenance	Hamama	08072401	100%	330	330	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	110
150287	Water WAI ITI DAM MAINTENANCE	General Maintenance	Wai-iti Dam	080924011	100%	960	960	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	320
150288	URBAN ELECTRICITY	Electricity	Asset Management	08012505	100%	22,818	22,818	455	543	566	590	614	639	663	689	699	709	720	731	742	753	764	776	787	799	811	823	8,944
150289	MOTUEKA ELECTRICITY	Electricity	Motueka - A	08022505	100%	1,314	1,314	35	36	36	37	37	38	38	39	39	40	41	41	42	42	43	44	44	45	46	46	505
150290	88 Valley ELECTRICITY	Electricity	88 Valley	08042505	100%	60	60	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	23
150291	DOVEDALE ELECTRICITY	Electricity	Dovedale	08052505	100%	1,258	1,258	34	34	35	35	36	36	37	37	38	38	39	39	40	41	41	42	43	43	44	44	483
150292	REDWOODS ELECTRICITY	Electricity	Redwoods Valley	08062505	100%	2,065	2,065	55	56	57	58	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	793
150293	TAKAKA ELECTRICITY	Electricity	Takaka	08262505	100%	60	60	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	23
150295	Water GEN P/S CONSULTANTS	Professional services	Asset Management	08012203	100%	1,650	1,650	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	550
150296	WATER METER READING	METER READING	Asset Management	08012404	100%	1,200	1,200	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	400
150297	Water PURCHASE N C C	Cost of water from NCC	Asset Management	08012607	100%	540	540	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	180
150300	Condition assessment (asset performance)	Asset management	Asset Management	801220327	100%	1,500	1,500	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	500
150301	Water Redwood Rates	Rates	Redwoods Valley	08062508	100%	36	36	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
150302	Water WAI-ITI DAM PROF SERVICES	Professional services	Wai-iti Dam	08092203	100%	405	405	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	135
150303	Water WAI-ITI DAM SAFETY REVIEWS	Professional services	Wai-iti Dam	0809220301	100%	330	330	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	110
150304	Water WAI-ITI DAM MONITORING	Professional services	Wai-iti Dam	08092605	100%	488	488	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	163
150305	Water RESOURCE CONSENT	Consent Application fees and costs all district except Motueka	Asset Management	080122031	100%	34	34	7	2	4	1	-	-	-	-	-	1	-	-	-	-	-	6	2	4	3	-	6
150307	Water - Asset Management PLAN	Professional Services for AMP preparation or backfill assistance	Asset Management	0801220304	100%	280	280	-	8	20	-	8	20	-	8	20	-	8	20	-	8	20	-	8	20	-	8	104
150308	Water ASSESSMENTS	District Except Motueka	Asset Management	0801220306	100%	80	80	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	-
150309	Water Safety Plans (was PHRMP)	Programme of minor and major peer reviews	Asset Management	0801220307	100%	820	820	29	29	40	27	39	47	33	14	24	18	32	38	24	14	24	18	32	38	24	14	262
150310	Water URBAN MODELLING	Modelling across District except Motueka	Asset Management	0801252601	100%	600	600	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	200

ID	Project Name	Project Description	Category	GL Code	% O&M	O&M Estimate	Total Project Estimate	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21 to Year 30
								2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	
150311	Water O&M CONTRACT TENDER	Tender across District except Motueka	Asset Management	0801220310	100%	81	81	-	27	-	-	-	-	-	-	-	-	-	27	-	-	-	-	-	-	-	-	27
150313	Water VALUATIONS	VALUATIONS across District except Motueka	Asset Management	08012205	100%	182	182	-	18	-	-	18	-	-	18	-	-	18	-	-	18	-	-	18	-	-	18	55
150316	RURAL SCHEME EASEMENT	RURAL SCHEME EASEMENT	Asset Management	0801220316	100%	45	45	-	3	-	3	-	3	-	3	-	3	-	3	-	3	-	3	-	3	-	3	15
150317	INSPECTION OF WATER STRUCTURE ASSETS	Includes seismic upgrades across District except Richmond refer 150136 & 150235	Asset Management	0801220318	100%	585	585	30	75	-	30	50	-	-	-	30	50	-	-	-	30	50	-	-	-	30	50	160
150318	REVIEW OF CURRENT BYLAWS	Legal costs	Asset Management	0801220319	100%	6	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3
150319	FIRE HYDRANT AUDIT AND FLOW TESTS	Hydrants	Asset Management	0801220320	100%	450	450	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	150
150320	WATER OPERATIONS AND MAINTENANCE PLAN	OPERATIONS AND MAINTENANCE PLAN	Asset Management	0801220321	100%	660	660	80	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	200
150323	WATER ANNUAL SURVEY	ANNUAL SURVEY	Asset Management	0801220324	100%	300	300	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	100
150324	Demand, Flow and Leakage Management	Demand Management programme including leak detection, night flow monitoring, pressure and flow management across District except Motueka	Asset Management	0801220325	100%	3,150	3,150	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	105	1,050
150325	WINZ DATA MANAGEMENT	WINZ DATA MANAGEMENT	Asset Management	0801220326	100%	30	30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	10
150327	Water Motueka METER READING	METER READING	Motueka - A	08022404	100%	120	120	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	40
150328	Water Motueka RESOURCE CONSENT	Professional Services (to assist and review consent applications)	Motueka - A	0802220318	100%	30	30	-	-	-	-	5	-	-	-	-	5	-	-	-	-	5	-	-	-	-	5	10
150329	Water Motueka RESOURCE CONSENT MONITORING	Consent monitorings cost Motueka	Motueka - A	0802220308	100%	18	18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6
150330	Water Motueka - A M PLAN P/S	AMP Assistance Motueka	Motueka - A	0802220306	100%	60	60	-	2	4	-	2	4	-	2	4	-	2	4	-	2	4	-	2	4	-	2	22
150331	Water Motueka ASSESSMENTS	Water Assessment	Motueka - A	0802220309	100%	6	6	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-
150332	Water Motueka WSP (was PHRMP)	Water Safety Plan	Motueka - A	0802220302	100%	58	58	1	-	2	-	-	15	-	2	-	2	-	6	-	2	-	2	-	6	-	2	18
150333	Water Motueka Model	Modelling	Motueka - A	0802220311	100%	119	119	4	17	2	2	2	4	2	4	2	4	2	8	2	4	2	4	2	8	2	4	38
150334	Water Motueka O&M CONTRACT TENDER	Tender	Motueka - A	0802220304	100%	9	9	-	-	3	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	3
150335	Water Motueka VALUATIONS	Valuations	Motueka - A	08022205	100%	17	17	-	2	-	-	2	-	-	2	-	-	2	-	-	2	-	-	2	-	-	2	5

ID	Project Name	Project Description	Category	GL Code	% O&M	O&M Estimate	Total Project Estimate	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21 to Year 30
								2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	
150338	Water Motueka FIRE HYDRANT AUDIT AND FLOW TESTS	FIRE HYDRANT AUDIT AND FLOW TESTS	Motueka - A	0802220312	100%	49	49	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	16
150341	Water Motueka ANNUAL SURVEY	ANNUAL SURVEY	Motueka - A	0802220315	100%	27	27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	9
150342	Demand, Flow and Leakage Management	Demand Management programme including leak detection, night flow monitoring, pressure and flow management in Motueka	Motueka - A	0802220316	100%	450	450	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	150
150344	Water Motueka OPERATIONS AND MAINTENANCE PLAN	OPERATIONS AND MAINTENANCE PLAN	Motueka - A	0802220303	100%	33	33	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	11
150345	Water Motueka - reticulation P/S CONSULTANTS	Professional services	Motueka - A	08022203	100%	60	60	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	20
150346	Water Motueka asset data gathering	Professional services	Motueka - A	0802220319	100%	5	5	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150348	Water Motueka Firewells O&M CONTRACT TENDER	Tender	Motueka - A	0802220305	100%	4	4	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
150349	Water Motueka Firewells Valuations	Valuations	Motueka - A	0802220501	100%	3	3	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	0	1
150352	Occupational health & Safety	OHS Site Hazard Evaluation, developing management Plans	Asset Management	0801210601	100%	70	70	20	20	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150353	Groundwater Radiological & Cryptosporidium testing	Motueka only	Motueka - A	0802220320	100%	8	8	-	-	-	1	-	-	-	1	-	-	1	-	-	-	-	-	-	2	-	-	2
150355	Water LEE VALLEY TDC CONTRIBUTION	Council contribution to proposal development costs	Waimea Basin	0801223012	100%	30	30	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150356	LAPP Insurance	Insurance	Asset Management	08012506	100%	2,700	2,700	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	900
150357	Water RATE PAYMENTS	Rates	Asset Management	08012508	100%	4,745	4,745	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	1,582
150358	Wai-iti Dam Rate Contribution	Rates	Wai-iti Dam	0801250801	100%	600	600	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	200
150359	Motueka Water rates	Rates	Motueka - A	08022508	100%	75	75	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	25
150360	Dovedale Water rates	Rates	Dovedale	08052508	100%	18	18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6
	TOTALS					123,245	297,161	3,720	3,883	3,888	3,888	3,999	3,965	3,930	4,002	4,021	4,037	4,058	4,087	4,025	4,092	4,128	4,071	4,119	4,197	4,141	4,252	42,742

Table E-3: 2015 – 2045 Water Supply Engineering Strategic Studies

Item	Study Name	Description
150307 & Motueka 150330	AMP Upgrades	Allowance 2 of 3 years
150308 & Motueka 150331	Water Services Assessments	Year 5 and 20
150310 & Motueka 150333	Water Modelling - Programme	Creation and reviews
150311 & Motueka 150334 & 150348	O&M Contract Tender	10 yearly reviews
150313 & Motueka 150335 & 150349	Valuations	3 yearly reviews
150324 & Motueka 150342	Demand, Flow and Leakage Management	Ongoing Programme
150309 & Motueka 150342	WSP Programme	Creation and reviews
Motueka 150329	Resource Consent Monitoring	Annual Programme
150320 & Motueka 150344	Water System Operating Plans	SOPs for 16 Water Supplies
150317	Inspection of all water retaining structures	Inspecting all water retaining structures throughout the district except Richmond
150255 & Motueka 150353	Radiological & Cryptosporidium testing of groundwater supplies	5 yearly
150316	Easement on rural water schemes	Biennial allowance to facilitate action as opportunities arise
150319 & Motueka 150338	Fire Hydrant Audit	Confirming operation of Fire Hydrants and checks to ensure the Fire Fighting Standards are being achieved
150318	Bylaw Review	Review of current Bylaw
150350	Intake Flow Meter Programme	To meet RMA (Water Metering) regulations
150323 & Motueka 150341	Water Supply Annual Survey	
150325	WINZ Data Management	

Item	Study Name	Description
150302, 150303, 150304	Wai-iti Dam - Annual Inspection & Reporting	Safety Review, Inspection, Deformation Surveys and Reporting Professional Services

APPENDIX F DEMAND AND FUTURE NEW CAPITAL REQUIREMENTS

F.1 Growth Demand and Supply Model (GDSM)

F.1.1. Model Summary

A comprehensive Growth Demand and Supply Model (GDSM or growth model) has been developed for Tasman District. The growth model is a long term planning tool, providing population and economic projections district wide. The supply potential is assessed as well as demand, and a development rollout for each settlement is then examined. The development rollout from the Growth Model informs capital budgets (new growth causes a demand for network services) which feed into the AMPs and in turn underpin the Long Term Plan and supporting policies eg, Development Contributions Policy.

The 2014 growth model is a fourth generation growth model with previous versions being completed in 2005, 2008 and 2011. In order to understand how and where growth will occur, the growth model is built up of a series of Settlement Areas which contain Development Areas. A Settlement Area (SA) is defined for each of the main towns and communities in the district. There are 17 Settlement Areas for the present version of the growth model. Each Settlement Area is sub-divided into a number of Development Areas. Each Development Area is defined as one continuous polygon within a Settlement Area that if assessed as developable, is expected to contain a common end-use and density for built development.

The growth model organises and integrates the assessments of demand and supply of built development. The development is categorised as residential or business demand and supply, with business including all industrial, commercial and retail uses.

For residential demand and supply:

- the ‘demand’ for residential buildings (dwellings) is assessed from population and household growth forecasts based on Statistics New Zealand’s latest release;
- the ‘supply’ of lots for future dwellings is assessed from analysis of the Development Areas in each Settlement Area and how many lots could feasibly be developed for residential end use over a 20 year time period, after accounting for a number of existing characteristics of the Development Area.

For business demand and supply:

- the ‘demand’ for business premises is assessed from economic and employment growth forecasts, and associated land requirements.
- the ‘supply’ of lots for future business premises is assessed from analysis of the Development Areas in each Settlement Area over time in a similar way as that for future dwellings.

The Development Areas and Settlement Areas are the building blocks that allow the growth model to spread demand for new dwellings and business premises, and assess where there is capacity to supply that demand.

The growth model is not just an isolated tool that calculates a development forecast. It is a number of linked processes that involve assessment of base data, expert interpretation and assessment, calculation and forecasting. The key input data, assessment and computational processes, and outputs of the growth model are captured in a database called the Growth Model Database.

The outputs of the growth model are located on a shared browser site that all Council staff have access to. The browser contains:

- all the various input data sets and calculated outputs;
- maps defining the Settlement Areas and Development Areas within those; and
- an updated model description describing the model working in detail, assumptions and planned improvements.

The review process is also mapped in ProMapp.

F.1.2. Overall Population Growth and Trends

Richmond is the largest and fastest growing town in the district with an estimated 13,606 residents, as at 2014. Motueka is the next largest town, with 6,687 residents. Another five settlements are relatively small, with populations ranging from 1239 in Takaka up to 2,498 in the Coastal Tasman area. Nine have populations of less than 500 people.

Tasman District is a popular destination for older age group or “retirees”. A high proportion of population growth results from people moving to the Tasman District from elsewhere, rather than from current residents having children. The growth modelling shows that older people moving to the Tasman district are choosing to live in larger centres with easier access to services, hence the larger settlements are growing and the smaller ones are not. As shown in Table F-1, Richmond, Brightwater and Wakefield are predicted to grow by 500 people or more over the next 25 years. Overall, Tasman’s population is expected to increase by 7,700 people by 2039. The Council’s planning also takes into consideration the decrease in the number of persons per household and provides for an increase in the number of holiday homes. The latter is particularly important for holiday settlements such as Kaiteriteri and Pohara/Ligar Bay.

The population projection in the growth model has been taken from Statistics New Zealand population projections derived from the 2013 census data, using a “medium” growth rate projection for all settlement areas (refer Table F-1). The population projections are used to determine a demand for new dwellings in each settlement area.

Table F-1: Population Projections Used in the Growth Model

Settlement Area	Population in 2014	Population projection for 2039	Increase or decrease in people by 2039
Brightwater	1835	2412	577
Coastal Tasman Area	2498	2903	405
Collingwood	232	250	18
Kaiteriteri	377	382	5
Mapua/Ruby Bay	2028	2506	478
Marahau	119	120	1
Motueka	6687	6810	123
Murchison	413	365	-48
Pohara/Ligar/Tata	543	583	40

Settlement Area	Population in 2014	Population projection for 2039	Increase or decrease in people by 2039
Richmond	13606	16396	2790
Riwaka	591	636	45
St Arnaud	101	93	-8
Takaka	1239	1056	-183
Tapawera	284	320	36
Tasman	189	210	21
Upper Moutere	148	177	29
Wakefield	1939	2471	532
Ward Remainder (Area Outside Ward Balance)	282	303	19
Ward Remainder Golden Bay	3023	3248	225
Ward Remainder Lakes Murchison	2418	2722	304
Ward Remainder Motueka	3096	3597	501
Ward Remainder Moutere Waimea	4248	4937	689
Ward Remainder Richmond	1612	2704	1092
Total for District	47508	55201	7693

Projected Population data derived from Statistics NZ 2013 Census Data (adjusted for Growth Model). Base projection series applied = medium

Table F-2 summarises some key statistics for Tasman's population, based on Statistics New Zealand medium growth projections (2006 base, updated in June 2013).

Table F-2: Population change in Tasman District

Key Statistics	2006	2013	2031
Population	45,800	48,800	53,900
Median age (years)	40.3	44.2	47.3
Proportion of population aged over 65	13.6%	17.9%	29.1%
Number of households	17,900	18,261	23,500
Working age population	29,810	30,500	29,170

Additional information from the 2013 census about Tasman District:

- Tasman's population is 1.1% of New Zealand's total population
- 93.1% of the population is European
- 7.6% of the population is Māori
- 20% of the population aged under 15 years
- 75% of households in occupied private dwellings owned the dwelling or held it in a family trust (this is the highest rate of home ownership in New Zealand)

As shown in Table F-2, Tasman's population is expected to be about 53,900 by 2031. Like the rest of New Zealand, the median age of Tasman's population is also increasing. The first of the baby boomers (those born between 1946 and 1964) commenced retiring in 2011 and fertility rates have also decreased over the last 20 years. The median age is projected to increase from 44.2 in 2013 to 47.3 in 2031. By 2031, the number of people aged over 65 in Tasman is projected to comprise 29.1 percent of the population, compared to 17.9 percent in 2013. Twenty years ago the figure was less than 10 percent. These demographic changes raise a number of challenges for Council.

As Tasman's population increases, Council needs to provide more services. However, many of the retired population will be on fixed incomes and unable to pay for increases in services (rates are a tax on property, not income, and if a property value is high the rates can take a significant portion of this fixed income payment). The Council's Growth Strategy considers whether our community can afford to support growth in all 17 settlements and what form this growth will take.

Communities with an older population are likely to have different aspirations to the communities with a younger median age. This may include:

- where they wish to live, possibly closer to main settlement areas where medical and social services are more readily available;
- an increase in the demand for smaller properties and a decrease in the demand for lifestyle or larger properties, particularly given the projected increase in the number of single households;
- the type of facilities and the levels of service requested, including more informal recreation facilities and the increased demand for "free" or low cost services such as libraries; and
- their ability and willingness to pay for services and facilities may be lower, given that incomes are expected to be lower.

The Council has taken these factors into account in the development of this AMP and the LTP.

F.1.3. Business Forecast

The last major review of business demand was undertaken as part of the 2008 growth model. Three economic demand assessments were used to build a quantitative picture of business growth in terms of employment growth and linked growth in demand for business space. Each study provided different datasets, but an aggregate picture of estimated business land demand in the Tasman district, including, Motueka and Environs, Golden Bay, and Tasman district balance (including Richmond).

For the 2011 and 2014 growth models, a high level consideration of business growth opportunities showed that in the two main demand areas (Richmond as part of the eastern sub regional demand catchment of Nelson-Tasman, and at Motueka as the centre of the western sub regional demand catchment), there is a large business land supply capacity becoming available for business development. This includes the current deferred business zonings in both the Richmond West Development Area, and draft deferred zonings in Motueka West Development Area. It was considered this amount of supply capacity will meet the expected needs of business growth for at least 50 years (well beyond the 20 year projection). On this basis, the 2014 review of the growth model simply adopted the data and assumptions in the 2008 growth model, but updated the datasets by extrapolation for a further three years (2032 to 2035).

Looking ahead, there are three main difficulties with relying on the historical demand assessments as the basis for business growth demand forecasts:

- the economic modelling by the consultants' assessments used two different sets of now-dated census data for economic and employment growth;
- the demand assessment methods have yielded results of limited reliability at the level of individual settlement areas, as the areas assessed yielded aggregate results from an undisclosed simulation economic modelling routine, that have then been apportioned and subject to a number of simplifying assumptions; and
- the consultant work done is not in a Council-managed information system and does not provide a confident results in a regional (Nelson-Tasman) context especially for future Nelson-Richmond urban area forecasting.

Notwithstanding that the last study is now six years old, the information used for business demand is considered sufficient as for part of this time the Global Financial Crisis also reduced local demand for new business land, and since this time many “new” businesses have been established on current business properties (brown fields development). What is required is the development of a regional (Nelson-Tasman) economic simulation model capable of yielding results at the settlement area level, and suitably populated with current data, to yield more reliable segmented business land demand estimates, for each settlement area. This is a strategic priority for further work after the completion of the 2014 growth model review.

F.1.4. Rollout Assessment

Once the analysis of demand for residential dwellings and buildings in each settlement area has been completed, and when the supply potential for new subdivision and dwelling/building construction has been assessed for each development area, the rollout analysis is done. This seeks to forecast when and if the demand for dwelling and business premises will be met and, if so, where and when. This results in a forecast for each development area of:

- the number of new residential dwellings that will be created through subdivision or building on vacant lots; and
- the number of new business buildings that will be created through subdivision or building on vacant lots.

This information is then used to plan how and where network infrastructure needs to be developed and to what capacity.

F.2 Projection of Demand for Water Services

F.2.1. Forecast Growth in Demand from GDSM

The forecast growth in demand from the GDSM growth forecasts is shown in Table F-1 to Table F-4 following.

Table F-1: Growth of Water Connections in Urban Water Supplies

Water Supply Name	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Brightwater Hope	1041	1051	1061	1069	1076	1084	1091	1099	1107	1116
Collingwood	217	217	217	217	217	217	217	217	217	217
Kaiteriteri	597	604	610	613	615	617	619	621	623	627
Mapua Ruby Bay	811	815	820	829	837	845	853	861	869	876
Murchison	303	303	303	304	304	304	304	304	304	304
Richmond & Waimea	5770	5825	5879	5968	6057	6146	6235	6324	6413	6504
Tapawera	167	167	167	168	168	169	169	170	171	173
Upper Takaka	20	20	20	20	20	20	20	20	20	20
Wakefield	776	781	786	797	807	818	828	839	850	860
Pohara Valley	47	47	47	47	47	47	47	47	47	47
Total - all Urban Water Supplies	**9749**	**9830**	**9910**	**10032**	**10148**	**10267**	**10383**	**10502**	**10621**	**10744**

Table F-2: Growth of Water Connections in Community Water Supplies

Water Supply Name	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
Motueka[1]	1175	1192	1209	1231	1253	1275	1297	1319	1341	1363

Table F-3: Growth of Water Connections in Rural Water Supplies

Water Supply Name	**Flow per unit (m^3/day)**	**2015/16**	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
Dovedale RWS	2	265	265	265	265	265	265	265	265	265	265
Redwood Valley RWS	2	350	350	350	350	350	350	350	350	350	350
88 Valley RWS	1	172	172	172	172	172	172	172	172	172	172
Hamama - connections		27	27	27	27	27	27	27	27	27	27

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[1] Note, the forecast for Motueka assumes the Motueka Urban Water Supply is constructed over 2013 to 2016.

Table F-4: Growth of Water Connections in Rural Extensions

Water Supply Name	Flow per unit (m^3/day)	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Richmond Rural Ext	2	132	132	132	132	132	132	132	132	132	132
Best Island Rural Ext	2	32	32	32	32	32	32	32	32	32	32
Brightwater/Hope Rural Ext	2	150	150	150	150	150	150	150	150	150	150
Collingwood Rural Ext	2	1	1	1	1	1	1	1	1	1	1
Mapua Rural Ext	1	230	230	230	230	230	230	230	230	230	230
Murchison Rural Ext	2	2	2	2	2	2	2	2	2	2	2
Tapawera Rural Ext	2	1	1	1	1	1	1	1	1	1	1
Wakefield Rural Ext	2	58	60	62	64	66	68	70	72	74	76
Total - All Rural Extensions		**606**	**608**	**610**	**612**	**614**	**616**	**618**	**620**	**622**	**624**

F.2.2. Effect of Population Growth on Water Supply

The population growth anticipated in the district will have a significant impact on the water supply assets.

- Water Source: Some systems are experiencing demand higher than the permitted water take, particularly during the summer months when water restrictions may be in place. The implications are that new connections are not being allowed to the system. New sources need to be located and developed and levels of water loss need to be reduced.
- Water Reticulation: Certain areas of reticulation are already at capacity meaning that unless these are upsized, no new growth can be serviced.

In terms of specific components of the water supply systems, the responses are as follows:

- new reticulation and storage required to service expected growth to South Richmond is proposed;
- rezoning of Richmond to maximise the use of the Waimea supply is underway;
- a supplementary Richmond source also needs to be developed to meet demand;
- new source and treatment plant to service Wakefield is underway;
- reservoirs and mains rezoning for Wakefield and 88 Valley is scheduled;
- rural extension from Brightwater to serve Teapot Valley is scheduled;
- contribution to the Waimea Community Dam to cater for Richmond, Waimea, Mapua and Brightwater growth.

Appendix AA addresses options if the Waimea Community Dam is delayed or deleted.

F.2.2.1 New or Expanded Schemes

Projections for future growth in demand for water supply services must take into account not only new developments but also existing residents from un-serviced areas connecting to Council services.

Anticipated new developments and asset creation include the following significant schemes.

- Motueka – Whilst groundwater is readily available for private use in Motueka, the shallowness of the aquifers and the density of the population make the continuation of this practice a potential public health risk. The Council has obtained resource consent to abstract water from a secure, deep aquifer. Sufficient water will be readily available to allow full reticulation of the town. The Council decided to proceed with the project only if it received a satisfactory Government subsidy but this was not successful. Hence the major part of the project has been delayed to year 29 (2043/44) of this AMP pending new government assistance. In the meantime, the Council will continue to monitor the water supply and public health issues in Motueka. A smaller project involving relocation and upgrading of the Motueka Bores which will facilitate expansion of the Motueka reticulation is scheduled.
- The Coastal Pipeline and CTA – The proposed coastal pipeline scheme has been reviewed in this AMP and it does not represents good return on investment and hence this project has been deferred until year 29 (2043/44) of the AMP pending a significant change in the economics of the scheme.
- Pohara – There is unmet demand along the Pohara to Tata Beach coast that cannot be supplied from the limited existing Pohara scheme. The nearest water source of acceptable quality and yield is the Takaka aquifers. The WSSA report identified Pohara as a Priority 2 community which would benefit from a new town drinking water supply. The new Pohara scheme would include supply to all coastal communities to Tata Beach and is currently scheduled to commence in year 25 (2039/40) following extensive community consultation.
- Marahau – This community has a limited supply of potable water. Rainwater tanks are currently the main water source. With the combined pressures of growth potential and tourism, the Council considers that Marahau would benefit from a public water supply scheme. A scheme to provide a new town drinking water supply has been scheduled to commence in year 25 (2029/30) following extensive community consultation.
- Wakefield – In order to meet growing demand in Wakefield, a new water source must be established and treated, to ensure sufficient water is available. The current source is not adequate to meet projected growth. New bores have already been drilled and construction for a new water treatment plant and source is scheduled to be completed by the end of year 4 (2018/19).
- Waimea Community Dam – this major investment proposal would ensure that sufficient water exists to underpin growth in Richmond, Waimea, Mapua and Brightwater. The TRMP has already been changed (changes 45-48) to reflect a reallocation of flow from extractive uses to minimum environmental flows. If the dam does not proceed then this will have significant implications for water users as discussed in Appendix AA.

F.2.3. Implications of Changes in Community Expectations

Community expectations vary geographically and over time. Key trends in community expectations that the Council recognises include those listed in Table F-5 below.

Table F-5: Community Expectations

Trends in Community Expectations	Implications for Water Supplies	How Council Plans to Address the Issues
Rural water supply customers, particularly the farming community, are resistant to expenditure required to meet drinking water standards, especially where water is also for stock use.	Conflict with scheme users and management committees when rates rise to fund improvements.	Continue to inform management committees of current legislation and make clear that Council cannot decide not to meet their legal obligations.
'Lifestyle' property owners in rural water supply areas have high expectations of service level standards, and feel that rural supplies should deliver to the same standards as urban systems.	These expectations have resulted in a growing number of complaints, and an increase in costs associated with dealing with the complaints. Additionally, there are instances of unwise use and wastage of water in rural schemes because of misunderstandings of service level and capacity.	The Council will issue a rural water supply policy statement to new customers, and continue to educate rural scheme users about wise water user practices and the limitations of the rural service.
Urban customers' expectations of achievable water quality standards are increasing.	Resulting in higher number of complaints. Need to improve treatment.	Treatment upgrades or new sources are planned for the majority of schemes to meet DWSNZ.
In general, the public and communities of Tasman district are becoming more environmentally aware.	The Council will need to be seen as a leader in sustainable practices and water conservation.	Continue to identify water conservation opportunities and reduce water leakage across the supply network.
Customers and communities are becoming less tolerant of water restrictions, rationing, and interruptions in supply.	Upgrades needed to defer or reduce the need for restrictions and rationing. Also need to take steps to improve assets in order to minimise the number of shutdowns and interruptions to supply.	Increase storage capacities, increase systems inter-connectedness and flexibility to transfer water to where it is needed, and increase the robustness of the system in general.

F.2.4. Implications of Industrial Demand

There are very few significant industrial users within the Tasman district supplied from Council sources. The exceptions are Nelson Pine Industries Ltd in Richmond and ENZA Foods and the Alliance Group Ltd meat processing works within Stoke. All of these industrial users are supplied from the Waimea system.

Industry sources have indicated that water demand for the existing large industrial water users will decrease with water saving initiatives. For the purposes of this 30 year plan it is assumed that the consumption will remain at approximately 700,000m^3/year. The Council is in the process of reviewing contracts with the larger industrial water users.

Noted that the TRMP (plan change 45-48) lists priority end users for water. There is a likelihood that supply to industrial users would be cut back in preference of domestic users and public health needs during rationing in times of severe drought. In addition, no new demand greater than 15m^3/day can be approved before the Waimea Community Dam is operational.

F.2.5. Supply Agreement Changes

Almost all water supply schemes in Tasman have their own water sources that are controlled by resource consents. The exception is a supply agreement between Tasman District Council and Nelson City Council. This agreement stems from the joint funding of the construction of the Roding Dam and guarantees Tasman district 909 m3/day from the Nelson City Council system at a set cost.

This has been a valuable supply for Richmond. Generally only 2m3/day is taken, however during summer 2007/08 this source was almost fully utilised as a result of Stage 1 rationing being imposed in Richmond and the supply could not meet demand.

Maintaining use of the Nelson City Council supply serves two purposes:

- the original water right of 909m^3/per day is maintained;
- flow of the water through the valved connection maintains good water quality within the pipeline by preventing stagnation;
- further use of this supply in a no-dam scenario is considered in Appendix AA.

F.2.6. Implications of Technological Change

Technological change has the ability to impact on the demand for a service. These changes can reduce or increase the demand for water supply infrastructure. Relevant examples are:

- household water saving devices like dual flush toilets, low-flow shower heads and front-loading washing machines which reduce water demand;
- rainwater and grey water re-use schemes.

Similarly, technological advances can have an effect on the cost of maintenance and operation of assets. Relevant examples are:

- advances in treatment process could make quality improvements cost effective
- improvements in pump efficiency will decrease power consumption
- material improvements increase the base lives of assets
- advances in water leakage detection.

The potential impact of these technologies is generally unquantifiable, so apart from extended lives for urban meter replacements, no direct allowances have been made for them in this AMP.

F.2.7. Implications of Legislative Change

Drinking Water Standards of New Zealand (DWSNZ)

A minor amendment to terminology has seen Public Health Risk Management Plan (PHRMP) being replaced by Water Safety Plan (WSP). The Council are taking “all practical steps” to comply and are well advanced on its programme of preparing and implementing WSP for each water supply scheme.

Table F-6: Timeframes for Compliance with DWSNZ

Location	Size (Population Served)	WSP Date (expires 5 years after approval)	Implementation project #, works and date
Richmond/Waimea	Large (> 10,000)	Done, *to be revised in 2015/16 after WTP built*	Richmond WTP 2015
Brightwater/Hope	Minor (501 – 5,000)	Done September 2011, *Due 2015*	150018, WTP Upgrade 2019
Motueka	Minor	Done, lapsed, *Due 1 July 15*	150231, Parker Street WTP and mains, 2017
Kaiteriteri/Riwaka	Minor	*Due 1 July 15*	150051, WTP upgrade, 2017
Wakefield	Minor	Done March 2012, *Due 2017*	150184, Wakefield WTP and mains, 2019
Mapua/Ruby Bay	Minor	*Due 1 July 14*	150164, Waimea WTP upgrade, 2019
Murchison	Small(101-500)	Done June 2012, *Due 2015*	150199, Treatment upgrade, 2022
Redwood Valley	Small	Golden Hills Done June 2013, O'Connors *Due 1 July 15*	150104, Golden Hills & 150105, O'Connor Creek Treatment upgrade, 2027
Dovedale	Small	*Due 1 July 15*	150031, New Motueka River Valley Source, 2028
Pohara	Small	*Due 1 July 15*	150092 Treatment Upgrade 2021
Collingwood	Small	Done May 2012, *Due 2017*	150023 Treatment upgrade 2029
Tapawera	Small	Done March 2011, *Due 2016*	150240, Treatment Plant, 2029
88 Valley	Small	*Due 1 July 15*	150007, Treatment Upgrade, 2029
Hamama	Neighbourhood (25 – 100)	Proposed to transfer to community else *Due 2016*	Not Scheduled
Upper Takaka	Neighbourhood	Done March 2011, *Due 2016*	Complete

The Drinking Water Assistance Programme (DWAP)

The DWAP is a pool of subsidy funding available for water suppliers to aid with upgrading supplies to meet DWSNZ requirements. Currently (2015), the Council's schemes are either not eligible for funding or are very low priority.

Water Gradings

Water gradings are no longer carried out now that it is mandatory to comply with the DWSNZ.

F.3 Assessment of New Capital Works

In the preparation of this AMP, new works were identified by:

- reviewing levels of service and performance deficiencies;
- reviewing risk assessments;
- reviewing previously completed investigation and design reports; and
- using the collective knowledge and system understanding of the project team.

Each project identified was developed with a scope and a project cost estimate. Common project estimating templates were used to ensure consistent estimating practices and rates were used. This is described in Appendix Q. The project estimate template includes:

- physical works estimates;
- professional services estimates;
- consenting and land purchase estimates;
- contingencies for unknowns.

All estimates are documented in the AMPs directory. The information from the estimates has then been entered into the Capital Forecast spreadsheet that enables listing and summarising of the Capital Costs per project, per scheme, per project driver and per year. This has been used as the source data for input into Council's financial system for financial modelling.

F.4 Determination of Project Drivers and Programming

All expenditure is allocated against at least one of the following project drivers.

Operation and Maintenance:	operational activities which have no effect on asset condition but are necessary to keep the asset utilised appropriately and on-going day-to-day work required to keep assets operating at required service levels[2].
Renewals:	significant work that restores or replaces an existing asset towards its original size, condition or capacity[3].
Increase Level of Service:	works to create a new asset to upgrade or improve an existing asset beyond its original capacity or performance to improve the level of service provided to existing customers.
Growth:	works to create a new asset to upgrade or improve an existing asset beyond its original capacity or performance to provide for the anticipated demands of future growth.

This is necessary for two reasons as follows:

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[2] Definition from International Infrastructure Management Manual – Version 3.0, 2006, pg 3.114

[3] Definition from International Infrastructure Management Manual – Version 3.0, 2006, pg 3.114

- Schedule 13(1) (a) of the Local Government Act requires the local authority to identify the total costs it expects to have to meet relating to increased demand resulting from growth when intending to introduce a Development Contributions Policy.
- Schedule 10(2)(1)(d)(l)-(iv) of the Local Government Act requires the local authority to identify the estimated costs of the provision of additional capacity and the division of these costs between changes to demand for, or consumption of, the service, and changes to service provision levels and standards.

Some projects may be driven by a combination of these factors and an assessment has been made of the proportion attributed to each driver. A guideline was prepared to ensure a consistent approach to how each project is apportioned between the drivers.

Some projects may be driven fully or partly by needs for renewal. These aspects are covered in Appendix I.

The projects have been scheduled out across the 30 year period. They were then loaded into Mapinfo along with projects from all other engineering activities to allow Programme Managers to assess any programme clashes or optimisation opportunities.

F.4.1. Project Prioritisation

Project prioritisation built upon the “non-discretionary” or “discretionary” system employed in 2012; where:

A non-discretionary investment is one that relates to:

- a critical asset, that without investment is likely or almost certain to fail within the next three years, with a medium, major or extreme impact;
- any asset that has a regulatory requirement to make the proposed investment.

A discretionary investment is one that relates to:

- a non-critical asset with no regulatory requirement to make the proposed investment;
- a critical asset where asset failure is possible, unlikely or very unlikely to occur within the next three years with no regulatory requirement to make the proposed investment;
- a critical asset where asset failure has only a negligible or minor impact with no regulatory requirement to make the proposed investment.

Further review of priorities included consideration of:

- growth influences;
- a review of the criticality framework;
- cost-effectiveness reviews.

F.5 Developer Created Assets

Private developers generally construct new subdivisions with consent from the Council. It is very seldom that the Council itself constructs new subdivisions to service growth. The Council is normally responsible for the upgrading/upsizing of existing assets to provide for increased volumes associated with growth.

Council staff oversee the subdivision process, from consenting through to construction and handover to the Council. The Council’s engineers inspect design plans and finished works to ensure the assets meet the required standards and are in an acceptable condition to be accepted as a Council asset. Should any work not meet the required standards the Council requires the developer to remedy the issue prior to accepting ownership.

F.6 2015 – 2045 New Capital Works Forecast

The capital programme that has been forecast for this activity where the primary driver is classed as New Works (ie. growth or levels of service) is shown in Figure F-1 to Figure F-3 and Figure F-4 following shows the works expenditure profile by area.

F.7 Cross Activity Projects

There are several projects that span across more than one of the Engineering Departments activities. These projects are strongly linked either because one project causes the need for another or because it makes sense to undertake the projects either sequentially or in parallel. By managing related projects as a group the Programme Delivery Team will ensure that the overall cost and disruption caused by the works is minimised. Highlighting the linkages also helps to reduce the risk of a dependant project being rescheduled independently.

Table F-7 summarises cross activity projects including the predominant year of physical works and project cost.

Table F-7: Cross Activity Projects

Project ID	Activity	Project Description	Year	Project Cost
Richmond Town Centre Projects				**$8,916,490**
110077	Transportation	Upgrade of the Richmond Town Centre (Queen Street) to provide improved traffic calming and shared spaces	2016/17	$4,653,000
150129	Water	Renewal of existing 300mm and 100mm diameter pipes	2016/17	$1,837,000
160036	Stormwater	Renewal of existing pipes, plus additional capacity to reduce CBD flooding	2016/17	$2,214,000
140035	Wastewater	Upgrade of pipes between 202 Queen Street to Sundial Square	2016/17	$212,490
Oxford Street – Richmond				**3,714,268**
160033	Stormwater	Partial pipe upgrade	2022/23	1,754,924
110093	Transportation	Widening of Oxford Street between Wensley Road and Gladstone Road	2022/23	872,000
140034	Wastewater	Pipeline upgrade	2022/23	772,600
150126	Water	Replace 100mm with 150mm main Wensley Road to Gladstone Road	2022/23	314,744
Queen Street and Salisbury Road Intersection – Richmond				**1,716,055**
110096	Transportation	Upgrade intersection to improve efficiency	2019/20	1,041,000

Project ID	Activity	Project Description	Year	Project Cost
160073	Stormwater	Rework stormwater at intersection	2016/17	432,004
150131	Water	Rework water at intersection	2019/20	243,051
Salisbury Road – Richmond				**1,240,476**
160076	Stormwater	Extend pipe to William Street	2021/22	640,476
110095	Transportation	Upgrade intersection to improve efficiency	2021/22	550,000
150246	Water	Renew old copper laterals	2021/22	50,000
Gladstone Road – Richmond				**1,983,670**
150118	Water	New 250mm main from Queen Street to Three Brothers Corner	2026/27	1,651,370
140031	Wastewater	Upgrade from WWSF-1709 to WWSF-1708	2026/27	332,300
Pipe Works – Mapua				**4,200,000**
150237	Water	Replace existing water pipe in the same trench	2027/28	3,700,000
140017	Wastewater	New rising main along Aranui Road and across channel	2027/28	500,000
Flood Mitigation Works – Brightwater				**2,535,534**
160002	Stormwater	Mt Heslington stream diversion	2020/21	2,235,534
160138	Stormwater	Drainage repair works	2020/21	300,000
130020	Rivers	Removal of the railway embankment	2020/21	80,000
Murchison Town Centre Projects				**1,344,000**
160019	Stormwater	Ned’s Creek flood mitigation works	2019/20	750,000
110084	Transportation	Town centre upgrade (potential link)	2023/24	594,000
160070	Stormwater	Pipe renewals	2020/21	200,000

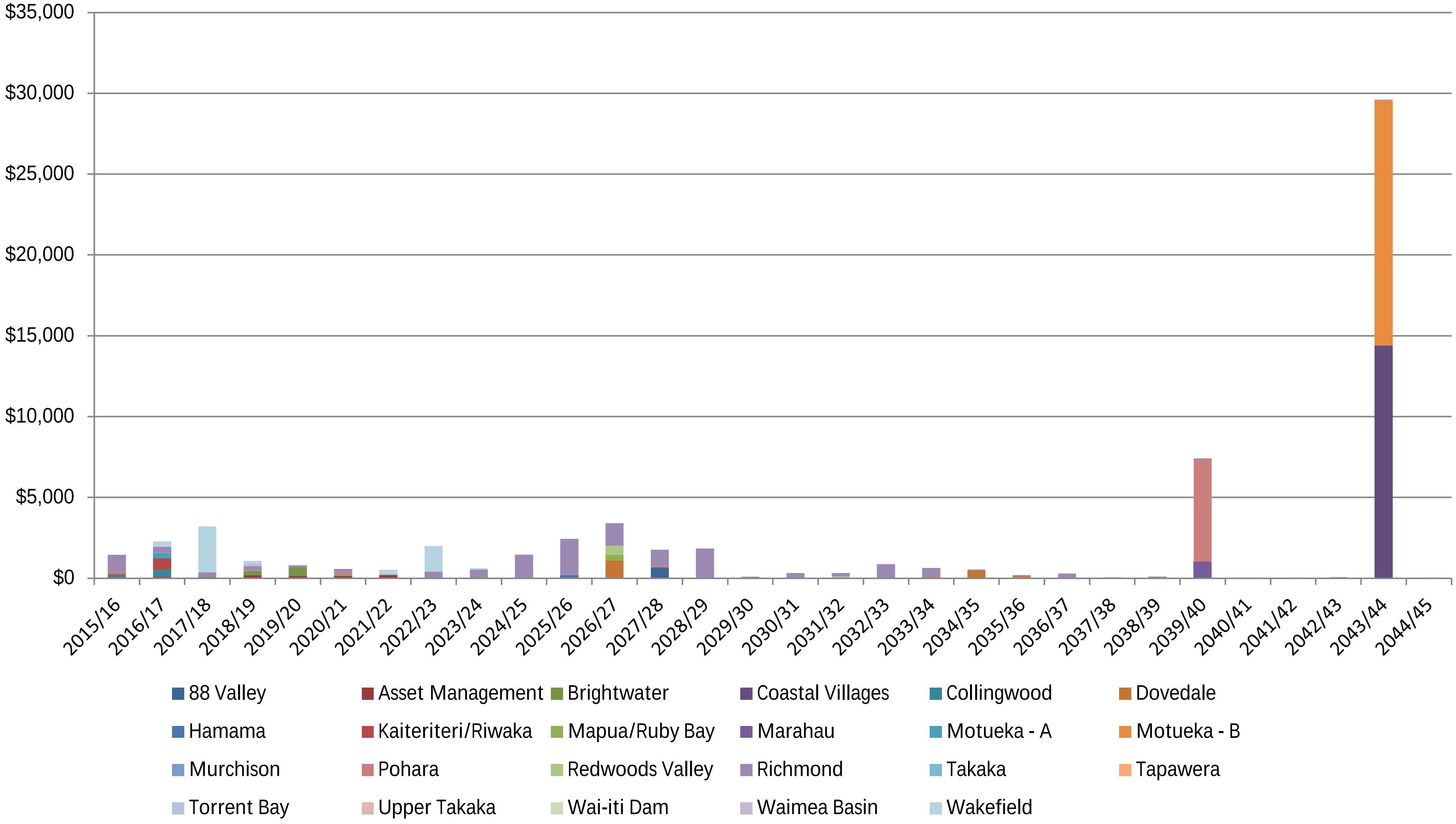


Figure F-1: 2015 – 2045 Water Supply Growth Expenditure ($000)

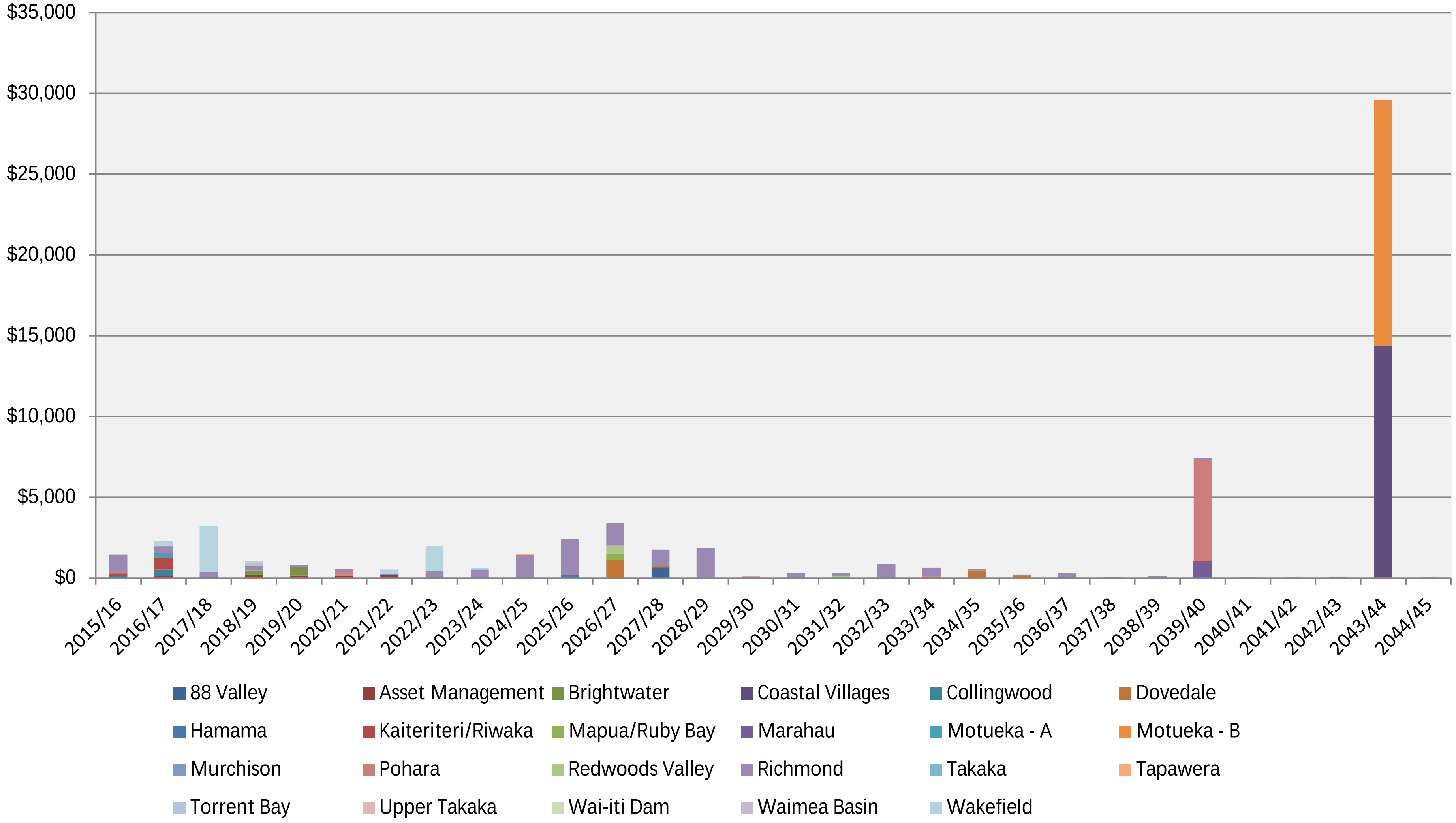


Figure F-2: 2015 – 2045 Water Supply Increased Level of Service Expenditure ($000)

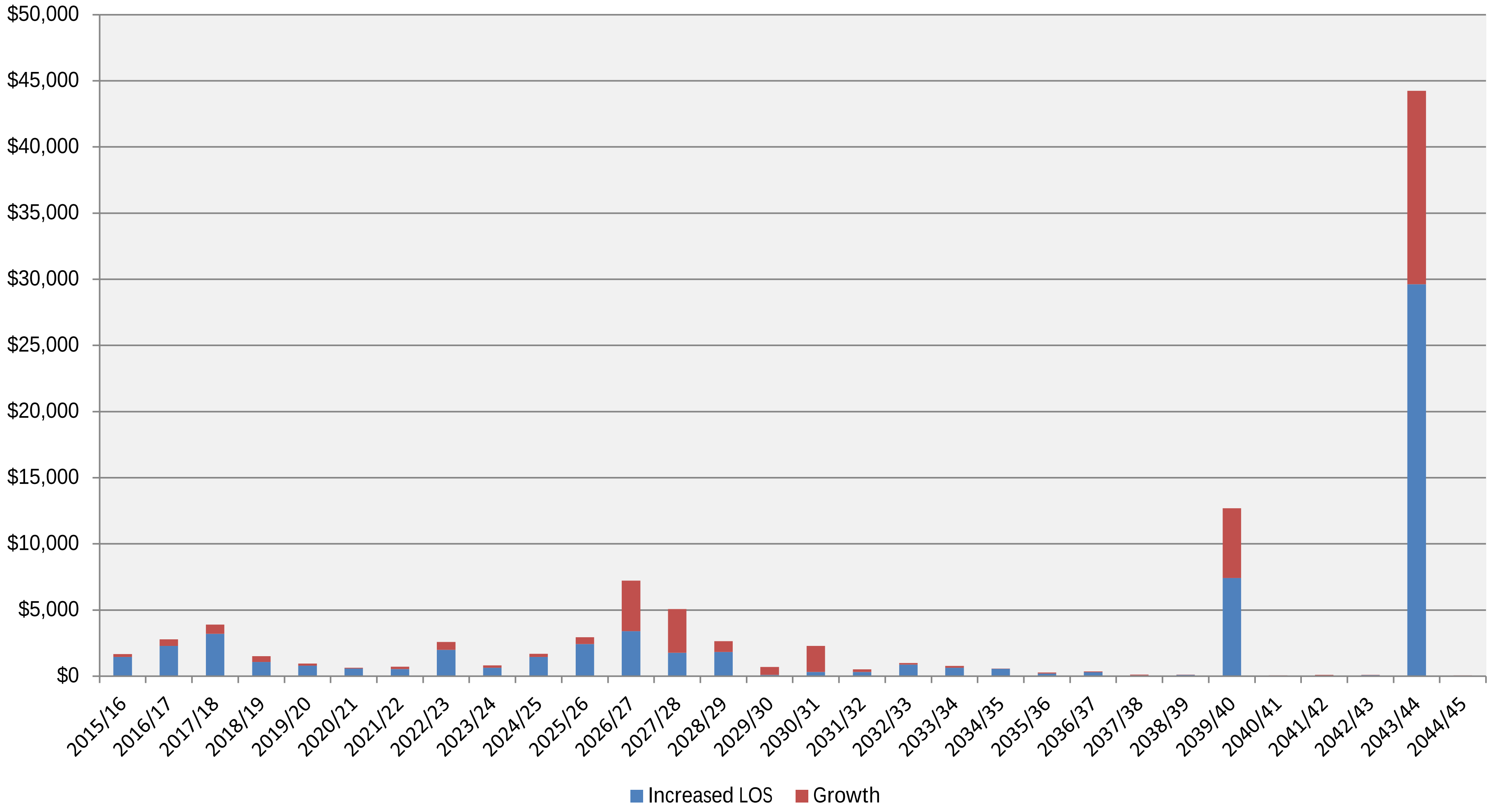
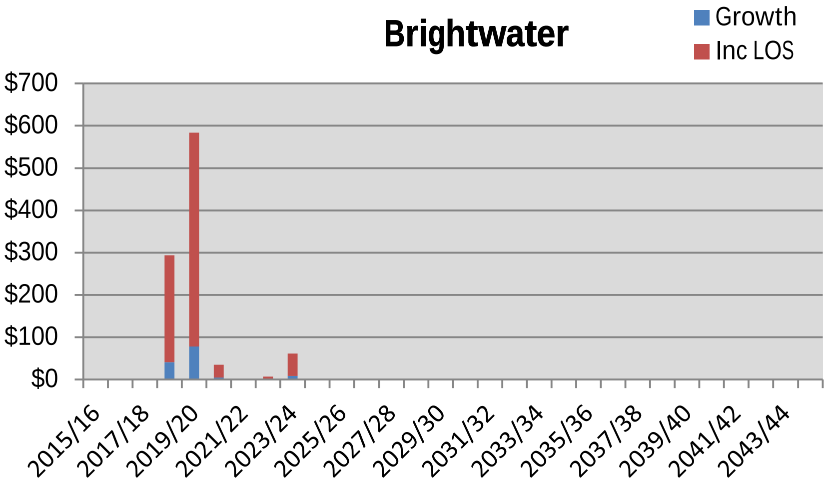
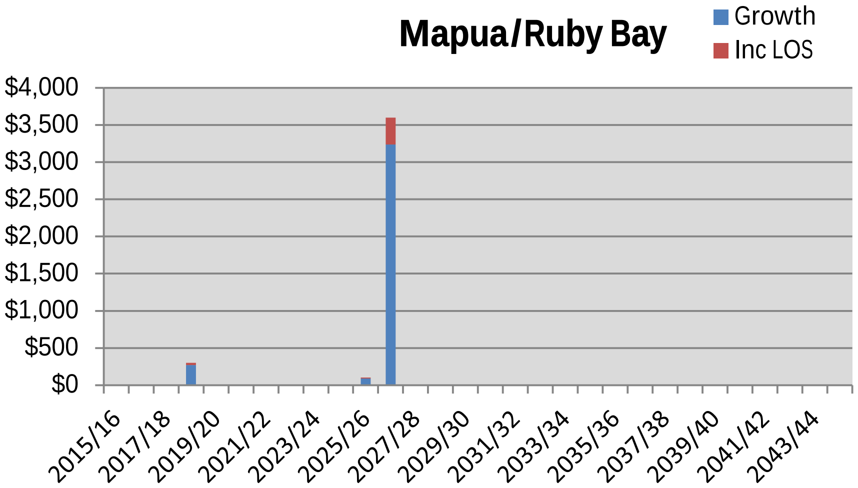


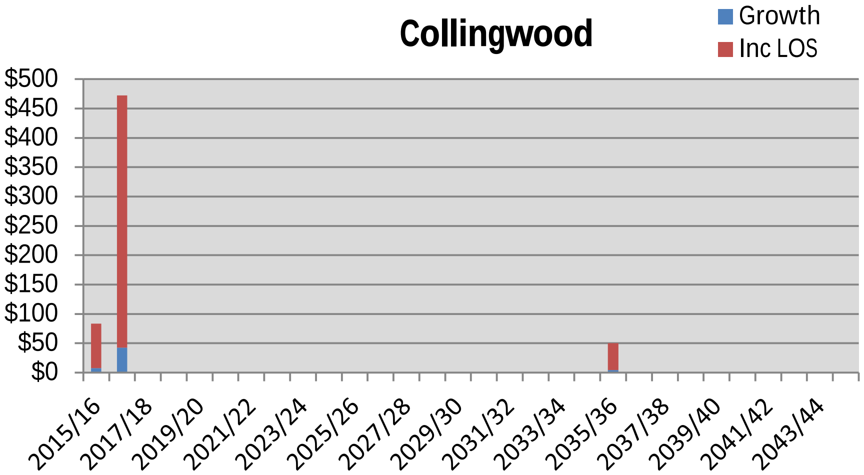
Figure F-2: 2015 – 2045 Water Supply New Capital Expenditure ($000)



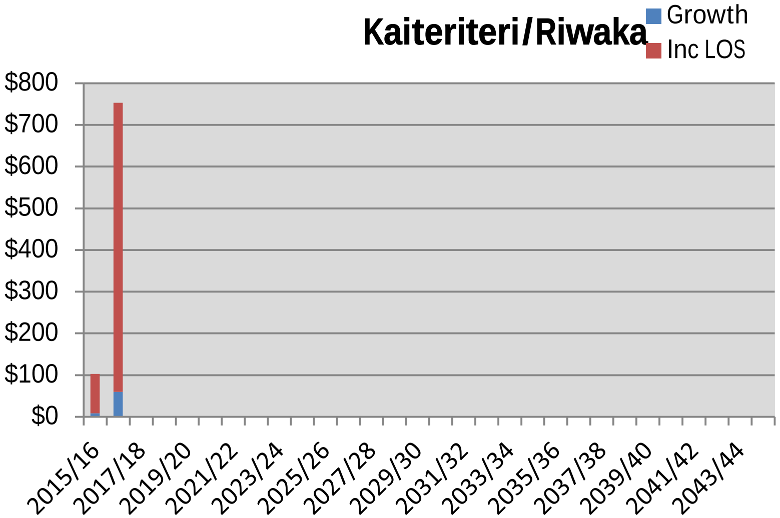
Major Capital Projects
-Treatment Plant Upgrade 2018-20
- New Bore 2022-23



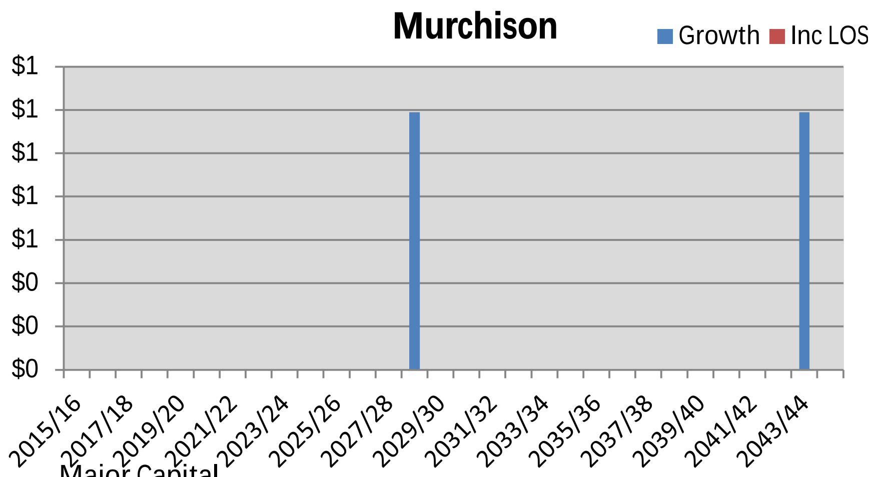
Major Capital Projects
Upgrade Pipe Waimea to Mapua 2026-27



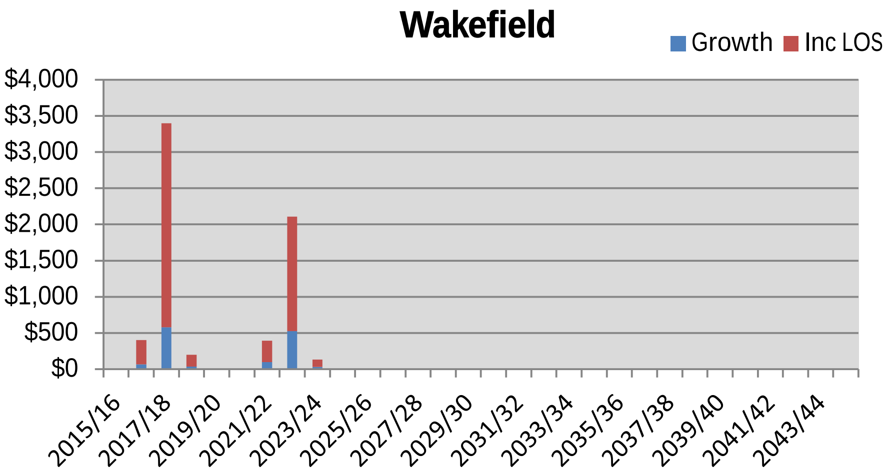
Major Capital Projects
Treatent Plant Upgrade,2015-17



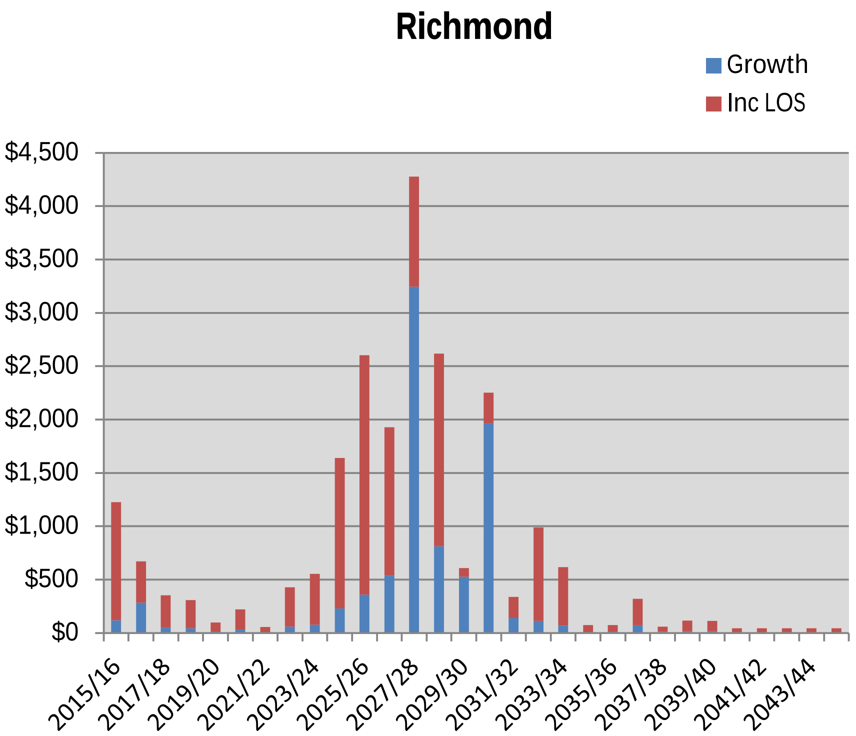
Major Capital Projects
Treatment Plant upgrade 2015-17



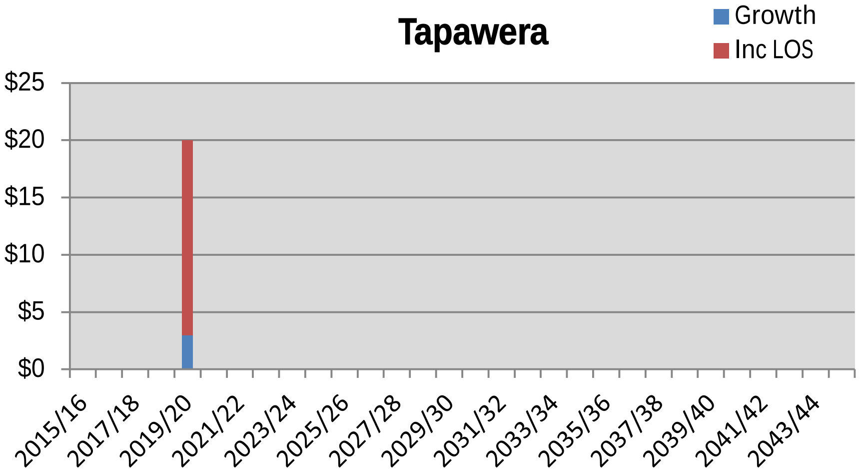
Major Capital



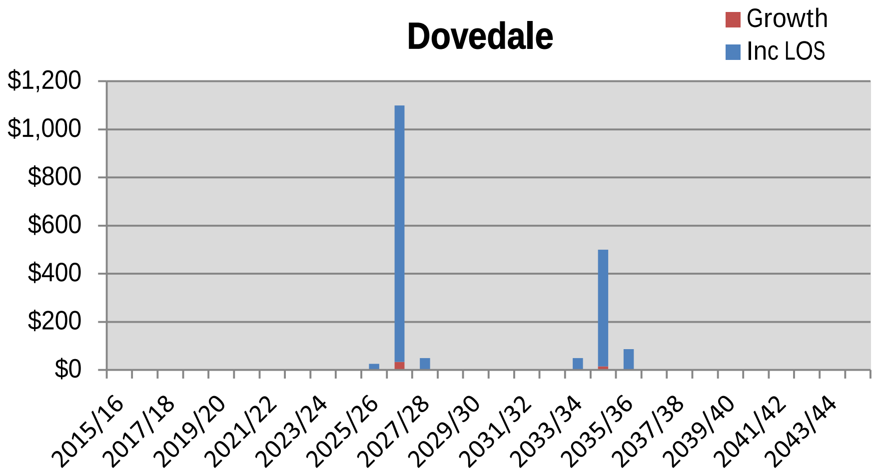
Major Capital Projects
New pipes and Treatment Plant, 2016 - 2018
Rezoning, new mains and reservoirs 2021-23



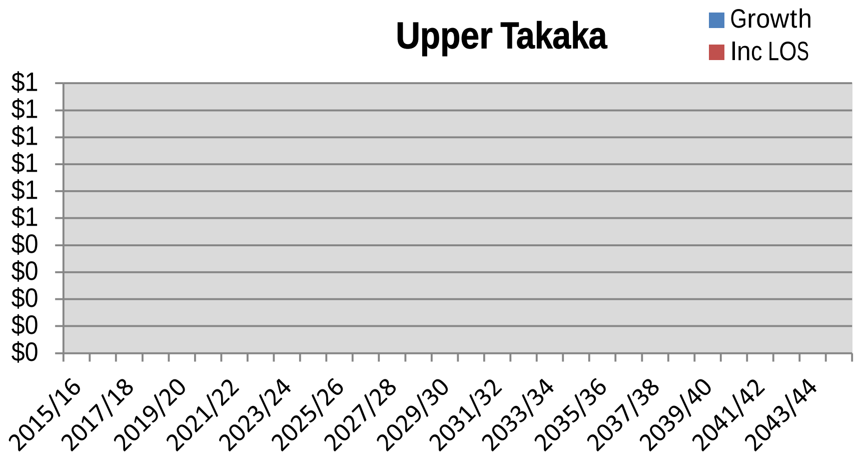
Major Capital Projects
- Rezoning Projects 2015-17
- Waverly St main 2017-19
- Gladstone Road 250mm Main 2025-26
- Reservoir Strengthening 2015-16
- New Groundwater source 2023-26
- Queen Street main 2016-20
- Richmond South mains & reservoirs 2026-37
- Oxford St main 2022
- Lower Queen Street Main 2028-29



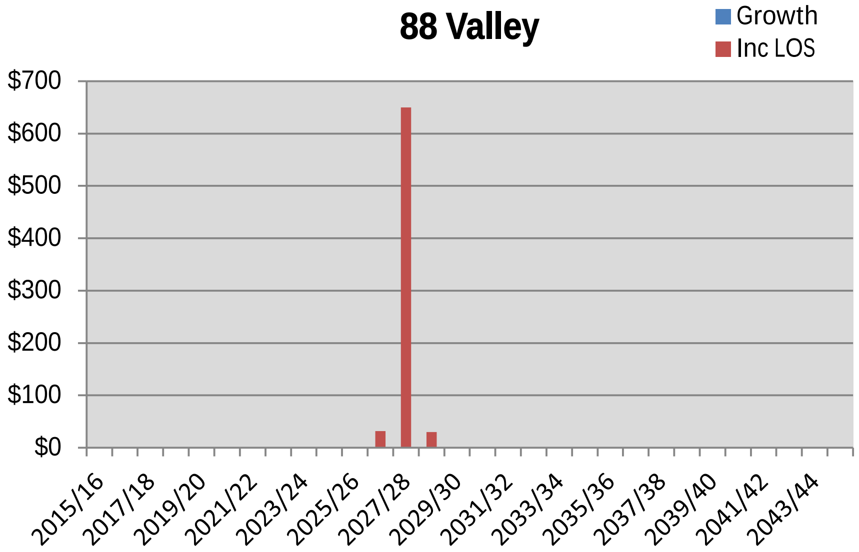
Major Capital Projects
Not Applicable



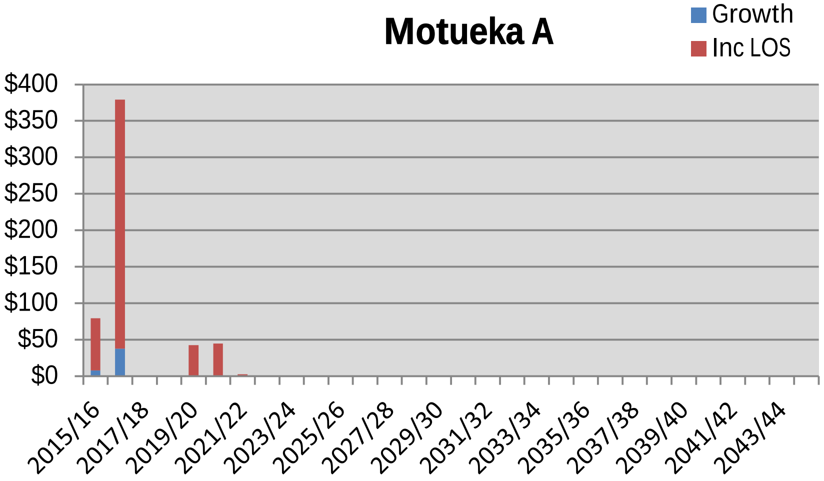
Major Capital Projects
New Source and Treatment Plant 2025-28, 2033-36



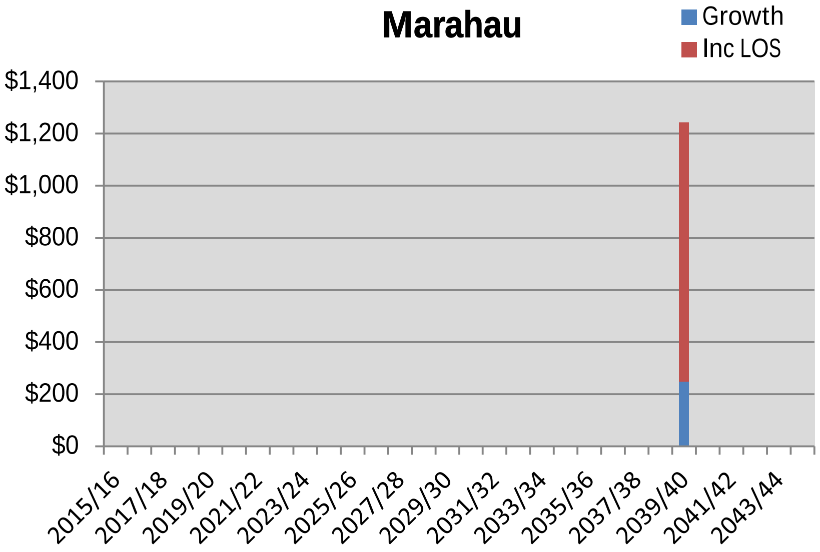
Major Capital Projects
Not Applicable



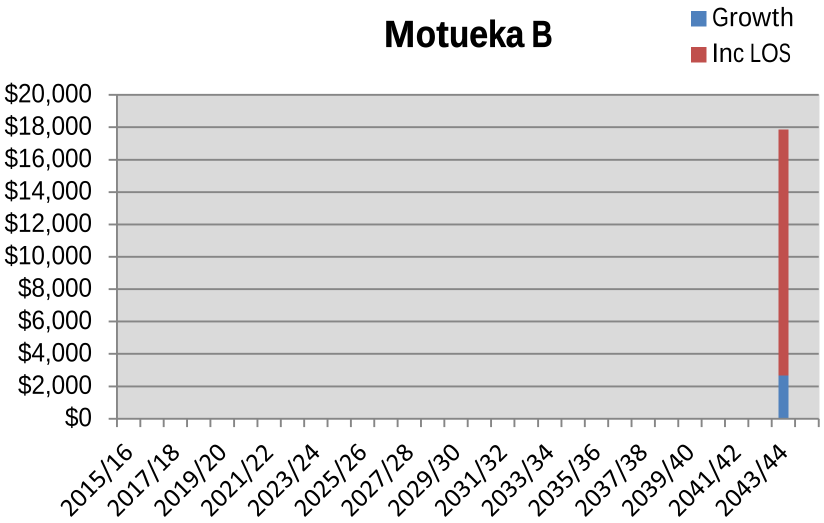
Major Capital Projects
Treatment Plant upgrade 2026-29



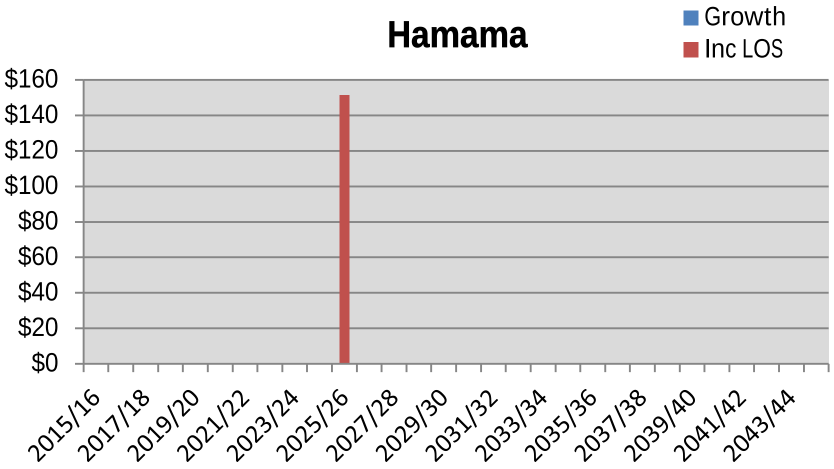
Major Capital Projects
- Relocate & upgrade Fearons Bush Treatment 2015-17



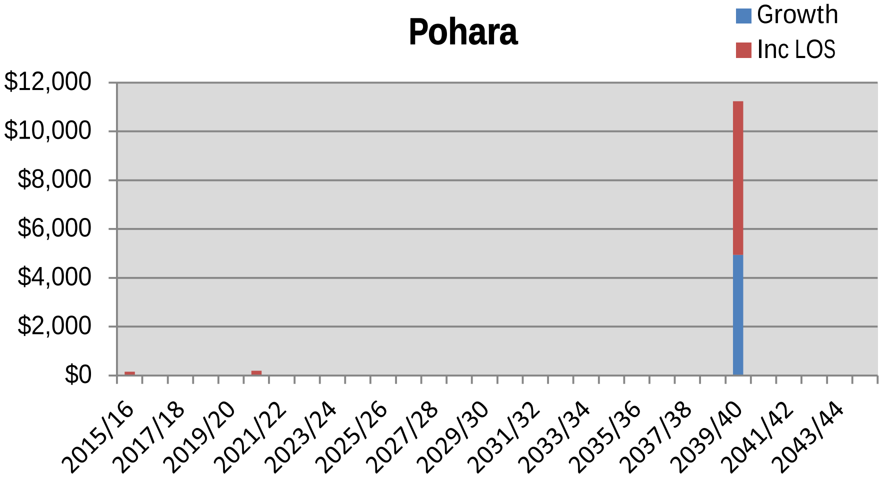
Major Capital Projects
New town supply 2039-40



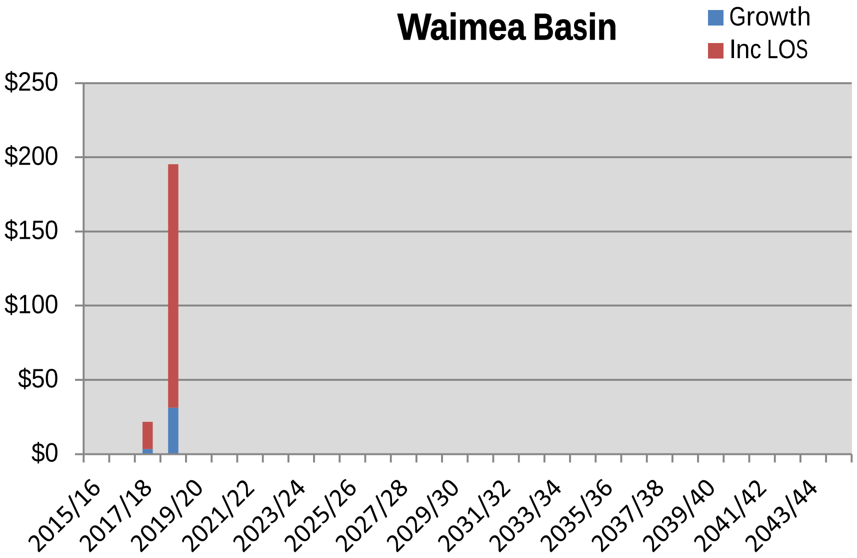
Major Capital Projects
- Full Town Reticulation 2043



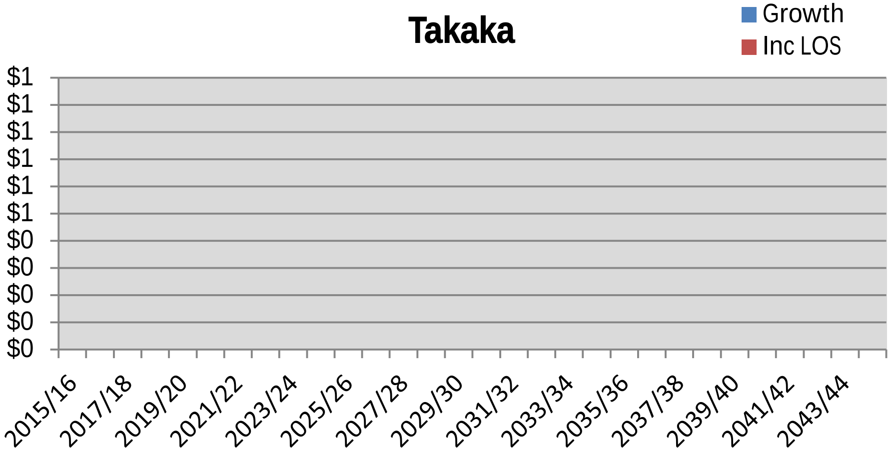
Major Capital Projects
Not Applicable



Major Capital Projects
-New Town Supply 2039-40



Major Capital Projects



Major Capital Projects
Not Applicable

Figure F-3: 2015 – 2045 Water Supply New Capital Expenditure individual Schemes

Table F-8: 2015 – 2045 Water Supply New Capital Expenditure Forecast ($000)

ID	Project Name	Project Description	Category	GL Code	% Growth	% LOS	New Capital Estimate	Total Project Estimate	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21 to Year 30
									2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	
150007	88 Valley Treatment Upgrade	Upgrade treatment to mitigate risks identified in PHRMP and meet DWSNZ.	88 Valley	08046215005	0%	100%	712	712	-	-	-	-	-	-	-	-	-	-	-	32	650	30	-	-	-	-	-	-	-
150011	Factory Road Main replacement	Replace 660m of 100mm AC main with 150mm PVC from SH6 to River Terrace Road	Brightwater	08156215004	0%	6%	25	419	-	-	-	1	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150015	Brightwater New Bore	Supplementary Bore	Brightwater	08156215002	4%	27%	68	220	-	-	-	-	-	-	-	7	61	-	-	-	-	-	-	-	-	-	-	-	-
150016	Teapot Valley extension	2390m of 63mm pipeline along Waimea West Road to Teapot Valley	Brightwater	08156215007	14%	86%	188	188	-	-	-	188	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150018	Brightwater Treatment Upgrade	Upgrade treatment to meet DWSNZ.	Brightwater	08156215008	14%	86%	700	700	-	-	-	105	560	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150023	Treatment Upgrade	Upgrade treatment to meet DWSNZ.	Collingwood	08226215004	9%	91%	606	606	83	473	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50
150031	New Motueka River Valley Water Source	Wells, headworks, pump station, treatment plant, delivery pipework	Dovedale	08056215004	3%	97%	1,812	1,812	-	-	-	-	-	-	-	-	-	-	25	1,100	50	-	-	-	-	-	50	500	87
150043	Install Household Treatment Units	Install household treatment units in each house.	Hamama	08076215001	0%	100%	151	151	-	-	-	-	-	-	-	-	-	-	151	-	-	-	-	-	-	-	-	-	-
150051	Kaiteriteri Treatment Upgrade	Upgrade treatment to meet DWSNZ.	Kaiteriteri/ Riwaka	08236215005	8%	92%	856	856	103	753	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150055	Coastal Pipeline - Urban	CTA/Coastal Pipeline - Component for Urban WS Account	Coastal Villages	08146215005	0%	100%	14,403	14,403	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14,403
150061	Coastal Pipeline - DC	CTA/Coastal Pipeline - Component for CTA DC	Coastal Villages	08146215004	100%	0%	11,886	11,886	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11,886
150063	New town supply	Construct new water supply	Marahau	08136215001	20%	80%	1,243	1,243	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,243
150069	Motueka New Town Supply - Commercial	Component for Commercial for scheme extension	Motueka - B	08146215006	0%	100%	892	892	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	892
150071	Motueka New Town Supply - Rates	Component for Targeted Rate for scheme extension	Motueka - B	08146215002	0%	100%	6,605	6,605	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,605
150072	Motueka New Town Supply - Urban	Component for Urban WS Account for scheme extension	Motueka - B	08146215003	0%	100%	3,253	3,253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,253
150075	Naumai Street	Extending main to create a loop	Motueka - A	08026215013	10%	90%	64	64	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150076	Motueka New Town Supply - DC	Component for General District DC for scheme extension	Motueka - B	08146215001	100%	0%	2,677	2,677	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,677
150079	92 Fairfax Street Headworks	Replacing Electrical box	Murchison	08176215006	3%	0%	2	79	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
150089	Construct New Town Supply	Construct new water supply serving Pohara, Tata Beach & Ligar Bay from water source near Takaka	Pohara	08576215003	44%	56%	11,233	11,233	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11,233

ID	Project Name	Project Description	Category	GL Code	% Growth	% LOS	New Capital Estimate	Total Project Estimate	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21 to Year 30
									2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	
150092	Pohara Treatment Upgrade	Upgrade treatment to meet DWSNZ. Storage needed later	Pohara	08576215002	10%	90%	350	350	150	-	-	-	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150104	Treatment Upgrade-Golden Hills	Upgrade treatment to meet DWSNZ.	Redwoods Valley	08066215013	0%	100%	250	250	-	-	-	-	-	-	-	-	-	-	-	200	-	-	-	-	50	-	-	-	-
150105	Treatment Upgrade-O'Connor Ck	Upgrade treatment to meet DWSNZ.	Redwoods Valley	08066215014	0%	100%	420	420	-	-	-	-	-	-	-	-	-	-	-	350	-	-	-	-	70	-	-	-	-
150110	Re-zoning - Cambridge St and Wensley Road	Upsize mains to 150mm between Queen St and Oxford St. Work to tie in with Queen Street Watermain	Richmond	08016215068	14%	86%	312	312	312	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150118	Gladstone Road	New 250mm main from Queen St to Three Brothers Roundabout - 1500m Linked to WW # 97	Richmond	08016215071	11%	89%	1,651	1,651	-	-	-	-	-	-	-	-	-	-	165	1,404	83	-	-	-	-	-	-	-	-
150119	Growth Allowance for pipelines	Reactive optimisation allowance to increase pipelines due to growth.	Asset Management	08016215072	100%	0%	900	900	60	-	60	-	60	-	60	-	60	-	60	-	60	-	60	-	60	-	60	-	300
150120	Re-zoning - Hi Level Vahalla	Upgrade pipe to 200mm from Reservoir	Richmond	08016215073	14%	86%	168	168	168	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150123	Lower Queen St	Replace 100 main with 150mm	Richmond	08016215076	2%	6%	68	850	7	58	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150125	New Groundwater Source	New Wellfield and new main to Richmond WTP.	Richmond	08016215035	14%	86%	4,357	4,357	-	-	-	-	-	-	-	-	436	1,525	2,397	-	-	-	-	-	-	-	-	-	-
150126	Oxford Street Main replacement	Wensley Road - Gladstone Road, replace 100mm with 150mm. Link with WW#140034 and SW#160033	Richmond	08016215023	14%	86%	315	315	-	-	-	-	-	-	-	315	-	-	-	-	-	-	-	-	-	-	-	-	-
150127	Patons Road Rider link	Link Line on Patons Road to 63mm OD PE.	Richmond	08016215078	14%	86%	93	93	93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150129	Queen St Watermain replacement	Replacing all existing 300mm and 100mm in Queen St due to lowering the road by 300mm. New 100mm rider main included. Linked to TPT #110077	Richmond	08016215009	2%	13%	276	1,837	-	15	261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150132	Richmond South Rising Main & Pump Station Low Level to High Level Reservoir	New Rising main and pump station from Low Level Reservoir to High Level Reservoir	Richmond	08016215018	87%	13%	930	930	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93	790	46	-	-	-	-
150133	Richmond South Rising main Queen Street to Low Level Reservoir	300mm trunk main from new WTP to Richmond South Low Level Reservoir. Route along Borck Drain.	Richmond	08016215017	63%	37%	2,484	2,484	-	-	-	-	-	-	-	-	-	-	-	248	2,112	124	-	-	-	-	-	-	-

ID	Project Name	Project Description	Category	GL Code	% Growth	% LOS	New Capital Estimate	Total Project Estimate	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21 to Year 30
									2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	
150134	Richmond South Rising main High Level Reservoir to Heights Reservoir	New rising main and pump station from High Level Reservoir to Heights Reservoir	Richmond	08016215019	11%	89%	621	621	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	62	528	31	-
150135	Replace Waverly Street Main	Wensley Road - Gladstone Road, replace 100mm with 150mm	Richmond	08016215024	14%	86%	264	264	-	-	26	237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150136	Reservoir Seismic Remediation	Strengthen of Reservoirs	Richmond	08016215080	0%	100%	282	282	282	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150138	Re-zoning McGlashen Ave	New 150mm main down McGlashen Ave	Richmond	08016215093	14%	86%	370	370	37	314	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150144	Richmond South - High Level Hill St South	Upsize 1230m of 50mm to 150mm along Hill Street.	Richmond	08016215022	95%	5%	502	502	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	427	25	-	-	-	-
150145	Richmond South - High Level Paton Road Main	New 150mm high level main from Hart Road to Ranzau Road	Richmond	08016215020	95%	5%	335	335	-	-	-	-	-	-	-	-	-	-	-	-	-	34	285	17	-	-	-	-	-
150146	Richmond South - Low Level Paton Road Main	New 150mm low level main from end of trunk main to Ranzau Road	Richmond	08016215021	95%	5%	468	468	-	-	-	-	-	-	-	-	-	-	-	-	47	398	23	-	-	-	-	-	-
150148	Richmond South-Hill Plough-Hill St	New 150mm main along Hill Street from Hillplough Heights and southwest. Connects to existing in Whites Road	Richmond	08016215030	11%	89%	957	957	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96	813	48	-	-
150153	Richmond South-Heights Reservoir	Construct new reservoir - 100m3	Richmond	08016215012	23%	77%	327	327	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	327
150154	Richmond South-High Level Reservoir	Construct new high level reservoir - 650m3	Richmond	08016215011	87%	13%	1,146	1,146	-	-	-	-	-	-	-	-	-	-	-	-	-	-	115	974	57	-	-	-	-
150155	Richmond South-Low Lvl Reservoir	Construct new low level reservoir - 2000m3	Richmond	08016215010	93%	7%	2,345	2,345	-	-	-	-	-	-	-	-	-	-	-	235	1,994	117	-	-	-	-	-	-	-
150159	Telemetry Upgrade	New Control Panels and telemetry and renewals of existing sites	Richmond	08016215059	8%	49%	1,815	3,185	60	60	43	43	43	43	43	114	114	114	43	43	43	43	43	43	114	114	43	43	570
150164	Waimea Treatment Upgrade	Upgrade to treatment to DWSNZ for Mapua supply	Waimea Basin	08016215085	16%	84%	217	217	-	-	22	195	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150184	New Source Construction	New treatment plant in Spring Grove. Piped to Wakefield	Wakefield	08216215006	17%	83%	4,000	4,000	-	400	3,400	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150189	Wakefield & 88 Valley Water Supply Upgrades	Rezoning, new reservoirs and mains for 88 Valley and Wakefield.	Wakefield	08216215001	25%	75%	2,634	2,634	-	-	-	-	-	-	395	2,108	132	-	-	-	-	-	-	-	-	-	-	-	-
150194	Richmond Backflow	Installation of backflow preventions at key sites	Richmond	08016215087	0%	100%	149	149	149	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150207	Re-zoning - Edward, Roeske Wilkes	Upgrading Edward St, Roeske St and Wilkes St includes new ridermains	Richmond	08016215088	4%	22%	274	1,095	-	-	-	27	55	178	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-

ID	Project Name	Project Description	Category	GL Code	% Growth	% LOS	New Capital Estimate	Total Project Estimate	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21 to Year 30
									2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	
150208	Re-zoning Salisbury Road	Upgrade main to 200mm	Richmond	08016215089	11%	89%	275	275	-	-	-	-	-	-	-	-	-	-	-	-	-	275	-	-	-	-	-	-	-
150209	Lower Queen St Trunkmain	Upgrade main to 400mm	Richmond	08016215090	11%	89%	1,628	1,628	-	-	-	-	-	-	-	-	-	-	-	-	-	1,628	-	-	-	-	-	-	-
150210	Motueka New Town Supply - Subsidy	Government subsidy for scheme extension	Motueka - B	08146215008	0%	100%	4,420	4,420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,420
150231	Relocate Fearons Bush WTP to Parkers Street WTP	Relocate Fearons Bush WTP to Parkers Street WTP extend mains in Jocelyn and Parker	Motueka - A	08026215009	6%	54%	394	657	15	379	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150235	Reservoir seismic strengthening	All except Richmond as per report - maybe delete in favour of 150317	Asset Management	08016215100	9%	91%	500	500	-	-	-	100	100	100	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150236	Richmond South facilitation works	Works to facilitate early start in Richmond south pending full construction of new principal main from WTP and new reservoirs	Richmond	08016215101	95%	5%	250	250	25	225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150237	Mapua Growth Facilitation works	Works to facilitate growth in Mapua including replacing main across Best and Rabbit Island (with 250mm) and upgraded pumps at Waimea bores and storage in year 4 - based on cancellation of CTP Linked to WW #140017 works	Mapua/ Ruby Bay	08166215050	90%	10%	4,000	4,000	-	-	-	300	-	-	-	-	-	-	100	3,600	-	-	-	-	-	-	-	-	-
150239	Maiseys Reservoir	Improve inlet/outlet/scour. Raise outlet	Redwoods Valley	08066215050	0%	100%	10	10	-	-	-	-	3	-	-	-	-	3	-	-	-	-	5	-	-	-	-	-	-
150240	treatment plant	improve lime dosing-needs bigger tank. New stirrer and pipework, possibly better programming of lime dosing.	Tapawera	08016215103	15%	85%	10	10	-	-	-	-	3	-	-	-	-	3	-	-	-	-	5	-	-	-	-	-	-
150241	treatment plant	install fence around site to improve security	Tapawera	08016215104	15%	85%	10	10	-	-	-	-	3	-	-	-	-	3	-	-	-	-	5	-	-	-	-	-	-
150253	Recreation Centre Bore	Raise bore headworks above ground	Motueka - A	08026215050	0%	100%	40	40	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150257	Reticulate between sources and Warehouse	Subject to modelling - replace smaller pipes with larger as part of renewals.	Motueka - A	08026215051	0%	50%	50	100	-	-	-	-	3	45	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150350	Bulk Meter Programme	Install new bulk meters to facilitate flow monitoring	Asset Management	0801621578	0%	100%	320	320	64	64	64	64	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150351	Occupational health & Safety	OHS Capital Initiatives	Asset Management	0801621579	9%	91%	440	440	-	40	-	40	-	40	-	40	-	40	-	-	40	-	-	40	-	-	40	-	120
	TOTALS						99,004	297,161	1,672	2,781	3,897	1,501	955	641	714	2,583	803	1,687	2,941	7,211	5,077	2,649	684	2,291	519	989	768	574	58,067

APPENDIX G DEVELOPMENT CONTRIBUTIONS / FINANCIAL CONTRIBUTIONS

Tasman District Council's full Development Contribution Policy (The Policy) can be found on our website at www. www.tasman.govt.nz/policy/policies/development-contributions-policy.

The policy was adopted in conjunction with the Council's Long Term Plan (LTP) and will come into effect on 1 July 2015.

The policy sets out the development contributions payable by developers, how and when they are to be calculated and paid, and a summary of the methodology and rationale used in calculating the level of contributions.

The key purpose of the Development Contribution Policy is to ensure that growth, and the cost of infrastructure to meet that growth, is funded by those who cause the need for and the benefit from the new or additional infrastructure, or infrastructure of increased capacity.

There is one Water Development Contribution in place (as shown in Table G-1 below).

Table G-1: Current Development Contributions

Activity	Growth costs to be recovered (in GST)	Recoverable growth	Development Contribution per HUD $ (incl GST)*
Water	$7,627,839	1,514	$5,039
Wastewater	$17,062,205	1,699	$10,041
Transportation	$2,025,024	2,412	$840
Stormwater	$15,766,878	1,702	$9,264
TOTAL	$42,481,945		$25,184

HUD = Household Unit of Demand

* The value of the Development Contribution shall be adjusted on 1 July each calendar year using the annual change in the Construction Cost Index.

A forecast of the income from Water Development Contributions expected over the 10 year period of the Long Term Plan has been prepared by Council's Corporate Services staff based on the forecast residential and business growth projections of the Growth Demand and Supply Model (GDSM – refer Appendix F). The forecast income is included as a line item in the Cost of Service Statement included in Appendix L.

APPENDIX H RESOURCE CONSENTS AND PROPERTY DESIGNATIONS

H.1 Introduction

The statutory framework defining what activities require resource consents is the Resource Management Act (RMA) 1991. The RMA is administered locally by Tasman District Council, a Unitary Authority, through the Tasman Resource Management Plan (TRMP).

An important aspect of the water supply activity is to ensure that all community water takes, whether they be from ground water or surface water, are managed responsibly.

Under the RMA and the TRMP, water permits are required for community water supplies. Resource consents may also be required for dams, weirs (and other structures in river beds), treatment plants and other infrastructure associated with the water supply systems.

Generally, Council holds resource consents or designations for its water supply activities to the extent required by the RMA and current rules in the TRMP. For some water infrastructure installed prior to the RMA being enacted in 1991, such as pipelines across rivers and streambeds, previous authorisations are relied on.

H.2 Resource Consents

Resource consents are in place for all the community water supplies that Council manages. A summary of the active resource consents held for the Council water supplies is provided in Table H-1. Please note that this list may not be exhaustive, is only accurate at the time of compilation (November 2014), and is subject to change. Short term consents are required from time to time for construction activities and are not included in Table H-1.

Table H-1: Schedule of Resource Consents

Scheme	Consent No.	Consent Type	Date Effective	Date Expiry
Brightwater	NN020022	Water take - ground	7/7/2003	31/5/2017
Collingwood	NN020325 RM030480 RM030680	Water take – ground Watercourse – pipeline structure Land use – water reservoir	21/11/2002 26/06/2003 23/102003	21/5/2019 31/05/2019 N/A
Murchison	RM040976 RM100291 RM140576	Water take – ground Land use – bore Discharge – from bypass pipeline	3/8/2007 25/5/2010 5/8/2014	31/5/2020 N/A 5/8/2049
Richmond	NN960213	Water take - ground	21/9/1998	31/5/2016
Redwood Valley 1 and 2 RWS[1] - River Road	RM110193	Water take - ground	20/5/2011	31/5/2017
Redwood Valley 2 RWS[1] – O'Connor Creek	RM110191	Water take - ground	20/05/2011	31/5/2017
Redwood Valley 1 RWS[1] - Golden Hills	NN970139	Water take - ground	8/5/2002	31/5/2017
Redwood RWS[1] – O'Connor Creek	RM041164	Land use for water supply structure in a river bed	29/11/2004	31/5/2028

Scheme	Consent No.	Consent Type	Date Effective	Date Expiry
Pohara	NN720010	Water take - surface	19/4/1996	1/10/2026
Hamama	RM031060	Water take - surface	1/6/2004	31/5/2019[2]
Tapawera	RM040256	Water take - ground	21/09/2004	31/5/2019
Dovedale RWS[1]	RM100114V1	Water take - surface	12/12/2011	31/5/2033[3]
	RM100116	Watercourse - dam	14/3/2011	31/5/2033[3]
	RM100117	Watercourse – intake weir structures	14/3/2011	31/5/2033[3]
88 Valley RWS[1]	RM100828	Water take – surface	12/1/2010	31/5/2016
	RM061023	Watercourse – intake weir & pipeline	12/12/2009	30/11/2044
Motueka – Fearon's Bush	NN000256	Water take - ground	16/8/2000	31/5/2015[R]
Motueka – Recreation Centre	NN000254V1	Water take – ground	12/2/2013	31/5/2015[R]
	RM120932	Land use – back up bore	11/12/2012	N/A
Motueka – Atkins St	NN000242	Water take – ground (future source)	11/8/2000	31/5/2015[R]
Torrent Bay[4]	RM040248	Water take - surface	21/9/2004	31/5/2015[R]
Wakefield	NN010213	Water take – ground	16/8/2001	31/5/2016
	RM110311	Water take – ground (future source)	3/10/2011	31/5/2031
Upper Takaka	RM100113	Water take - surface	18/3/2011	31/5/2034
	RM100120	Watercourse – intake weir & pipeline		
Waimea	RM110192	Water take – ground	20/5/2011	31/5/2017
	RM120800	Land use – replacement bore	26/10/2012	N/A
Mapua extension	RM060492	Coastal – pipeline across Waimea inlet	21/3/2007	27/6/2041
Mapua extension	RM070870	Watercourse – pipelines (Seaton Valley streams)	29/10/2007	3/10/2042
Kaiteriteri	NN000255	Water take	29/8/2000	31/5/2015[R]
Motueka Coastal	RM070187	Water take - ground	11/6/2014	31/5/2033

[1] RWS = rural water supply (restricted supply)
[2] Not a Tasman District Council consent (Hamama Water supply committee)
3 Possible review of expiry in 2017/2018
[4] Scheme not operated by Tasman District Council
[R] Renewal process underway

H.3 Resource Consent Reporting and Monitoring

The Council aims to achieve minimum compliance with all consents and / or operating conditions. Use of the Council's Napier Computer System (NCS) monitoring database allows the accurate programming of all actions required by the consents including renewal prior to expiry.

H.3.1. Auditing

Regular site audits are completed to ensure the Council's maintenance contractor is operating in accordance with a number of key performance indicators aligned to any relevant consent conditions or other legislative requirements

H.3.2. Environmental Reporting and Monitoring

In addition to audit assessments, any non-compliance incidents are recorded, notified to Council's Compliance Monitoring team, and mitigation measures put in place to minimise any potential impacts. Water quality sampling is undertaken to comply with the latest NZ Drinking Water standards (NZDWS).

H.3.3. Annual Report

The extent to which the Council has been able to meet all of the conditions of each consent and NZDWS is reported in its Annual Report each year.

A summary of how Council is performing with regard to any enforcement action related to consents is part of the Level of Service details provided in Appendix R.

H.4 Property Designations

Once given effect, a designation remains valid for the life of the TRMP or until the requiring authority removes of alters the designation. The majority of the Council public water supply designations have been given effect. The balance are subject to review to ensure they do not lapse.

Alterations to some designations (e.g. boundaries) and outline plans for proposed work may be required from time to time. Designations do not negate the on-going need for regional resource consents (e.g. water permits) required for the designated site or purpose (refer to section H.2 above).

Table H-4: Summary of Public Water Supply Designations

ID	Location	Site Name/Function	Duration of Designation
D170	87 Queen Street, Richmond	Queen Street Reservoir and Pump Station	Indefinite – given effect
D171	11 Valhalla Lane, Richmond	Valhalla Lane High Level Reservoir	Indefinite – given effect
D172	132 Edward Street, Wakefield	Wakefield Reservoir	Indefinite – given effect
D173	92 Fairfax Street, Murchison	Murchison Pump Station	Indefinite – given effect
D174	Chalgrave Street, Murchison	Murchison Reservoir	Indefinite – given effect
D175	Hamama Road	Hamama Water Supply Intake	Indefinite – given effect
D184	Pomona Road, Ruby Bay	Pomona Road Reservoir and Pump Station	Indefinite – given effect
D185	Brabant Drive, Ruby Bay	Brabant Drive Reservoir and Pump Station	Indefinite – given effect
D186	Lightband Road, Brightwater	Brightwater Pump Station	Indefinite – given effect
D187	Lord Rutherford Road South, Brightwater	Brightwater Reservoir	Indefinite – given effect
D188	Pigeon Valley Road, Wakefield	Wakefield Pump Station and	Indefinite – given effect

ID	Location	Site Name/Function	Duration of Designation
		well	
D189	45 Vahalla Drive, Richmond	Valhalla Drive Extra High Level Reservoir	Indefinite – given effect
D190	11 Cropp Place, Richmond	Cropp Place High Level Reservoir	Indefinite – given effect
D191	Lower Queen Street, Appleby	Waimea Pump Station	Indefinite – given effect
D192	Tapawera – Glenhope Road, Tapawera	Tapawera Pump Station	Indefinite – given effect
D193	Totara Street, Tapawera	Tapawera Reservoir	Indefinite – given effect
D194	10 Fearon Street, Motueka	Fearon's Bush Pump Station	Indefinite – given effect
D195	Old Wharf Road, Motueka	Recreation Centre Pump Station	Indefinite – given effect
D196	Unnamed Stream, Torrent Bay	Torrent Bay Water Supply Intake	Indefinite – given effect
D197	Golden Hills Road	Redwood Valley No.1 Pump Station	Indefinite – given effect
D198	O'Connor's Creek SH60	Redwood Valley No.2 Pump Station	Indefinite – given effect
D199	Haile Lane, Pohara	Pohara Valley Water Supply Intake	Indefinite – given effect
D200	Haile Lane, Pohara	Pohara Valley Pump Station	Indefinite – given effect
D201	Pohara Valley Road	Pohara Valley Reservoir	Indefinite – given effect
D202	Lower Queen Street	Neimans Creek Pump Station	No longer required
D205	State Highway 60, Upper Takaka	Upper Takaka Reservoir	Indefinite – given effect
D206	State Highway 60, Takaka Hill	Upper Takaka Water Supply Intake	Indefinite – given effect
D236	226 Champion Road, Richmond	Waimea Reservoir and Pump Station	Indefinite – given effect
D244	Lower Queen Street and McShane Road, Richmond	Water Treatment and Wastewater Pump Station	20 years (Built 2015)
D245	McShane Road, Richmond	Water Wells	20 years
D246	216 Champion Road, Richmond	Richmond East High Level Reservoir	20 years (Built 2015)

APPENDIX I. CAPITAL REQUIREMENTS FOR FUTURE RENEWALS

I.1 Introduction

Renewal expenditure is major work that does not increase the asset's design capacity but restores, rehabilitates, replaces or renews an existing asset to its original capacity. Work over and above restoring an asset to original capacity is considered to be new capital works expenditure.

I.2 Renewal Strategy

Assets are considered for renewal as they near the end of their effective working life or where the cost of maintenance becomes uneconomical and when the risk of failure of critical assets is sufficiently high.

The renewal programme has been developed by the following.

- Taking asset age and remaining life predictions from Confirm, calculating when the remaining life expires and converting that into a programme of replacements based on valuation replacement costs.
- Reviewing and justifying the renewals forecasts using the accumulated knowledge and experience of asset operations and asset management staff. This incorporates the knowledge gained from tracking asset failures through the Customer Services System, the GPS locating of pipe breaks and overflows, and contract reporting structures.
- Undertaking an optimising review to identify opportunities for bundling projects across assets, optimised replacement, timing across assets – especially between pipe upgrades and roading works, and smoothing of expenditure.
- The renewal programme is reviewed in detail at each AMP (ie. three yearly), and every year the annual renewal programme is reviewed and planned with the input of the maintenance contractor.

The 2015 review included plotting the location of pipe maintenance data with an emphasis on breaks. This is located at: http://tsrvgis01.tdc.tdc.govt.nz/CustomFlexviewers/PipeBurst/ and a sample image is shown in Figure I-1.

Sample sections were examined in detail and the cost of renewal compared to the cost of maintenance. An indicative ratio of 1:10 was used as a guide to when a pipe should be considered for renewal on the basis of annual maintenance cost ie, when the annual maintenance was at least 10% of pipe renewal cost then these works would be considered more.

I.3 Delivery of Renewals

The identification of water pipeline renewals in the rural areas is refined to achieve the most suitable renewals programme for the available budget. This refinement is primarily based on the latest burst information, but does also include a base level of multi-criteria analysis.

Identification of pipeline renewals in the urban areas is targeted to link in with pipeline upgrades in the network under other drivers but also considers the linkages with other activity programmes (eg, roading). The identification of specific renewals and design is scheduled to take place one year prior to construction.

A water meter renewal strategy has been developed and incorporated within this AMP. This renewal strategy takes into account accuracy of meters and highlights the optimum time for renewal.

The renewal of assets including all the mechanical, electrical, and small scale civil renewal works which were identified from the asset valuations. These assets and associated timings and costs were transferred into the AMPs. To smooth the expenditure profile the timing of some of these assets have been deferred and grouped together in a logical manner, to minimise the cost of the renewal. Prior to the asset being renewed, the operations and maintenance contractor will inspect these assets to confirm whether renewal is actually necessary. In the event it does not need to be renewed, a recommended date of renewal is then inputted back into the Confirm database. This new date will then be included in the next AMP update.

Figure I-1 Graphical presentation of pipe work data to emphasise high cost sections

I.4 Renewal Standards

The work to be performed and materials to be used shall comply with the current Council Engineering Standards and Policies.

I.5 Deferred Renewals

Deferred renewals is the shortfall in renewals required to maintain the service potential of the assets. This can include:

- renewal work that is scheduled but not performed when it should have been and which has been put off for a later date (this can often be due to cost and affordability reasons);
- an overall lack of investment in renewals that allows the asset to be consumed or run-down, causing increasing maintenance and replacement expenditure for future communities.

MWH New Zealand Ltd have prepared a draft renewals strategy for the Council which is summarised below. For further information refer to Tasman District Water Pipeline Renewals Strategy Draft Report – October 2011.

I.5.1. Assessment of Deferred Renewals

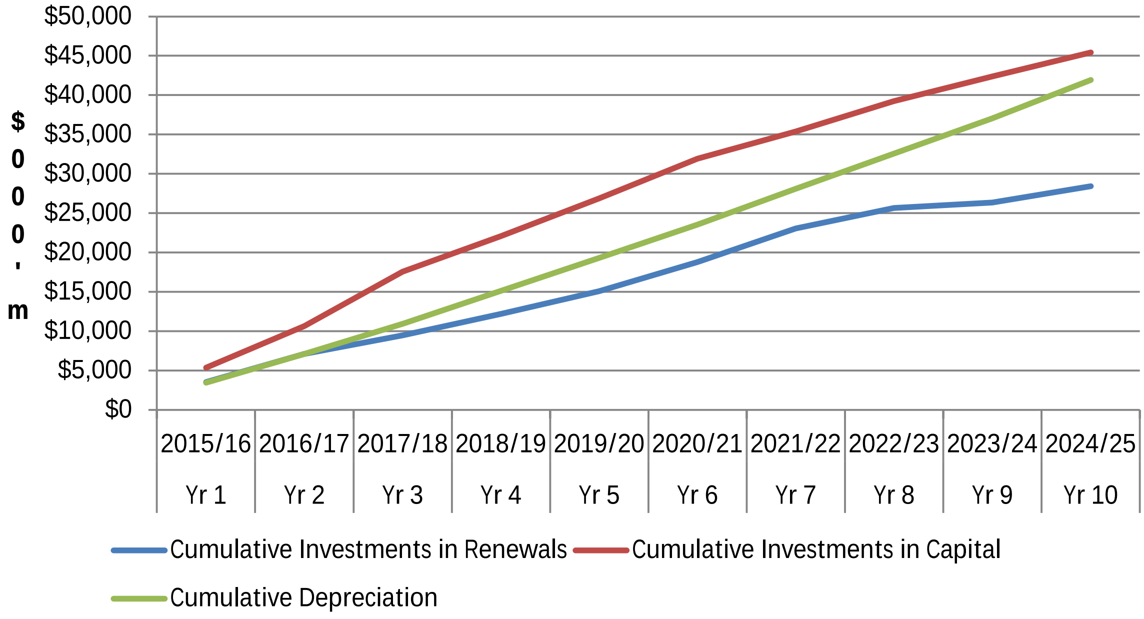


Figure I–1 shows a comparison of the amount being spent on renewals with the amount of depreciation recognised annually. If the renewals expenditure starts falling behind the accumulative depreciation then the asset are not being replaced or renewed at the rate at which they are being consumed. If this continues unchecked for too long, future communities will inherit a run-down asset, high maintenance costs and high capital costs to renew failing infrastructure.

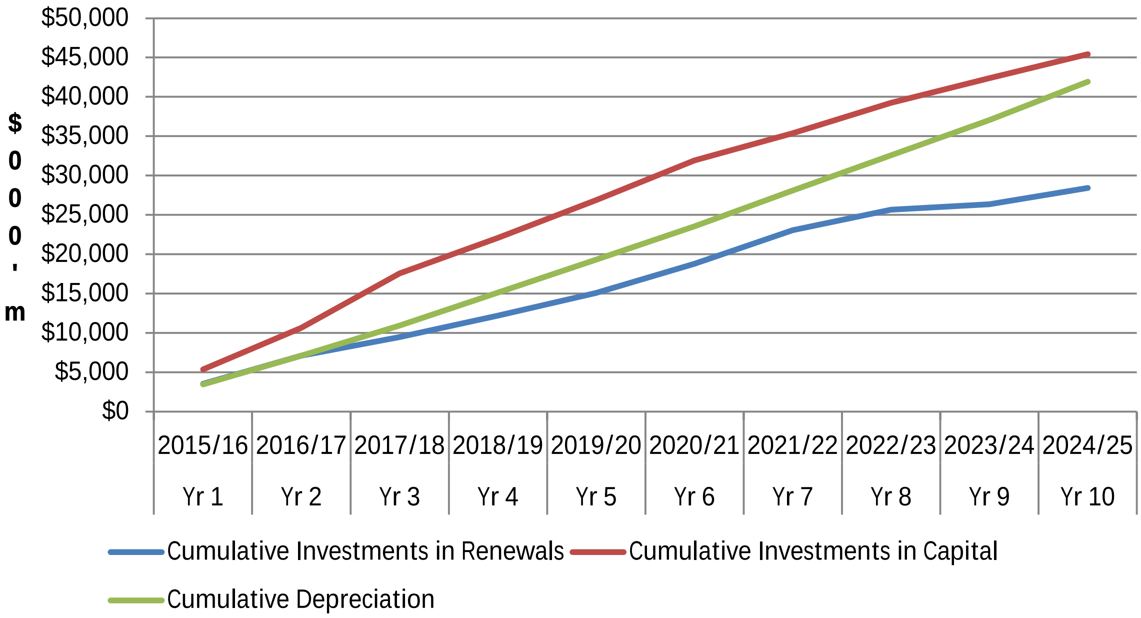


Figure I-1: Investment in Renewals

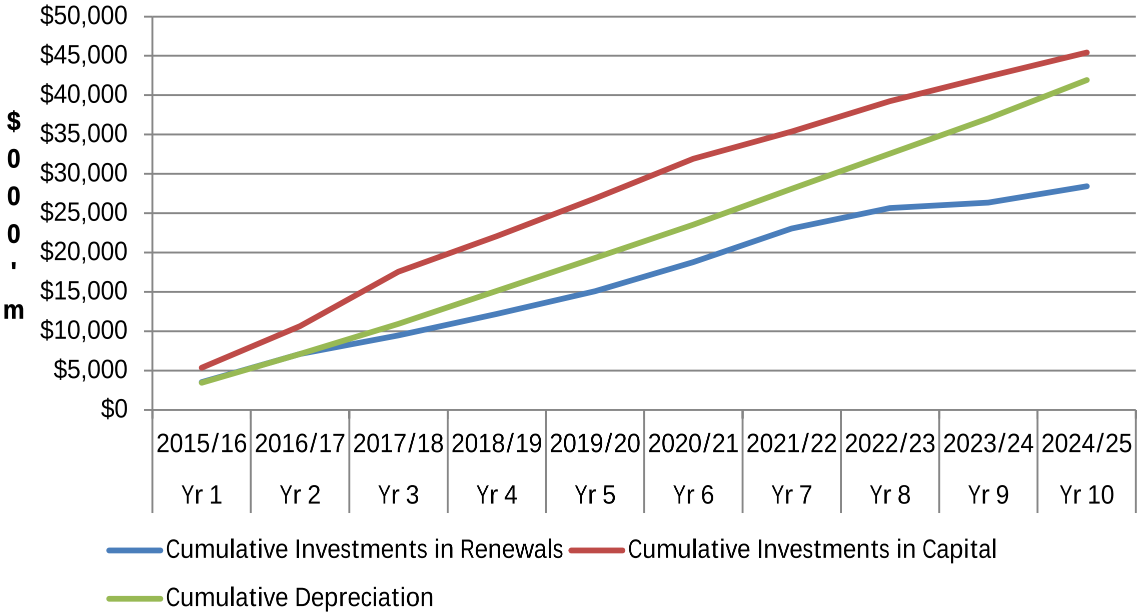


Figure I-1 shows the Council is investing in renewals at a rate that approximately matches depreciation so the asset is not being consumed. As newer pipe technology has a longer life than most of the current in-ground assets, the need for renewal is being deferred without significant risk of premature failure.

I.5.2. Management and Mitigation of Renewals

To improve the information base for the renewals strategy and replacement programme, the Council plans to focus on the following improvements:

- more critically assessing remaining life of pipelines with known condition problems;
- capturing asset data to reduce the high level of “unknown” pipelines;
- using a risk based approach to identifying pipeline replacement programmes;

- improving condition knowledge of some of the “high risk” pipelines, especially to identify:
  - ¾ asset condition may be worse than expected;
  - ¾ situations where remaining life is under-estimated.

I.6 Forecast of Renewals Expenditure for Next 30 years

Graphs showing a summary and total breakdown of the expenditure forecast for renewals over the next 30 years are provided in Figures I-4 and I-5. A table of the renewals expenditure is shown in Table I-1.

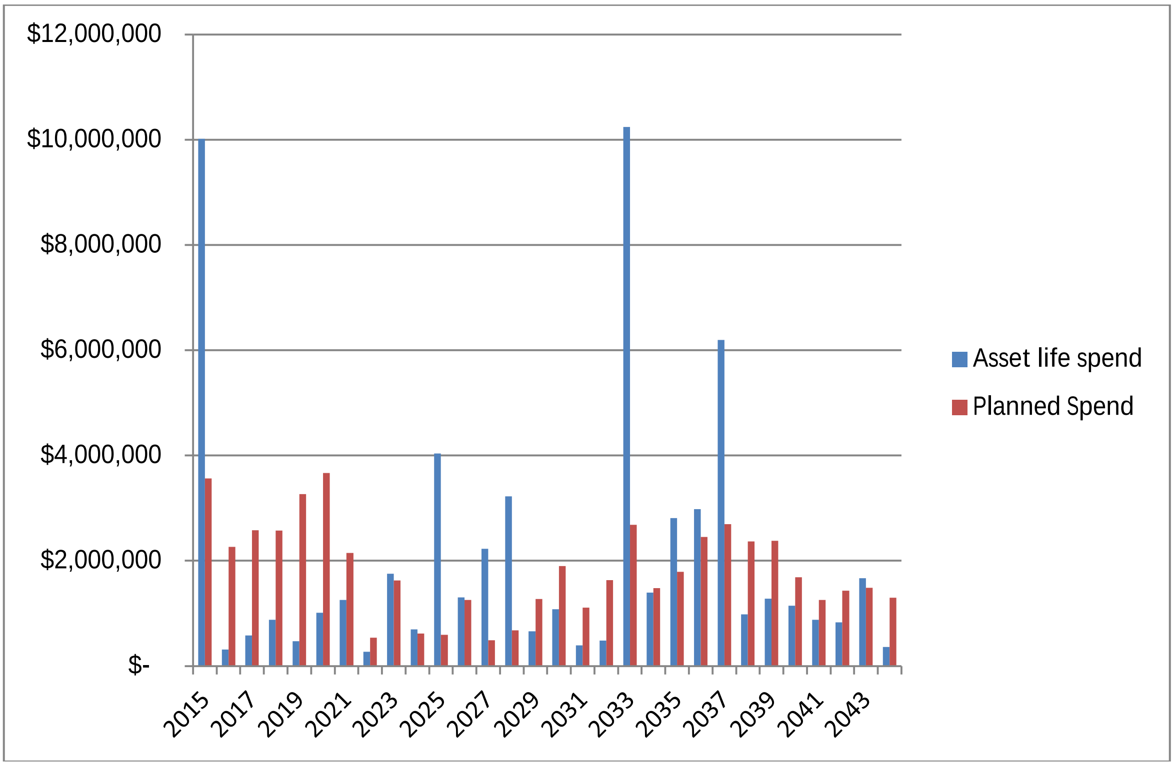


Figure I-2: 2015 – 2045 Un-inflated Comparison of Annual Renewals Based on Asset Life with Planned Renewals

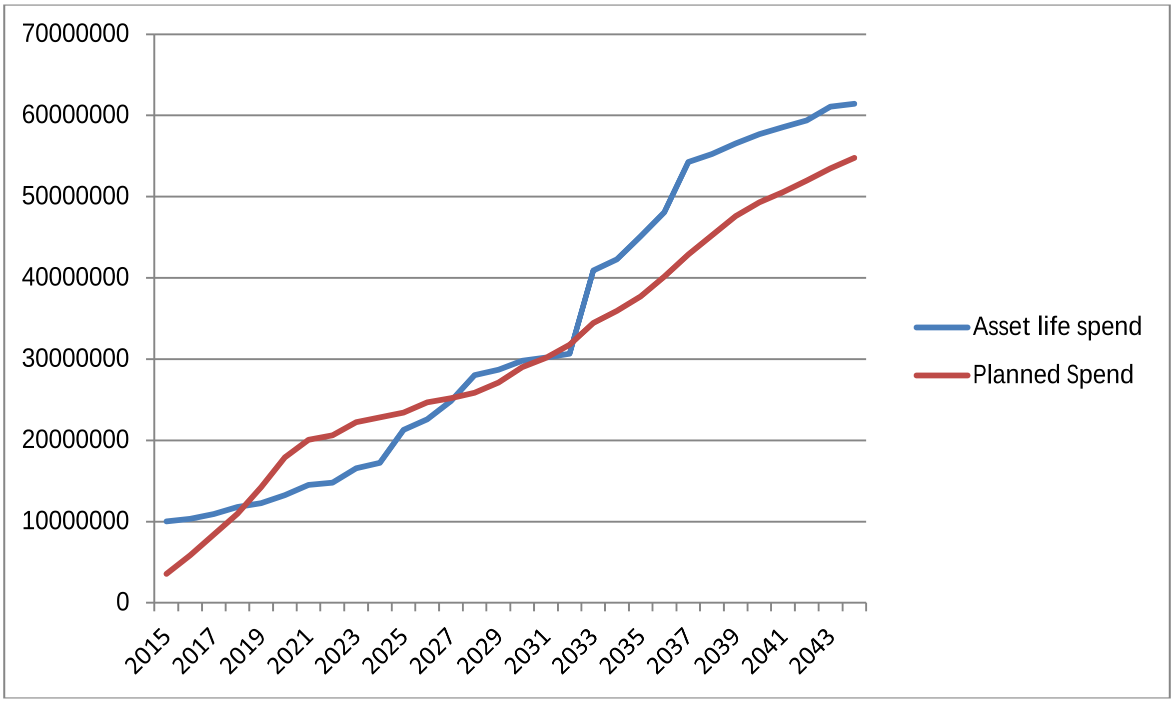


Figure I-3: 2015 - 2045 Un-inflated Comparison of Renewals Based on Asset Life with Planned Renewals

The graphs demonstrate that the Planned and Asset Life spend are similar however there are known issues with the Confirm data such as:

- Missing installed date
- Missing asset life
- Missing replacement values (approximately 23% of the Confirm data is in doubt and the associated spend, if required during the period, could be approximately $1.0m per year.)
- Lack of multiple renewal spend for short life items eg meters (a correction multiplication factor of 1.5 has been added to surface assets from year 11).

This data will be reviewed and improved prior to the issuing of the final 2015 AMP and before the 2018 AMP.

There is also a significant backlog of work ($17m of the 2015 $19m asset life spend) that suggests that the Confirm asset lives are underestimated. This will be clarified as part of the inter-AMP asset data investigations.

Other assumptions include:

- that all Confirm spend data has been inflated by 5.5% to bring it to July 2014 values.

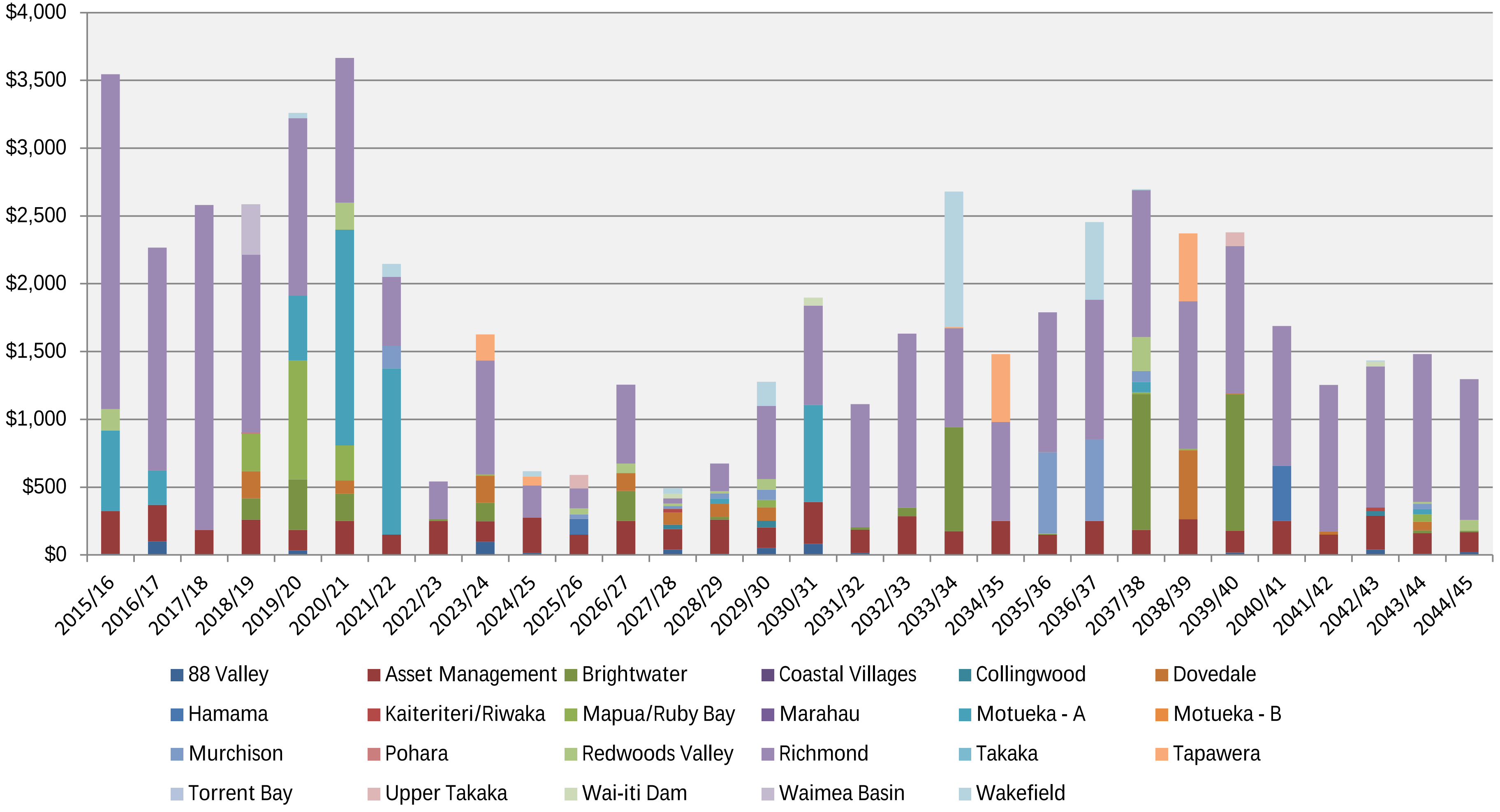
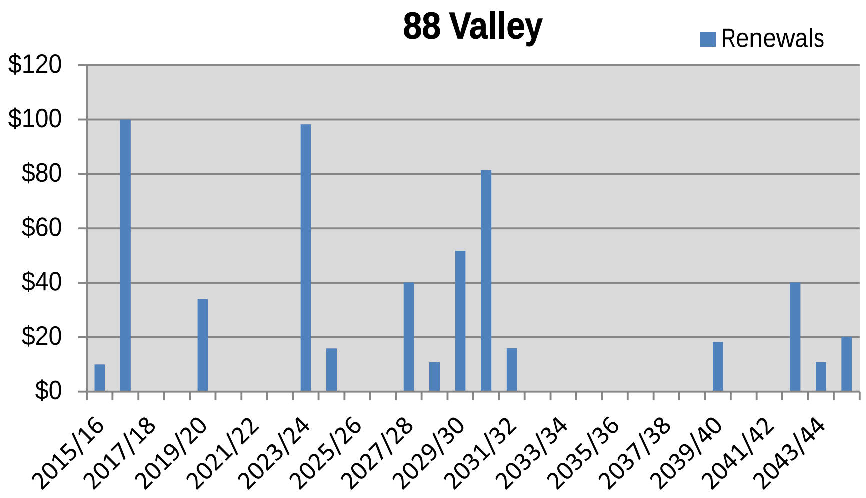
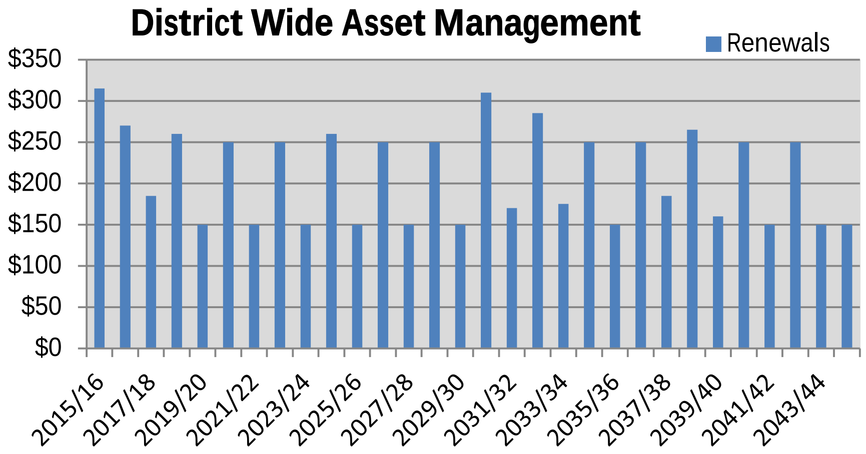


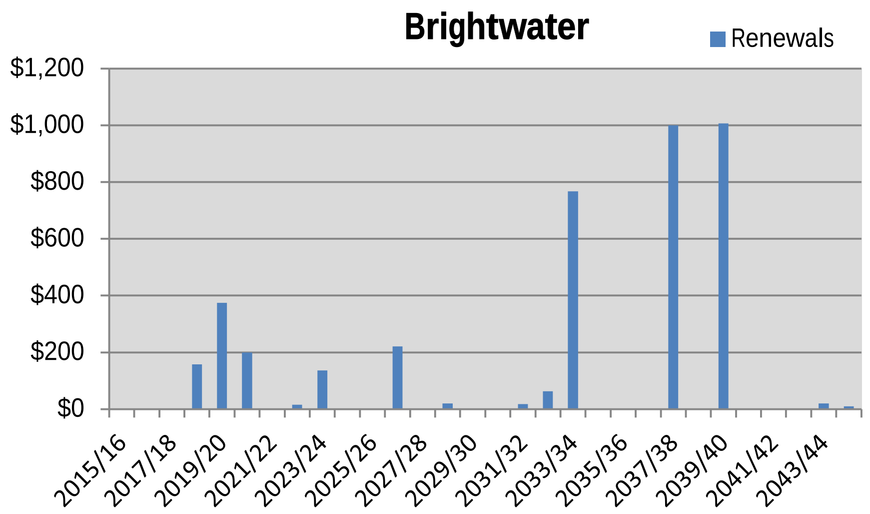
Figure I-4: 2015 – 2045 Water Supply Renewals Expenditure Forecast ($000)



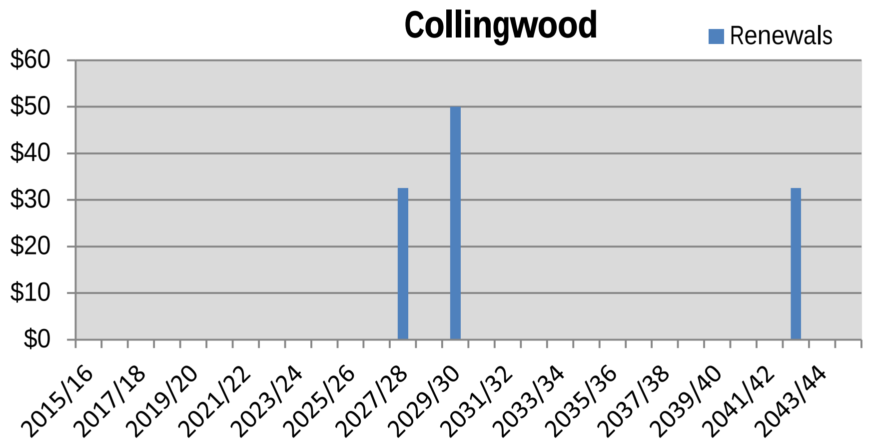
Major Projects:
- 88 Valley Pipelines renewals 2015-16
- 88 Valley intake access and pipe renewal 2024-25



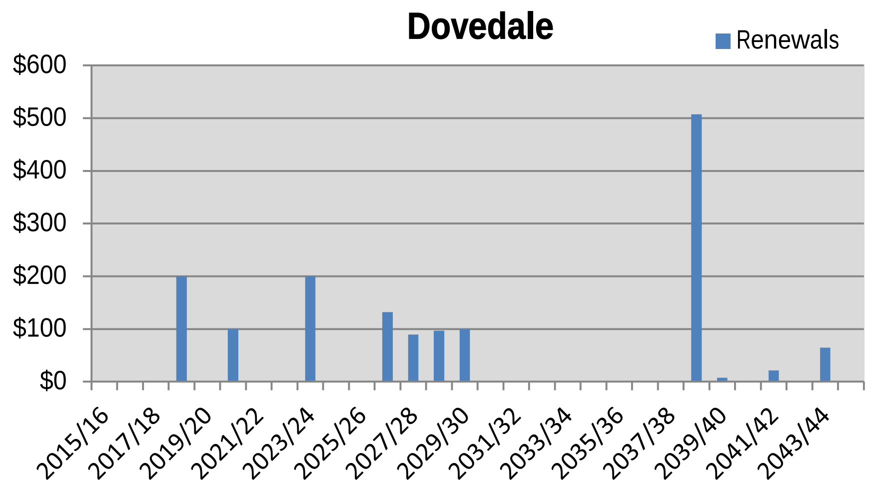
Major Projects:
- Pump Station renewal programme 2015-2045



Major Projects:
- Brightwater pipes 2020-21, 2038, 2040
- Fire hydrant renewal 2027-28
- Brightwater to Richmond Main 2034-35

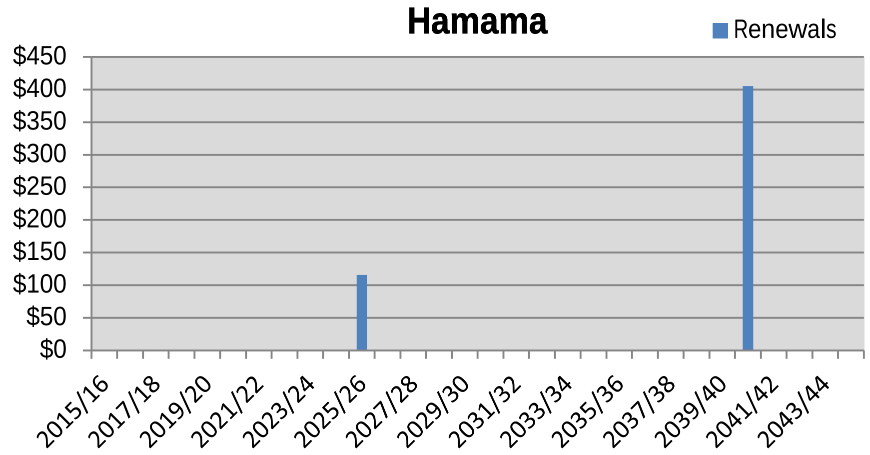


Major Projects: Nil



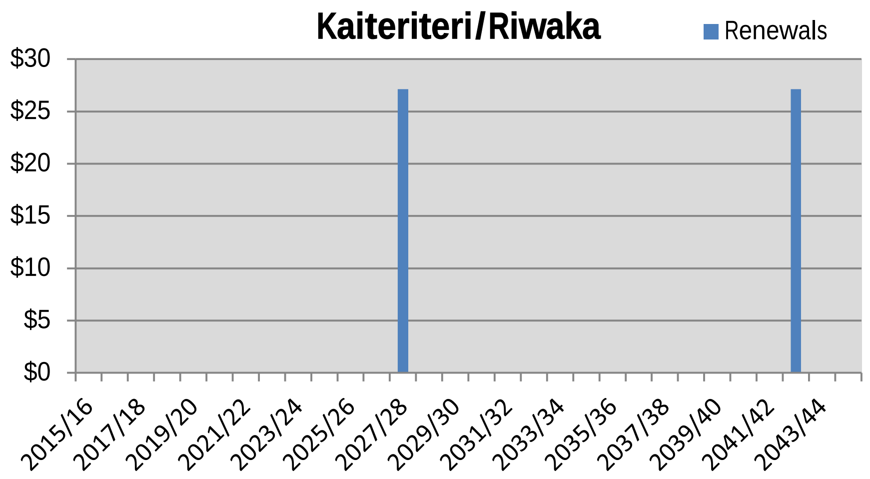
Major Projects:

- Pipeline Renewal Programme 2019, 2021, 2024, 2030, 2039,

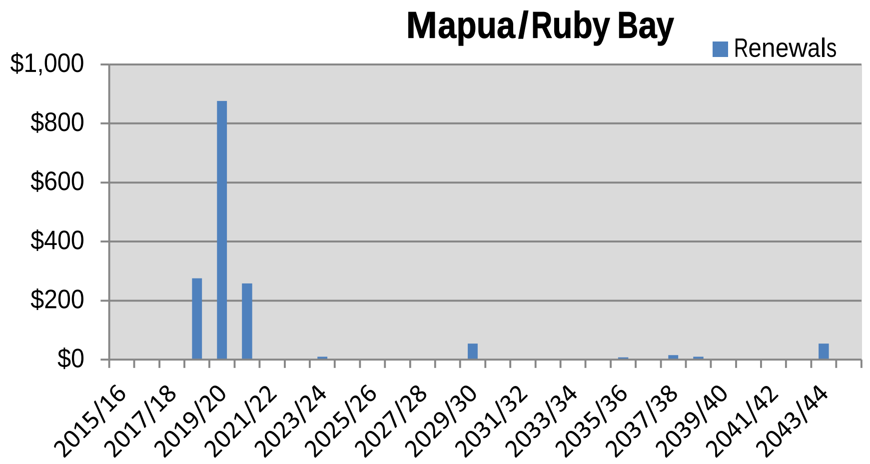


Major Projects:

- Pipeline Renewal Programme 2025-26, 2040-41

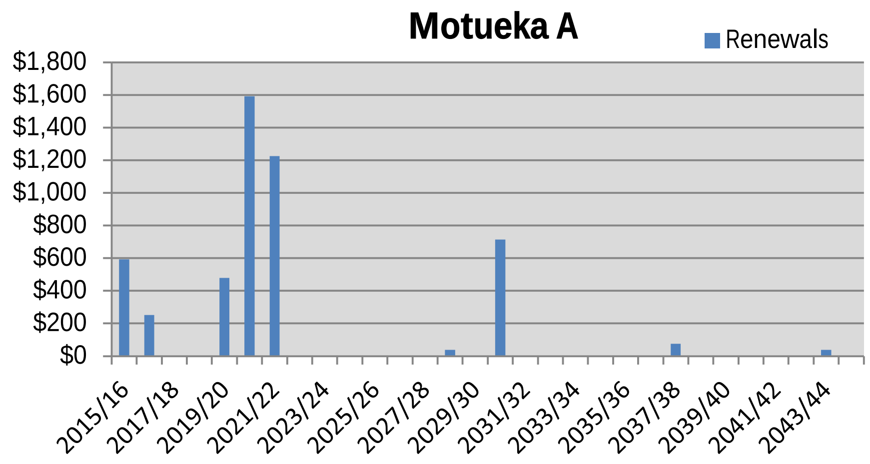


Major Projects: Nil

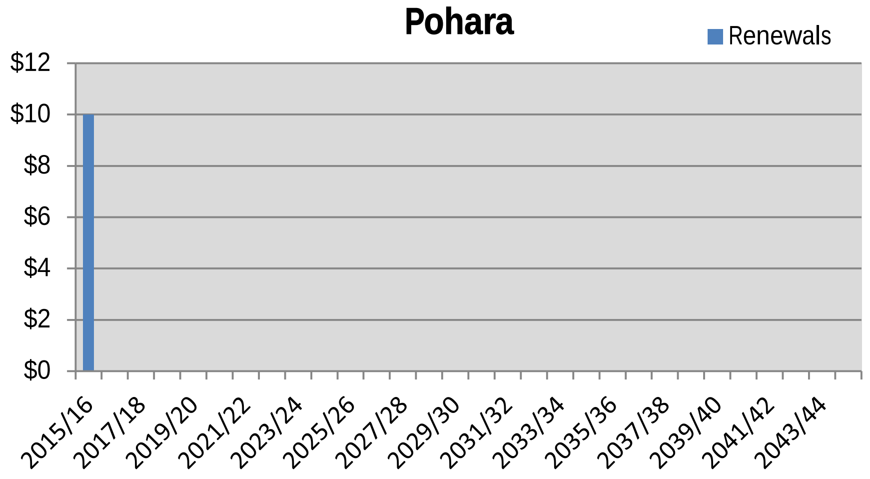


Major Projects:

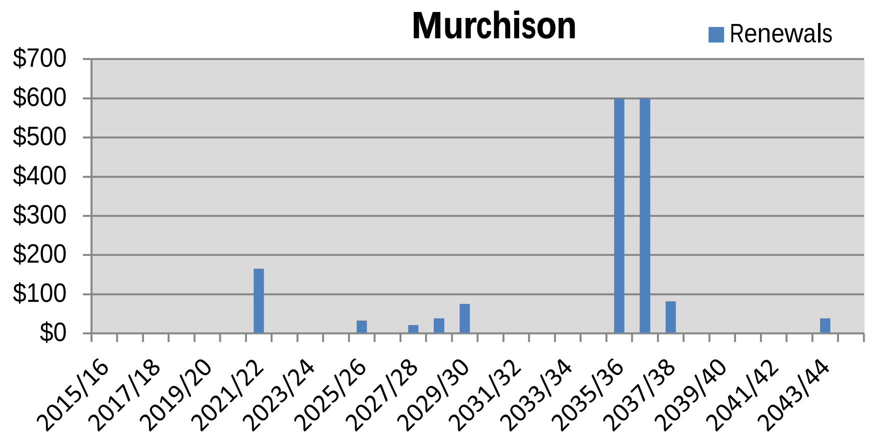
- Aranui Road Main replacement 2019-21
- Pipeline Renewal Programme 2019, 2021-22



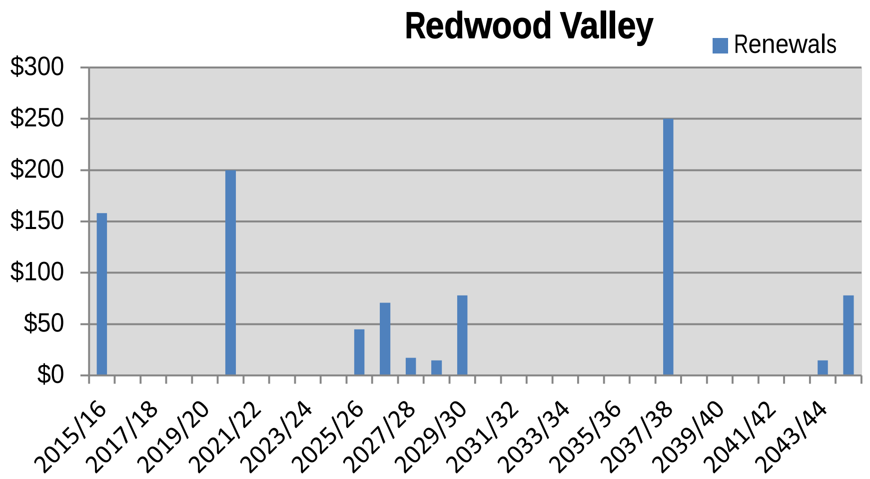
Major Projects:
- Meter renewals 2015-16, 2030-31
- Relocate Fearons Bush WTP 2016-17
- Thorpe Street replacement 2020-23
- High Street Mains 2021-23
- Fearon street mains 2023-24



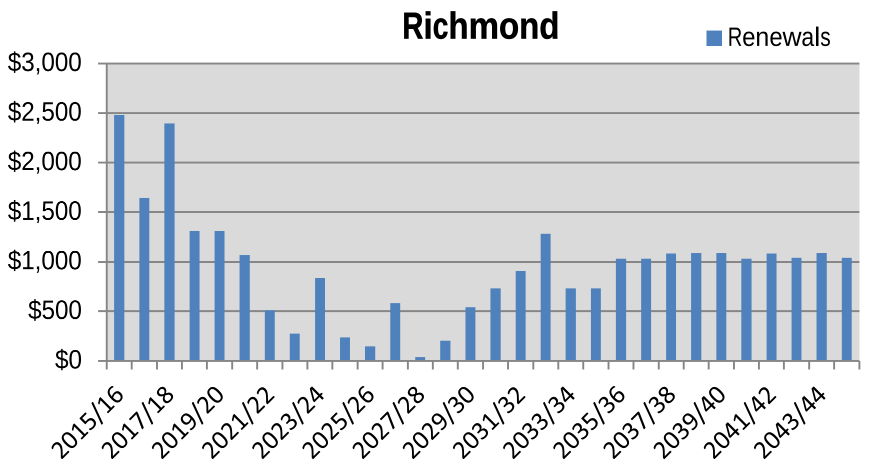
Major Projects: Nil



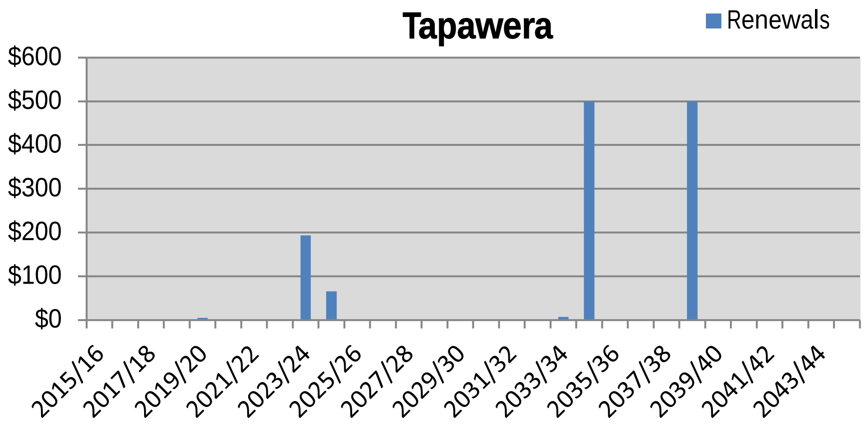
Major Projects:
-Murchison Pipes and ridermains 2035-38



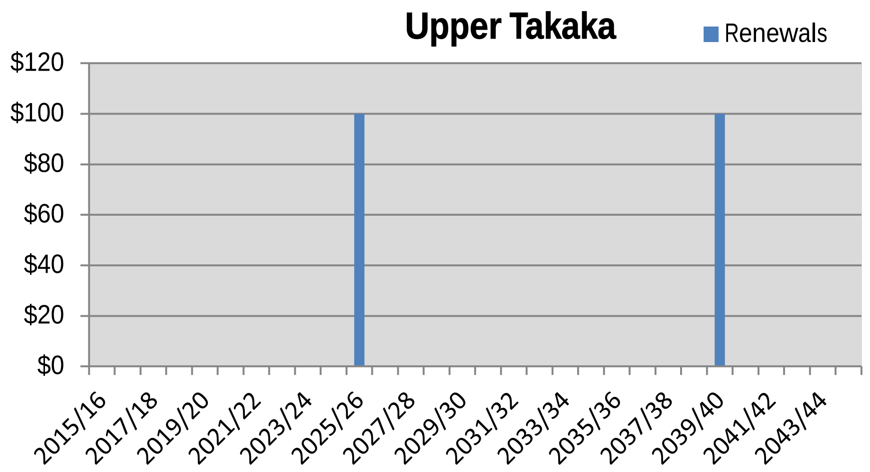
Major Projects:
- Pipeline Renewal Programme 2020-21, 2037-38



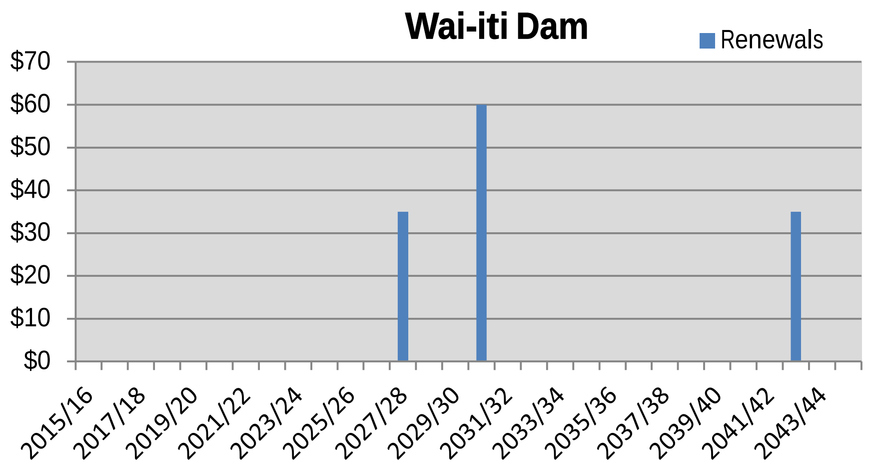
Major Projects:
- Pipeline Renewal Programme 2015-25, 2027, 2030 2033, 2036-45
- Valve replacements 2015, 2024, - Richmond Meters 2015-2020, 2031-36
- Rezoning Edward, Roske, Wilkes 2019-23, - Queen Street 2015-2021
- Telemetry Programme 2015-45, - Fauchelle, Darcy, Florence 2015-16



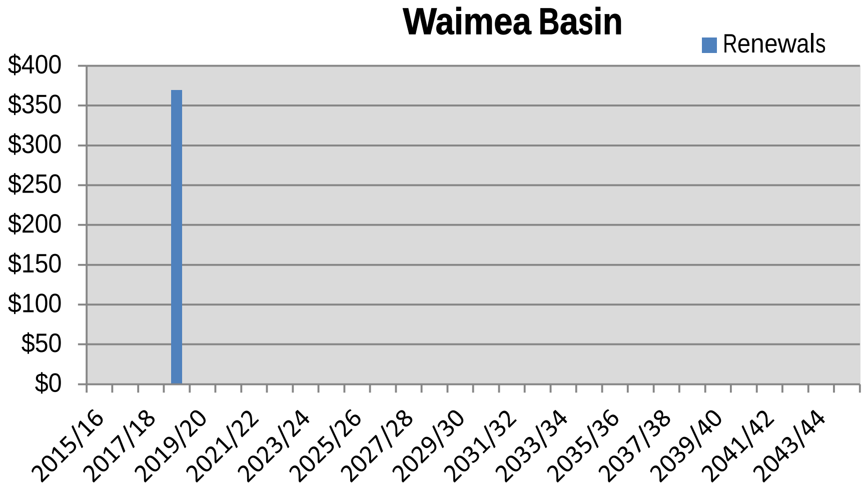
Major Projects:
- Pipeline Renewal Programme 2024-25, 2235, 2039

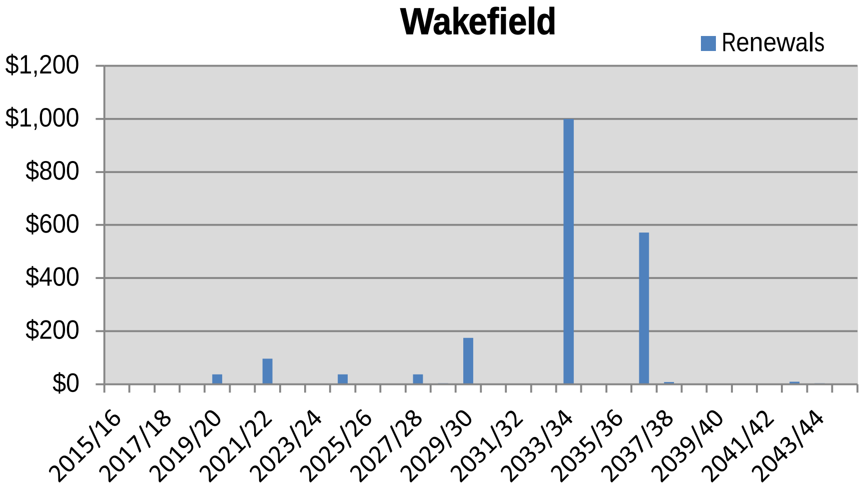


Major Projects:
- Upper Takaka pipe, valves and hydrants 2025-26, 2039-40



Major Projects: Nil





Major Projects:

- Waimea Treatment Plant and Pump Station 2018-19

Major Projects:

- Pipeline and Ridermain Renewal Programme 2029-30, 33-34, 36-37

Figure I-5: 2015 – 2045 Water Supply Renewals Expenditure Forecast ($000) by Area

Table I-1: 2015 – 2045 Water Supply Renewals Expenditure Forecast

ID	Project Name	Project Description	Category	GL Code	% Renewal	Renewal Estimate	Total Project Estimate	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21 to Year 30
								2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	
150001	88 Valley Pipeline Renewals	Pipeline Renewal Programme	88 Valley	08046215006	100%	110	110	10	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150002	88 Valley Reservoirs	Replacing Electrical, Flowmeter	88 Valley	08046215009	100%	36	36	-	-	-	-	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18
150003	88 Valley WTP	Replacing Chlorinator, Electrical, Flowmeter, Pump	88 Valley	08046215010	100%	81	81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	81	-	-	-	-	-
150004	88 Valley Intake access & pipeline renewal	Replace the top end of the main and upgrade the access track	88 Valley	08046215003	100%	98	98	-	-	-	-	-	-	-	-	98	-	-	-	-	-	-	-	-	-	-	-	-
150005	88 Valley Restrictor Renewals	Restrictor Renewals	88 Valley	08046215011	100%	80	80	-	-	-	-	-	-	-	-	-	-	-	-	40	-	-	-	-	-	-	-	40
150006	River Terrace Road Flowmeter	Replacing Flowmeter	88 Valley	08046215012	100%	15	15	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	8
150009	Brightwater Pipes	Pipeline Renewal Programme	Brightwater	08156215011	100%	2,275	2,275	-	-	-	75	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,000
150010	Brightwater Well Field	Replacing Pumps	Brightwater	08156215019	100%	18	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-
150011	Factory Road Main replacement	Replace 660m of 100mm AC main with 150mm PVC from SH6 to River Terrace Road	Brightwater	08156215004	94%	394	419	-	-	-	20	374	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150012	Brightwater Fire Hydrant Renewal	Fire Hydrant Renewals	Brightwater	08156215012	100%	172	172	-	-	-	-	-	-	-	-	-	-	-	172	-	-	-	-	-	-	-	-	-
150013	Brightwater Restrictor Renewals	Restrictor Renewals	Brightwater	08156215020	100%	125	125	-	-	-	63	-	-	-	-	-	-	-	-	-	-	-	-	-	63	-	-	-
150014	SH6 main replace, Ranzau Road - 3 Brothers Corner	Replace 1525m of 150mm AC main with 200mm pvc	Brightwater	08156215010	100%	767	767	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	767	-	-
150015	Brightwater New Bore	Supplementary Bore	Brightwater	08156215002	69%	152	220	-	-	-	-	-	-	-	15	137	-	-	-	-	-	-	-	-	-	-	-	-
150019	Brightwater Valve Renewals	Valve Renewals	Brightwater	08156215018	100%	66	66	-	-	-	-	-	-	-	-	-	-	-	49	-	-	-	-	-	-	-	-	16
150021	Collingwood WTP	Replacing Limestone saturator, Flowmeter, Distribution weir, Chlorine Store	Collingwood	08226215002	100%	50	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	-	-	-	-	-
150024	Bensemann's BP Tank	Replacing Break pressure tank	Dovedale	08056215005	100%	55	55	-	-	-	-	-	-	-	-	-	-	-	55	-	-	-	-	-	-	-	-	-
150025	Beuke's BP Tank	Replacing Break pressure tank	Dovedale	08056215006	100%	33	33	-	-	-	-	-	-	-	-	-	-	-	33	-	-	-	-	-	-	-	-	-
150026	Cozens Valley BP Tank - Sunday Creek Road	Replacing Break pressure tank	Dovedale	08056215022	100%	11	11	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-
150027	Dovedale Pipes	Pipeline Renewal Programme	Dovedale	08056215003	100%	1,100	1,100	-	-	-	200	-	100	-	-	200	-	-	-	-	-	100	-	-	-	-	-	500
150030	Neudorf Saddle BP Tank	Replacing Break pressure tank	Dovedale	08056215011	100%	22	22	-	-	-	-	-	-	-	-	-	-	-	22	-	-	-	-	-	-	-	-	-
150032	Restrictor Renewals	Restrictor Renewals	Dovedale	08056215012	100%	130	130	-	-	-	-	-	-	-	-	-	-	-	-	-	65	-	-	-	-	-	-	65

ID	Project Name	Project Description	Category	GL Code	% Renewal	Renewal Estimate	Total Project Estimate	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21 to Year 30
								2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	
150033	Rosedale Saddle BP Tank	Replacing Break pressure tank	Dovedale	08056215013	100%	11	11	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-
150034	Source Treatment Plant - Humphries Creek	Replacing Grit chamber, Chlorinator	Dovedale	08056215008	100%	51	51	-	-	-	-	-	-	-	-	-	-	-	-	51	-	-	-	-	-	-	-	-
150039	Dovedale Valve Renewals	Valve Renewals	Dovedale	08056215018	100%	86	86	-	-	-	-	-	-	-	-	-	-	-	-	39	32	-	-	-	-	-	-	15
150041	88 Valley Valve Renewals	Valve Renewals	88 Valley	08046215019	100%	16	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	-	-
150042	Hamama Reservoir	Replacing Strainer, Settlement tank	Hamama	08076215002	100%	26	26	-	-	-	-	-	-	-	-	-	-	26	-	-	-	-	-	-	-	-	-	-
150044	Hamama Pipeline Renewals	Pipeline Renewal Programme	Hamama	08076215004	100%	475	475	-	-	-	-	-	-	-	-	-	-	75	-	-	-	-	-	-	-	-	-	400
150045	Hamama Restrictor Renewals	Restrictor Renewals	Hamama	08076215005	100%	11	11	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	6
150046	Hamama Valve Renewals	Valve Renewals	Hamama	08076215003	100%	10	10	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-
150048	Kaiteriteri Pipeline Renewals	Pipeline Renewal Programme	Kaiteriteri/ Riwaka	08236215002	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150052	Mapua Restrictor Renewals	Restrictor Renewals	Mapua/ Ruby Bay	08166215044	100%	108	108	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54	-	-	-	-	-	54
150053	Aranui Road main replacement	Tie in with WW #140011	Mapua/ Ruby Bay	08166215035	100%	956	956	-	-	-	96	860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150056	Mapua Pipes	Pipeline Renewal Programme	Mapua/ Ruby Bay	08166215036	100%	445	445	-	-	-	180	-	250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15
150059	Pomona Road Reservoir	Replacing Flowmeter	Mapua/ Ruby Bay	08166215042	100%	15	15	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150062	Stafford Drive	Replacing Flowmeter, Pressure gauge	Mapua/ Ruby Bay	08166215002	100%	19	19	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	9
150065	Fearon street mains replacement	Main needs to be lowered, currently has 480mm cover and suffers from bursts	Motueka - A	08026215012	100%	743	743	-	-	-	-	-	-	743	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150068	High Street South main renewal	Replace Class B 200mm main along High St. South from Old Wharf Road to Wharf Road roundabout	Motueka - A	08026215002	100%	436	436	-	-	-	-	-	44	392	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150070	Motueka Treatment	Motueka - Treatment system renewal	Motueka - A	08146215009	100%	300	300	-	-	-	-	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150073	Motueka Pipeline Renewals	Pipeline Renewal Programme	Motueka - A	08026215005	100%	105	105	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75
150078	Thorpe Street replacement	Main needs to be lowered, currently has 480mm cover and suffers from bursts	Motueka - A	08026215014	100%	1,768	1,768	-	-	-	-	177	1,503	88	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150079	92 Fairfax Street Headworks	Replacing Electrical box	Murchison	08176215006	97%	77	79	-	-	-	-	-	-	-	-	-	-	-	-	-	38	-	-	-	-	-	-	38
150080	92 Fairfax Street WTP	Replacing Aeration tower, Chlorinator, Contact tank	Murchison	08176215005	100%	70	70	-	-	-	-	-	-	35	-	-	-	-	-	-	-	-	-	-	-	-	-	35
150081	Canton Road	Replacing Flowmeter	Murchison	08176215010	100%	8	8	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150082	Chalgrave St Reservoir	Replacing Valve chamber, Flowmeter	Murchison	08176215007	100%	33	33	-	-	-	-	-	-	-	-	-	-	33	-	-	-	-	-	-	-	-	-	-

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								2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	
150083	Fire Hydrant Renewal	Fire Hydrant Renewals	Murchison	08176215011	100%	76	76	-	-	-	-	-	-	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150084	Murchison Pipes and Ridermains	Pipeline Renewal Programme	Murchison	08176215003	100%	1,200	1,200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,200
150087	Murchison Treatment Renewals	Electrical, UV, filters, UTV meter, valves	Murchison	08176215016	100%	75	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75	-	-	-	-	-	-
150088	Murchison Valve Renewals	Valve Renewals	Murchison	08176215013	100%	94	94	-	-	-	-	-	-	47	-	-	-	-	-	-	-	-	-	-	-	-	-	47
150090	New Intake pipeline Pohara	Replace pipe from intake to treatment plant. Linked with Treatment upgrade	Pohara	08576215001	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150093	119 Malling Road BP Tank	Replacing Tank	Redwoods Valley	08066215019	100%	24	24	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-	-	-	-	-	-	-
150094	337 Redwood Valley Road BP Tank	Replacing Tanks	Redwoods Valley	08066215020	100%	47	47	-	-	-	-	-	-	-	-	-	-	-	47	-	-	-	-	-	-	-	-	-
150097	O'Connors Creek Pump Station	Replacing Aeration tower, Chlorinator, Contact tank, UV	Redwoods Valley	08066215004	100%	95	95	50	-	-	-	-	-	-	-	-	-	45	-	-	-	-	-	-	-	-	-	-
150099	Redwoods Restrictor Renewals	Restrictor Renewals	Redwoods Valley	08066215021	100%	156	156	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-	-	78
150101	Redwoods Valve Renewals	Valve Renewals	Redwoods Valley	08066215011	100%	17	17	-	-	-	-	-	-	-	-	-	-	-	-	17	-	-	-	-	-	-	-	-
150102	Neal Property Pipeline Renewal	Renew 700m of 32mm HDPE with 40mm OD MDPE.	Redwoods Valley	08066215012	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150103	Redwoods Pipeline	Pipeline Renewal Programme	Redwoods Valley	08066215017	100%	500	500	50	-	-	-	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	250
150109	Best Island Flow Meter	Replacing Flowmeter	Richmond	08016215067	100%	15	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	8
150112	Church St	Watermain Renewal	Richmond	08016215070	100%	149	149	149	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150115	Fauchelle Avenue, Darcy St and Florence Ave main replacement	Renew 100mm AC main with 100mm PVC. Includes rider main.	Richmond	08016215002	100%	1,032	1,032	1,032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150116	Richmond Fire Hydrant Renewal	Fire Hydrant Renewals	Richmond	08016215041	100%	692	692	115	-	-	-	-	-	232	-	-	-	115	-	-	115	-	-	115	-	-	-	-
150122	Lansdowne Road	Replacing Flowmeter	Richmond	08016215075	100%	15	15	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-
150123	Lower Queen St	Replace 100 main with 150mm	Richmond	08016215076	92%	782	850	78	665	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150128	Richmond Pipes & Ridermains	Pipeline Renewal Programme	Richmond	08016215037	100%	14,050	14,050	150	150	150	500	150	500	150	150	500	150	-	500	-	-	500	-	-	500	-	-	10,000
150129	Queen St Watermain replacement	Replacing all existing 300mm and 100mm in Queen St due to lowering the road by 300mm. New 100mm rider main included. Linked to TPT #110077	Richmond	08016215009	85%	1,562	1,837	-	85	1,477	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150131	Queen St Salisbury Rd Intersection Improvements	New alignment due to changes at road junction. Linked to TPT #110096 and SW #160073	Richmond	08016215079	100%	243	243	-	-	-	-	243	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150137	Restrictor Renewals	Restrictor Renewals	Richmond	08016215094	100%	15	15	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	8

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								2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	
150152	Richmond No1 Well -Queen Street (Cargills Corner)	Replacing Flowmeter	Richmond	08016215082	100%	15	15	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	8
150156	Richmond Water Treatment Plant	Mixing, UV, pH correction of combined Richmond/Waimea water.	Richmond	08016215034	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150157	Richmond Wells - Lower Queen Street	Replacing Well housing, Pump	Richmond	08016215083	100%	98	98	-	-	-	-	-	-	-	-	-	-	-	-	-	49	-	-	-	-	-	-	49
150159	Telemetry Upgrade	New Control Panels and telemetry and renewals of existing sites	Richmond	08016215059	43%	1,370	3,185	45	45	32	32	32	32	32	86	86	86	32	32	32	32	32	32	86	86	32	32	430
150161	Valve Renewals	Valve Renewals	Richmond	08016215051	100%	389	389	195	-	-	-	-	-	-	-	195	-	-	-	-	-	-	-	-	-	-	-	-
150163	Waimea Treatment Plant and Pump Station	Replacing Valve chamber, Chlorinator, Contact tank, Flowmeter, Generator, Lime dosing tank, Pumps, Electrical, Mechanical.	Waimea Basin	08016215057	100%	370	370	-	-	-	370	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150169	Tapawera Hydrants	Fire Hydrant Renewals	Tapawera	08186215004	100%	50	50	-	-	-	-	-	-	-	-	43	-	-	-	-	-	-	-	-	-	7	-	-
150172	Tapawera Pipes	Pipeline Renewal Programme	Tapawera	08186215002	100%	1,150	1,150	-	-	-	-	-	-	-	-	150	-	-	-	-	-	-	-	-	-	-	500	500
150174	Tapawera Water Treatment Plant	Replacing Chlorinator, Contact tank, Flowmeter, Lime dosing tank, Miscellaneous items, Pumps, Well / bore, Reservoir Control Building, UV Treatment and Monitor	Tapawera	08186215003	100%	40	40	-	-	-	-	-	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-
150175	Tapawera Valves	Valve Renewals	Tapawera	08186215007	100%	26	26	-	-	-	-	-	-	-	-	-	26	-	-	-	-	-	-	-	-	-	-	-
150177	Upper Takaka Pipes, valves and hydrants	Pipe, valve and hydrant renewals	Upper Takaka	08196215003	100%	200	200	-	-	-	-	-	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	100
150179	Wai-iti Dam - Wai-iti Valley	Replacing Monitoring System and Environmental improvements	Wai-iti Dam	08096215002	100%	130	130	-	-	-	-	-	-	-	-	-	-	-	-	35	-	-	60	-	-	-	-	35
150182	Fire Hydrant Renewal	Fire Hydrant Renewals	Wakefield	08216215011	100%	120	120	-	-	-	-	-	-	48	-	-	-	-	-	-	-	-	-	-	-	-	-	72
150183	Higgins Road	Replacing Flowmeter	Wakefield	08216215020	100%	15	15	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	8
150185	Restrictor Renewals	Restrictor Renewals	Wakefield	08216215012	100%	19	19	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	10
150188	Wakefield Valves	Valve Renewals	Wakefield	08216215014	100%	68	68	-	-	-	-	-	-	40	-	-	-	-	-	28	-	-	-	-	-	-	-	-
150191	Wakefield Pipes and Ridermains	Pipeline Renewal Programme	Wakefield	08216215007	100%	1,600	1,600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-	-	1,000	-	500
150195	Richmond Meters	Meter Renewals	Richmond	08016215038	100%	7,188	7,188	699	699	699	699	699	-	-	-	50	-	-	50	-	-	-	699	699	699	699	699	100
150196	Motueka Meters	Meter Renewals	Motueka - A	08026215007	100%	1,268	1,268	553	-	-	-	-	-	-	-	-	-	-	-	-	-	-	715	-	-	-	-	-
150198	Redwoods Treatment	Installing UVT monitors	Redwoods Valley	08066215022	100%	58	58	58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150199	Murchison Treatment	Installing UVT monitor	Murchison	08176215014	100%	22	22	-	-	-	-	-	-	-	-	-	-	-	-	22	-	-	-	-	-	-	-	-

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								2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	
150200	Motueka Treatment	Installing UVT monitors	Motueka - A	08026215015	100%	78	78	-	-	-	-	-	-	-	-	-	-	-	-	-	39	-	-	-	-	-	-	39
150201	Collingwood Treatment	Installing UVT monitor, turbidity meter	Collingwood	08226215005	100%	65	65	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	-	-	-	-	-	33
150202	88 Valley Treatment	Installing UVT monitor	88 Valley	08046215020	100%	40	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-	-	-	20
150203	Kaiteriteri/Riwaka Treatment	Installing conductivity meter, pH and turbidity meter	Kaiteriteri/ Riwaka	08236215006	100%	54	54	-	-	-	-	-	-	-	-	-	-	-	-	27	-	-	-	-	-	-	-	27
150205	Top Hepe Reservoir	Upgrade Reservoir	Dovedale	08056215024	100%	22	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
150207	Re-zoning - Edward, Roeske Wilkes	Upgrading Edward St, Roeske St and Wilkes St includes new ridermains	Richmond	08016215088	75%	821	1,095	-	-	-	82	164	534	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150211	Bulk Meter Supply	Bulk Meter Supply	Richmond	08016215091	100%	8	8	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	4
150212	Bulk Meter Supply	Flowmeter	Brightwater	08156215022	100%	39	39	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-	-	-	-	20
150213	Bulk Meter Supply	Mapua/Ruby Bay	Mapua/Ruby Bay	08156215003	100%	16	16	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
150214	Bulk Meter Supply	Wakefield	Wakefield	08216215021	100%	7	7	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	3
150215	Bulk Meter Supply	Redwoods Valley	Redwoods Valley	08066215023	100%	29	29	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	15
150216	Bulk Meter Supply	88 Valley	88 Valley	08046215021	100%	7	7	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	3
150231	Relocate Fearons Bush WTP to Parkers Street WTP	Relocate Fearons Bush WTP to Parkers Street WTP extend mains in Jocelyn and Parker	Motueka - A	08026215009	40%	263	657	10	253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150242	treatment plant	replace contact tank.	Tapawera	08016215105	100%	5	5	-	-	-	-	1	-	-	-	-	1	-	-	-	-	3	-	-	-	-	-	-
150243	Reticulation- Whitby Road	renewal of ridermain and mains in Whitby Road	Wakefield	08016215106	100%	150	150	-	-	-	-	38	-	-	-	-	38	-	-	-	-	75	-	-	-	-	-	-
150244	Pohara Treatment Plant	Remove old equipment/ tanks outside TREATMENT PLANT	Pohara	08016215107	100%	10	10	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150246	Salisbury Road laterals	Renew old copper laterals with new rider main link to TPT #110095 and SW#160076	Richmond	08016215108	100%	50	50	-	-	-	-	-	-	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150250	Oxford/Gladstone intersection	re-do whole connection	Richmond	08016215110	100%	20	20	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150251	24 & 26 Gibbs Valley road	Section of pipe to be replaced 700 m of 20mm Dia	88 Valley	08046215026	100%	64	64	-	-	-	-	16	-	-	-	-	16	-	-	-	-	32	-	-	-	-	-	-
150254	Consent Renewal Programme	Professional Services (to assist and review consent applications)	Asset Management	0801220353	100%	340	340	65	20	35	10	-	-	-	-	-	10	-	-	-	-	-	60	20	35	25	-	60
150256	Cargil place	Relay substandard reticulation	Richmond	08016215111	100%	50	50	-	-	-	-	-	-	5	40	5	-	-	-	-	-	-	-	-	-	-	-	-

ID	Project Name	Project Description	Category	GL Code	% Renewal	Renewal Estimate	Total Project Estimate	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21 to Year 30
								2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	2034/35	
150257	Reticulate between sources and Warehouse	Subject to modelling - replace smaller pipes with larger as part of renewals.	Motueka - A	08026215051	50%	50	100	-	-	-	-	3	45	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150259	Pump Station Programme	Pump renewals	Asset Management	0801621577	100%	1,500	1,500	100	100	-	100	-	100	-	100	-	100	-	100	-	100	-	100	-	100	-	100	400
150299	Renewals Contingency	Renewals	Asset Management	801621580	100%	4,500	4,500	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	1,500
	TOTALS					54,776	297,161	3,546	2,266	2,582	2,586	3,260	3,665	2,147	541	1,627	616	591	1,256	491	676	1,276	1,897	1,111	1,632	2,680	1,481	18,848

APPENDIX J DEPRECIATION AND DECLINE IN SERVICE POTENTIAL

J.1 Depreciation of Infrastructural Assets

Depreciation is provided on a straight line basis on all infrastructural assets at rates which will write off the cost (or valuation) of the assets to their estimated residual values, over their useful lives.

The remaining useful lives and associated rates for the water infrastructure are detailed in Appendix D – Asset Valuations.

J.2 Decline in Service Potential

The decline in service potential is a decline in the future economic benefits (service potential) embodied in an asset.

It is the Council's policy to operate the water supply activity to meet a desired level of service. The Council will monitor and assess the state of the water infrastructure and upgrade or replace components over time to counter the decline in service potential at the optimum times.

J.3 Council's Borrowing Policy

The Council's borrowing policy was that it only funds capital and renewal expenditure through borrowing, normally for 20 years, but shorter terms are used for some assets depending on how long they are expected to last before they need to be replaced.

The Council has now made a decision to start phasing in the funding of depreciation; effectively this will create a reserve to fund the replacement of assets. This method means that debt will not be raised to fund asset replacement. This is being phased in over ten years and is more fully explained in the Financial Strategy which is part of the supporting information associated with the 2015 Long Term Plan.

This method of funding capital expenditure provides intergenerational equity, this means that those people that receive the benefit from the asset generally pay for the asset.

APPENDIX K PUBLIC DEBT AND ANNUAL LOAN SERVICING COSTS

K.1 General Policy

The Council borrows as it considers prudent and appropriate and exercises its flexible and diversified funding powers pursuant to the Local Government Act 2002. The Council approves, by resolution, the borrowing requirement for each financial year during the annual planning process. The arrangement of precise terms and conditions of borrowing is delegated to the Corporate Services Manager.

> *The Council has significant infrastructural assets with long economic lives yielding long term benefits. The Council also has a significant strategic investment holding. The use of debt is seen as an appropriate and efficient mechanism for promoting intergenerational equity between current and future ratepayers in relation to the Council's assets and investments. Debt in the context of this policy refers to the Council's net external public debt, which is derived from the Council's gross external public debt adjusted for reserves as recorded in the Council's general ledger.*

Generally, the Council's capital expenditure projects, with their long term benefits, are debt funded. The Council's other district responsibilities have policy and social objectives and are generally revenue funded.

The Council raises debt for the following primary purposes.

- capital to fund development of infrastructural assets;
- short term debt to manage timing differences between cash inflows and outflows and to maintain the Council's liquidity;
- debt associated with specific projects as approved in the Annual Plan or LTP. The specific debt can also result from finance which has been packaged into a particular project.

In approving new debt, the Council considers the impact on its borrowing limits as well as the size and the economic life of the asset that is being funded and its consistency with Council's long term financial strategy.

The Borrowing Policy is found in Volume 2 of Council's Long Term Plan.

K.2 Loans

Loans to fund capital projects over the next 10 years add up to the following costs detailed in Table K-1.

Table K-1: Projected Capital Works Funded by Loan

Water Supply	2015/16 Year 1 $	2016/17 Year 2 $	2017/18 Year 3 $	2018/19 Year 4 $	2019/20 Year 5 $	2020/21 Year 6 $	2021/22 Year 7 $	2022/23 Year 8 $	2023/24 Year 9 $	2024/25 Year 10 $
Loans Raised	5,389	5,278	19,975	10,524	7,831	5,034	3,424	3,705	2,938	2,812
Opening loan balance	35,914	38,527	40,695	57,245	63,903	67,619	68,223	67,033	65,934	63,930

Note: Figures do not include for inflation and are in thousands of dollars (ie. x 1000)

K.3 Cost of Loans

The Council funds the principal and interest costs of past loans and these are added to the projected loan costs for the next 10 years as shown in Table K-2.

Table K-2: Projected Annual Loan Repayment Costs for Next 10 Years

Water Supply	**2015/16 Year 1 $**	**2016/17 Year 2 $**	**2017/18 Year 3 $**	**2018/19 Year 4 $**	**2019/20 Year 5 $**	**2020/21 Year 6 $**	**2021/22 Year 7 $**	**2022/23 Year 8 $**	**2023/24 Year 9 $**	**2024/25 Year 10 $**
Loan Interest	2,191	2,351	2,932	3,548	3,967	4,095	4,072	4,100	4,002	3,867
Principal repaid	2,776	3,110	3,425	3,866	4,115	4,430	4,614	4,804	4,942	5,131

Note: Figures do not include for inflation and are in thousands of dollars (ie. x 1000)

APPENDIX L. SUMMARY OF FUTURE OVERALL FINANCIAL REQUIREMENTS

Table L-1 following presents a summary of the overall future financial requirements for the water supply activity in the Tasman district.

Table L-1: Summary of Projected Costs and Income for Next 10 years

Tasman District Council											
Funding Impact Statement - Water Supply											
For the Long Term Plan 2015-25											
	2014/15 Budget $000	**2015/16 Budget $000**	**2016/17 Budget $000**	**2017/18 Budget $000**	**2018/19 Budget $000**	**2019/20 Budget $000**	**2020/21 Budget $000**	**2021/22 Budget $000**	**2022/23 Budget $000**	**2023/24 Budget $000**	**2024/25 Budget $000**
SOURCES OF OPERATING FUNDING											
General rates, uniform annual general charges, rates penalties	102	237	237	529	957	1,160	1,227	1,227	1,227	1,227	1,227
Targeted rates (other than a targeted rate for water supply)	1,810	1,281	1,352	1,414	1,449	1,471	1,499	1,555	1,490	1,537	1,550
Subsidies and grants for operating purposes	0	0	0	0	0	0	0	0	0	0	0
Fees, charges and targeted rates for water supply	7,002	7,850	8,396	9,128	9,775	10,466	11,003	11,503	12,173	12,614	13,259
Internal charges and overheads recovered	0	0	0	0	0	0	0	0	0	0	0
Local authorities fuel tax, fines, infringement fees, and other receipts	334	226	245	271	290	310	319	332	351	366	387
TOTAL OPERATING FUNDING	**9,248**	**9,595**	**10,230**	**11,342**	**12,471**	**13,407**	**14,048**	**14,617**	**15,242**	**15,744**	**16,423**
APPLICATIONS OF OPERATING FUNDING											
Payments to staff and suppliers	3,735	4,348	4,528	4,678	4,788	5,024	5,150	5,284	5,568	5,805	6,071
Finance costs	1,686	2,151	2,303	2,875	3,465	3,887	4,012	3,980	3,996	3,872	3,695
Internal charges and overheads applied	1,193	844	805	828	820	808	843	870	902	946	980
Other operating funding applications	0	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATIONS OF OPERATING FUNDING	**6,615**	**7,343**	**7,636**	**8,381**	**9,073**	**9,718**	**10,005**	**10,134**	**10,466**	**10,623**	**10,746**
SURPLUS (DEFICIT) OF OPERATING FUNDING	**2,633**	**2,252**	**2,594**	**2,961**	**3,398**	**3,688**	**4,043**	**4,482**	**4,775**	**5,121**	**5,677**

	2014/15 Budget $000	2015/16 Budget $000	2016/17 Budget $000	2017/18 Budget $000	2018/19 Budget $000	2019/20 Budget $000	2020/21 Budget $000	2021/22 Budget $000	2022/23 Budget $000	2023/24 Budget $000	2024/25 Budget $000
SOURCES OF CAPITAL FUNDING											
Subsidies and grants for capital expenditure	0	0	0	0	0	0	0	0	0	0	0
Development and financial contributions	459	595	666	623	698	647	678	647	670	670	737
Increase (decrease) in debt	3,684	2,565	2,085	3,476	579	655	461	(1,522)	(1,508)	(2,599)	(3,309)
Gross proceeds from sale of assets	0	0	0	0	0	0	0	0	0	0	0
Lump sum contributions	0	0	0	0	0	0	0	0	0	0	0
TOTAL SOURCES OF CAPITAL FUNDING	**4,143**	**3,160**	**2,751**	**4,099**	**1,277**	**1,302**	**1,140**	**(876)**	**(838)**	**(1,928)**	**(2,572)**
APPLICATIONS OF CAPITAL FUNDING											
Capital expenditure											
- to meet additional demand	904	87	236	65	332	68	0	72	0	77	0
- to improve the level of service	4,447	1,723	2,914	3,878	1,321	982	626	815	3,310	991	2,349
- to replace existing assets	745	3,573	2,121	2,992	2,834	3,755	4,410	2,567	576	2,068	695
Increase (decrease) in reserves	680	30	73	126	188	185	147	152	51	56	62
Increase (decrease) in investments	0	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATIONS OF CAPITAL FUNDING	**6,777**	**5,412**	**5,345**	**7,061**	**4,675**	**4,990**	**5,183**	**3,607**	**3,937**	**3,192**	**3,106**
SURPLUS (DEFICIT) OF CAPITAL FUNDING	**(2,633)**	**(2,252)**	**(2,594)**	**(2,961)**	**(3,398)**	**(3,688)**	**(4,043)**	**(4,482)**	**(4,775)**	**(5,121)**	**(5,677)**
FUNDING BALANCE	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: Figures do include inflation.

L.1 Total Expenditure

Figure L-1 and Figure L-2 show the total expenditure for the Water activity for the first 10 and 30 years respectively. The significant expenditure peak in the 25-30 year period is associated with the major projects to reticulate Motueka and the Coastal Tasman Area. Operating costs increases in the longer term are required to service debt associated with the capital investment programme.

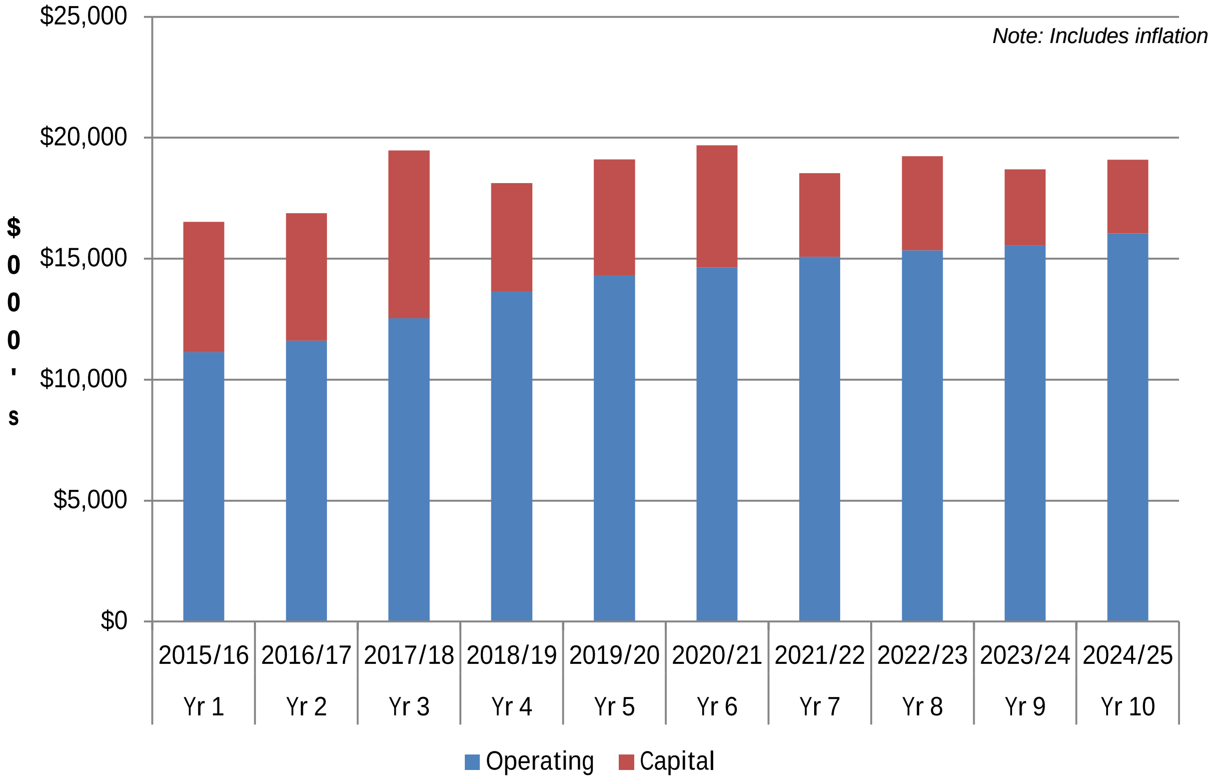

Figure L-1: Total Annual Expenditure Years 1 to 10

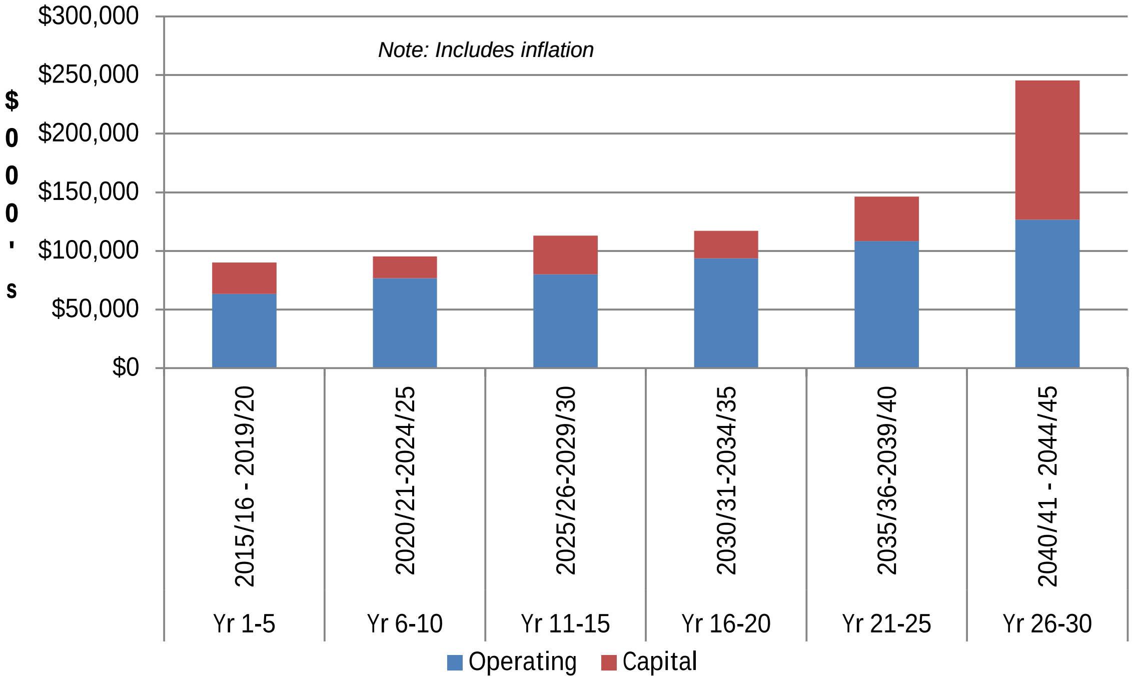

Figure L-2: Five Yearly Total Expenditure Years 1 to 30

L.2 Total Income

Figure L-3 and Figure L-4 show the total income for the Water activity for the first 10 and 30 years respectively.

Rate increases account for the majority of the increase in income.

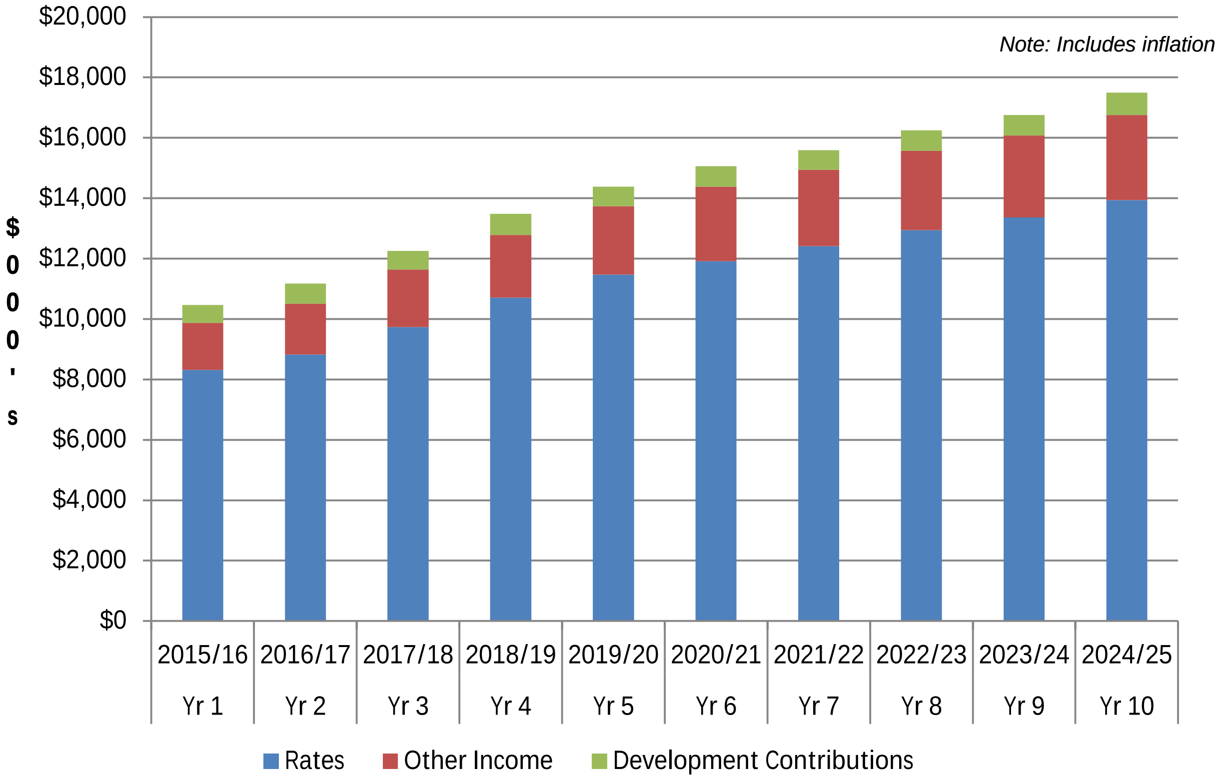

Figure L-3: Total Annual Income Years 1 to 10

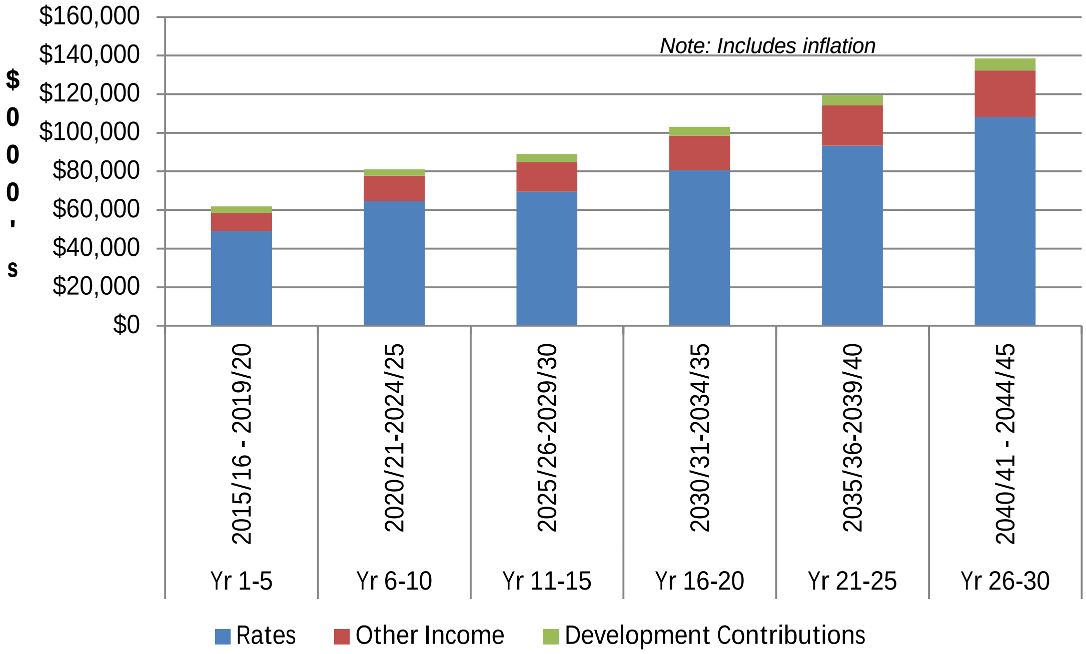

Figure L-4: Five Yearly Total Income Years 1 to 30

L.3 Operational Costs

Figure L-5 and Figure L-6 show the total operating expenditure for the Water activity for the first 10 and 30 years respectively.

The operating costs for water are currently $11m per annum. These are expecting to rise to around $16m in 10 years, and $27m in 30 years. This results in an annual cost increase of around 4.2% in the first 10 years and around 3% over the whole period. Cost increases in the first 10 years are largely driven by indirect cost increases, principally as a result of loans costs for the Waimea community dam affecting this activity.

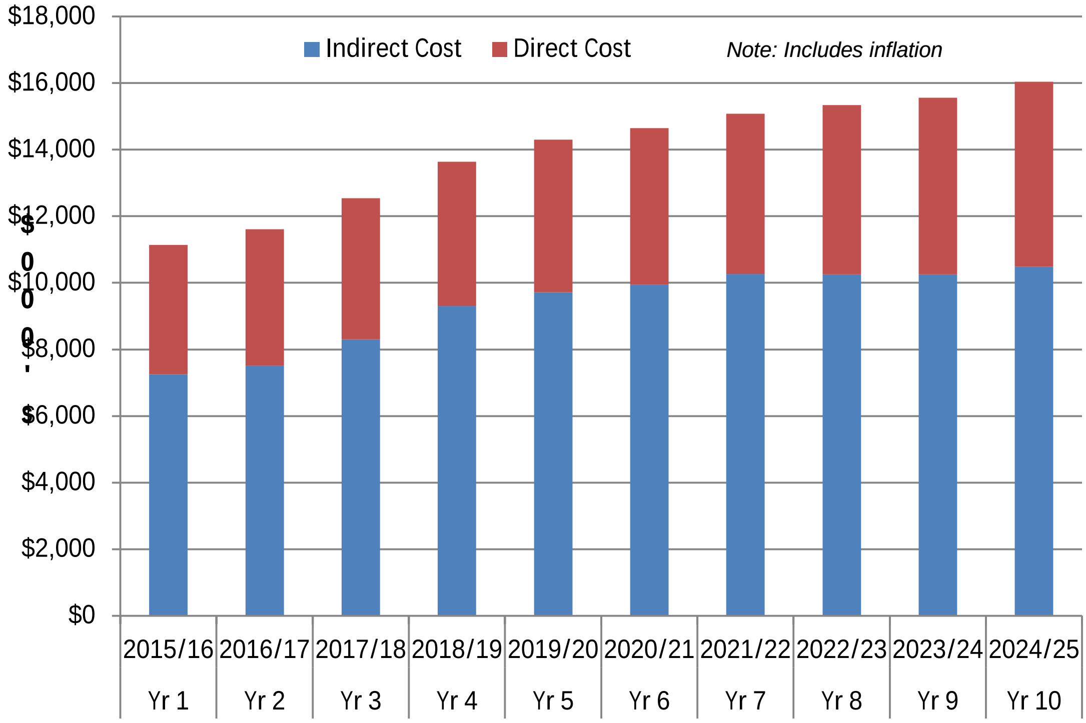

Figure L-5: Annual Operating Costs Years 1 to 10

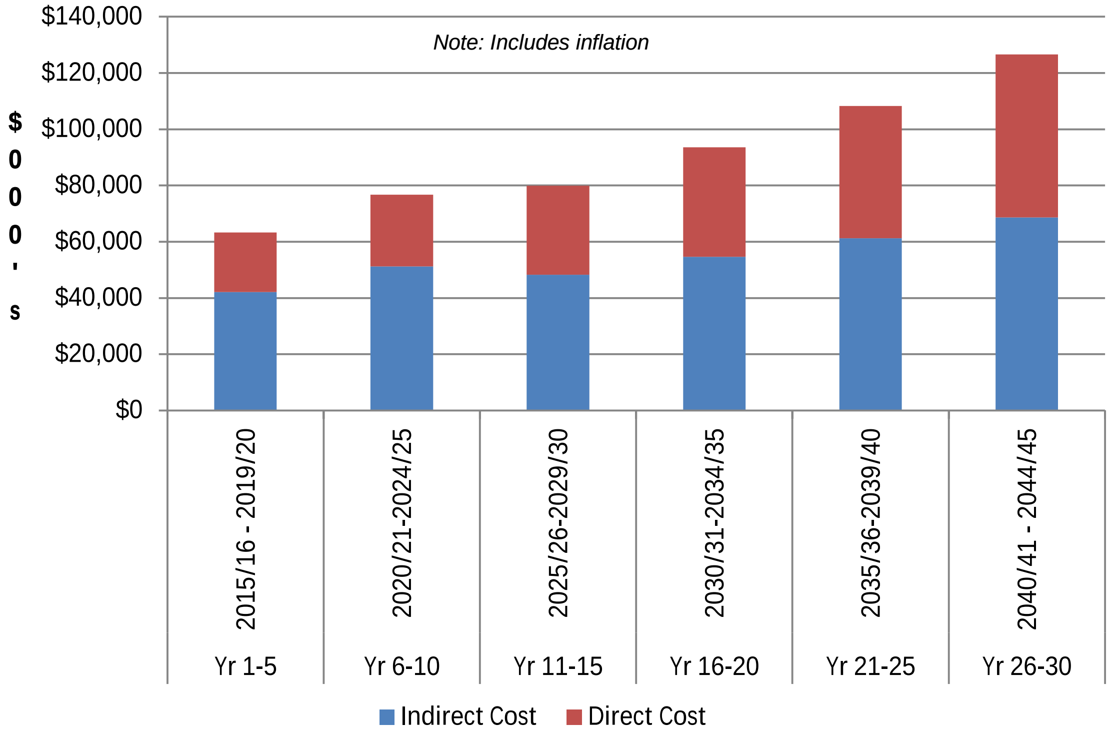

Figure L-6: Five Yearly Operating Cost Years 1 to 30

L.4 Capital Expenditure

Figure L-7 and Figure L-8 show the total capital expenditure for the Water activity for the first 10 and 30 years respectively.

Just over $67m in capital expenditure is forecast over the next 10 years, and nearly $281m over 30 years. The spikes in expenditure in years three-five are associated with the Waimea Community Dam. The large spike in the last 5 year period (years 26-30) is due to construction of the full reticulation of Motueka and the Coastal Tasman pipeline.

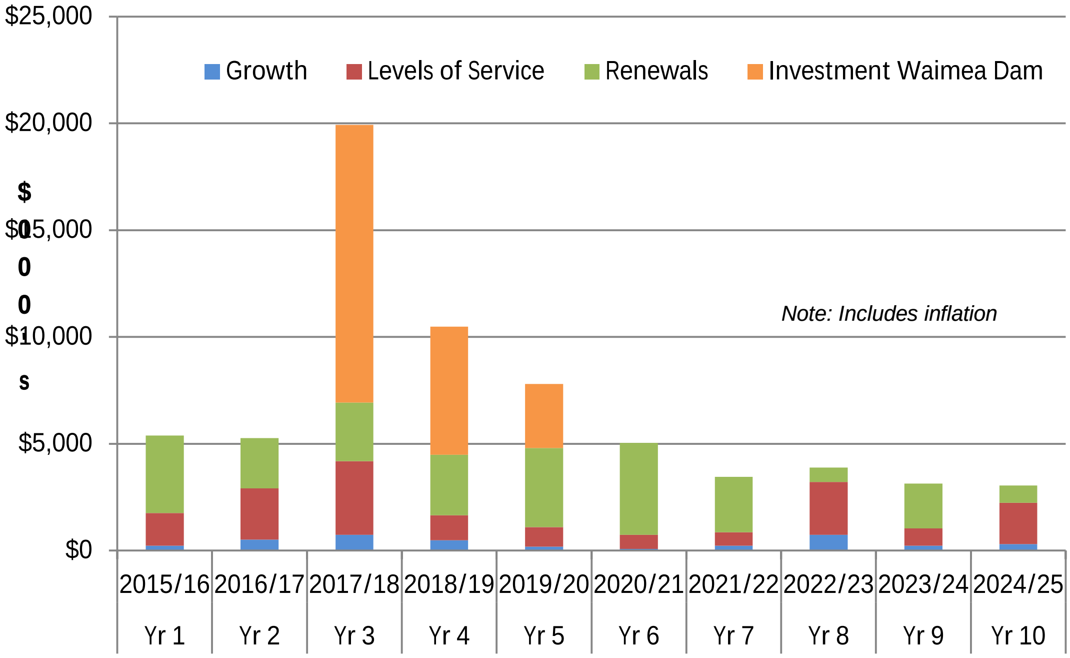

Figure L-7: Annual Capital Expenditure Years 1 to 10

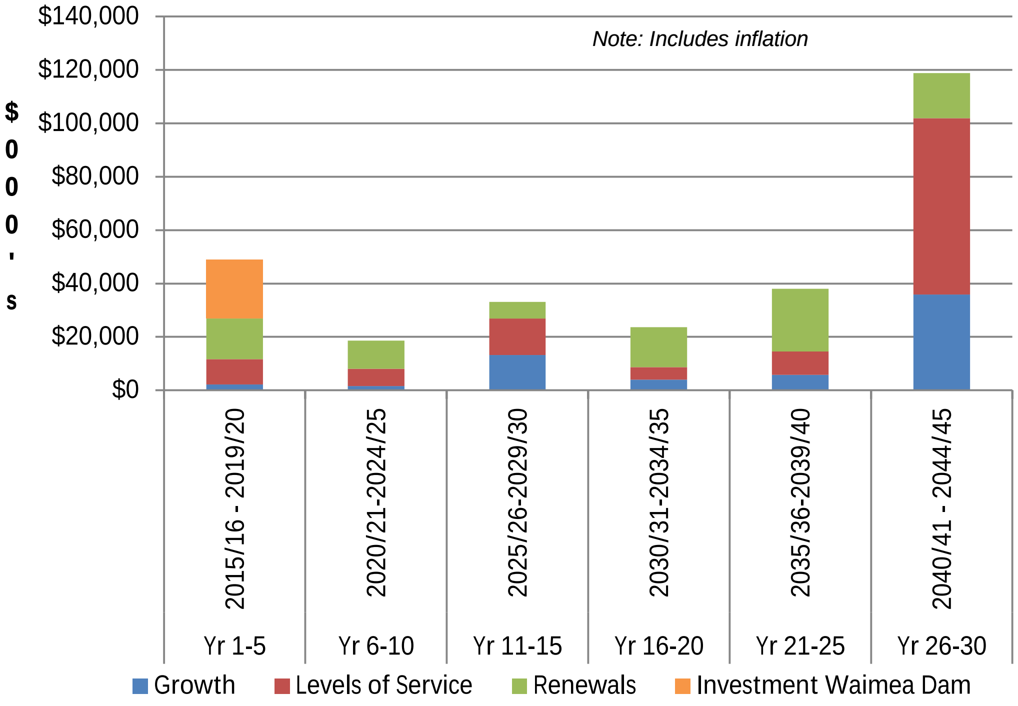

Figure L-8: Five Yearly Capital Expenditure Years 1 to 30

APPENDIX M FUNDING POLICY, FEES AND CHARGES

M.1 Funding Strategy

The focus of the AMPs has been on identifying the optimum (lowest life cycle) cost for operating / maintaining, renewing, developing and disposing of the assets necessary to produce the desired level of service. The Council's funding strategy is based on the following.

(a) Water supply services have been assessed as having 100% user benefit and are not funded by rate appropriation.

(b) A group account shall be operated for urban schemes.

(c) All urban water supply areas, once established, shall be part of one combined district urban water account, shall be metered, and shall have standardised charges (except for the industrial water users). Membership is compulsory within the defined supply area.

(d) Water is currently charged at a fixed daily rate and a rate per unit volume. The fixed daily rate is levied on *all* metered properties inside the urban water supply area, even if not occupied.

(e) The group account shall subsidise the initial capital cost of all new schemes that meet minimum criteria by one third. Connections onto the new scheme are expected to either provide a lump sum for the remainder of the cost, or finance a loan which the Council will manage via a uniform annual charge usually over a 20-30 year period.

(f) Inside the existing urban supply areas, developers pay 100% for reticulation within the development and pay a contribution towards the future upgrading of the existing networks (Development Impact Contributions).

(g) New rural extensions off urban schemes are self-funding by the users with no subsidy from the group Urban Account.

(h) In the rural schemes, new connections pay a capital contribution fee and are self-funding for the costs of installed new reticulation.

Funding sources available for water supply schemes include:

- user charges;
- development contributions (DCs);
- loans;
- private (developer/community) funded works.

New urban schemes must meet five criteria to obtain the Council's approval to subsidise the capital funding:

- there must be a community health need;
- there must be a need to comply with a minimum development standard;
- there must be consultation with potential users (although their wishes may be overridden by the above factors);
- the scheme must be economically viable;
- such schemes are compulsory for all properties within the defined areas.

Major capital projects may be loan funded. When loans are made, the loan is taken for a fixed period, usually 20-30 years, with a fixed annual principal repayment as a capital expense on the account, and interest payments as an operating expense. For the purpose of the financial forecasts, all new works and renewal work have been assumed to be loan funded.

M.2 Schedule of Fees and Charges

The fees and charges for the water supply assets are updated annually. A selected area is shown in Section M.2.1 (Urban), M.2.2 (Rural), and M.2.3 (Community).

M.2.1. Urban Water Group Account

Rates

The rate types for the Urban Water Group are:

- Metered Connections - All rating units with metered connections, excluding the Nelson Pine Industries site.
- Standard Rate - Irrespective of usage – cents per day

The current version of these is available in the Rates Funding Impact Statement.

Connection Charges

Payable by a property that connects to the low pressure supply in one of the Group Account Rural Extension areas.

Connection Charge per Property (GST incl)	2012/2013	2015/2016
Rural Extension Water Supplies.	$4,152.00 plus outwork plus admin	$4,540.00 plus outwork plus admin

Payable by a property that connects in any urban area that is part of the Group Water Account.

Connection Charge per Property (GST incl)	2012/2013	2015/2016
All urban areas.	$1,503.00 plus outworks plus admin	$1640.00 plus physical works charge
Special water reading fee.	$57.00	$65.00

M.2.2. Rural Water Supply Schemes

The rural water supply schemes are set up so that a unit of water will be supplied to the customer each day via a restrictor. The units are not all the same in quantity delivered.

The rate types for the rural water schemes are:

- Dovedale:

First unit supplied (2m^3/day)

Second and subsequent units supplied

- Redwood Valley (2m^3/day)
- Eighty Eight Valley (1m^3/day)
- Low flow restricted supply connections (1m^3/day)
- Eighty-Eight Valley - Targeted Rate Per Property

The current version of these is available in the Rates Funding Impact Statement

Rural Water Supply Connection Charges

Payable by a property that connects to the low pressure supply in one of the Group Account Rural Extension areas. This is the fee payable to connect to the scheme, as follows:

Connection Charge	2012/2013 (GST incl)	2015/2016 (GST incl)
Dovedale Redwood Valley Eighty Eight Valley	Only if capacity is available	Only if capacity is available
First Unit	$4,152.00 plus outwork plus admin	$4540.00 plus outworks plus admin
Additional Units	$725.00 plus outwork plus admin	$800 plus outworks plus admin
To alter the restrictor element, i.e. increase/decrease water allocation	$200.00	$220.00
To remove and/or relocate the restrictor	Outwork plus admin	Outwork plus admin

M.2.3. Community Water Supply Funding

Motueka Urban Water Supply Area

Motueka is only partly serviced and not part of the Group Water Account. This may not change until the proposed full scheme is completed. The expenditure up to the year when Motueka joins the Group Account is to be funded by the following rate types:

- targeted rate of cents per cubic metre of water used;
- targeted rate set differentially on where the land is situated for capital and/or maintenance expenditure.

The current version of these is available in the Rates Funding Impact Statement.

Hamama Rural Water Supply

The Council is proposing to transfer management of this scheme back to the community; however until this is complete maintenance will be funded by a rate based on a cents per dollar of land value.

The current version of these is available in the Rates Funding Impact Statement.

Takaka Fire Fighting Water Supply Area

A targeted rate will be set differentially based on where the land is situated. These rates cover the capital and maintenance of fire fighting scheme within the Takaka township area.

- Golden Bay Ward per property;
- Takaka Residential per property;
- Takaka Commercial CBD - cents per dollar of capital value- Capital;
- Takaka Residential and Commercial CBD per property – Operational.

Other Rates

Wai-iti Dam Costs - Per property served.

Waimea Water Augmentation (Lee Valley) - Per property served.

The current version of these is available in the Rates Funding Impact Statement.

APPENDIX N DEMAND MANAGEMENT

N.1 Introduction to Water Demand Management

Tasman District Council has developed this Appendix of the AMP as an overarching Tasman District Water Demand Management Plan (WDMP) in order to set out a roadmap for future demand management throughout the district. The findings of this WDMP will also assist the Council to monitor its performance towards meeting its target levels of service.

The Council has completed scheme specific WDMPs for six of the largest water supply schemes in the district and the results from these WDMPs are included in this overarching document.

- Richmond
- Brightwater/Hope
- Wakefield
- Mapua/Ruby Bay
- Waimea
- Kaiteriteri/Riwaka

The Council will continue to complete WDMPs for other water supplies as and when they can be afforded within the Council's budgets. It is intended that this AMP will be updated progressively as each WDMP is completed or reviewed so that this document remains a current and overarching support to the Council's water demand activities.

The plan will also be reviewed to assess progress and outcomes of demand management measures at least every three years in advance of the Council's Long Term Plan development and perhaps more frequently if the Council considers there is a need.

N.2 Objective

The objective of this Water Demand Management Plan is to provide a framework and action plan to continuously improve efficient use of water and water demand management across Tasman District Council water supplies, targeting the highest demands / water loss first, to achieve a level of water demand management that is consistent with good performance in New Zealand.

By doing this the Council will ensure its use of the water resource is efficient which is one of the levels of service that contributes to the community outcome "our unique and special natural environment is bountiful, healthy, clean and protected" (refer levels of service Appendix R).

The Council has set level of service performance measures for residential water consumption and non-revenue water that it will report on (refer Appendix R, performance measures 3 and 4). These are weighted averages of the performance of all water supplies.

To achieve these performance measures, the Council intends to set targets for each water supply for the following:

- residential water consumption in l/capita /day (metered customers only);
- non-revenue water in l/connection/day (this measure is recommended for process benchmarking and target setting);
- Infrastructure Leakage Index (the ratio of the current level of leakage against the theoretical unavoidable annual level of leakage, incorporates the current system pressure, length of mains and length of service connections and is recommended for metric benchmarking between supplies).

There are no accepted New Zealand benchmarks for water loss and it appears that few New Zealand water suppliers currently set water loss targets. The Council wants to set targets that achieve efficient use of water but are also achievable and affordable. Therefore when adopting targets, the Council will qualitatively balance:

- where it can get the best 'bang for buck' in terms of reducing water use / leakage;
- the scarcity of water – recognising that the Council and the community get better value by conserving water where it is most scarce;
- affordability of reduction activities;
- water usage / leakage performance compared to other New Zealand water supplies.

Targets will be adopted for each water supply as WDMPs are completed.

N.3 Water Demand Assessment Outcomes

N.3.1. Current Progress

The completed WDMPs include historic water demand assessment for:

- bulk water production (also called total demands);
- metered residential consumption;
- non-revenue water including leakage.

The outcomes of the completed water demand assessments are briefly described in the following sub-sections. For more detail, see each individual WDMP.

N.3.2. Bulk Water Production Record Assessment

The outcomes of bulk water demand assessments carried out on Tasman District Council water supplies to date are shown in Table N-1. Bulk water demands include total demands from residential, rural-residential, commercial, industrial and institutional properties, along with non-revenue water such as leakage, fire fighting, mains flushing etc. Where data is available 3 years are used in the bulk water assessment.

Table N-1: Outcome of Bulk Water Analyses for Tasman Water Supplies

Water Supplies	Date of assessment	3 Year Average Day Demand (m^3/day)	3 Year Peak Week Demand (Peak Week: Average Day Ratio)	3 Year Average Total Per Capita Usage (L/capita/day)	Climate Corrected Average Per Capita Usage (L/capita/day)
Richmond	2010	3,900	5,600 (1.4)	280	305
Brightwater/Hope	2010	1,600	2,400 (1.5)	530	560
Wakefield	2010	720	1,100 (1.5)	310	380
Mapua/Ruby Bay	2010	1,000	1,700 (1.7)	420	415
Waimea	2010	3,100	5,400 (1.7)	1,490	n/a
Kaiteriteri/Riwaka	2014	300	900 (3)	340[1]	n/a
Murchison	*2014/15*	tbc*	tbc	tbc	tbc
Collingwood	*2014/15*	tbc	tbc	tbc	tbc
Tapawera		tbc	tbc	tbc	tbc
Upper Takaka		tbc	tbc	tbc	tbc
Dovedale		tbc	tbc	tbc	tbc
Redwood Valley		tbc	tbc	tbc	tbc
Eighty Eight Valley		tbc	tbc	tbc	tbc
Motueka		tbc	tbc	tbc	tbc
Pohara		tbc	tbc	tbc	tbc
Hamama		tbc	tbc	tbc	tbc

Note: * = to be completed

Figure N-1 shows available 2010 Council scheme bulk demand data benchmarked against 16 councils[2] .

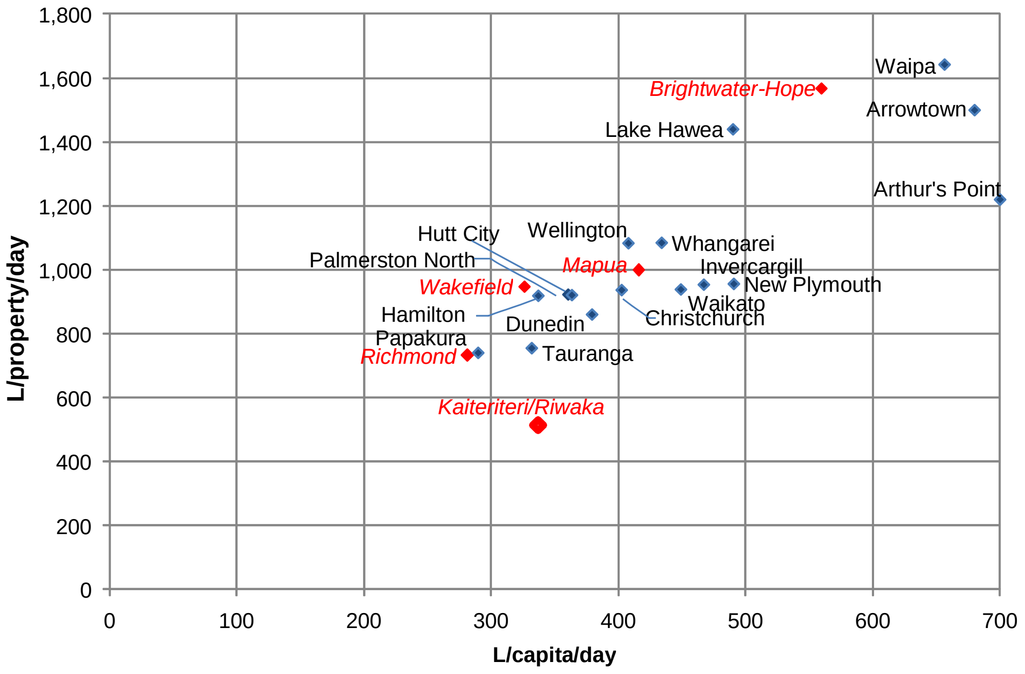

Figure N-1: Benchmarking Bulk Demand Data against other New Zealand Supplies

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[1] This value is based on connections and nominal occupancy but is indicative due to highly seasonal demand. Refer Kaiteriteri-Riwaka Water Demand Management Plan, MWH, August 2013.

[2] Using published data from council demand management plans and the Water New Zealand National Performance Review 2009/2010 Summary Report, published by the New Zealand Water and Wastes Association.

Figure N-1 shows that the water use from the Tasman District Council water supplies is comparable to other New Zealand communities that have information available. The exception is Brightwater / Hope where there is very high water use measured. Fonterra runs a plant with usage of around 20,000m^3/year so that explains the relatively high per capita usage shown.

Waimea is not shown on the plot because the total consumption for Waimea (1,490 l/capita/day, or 3,620 l/property/day) is significantly higher than the other water supply schemes because of the significant proportion of industrial consumption. This significant influence of industrial users on the total consumption figures confirms that the use of total or bulk per person demand at a production level does not provide a reliable benchmark. It is preferable to benchmark the residential consumption per capita as discussed further in Section N.4.

N.4 Residential Consumption

Apart from a small proportion of rural-restricted[3] properties, all of the customers in the Council's water supply schemes are metered and have volumetric charging for water. Figure N-2 shows available Council's metered residential consumption data from the most recent year benchmarked against 19 councils from across New Zealand (the councils without residential metering and volumetric pricing are shown in grey). The data from the six Auckland local network operators is from the Auckland Water Group 2007/08 Annual Benchmarking Report. The data for the other councils was sourced from the 2009/2010 National Performance Review Report.

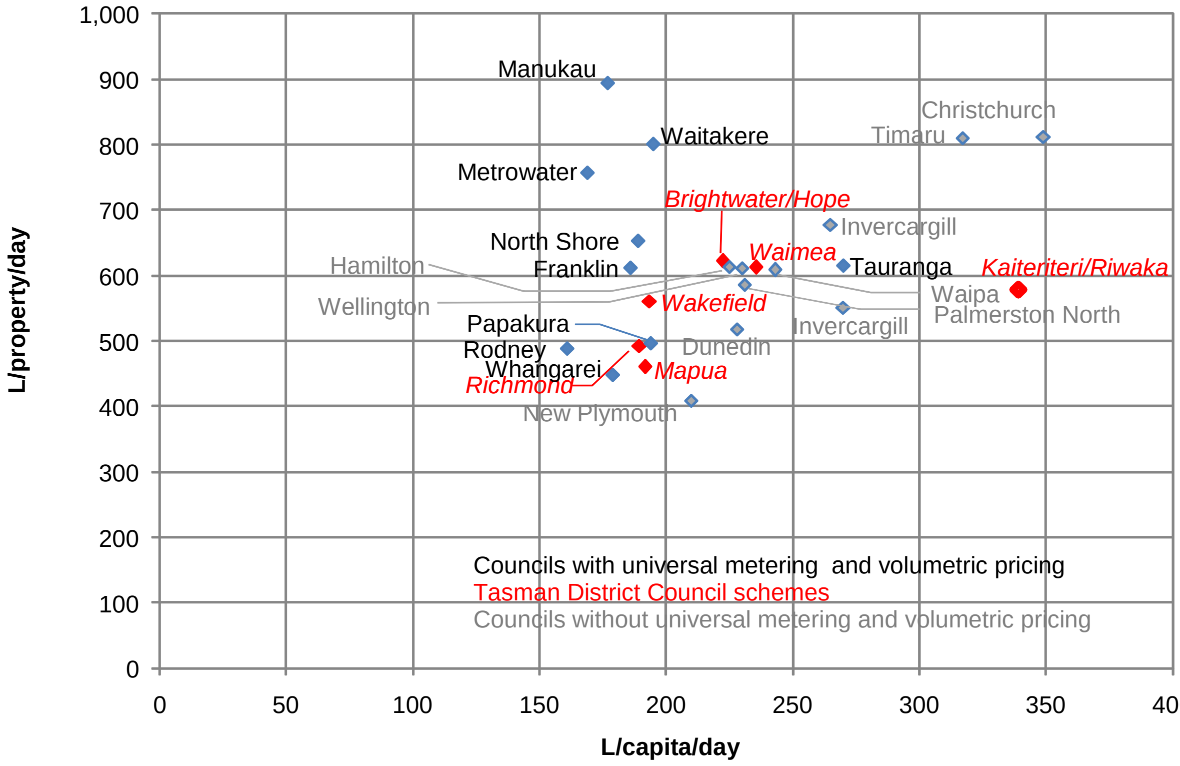

Figure N-2: Benchmarking Metered Residential Consumption Against other New Zealand Supplies

The plot above shows that metered residential consumption in Richmond, Wakefield and Mapua is comparable on a l/capita/day basis to the other New Zealand cities and towns shown. It also shows the influence of metering and charging as all those councils without residential metering and volumetric pricing have higher per capita consumption from 200 through to 350 l/capita/day (it should be noted that these councils will have estimated these values due to the lack of measured

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[3] Restricted connections are connections that have a physical restriction in the pipeline to limit the flow to the property to deliver a set volume of water to a property over a 24 hour period.

residential consumption data). All of the former Auckland cities reported metered residential consumption between 150 and 200 l/capita/day, whereas the Tasman District Council schemes report values between 190 and 235 l/capita/day. We expect that the wider range of residential consumption rates in Tasman District Council compared to the Auckland region is due to the influences of holidaymakers in the area over summer, as well as typically drier summers and higher garden watering in many of the Tasman district areas.

N.5 Non-residential Consumption

The water demand management plans for each water supply have identified the highest water users in each water supply. Most of these are non-residential properties including schools and rest homes, industrial properties and commercial properties. It is intended that these properties are visited and a water audit undertaken to inform property owners of water use and to look for water conservation opportunities.

N.6 Water Losses

The outcomes of water loss assessments carried out on Tasman District Council water supplies are shown in Table N-3. This table includes the World Bank Institute's rating based on their guideline bands for the Infrastructure Leakage Index (ILI) in developed countries, from A (Excellent) through to D (Very Bad). The World Bank Institute's guideline bands are shown in the matrix in Table N-2. The water loss assessments for Richmond and Waimea have been combined to show one result due to uncertainties around the number of residential connections within the Richmond area that are actually fed from the Waimea scheme (in the near future the Richmond and Waimea water sources will be combined and treated through one water treatment plant).

Table N-2: ILI Banding System

Band	ILI Values	Operational Performance in Leakage Management
A	< 2	Excellent – Further loss reduction may be uneconomic unless there are shortages; careful analysis needed to identify cost effective improvement.
B	2 to < 4	Good – Potential for marked improvements; consider pressure management; better active leakage control practices and better network maintenance.
C	4 to < 8	Poor – Poor leakage record; tolerable only if water is plentiful and cheap; even then, analyse level and nature of leakage and intensify leakage reduction efforts.
D	> 8	Very Bad – Very inefficient use of resources; leakage reduction programs imperative and high priority.

Table N-3: Outcome of Water Loss Assessments for Tasman Water Supplies

Water Supplies	Water Demand Assessment Status	Infrastructure Leakage Index (ILI)	Estimated Leakage (l/connection/day)	Non-revenue Water as a Percentage of Water Production
Richmond/ Waimea	Completed Aug 2010 and Feb 2011. Updated August 2011.	2.3 – B Good	173	14%
Brightwater/ Hope	Completed Aug 2010	7.6 – C Poor	575	39%
Wakefield	Completed Aug	3.9 – B Good	270	32%

Water Supplies	Water Demand Assessment Status	Infrastructure Leakage Index (ILI)	Estimated Leakage (l/connection/day)	Non-revenue Water as a Percentage of Water Production
	2010	(just)		
Mapua/ Ruby Bay	Completed Feb 2011	1 – A Excellent	105	16%
Kaiteriteri/ Riwaka	Completed Aug 2013	0.7 – A Excellent	84	20%
Murchison	To be done 2014/15	tbc	tbc	tbc
Collingwood	To be done 2014/15	tbc	tbc	tbc
Tapawera	Not yet started	tbc	tbc	tbc
Upper Takaka	Not yet started	tbc	tbc	tbc
Dovedale	Not yet started	tbc	tbc	tbc
Redwood Valley	Not yet started	tbc	tbc	tbc
Eighty Eight Valley	Not yet started	tbc	tbc	tbc
Motueka	Not yet started	tbc	tbc	tbc
Pohara	Not yet started	tbc	tbc	tbc
Hamama	Not yet started	tbc	tbc	tbc

Figure N-3 shows the Council's leakage data from the most recent year benchmarked against 18 councils from across New Zealand.

The data from the Auckland local network operators was from the 2007/08 Annual Performance Review Auckland Water Industry produced by the Auckland Water Group (Manukau Water, MetroWater, North Shore City Council, Rodney District Council, Waitakere City Council, United Water and WaterCare).

The data for the other councils was sourced from the Water New Zealand National Performance Review 2008/2009 and 2009/10 Summary Reports. Note that the councils without residential metering will typically have estimated the leakage values due to the lack of measured residential consumption data for the annual water balance.

Note: it would have been preferable to benchmark using the ILI but this measure was not included in the Annual Benchmarking Report or the National Performance Review Report (l/connection/day is preferable for target setting for a water supplier).

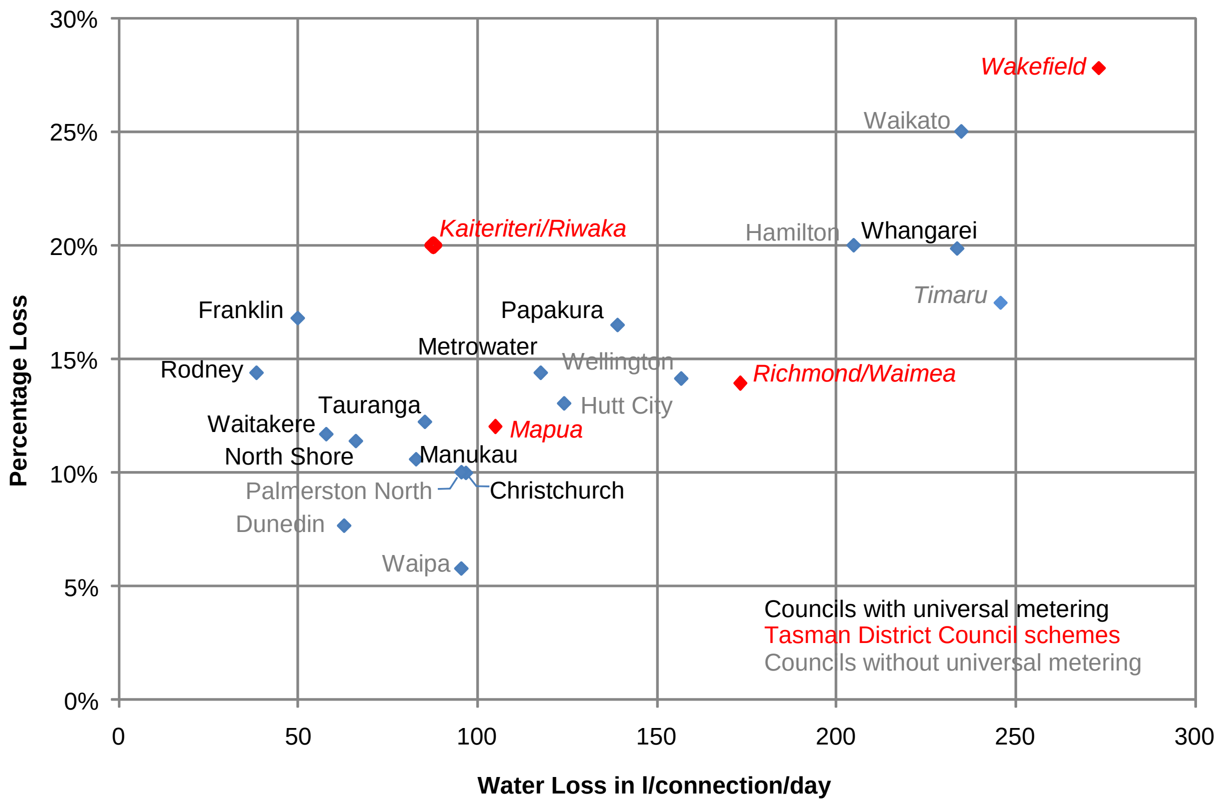

Figure N-3: Benchmarking Water Losses against other New Zealand Supplies

The plot shows that Mapua and Kaiteriteri/Riwaka compare well to the other New Zealand cities and towns. Richmond/Waimea is slightly high in comparison and warrants some attention. However Brightwater/Hope (off the chart at 575 l/connection/day and 39% of production) and Wakefield have the highest reported leakage levels of any of the benchmarked schemes and have been a high priority for leakage reduction. New assessments will be carried out for the 2018 AMP.

N.7 Water Demand Management Measures

N.7.1. Introduction to Management Measures

Water demand management options can be categorised into two key areas, measures and instruments.

- **Measures** – 'what to do' to achieve a reduction in water-use (eg, conversion of inefficient showers to efficient star rated showerheads).
- **Instruments** – 'how to do it' (how to ensure that the chosen 'measures' are put into place or taken up), which include the following types.
  - Economic – incentives such as rebates and retrofits for efficient fixtures and fittings or cost-reflective pricing which makes customers consider how they can reduce their water use to reduce their water bills.
  - Regulatory – the use of local development consent conditions to ensure all new properties sold achieve a specified level of water efficiency and minimum water efficiency performance standards at a national level that require all products sold to achieve a specified level of water efficiency.
  - Communicative – education and advertising / marketing to promote a water efficiency consciousness and promote behavioural changes.

In addition, the Water Services Association of Australia (WSAA) recommends identification of "foundation options" as they have often been critical elements to the success of a demand management programme. It may be difficult to analyse the costs and attribute savings to these options, however they should be considered in the full programme.

Foundation options include:

- an effective ongoing education and public awareness campaign that ensures the community understand how they use water and how they may be able to save water.
- a customer advisory service which assists in communicating to the public how to save water and participate in water efficiency programmes.
- the use of regular billing cycles including customer feedback on bills to advise on how the customer is tracking with respect to previous billing cycles and typical household water consumption.
- effective user-pays cost-reflective pricing including consideration of pricing water (and wastewater) in usage blocks that become progressively more expensive and peak, drought and scarcity based pricing.
- basic system management including systematic replacement of customer water meters and calibration of bulk water meters to ensure a high level of water accounting accuracy.

WSAA recommends designing both structural and behavioural changes into a demand management programme and using more than one instrument. A combination of at least two instruments is generally most effective. For example, an economic incentive for an indoor retrofit, plus communicative and educative material about water saving tips around the home, have the potential to tap into both structural and behavioural conservation.

Similarly, whenever considering changing a single measure such as a washing machine, at least two instruments are recommended to maximise effectiveness. For example, an economic incentive and communication/education that recognises both structural and behavioural changes can take place (eg, a more efficient machine and the participant being informed that they can save both water and energy if they wait to use a full load when washing clothes, which will save them money).

N.7.2. Water Demand Management Progress

In the Water Supply AMP 2012-2022, the Council proposed a staged approach for improving water demand management in the district. Progress on these actions since the publication of the Council's 2012 Water Supply AMP is detailed in Table N-3.

Table N-4: Water Demand Management Progress Since the Publication of 2012 Water Supply AMP

Actions from the 2015 AMP	Description	Benefit	Progress since the 2012 AMP	Future Plans
Bulk Meter Installation and Night Flow Monitoring	Identify locations for installation of new bulk meters with data loggers (or connections to SCADA however, this is expected to be more expensive), at for example reservoir outlets. Develop a night flow monitoring programme to estimate and monitor the level of leakage in each scheme from the bottom-up.	Ongoing monitoring of leakage in top priority schemes.	Have installed reservoir outlet flow meters in Waimea, Brightwater and Wakefield. Richmond Queen Street reservoir (the main reservoir) completed with a works order issued for Valhalla Reservoir.	
Further Demand Analysis	Further analyse historic water demands in each water supply system (16 in total) and identify trends and patterns in water use. Assess water supply issues for each system.	Identify schemes with highest demands.	Completed demand analysis for Kaiteriteri/Riwaka as part of the WDMP preparation.	Complete remaining plans as per performance measure targets.
Assess Level of Water Loss	Undertake an annual water balance for at least the most recent year of data in each urban system (10 in total) to assess the portion of water that is non-revenue (ie. water loss, meter under-registration etc.). Identify potential for water loss reduction in each urban system including estimation of the economic level of leakage for each system. Identify high leakage areas to prioritise for proactive leakage reduction.	Identify top priority schemes for further leak reduction and night flow monitoring.	Completed water loss assessment for six schemes as part of the WDMP preparation.	
Proactive Leak Reduction in Pilot Community	Develop a leakage reduction programme in a pilot community to prioritise on high leakage areas. Includes leak location and infrastructure repair / renewal.	Pilot to demonstrate effectiveness of leakage reduction.	Completed leakage reduction and priority repairs in Mapua and Wakefield.	
Hydraulic Modelling Upgrades	Undertake recalibration of the existing Infoworks water supply models, based on the latest GIS, population, water connection and demand data. The models are to be recalibrated on a system by system basis,	Provides a tool to assess the system performance, develop monitoring programmes and assess benefit of	Rebuilt and recalibrated Richmond water supply model and prepared Master Plan.	Modelling and master plan for Mapua. Remodel Richmond/Waimea once

Actions from the 2015 AMP	Description	Benefit	Progress since the 2012 AMP	Future Plans
	prioritised based on development, proposed upgrades and known problems.	improvements.	Work on Richmond South short term options.	combined.
Meter Replacement Programme	Develop a database of all flow meters including location, year of installation / replacement, diameter, brand and calibration results. Develop a proactive meter replacement programme prioritised by cumulative volume of water through the meter or meter age.	Increased revenue and higher accuracy for water demands.	Implementation of the residential customer meter replacement strategy – from inline meters to manifold meters underway (prioritised on age).	Keep gathering calibration data on meters after removal to improve understanding of meter accuracy (business as usual).
Cost-Benefit Analysis	Assess relevancy of demand management measures to each scheme and undertake a high level cost-benefit analysis for the short-listed options.	Identify options with best benefit to cost ratio for implementation.	Reprioritised projects based on cost-benefit for 2015 AMP.	Continual review with improved asset data
Water Demand Management Plans	Develop a water demand management implementation plan for each scheme through workshops and incorporating results from previous actions.	Implementation plan to improve water demand management in each scheme.	This document will propose implementation plans for Richmond, Waimea, Brightwater/Hope, Wakefield and Mapua/Ruby Bay.	Remaining WDMPs to be completed as per performance measure targets.
Pressure Management	Identify through hydraulic modelling the areas within the Richmond and Waimea systems that have the highest potential for pressure management.	Identify priority areas for pressure management.	Some modification of the Richmond and Waimea supply zones completed to get a better distribution of water across the zones.	Further zoning changes once Richmond WTP is completed in 2015. Report on pressure management initiatives.

N.8 Water Demand Management Targets

As specified in the technical performance measure, Council aims to identify demand targets (for metered residential consumption and leakage) for each water supply and implement a demand management programme to achieve those targets. Table N-5 specifies proposed metered residential consumption targets for those water supplies that have completed WDMPs.

Table N-5: Water Demand Targets for Metered Residential Consumption

Water Supply	Existing Metered Residential Consumption	Target Metered Residential Consumption	General Approach	Action Priority
Richmond/ Waimea Combined	190 l/capita/day Richmond 235 l/capita/day Waimea	<200 l/capita/day	Accept existing water use as reasonable (refer Figure N-2) and identify any unusual high water users for investigation/ audits. Significant alternative plan to be implemented if the Waimea Community Dam does not proceed – Refer Appendix AA.	Medium
Brightwater / Hope	220 l/capita/day	<250 l/capita/day	Accept existing water use and identify any unusual high water users for investigation/audits. Significant alternative plan to be implemented if the Waimea Community Dam does not proceed – Refer Appendix AA.	Medium
Wakefield	195 l/capita/day	<200 l/capita/day	Accept existing water use and identify any unusual high water users for investigation/audits. Significant alternative plan to be implemented if the Waimea Community Dam does not proceed – Refer Appendix AA.	Low
Mapua / Ruby Bay	190 l/capita/day	<200 l/capita/day	Accept existing water use and identify any unusual high water users for investigation/audits. Significant alternative plan to be implemented if the Waimea Community Dam does not proceed – Refer Appendix AA.	Low
Kaiteriteri/Riwaka	439	<300	Investigate usage per capita	High

Water Supply	Existing Metered Residential Consumption	Target Metered Residential Consumption	General Approach	Action Priority
	l/capita/day	l/capita/day	and determine the low resident population is sufficient explanation. If so accept existing water use and identify any unusual high water users for investigation/audits.	
Murchison	tbc	tbc	Complete WDMP.	
Collingwood	tbc	tbc	Complete WDMP.	
Tapawera	tbc	tbc	Complete WDMP.	
Upper Takaka	tbc	tbc	Complete WDMP.	
Dovedale	tbc	tbc	Complete WDMP.	
Redwood Valley	tbc	tbc	Complete WDMP.	
Eighty Eight Valley	tbc	tbc	Complete WDMP.	
Motueka	tbc	tbc	Complete WDMP.	
Pohara	tbc	tbc	Complete WDMP.	
Hamama	N/A (unmetered)	N/A	N/A	N/A
Weighted average	196 l/capita/day	200 l/capita/day		

Table N-6 specifies proposed water leakage targets for those water supplies that have completed demand management plans.

Table N-6: Water Leakage Targets

Water Supply	Existing Leakage	Target Leakage	General Approach	Action Priority
Richmond / Waimea	190 l/conn/day 2.7 ILI	≤150l/conn/day ≤2 ILI	Undertake some leak detection and repair work and determine how much leakage reduction can be achieved. Improve data collection systems to improve confidence. Improve monitoring of rural extensions through installation of bulk meters (as existing leakage estimate	Medium

Water Supply	Existing Leakage	Target Leakage	General Approach	Action Priority
			relies on assumed rural extension use based on 75% of restricted allowance).	
Brightwater/ Hope	575 l/conn/day 7.6 ILI	≤300l/conn/day ≤4 ILI	Target high water losses through night flow monitoring and leak detection survey then re-assess. Improve monitoring of rural extensions through installation of bulk meters (as existing leakage estimate relies on assumed rural extension use based on 75% of restricted allowance).	High
Wakefield	270 l/conn/day 3.9 ILI	≤200l/conn/day ≤3 ILI	Target high water losses through night flow monitoring and leak detection survey then re-assess. Improve monitoring of rural extensions through installation of bulk meters (as existing leakage estimate relies on assumed rural extension use based on 75% of restricted allowance).	High
Mapua / Ruby Bay	105 l/conn/day 1 ILI	≤150l/conn/day ≤2 ILI	Maintain current level of leakage and consumption. Improve data collection systems to improve confidence. Improve monitoring of rural extensions through installation of bulk meters (as existing leakage estimate relies on assumed rural extension use based on 75% of restricted allowance).	Low
Kaiteriteri/Riwaka	84l/conn/day 0.7 ILI	≤150l/conn/day ≤2 ILI	Maintain current level of leakage and consumption. Improve data collection systems to improve confidence. Improve monitoring of rural extensions through installation of bulk meters (as existing leakage estimate relies on assumed rural extension use based on 75% of restricted allowance).	Low

N.9 Action Plan

Significant work has been undertaken on demand management over the last five years and the resulting data is being considered to assist optimisation of future demand management spending. A significant unknown is the impact of the Waimea Community Dam decision as discussed in Appendix AA.

For this version of the AMP, the various types of demand management funding have been combined into a single programme and yearly priorities will be determined using the latest information. Hence these activities are no longer listed separately in the AMP financials:

- demand management;
- leak detection;
- night flow monitoring;
- education programmes; and
- water audits for high use non-residential properties.

The currently known action priorities are summarised in Table N-7.

Table N-7: Action Plans for Each Water Supply

Water Supply	Action
Richmond / Waimea	Review system priorities once combined Richmond/Waimea scheme has settled and implications of the Waimea Community Dam decision are clearer.
	Update model of network once rezoning complete.
Brightwater / Hope	Review system priorities.
Wakefield	Create model once new treatment plant, supply line, reservoirs and associated and network rezoning (Eighty-Eight Valley) complete. Install more bulk meters.
Mapua / Ruby Bay	Update modelling of network.
Kaiteriteri/Riwaka	Review system priorities.
Murchison	Prepare WDMP.
Collingwood	Prepare WDMP.
Tapawera	Prepare WDMP.
Upper Takaka	Prepare WDMP.
Dovedale	Prepare WDMP.
Redwood Valley	Prepare WDMP, monitoring of bulk meters.
Eighty Eight Valley	Prepare WDMP monitoring of bulk meters.
Motueka	Prepare WDMP, revise model 2016/17.
Pohara	Prepare WDMP.
Hamama	No action pending decision on transfer of system to community.
General	Consider change in volumetric charging scheme. Consider summer restrictions programme for Richmond, Mapua, Brightwater. Monitor zone flows, improve reservoir metering.

N.9.1. Demand Management Tools

Numerous Demand Management tools exist and Council has already employed many of them. Table N-8 summarises both the measures currently used and those that have potential for future use.

Table N-8: Demand management measures used by TDC and potential future options

Demand Management Measures	Currently used	Potential future option
Measures - Infrastructure Management		
Active leakage control programme in targeted schemes.	ü	
Reactive leakage repair.	ü	
Pressure management.	ü	ü
Bulk metering of rural-restricted areas to improve understanding of demands.	ü	
Bulk metering of reservoir outlets to improve night flow monitoring.	ü	
Customer meter testing and replacement programme.	ü	
Water modelling to improve system performance and leakage.	ü	
Advanced asset renewal planning to prioritise infrastructure replacement and reduce leakage.	ü	
Instruments - Community Engagement		
Passive education programme with information on Council website.	ü	
Community education programme with full time in-house staff champion.		ü
Educational resources and programmes for schools.		ü
Targeted education programmes for specific users, eg, rural properties.		ü
Free mobile service for water efficiency in residential properties (similar to Tauranga's Waterline service).		ü
Provision of shower timers for people to limit their shower time.		ü
Green gardener – water efficient landscaping workshops and free advice.		ü
Water advisory service and audits for water users eg, commercial.		ü
Instruments - Regulatory Control		
Restricted connections (trickle feed) to rural properties.	ü	
Water restrictions during peak summer periods (eg. alternate day garden watering).	ü	
Active enforcement of water restrictions during peak summer periods.		ü
Mandatory water efficient fixtures in new construction beyond Building Code.		ü
Requirement for large customers to prepare demand management plans.		ü
Mix of Measures and Instruments - Water Efficient Technologies		
Rebate or subsidy or grant programme for retrofit of water efficient fixtures (can be targeted at residential properties, schools, commercial properties etc. and at specific fixtures eg. showerheads or dual flush toilets).		ü
Retrofit of water-efficient technologies into Council properties.		ü
Rebate or subsidy programme for automatic timers for residential irrigation systems.		ü

Demand Management Measures	Currently used	Potential future option
Mandatory rain/soil moisture sensors for properties with high garden watering.		ü
Instruments - Metering, Pricing and Other Financial Initiatives		
Increasing block volumetric charges for metered customers.		ü
Measures - Water Capture, Reuse and Recycling		
Rainwater tank rebate or subsidy programme.		ü
Grey water recycling rebate or subsidy programme.		ü

N.10 Climate Change

The RMA 1991 states, in Section 7, that a local authority shall take account of the effects of climate change when developing and managing its resources. The Local Government Act 2002 also contains requirements to “to meet the current and future needs of communities for good quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses”. “Good quality” means infrastructure, services, and performance that are efficient and effective and appropriate to present and anticipated future circumstances.

This appendix summarises climate change information available to the Council for asset and activity planning. Key information sources include:

- Climate Change Effects and Impacts Assessment: A Guidance Manual for Local Government in NZ, MfE (2008).
- Climate Change and Variability in the Tasman District, NIWA (2008).
- Mean High Water Springs report, NIWA (2013).
- Fifth Assessment Report, IPCC (2013).
- Extreme sea-level elevations from storm-tides and waves: Tasman and Golden Bay coastlines, NIWA (2014).

N.10.1. Changing Climatic Patterns

To assist local authorities, the Ministry for the Environment (MfE) prepared a report[4] to support councils’ assessing expected effects of climate change, and to help them prepare appropriate responses when necessary.

In 2008, Tasman District Council commissioned NIWA to provide local interpretation[5]. The report examined the impacts of expected climate changes for the Tasman-Nelson region.

Subsequently, the Intergovernmental Panel on Climate Change (IPCC) has produced its fifth assessment report AR5 (2013). The AR5 is a result of substantial collective international science over the past five years, and has synthesised the current physical science basis for climate change understanding. The report covers the scope and significance of expected impacts, vulnerabilities and adaptation challenges arising at an international level, and national level.

AR5 does not fundamentally change our understanding of how global climate impacts will manifest themselves locally in Tasman; however the Council will undertake a similar exercise to that of 2008 to commission NIWA to produce a Climate Change and Variability report specific to the Tasman District.

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[4] Climate Change Effects and Impacts Assessment A Guidance Manual for Local Government in NZ (MfE, May 2008)

[5] Climate Change and Variability – Tasman District (NIWA, June 2008)

N.10.2. Temperature Change

Table N-9 shows that the mean annual temperatures in Tasman-Nelson are expected to increase in the future.

Table N-9: Projected Mean Temperature Change (Upper and Lower Limits) in Tasman-Nelson (in °C)

	Summer	Autumn	Winter	Spring	Annual
Projected changes 1990-2040	0.2 – 2.2	0.2 – 2.3	0.2 – 2.0	0.1 – 1.8	0.2 – 2.0
Projected changes 1990-2090	0.9 – 5.6	0.6 – 5.1	0.5 – 4.9	0.3 – 4.6	0.6 – 5.0

Source: Climate Change and Variability – Tasman District (NIWA, June 2008)

It is the opinion of NIWA[6] scientists that the actual temperature increase this century is very likely to be more than the 'low' scenario given here. Under the mid-range scenario for 2090, an increase in mean temperature of 2.0°C would represent annual average temperature in coastal Tasman in 2090.

N.10.3. Rainfall Patterns

Table N-10 shows an expected increase in mean annual precipitation in Tasman-Nelson from 1990 to 2090.

Table N-10: Projected Mean Precipitation Change (Upper and Lower Limits) in Tasman-Nelson (in %)

	Summer	Autumn	Winter	Spring	Annual
Projected changes 1990-2040	-14, 27	-2, 19	-4, 9	-8,9	-3,9
Projected changes 1990-2090	-13, 30	-4, 18	-2, 19	-20, 19	-3, 14

Source: Climate Change and Variability – Tasman District (NIWA, June 2008)

N.10.4. Heavy Rainfall

A warmer atmosphere can hold more moisture (about 8% more for every 1°C increase in temperature), so there is an obvious potential for heavier extreme rainfall under climate change.

More recent climate model simulations confirm the likelihood that heavy rainfall events will become more frequent.

N.10.5. Evaporation, Soil Moisture and Drought

From the report, NIWA conclude that there is a risk that the frequency of drought (in terms of low soil moisture conditions) could increase as the century progresses, for the main agriculturally productive parts of Tasman district.

N.10.6. Climate Change and Sea Level

The MfE report provides guidance for local government on coastal hazards and climate change. The report recommends:

For planning and decision timeframes out to the 2090s (2090–2099):

- a base value sea-level rise of 0.5 m relative to the 1980–1999 average should be used, along with
- an assessment of the potential consequences from a range of possible higher sea-level rises (particularly where impacts are likely to have high consequence or where additional future adaptation options are limited). At the very least, all assessments should consider the

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[6] Climate Change and Variability – Tasman District (NIWA, June 2008)

consequences of a mean sea-level rise of at least 0.8 m relative to the 1980–1999 average. Guidance on potential sea-level rise uncertainties and values at the time (2008) is provided within the Guidance Manual to aid this assessment.

For planning and decision timeframes beyond the 2090s where, as a result of the particular decision, future adaptation options will be limited, an allowance for sea-level rise of 10 mm per year beyond 2100 is recommended.

Since the MfE guidance was published in 2008, the NZ Coastal Policy Statement has been updated, requiring identification of areas in the coastal environment that are potentially affected by coastal hazards over at least 100 years, taking into account the effects of climate change (Policy 24).

The two values of sea-level rise to be considered as a minimum number of rises for assessing risk of 0.5 m and 0.8 m by the 2090s in the 2008 MfE guidance are equivalent to rises of 0.7 m and 1.0 m extended out to 2115, which is "at least 100 years" from the present. These projections are for mean sea levels.

In 2013 the Council commissioned NIWA to prepare a report on mean high water springs (MHWS) for Tasman District, and includes a range of sea level rise scenarios[7]. Ongoing sea-level rise will require updates of the MHWS levels and for projecting MHWS levels into the future, whereby the appropriate sea-level rise is simply added to the 'present day' MHWS levels. The report includes worked examples for sea-level rise magnitudes of 0.7 m and 1.0 m, which extend the equivalent tie-point values for the 2090s (0.5 m and 0.8 m) in the Ministry for the Environment (2008) guidance out to 2115 to cover at least a 100-year period.

Subsequently, Tasman District Council was granted an Envirolink medium advice grant (1413-TSDC99)[8] for NIWA to develop defensible coastal inundation elevations and likelihoods as a result of combinations of elevated storm-tide, wave setup and wave run-up, along the "open coast" of the Tasman Bay and Golden Bay coastlines. The study excludes inlets and the west coast of Tasman District. The report includes an interactive 'calculator' which allows council to accommodate various predicted sea level rise scenarios and different beach profiles.

The extent of coastal inundation in Motueka is being modelled at the time of writing this AMP (2014). The model is an extension of the modelling work undertaken on the movement of the Motueka Sandspit and impacts on Jackett Island. The Motueka modelling is expected to show the depth and extent of land affected by sea water inundation.

Mapua and Ruby Bay have also been subject to inundation modelling as a result of TRMP Plan Change 22.

Future urban locations for inundation modelling have yet to be determined.

A wider coastal hazard assessment project for Tasman District commenced in 2014. The project will consider options for risk mitigation and adaptation. The results will be integrated into land use and infrastructure planning.

N.10.7. Potential Impacts on Council's Infrastructure and Services

Table N-3 lists the potential impacts of climate change on the Council's infrastructure and services.

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[7] NIWA Report: Mean High Water Spring (MHWS) levels including sea-level rise scenarios: Envirolink Small Advice Grant (1289-TSDC95), 4 September 2013 (revised 30 April 2014)

[8] NIWA Report: Extreme sea-level elevations from storm-tides and waves: Tasman and Golden Bay coastlines, March 2014.

Table N-3: Local Government Functions and Possible Negative Climate Change Outcomes

Function	Affected Assets of Activities	Key Climate Influences	Possible Effects
Water supply and irrigation	Infrastructure	Reduced rainfall, extreme rainfall events and increased temperature. Sea level rise.	Reduced security of supply (depending on water source). Contamination of water supply. Saltwater intrusion into coastal wells.
Wastewater	Infrastructure	Increased rainfall. Sea level rise.	More intense rainfall (extreme events) will cause more inflow and infiltration into the wastewater network. Wet weather overflow events will increase in frequency and volume. Longer dry spells will increase the likelihood of blockages and related dry weather overflows. Disruption of WWTPs due to coastal inundation or erosion impacts.
Stormwater	Reticulation Stopbanks	Increased rainfall. Sea-level rise.	Increased frequency and/or volume of system flooding. Increased peak flows in streams and related erosion. Groundwater level changes. Saltwater intrusion in coastal zones. Changing flood plains and greater likelihood of damage to properties and infrastructure.
Transportation	Road network and associated infrastructure (power, telecommunications, drainage).	Extreme rainfall events, extreme winds, high temperatures. Sea-level rise.	Disruption due to flooding, landslides, falling trees and lines. Direct effects of wind exposure on heavy vehicles. Melting of tar. Increased coastal erosion or storm induced damage.
Planning/policy development	Management of development in the private sector. Expansion of urban areas. Infrastructure and communications planning.	All.	Inappropriate location of urban expansion areas. Inadequate or inappropriate infrastructure, costly retro-fitting of systems.

Function	Affected Assets of Activities	Key Climate Influences	Possible Effects
Land management	Rural land management.	Changes in rainfall, wind and temperature.	Enhanced erosion, Changes in type/distribution of pest species. Increased fire risk. Reduction in water availability for irrigation. Changes in appropriate land use. Changes in evapotranspiration.
Water management	Management of watercourses/lakes/ wetlands	Changes in rainfall and temperature.	More variation in water volumes possible. Reduced water quality. Sedimentation and weed growth. Changes in type/distribution of pest species.
Coastal management	Infrastructure. Management of coastal development.	Temperature changes leading to sea-level changes. Extreme storm events.	Coastal erosion and flooding. Disruption in roading, communications. Loss of private property and community assets. Effects on water quality.
Civil defence and emergency management.	Emergency planning and response, and recovery operations.	Extreme events.	Greater risks to public safety, and resources needed to manage flood, rural fire, landslip and storm events.
Biosecurity	Pest management.	Temperature and rainfall changes.	Changes in the range and density of pest species
Open space and community facilities management	Planning and management of parks, playing fields and urban open spaces.	Temperature and rainfall changes. Extreme wind and rainfall events.	Changes/reduction in water availability. Changes in biodiversity. Changes in type/distribution of pest species. Groundwater changes. Saltwater intrusion in coastal zones. Need for more shelter in urban spaces.
Public Transport	Management of public transport. Provision of footpaths, cycleways etc.	Changes in temperatures, wind and rainfall.	Changed maintenance needs for public transport infrastructure. Disruption due to extreme events.
Waste	Transfer stations and	Changes in rainfall	Increased surface flooding

Function	Affected Assets of Activities	Key Climate Influences	Possible Effects
management	landfills	and temperature.	risk. Biosecurity changes. Changes in ground water level and leaching.
Water supply and irrigation	Infrastructure	Reduced rainfall, extreme rainfall events and increased temperature.	Reduced security of supply (depending on water source). Contamination of water supply.

Source: Climate Change Effects and Impacts Assessment (MfE, May 2008)

The Council has incorporated the potential impacts of climate change in the 2008 update of the Engineering Standards and Policies.

APPENDIX O THE SUPPLY OF WATER FOR FIREFIGHTING PURPOSES

O.1 Fire-Fighting Levels of Service

In urban schemes, the water supply system is designed to meet FW2 Standard from the NZ Fire Service Fire Fighting Water Supplies Code of Practice 2003 (SNZ 4509:2008). In highly commercial, central business district areas, a FW3 standard will be provided at the discretion of the Council. The Council considers it the responsibility of building owners to provide their own systems if their building requires a higher fire fighting standard to be met.

Table O-1: The Supply of Water for Fire Fighting Purposes

Standard	Reticulated Flow (l/s)	Max no. hydrants from which the required flow is to be obtained within a 270m radius	Max. spacing of fire hydrants	Reserve storage capacity or alternative supply in water supply scheme
FW2	25	2	135 m	0.5 hour as 25l/s 45,000 litres
FW3	50	3	135 m	1 hour at 50l/s 180,000 litres

No fire fighting capability is provided from rural water supply systems.

In the areas of Motueka that are not reticulated, there are several fire wells provided for fire fighting purposes. The Council does not guarantee that these will meet the requirements of the Code.

O.2 The Degree to which Fire Hydrants Presently Meet the Requirements of the Fire Service Standards

System modelling had been carried out in Richmond/Waimea in 2011. Generally the water supply systems modelled meet the standard for fire fighting requirements but with a few exceptions.

- *Richmond* – Lower Queen Street, Appleby Highway, Gilbert Street, Hill Plough Heights and Cropp Place These issues should be resolved in the future with pipeline upgrades.

The commercial town centre of Richmond was analysed for class FW4 (50l/s for 90 minutes), where two hydrants achieved the necessary flows and pressures.

A new FW3 standard fire fighting reticulation was installed in Takaka CBD in 2011.

System modelling had been carried out in Mapua/Ruby Bay, Wakefield and Brightwater in 2007. This model was analysed against the NZ Fire Service Fire Fighting Water Supplies Code of Practice 2003 W3 (25l/s for 30mins) standard, where the water supply systems modelled generally met this standard, but with a few exceptions.

- *Wakefield* - Clifford Road, Martin Avenue and the Whitby Road areas.
- *Brightwater* - Main Road Hope from Aniseed Valley Road to Bateup Road.
- *Mapua/Ruby Bay* - Brabant Drive area of Ruby Bay.

Within the same study the Waimea system was examined to determine fire fighting capacity for commercial W4 (50l/s for 60 minutes) fire risk classes. The Waimea industrial area has a very high capacity due to the 450mm principal main and performs well under fire fighting stresses. 150l/s class W6 compliance is achieved along Nayland Road with a residual pressure of 15m and adjacent to Nelson Pine Industries Ltd factory on Queen Street the simulated residual pressure is 55m.

Other urban water supply systems with known fire fighting deficiencies against the 2003 W3 standard include.

- Upper Takaka’s fire fighting capability does not meet the W3 standard;
- in Collingwood the south end of Beach Road and high area around Swiftsure Street do not meet the W3 standard;
- in Motueka the areas covered by fire wells do not meet the W3 standard. New development within Motueka will progressively address deficiencies in the current fire fighting system. However, full compliance with the fire code within the urban supply area is not anticipated for many years.

O.3 Monitoring of Fire Fighting Supplies and Future Intentions for the Service

The following work will be undertaken to check compliance against 2008 code:

- an audit of fire hydrants throughout the district;
- the fire wells in Motueka to be tested annually;
- hydraulic modelling will be undertaken for a number of urban water supply systems. The fire flows will be assessed as part of this exercise to check against NZ Fire Service Fire Fighting Water Supplies Code of Practice 2008 FW3 Standard. The current hydraulic models will be maintained and recalibrated on a regular basis.

APPENDIX P POTENTIAL SIGNIFICANT EFFECTS

P.1 Potential Significant Negative Effects

Schedule 10 of the Local Government Act (LGA) requires an outline of any significant negative effects that an activity may have on the social, economic, environmental, or cultural well-being. Potential negative effects associated with the Water Activity are outlined in Table P-1.

Table P-1: Potential Significant Negative Effects

Effect	Description	Mitigation Measure
Construction of Future Schemes	**Social** - Installation of water schemes do cause a disruption to the local community. The works can impact on traffic flow, and cause noise, dust and visual impacts. Shutdowns may result in residence not receiving water during the day. **Economic** - This may result in customers avoiding the works and therefore nearby business may suffer. Shutdowns may result in businesses not receiving water during the day. **Environmental** - Construction of water contracts typically creates noise, dust and mud. The TRMP and specific resource consents must be followed. Projects can involve acts such as de-watering, which requires the water to be discharged. Potential risk to the environment.	Public consultation. Notifying the public of the works through various forms of the media. Standard construction controls cover time of operation, noise and dust mitigation. In some cases visual impacts are mitigated.
Water Restrictions	**Social** - Typically effects people who use the water for washing cars or watering the garden. This can frustrate the local community. **Economic -** This can have a larger impact on businesses that rely on using water for irrigation. This can cause a negative effect on these businesses.	The Council is supporting the Waimea Community Dam project and has made allowances in the AMP for new water sources. The Council has made allowances for improving demand management which will assist with making water usage more sustainable.
Spillage of Chemicals Stored at Water Treatment Plants	**Social -** The rate payer expects the council to handling all chemicals in the correct manner. **Economic -** Businesses which rely on nearby watercourses may not be able to operate until the chemical spill is resolved**.** **Environmental** - Tasman region is an environmentally sensitive area, any chemical spill will have a notable effect on the environment.	Appropriately trained staff and contractors. All chemicals are stored in the correct manner.
Water	Water is abstracted from surface water	The Council introduces water rationing

Effect	Description	Mitigation Measure
Abstraction	and groundwater sources. **Social** - The removal of water from the natural environment results in the water being unavailable for other uses such as irrigation or recreational. **Economic**. The removal of water from the natural environment results in the water being unavailable for other uses such as irrigation or recreational. **Environmental.** The removal may add strain on a river system which is already very low and can significantly impact the ecology.	during times of drought. Demand Management will assist with reducing the volume of water abstracted from the water source. Investigating new water sources and educating the public on water usage. Resource consents are in place, so Council cannot exceed a certain limit.
Historic and Wahi Tapu Sites	**Cultural –** Construction of water supply assets can potentially affect historic and wahi tapu sites.	The Council undertakes consultation with stakeholders prior to undertaking works. Council also maintains a record of known heritage sites.

Significant positive effects are described in terms of how this activity contributes to the Community Outcomes, and are outlined in Table P-2.

Table P-2: Potential Significant Positive Effects

Effect	Description
Economic Development	Provision and maintenance of water supplies allows for the development of commercial businesses, industry and residential use, therefore, contributing to economic growth and prosperity in the district. The Council's management of the water supply activities uses best practice and competitive tendering to provide value for money for ratepayers and provides jobs for contractors.
Public Health	Safe drinking water supplies provide critical public health benefits related to sustenance and sanitation.
Safety and Personal Security	The majority of the Council's urban water supply network is built to accommodate fire fighting requirements and supports protection of life and property.

APPENDIX Q SIGNIFICANT ASSUMPTIONS, UNCERTAINTIES AND RISK MANAGEMENT

Q.1 Assumptions and Uncertainties

This AMP and the financial forecasts within it have been developed from information that has varying degrees of completeness and accuracy. In order to make decisions in the face of these uncertainties, assumptions have to be made. This section documents the uncertainties and assumptions that Council consider could have a significant effect on the financial forecasts, and discusses the potential risks that this creates.

Q.1.1. Financial Assumptions

The following assumptions have been made:

- all expenditure is stated in dollar values as at 1 July 2014, with no allowance made for inflation;
- all costs and financial projections are GST exclusive.

Q.1.2. Asset Data Knowledge

While the Council has asset registers and many digital systems, processes and records, it does not have complete knowledge of the assets it owns. To varying degrees, the Council has incomplete knowledge of asset location, asset condition, remaining useful life and asset capacities. This requires assumptions to be made on the total value of the assets owned, the time at which assets will need to be replaced and when new assets will need to be constructed to provide better service.

The Council considers these assumptions and uncertainties constitute only a small risk to the financial forecasts because:

- significant amounts of asset data is known;
- asset performance is well known from experience;
- there are plans to upgrade significant extents of poorly performing assets.

The following assumptions that have been made are considered significant:

- the majority of the pipework in the urban water supplies is in satisfactory condition. The only known exceptions to this are:
  - the AC pipe in Richmond - this is being progressively replaced over time;
  - the polyethylene laterals in Richmond, Wakefield and Murchison – these are being progressively replaced over time;
  - class B watermains within Motueka are programmed to be replaced.
- the pipework in the rural water supplies has some condition problems, however, it is considered that the cost/benefit of large scale asset replacement is such that is better not to replace. Council has in place plans and measures to identify and replace the worst performing areas and replace pipes as considered affordable.

Q.1.3. Growth Forecasts

Growth forecasts are inherently uncertain and involve many assumptions. The growth forecasts also have a very strong influence on the financial forecasts, especially in the Tasman district where population growth is higher than the national average. The growth forecasts underpin and drive:

- the asset creation programme;
- the Council's income forecasts including rates and development contributions;
- funding strategies.

The significant assumptions in the growth forecasts are covered in the explanation on method and assumptions in Appendix F: Demand and Future New Capital Requirements.

Q.1.4. Timing of Capital Projects

The timing of many capital projects can be well defined and accurately forecast because there are few limitations on the implementation other than the community approval through the LTP/Annual Plan processes. However, the timing of some projects is highly dependent on some factors which are beyond the Council's ability to fully control. These include factors like:

- obtaining resource consent, especially where community input is necessary;
- obtaining community support;
- obtaining a subsidy from central government;
- securing land purchase and / or land entry agreements;
- the timing of larger private developments;
- the rate of population growth.

Where these issues may be a factor, allowances have been made to complete the projects in a reasonable timeframe. However these plans may not always be achieved and projects may be deferred as a consequence.

Q.1.5. Funding of Capital Projects

Funding of capital projects is crucial to a successful project. When forecasting projects that will not occur for a number of years, a number of assumptions have to be made about how the scheme will be funded.

Funding assumptions are made about:

- whether projects will qualify for subsidies;
- whether major beneficiaries of the work (for example a 'wet' factory that gets a connection) will contribute to the scheme, and if so, how much will they pay;
- whether the scheme has compulsory connections or voluntary connections;
- whether and how much should be funded from development contributions;
- whether the Council will subsidise the development of the schemes.

The correctness of these assumptions has major consequences on the affordability especially of new schemes. The Council has considered each new scheme proposal individually (Pohara, Marahau) and concluded for each a funding model. The funding strategy will form one part of the consultation process as these schemes are advanced toward construction.

Q.1.6. Accuracy of Capital Project Cost Estimates

The financial forecasts contain many projects, each of which has been estimated from the best available knowledge. The level of uncertainty inherent in each project is different depending on how much work has been done in defining the problem and determining a solution. In many cases, only a rough order cost estimate is possible because little or no preliminary investigation has been carried out. It is not feasible to have all projects in the next 30 years advanced to a high level of estimate accuracy. However, it is general practice across the Engineering Services AMPs for all projects within the first three years and projects over $500,000 within the first 10 years advanced to a level that provides reasonable confidence about the accuracy of the estimate.

To get consistency and formality in cost estimating, the following has practices have been followed.

- applying financial assumptions listed in Q.1.1;
- a project estimating template has been developed that provides a consistent means of preparing estimates;
- where practical, a common set of rates has been determined;
- specific lines have been included to deal with non-construction costs like contract preliminary and general costs, engineering costs, Council staff costs, resource consenting costs and land acquisition costs;
- specific provision has been included to deal with construction contingency, project complexity and estimate accuracy and these are described next;
- where capital items from the 2012 AMP have been retained, the estimates have not been revised in detail. Capital costs for the works have been increased by 8.5%;
- where renewal costs have been included from Confirm, a 5.5% inflation factor has been applied to align equivalent values since the revaluation.

A 10% construction contingency provision has been included to get a “Base Project Estimate” to reflect the uncertainties in the unit rates used. A further provision has been added to reflect the uncertainties in the scope of the project – ie, is the adopted solution the right solution? Often detailed investigation will reveal the need for additional works over and above that initially expected. The amount added depends on the amount of work already done on the project. Each project has been assessed as being at the project lifecycle stage as detailed in Table Q-1 below, and from this an estimated accuracy assessed. The estimate accuracy is added to the Base Project Estimate to get the Total Project Estimate – the figure that is carried forward into the financial forecasts. Project complexity ratings of “simple”, “normal” or “complex” lead to different cost estimate multipliers of 0.8, 1.0 and 1.3 respectively.

Table Q-2 below shows the complexity ratings assigned for large projects. In the 2015-2025 AMP preparation cycle contingencies were reduced to allow for the reduced risk of full cost overruns on a programme-wide basis. Individual projects are now more likely to go over budget and Council has specifically accepted this risk.

Table Q-1: Life Cycle Estimate Accuracies

Stage in Project Lifecycle	Estimate Accuracy
Concept / Feasibility	± 20%
Preliminary Design / Investigation	± 10%
Detailed Design	± 5%

Table Q-2 details significant uncertainties and stage for major projects in the next three years of this AMP.

Table Q-2: Major Projects (>$500K) in the First Three Years of this AMP

ID	Project	Project Stage	Uninflated year 1-3 Project Value	Factors that could affect Estimate Accuracy
150023	Collingwood WTP Upgrade.	Preliminary Design	$606,000	DWSNZ: compliance, equipment cost fluctuations.
150051	Kaiteriteri Treatment Upgrade.	Preliminary Design	$855,608	DWSNZ: compliance, equipment cost fluctuations.
150115	Fauchelle Avenue, Darcy St and Florence Ave main replacement.	Preliminary Design	$1,032,052	Underground service location and depth.
150129	Queen Street renewal.	Preliminary Design	$1,837,285	Underground service location and depth.
150184	New Source treatment plant construction Wakefield.	Preliminary Design	$4,000,000	Ground conditions, consenting requirements, land purchase negotiations.
150195	Richmond meter renewals.	Works commenced	$2,096,250	Tender market cycle.
150196	Motueka meter renewals.	Reader for tender	$552,500	Tender market cycle.
150231	Relocate Fearons Bush WTP to Parkers Street WTP.	Preliminary Design	$656,875	DWSNZ: compliance, equipment cost fluctuations, ground conditions.

Q.1.7. Land Purchase and Access

The Council has made the assumption that it will be able to purchase land required to complete projects. The risk of delays to project timing is high due to possible delays in land purchase. The Council works to mitigate this issue by undertaking consultation with landowners sufficiently in advance of the construction phase of a project. The consequence of not securing land for projects may require redesign which can have a moderate cost implication. If delays do occur, it may influence the level of service the Council can provide.

Q.1.8. Future Changes in Legislation and Policy

The legal and planning framework under which local government operates frequently changes. This can significantly affect the feasibility of projects, how they are designed, constructed and funded. The Council has assumed that there will be no major changes in legislation or policy. The risk of significant changes remains high owing to the nature of government policy formulation. If major changes occur it will impact on required expenditure and the Council has not provided mitigation for this effect.

Q.1.9. Resource Consents

The need to secure and comply with resource consents can materially affect asset activities and the delivery of capital projects.

Complying with resource consent conditions can affect the cost and time required to perform an activity, and in some instances determine whether or not the activity can continue. Council has assumed that there will be no material change in operations due to consenting requirements over the period of the AMP.

There may be some risk of change in the following areas of the activity:

- renewal of abstraction consents for water in the Waimea Basin as a result of TRMP change 45-48.,

Securing resource consent is often a significant task in the successful delivery of a capital project or in the management of a particular facility. Consent applications may consume significant time and resources, particularly in the instance of a publically notified application or where a decision is subject to appeal.

The Council has assumed that there will be no material change in the need to secure consents for activities and that consent costs for future projects will be broadly in line with the cost of consents in the past.

Q.1.10. Resource Consent Monitoring

The assumption has been made that the costs identified in this AMP for the monitoring of resource consents is sufficient. Until CMPs have been developed and resource consents applied for, the conditions requiring monitoring are unknown. Once this information is understood, Council may need to allocate additional costs for monitoring compliance against consent conditions.

Q.1.11. Disaster Fund Reserves

That the level of funding held in the Council's disaster fund reserves and available from insurance cover will be adequate to cover reinstatement following emergency events. The risk of inadequate reserves and recovery from insurance claims would mean deferral of future capital projects to provide any financial shortfall required to cover reinstatement costs.

Q.1.12. Network Capacity

The Council has a growing knowledge and understanding of network capacity, however, the knowledge is not complete. The Council has updated the model for Richmond, and is working towards updates for Motueka, Mapua and Brightwater during the first three years of this AMP

System capacity upgrades have been planned where shortfalls are known or where growth is expected, however, the models will provide new information that may create a need for new projects and/or re-prioritisation of existing projects. If the network capacity is lower than assumed, The Council may be required to advance capital works projects to address this issue. The risk of this occurring is low; however the impact on expenditure could be large. If the network capacity is greater than assumed, the Council may be able to defer works. The risk of this occurring is low and is likely to have little impacts.

Q.1.13. Water Source Quantity and Quality

The Council plans to find and develop a water source of sufficient quality and quantity to meet the needs of Wakefield. If the proposed water sources do not have sufficient water to cope with the projected demand, the Council will need to investigate new source locations, this could have an effect on the timing and cost of the jobs. If the water quality is poor, ie, high nitrate levels, then the cost of treatment may increase.

Q.1.14. Changes in the Fire Fighting Standards

The NZ Fire Service Fire Fighting Water Supplies Code of Practice 2003 was updated in 2008. Modelling had been undertaken in various water supplies in 2007 to confirm whether the networks met the 2003 fire fighting standard. Since the introduction of the 2008 standard, only Richmond has been modelled to check compliance with this standard. An allowance has been made in this AMP to confirm whether the rest of the urban water supplies meet the standard. In the event new areas do not, additional projects may need to be introduced to meet the standard.

Q.1.15. Motueka Water Supply Subsidy

The Council will not pursue the proposed Motueka water supply until a central government subsidy is available. Hence the full reticulation project has been deferred until 2043/44 in this AMP. Future AMPs will review the potential for central government contributions and may advance the project.

Q.1.16. Waimea Community Dam

The Council assumes that the Waimea Community Dam will proceed and the Council will be able to increase its water allocations on the Waimea Plains, including the allocation for water supply purposes. If the Waimea Community Dam does not proceed, the Council's current allocations may be reduced and the Council would need to find alternative water sources. Appendix AA discusses alternative solutions.

Q.2 Risk Management

Q.2.1. Why Do We Do Risk Management

Risk management is the systematic process of identifying, analysing, evaluating, treating and monitoring risk events so that they are mitigated as far as possible, refer to Figure Q-1.

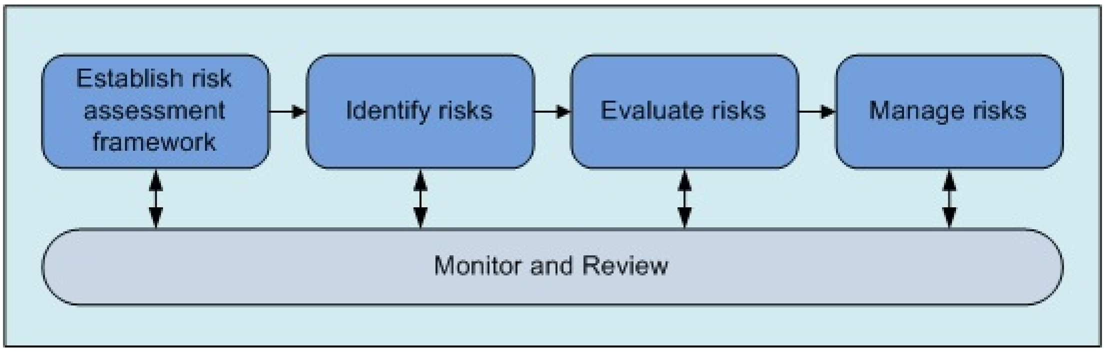


Figure Q-1: Risk Management Process

Risk management involves assessing each risk event and identifying an appropriate treatment. Treatments are identified to try and manage or reduce the risk. There are some risk events for which it is near impossible or not feasible to reduce the likelihood of the event occurring, or to mitigate the effects of the risk event if it occurs eg, extreme natural hazards. In this situation the most appropriate response may be to accept the risk as is, or prepare response plans and consider system resilience.

Well managed risks can help reduce:

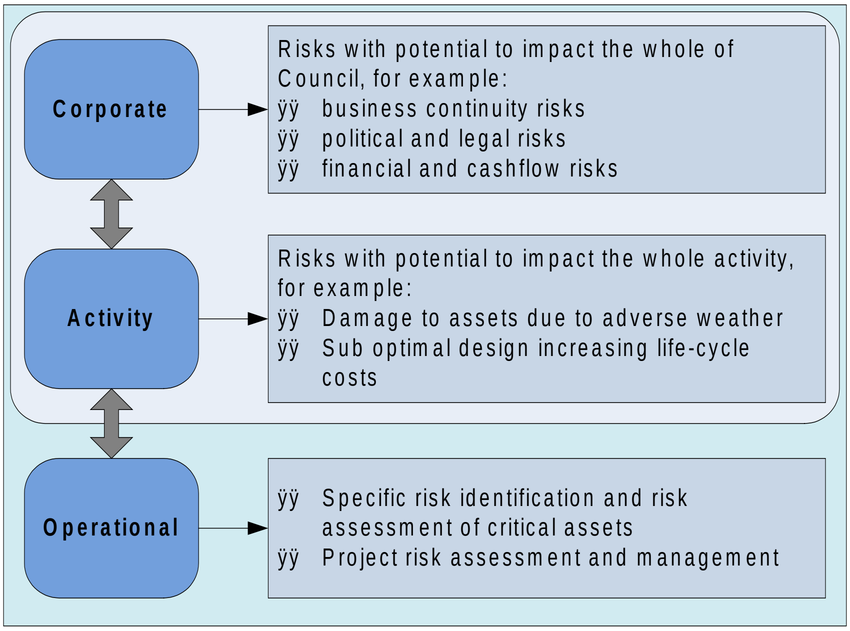
- disruption to infrastructure assets and services;
- financial loss;
- damage to the environment;
- injury and harm;
- legal obligation failures.

Q.2.2. Our Approach to Risk Management

Q.2.2.1 Risk Assessment Framework

The Council's risk assessment framework was developed in 2011 to be consistent with *AS/NZS IS 4360:2004 Risk Management.* It assesses risk exposure by considering the consequence and likelihood of each risk event. Risk exposure is managed at three levels within the Council organisation, refer to Figure Q-2:

- Level 1 – Corporate Risks
- Level 2 – Activity Risks
- Level 3 – Operational Risks.



Risks with potential to impact the whole of Council, for example:

ÿÿ business continuity risks
ÿÿ political and legal risks
ÿÿ financial and cashflow risks

Risks with potential to impact the whole activity, for example:

ÿÿ Damage to assets due to adverse weather
ÿÿ Sub optimal design increasing life-cycle costs

ÿÿ Specific risk identification and risk assessment of critical assets
ÿÿ Project risk assessment and management

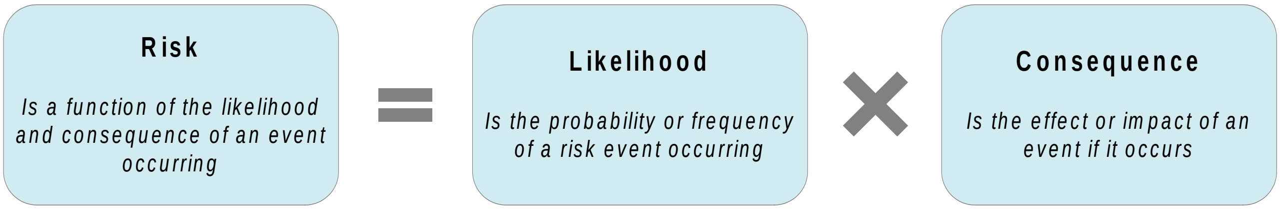
Figure Q-2: Levels of Risk Assessment

The risk assessment framework discussed in Section Q.2.2.1 and Q.2.2.2 is applied to Corporate and Activity specific risks. There are some risk events which could be interpreted as either Corporate or Activity level risks. For example, a risk event may have the potential to impact the Council organisation as a whole or many parts of the organisation if it was to occur. In the first instance this type of risk would be classified as a Corporate risk. There is however a secondary consideration that needs to be given, that is, "is the risk best managed in different ways within the separate activities?" For example, a large seismic event will likely impact the Council organisation as a whole, however each activity will prepare for and manage these risks differently; eg, water reservoirs may be strengthen to minimise the risk of collapse, or corporate services may prepare a business continuity plan.

The Council is yet to implement consistent risk management processes at the Operational risk level. Development of the critical asset framework is discussed in Section Q.2.5. The Council plans to develop a framework for assessing maintenance and project risks in 2015.

Q.2.2.2 Risk Identification and Evaluation

The risk management framework requires the activity management team to identify activity risks and to then assess the risk, likelihood and consequence for each individual event. The definitions of risk, likelihood and consequence are defined Figure Q-3.



Risk

Is a function of the likelihood and consequence of an event occurring

=

Likelihood

Is the probability or frequency of a risk event occurring

×

Consequence

Is the effect or impact of an event if it occurs

Figure Q-3: Risk Assessment Definitions

The Council has developed objective based scales to assist asset managers when determining the likelihood and consequence scores for all risk events. The consequence of each risk event is assessed on a scale of 1to 100 for all of the consequence categories listed in Table Q-3 and the respective consequence rating score (Table Q-4) is selected. The detailed categories used to assess the consequence rating of the risk event against the risk is attached in Table Q-10.

Table Q-3: Risk Consequence Categories

Category		Sub Category	Description
Consequence Categories	Service Delivery	N/A	Asset's compliance with Performance Measures and value in relation to outcomes and resource usage.
	Social / Cultural	Health and Safety	Impact as it relates to death, injury, illness, life expectancy and health.
		Community Safety and Security	Impact on perceived safety and reported levels of crime.
		Community / Social / Cultural	Damage and disruption to community services and structures, and effect on social quality of life and cultural relationships.
		Compliance / Governance	Effect on the Council's governance and statutory compliance.
		Reputation / Perception of Council	Public perception of the Council and media coverage in relation to the Council.
	Environment	Natural Environment	Effect on the physical and ecological environment, open space and productive land.
		Built Environment	Effect on amenity, character, heritage, cultural, and economic aspects of the built environment.
	Economic	Direct Cost	Cost to the Council.
		Indirect Cost	Cost to the wider community.

Table Q-4: Consequence Ratings

Consequence Rating					
Description	Extreme	Major	Medium	Minor	Negligible
Rating	100	70	40	10	1

Table Q-5 provides a summary of the likelihood assessment criteria.

Table Q-5: Likelihood Ratings

Likelihood Rating			
Description	**Frequency**	**Criteria**	**Rating**
Almost certain	Greater than every 2 years	The threat can be expected to occur **or** A very poor state of knowledge has been established on the threat	5
Likely	Once per 2-5 years	The threat will quite commonly occur **or** A poor state of knowledge has been established on the threat	4
Possible	Once per 5-10 years	The threat may occur occasionally **or** A moderate state of knowledge has been established on the threat	3
Unlikely	Once per 10-50 years	The threat could infrequently occur **or** A good state of knowledge has been established on the threat	2
Very Unlikely	Less than once per 50 years	The threat may occur in exceptional circumstances **or** A very good state of knowledge has been established on the threat	1

Using the existing risk management framework summarised in Table Q-6, the risk score is calculated by multiplying the likelihood of the risk event with the highest rated individual consequence category for that risk event to generate a risk score, as shown in Figure Q-4.

Table Q-6: Risk Scores

Risk Scoring Matrix		Consequence				
		Negligible	Minor	Medium	Major	Extreme
Likelihood	Almost Certain	5	50	200	350	500
	Likely	4	40	160	280	400
	Possible	3	30	120	210	300
	Unlikely	2	20	80	140	200
	Very Unlikely	1	10	40	70	100

Risk Score
Extreme
Very High
High
Moderate
Low
Negligible

An example of how the risk score is calculated is below.

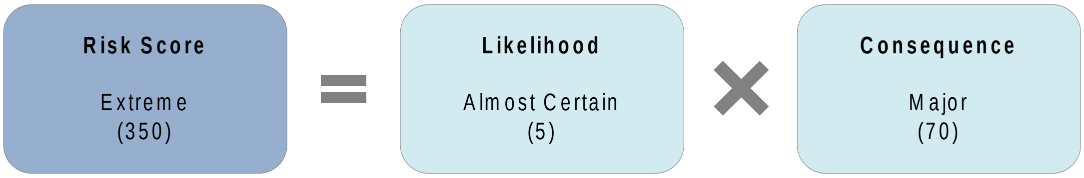


Figure Q-4: Risk Score Calculation

Risk scores are generated for inherent risk, current risk and target risk.

Inherent risk is the raw risk score without taking into consideration any current or future controls.

Current risk the level of risk to the Council after considering the effect of existing risk management controls.

Target risk is the level of risk the Council expects and wants to achieve after applying the proposed risk management controls.

In some cases it is not feasible to reduce the inherent risk and in this case the Council would accept the inherent risk level as the current and target risk levels.

Q.2.2.3 Limitations

The processes outlined above forms a conservative approach to evaluating risk and could been seen as representing the worst case scenario. It also provides limited ability to differentiate the priority of risks due to the potential to score highly in at least one of the consequence categories; this tends to create a smaller range of results. For example two events with a likelihood of “Almost Certain (5)” have been compared below:

- **Event A** – scores “Major (70)” for one consequence category and “Negligible (1)” in all the remaining consequence categories, this will generate an inherent risk score of “Extreme (350)”.
- **Event B** – scores “Medium (40)” in all 10 consequence categories, this will generate an inherent risk score of “Very High (200)”.
- **Event C** – scores “Major (70)” in all 10 consequence categories, this will generate an inherent risk score of “Extreme (350)”.

These examples show that there are limitations for the Council when prioritising risk events, especially those that may have a wider impact on the activity eg, Event B or C. Consequently, the Council acknowledges that there are some downfalls in its existing framework and it has proposed to undertake a full review of its risk management framework during 2015.

Q.2.3. Corporate Risk Mitigation Measures

Q.2.3.1 Asset Insurance

Tasman District Council has various mechanisms to insure assets against damage. These include:

- Tasman District Council insures its above ground assets, like buildings, through private insurance which is arranged as a shared service with Nelson City and Marlborough District Councils.
- Tasman District Council is a member of the Local Authority Protection Programme (LAPP) which is a mutual pool created by local authorities to cater for the replacement of some types of infrastructure assets following catastrophic damage by natural disasters like earthquake, storms, floods, cyclones, tornados, volcanic eruption and tsunami. These infrastructure assets are largely stopbanks along rivers and underground assets like water and wastewater pipes and stormwater drainage.
- Taman District Council has a Classified Rivers Protection Fund, which is a form of self-insurance. The fund is used to pay the excess on the LAPP insurance, when an event occurs that affects rivers and stopbank assets.
- Tasman District Council has a General Disaster Fund, which is also a form of self-insurance. Some assets, like roads and bridges, are very difficult to obtain insurance for or it is prohibitively expensive if it can be obtained. For these reasons Council has a fund that it can tap into when events occur which damage Council assets that are not covered by other forms of insurance. Some of the cost of damage to these assets is covered by central government, for example the New Zealand Transport Agency covers around half the cost of damage to local roads and bridges (as set out in the co-investment rate/financial assistance rate).
- Refer to the Council’s Financial Strategy for insurance disclosures as required under Section 31 of the Local Government Act.

Q.2.3.2 Civil Defence Emergency Management

The Civil Defence Emergency Management Act 2002 was developed to ensure that the community is in the best possible position to prepare for, deal with, and recover from local, regional and national emergencies. The Act requires that a risk management approach be taken when dealing with hazards including natural hazards. In identifying and analyzing these risks the Act dictates that consideration is given to both the likelihood of the event occurring and its consequences. The Act sets out the responsibilities for Local Authorities. These are:

- ensure you are able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency;
- plan and provide for civil defence emergency management within your own district.

Tasman District Council and Nelson City Council jointly deliver civil defence as the Nelson Tasman Civil Defence Emergency Management (CDEM) Group. The vision of the CDEM Group is to build “A resilient Nelson Tasman community”.

Civil Defence services are provided by the Nelson Tasman Emergency Management Office. Other council staff are also heavily involved in preparing for and responding to civil defence events. For example, Council monitors river flows and rainfall, and has a major role in alleviating the effects of flooding.

The Nelson Tasman Civil Defence Emergency Management Group developed a Regional Plan in 2012. The Plan sets out how Civil Defence is organised in the region and describes how the region prepares for, responds to and recovers from emergency events. A review is scheduled for 2016/2017.

Q.2.3.3 Engineering Lifelines

The Nelson Tasman Engineering Lifelines (NTEL) project commenced in 2002. The NTEL Group formed in 2003. Its report *Limiting the Impact* was reviewed in 2009. The purpose of the report was:

- to help the Nelson Tasman region reduce its infrastructure vulnerability and improve resilience through working collaboratively;
- to assist Lifeline Utilities with their risk reduction programmes and in their preparedness for response and recovery;
- to provide a mechanism for information flow during and after an emergency event.

The NTEL Group is in the process of applying for funding to hold a further review to begin in 2015.

The project was supported and funded by the two controlling authorities, Nelson City Council and Tasman District Council. Following the initial start-up forum in 2002, a Project Steering Group was formed and initial project work was completed. The initial work to investigate risks and assess vulnerabilities from natural hazard disaster events was divided amongst five task groups:

- Hazards Task Group;
- Civil Task Group;
- Communications Task Group;
- Energy Task Group;
- Transportation Task Group.

These groups were then tasked with assessing the risk and vulnerability of segments of their own networks against the impacts of major natural hazard disaster events. These natural hazards included:

- earthquake
- landslide
- coastal / flooding.

The Nelson Tasman region is geotechnically complex with high probabilities of earthquake, river flooding and landslides. By identifying impacts that these hazards may have on the local communities, the NTEL Group aim to have processes in place to allow the community to return to normal functionality as quickly as possible after a major natural disaster event.

To date the project has identified the impacts of natural hazards and the critical lifelines of the regions service networks including communication, transportation, power and fuel supply, water, sewerage, and stormwater networks. The initial NTEL assessment work is the first stage of an on-going process to gain a more comprehensive understanding of the impacts of natural hazards in the Nelson Tasman region.

The review date of the NTEL assessments is 2015.

Q.2.3.4 Recovery Plans

These plans are designed to come into effect in the aftermath of an event causing widespread damage and guide the restoration of full service.

The Recovery Plan for the Nelson Tasman Civil Defence and Emergency Management Group (June 2008) identifies recovery principles and key tasks, defines recovery organisation, specifies the role of the Recovery Manager, and outlines specific resources and how funds are to be managed.

Information about welfare provision in the Nelson-Tasman region is contained in a Welfare Plan (December 2005), which gives an overview of how welfare will be delivered during the response and recovery phases of an emergency.

The plan is a coordinated approach to welfare services for both people and animals in the Nelson Tasman region following an emergency event.

Q.2.3.5 Business Continuance

The Council has a number of processes and procedures in place to ensure minimum impact to transportation services in the event of a major emergency or natural hazard event.

The Council has limited business continuity plans that were developed around influenza pandemic planning in 2014.

The Council's contractors have up-to-date Health and Safety Plans in place.

Q.2.4. Water Risks

In order to identify the key activity risks the asset management team have applied a secondary filter to the outcomes of the risk management framework. This is necessary to overcome the limitations of the framework. To apply this secondary filter the asset management team have used their network knowledge and engineering judgement to identify the key activity risks. The key risks relevant to the water activity are summarised in Table Q-7.

Table Q-7: Key Risks

Risk Event	Mitigation Measures
Catastrophic failure of a network structure	**Current** · routine maintenance and inspections are included in the network maintenance contracts. · reactive inspection following extreme weather events. **Proposed** · additional seismic strengthening of reservoirs
Premature deterioration or obsolescence of an asset	**Current** · maintenance performance measures included in the network maintenance contracts. · routine inspections. **Proposed** · increased assessment and progressive renewal of lower quality pipe materials
Sub-optimal design and/or construction practices or materials	**Current** · Engineering Standards and Policies document and construction inspections · contract quality plans. · professional services and construction contract specifications. · third party reviews. **Proposed** · ongoing staff training.
Ineffective stakeholder	**Current** · the Council holds regular meetings with iwi.

Risk Event	Mitigation Measures
engagement eg, iwi, Heritage New Zealand, community groups	- the Council's GIS software includes layers identifying cultural heritage sites and precincts. Council staff apply for Heritage New Zealand when these known sites are at risk of damage or destruction. - project management processes and the Council's consultation guidelines are followed.
Failure to gain property access	**Current** - stakeholder management. - works and entry agreements. - use of the Council's property team to undertake land purchase negotiations. - Public Works Act.

An asset management improvement item included in Appendix V is to review all inherent, current and target risk scores following the adoption of the amended framework.

Q.2.4.1 Other Risks Mitigation Measures

General risk mitigation is fostered by continual staff and system development to progressively improve the "what" and "how" we are undertaking the activity.

Q.2.5. Critical Assets

A revised critical asset framework was developed in 2014. The framework has been applied to the Confirm dataset so all water assets have an initial rating. It is planned to review and refine the ratings in 2015. Figure Q-5 represents the process used by the activity planning team to assess assets for criticality.

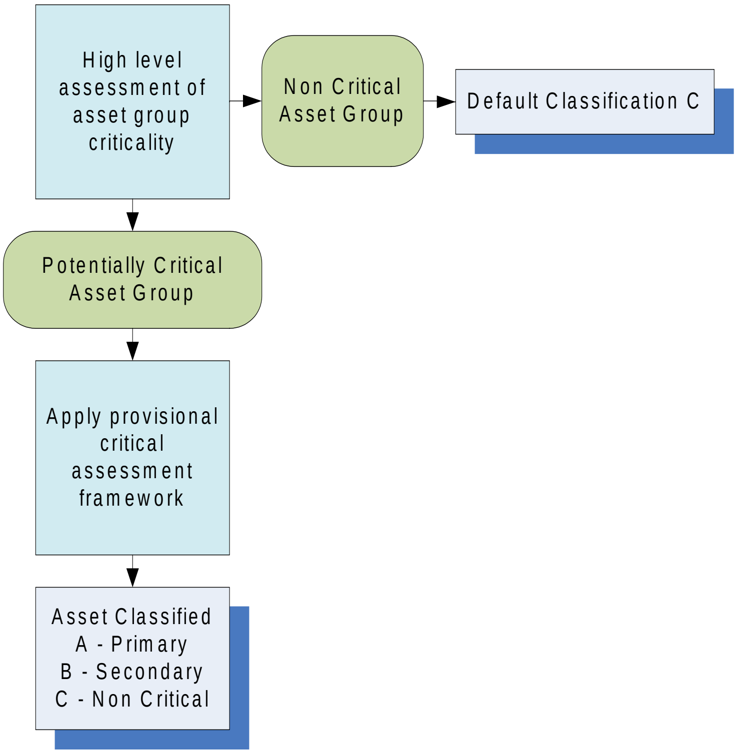


Figure Q-5: Critical Asset Assessment Process

A high level assessment was first undertaken to determine if some asset groups as a whole could be considered either critical or non-critical. This initial assessment determined that bridges, retaining structures and drainage asset groups were critical.

The following asset groups were considered non-critical:

- small diameter pipes;
- small valves and meters; and
- other assets serving a small number of low volume clients.

The key inputs into the framework and critical asset decision making process are:

- Nelson Tasman Engineering Lifelines report;
- the Council's traffic count data;
- water critical assets;
- utilities engineer's knowledge and experience.

Q.2.5.1 Critical Asset Assessment

Criticality assessments will be completed using the framework set out in Table Q-8 below.

To assess for criticality individual assets will be evaluated against all seven of the criteria categories listed below and a sub score will be selected based on the impact potential if the asset was to catastrophically fail. The sub score is then multiplied by the weighting to produce a weighted score. The final score is the total sum of the weighted scores for all seven categories.

Table Q-8: Critical Asset Framework

Criteria Category	Severity	Level	Score	Weighting	Weighted Point Score
Quality (Includes Health)	Safe (meets standards)	1	0	5	0
	Safe but marginal Aesthetic	2	2	5	10
	Safe but low Aesthetic	3	3	5	15
	Safe based on track record	4	5	5	25
	Unsafe	5	10	5	50
Quantity (Disruption to LOS)	Nil	1	0	4	0
	Minor	2	2	4	8
	Moderate	3	6	4	24
	Extreme	4	10	4	40
Number of Properties Affected	Nil	1	0	5	0
	Individual Property	2	2	5	10
	Individual Street (2-100 properties)	3	4	5	20

Criteria Category	Severity	Level	Score	Weighting	Weighted Point Score
(Disruption to LOS)	Community 101-500 properties	4	6	5	30
	Widespread (>500 or >1 community)	5	10	5	50
Time to Repair	<1/2 day	1	1	3	3
	<1 day	2	2	3	6
	1-3 days	3	5	3	15
	>3 days	4	10	3	30
Environmental Impacts	Nil	1	0	2	0
	Minor	2	2	2	4
	Moderate	3	4	2	8
	Extreme	4	10	2	20
Cultural Impacts	Nil	1	0	2	0
	Minor	2	2	2	4
	Moderate	3	5	2	10
	Extreme	4	10	2	20
Cost of Repair	<$1000	1	1	4	4
	$1K - $10K	2	3	4	12
	$10K - $50K	3	5	4	20
	<$50K<250K	4	10	4	40
	$250K+	5	15	4	60
Affect on Other Assets	Nil	1	0	3	0
	Minor	2	5	3	15
	Several non-critical assets	3	10	3	30
	1 critical asset or many assets	4	15	3	45
	>1 critical asset	5	20	3	60

Once the final score has been calculated the critical asset hierarchy can be determined as shown in Table Q-9. The critical asset hierarchy will be a key input that informs asset life-cycle decisions, especially when considering how much the Council should prolong the life of an asset.

Table Q-9: Critical Asset Hierarchy

Category	Description	Final Score
A	Primary	150+
B	Secondary	75-149
C	Non Critical	<75

Q.2.6. Projects to Address Risk Shortfalls

The Council plans to reduce its risk profile by undertaking the specific projects and asset management activities. The specific risk mitigation measures that have been planned within the 30 year water programme include:

Asset Management Activity

- test Emergency Management Plan;
- review Wai-iti Dam Emergency Action Plan;
- design to minimise fire potential and animal incursion;
- design to allow for manual operation;
- improve HAZOPs;
- regular communication with health authorities to identify critical users.

Operational Project

- test existing backflow protection;
- review existing fire controls at water treatment plants;
- leak detection programme;
- inspection of water retaining structure throughout the district;
- Wai-iti Dam safety audits.

Capital Project

- install backflow protection where needed;
- wellhead protection improvements;
- a programme of telemetry installation and upgrade;
- seismic protection at key reservoirs;

Strategic Study

- identify critical mains;
- develop policy on who owns and maintains backflow protection assets;
- investigate new water sources for Richmond/Waimea;
- completing WSPs for all water supply systems;
- hydraulic modelling.

Table Q-10: Critical and Significant Assets[1]

Identified as Critical Main in C688
Not identified as Critical Asset

Key	
🟪	Measure to be considered
🟩	Measure in place
🟨	No measure in place - not necessary
🟥	No measure in place - Project needed

Water Supply Scheme	Asset Group	Critical and Significant Asset	Project ID	Project Name	Backflow Prevention	By-Pass Capabilities	Additional Storage	Duty/Stand-by Pump Arrangement	Telemetry	Stand-by / Portable Generators	Well Head Security	Seismic Valving	Duplicate Wells	Critical Spares	Valving	Land Easement for Access	Increase Monitoring	Vulnerability Checks	Back up Communications	Emergency Response Plan	Drought Contingency Plans	Water Restriction	As Builts / Data Management	System Operating Plans
District	All	All	150316	Land Easement on Rural Water Schemes												🟥								
			150320, 344 Mot	Water System Operating Plans																				🟥
			150317	Inspection of significant assets														🟥						
			150159	Telemetry status study					🟥															
			150194	Backflow Prevention at key sites	🟥																			
Richmond	Source	Lower Queen Street Bores	150125	New groundwater source							🟥	🟨	🟩	🟨			🟥	🟩	🟩	🟩	🟩	🟩	🟩	
		Appleby Bore									🟥	🟨	🟩	🟨			🟥	🟩	🟩	🟩	🟩	🟩	🟩	
		Roding Dam (not TDC asset)																						
	Treatment Plant	-							🟩	🟩				🟨			🟪	🟪	🟩	🟩	🟩	🟩	🟩	
	Reservoirs	Queen Street Main Reservoir				🟩	🟥		🟩			🟩						🟪		🟩	🟩	🟩	🟩	
		Richmond High Level Reservoir	150136	Seismic Remediation		🟩	🟥		🟩			🟨						🟪		🟩	🟩	🟩	🟩	
		Valhalla High Level Reservoir	150136	Seismic Remediation		🟩	🟥		🟨			🟨						🟪		🟩	🟩	🟩	🟩	
		Faraday Rise Reservoir	150159	Telemetry		🟩	🟥		🟥			🟨						🟪		🟩	🟩	🟩	🟩	
		Haycock Rd Reservoir	150159	Telemetry		🟩	🟥		🟥			🟨						🟪		🟩	🟩	🟩	🟩	
	Pump Stations	Headworks - Appleby Well						🟩	🟩	🟩				🟨				🟪	🟩	🟩	🟩	🟩	🟩	
		Headworks - Queen Street						🟩	🟩	🟩				🟨				🟪	🟩	🟩	🟩	🟩	🟩	
		Queen Street Main Reservoir PS						🟩	🟨	🟩				🟨				🟪	🟩	🟩	🟩	🟩	🟩	
		Cropp Place PS	150159	Telemetry				🟩	🟥	🟩				🟨				🟪	🟩	🟩	🟩	🟩	🟩	
		Valhalla PS						🟩	🟩	🟩				🟨				🟪	🟩	🟩	🟩	🟩	🟩	
		Hill Street South PS						🟩	🟩	🟩				🟨				🟪	🟩	🟩	🟩	🟩	🟩	
	Critical Mains	***Queen Street Bores - Queen Street Reservoir***	150129 150131 150209	Queen Street watermain replacement		🟩									🟩					🟩	🟩	🟩	🟩	
		Queen Street Reservoir - Richmond High Level Reservoir				🟩									🟩					🟩	🟩	🟩	🟩	

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[1] This table has not been fully revised for the 2015 AMP but will be for the renewal of the Operations contract C688 in 2017

Water Supply Scheme	Asset Group	Critical and Significant Asset	Project ID	Project Name	Backflow Prevention	By-Pass Capabilities	Additional Storage	Duty/Stand-by Pump Arrangement	Telemetry	Stand-by / Portable Generators	Well Head Security	Seismic Valving	Duplicate Wells	Critical Spares	Valving	Land Easement for Access	Increase Monitoring	Vulnerability Checks	Back up Communications	Emergency Response Plan	Drought Contingency Plans	Water Restriction	As Builts / Data Management	System Operating Plans
Waimea	Source	Waimea Bores									🟥	🟧	🟩	🟧				🟩	🟪	🟩	🟩	🟩	🟩	
	Treatment Plant	Waimea Treatment Plant	150163 150164	WTP Upgrade																				
	Reservoirs	Champion Road Reservoir				🟪	🟪		🟩			🟩						🟥		🟩	🟩	🟩	🟩	
		Champion Road High Level Reservoir	150136	Seismic Remediation		🟪	🟪		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
	Pump Stations	Headworks - Waimea Bores						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Waimea Treatment Plant PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Champion Road PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Critical Mains	Waimea Bores - WTP				🟪									🟩					🟩	🟩	🟩	🟩	
		Waimea WTP - Champion Rd Main Reservoir				🟪									🟩					🟩	🟩	🟩	🟩	
		Main serving major industry (ENZA etc.)				🟪									🟩					🟩	🟩	🟩	🟩	
Mapua / Ruby Bay	Source	Waimea Bores									🟥	🟧	🟩	🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Treatment Plant	Waimea Treatment Plant							🟩	🟩				🟧			🟪	🟪	🟪	🟩	🟩	🟩	🟩	
	Reservoirs	Pomona Road Reservoir				🟪	🟩		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
		Pine Hill Heights Reservoir				🟪	🟩		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
		Old Coach Road Reservoir				🟪	🟥		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
	Pump Stations	Queen Street Pumps						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Mapua Booster PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Pinehill Reservoir PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Brabant Drive PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Pomona Road PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Critical Mains	***Waimea Bores - Mapua Booster PS***				🟪									🟩					🟩	🟩	🟩	🟩	
		Mapua Booster PS - Pomona Rd Reservoir	150053	Aranui main replacement		🟪									🟩					🟩	🟩	🟩	🟩	
		Mapua Booster PS - Pomona Rd Reservoir (along Seaton Valley Road)				🟪									🟩					🟩	🟩	🟩	🟩	
		Pomona Road Reservoir - Old Coach Reservoir				🟪									🟩									
Wakefield	Source	Wakefield Bore and Infiltration Gallery	150184	New Source Construction							🟥	🟧	🟥	🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Treatment Plant	Wakefield WPT							🟩	🟩				🟧			🟪	🟪	🟪	🟩	🟩	🟩	🟩	
	Reservoirs	Wakefield Reservoir				🟥	🟩		🟩			🟩						🟪		🟩	🟩	🟩	🟩	
	Pump Stations	Wakefield Wells PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Wakefield WTP PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Brightwater Link PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Treeton Place PS	150159	Telemetry				🟩	🟥	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Critical Mains	Wells - WTP				🟪									🟩					🟩	🟩	🟩	🟩	
		WTP - Wakefield Reservoir				🟪									🟩									

Water Supply Scheme	Asset Group	Critical and Significant Asset	Project ID	Project Name	Backflow Prevention	By-Pass Capabilities	Additional Storage	Duty/Stand-by Pump Arrangement	Telemetry	Stand-by / Portable Generators	Well Head Security	Seismic Valving	Duplicate Wells	Critical Spares	Valving	Land Easement for Access	Increase Monitoring	Vulnerability Checks	Back up Communications	Emergency Response Plan	Drought Contingency Plans	Water Restriction	As Builts / Data Management	System Operating Plans
Brightwater	Source	Brightwater Bores	15015	supplementary bore							🟩	🟧	🟩	🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Treatment Plant	Brightwater WTP	15018	WTP upgrade					🟩	🟩				🟧			🟪	🟪	🟪	🟩	🟩	🟩	🟩	
	Reservoirs	Brightwater Reservoir				🟩	🟩		🟩			🟩						🟪		🟩	🟩	🟩	🟩	
		Teapot Valley	150159	Telemetry		🟧	🟩		🟥			🟧						🟪		🟩	🟩	🟩	🟩	
		New Brightwater Res				🟩	🟩		🟩			🟩						🟪		🟩	🟩	🟩	🟩	
	Pump Stations	Wellfield Lightband Road						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Brightwater Main PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Teapot Valley PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Critical Mains	Wellfield - WTP				🟧									🟩					🟩	🟩	🟩	🟩	
		WTP - Brightwater Main Reservoir				🟧									🟩					🟩	🟩	🟩	🟩	
Tapawera	Source	Bores									🟩	🟧	🟩	🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Treatment Plant	Tapawera WTP							🟩	🟩				🟧			🟪	🟪	🟪	🟩	🟩	🟩	🟩	
	Reservoirs	WTP storage				🟪	🟩		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
	Pump Stations	Main Road PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Highlift PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Critical Mains	Tadmor Valley Road PS - Tapawera Reservoir				🟪									🟩					🟩	🟩	🟩	🟩	
		Main Road Tapawera (school)				🟪									🟩									
Murchison	Source	Matakitaki River bores									🟩	🟧	🟩	🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Treatment Plant	WTP	150087	WTP upgrade					🟩	🟩				🟧			🟪	🟪	🟪	🟩	🟩	🟩	🟩	
	Reservoirs	Chalgrave Street Reservoirs	150159	Telemetry		🟪	🟪		🟥			🟩						🟪		🟩	🟩	🟩	🟩	
	Pump Stations	Fairfax Street Main PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Critical Mains	Bores - Fairfax Street Main PS				🟪									🟪									
		Main PS - Waller Street				🟪									🟪									
		Waller Street (Fairfax Street - Chalgrave Street)				🟪									🟪									
		Chalgrave Street (Waller Street - Chalgrave St Reservoir)				🟪									🟪									
		Chalgrave Street Reservoir - Hotham Street				🟪									🟪									
		Hotham Street - Hospital				🟪									🟪									
Upper Takaka	Source	Whiskey Creek Surface Water	150159	Telemetry					🟥		🟩	🟧	🟩	🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Treatment Plant	WTP							🟩	🟩				🟧			🟪	🟪	🟪	🟩	🟩	🟩	🟩	
	Reservoirs	Upper Takaka Reservoir				🟪	🟪		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
	Pump Stations	-																						
	Critical Mains	Intake - Reservoir				🟪									🟩					🟩	🟩	🟩	🟩	
		Reservoir - WTP				🟪									🟩					🟩	🟩	🟩	🟩	

Water Supply Scheme	Asset Group	Critical and Significant Asset	Project ID	Project Name	Backflow Prevention	By-Pass Capabilities	Additional Storage	Duty/Stand-by Pump Arrangement	Telemetry	Stand-by / Portable Generators	Well Head Security	Seismic Valving	Duplicate Wells	Critical Spares	Valving	Land Easement for Access	Increase Monitoring	Vulnerability Checks	Back up Communications	Emergency Response Plan	Drought Contingency Plans	Water Restriction	As Builts / Data Management	System Operating Plans
Kaiteriteri	Source	River Road Bore	150051	WTP Upgrade							🟥	🟧	🟥	🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Treatment Plant	WTP	150051	WTP Upgrade					🟩	🟩				🟧			🟪	🟪	🟪	🟩	🟩	🟩	🟩	
	Reservoirs	Main Reservoir				🟪	🟪		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
		High Level Reservoir				🟪	🟪		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
	Pump Stations	River Road Well PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Kaiteriteri High Level Booster PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Kaiteriteri Lower Booster PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Critical Mains	River Road Bore - Lower Booster PS				🟪									🟩					🟩	🟩	🟩	🟩	
		Lower Booster PS - Low Level Reservoir				🟪									🟩					🟩	🟩	🟩	🟩	
		Low Level Reservoir - Camp Ground				🟪									🟩					🟩	🟩	🟩	🟩	
Collingwood	Source	Aorere River Bore									🟩	🟧	🟥	🟧				🟧	🟩	🟩	🟩	🟩	🟩	
	Treatment Plant	WTP	150023	WTP upgrade					🟩	🟩				🟧			🟧	🟧	🟩	🟩	🟩	🟩	🟩	
	Reservoirs	Collingwood Reservoir				🟩	🟧		🟩			🟧						🟧		🟩	🟩	🟩	🟩	
	Pump Stations	Collingwood Bore PS						🟩	🟩	🟩				🟧				🟧	🟩	🟩	🟩	🟩	🟩	
		Collingwood PS						🟩	🟩	🟩				🟧				🟧	🟩	🟩	🟩	🟩	🟩	
	Critical Mains	Aorere River Bore - WTP				🟧									🟩					🟩	🟩	🟩	🟩	
		WTP - Collingwood Reservoir				🟧									🟩									
Dovedale	Source	Humphries Creek	150031	New source and WTP							🟥	🟧	🟥	🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Treatment Plant	WTP	150031	New source and WTP					🟩	🟩				🟧			🟪	🟪	🟪	🟩	🟩	🟩	🟩	
	Reservoirs	Neudorf Saddle BP tank				🟪	🟪		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
		Knots Reservoir	150159	Telemetry		🟪	🟪		🟥			🟧						🟪		🟩	🟩	🟩	🟩	
		Silcocks Reservoir				🟪	🟧		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
		Te Hepe Top Reservoir	150159	Telemetry		🟪	🟪		🟥			🟧						🟪		🟩	🟩	🟩	🟩	
		Winns Reservoir				🟪	🟪		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
		Te Hepe Lowere Reservoir				🟪	🟪		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
		Thorns Reservoir				🟪	🟪		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
	Pump Stations	Humphries Creek PS						🟩	🟩	🟩				🟧				🟪	🟧	🟩	🟩	🟩	🟩	
		Knots PS						🟩	🟩	🟩				🟧				🟪	🟧	🟩	🟩	🟩	🟩	
		Lower Tehepe PS						🟩	🟩	🟩				🟧				🟪	🟧	🟩	🟩	🟩	🟩	
		Upper Tehepe PS						🟩	🟩	🟩				🟧				🟪	🟧	🟩	🟩	🟩	🟩	
		Wins PS						🟩	🟩	🟩				🟧				🟪	🟧	🟩	🟩	🟩	🟩	
		Thorne PS						🟩	🟩	🟩				🟧				🟪	🟧	🟩	🟩	🟩	🟩	
	Critical Mains	High level intake - High level WTP	150031	New source and WTP		🟧									🟩					🟩	🟩	🟩	🟩	
		High level WTP - Main Intake	150031	New source and WTP		🟧									🟩					🟩	🟩	🟩	🟩	
		Main Intake - Main WTP	150031	New source and WTP		🟧									🟩					🟩	🟩	🟩	🟩	
		Main WTP - Thorns Reservoir				🟧									🟩					🟩	🟩	🟩	🟩	

		Thorns Reservoir - Silcocks Reservoir				🟧									🟩					🟩	🟩	🟩	🟩	

Water Supply Scheme	**Asset Group**	**Critical and Significant Asset**	**Project ID**	**Project Name**	Backflow Prevention	By-Pass Capabilities	Additional Storage	Duty/Stand-by Pump Arrangement	Telemetry	Stand-by / Portable Generators	Well Head Security	Seismic Valving	Duplicate Wells	Critical Spares	Valving	Land Easement for Access	Increase Monitoring	Vulnerability Checks	Back up Communications	Emergency Response Plan	Drought Contingency Plans	Water Restriction	As Builts / Data Management	System Operating Plans
88 Valley	Source	Parkes Stream									🟩	🟧	🟧	🟧				🟧	🟩	🟩	🟩	🟩	🟩	
	Treatment Plant	WTP	150202 150003 150007 150202	WTP renewal and upgrade					🟥	🟩				🟧			🟧	🟧	🟩	🟩	🟩	🟩	🟩	
	Reservoirs	88 Valley Tanks	150189	Wakefield & 88 Valley Upgrades		🟧	🟧		🟩			🟧						🟧		🟩	🟩	🟩	🟩	
	Pump Stations	-																						
	Critical Mains	Intake - Totara View Rd Reservoir	150001 150004	intake access and pipeline renewal		🟧									🟩					🟩	🟩	🟩	🟩	
Redwoods Valley	Source	Golden Hills Well									🟥	🟧	🟩	🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		O'Connors Creek Wells									🟥	🟧	🟥	🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		River Road Well									🟥	🟧	🟩	🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Treatment Plant	WTP - Golden Hills	150198 150104	WTP Upgrade					🟩	🟩				🟧			🟪	🟪	🟪	🟩	🟩	🟩	🟩	
		WTP - O'Connors Creek	150198 150105	WTP Upgrade					🟩	🟩				🟧			🟪	🟪	🟪	🟩	🟩	🟩	🟩	
	Reservoirs	Maisey High Level Reservoir				🟪	🟧		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
		Maisey Road Reservoir 1	150239	Improve inlet/outlet/scour. Raise outlet		🟪	🟩		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
		Maisey Road Reservoir 2	150239	Improve inlet/outlet/scour. Raise outlet		🟪	🟧		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
		Redwoods High Level Reservoir				🟪	🟧		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
		Redwood Malling Road BP tank				🟪	🟧		🟩			🟧						🟪		🟩	🟩	🟩	🟩	
	Pump Stations	River Road Well PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		O'Connors Creek Well PS						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Golden Hills PS	150097	Replacing Aeration tower, Chlorinator, Contact tank, UV				🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Redwoods Booster PS 1					🟥	🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Redwoods Booster PS 2						🟩	🟩	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Critical Mains	River Road Bore - Golden Hills PS				🟪									🟩					🟩	🟩	🟩	🟩	
		River Rd Bore - O'Connors Creek PS				🟪									🟩					🟩	🟩	🟩	🟩	
		Golden Hills PS - Redwoods Booster PS 1				🟪									🟩					🟩	🟩	🟩	🟩	
		Redwoods Booster PS 1 - High Level Reservoir				🟪									🟩					🟩	🟩	🟩	🟩	
		O'Connors Creek PS - Maisey Rd Reservoir				🟪									🟩					🟩	🟩	🟩	🟩	
		O'Connors Creek PS - Maisey Rd Reservoir				🟪									🟩					🟩	🟩	🟩	🟩	

Pohara	Source	Stream Intake	150089 150090	New Town Supply New inlet pipe							🟧	🟧	🟧	🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Treatment Plant	WTP	150089 150092 150244	New Town Supply Treatment Upgrade Remove old equipment					🟥	🟩				🟧			🟪	🟪	🟪	🟩	🟩	🟩	🟩	
	Reservoirs	Pohara Reservoir	150089	New Town Supply		🟪	🟪		🟥			🟧						🟪		🟩	🟩	🟩	🟩	
	Pump Stations	Pohara Valley PS	150159	Telemetry Upgrade				🟩	🟥	🟩				🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Critical Mains	Abel Tasman Drive	150089	New Town Supply		🟪									🟩					🟩	🟩	🟩	🟩	
		WTP - Pohara Reservoir	150089	New Town Supply		🟪									🟩					🟩	🟩	🟩	🟩	
		Source - WTP	150090	intake - WTP main replacement		🟪									🟩					🟩	🟩	🟩	🟩	

Water Supply Scheme	**Asset Group**	**Critical and Significant Asset**	**Project ID**	**Project Name**	Backflow Prevention	By-Pass Capabilities	Additional Storage	Duty/Stand-by Pump Arrangement	Telemetry	Stand-by / Portable Generators	Well Head Security	Seismic Valving	Duplicate Wells	Critical Spares	Valving	Land Easement for Access	Increase Monitoring	Vulnerability Checks	Back up Communications	Emergency Response Plan	Drought Contingency Plans	Water Restriction	As Builts / Data Management	System Operating Plans
Hamama	Source	Stream intake									🟪	🟪	🟪	🟪				🟪	🟪	🟩	🟩	🟩	🟩	
	Treatment Plant	-	150043	Individual household units																				
	Reservoirs	-	150042	Replacing Strainer, Settlement tank																				
	Pump Stations	-																						
	Critical Mains																							
Motueka	Source	Fearons Bush Bore	150231	Take out of service							🟥	🟧	🟩	🟧				🟪	🟪	🟩	🟩	🟩	🟩	
		Rec Centre Bore	150253	Raise bore headworks above ground							🟥	🟧	🟩	🟧				🟪	🟪	🟩	🟩	🟩	🟩	
	Treatment Plant	-	150069	New town supply																				
	Reservoirs	-	150069	New town supply			🟥																	
	Pump Stations	Fearons Bush PS	150231	Relocate to Parker Street				🟩	🟩	🟩				🟧				🟪	🟩	🟩	🟩	🟩	🟩	
		Fearons Bush Well PS	150231	Take out of service				🟩	🟩	🟩				🟧				🟪	🟩	🟩	🟩	🟩	🟩	
		Rec Centre Well PS						🟩	🟩	🟩				🟧				🟪	🟩	🟩	🟩	🟩	🟩	
	Critical Mains	High Street (Parker Street - Whakarewa Street)	150075	Naumai Street loop		🟪									🟩					🟩	🟩	🟩	🟩	
		Thorp Street	150078	Thorpe Street Main replacement		🟪									🟩					🟩	🟩	🟩	🟩	
		Fearon Street (High Street - Thorp Street)	150065	Fearon Street Mains Replacement		🟪									🟩					🟩	🟩	🟩	🟩	
		Old Wharf Road (High Street - Thorp Street)				🟪									🟩					🟩	🟩	🟩	🟩	
		High Street (King Edward Street - Hospital)	150068	High Street South Main Renewal		🟪									🟩					🟩	🟩	🟩	🟩	
		Woodland Avenue				🟪									🟩					🟩	🟩	🟩	🟩	

APPENDIX R LEVELS OF SERVICE, PERFORMANCE MEASURES AND RELATIONSHIP TO COMMUNITY OUTCOMES

R.1 Introduction

A key objective of this AMP is to match the level of service provided by the water supply activity with agreed expectations of customers and their willingness to pay for that level of service. The levels of service provide the basis for the life cycle management strategies and works programmes identified in the AMP.

The levels of service for Water Supply have been developed to contribute to the achievement of the stated Community Outcomes that were developed in consultation with the community, but taking into account:

- the Council's statutory and legal obligations;
- the Council's policies and objectives;
- the Council's understanding of what the community is able to fund.

R.2 How Do Our Water Supply Activities Contribute to the Community Outcomes?

Through consultation, the Council identified eight Community Outcomes. Table A-1 in Appendix A summarises how the water activity contributes to the achievement of the Council's Community Outcomes.

R.3 Level of Service

Levels of service are attributes that Tasman District Council expects of its assets to deliver the required services to stakeholders.

A key objective of this plan is to clarify and define the levels of service for the water assets, and then identify and cost future operations, maintenance, renewal and development works required of these assets to deliver that service level. This requires converting user's needs, expectations and preferences into meaningful levels of service.

Levels of service can be strategic, tactical, operational or implementation and should reflect the current industry standards and be based on.

- ***Customer Research and Expectations:*** Information gained from stakeholders on expected types and quality of service provided.
- ***Statutory Requirements:*** Legislation, regulations, environmental standards and Council bylaws that impact on the way assets are managed (eg, resource consents, building regulations, health and safety legislation). These requirements set the minimum level of service to be provided.
- ***Strategic and Corporate Goals:*** Provide guidelines for the scope of current and future services offered and manner of service delivery, and define specific levels of service, which the organisation wishes to achieve.
- ***Best Practices and Standards***: Specify the design and construction requirements to meet the levels of service and needs of stakeholders.

R.3.1. Industry Standards and Best Practice

The AMP acknowledges the Council's responsibility to act in accordance with the legislative requirements that impact on the Council's water activity. A variety of legislation affects the operation of these assets, as detailed in Appendix A.

R.3.2. Prioritisation Related to Available Resources

With water assets, there are often higher levels of maintenance and renewal requirements proposed (increased Levels of Service etc) than the resources allow for. Tradeoffs then have to be made as to what impacts on the ability of an asset to provide a service against the nice to have aspects.

To assist this prioritisation the Council has considered the return on investment of capital projects considering the number of new sections or dwellings that would be serviced.

For renewal vs operational cost expenditure tradeoffs a ratio of 10:1 has been adopted meaning that id maintenance cost are greater than 10% of the renewal cost in any year then renewal would be programmed.

R.4 Aim of Water Services

We aim to provide and maintain water supply systems to communities in a manner that meets the levels of service.

R.5 Mandatory Reporting Measures

The new national Non-financial Performance Measures Rules 2013 require ongoing recording of relevant data to report against the following four performance measures.

R.5.1. Performance Measure One (Safety of Drinking Water):

The extent to which the local authority's drinking water supply complies with:

- part 4 of the drinking-water standards (bacteria compliance criteria); and
- part 5 of the drinking-water standards (protozoal compliance criteria).

R.5.2. Performance Measure Two (Maintenance of the Reticulation Network)

The percentage of real water loss from the local authority's networked reticulation system (including a description of the methodology used to calculate this).

R.5.3. Performance Measure Three (Fault Response Times):

Where the local authority attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times are measured:

- attendance for urgent call-outs: from the time that the local authority receives notification to the time that service personnel reach the site;
- resolution of urgent call-outs: from the time that the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption;
- attendance for non-urgent call-outs: from the time that the local authority receives notification to the time that service personnel reach the site; and

- resolution of non-urgent call-outs: from the time that the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption.

R.5.4. Performance Measure Four (Customer Satisfaction):

The total number of complaints received by the local authority about any of the following:

- drinking water clarity;
- drinking water taste;
- drinking water odour;
- drinking water pressure or flow;
- continuity of supply; and
- the local authority's response to any of these issues, expressed per 1000 connections to the local authority's networked reticulation system.

R.5.5. Performance Measure Five (Demand Management)

The average consumption of drinking water per day per resident within the territorial authority district.

R.6 What Level of Service Do We Seek to Achieve?

There are many factors that need to be considered when deciding what level of service the Council will aim to provide. These factors include:

- the Council needs to aim to understand and meet the needs and expectations of the community;
- the Council must meet its statutory obligations;
- the services must be operated within the Council's policy and objectives; and
- the community must be able to fund the level of service provided.

Two tiers of levels of service are outlined: strategic and operational.

The operational levels of service and performance measures are used to ensure the service and facilities are able to achieve the strategic levels of service and Councils objectives.

Level of services are reviewed and upgraded on a cyclic basis in line with legislative and regulatory changes and feedback from customers, consultation, internal assessments, audits and strategic objectives

The Levels of Service that the Council has adopted for this AMP have been developed from:

- the Levels of Service in the 2012 AMPs; and
- the new Mandatory Reporting Measures.

They also take in account feedback from various parties including Audit New Zealand, industry best practice and the ease of measuring and reporting of performance.

The Council has decided to show only the LOS measures that are considered to be customer focussed in the LTP. These public Levels of Service and performance measures are consulted on and adopted as part of the Long Term Plan consultation process.

The AMP extends the levels of service and performance measures to include the more technical measures associated with the management of the activity.

Table R-1 details the levels of service and associated performance measures for the water activity. Those shaded are the customer focussed measures which are included in the LTP. The table sets out the Council's current performance and the targets they aim to achieve within the next three years and by the end of the next 10 year period.

The levels of service that the Council has adopted for this AMP have been developed from the levels of service prepared in the previous Activity Management Plans. They take into account feedback from various parties including Audit New Zealand, industry best practice and ease of measuring and reporting of performance measures.

R.7 Plans the Council Has Made to Meet the Levels of Service

The Council is making a substantial capital works investment over the next 30 year period to upgrade existing water assets and improve levels of service (Appendix F). This includes the following specific schemes:

- new source and treatment for the Dovedale scheme to remove the permanent Boil Water Notice;
- a programme of water treatment upgrades in line with the recommendations outlined in the WSPs to ensure compliance with DWSNZ:2008;
- increasing the capacity of the reticulation in the Richmond region to allow for the predicted future growth;
- improving the water balance supply and level of service in Richmond during the peak demand;
- installation of telemetry at key sites throughout the district;
- installation of backflow prevention devices;
- seismic strengthening of reservoirs;

Please refer to Appendix F for specific projects.

In addition to the capital works, the Council has allocated a substantial budget for the operation and maintenance of its current and future water supply assets (Appendix E). This allocation includes work and studies such as:

- production of a WSP for each of the Council owned water supplies;
- implementation of a demand management plan, including further demand analysis, pressure management, leak detection programme and water demand initiatives;
- hydraulic modelling of several urban water supply systems;
- water system operating plans;
- night flow monitoring;
- fire hydrant audit.

R.7.1. Levels of Service Linked to Legislation

Whilst the Council is required to comply with various legislation and regulations when managing the water activity, the only specific levels of service relate to legislation are the mandatory performance measures noted discussed at section R.5 and shown in Table R-1.

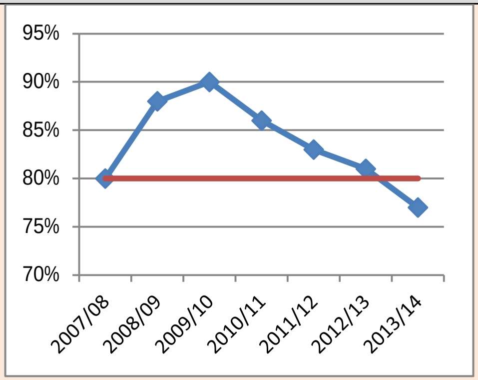
Table R-1 Levels of Service Summary

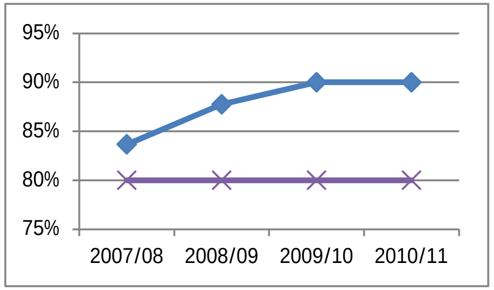
Our level of service – What the Council will do and how it will measure performance over the 10 years from 2015. Shaded sections are publically reported and unshaded sections are used for self-assessment by Utilities Engineers and Engineering Services Management.

ID	Levels of Service	Performance Measures	Current Performance	Future Performance Y1-3			Future Performance Y10
	(we provide)	(We will know we are meeting the level of service if…)		Year 1	Year 2	Year 3	(targets)
				2015/16	2016/17	2017/18	2024/25
Community Outcome: Our unique natural environment is healthy and protected.							
1	**Our water takes are sustainable.**	All water takes have all necessary resource consents. Details are held in NCS.	**Actual = 100%** A current resource consent is in place for each water take. No abatement notices have been received for breach of resource consent conditions.	100%	100%	100%	100%
2		Compliance with water resource consents is achieved, as measured by the number of; · abatement notices · infringement notices · enforcement orders, or · convictions issued.	Actual = Not fully recorded. No abatement notices have been received for breach of conditions. This is a new measure, performance will be recorded in NCS.	≤1 0 0 0	≤1 0 0 0	≤1 0 0 0	≤1 0 0 0
3		Our percentage of real water loss from the network is less than the target. As calculated: Total water provided less water metered less non revenue water = total real water loss. Then % = L real loss divided by average L usage per connection. (Mandatory measure 2)	Actual = NA This is a new measure, performance will be recorded in the AMP.	120 L/connection	120 L/connection	120 L/connection	100 L/connection
4		The average consumption of drinking water per day per resident is less than the target. (Mandatory measure 5)	Actual = NA This is a new measure, performance will be recorded in the AMP.	<300 L/person/day	300 L/person/day	300 L/person/day	300 L/person/day

ID	Levels of Service	Performance Measures	Current Performance	Future Performance Y1-3			Future Performance Y10
Community Outcome: Our urban and rural environments are pleasant, safe and sustainably managed.							
5	**Our use of the Water Resource is efficient.**	Water Demand Management Plans are in place for each water scheme	**Actual = 5/15** Plans are in place for Richmond/Waimea, Brightwater/Hope, Wakefield, Mapua/Ruby Bay and Kaiteriteri/Riwaka.	8/15	9/15	10/15	15/15
6		The weighted average of metered residential consumption across the district reduces. As measured through Council's district-wide Water Demand Management Plan.	**Actual =** 196 l/capita/day	<250l/capita/day	<250l/capita/day	<250l/capita/day	<250l/capita/day
7		The weighted average of measured water loss across the district reduces. As measured through Council's district-wide Water Demand Management Plan.	**Actual =** 239 l/connections/day	<235l/connection/day	<230l/connection/day	<225l/connection/day	<175l/connection/day
8	**Our water is safe to drink.**	Number of temporary advisory notices issued to boil water - as issued in consultation with the Ministry of Health	**Actual = 0 in 2014** There is a permanent notice in place at Dovedale, which is not covered in the targets as it is permanently in place.	0	0	0	0
9		We comply with part 4 (bacteria compliance criteria) of the drinking-water standards As measured by bacterial water sample results. (Mandatory measure 1)	**Actual = 99.7%** Zone – 640 E.coli samples were taken over the year. Of these, four transgressions were recorded for E.coli = 99.4% Plant – 595 E.coli samples were taken over the year. Of these, no transgressions were recorded for E.coli = 100% compliance Performance will be recorded in the National Water database (WINZ).	99%	99%	99%	99%
10		We comply with part 5 (protozoal compliance criteria) of the drinking-water standards As measured by number of schemes with compliant protozoa treatment determined by the Drinking Water Assessor)	Actual = 1 of 15 Not all schemes need to comply yet and the number of schemes will reduce with planned changes. Performance will be recorded in the National Water database (WINZ).	2 of 15: Upper Takaka, Richmond	3 of 15 Tapawera	3 of 14 (Hamama retired)	14 of 14

ID	Levels of Service	Performance Measures	Current Performance	Future Performance Y1-3			Future Performance Y10
		(Mandatory measure 1)					
11		WSPs are in place, approved and being implemented for each water supply. As measured by approval by Ministry of Health.	**Actual = 5/15** WSPs approved for Tapawera, Upper Takaka and Motueka, Waimea, Richmond Two further ready for submission (Wakefield, Brightwater) and one in appeal (Collingwood).	10/15	13/15	14/15	15/15
12	**Our water supply systems provide fire protection to a level that is consistent with the national standard.**	Our water supply system's meet the FW2 standard as per the Code of Practice for Fire Fighting Water Supplies - measured through hydraulic modelling, and field testing revised biennially.	**Actual = 90%.** 9/10 urban systems fully comply with fire fighting capability. The vast majority of Richmond complies, with the exception of Cropp Place. Rural water supplies and community supplies do not provide fire fighting capacity so are not covered by this performance measure. However, Takaka has a reticulated fire fighting scheme for the central business area and Motueka has a network of fire wells which provide a limited fire fighting service.	90%	90%	90%	100%
13		Planned service interruptions do not exceed 4 hours. As measured through the maintenance contract.	**Actual = 0** No planned service interruptions have exceeded four hours.	0	0	0	0
14		Flow from hydrants meets fire fighting standards. As measured by random annual spot checks of hydrants.	**Actual = This is not currently being measured.** Budget assigned in AMP to undertake programme of hydrant spot checks.	100%	100%	100%	100%
15		No system shall be down for longer than two hours per week. As measured through the Maintenance contract.	**Actual = 0** No system has been interrupted for more than two hours in any one week	0	0	0	0
16	**Our water supply activities are managed at a level that the community is satisfied with.**	% of customers are satisfied with the water supply service - as measured through the annual residents' survey.	**Actual = 77%**	80%	80%	80%	85%

ID	Levels of Service	Performance Measures	Current Performance	Future Performance Y1-3			Future Performance Y10
							
17	**Our systems are built, operated and maintained so that failures can be managed and responded to quickly.**	Complaints per 1000 connections are less than the target - relates to clarity, taste, odour, pressure or flow, continuity of supply and Council response to these issues. - as recorded through Council's Confirm database (Mandatory measure 4)	Actual =NA This is a new measure, performance will be recorded in Confirm.	<20	<20	<20	<20
18		Median resolution times are within targets for urgent call-outs (1 day) (Mandatory measure 3)	Actual = 99% This is a new measure, performance will be recorded in Confirm. More detailed response timeframes are monitored through contract 688	<24 hours	<24 hours	<24 hours	<24 hours
19		Median response times are within targets for urgent call-outs (2 hours) (Mandatory measure 3)	Actual = 99% The operations and maintenance contractor is required to meet a target of 90% of faults to be responded to and fixed within specified timeframes. The figure reported here relates to completion within the final completion timeframe. More detailed response timeframes are monitored through contract 688.	<2 hours	<2 hours	<2 hours	<2 hours
20		Median response times are within targets for non-urgent call-outs (72 hours) (Mandatory measure 3)	Actual =NA This is a new measure, performance will be recorded in Confirm. More detailed response timeframes are monitored through contract 688	<72 hours	<72 hours	<72 hours	<72 hours
21		Median resolution times are within	Actual =NA	<8	<8	<8	<8 Working days

ID	Levels of Service	Performance Measures	Current Performance	Future Performance Y1-3			Future Performance Y10
		targets for non-urgent call-outs (7 working day) (Mandatory measure 3)	This is a new measure, performance will be recorded in Confirm. More detailed response timeframes are monitored through contract 688	Working days	Working days	Working days	
22		Hydraulic models are in place for key urban water supplies. As measured through professional services contracts.	**Actual = 6 hydraulic models are in place** for Richmond, Waimea, Brightwater, Wakefield, Mapua, Motueka.	6 / 10	6 / 10	6 / 10	8 / 10
23		Critical assets are identified and included in the Activity Risk Register.	**Actual = Critical assets are identified and assessed for Risk** Where mitigations measures are required, they have been included for action in the AMP.	In Place	In Place	In Place	In Place
24		Water supply systems have the following storage: Urban: - one day at average annual demand Rural: - six hours at average annual demand As measured through annual demand figures vs actual storage.	**Actual = 12 of 12 schemes have the required storage** Recent construction of reservoirs in Richmond have allowed this scheme to comply	12/12	12/12	12/12	12/12
25		Assets are operated, maintained and repaired to a high standard. As measured through contract audits	**Actual = 90.6%** 	80%	80%	80%	80%

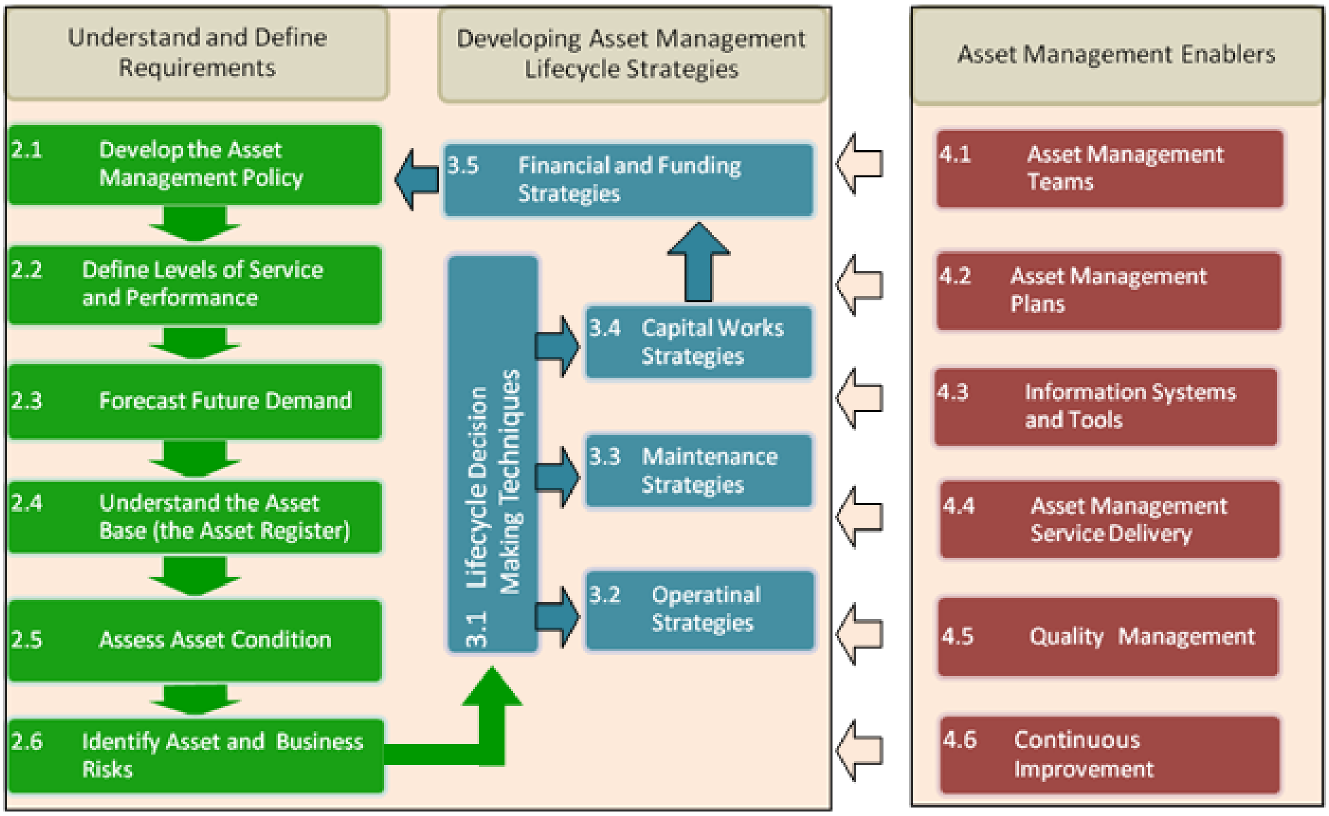
APPENDIX S COUNCIL'S DATA MANAGEMENT, ASSET MANAGEMENT PROCESSES AND SYSTEMS

S1 Introduction

The Office of the Auditor General (OAG) has chosen to use the International Infrastructure Management Manual (IIMM) as the benchmark against which New Zealand councils measure their standards. The IIMM describes the Asset Management (AM) process as a step by step process applied to an activity or network level, to manage assets from planning to disposal or renewal. This process is shown in Figure S-1.

Each of these processes is summarised in this Appendix.

Figure S-1: The Asset Management Process (taken from IIMM 2011)



S2 Understand and Define Requirements

This phase determines what service levels are required and how future demand might change over time, as well as the current assets' capability to deliver on those requirements.

S2.1 Develop the Asset Management Policy

The Asset Management policy framework guides the organisation in terms of priorities and strategies, and sets out specific responsibilities, objectives, targets and plans. The Council has approached this by determining the desired and actual levels of asset management practice, and identifying the gaps between them for future improvement.

S2.1.1 Determine the Appropriate (Desired) Level of Asset Management Practice

The level of Asset Management expected can differ between activities. The IIMM defines the standards of the Activity Management Plans (AMPs) on a scale as follows:

·	Minimum	Starting point
·	Core	Basic
·	Intermediate (core plus)	Transition between Core and Advanced
·	Advanced	Most thorough

In 2010, Waugh Infrastructure Management Ltd undertook a review these levels and advised on target levels. A range of parameters (including populations, issues affecting the district, costs and benefits to the community, legislative requirements, size, condition and complexity of assets, risk associated with failure, skills and resources available, and customer expectation) was assessed to determine the most suitable level of asset management.

The results showed that Tasman District Council should be managing its assets at the following levels:

·	Transportation	Intermediate with demand management and resource availability drivers
·	Stormwater, Water, Wastewater	Intermediate with demand and risk management drivers
·	Solid Waste	Core with risk management drivers
·	Rivers	Core
·	Coastal Structures	Core (future reassessment may be required)

S2.1.2 Determine the Actual Level of Asset Management Practice and Identify Gaps

At the end of the 2009 AMP, the Council carried out a high level review of the AMPs and associated activity management processes against good practice asset management as described in the IIMM and in accordance with the Office of Auditor General. During this process, the AMP and associated practices were scored to give a snapshot of the current status and then set targets as to where the Council wished to head. The 2009 AMP Improvement Plan was assessed in its effectiveness to close the gap between actual and target compliance levels and new items added to the Improvement Plan where gaps were identified.

The results of the review are detailed in a separate report (Performance Review of Stormwater Activity Management Processes, MWH New Zealand Ltd February 2010).

The two reviews described above were carried out independently of each other however the outputs from both were compared to ensure consistency of recommendations. Whilst both reviews focused on slightly different aspects of asset management practices, there was no conflict between the recommendations made.

This work is now somewhat dated as the AMPs have changed substantially since 2009. This area will be renewed following development of the LTP.

Table S-1 below shows analysis undertaken to link the two reviews to identify the compliance gaps and actions that should be undertaken to address them.

Table S-1: Analysis of Asset Management Reviews

	INTERMEDIATE	Compliance Status	Compliance Gaps to Address to Meet INTERMEDIATE
Description of Assets	Advanced	Substantially Compliant	**Action:** improve level of performance data in Confirm.
Levels of Service	Core	Higher level of compliance than suggested	There is substantial communication of LoS with the public.
Managing Growth	Advanced	Substantially Compliant	**Action:** Improve level of demand strategies for Wastewater and Stormwater.
Risk Management	Advanced	Substantially Compliant	**Action:** Improve integration with maintenance and replacement strategies.
Lifecycle Decision Making	Advanced (with the exception of predictive modelling)	Partially Compliant	**Action:** Improve evaluation tools.
Financial Forecasts	Advanced (with the exception of sensitivity testing of forecasts)	Compliant	No plans to undertake sensitivity testing of forecasts.
Planning Assumptions and Confidence Levels	Advanced	Substantially Compliant	**Action:** Improve confidence and accuracy of asset data and performance.
Outline Improvement Programmes	Advanced	Substantially Compliant	**Action:** Identify timeframes, priorities and resources for Improvement Plan actions.
Planning by Qualified Persons	Core	Compliant	Intending to achieve Advanced by undertaking Peer Review.
Commitment	Advanced	Substantially Compliant	**Action:** More emphasis and commitment needed to Improvement Plan.

S2.2 Define Levels of Service and Performance

The Level of Service and Performance Management frameworks will ensure that agreed stakeholder requirements are met. Levels of Service, Performance measures, and Relationship to Community Outcomes are detailed in Appendix R.

S2.3 Forecast Future Demand

Understanding how future demand for service will change enables the Council to plan ahead to meet that demand. Demand and future new capital requirements are dealt with in Appendix F.

S2.4 Understand the Asset Base (the Asset Register)

A robust asset register is a core requirement for asset management.

Data on the Council's assets is collected via as-built plans (supplied through capital works and subdivision), maintenance contract work and field studies. Two enterprise asset systems are used to record core data:

- RAMM – Transportation excluding Streetlights;
- Confirm – Stormwater, Water, Wastewater, Solid Waste, Rivers, Coastal Structures, Streetlights.

Most data sets are viewable on the corporate GIS browser, Explore Tasman. Reporting systems summarise data for management and performance reporting, and for providing links between AM systems and GIS / financial systems. Several other standalone applications exist for specific purposes.

The Asset Register and other Information Systems are described more comprehensively in section S4.3 Information Systems and Tools.

S2.5 Assess Asset Condition

The Council needs to understand the current condition of its assets. Monitoring programmes should be tailored to consider how critical the asset is, how quickly it is likely to deteriorate, and the cost of data collection.

Condition assessment is not performed on individual reticulation assets; reticulation systems as a whole and electrical / control mechanisms are audited. The audits look at the conditions of the sites and items that need replacement or repair are identified. Pumps are scheduled to be replaced at the end of their standard life assessment. Most of our network is comparatively young so condition is not yet a big issue. Once critical assets are defined, these will be assessed for condition, especially those assets which are approaching the end of their theoretical useful life. We are also looking at ways to make better use of current information that is gathered but not stored in the asset register.

Pipe condition rating cannot easily be done as the assets are buried and cannot be examined by CCTV without risk of contamination. Breakage reports are used as an indication of poor condition (number of breaks per 100m of pipe). This can be cross-referenced with known pressures in the system to see if the area has a mismatch between actual pressure and the rating of the pipes.

Where condition rating is done, a 1-5 scale is used, as per the NZQQA Infrastructure Asset Grading Guidelines, as shown in Table S-4.

Table S-4: Asset Condition Rating Table

Condition Grade and Meaning	General Meaning
1 Very Good	Life: 10+ years. Physical: Fit for purpose. Robust and modern design. Access: Easy; easy lift manhole lids, clear access roads. Security: Sound structure with modern locks. Exposure: Fully protected from elements or providing full protection.
2 Good	Life: Review in 5 – 10 years. Physical: Fit for purpose. Early signs of corrosion/wear. Robust, but not latest design. Access: Awkward; heavy/corroded lids, overgrown with vegetation. Security: Sound structure with locks. Exposure: Adequate protection from elements or providing adequate protection.

Condition Grade and Meaning	General Meaning
3 Moderate	Life: Review in 5 years. Physical: Potentially impaired by corrosion/wear, old design or poor implementation. Access: Difficult: requires special tools or more than one person. Secure: Locked but structure not secure, or secure structure with no locks. Exposure: Showing signs of wear that could lead to exposure.
4 Poor	Life: Almost at failure, needs immediate expert review. Physical: Heavy corrosion impairing use. Obvious signs of potential failure. Access: Restricted, potentially dangerous. Secure: Locks and/or structure easily breeched. Exposure: Exposure to elements evident e.g. leaks, over heating.
5 Very Poor	Life: 0 years – broken. Physical: Obvious impairments to use. Heavy wear/corrosion. Outdated/flawed design/build. Access: Severely limited or dangerous. Security: No locks or easily breeched. Exposure: Exposed to elements when not specifically designed to be.

S2.6 Identify Asset and Business Risks

A key process is assessing critical assets and risks. This feeds into all lifecycle decision making processes.

S2.6.1 Asset Risks - Critical Assets

All assets except roading ones are now being graded for Criticality as shown in Table S-5. This process is expected to be complete by early 2015.

Table S-5: Asset Criticality Rating Table

Condition Grade	Meaning	Significance for future maintenance
A	Critical	Advanced condition assessment and preventative maintenance
B	Normal	Standard condition assessment and maintenance
C	Non-critical	Reduced maintenance acceptable

Asset criticality is partially captured in Confirm; there is an ongoing project to complete this by early 2015.

Assets are created in Confirm with a default value of C. Asset Type and Site is then used as a first assessment of criticality. Further assessments are now being made using the criteria of position in the network and number of customers served, to get a final grading.

2.6.2 Business Risks

The Council has adopted an Integrated Risk Management framework to manage risks, both at corporate and activity level. This is detailed in Appendix Q, Significant Assumptions, Uncertainties and Risk Management.

S3 Developing Asset Management Lifecycle Strategies

S3.1 Lifecycle Decision Making Techniques

The lifecycle decision phase looks at how best to deliver on the requirements by applying various decision-making techniques, strategies and plans. These are discussed in separate appendices as listed below.

S3.2 Operational Strategies and Plans

Demand management strategies (reducing overall demand and / or reducing peak demands) are covered in Appendix N, Demand management.

Emergency management processes are covered in Appendix Q, Significant Assumptions, Uncertainties and Risk Management.

S3.3 Maintenance Strategies and Plans

Optimised maintenance programmes are dealt with in Appendix E, Operations and Maintenance.

S3.4 Capital Works Strategies

Forecast growth and demand and new asset investment programming are detailed in Appendix F, Demand and Future New Capital Requirements.

Optimised renewal programmes and Asset investment programmes are covered in Appendix I, Capital Requirements for Future Renewals.

S3.5 Financial and Funding Strategies

A robust, long-term financial forecast is developed as the culmination of this phase, which identifies strategies to fund these programmes. This section covers how the resource demand of AM can be identified, disclosed and funded.

The following appendices hold this information:

Appendix D – Asset Valuations

Appendix G – Development Contributions / Financial Contributions

Appendix K – Public Debt and Annual Loan Servicing Costs

Appendix L – Summary of Future Overall Financial Requirements

Appendix M – Funding Policy, Fees and Charges

S4 Asset Management Enablers

Underpinning Asset Management decision-making at each stage are the following.

S4.1 Asset Management Teams

The Council has an organisational structure and capability that supports the AM planning process. Responsibility for asset planning across the lifecycle is delivered by teams within the Council as shown by Figure S-3 below.

Corporate and Strategic Planning is performed by the Strategic Policy team in the Community Services Department.

The Asset Management function is managed by Engineering's Activity Planning team. Operations are the responsibility of the Utilities and Transportation teams, while Projects and Contracts are managed by the Programme Delivery team.

Operations and maintenance contracts are externally tendered. Professional services are supplied by MWH New Zealand Ltd and other consultants. Details are discussed in Section 4.4.

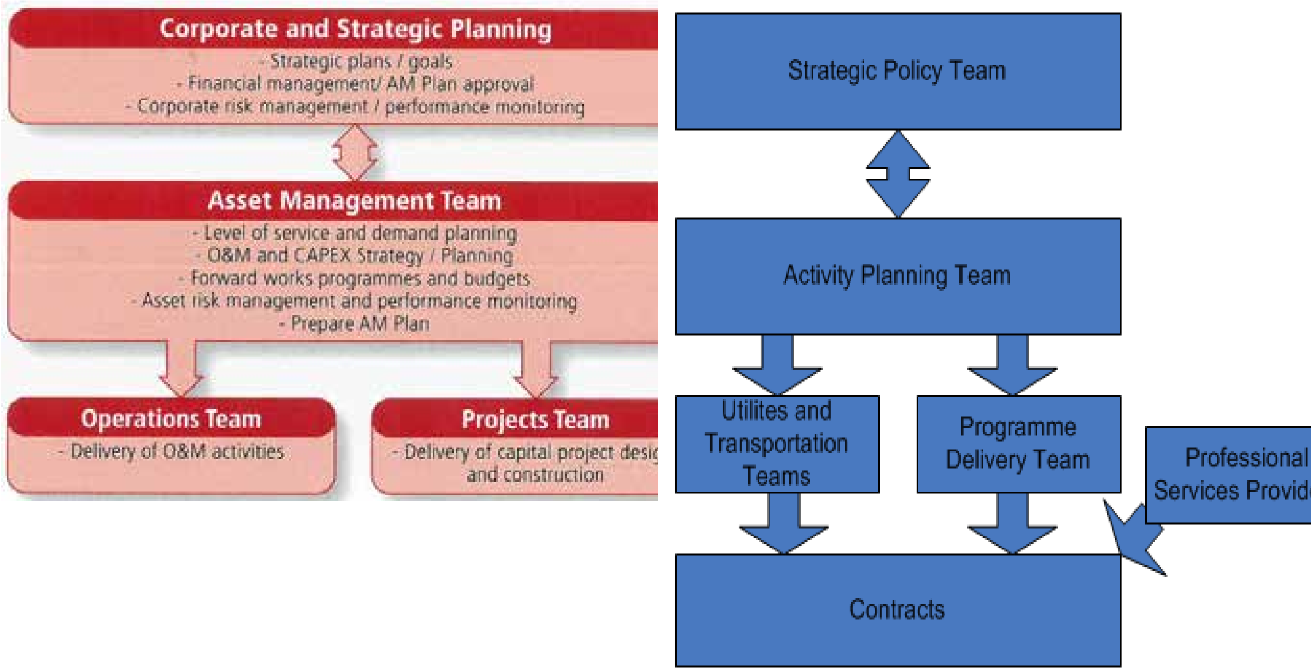


Figure S-3: Asset Management Team Roles (taken from IIMM 2011) and Asset Management Teams at Tasman District Council.

S4.2 Asset Management Plans

Asset Management plans need to be robust and set out clear future strategies and programmes. This document is a key part of the Asset Management process and will be updated on a regular basis in between AMP planning cycles.

S4.3 Information Systems and Tools

The Council has a variety of systems and tools that support effective operation and maintenance, record asset data, and enable that data to be analysed to support optimal asset programmes. These are detailed below. There is a continual push to incorporate all asset data into the core AM systems where possible; where not possible, attempts are made to integrate or link systems so that they can be easily accessed.

Figure S-2 shows how the various systems used in the Council inter-relate.

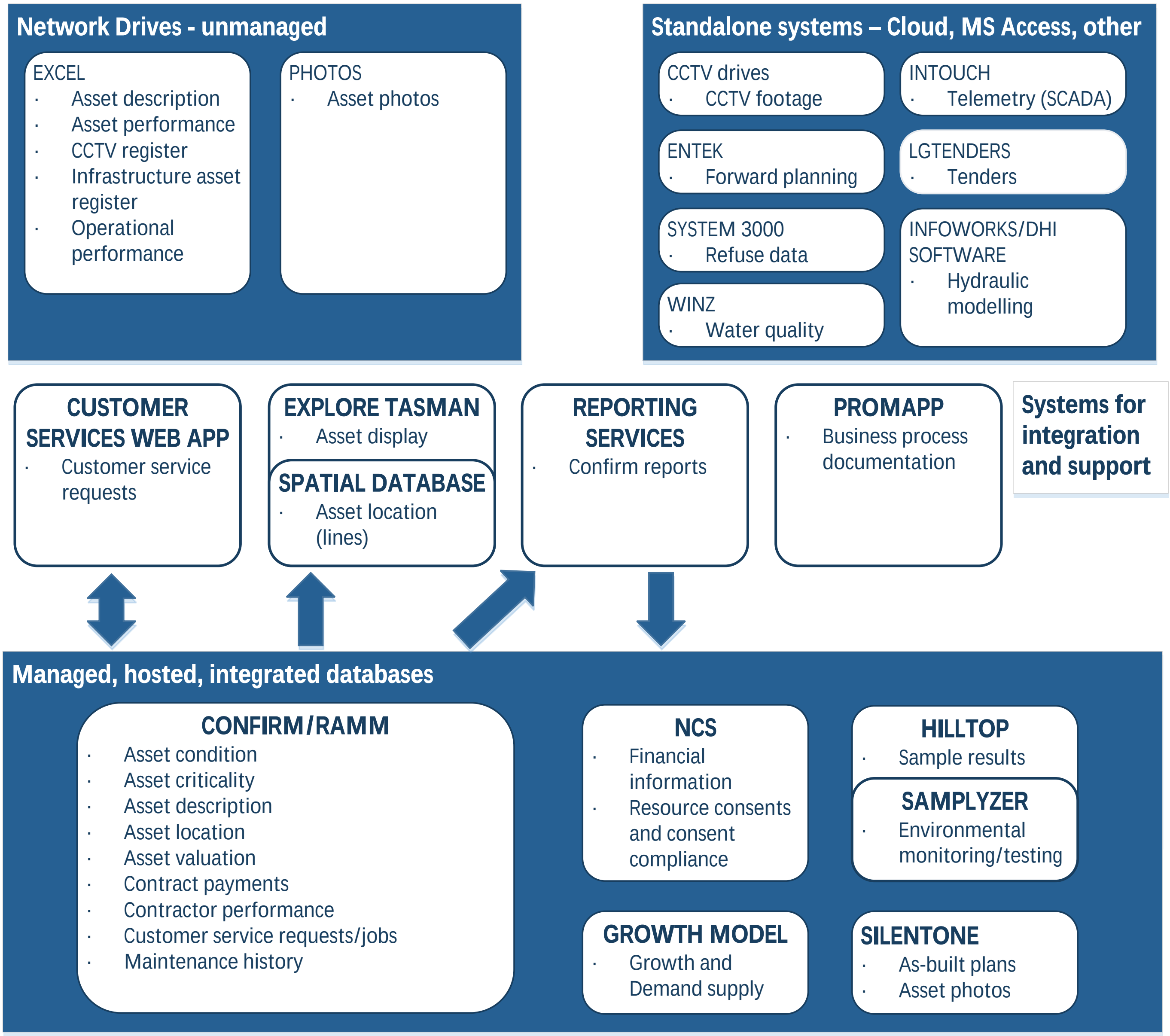


Figure S-2: Systems used for Asset Management at Tasman District Council

Table S-2 lists the various data types and systems they are held in, with a summary of how they are managed.

Table S-3 defines the Accuracy and Completeness grades applied to asset data in Table S-2

Table S-2: Data Types and Information Systems Used

Data type	Information system	Management strategy	Data accuracy	Data completeness
As-built plans	SilentOne	As-built plans are uploaded to SilentOne, allowing digital retrieval. Each plan is audited on receipt to ensure a consistent standard and quality.	2	2
Asset condition	Confirm	See discussion in section S2.5.	N/A	N/A
Asset criticality	Confirm	See section S2.6.1 Asset Risks	4	3

Data type	Information system	Management strategy	Data accuracy	Data completeness
		- Critical assets.		
Asset description	Confirm / spreadsheets	All assets are captured in Confirm's Site and Asset modules, from as-built plans and maintenance notes. Hierarchy is defined by Site and three levels of Asset ID (whole site, whole asset or asset). Assets are not broken down to component level except where required for valuation purposes. It is also possible to set up asset connectivity but this hasn't been prioritised for the future yet. Detail on some datasets held in spreadsheets relating to Utilities Maintenance Contract 688; work is in progress to transfer this detail to Confirm as resourcing allows.	2	2
Asset location	Confirm (point data) / GIS (line data)	Co-ordinates for point data completely (NZTM) describe spatial location. Line data links to GIS layers that describe the shape.	2	2
Asset valuation	Confirm	Valuation of assets done based on data in Confirm and valuation figures stored in Confirm.	2	2
Contract payments	Confirm	All maintenance and capital works contract payments are done through Confirm. Data on expenditure is extracted and uploaded to NCS.	N/A	N/A
Contractor performance	Confirm	Time to complete jobs is measured against contract KPIs through Confirm's Maintenance Management module.	N/A	N/A
Corporate GIS browser	Explore Tasman	Selected datasets are made available to all the Council staff through this internal GIS browser via individual layers and associated reports.	N/A	N/A

Data type	Information system	Management strategy	Data accuracy	Data completeness
Customer service requests	Customer Services Application / Confirm	Customer calls relating to asset maintenance are captured in the custom-made Customer Services Application and passed to Confirm's Enquiry module or as a RAMM Contractor Dispatch.	N/A	N/A
Drinking water quality monitoring / testing	WINZ	WINZ is a desktop system based on the Drinking-water Standards for New Zealand 2005. It is used for scheduling, monitoring sample entry, evaluating standards compliance, and completing the Annual Review.	2	2
Financial information	NCS	The Council's corporate financial system is NCS, a specialist supplier of integrated financial, regulatory and administration systems for Local Government. Contract payment summaries are reported from Confirm and imported into NCS for financial tracking of budgets. NCS also holds Water billing information, while asset details and spatial component are recorded in Confirm and cross-referenced.	N/A	N/A
Infrastructure Asset Register	Spreadsheet	High level financial tracking spreadsheet for monitoring asset addition, disposals and depreciation. High level data is checked against detail data in the AM system and reconciled when a valuation is performed.	2	2
Forward planning	Entek TPM (Time and Space Project Management)	Forward programmes for the Council's activities, and reseal / footpath renewal programmes, are uploaded to TPM in order to identify clashes and opportunities. The strength of this module relied on buy in from Utilities Companies and Local Contractors (neither of which occurred).	N/A	N/A
Growth and	Growth	A series of linked processes	2	2

Data type	**Information system**	**Management strategy**	**Data accuracy**	**Data completeness**
Demand Supply	Model	that underpin the Council's long term planning, by predicting expected development areas, revenues and costs, and estimating income for the long term.		
Hydraulic modelling	Infoworks / DHI Software	Models have been developed for a number of schemes and catchments. Copies of the models are held on the Council's network drives.	2	4
Maintenance history	Confirm	Contractor work is issued via Confirm's Maintenance Management module. History of maintenance is stored against individual assets. Prior to 2007 it was logged at a scheme level.	2	2
Operational performance	Spreadsheet / Intouch	Flow meter (determines performance of network as a whole) and pump performance is recorded in a spreadsheet and Intouch, which is shared with the contractor. Annual compliance reports for Resource Consents sent to various parties are also an indication of performance. Standard Operating Procedures are updated as changes are made.	2	2
Photos	Network drives / SilentOne	Electronic photos of assets are mainly stored on the Council's network drives. Coastal Structures and Streetlight photos have been uploaded to SilentOne and linked to the assets displayed via Explore Tasman.	N/A	N/A
Processes and documentation	Promapp	Promapp is process management software that provides a central online repository where Council's process diagrams and documentation is stored. It was implemented in 2014 and there is a phased uptake by business units.	2	5

Data type	Information system	Management strategy	Data accuracy	Data completeness
Resource consents and consent compliance	NCS	Detail on Resource Consents and their compliance of conditions (e.g. sample testing) are recorded in the NCS Resource Consents module.	2	2
Reports	Confirm Reports	Many SQL based reports from Confirm and a few from RAMM are delivered through Confirm Reports. Explore Tasman also links to this reported information to show asset information and links (to data in SilentOne and NCS).	N/A	N/A
Telemetry (SCADA)	Intouch	Used to monitor remotely the performance of key assets at major installations. Contractors can remotely control systems and assets.	2	2
Tenders	LGTenders	Almost all New Zealand councils use this system to advertise their tenders and to conduct the complete tendering process electronically.	N/A	N/A

Table S-3: Asset Data Accuracy and Completeness Grades

Grade	Description	% Accuracy
1	Accurate	100
2	Minor inaccuracies	± 5
3	50% estimated	± 20
4	Significant data estimated	± 30
5	All data estimated	± 40

Grade	Description	% Completeness
1	Complete	100
2	Minor gaps	90 – 99
3	Major gaps	60 – 90
4	Significant gaps	20 – 60
5	Limited data available	0 – 20

S4.4 Asset Management Service Delivery

The Council has opted to tender Capital Works and Operations and Maintenance externally to obtain more cost-effective service delivery.

The Council has adopted effective procurement strategies, such that AM activities are being delivered in the most cost-effective way (value for money rather than lowest cost).

S4.4.1 Procurement Strategy

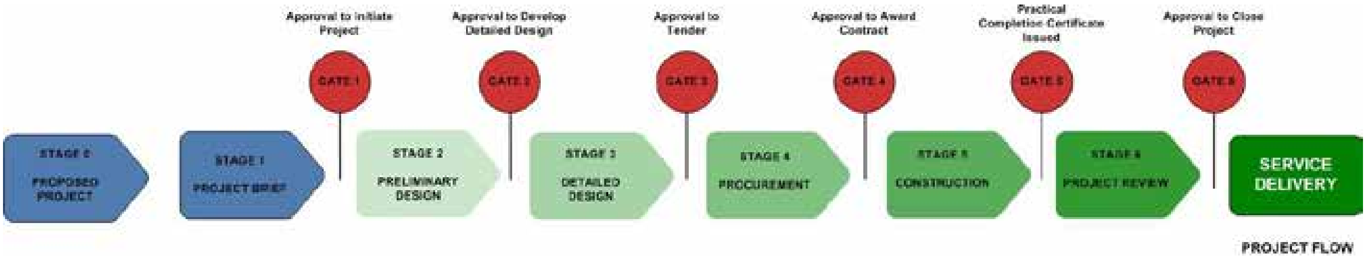
Tasman District Council has a formal Procurement Strategy for its Engineering Services. This Strategy has been prepared to meet New Zealand Transport Agency’s (NZTA) requirements for expenditure from the National Land Transport Fund, and it describes the procurement environment that exists within the Tasman District. It has been developed following a three-year review of the Strategy and approved in November 2013. It principally focuses on Engineering Services activities but is framed in the NZTA procurement plan format, which is consistent with whole of government procurement initiatives.

The Council's objectives are to:

- implement policies and financial management strategies that advance the Tasman District;
- ensure sustainable management of natural and physical resources, and security of environmental standards;
- sustainably manage infrastructure assets relating to Tasman District;
- enhance community development and the social, natural, cultural and recreational assets relating to Tasman District;
- promote sustainable economic development in the Tasman District.

The Council has recently implemented a procurement and tender award governance gateway process. This is shown in Figure S-3 below.

Figure S-3: Gateway Process used by Programme Delivery Team



At the Approval to Tender gate (Gate 3), the Tender Evaluation Team:

1. Carefully reviews the specifications, drawings, detailed design;
2. Reviews estimate against allocated budget and checks availability of funds;
3. Assesses/ reviews project-specific risks and critical success factors;
4. Selects the evaluation method (supplier panel or direct to market; Price/Quality, Lowest Price Conforming, Weighted Attributes, Target Price, Brooks Law, etc) – check best suited to project's scope and risk levels;
5. Checks peer review of design;
6. Checks status of required consents and land issues;
7. Reviews Price/ Non-Price weightings, risk review and quality premium they are prepared to pay;
8. Reviews attributes (including pass/ fail and/ or weightings) and targeted questions in RFT to check for relevance to project-specific success factors and differentiators;
9. Reviews the response period (relative to RFT requirements) to ensure there is sufficient time for quality responses;

At the Approval to Award gate (Gate 4), the Programme Delivery Manager:

1. Reviews the tender process to check relevance/ effectiveness;
2. Reviews the recommendation;
3. Checks if Tender Panel approval is required;

4. Awards the Contract.

S4.4.2 Professional Services Contract

The Engineering Services Department has a need to access a broad range of professional service capabilities to undertake investigation, design and procurement management in support of its significant transport, utilities, coastal management, flood protection and solid waste capital works programme. There is also a need to access specialist skills for design, planning and policy to support the in-house management of the Council's networks, operations and maintenance.

To achieve this the Council went to the open market in late 2013 for a primary professional services provider as a single preferred consultant to undertake a minimum of 60% in value of the Council's infrastructure professional services programmes. The contract was awarded to MWH New Zealand Ltd following a six month tender selection process and commenced on 1 July 2014 with an initial three year term and two three-year extensions to be awarded at the Council's sole discretion.

S4.5 Quality Management

Table 5-4 outlines quality management approaches that support the Council's asset management processes and systems.

Table 5-4: Quality Management Approach

Process documentation	This is being phased in across the Council with the implementation of Promapp. Over time business units are capturing organisational knowledge in an area accessible to all staff, to ensure business continuity and consistency. Detailed documentation, forms and templates can be linked to each activity in a process. Processes are shown in flowchart or swim lane format, and can be shared with external parties.
Quality Management systems	Tasman District Council does not have a formal Quality Management system across the Council; quality is ensured by audits and checks that are managed in individual teams. Quality checks are done at many stages throughout the Asset Management process.
Planning	The planning process is formalised across the Council, with internal reviews and the Council approval stages. Following completion of the AMPs, a peer review is done. From that a comprehensive Improvement Plan is drawn up. Actions are discussed at regular meetings and progress noted. These will be incorporated into the following round of AMPs.
Programme Delivery	This strictly follows a gateway system with inbuilt checks and balances at every stage. Projects can't proceed until all criteria of a certain stage have been completely met and formally signed off.
Subdivision works	Subdivision sites are audited for accuracy of data against the plans submitted. CCTV is performed on all subdivision Stormwater and Wastewater assets at completion of works and again before the assets are vested in the Council, so that defects can be repaired.
Asset creation	As-built plans are reviewed on receipt for completeness and adherence to the Engineering Standards and Policies. If anomalies are discovered during data entry, these are investigated and corrected. As-built information and accompanying documentation is required to accompany maintenance contract claims.
Asset data integrity	Monthly reports are run to ensure data accuracy and completeness. Stormwater, Water, Wastewater, Coastal Structures, Solid Waste and Streetlight assets are

	shown on the corporate GIS browser, Explore Tasman, and viewers are encouraged to report anomalies to the Activity Planning Data Management team.
Asset performance	Audits of reticulation flows are done regularly to ensure that system performance is optimal.
Operations	Audits of a percentage of contract maintenance works are done every month to ensure that performance standards are maintained. Failure to comply with standards is linked to financial penalties for the contractor.
Levels of Service	Key performance indicators are reported regularly in Engineering Services council meetings and then again annually and audited by the Office of the Auditor-General.
Customer Service Requests (CSRs)	Asset based CSRs (in Confirm and RAMM) are checked monthly for outstanding items via a customised report that is e-mailed to action officers. Non-asset based CSRs (in NCS) are checked for compliance weekly at Senior Management Teams, via a dashboard reporting system.
Reports to Council	All reports that are presented to the Council are reviewed and edited by the Executive Assistant prior to approval by the Engineering Manager and the Senior Management Team.

S4.6 Continuous Improvement

Processes are in place to monitor the adequacy, suitability and effectiveness of all asset management planning activities to drive a continuous cycle of review, corrective action and improvement. These are covered by Appendix V, Improvement Programme.

APPENDIX T BYLAWS

The following bylaws have been adopted by the Council:

- Consolidated Bylaws 2013 - Introduction
- Control of Liquor in Public Places 2012
- Dog Control Bylaw 2014
- Freedom Camping Bylaw 2011
- Freedom Camping (Motueka Beach Reserve) Bylaw 2013
- Navigation Safety Bylaw 2014
- Speed Limits Bylaw 2013
- Stock Control and Droving Bylaw 2005
- Wastewater Bylaw 2015
- Trading in Public Places Bylaw 2010
- Traffic Control Bylaw 2013
- **Water Supply Bylaw 2009*.**

In accordance with the Local Government Act 2002, these bylaws will be reviewed no later than 10 years after they was last reviewed.

*Bylaw of direct relevance in to this activity.

APPENDIX U STAKEHOLDERS AND CONSULTATION

U.1 Stakeholders

There are many individuals and organisations that have an interest in the management and / or operation of Council's assets. The Council has a Community and Engagement Policy which is designed to guide the expectations with the relationship between the Council and the Tasman community. The Council has made a promise to seek out opportunities to ensure the communities and people it represents and provides services to have the opportunity to:

- be fully informed;
- provide reasonable time for those participating to come to a view;
- listen to what they have to say with an open mind;
- acknowledge what we have been told; and
- inform contributors how their input influenced the decision the Council made or is contemplating.

Engagement or consultation:

- is about providing more than information or meeting a legal requirement;
- aids decision making;
- is about reaching a common understanding of issues;
- is about the quality of contact not the amount; and
- is an opportunity for a fully informed community to contribute to decision-making.

The key stakeholders the Council consults with about the wastewater activity are:

- elected members (Councillors and Community Board members);
- iwi/Maori (including Tiakina te Taiao and Manawhenua ki Mohua, iwi monitors);
- regulatory (consent compliance, Public Health);
- fisheries organizations;
- Public Health Service (Nelson Marlborough District Health Board);
- Heritage New Zealand;
- Civil Contractors New Zealand (Nelson - Marlborough);
- service providers / suppliers (Network Tasman, power companies);
- affected or interested parties (when applying for resource consents);
- Neighbours.

U.2 Consultation

U.2.1 Purpose of Consultation and Types of Consultation

The Council consults with the public to gain an understanding of customer expectations and preferences. This enables the Council to provide a level of service that better meets the community's needs.

The Council's knowledge of customer expectations and preferences is based on:

- feedback from surveys;

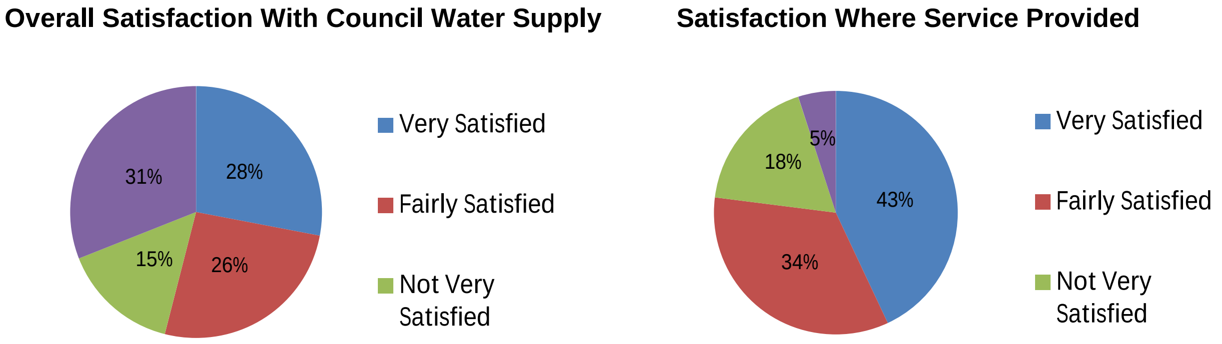
- public meetings;
- feedback from elected members, advisory groups and working parties;
- analysis of customer service requests and complaints;
- consultation via the Annual Plan and Long Term Plan (LTP) process.

The Council commission's resident surveys on a regular basis, every year since 2008, from the National Research Bureau Ltd[1]. These CommunitrakTM surveys assess the levels of satisfaction with key services, including water supply services, and the willingness across the community to pay to improve services.

From time to time the Council undertakes focussed surveys to get information on specific subjects or projects.

U.2.2 Consultation Outcomes

The most recent NRB Communitrak™ survey was undertaken in May 2014. This asked whether residents were satisfied with the water system and included residents that had a Council service and some that were not on a Council service. The results from this survey are summarised in Figure U-1.


Overall Satisfaction With Council Water Supply

Satisfaction Where Service Provided

Figure U-1: Customer Satisfaction with Council Water Supply – Communitrak™ 2014

A large percent (31%) were unable to comment on their satisfaction with the Council's water supply. This is likely to due to the fact that many residents interviewed said they were not provided with a Council water supply.

Figure U-2 shows a downward trend since 2012 in the numbers of people either 'very' or 'fairly' satisfied with the service.

The results are also slightly below Council's Peer Group average and below the National average. Where service is provided, the level of satisfaction is more comparable.

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[1] Communitrak™: Public Perceptions and Interpretations of Council Services / Facilities and Representation, NRB Ltd May 2014.

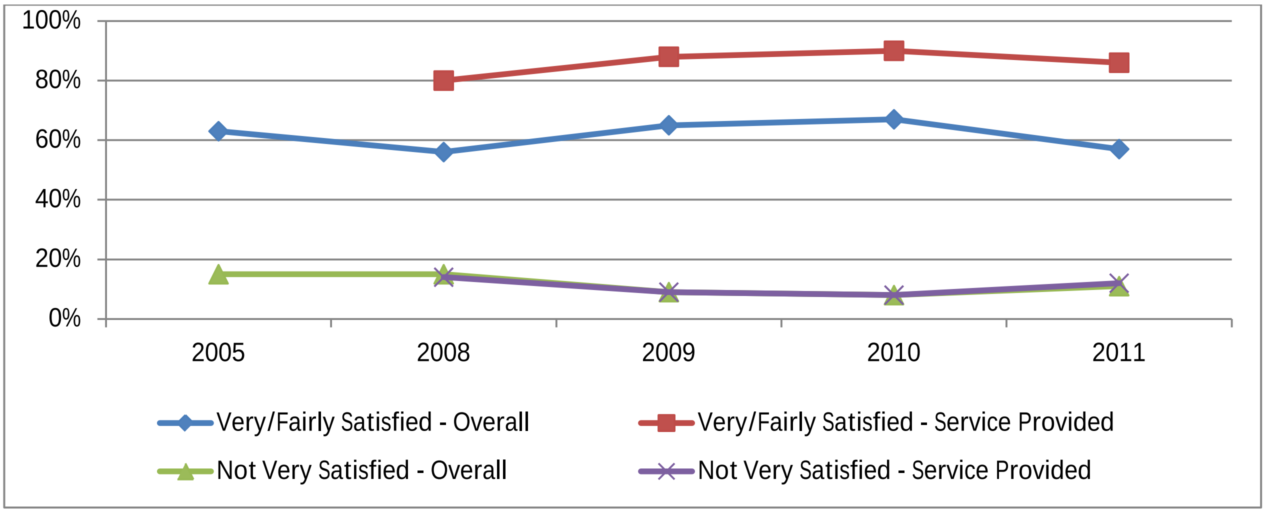

Figure U-2: Trend in Customer Satisfaction

The main reasons residents are not very satisfied with the water supply in Tasman district are:

- cost / too expensive / increased charges / paying for other areas;
- not on town piped water supply;
- inadequate supply / restrictions.

Tasman has a slightly higher level of dissatisfaction than its peer group and the National average.

Figure U-3 shows the overall satisfaction with the Council's water supply by Ward.

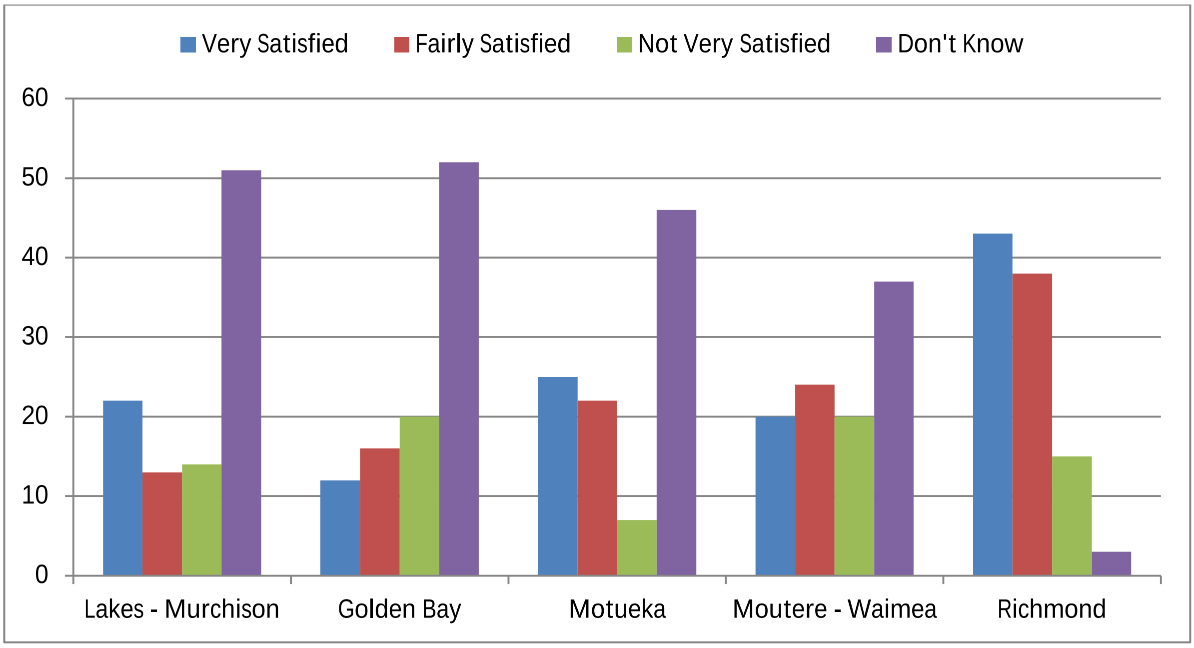

Figure U-3: Comparison of Customer Satisfaction by Ward

When asked whether they would like more to be spent, or less or about the same on water supply given that the Council cannot spend more without increasing rates or user charges, most said they would like to see the same or more. This is shown in Figure U-4.

The community's spending desires relating to water services have stayed essentially static comparing 2011 and 2014 results.

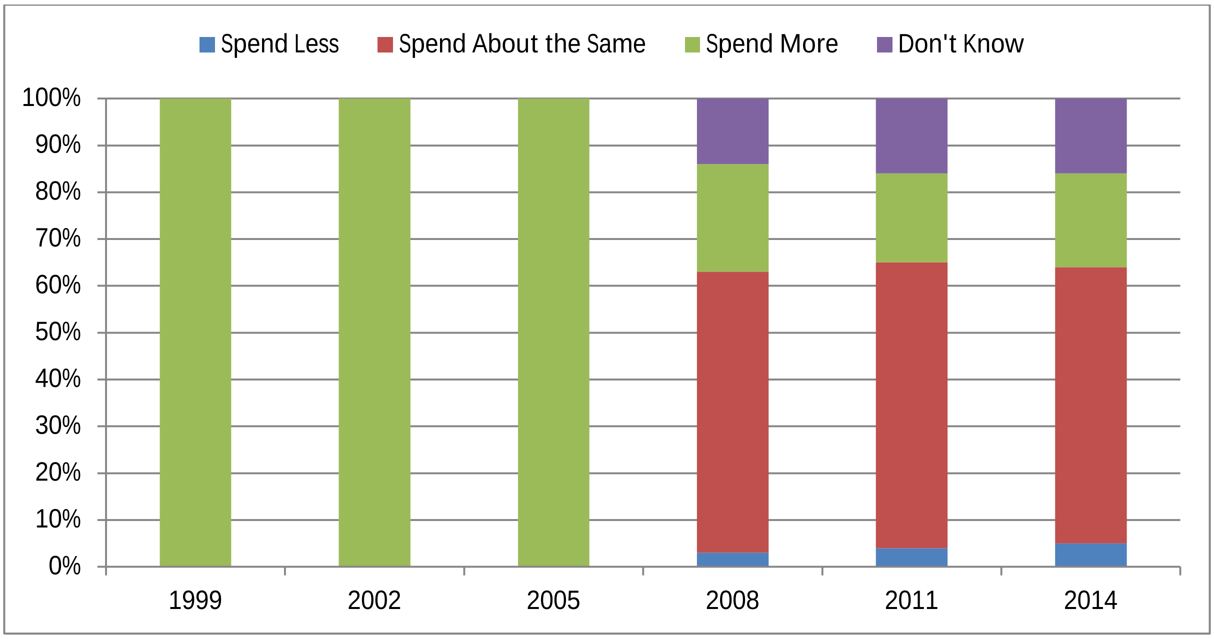

Figure U-4: More or Less Spending on Water Supply

APPENDIX V IMPROVEMENT PLAN

To be provided in final document.

APPENDIX W ASSET DISPOSALS

W.1 Asset Disposal Strategy

The Council does not have a formal strategy on asset disposals and as such it will treat each asset individually on a case by case basis when it reaches a state that disposal needs to be considered.

Asset disposal is generally a by-product of renewal or upgrade decisions that involve the replacement of assets.

Assets may also become redundant for any of the followings reasons:

- under utilisation;
- obsolescence;
- provision of the asset exceeds the required level of service;
- uneconomic to upgrade or operate;
- policy change;
- the service is provided by other means (eg. private sector involvement);
- potential risk of ownership (financial, environmental, legal, social, vandalism).

Depending on the nature, location, condition and value of an asset it is either:

- made safe and left in place;
- removed and disposed of;
- removed and sold;
- ownership transferred to other stakeholders by agreement.

In most situation assets are replaced at the end of their useful lives and are generally in poor physical condition. Consequently, the asset with be disposed of to waste upon its removal. In some situations an asset may require removal or replacement prior to the end of its useful life. In this circumstance the Council may hold the asset in stock for reuse elsewhere on the network. Otherwise, if this is not appropriate it could be sold off, transferred or disposed of.

When assets sales take place the Council aims to obtain the best available return from the sale and any net income will be credited to that activity. The Council follows practices that comply with the relevant legislative requirements for local government when selling off assets.

W.2 Disposal Standards

The Council follows a practice of obtaining best available return from the disposal or sale of assets within an infrastructural activity and any net income is credited to that activity.

W.3 Forecast Asset Disposals

Currently significant water assets programmed for disposal are:

- Richmond Water Treatment Plant once the new plant is operational in 2015.
- Fearons Bush Motueka Water Treatment Plant once the new Parker Street plant is operational in 2017.

APPENDIX X GLOSSARY OF ASSET MANAGEMENT TERMS

Acronyms and Abbreviations

AMP	Activity Management Plan
LGA	Local Government Act
LTP	Long Term Plan
TRMP	Tasman Regional Management Plan

Term	Description
Activity	An activity is the work undertaken on an asset or group of assets to achieve a desired outcome.
Activity Management Plan (AMP)	Activity Management Plans are key strategic documents that describe all aspects of the management of assets and services for an activity. The documents feed information directly in the Council's LTP, and place an emphasis on long term financial planning, community consultation, and a clear definition of service levels and performance standards.
Advanced Asset Management	Asset management that employs predictive modelling, risk management and optimised renewal decision-making techniques to establish asset lifecycle treatment options and related long term cash flow predictions. (See Basic Asset Management).
Annual Plan	The Annual Plan provides a statement of the direction of Council and ensures consistency and co-ordination in both making policies and decisions concerning the use of Council resources. It is a reference document for monitoring and measuring performance for the community as well as the Council itself.
Asset	A physical component of a facility that has value enables services to be provided and has an economic life of greater than 12 months.
Asset Management (AM)	The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost-effective manner.
Asset Management System (AMS)	A system (usually computerised) for collecting analysing and reporting data on the utilisation, performance, lifecycle management and funding of existing assets.
Asset Management Plan	A plan developed for the management of one or more infrastructure assets that combines multi-disciplinary management techniques (including technical and financial) over the lifecycle of the asset in the most cost-effective manner to provide a specified level of service. A significant component of the plan is a long-term cash flow projection for the activities.
Asset Management Strategy	A strategy for asset management covering, the development and implementation of plans and programmes for asset creation, operation, maintenance, renewal, disposal and performance monitoring to ensure that the desired levels of service and other operational objectives are achieved at optimum cost.

Term	Description
Asset Register	A record of asset information considered worthy of separate identification including inventory, historical, financial, condition, construction, technical and financial information about each.
Basic Asset Management	Asset management which relies primarily on the use of an asset register, maintenance management systems, job/resource management, inventory control, condition assessment and defined levels of service, in order to establish alternative treatment options and long term cashflow predictions. Priorities are usually established on the basis of financial return gained by carrying out the work (rather than risk analysis and optimised renewal decision making).
Benefit Cost Ratio (B/C)	The sum of the present values of all benefits (including residual value, if any) over a specified period, or the life cycle of the asset or facility, divided by the sum of the present value of all costs.
Business Plan	A plan produced by an organisation (or business units within it) which translate the objectives contained in an Annual Plan into detailed work plans for a particular, or range of, business activities. Activities may include marketing, development, operations, management, personnel, technology and financial planning.
Capital Expenditure (CAPEX)	Expenditure used to create new assets or to increase the capacity of existing assets beyond their original design capacity or service potential. CAPEX increases the value of an asset.
Condition Monitoring	Continuous or periodic inspection, assessment, measurement and interpretation of resulting data, to indicate the condition of a specific component so as to determine the need for some preventive or remedial action
Critical Assets	Assets for which the financial, business or service level consequences of failure are sufficiently severe to justify proactive inspection and rehabilitation. Critical assets have a lower threshold for action than non-critical assets.
Current Replacement Cost	The cost of replacing the service potential of an existing asset, by reference to some measure of capacity, with an appropriate modern equivalent asset.
Deferred Maintenance	The shortfall in rehabilitation work required to maintain the service potential of an asset.
Demand Management	The active intervention in the market to influence demand for services and assets with forecast consequences, usually to avoid or defer CAPEX expenditure. Demand management is based on the notion that as needs are satisfied expectations rise automatically and almost every action taken to satisfy demand will stimulate further demand.
Depreciated Replacement Cost (DRC)	The replacement cost of an existing asset after deducting an allowance for wear or consumption to reflect the remaining economic life of the existing asset.
Depreciation	The wearing out, consumption or other loss of value of an asset whether arising from use, passing of time or obsolescence through technological and market changes. It is accounted for by the allocation of the historical cost (or revalued amount) of the asset less its residual value over its useful life.
Disposal	Activities necessary to dispose of decommissioned assets.

Term	Description
Economic Life	The period from the acquisition of the asset to the time when the asset, while physically able to provide a service, ceases to be the lowest cost alternative to satisfy a particular level of service. The economic life is at the maximum when equal to the physical life however obsolescence will often ensure that the economic life is less than the physical life.
Facility	A complex comprising many assets (eg. swimming pool complex, etc.) which represents a single management unit for financial, operational, maintenance or other purposes.
Geographic Information System (GIS)	Software which provides a means of spatially viewing, searching, manipulating, and analysing an electronic database.
Infrastructure Assets	Stationary systems forming a network and serving whole communities, where the system as a whole is intended to be maintained indefinitely at a particular level of service potential by the continuing replacement and refurbishment of its components. The network may include normally recognised 'ordinary' assets as components.
I.M.S.	Infrastructure Management System - computer database
Level of Service (LoS)	The defined service quality for a particular activity (ie. water) or service area (ie. Water quality) against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental acceptability and cost.
Life	A measure of the anticipated life of an asset or component; such as time, number of cycles, distance intervals etc.
Life Cycle	Life cycle has two meanings. · The cycle of activities that an asset (or facility) goes through while it retains an identity as a particular asset ie. from planning and design to decommissioning or disposal. · The period of time between a selected date and the last year over which the criteria (eg. costs) relating to a decision or alternative under study will be assessed.
Life Cycle Cost	The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal costs.
Life Cycle Maintenance	All actions necessary for retaining an asset as near as practicable to its original condition, but excluding rehabilitation or renewal.
Long Term Plan (LTP)	The Long Term Plan is the primary strategic document through which Council communicates its intentions over the next 10 years for meeting community service expectations and how it intends to fund this work. The LTP is a key output required of Local Authorities under the Local Government Act 2002. The LTP replaces the Long Term Council Community Plan (LTCCP).
Maintenance Plan	Collated information, policies and procedures for the optimum maintenance of an asset, or group of assets.

Term	Description
Objective	An objective is a general statement of intention relating to a specific output or activity. They are generally longer-term aims and are not necessarily outcomes that managers can control.
Operation	The active process of utilising an asset which will consume resources such as manpower, energy, chemicals and materials. Operation costs are part of the life cycle costs of an asset.
Optimised Renewal Decision Making (ORDM)	An optimisation process for considering and prioritising all options to rectify performance failures of assets. The process encompasses NPV analysis and risk assessment.
Performance Indicator (PI)	A qualitative or quantitative measure of a service or activity used to compare actual performance against a standard or other target. Performance indicators commonly relate to statutory limits, safety, responsiveness, cost, comfort, asset performance, reliability, efficiency, environmental protection and customer satisfaction.
Performance Monitoring	Continuous or periodic quantitative and qualitative assessments of the actual performance compared with specific objectives, targets or standards.
Planned Maintenance	Planned maintenance activities fall into three categories. · Periodic – necessary to ensure the reliability or sustain the design life of an asset. · Predictive – condition monitoring activities used to predict failure. · Preventive – maintenance that can be initiated without routine or continuous checking (eg. using information contained in maintenance manuals or manufacturers' recommendations) and is not condition-based.
Recreation	Means voluntary non-work activities for the attainment of personal and social benefits, including restoration (recreation) and social cohesion.
Rehabilitation	Works to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. Generally involves repairing the asset using available techniques and standards to deliver its original level of service without resorting to significant upgrading or replacement.
Renewal	Works to upgrade, refurbish, rehabilitate or replace existing facilities with facilities of equivalent capacity or performance capability.
Renewal Accounting	A method of infrastructure asset accounting which recognises that infrastructure assets are maintained at an agreed service level through regular planned maintenance, rehabilitation and renewal programmes contained in an asset management plan. The system as a whole is maintained in perpetuity and therefore does not need to be depreciated. The relevant rehabilitation and renewal costs are treated as operational rather than capital expenditure and any loss in service potential is recognised as deferred maintenance.
Repair	Action to restore an item to its previous condition after failure or damage.
Replacement	The complete replacement of an asset that has reached the end of its life, so as to provide a similar or agreed alternative, level of service.

Term	Description
Remaining Economic Life	The time remaining until an asset ceases to provide service level or economic usefulness.
Risk Cost	The assessed annual cost or benefit relating to the consequence of an event. Risk cost equals the costs relating to the event multiplied by the probability of the event occurring.
Risk Management	The application of a formal process to the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probability of occurrence.
Routine Maintenance	Day to day operational activities to keep the asset operating (eg. replacement of light bulbs, cleaning of drains, repairing leaks) and which form part of the annual operating budget, including preventative maintenance.
Service Potential	The total future service capacity of an asset. It is normally determined by reference to the operating capacity and economic life of an asset.
Strategic Plan	Strategic planning involves making decisions about the long term goals and strategies of an organisation. Strategic plans have a strong external focus, cover major portions of the organisation and identify major targets, actions and resource allocations relating to the long term survival, value and growth of the organisation.
Unplanned Maintenance	Corrective work required in the short term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity.
Upgrading	The replacement of an asset or addition/ replacement of an asset component which materially improves the original service potential of the asset.
Valuation	Estimated asset value that may depend on the purpose for which the valuation is required, ie. replacement value for determining maintenance levels or market value for life cycle costing.

APPENDIX Y WATER SUPPLY AREA BOUNDARIES AND FACILITIES

The area boundaries are correct as at July 2015. The boundaries are revised periodically.

- Brightwater/Teapot Valley
- Collingwood
- Dovedale
- Eighty Eight Valley
- Kaiteriteri
- Mapua
- Motueka
- Murchison
- Pohara
- Redwood Valley
- Richmond/Waimea North (Richmond Supply Wells)
- Richmond/Waimea North (Waimea Water Treatment and Supply Wells)
- Richmond/Waimea South East
- Richmond/Waimea South West
- Tapawera
- Upper Takaka
- Wakefield

APPENDIX Z AMP STATUS AND DEVELOPMENT PROCESS – STORMWATER

Z.1 Quality Assurance

Quality Assurance Statement		
Tasman District Council 189 Queen Street Private Bag 4 Richmond 7050 Telephone: (03) 543 8400 Fax: (03) 543 9524	**Version:**	Draft – January 2015
	Status:	Draft
	Project Manager:	Dwayne Fletcher
	Prepared by: **AMP Author**	Ian McComb
	Approved for issue by: **Engineering Manager**	Peter Thomson

Z.2 Quality Requirements and Issues

	Issues and Requirements	Description
1	Fitness for Purpose	The AMP has to be “fit for purpose”. It has to comply with Audit NZ expectations of what an AMP should be to provide them the confidence that the Council is adequately managing the Council activities.
2	AMP Document Consistency	Council want a high level of consistency between AMPs so that a reader can comfortably switch between plans.
3	AMP Document Format	The documents need to be prepared to a consistent and robust format so that the electronic documents are not corrupted (as happens to large documents that have been put together with a lot of cutting and pasting) and can be made available digitally over the internet.
4	AMP Text Accuracy and Currency	The AMPs are large and include a lot of detail. Errors or outdated statements reduce confidence in the document. The AMPs need to be updated to current information and statistics.
5	AMP Readability	The AMPs in their current form have duplication – where text is repeated in the “front” section and the Appendices. This needs to be rationalised so that the front section is slim and readable and the Appendix contains the detail without unnecessary duplication.
6	Completeness of Required Upgrades/Expenditure Elements	The capital expenditure forecasts and the operations and maintenance forecasts need to be complete. All projects and cost elements need to be included.
7	Accuracy of Cost Estimates	Cost estimates need to be as accurate as the data and present knowledge allows, consistently prepared and decisions made about timing of implementation, drivers for the project and level of accuracy the estimate is prepared to.

	Issues and Requirements	Description
8	Correctness of Spreadsheet Templates	The templates prepared for use need to be correct and fit for purpose.
9	Assumptions and Uncertainties	Assumptions and uncertainties need to be explicitly stated on the estimates.
10	Changes Made After Submission to Financial Model	If Council makes decisions on expenditure after they have been submitted into the financial model, the implications of the decisions must be reflected in the financial information and other relevant places in the AMP – eg. Levels of service and performance measures, improvement plans etc.
11	Improvement Plan Adequate	Improvements identified, costed, planned and financially provided for in financial forecasts.