tasman district council | Te Kaunihera o te tai o Aorere

Water Supply
Activity Management Plan
2021-2051

Quality Assurance Statement		
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Contents

1 Executive Summary

1.1 What We Do

Safe and reliable water is a fundamental community need. The Council provides potable and non-potable water to about 13,600 properties (approximately 30,000 people) throughout Tasman District. About 55% of our population is serviced by one of our managed community water supplies.

Our water supply services include:

- On demand-metered supply – no restriction is placed on the supply and the urban property has a meter
- Restricted supply – a set amount of water per day is made available to the property, this typically occurs on our rural schemes)
- Firefighting capability – to FW2 standard is provided in the urban-metered supply areas
- The capture, storage, and release of water from the Wai-iti Community Dam (provides supplementary flow to Wai-iti River); and
- An investment, in conjunction with Waimea Irrigators Limited, in the Waimea Community Dam (WCD) to capture, store and release water into the Waimea Plains.

The Council own and operate 20 water supplies and manage the associated infrastructure. Water supplies include Brightwater, Collingwood, Dovedale, Eighty –Eight Valley, Hamama, Kaiteriteri/Riwaka, Māpua Rise, Māpua/Ruby Bay, Motueka, Murchison, Pōhara, Redwood Valley 1, Redwood Valley 2, Richmond, Tākaka, Tapawera, Upper Tākaka, Wai-iti Community Dam', 51% of WCD (under construction) and Wakefield.

In addition to water supply schemes, we manage the Wai-iti storage dam to provide supplementary water into the Lower Wai-iti River and adjoining aquifer. This enables sustained water extraction for land irrigation at times of low river flows. We are a majority shareholder in the WCD. The WCD is currently under construction and is anticipated to be completed in 2022. Once operational, the WCD will deliver a secure water source into the Waimea River (and related aquifers) and will ensure a sustainable source of water for our community's water supplies in the long term.

From a rating perspective, the 20 water supplies comprise:

- 11 metered schemes including rural extensions (known as the urban water club)
- Motueka metered scheme
- Five rural restricted schemes (Dovedale, Eighty-Eight Valley, Hamama, Redwood Valley 1 and Redwood Valley 2)
- Takaka fire-fighting supply
- Wai-iti Dam; and
- Waimea Community Dam (under construction).

The Council's water supply infrastructure, currently valued at about $200M is extensive and continuing to grow. At present, key assets include 15 water treatment plants, 28 pump stations, 756km of reticulation pipeline, 61 reservoirs, 32 bores, 12,000-metered connections, 1,600 rural restrictors, 332 backflow preventers, and 1,546 hydrants.

The following diagrams summarises the key components of the water supply activity.

Water Sources
- Bores (groundwater)
- Surface takes (surface water)

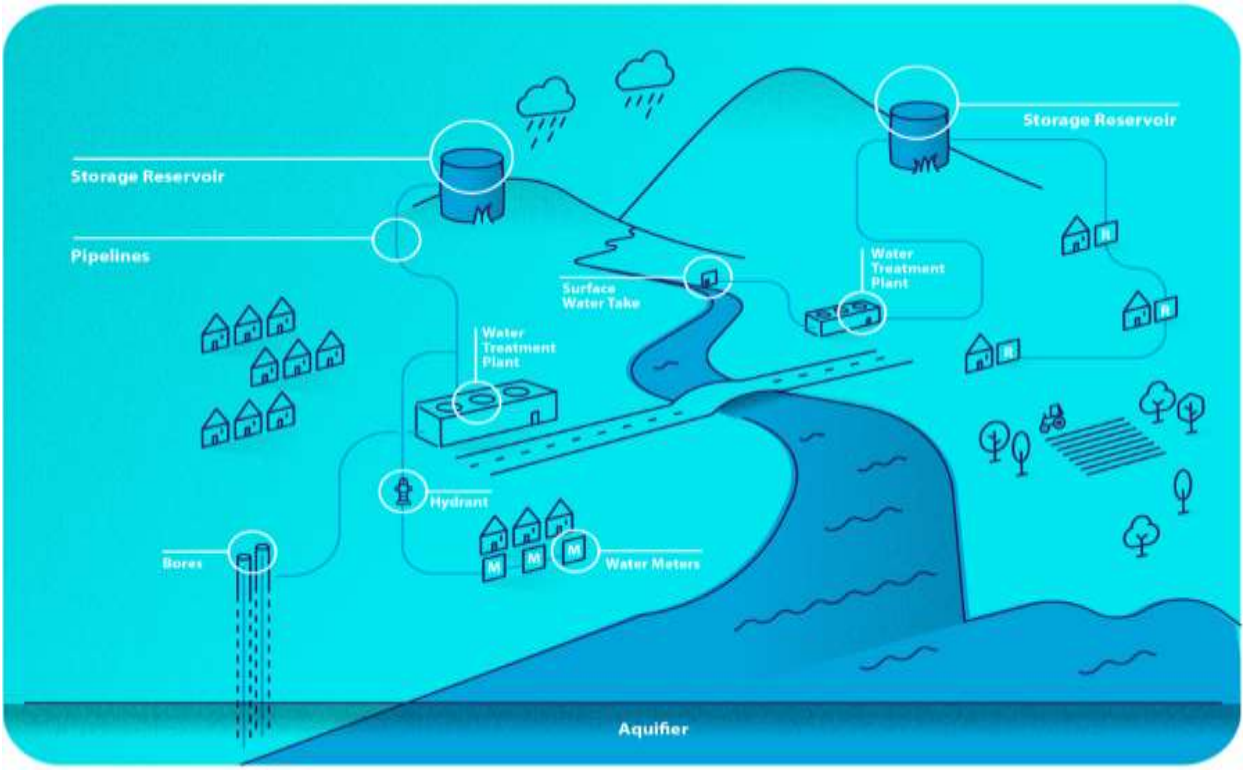
Domestic and Commercial Connections
- Urban meters
- Rural restrictors

Treatment Options
- UV
- Filtration
- Chlorination
- pH correction

26,000 people served

Reticulation Infrastructure
- Pipes
- Hydrants
- Valves
- Backflow prevention
- Reservoir

Industrial Users (5 big water users)
- Alliance (meat processor)
- ENZA (food manufacturer & cool stores)
- Nelson Pine Industries (manufacturer)
- AICA (chemical manufacturer)
- Fonterra (dairy cooperative)



1.2 Why We Do It

Activity Goal
We aim to provide secure water supply systems that deliver safe water to our communities.

The provision of safe, secure and reliable water supply is a fundamental community requirement and one of our core activities. We aim to provide ready access to high quality drinking water in our urban schemes and fit for purpose water supply in our rural schemes to enhance the health and well-being of our residents.

Safe, secure and reliable water supply also facilitates economic growth and enables the protection of property through the provision of water at a pressure adequate for firefighting needs. The service provides many public benefits and we consider it necessary and beneficial to the community to plan, implement and maintain our water supply services in the District. Territorial authorities have numerous responsibilities relating to the supply of water. One key responsibility is the duty under the Health Act 1956 to improve, promote, and protect public health within the District.

1.3 Levels of Service

The Council aims to provide the following levels of service for the Water Supply activity:

"Our water takes are sustainable."	"Our use of the water resource is efficient."	"Our water is safe to drink."
"Our water supply systems provide fire protection to a level that is consistent with the national standard.	"Our water supply systems are built, operated and maintained so failures can be managed and responded to quickly."	"Our water supply activities are managed at a level that the community is satisfied with."
"Our water supply systems are designed and operated to be resilient."		

Providing safe and secure infrastructure services is a priority. We have planned to invest significantly in improving water treatment. We started water treatment plant upgrades in 2018, and plan to continue through to 2028. This investment will lift our performance against our agreed levels of service.

1.4 Key Issues

The most important issues for this activity and how the Council is planning to respond are summarised in Table 1.

Table 1: Key Issues

Key issue	The Council's Response
Legislation Changes Government Reform The Havelock North Water Contamination Event in 2016 prompted a Government Inquiry and a major review of Three Water Services delivery in New Zealand. New legislation has established Taumata Arowai as a new regulator. Another Bill, expected in 2021, will replace existing legislation to regulate drinking water. The Government has provided a $9.78M funding package to provide immediate post Covid-19 stimulus, improve, and maintain three waters infrastructure in Tasman. The majority of this will pay for priority water projects. Improving the safety of the water supply and meeting Drinking Water Standards New Zealand (DWSNZ) Irrespective of new legislation, we are required in accordance with the Health Act 1956 to provide safe water supplies that comply with the DWSNZ. Of our 15 water treatment plants that we operate, only two fully meet the requirements of the Standards. The main reason for non-compliance is a lack of protozoa treatment. Complying with DWSNZ is not a new issue, but one that has increased in priority following water contamination issues at Havelock North and the subsequent inquiry. In order to comply with the DWSNZ, we need to upgrade our existing Water Treatment Plants (WTP) and build new WTPs. New and upgraded WTPs mean that the cost of providing water will increase in the future.	• Capital works programme to build new or upgrade existing WTPs • Focus on staff completing Water Safety Plans; • Development and implementation of a Water Safety Policy based on Water Safety framework; • Established internal and external working groups to focus on water safety; • Water Safety Consultation with the public on permanent chlorination; • Directed Government stimulus funding into upgrading water infrastructure; • The Council submission on the new legislation highlight specific issues in Tasman.
Rural Water Supplies We manage several rural water supplies including Dovedale, Eight-Eight Valley and Redwood Valley (1 and 2). Only the users connected to those schemes contribute towards the cost of providing for each supply. Aging infrastructure, deferred maintenance and high compliance costs mean some schemes are becoming increasingly costly to run and are financially unsustainable. The Council is working with the respective Rural Water Supply Committees to raise the profile of rural water supply issues with the Government to find alternative solutions, key to which is Point-of Entry treatment, for which the resident has responsibility, for schemes, which are predominantly agricultural/stock water supplies. The Council is planning to reconfigure and upgrade key water supply infrastructure on all rural schemes.	• Working with the rural water supply committees to understand needs and investigate solutions; • Active investigations to get RADWS approval for Dovedale and Hamama schemes; • Directed 'shovel ready' funding towards Dovedale source and treatment upgrade project; • Planned solutions for Eight-Eight Valley water shortage issues; • Planned Redwood Valley WTP upgrades; • General rate subsidy applied to Dovedale and Eight-Eight Valley users.

Key issue	The Council's Response
Growth Tasman's population is projected to grow significantly. We are strategically planning essential water infrastructure for new houses and business. Where there is space, we can supply some of this new demand through existing infrastructure. New areas of development such as Richmond West, Richmond South and Motueka West require new infrastructure in order to deliver water to those areas, or in the case of Brightwater, Wakefield and Māpua, the existing infrastructure will require upgrading to provide for additional users.	• The Council is planning new water infrastructure for Richmond and Motueka.
Climate Change and Resilience We are responsible for providing resilient water supply infrastructure during 'business as usual' circumstances, and during disruptive events such as droughts and pipeline breaks. These events can limit the Council's ability to provide adequate water supply to the community. The investment required to ensure Tasman's water supply infrastructure can withstand the effects of climate change and natural hazard shock events will be significant. We plan to invest in water supply security, safety and redundancy projects to ensure water supply services can continue operating in the future and is resilient to change. Sea level rise will mean some coastal infrastructure will become increasingly vulnerable to inundation. The Council needs to consider and strategically plan if, how and when to move critical water infrastructure inland. This is a major conversation to be had with the community and will take some time.	The Council is investing in water security, safety and redundancy projects to ensure water supply infrastructure is resilient to our needs now and in the future. Programmes include • Waimea Community Dam; • Supplementary source for Wai-iti Dam; • New bores at Clover Road; • New inland bores in Richmond; • New storage reservoirs at Richmond, Māpua and Motueka; and • WTP upgrades.

1.5 Operational Programme

The operations and maintenance programme covers all day to day activities that are required to manage the water supply activity. The major activities in this programme and the forecast inflated budgets over 30 years are summarised below.

Routine & Reactive Maintenance	Operations	General Operating Costs	Professional Fees
Bores, reticulations, treatment and reservoirs	SCADA / Telemetry, meter reading, backflow and hydrant tests	Electricity, rates	Consultants, legal fees, strategic studies

$148m	$17m	$36m	$9.3m

1.6 Capital Programme

The Council plans to spend around $~~284~~306 million (inflated) on capital improvements and investments over the next 30 years. Key capital projects and programmes of work are shown in

Figure 1~~Figure 1~~.

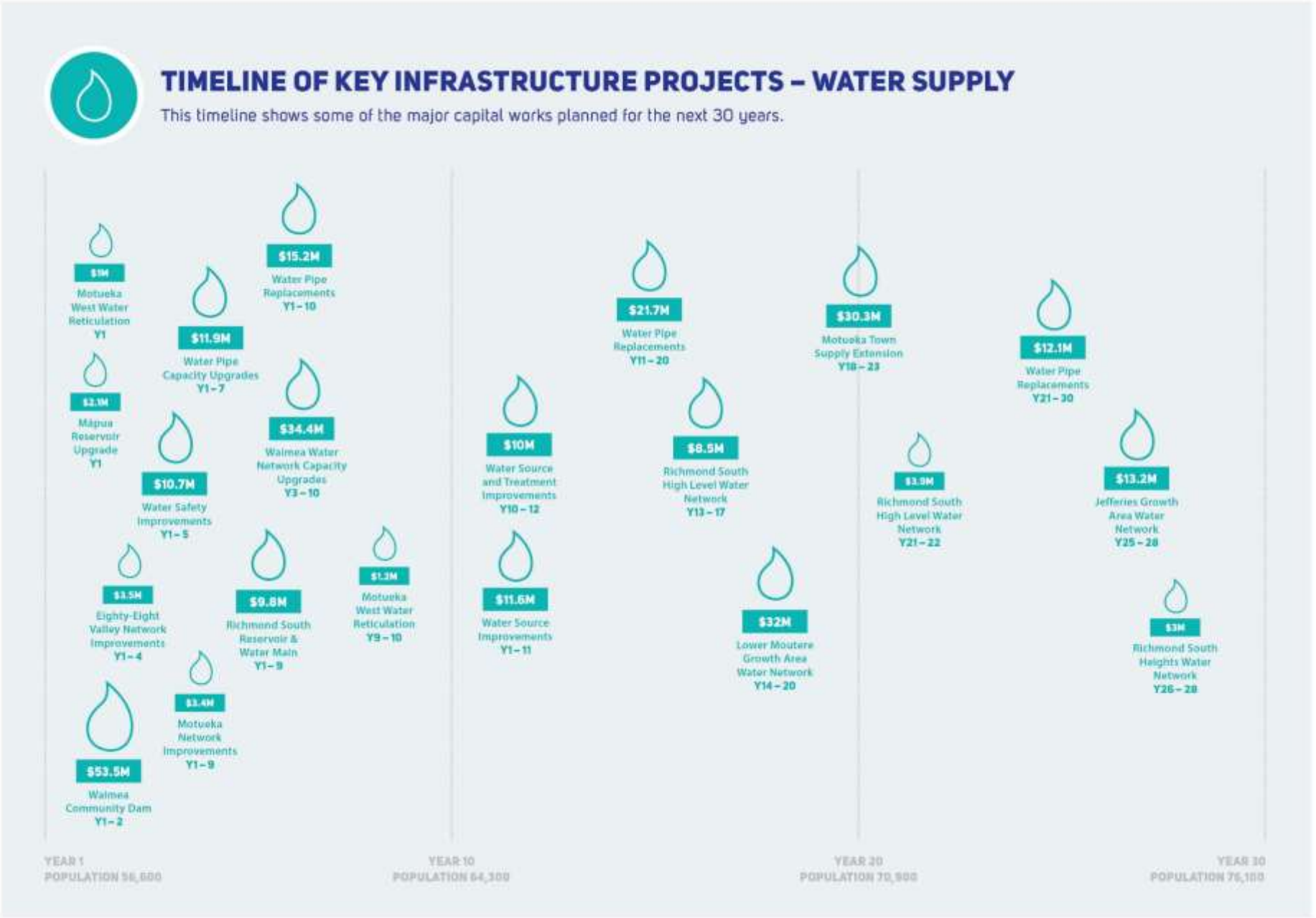


Figure 1: Timeline of Key Water Supply projects

1.7 Key Changes

Key changes between the 2018 Activity Management Plan and the 2021 plan are summarised in Table 2~~Table 2~~ and Table 3~~Table 3~~ below.

Table 2 Summary Key Changes to Capital Programme

Key Change	Reason for Change
The Council has accelerated and increased the programme to build new and upgrade existing water treatment plants.	The Government provided stimulus funding, and we propose to use a majority of this funding to pay for priority water projects.
The Council is proposing a new approach to supplying water to Brightwater, Eight-Eight Valley, and Wakefield	The Waimea Water Network strategy sets out a new approach to provide safe water that complies with the Drinking Water Standards within the Government's timeframes, meets demand during summer months, and accommodates expected growth. The staged programme provides a flexible and robust solution to meet demand.
Waimea Community Dam (WCD) project cost increases and delays	On 22 February 2021, Waimea Water Limited (WWL) presented a revised cost estimate range of $148 million to $164 million to complete the Waimea Community Dam, with an expected cost of $158.4 million (excluding provision for future hydropower). The estimate range takes account of the cost uncertainty associated with project risks, with key risks being the costs associated with any further Covid-19 related delays, and the scale of work required on unexposed geological features. A lot of work has been completed to date and the project is approximately 50% complete. This means WWL has a good understanding of these risks based on what they have experienced so far and how they have responded to unexpected geological conditions. Going forward, most of the work is above ground level, reducing the likelihood of further geological risks. The Council has decided to include a budget in the proposed LTP 2021 – 2031 that will provide for a total project cost of $159 million. This amount covers the expected cost of $158.4 million and allows for necessary work to provide for a future hydro option. This reflects a total project budget increase of $54.5 million since 2018.

Table 3 Summary Key Changes to Operations and Maintenance Programme

Key Change	Reason for Change
Decrease in professional service fees	We have employed additional staff who will contribute to the management of the water activity. This will reduce the need for external advice and support.
Reactive maintenance work increases on our Rural Supplies	General costs have increased and the new maintenance contract has clearly identified where the Urban Water Club was partially subsidising the rural water supply schemes.

Key Change	Reason for Change
Increased cost of electricity	A new electricity supply contract came into effect in March 2020. Due to market conditions at the time of the renegotiation, the new rates were significantly higher than previous ones.

1.8 Key Risks and Assumptions

There are factors outside of the Council's control that can change, these have an impact on the Council's ability to do what it planned. Sometimes the impact can be significant. There is always uncertainty in any planning process but the key to good quality planning is to make clear assumptions to help address this uncertainty. The key risks and assumptions that relate to this activity are:

- As part of the Three Waters Review, the Government is considering reform of the current Water Service Delivery Models from the Council owned authorities into larger scale multi regional model providers. The nature of service delivery upon implementation of the reforms is uncertain. For the development of thisAMP, we have assumed no change in service delivery for the water supply activity.
- The Government has completed the Inquiry into the Havelock North drinking water contamination incident. One recommendation lead to the Drinking Water Standards New Zealand (DWSNZ) being amended. Uncertainty remains about whether a network residual disinfection will become mandatory in the future. The Council is planning to incorporate chlorination as treatment barrier in its new and upgraded water treatment plant programme. The Council is also currently considering whether apply residual disinfection using chlorine in the Council's remaining unchlorinated water supplies. Once a decision is made it will be included in the LTP.
- Alongside Nelson City Council and Marlborough District Council, Tasman has signed a memorandum of understanding (MOU) with the Government that requires participation in ongoing dialogue, ensuring a regional perspective is included in Three Waters Reform. By signing the MOU, Tasman received an initial $9.78M funding package to improve three waters infrastructure. It is uncertainty whether there will be further funding from the Government.
- The Council cannot be certain about the quantity of water that industrial users will require. The Council has assumed that future consumption by existing industries will be in line with historic use. The Council has not planned for additional wet industries. If consumption is significantly different from that assumed, it may have an impact on the Council's funding requirements.
- Central Government is considering a Bill, which would give power to District Health Boards to make decisions and give directions about the fluoridation of local government drinking water supplies. It is unclear whether the Bill will be successful and what the actual implications for us would be. For this AMP, we have assumed that its drinking water supplies will not be fluoridated. If the Bill is passed and the Nelson Marlborough District Health Board instructs the Council to fluoridate its supplies, it will create additional capital and operating costs.
- The Council cannot be certain how long each individual asset will last. To address this uncertainty, the Council assigns an average expected life for types of assets to assist with renewal planning. Some assets will fail before reaching the end of their expected life useful life, and some will last longer. The Council has assumed that it will be able to manage this variance within its budgets it set by prioritising renewals annually.

2 Introduction

The purpose of this Activity Management Plan is to outline and to summarise in one place, the Council's strategic management and long-term approach for the provision and maintenance of its Water Supply activity.

2.1 Rationale for Council Involvement

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. A key responsibility is the duty under the Health Act 1956 to improve, promote, and protect public health within the District. 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 document outlines and summarises the Council's strategic and long-term management approach for the provision and maintenance of potable water supplies to properties throughout the District (excluding those that service single premises that have their own rainwater tanks or bores).

2.2 Description of Assets and Services

Table 4~~Table 4~~ below provides an overview of the water supply networks assets and valuation data (as of June 2020).

Table 4: Summary of Water Supply Assets

Water Supply		Replacement Value	Depreciated Value
	15 Water Treatment Plants	$13.9M	$10.2M
	28 Pump Stations	$4.7M	$1.6M

Water Supply		Replacement Value	Depreciated Value
	756km of reticulation pipe	$121M	$75.9M
	4251 Valves	$7.2M	$4.8M
	1546 Hydrants	$4.0M	$2.2M
	332 Backflow Prevention	$0.3M	$0.3M
	61 Reservoirs	$20.9M	$12.11M

Water Supply		Replacement Value	Depreciated Value
	12,096 Meters	$6.7M	$4.1M
	1590 Rural Restrictors	$0.4M	$0.1M
	32 Bores	$4.9M	$2.3M
TOTAL VALUE OF OTHER ASSETS		$12.6 M	$7.3 M
Investment in the Waimea Community Dam (extractive capacity)		$27.3M	$27.3M
TOTAL VALUE OF WATER SUPPLY ASSETS and Investments		$223.9M	$148.2M

2.3 Water Supply Overview

There are 20 water supplies within the District. Table 5 provides a summary of the supplies, a classification of the type of supply and the way the supply is rated. The following sections provide a high-level overview and description of the water supply schemes. Detailed information about each scheme is available in ActiveManuals™ for those staff and contractors that require access to more technical information about specific assets.

Table 5: Summary of Water Supply Supplies (circa November 2020)

Water Supply	Source	Type of Supply (number of connections)	Types of Water Supply Rates
Brightwater	Groundwater	Metered (1122)	Urban Water Supply Metered connections service charge
			Volumetric charge
		Restricted (325)	Rural Water Extension to Urban Water scheme
Collingwood	Groundwater	Metered (218)	Urban Water Supply Metered connections service charge
		Restricted (1)	Volumetric charge
Dovedale	Surface take	Restricted (305)	Dovedale Rural Water Supply – differential A
			Dovedale Rural Water Supply – differential B
Eighty-Eight Valley	Surface take	Restricted (180)	Eight-Eight Valley Rural Water Supply Service charge
			Variable charge (based on restrictor volume)
Hamama	Surface take	Restricted (24)	Hamama Rural Water Supply Service Charge
			Variable Charge
			Fixed Charge based on set land value
Kaiteriteri/Riwaka	Groundwater	Metered (627)	Urban Water Supply Metered connections service charge
			Volumetric charge
Māpua /Ruby Bay	Groundwater	Metered (953)	Urban Water Supply Metered connections service charge
			Volumetric charge
		Restricted (239)	Rural Water Extension to Urban Water scheme

Water Supply	Source	Type of Supply (number of connections)	Types of Water Supply Rates
Māpua Rise	Groundwater	Metered Connected to Māpua /Ruby Bay Scheme	Urban Water Supply Metered connections service charge
			Volumetric charge
Motueka	Groundwater	Metered (1358)	Motueka Water Supply metered connection service charge
			Volumetric charge
			Motueka firefighting rate
Murchison	Groundwater	Metered (305)	Urban Water Supply Metered connections service charge
			Volumetric charge
Pōhara	Surface take	Metered (53)	Urban Water Supply Metered connections service charge
			Volumetric charge
Redwood Valley 1	Groundwater	Restricted (405)	Redwood Valley Rural Water Supply (based on restrictor volume)
Redwood Valley 2	Groundwater	Restricted	Redwood Valley Rural Water Supply (based on restrictor volume)
Richmond	Groundwater	Metered (6325) Incl. with Hope/Brightwater	Urban Water Supply Metered connections service charge
			Volumetric charge
			Rural Water Extension to Urban Water scheme
Takaka	Groundwater	Fire-fighting Supply	Takaka Firefighting Operating
			Takaka Fighting Capital – with differentials based on location

Water Supply	Source	Type of Supply (number of connections)	Types of Water Supply Rates
Tapawera	Groundwater	Metered (166)	Urban Water Supply Metered connections service charge
			Volumetric charge
Wai-iti Valley Community Dam	Surface take	Water source supply only	Wai-iti Valley Community Dam Rate
Waimea Community Dam	Surface take	Water source supply only	The rating methodology for the full cost of the Dam is yet to be determined. It is subject to consultation on the proposed LTP 2021-2031. ~~Urban Water Supply Metered connections service charge~~
			~~Volumetric charge~~
			~~Environmental and community benefits along with the Council's share of Irrigator extractive capacity are funded by targeted rates.~~
Wakefield	Groundwater	Metered (804)	Urban Water Supply Metered connections service charge
			Volumetric charge
		Restricted (66)	Rural Water Extension to Urban Water scheme
Upper Takaka		Metered (18)	Urban Water Supply Metered connections service charge
			Volumetric charges

Fundamentally, each water supply network consists of three basic components: source, treatment and distribution infrastructure.

Table 6~~Table 6~~ describes the three components, processes with examples of infrastructure.

Table 6: Components of a Water Supply Network

Network Component	Process
Source - refers to the collection of raw water from creeks, rivers, lakes, dams and aquifers.	Raw (untreated) water is abstracted from a surface or groundwater source and transferred into reticulation (distribution network). Examples of source infrastructure includes intake galleries, bores and wells.
Treatment –refers to cleaning source water making it safe for consumption.	Water treatment is the process of removing sediment, particles and harmful microorganisms before it is supplied to customers. Treatment generally consists of three steps clarification, filtration and disinfection. Examples of treatment infrastructure includes, aerations towers, cartridge filters, lime/caustic soda dosers, UV and Chlorine disinfection.
Reticulation- refers to the network that water travels through to get from source to tap (property boundary)	Reticulation includes all the component structures of a water distribution network. Examples of reticulation infrastructure includes pipes, valves, hydrants, reservoirs, meters and restrictors

2.3.1 Water Supply Scheme Descriptions

2.3.1.1 Brightwater/Hope

The Brightwater supply was constructed in 1976 and serves the Brightwater urban area, the Main Road Hope area and the following rural extensions areas:

- Mt Heslington Road to the lower end of the Eighty-Eight Valley Rural scheme at River Terrace Road
- Teapot Valley
- Jeffries Road
- Hope (e.g. 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 Brightwater Bridge (SH6). From the bores, water is pumped to a water treatment plant on the other side of the state highway. The water is then chlorinated in line before entering a contact tank. Three high lift pumps extract water from the contact tank and deliver it to the town and the reservoirs. The town's two main reservoirs are located above Katania Heights to the south-west of the town. Adjacent to the main reservoir a subdivision is supplied by a booster pump station which runs on demand.

In the event of an emergency, water can be diverted from either the Richmond Water Supply or the Wakefield Water Supply for a short period. The supply serves a mix of urban and rural lifestyle/agricultural properties with few commercial properties. There are 1122 metered connections (December 2020) and 325 restricted rural connections (December 2020), and a total estimated population of approximately 2,100.

During periods of heavy rain the Wairoa River becomes dirty which affects the bore water quality. The higher turbidity water reduces the effectiveness of the chlorination. In the past (April 2017) this has led to the Council to issue a Boil Water Notice.

This scheme is subject to TRMP rationing rules associated with the Waimea Community Dam. Users of this scheme are likely to experience rationing restrictions until the WCD is operational.

2.3.1.2 Collingwood

The Collingwood water supply was constructed in 2003 and commissioned 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 from 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.

The capacity of the in ground concrete reservoir on Swiftsure Street is 285m^3.

The Collingwood WTP is currently being upgraded and is expected to be completed and operational by 2021.

There are 218 metered connections (December 2020) on the scheme and one restricted connection on a small rural extension at the end of Beach Road. The permanent residential population of Collingwood is approximately 244 people.

2.3.1.3 Dovedale

The Dovedale water supply is obtained from Humphries Creek, a tributary of the Dove River. There are two surface 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 Dovedale water supply covers a large rural area, supplying properties in the Dovedale, Rosedale and Upper Moutere areas. The reticulation is approximately 150km in length. The area is very hilly and pumping costs are quite high. Most of the reticulation is on private land and access to some sites is difficult especially in winter.

Thorns Reservoir receives water by gravity from the intake from where it is pumped to Silcocks Reservoirs. These two reservoirs are the two main storage facilities for the scheme. Between the WTP and Thorns, three pump stations boost water up to smaller high-level reservoirs. From Silcocks Reservoir the Upper Moutere and Rosedale area are fed by gravity with the water passing through numbers break pressure tanks.

The WTP is located on Dovedale Road near the confluence of the Humphries Creek and Dove River. Treatment consists of inline chlorination. There has been a permanent boil water notice in place since 1989. This is due to the poor quality of the source water (high turbidity), especially during heavy rain. There are no metered connections and 305 restricted rural connections (December 2020). Many of the connections are to rural farm tanks, with a few to commercial properties. The number of connections is not in direct relation to the estimated supplied population. The estimated population of Dovedale is approximately 450-500 people. Dovedale water supply is nearly fully allocated and there are a few units available.

The scheme was constructed in 1977 as a stock water/farming supply with a 1:1 Government subsidy. Since this time, the scheme has expanded.

Logging operations on the private land surrounding the intake are planned to commence in 2024/25 and the Council is concerned about the effect on water quality and quantity. The Council is currently upgrading the lower intake and building a new WTP to improve water quality. We are likely to apply for a Rural Agricultural Drinking Water Scheme (RADWS) status for Dovedale and are waiting on clear direction on RADWS treatment standards from Taumata Arowai.

2.3.1.4 Eighty Eight Valley

The Eighty-Eight Valley rural water supply's source is an un-named stream locally known as Parkes Stream which is a tributary of the Eighty-Eight Valley Stream. The intake is located in native bush in Department of Conservation (DoC) administered land at a level of 230m above sea level. Water flows from this source by gravity to reservoirs (4 x 30,000 litre plastic tanks) at Totara View Road. The treatment plant is located on a farm in Eighty Eight Valley. Treatment consists of chlorination only. When there is heavy rain in the Richmond Ranges, the source water can become dirty which reduces the effectiveness of the chlorination.

The Eighty-Eight Valley water supply serves the rural farming area from Parkes Stream to Totara View area and mainly lifestyle blocks and small farms from Totara View to Mt Heslington.
There are two closed valves that link the scheme with Brightwater and the Wakefield scheme.
The Waimea County Council constructed the Eighty-Eight Valley rural scheme in 1981 with assistance from local farmers/landowners, and since then the scheme has expanded.
There are no metered connections and 180 restricted rural connections (December 2020). Based on the restrictor numbers, the population of Eighty-Eight Valley is likely to be about 450 people. Some of the restrictors are to rural farm tanks and do not supply domestic properties. The Eighty-Eight Valley water supply is fully allocated and there is a waiting list to connect to it.

2.3.1.5 Hamama

The Hamama water supply system was installed, paid for and administered by a group of local farmers through the 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 stream catchment is an 80 hectare area of land owned by the Council and designated as a water supply reserve area. A user committee operates the supply under a Golden Bay County Council bylaw. The Council rates the supply area to provide maintenance and operations funding for the management committee but has 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 24 connections registered in the Council's billing database. When the road was re-laid in 2007 all of these connections were re-done, with new toby boxes and double check valves. The population of Hamama is approximately 60 people.

2.3.1.6 Kaiteriteri/Riwaka

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 intersection. The Kaiteriteri source bore has been recently upgraded.

The system has three supply zones, namely:

- From River Road bore to the No. 1 booster (prior to the main reservoir). This includes Riwaka and Riwaka-Kaiteriteri Road as far as 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.

The 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 that significantly increases demand in summer. These campgrounds have a capacity to house 1,800 people.

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 expectancy of some assets. There is currently only one well, but a spare pump is held in store nearby.

There are 627 metered connections in use (December 2020) and no rural extensions off the Kaiteriteri scheme. The estimated permanent population of Kaiteriteri is approximately 420 people, however over peak holiday periods (when holiday homes are used, and the camp is full) the population swells to over 2,000.

As Kaiteriteri is a holiday destination, some of the properties which use water are not inhabited throughout the year. This inference can also be seen through the average water use and by looking at individual water meter accounts. Water consumption significantly increases in the peak summer weeks between Christmas and the first weeks of January.

2.3.1.7 Māpua Rise

The Māpua Rise Water Scheme is a temporary supply that used to service an 80 section subdivision, transferred to the Council in May 2017 and will likely not be required when the Māpua /Ruby Bay infrastructure upgrades are complete. The scheme has a deep bore producing 1.2L/second and is filtered and pumped to a small storage tank that services the reticulation area. The quality of the water from the bore is poor, so properties are supplied now from the Māpua /Ruby Bay supply. The bore is regularly flushed and the WTP is maintained for use in emergencies. **Māpua /Ruby Bay** Māpua and Ruby Bay zones are part of the Waimea water supply. Following the construction of the Richmond WTP, the scheme was re-configured.

Water is sourced from five bores along the Waimea River stop bank. These deliver water to a balance tank at the WTP in Lower Queen Street. Two transfer pumps extract water from the balance tank and pump it into 3 contact tanks. The water is chlorinated inline before the contact tanks and dosed with lime (for pH correction) before being pumped across Rabbit Island to Māpua.

The Māpua /Ruby Bay zone serves a mix of urban and rural properties with some commercial use connections. There are 953 metered connections (December 2020) and 239 restricted rural connections (December 2017), and a total estimated population of approximately 2,238.

The Māpua /Ruby Bay zone starts on Lower Queen Street and covers the golf course and houses on Best Island, Bell Island wastewater treatment plant, public facilities at Rabbit Island and the urban area of Māpua and Ruby Bay. The main reservoirs are located at Pomona Road. A pump station at the Pomona Road Reservoirs boost water up to a high level reservoir site at Stage Coach Road. This reservoir supplies water to the rural extension areas of Old Coach Road, Marriages Road, Seaton Valley Road, Ruby Bay Bluff and Permin Road areas.

A small pump station on Brabant Drive boosts water up to a reservoir site and pump station at Pine Hill Heights. This supplies water by both gravity and pressure system to the Brabant Pine Hills Heights area.

There is also a booster pump at the Māpua Wharf that can be used to increase flow when required. This pump has not been used in many years due to fragile nature of the trunk main.

No new connections to the scheme can be made until a series of infrastructure upgrades are complete. We are currently in the process of:

- Upgrading the trunk main along Aranui Road and Strafford Drive
- Installing a new main along Rabbit Island
- Upgrading the Pomona Road and Stage Coach Road Reservoirs.

Once completed, these projects will increase supply capacity to Māpua /Ruby Bay and allow growth to occur, The moratorium on new connections will likely occur in the second half of 2021.

2.3.1.8 Motueka

The Motueka township does not have a full urban water supply. Only parts of the urban area are reticulated and connection to this on a voluntary basis. Where there is no reticulated water supply shallow private bores are generally used. Hydrants on the scheme provide water for firefighting. 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 Motueka, was built by the Motueka Harbour Board. The Waimea County Council took over the scheme in the 1960s 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:

- Two bores at the Recreation Centre in Old Wharf Road
- A bore at the Fearon's Bush Motor Camp on Fearon Street (emergency supply only)

Whilst the bores are not considered secure they are more than 10m deep. The Recreation Centre bores are 21.5m deep with screens starting at 16m and the Fearon's Bush bore is 15m deep with a casing starting at 11m. There are 1,358 metered connections (December 2020) and no restricted rural connections. The population of Motueka is approximately 7,200.

A new WTP in Parker Street that will meet the DWSNZ has started to be built and the area surrounding the WTP will have new reticulation installed. A major renewal project of the water main in Thorp Street will commence in 2021.

2.3.1.9 Murchison

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 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 305 metered connections (December 2020) and one restricted connection to the Tasman District Council Stock Effluent Facility. The population of Murchison is approximately 430 people.

2.3.1.10 Pōhara

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

There are 53 metered connections (December 2020) and no restricted rural extension connections. Many houses in the area (approximately 70%) are holiday homes/baches.
The largest connection feeds the camping ground. The camping ground can increase population numbers to over a thousand people using the scheme during summer months. The campground is the largest water user and has installed 90m3 of storage as a buffer for emergencies.

Most of the year the scheme is considered a small supply but during months of summer when the campground is busy and the baches are full (mid-December to mid-February) the scheme is considered minor. This means extra monitoring needs to be carried out.

The Pōhara water supply scheme is at its maximum limit and any further connections would require new sources of water. Currently the WTP has filtration and chlorine disinfection but this does not provide adequate barriers for compliance with the DWSNZ. An upgrade to the existing WTP is planned in 2021/22 and includes a new building and membrane filtration.
We also plan to centralised existing storage reservoirs at the Haile Lane site and remove the three that are located an Falconer Road.

2.3.1.11 Redwood Valley 1 and 2

The Redwood Valley Rural Water Supply scheme services properties throughout the coastal hill country to the north west of Richmond. The two schemes can be 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 to Bronte Road. 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 was a mainly stock water scheme and 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 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 the 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/wells are considered unsecure because they are less than 10m deep.

There are no metered connections on either scheme, Redwood Valley 1 has 97 restricted connections and Redwood Valley 2 has 265 (2020). 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. The Redwood 1 and2 schemes are fully allocated and there is a waiting list to connect to them.

We are planning to undertake interim upgrades of the two WTPs on the Redwood Valley scheme in 2022/23 so they can meet the DWSNZ. In the longer term (20XX) we are planning for centralised treatment plant located near the River Road area that can potentially benefit from the WCD allocation.

2.3.1.12 Richmond

Richmond water supply is taken from two separate sources: five bores at the bottom of Lower Queen Street by the Waimea River and four bores adjacent to Lower Queen Street by Nelson Pine Industries. There are also two emergency bores located near the Waimea River. The two water sources are mixed at Richmond WTP and disinfected using UV and pH corrected using caustic soda. Emergency chlorination is also in place. The Richmond source water has elevated nitrate levels and the Waimea source water is slightly corrosive; however mixing the two sources provides a low cost to solution to these issues.

The reticulation service two separate zones: Richmond (township) and Waimea Industrial (Wakatu Industrial Estate, houses on either side of Champion Road).

There are four main reservoirs that provide storage capacity; these are Champion Road and Queen Street (at the same elevation) and Richmond East High Level and Richmond Upper on Valhalla Lane. There are also smaller reservoirs at Valhalla Drive, Cropp Place and Faraday Rise. On Hart Road there is a system with a reservoir and pump station that takes water from the main reticulation system at night will supply new housing development that is currently being built.

Richmond supply serves approximately 14,000 people in Richmond alone. There are 6,325 metered connections and 48 restricted rural connections (December 2020) serving a rural extension in the Haycock Road area. The scheme also provides water to residential areas around Champion Road, and commercial and industrial properties in Stoke (Nelson City Council).

The Richmond water scheme supplies approximately 8,000 m^3 -11,000 m^3 of water 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.

In the event of an emergency, some water can be supplied from Nelson City Council supply. There is also a closed valve connection to the Brightwater scheme at Three Brothers Corner where water can be supplied either way.

2.3.1.13 Takaka

Currently there is no drinking water supply in Takaka, however a FW2 standard firefighting reticulation was installed in Takaka CBD in 2011. It consists of two bores and pumps with an emergency generator.

2.3.1.14 Tapawera

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

Tapawera is supplied from two bores between the Motueka River and the village on the Tadmor Valley Road. These bores were installed in 1954 and are coming to the end of their working asset life. The groundwater supply is unsecure because the bore screens are at a depth of less than 10m. Water is treated with chlorine and UV disinfection; and pH corrected using lime dosing. The WTP pumps water to a concrete reservoir on the hill above Totara Street and then feeds to town by gravity. The existing WTP is too small to upgrade in order to meet the DWSNZ and the existing bores are within the building which limits options for maintenance. We are planning to install two new exterior bores and build a new WTP with filtration, UV and chlorination commencing in 2024/25.

The population of Tapawera is approximately 300 and there are 166 metered connections on the scheme (December 2020). Although one person is supplied water through a low flow restrictor close to the reservoir, there are no rural extensions on the scheme.

2.3.1.15 Upper Takaka

Upper Takaka water supply takes 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 Council in 1991. The system supplies untreated water to farmland that the pipeline is laid through and treated water to the Upper Takaka Township. The WTP and reservoir were recently upgraded. Treatment consists of filtration and UV.

There are 19 metered connections (December 2020) and no rural extensions off the Upper Takaka scheme. The estimated population of Upper Takaka is approximately 45 people.

2.3.1.16 Wakefield

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

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

Source water for the Wakefield scheme is extracted from a well with an infiltration gallery close to the Wai-iti River behind the Wakefield fire station. The infiltration gallery is at a depth of approximately 4m.

The WTP is located close to the well on Pigeon Valley Road. Treatment includes aeration (for pH correction) and chlorination.

The Wakefield Water Supply scheme supplies a population of approximately 2,100. All 776 urban connections are metered (December 2020) and the 66 connections from rural extensions are restricted by a low-flow valve.

The two main reservoirs are located on Edward Street behind a church. Treeton Place has a small reservoir and pump station to supply an area above the main reservoirs.

The scheme is linked to the Eight-Eight Valley scheme, which can be pulled by opening a closed valve on Higgins Road. The scheme is also linked to the Brightwater scheme via a pipe that 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.

2.3.1.17 Wai-iti Dam

The Council manages the Wai-iti water storage dam (also known as the Kainui Dam) which provides supplementary water into the Lower Wai-iti River and aquifer. This enables sustained water extraction for land irrigation at times of low river flows.

2.3.1.18 Waimea Community Dam

Waimea Water Ltd owns and operates the Waimea Community D~~d~~am (under construction). The Council currently owns a 51% share in the company that will rise to a 75% share as a result of cost over runs. The Dam provides supplementary water into the Waimea and Wairoa and related aquifers. This enables sustained water extraction for land irrigation and urban use along with providing environmental and community benefits.

2.4 Fire-Fighting

In urban schemes, the water supply system is designed to meet FW2 Standard from the New Zealand Fire Service Firefighting Water Supplies Code of Practice (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 firefighting standard to be met.

There are a number of urban areas (usually associated with an elevated position in relation to reservoirs) that receive marginal or below standard levels of service compared to the code of practice. Performance in these areas cannot be practically remedied without major upgrades. Some areas affected by pipe size may be improved by renewals over time. In the areas of Motueka that are not reticulated, there are several fire wells provided for firefighting purposes.

The Council does not guarantee that these will meet the requirements of the Code. A new FW3 standard firefighting reticulation was installed in Takaka CBD in 2011. No firefighting capability is provided within rural water supply systems, instead the TRMP outlines water capacity expectation for dwellings in rural areas for fire-fighting purposes.

Table 7: The Supply of Water for Fire Fighting Purposes (SNZ PAS 4509:2008)

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 at 25l/s 45,000 litres
FW3	50	3	135 m	1 hour at 50l/s 180,000 litres

The following work will be undertaken to check compliance against the code:

- An audit of fire hydrants throughout the District.
- The fire wells in Motueka to be tested annually.
- Hydraulic modelling will be undertaken for key urban water supply systems. The fire flows will be assessed as part of this exercise to check against the code of practice. The current hydraulic models will be maintained and recalibrated on a regular basis.

3 Strategic Direction

Strategic direction provides overall guidance to the Council and involves specifying the organisation's objectives, developing policies and plans designed to achieve these objectives, and then allocating resources to implement the plans.

3.1 Our Goal

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

3.2 Contribution to Community Outcomes

The Council operates, maintains and improves the water supply infrastructure assets on behalf of its ratepayers. The water supply activity contributes to the community outcomes as detailed below.

Table 8: Summarises how this activity contributes to achievement of the Council's community outcomes

Community Outcomes	Does Our Activity Contribute to the Community Outcome	How Our Activity Contributes to the Community Outcomes
Our unique natural environment is healthy, protected and sustainably managed.	Yes	All of our water schemes take water from the environment (via surface or groundwater) and require a resource consent. We aim to manage water takes so the impact does not prove detrimental to the surrounding environment.
Our urban and rural environments are people-friendly, well-planned, accessible and sustainably managed.	Yes	We consider water supply to be an essential service to the community and our schemes are designed to be efficiently managed to meet current and future needs. Our networks also provide a means for firefighting consistent with the national firefighting standards.
Our infrastructure is efficient, cost effective and meets current and future needs.	Yes	We aim to efficiently provide water to meet the demands of existing of future customers in a cost effective way.
Our communities are healthy, safe, inclusive and resilient.	Yes	We aim to provide water supplies that are safe to drink and used for firefighting purposes that are delivered and supported by resilient infrastructure.
Our communities have opportunities to celebrate and explore their heritage, identity and creativity.	No	By providing water we don't primarily contribute to this outcome. However, where possible we incorporate community and school groups into the design and provision of infrastructure.

Community Outcomes	Does Our Activity Contribute to the Community Outcome	How Our Activity Contributes to the Community Outcomes
Our communities have access to a range of social, cultural, educational and recreational facilities and activities.	Yes	Water is an essential service that underpins other facilities and activities.
Our Council provides leadership and fosters partnerships, a regional perspective, and community engagement	Yes	We take opportunities to partner with Nelson City Council where possible, including agreements to supply some of the customers with water.
Our region is supported by an innovative and sustainable economy.	Yes	Water underpins the economy by providing water for our communities enabling them to function. We aim to provide sustainable supplies that are built for the future.

3.3 Infrastructure Strategy

The Council's Infrastructure Strategy covers the provision of the Council's water supply, stormwater, wastewater, rivers and flood control, and transportation services. The purpose of the Strategy is to identify the significant infrastructure issues for Tasman over the next 30 years, and to identify the principal options for managing those issues and the implications of those options.

The key infrastructure priorities included in the Strategy are:

- Providing infrastructure services that meet the needs of our changing population
- Planning, developing and maintaining resilient communities
- Providing safe and secure infrastructure and services
- Prudent management of our existing assets and environment.

The Council's Infrastructure Strategy and infrastructure activity management plans are directly linked. Information flows between the Strategy and the plans in both directions. The table below describes the structure of the Strategy and how it connects to the activity management plans.

Section	Section Overview	Connection to AMP
Executive Summary	A short consolidated summary of the current situation, investment priorities, key actions and total level of investment.	This section is intended to provide an outline of the Strategy to the reader. It does not have a direct connection to individual Activity Management Plans.

Section	Section Overview	Connection to AMP
Strategic Direction	Examines the context and issues surrounding the provision of infrastructure services. Sets the direction for infrastructure management and investment priorities. Sets out how the Council will: • respond to growth or decline in demand; • manage the renewal or replacement of existing assets over their lifetime; • manage planned increases or decreases in levels of service will be allowed for, • public health and environmental outcomes will be maintained or improved; and • natural hazard risks will be addressed in terms of infrastructure resilience and financial planning.	This section provides direction to the Council staff who prepare activity management plans for the relevant infrastructure activities. Each activity management plan is expected to consider the key priorities and identify actions that are in alignment with those priorities. It also provides a consolidated summary of this information from within the activity management plans.
Activity Summaries	For each activity: • Provides an overview of the assets and their condition and performance; • Outlines the levels of service; • Considers the options to address key issues/priorities and identifies the preferred option; • Summarises investment in the activity for the next 10 and 30 years; • Lists the key assumptions and uncertainties.	This section provides a concise summary of the activity management plan for the topics listed in this table.

3.4 Financial Strategy

The Financial Strategy outlines Council's financial vision for the next 10 to 20 years and the impacts on rates, debt, levels of service and investments. It guides the Council's future funding decisions and, along with the Infrastructure Strategy, informs the capital and operational spending for the Long Term Plan 2021-2031.

Three key financial limits are established in the Financial Strategy that set the Council's overall financial boundaries for its activities. These include limits include rates income, rates increases and net debt.

Infrastructure expenditure forms a large proportion of the Council's spending being 39% of operational expenditure and 80% of capital expenditure over the next 10 years. Because of this, the Infrastructure Strategy and Financial Strategy are closely linked to ensure the right balance is struck between providing the agreed levels of service within the agreed financial limits.

Over the next 10 years, forecast rate income increases and debt levels are projected to be very near the Council's limits. The Council has had to work hard to prioritise and plan a work programme which addresses the most pressing key issues while staying within these limits. This means there is very little scope to add further work to the programme within the next five years.

3.5 Key Issues

The Council has identified several key issues specific to the water supply activity, which are summarised in Table 9 below. Each of these issues relate to the Council's infrastructure priorities. For each issue, the significant decisions the Council is planning to make are outlined in the table below.

Table 9: Key Issues for the Water Supply Activity

Key Issue	Response
Government Reform and Legislation Changes As a result of the Havelock North contamination event and subsequent inquiry, the Government carried out a Three Waters Review and are planning a reform programme. The programme involves regulatory and service delivery reform, both of which are essential for addressing a range of issues and opportunities, including infrastructure investment requirements; funding, affordability, capability and capacity challenges; water security; and issues In August 2020, *The Water Services Regulators Act* established the crown entity *Taumata Arowai* (Water Services Regulator) to oversee, administer and enforce a new drinking water regulatory system. In December 2020 the Water Serices Bill was introduced in parliament. This obmnibus bill will repeal part 2A of the Health Act 1956 and will replace it with a standalone Act to regulate Drinking Water. The bill sets out the new regulatory framework and divides the current drinking water standards into two parts: 1. The maximum acceptable values (MAVs) will become 'standards'; and 2. The operational requirements will become the 'rules'. The Bill will go through a select committee process and the public will get the opportunity to provide feedback. Tasman District Council will provide a submission on the bill to highlight specific challenges we face in our District. In July 2020, the Government announced a $760M funding package to provide immediate post COVID-19 stimulus and improve and maintain three waters infrastructure. Tasman District Council received $9.78M and directed the majority of funding towards priority water infrastructure. Project that address water security and safety include: • Pohara WTP Upgrade ($1.4M); • Dovedale source/treatment upgrades ($2.3M); and	• Directed Government stimulus funding into priority water infrastructure; • The Council submission on the new legislation highlighting specific issues in Tasman.

Key Issue	Response
• Pomona Road Reservoir Upgrade ($1.4M). In order to receive the funding, the Council signed a memorandum of understanding that requires participation in ongoing dialogue about local government reform, provision of information relating to all three water services and assets, and investigating alternative water services delivery arrangements that reflect the direction Taumata Arowai is heading. The Government have signaled that Maori values will be embedded throughout Taumata Arowai. The Council will need to determine how to give effect to the concept of *Te Mana o te Wai*. This concept that embraces the fundamental importance of water and recognises that protecting the health of water protects the health and wellbeing of the wider environment and the community. The Council plan to engage with Tāngata Whenua/Mana Whenua to identify how best to give effect to Te Mana o te Wai.	
Delivering Safe Water- Clean, consistent drinking water Irrespective of new legislation, the Council still has obligations under the Health Act 1956 to provide safe water that comply with the Drinking Water Standards New Zealand (DWSNZ). Of the 15 water treatment plants that the Council operates, two supplies – Richmond and Tapawera achieved full compliance for the 2019/20 period. The main reason for non-compliance of the other schemes is a lack of protozoa treatment. Complying with the Standards is not a new issue for the Council but one that has increased in priority following recent water contamination issues at Havelock North and the subsequent inquiry. In order to comply with the DWSNZ, the Council need to upgrade existing or build new water treatment plants (WTP). Upgrades to existing Brightwater, Collingwood, Dovedale, Pohara, Waimea, and Wakefield WTPs are already underway and a new treatment plant is being built in Motueka that will operational in the second quarter of 2022. The next priority upgrades include Murchison, Redwood Valley, and Tapawera. New and upgraded WTPs will mean that the cost of providing water will increase in the future. The Council staff are currently focused on completing Water Safety Plans to specifically identify	• Capital works programme to build new or upgrade existing WTPs; • Focus on staff completing Water Safety Plans; • Development and implementation of a Water Safety Policy based on Water Safety framework; • Established internal and external working groups to focus on water safety; • Water Safety Consultation with the public on permanent chlorination.

Key Issue	Response
and address the risk for each water supply scheme. In 2017, the Council established a local *Drinking-water Working Party* including staff from Engineering (Territorial Authority) and Environment and Planning (Regional Regulatory Authority), Nelson-Marlborough District Health Board (NMDHB) and the Ministry of Health (MoH). The purpose of these quarterly meetings is to enhance a better working relationship between all parties that influence the water quality and address any safety issues or concerns. In early 2020, the Council also established a Water Safety Group including staff from Engineering (Utilities and Activity Planning) and from the operations and maintenance contractor. The purpose of the six weekly meeting is to discuss ongoing compliance issues and identify any potential water safety risks.	
Rural Water Supplies The Council currently manage rural water supplies in Dovedale, Eight-Eight Valley, and Redwood Valley (1 and 2). Each supply has its own unique challenges. Each rural water supply account is financially ring fenced so only scheme users pay for operational and capital expenditure costs. This is in contrast to the way urban schemes (referred to as 'Urban Water Club') are operated. Aging infrastructure, deferred maintenance and high compliance costs mean some schemes are becoming increasingly costly to run and are financially unsustainable. Some users have already left the schemes, compounding the financial burden on those that remain. This is a particular challenge for Dovedale and Eighty-Eight Valley. In response the Council has agreed to apply an affordability adjustment in the form of a general rate subsidy for these two schemes. None of the rural water supplies are approved Rural Agricultural Drinking Water Supplies (RADWS) under the DWSNZ and all require significant infrastructure upgrades to address source and treatment challenges. The new regulator (Taumata Arowai) acknowledge the situation where water on rural schemes is primarily used for stock or agricultural purposes. They are signaling that 'point of entry' treatment maybe a viable solution for domestic users on rural water supplies. Details have yet to be confirmed, and the Council will need to demonstrate that at least about 65-75% of water is used for agricultural or stock purposes. It is likely that the Council will pursue this approach for Dovedale and Hamama schemes.	• Reinstated rural water supply committees to work with scheme users • Active investigations to get RADWS approval for Dovedale and Hamama schemes; • Directed 'shovel ready' funding towards Dovedale source and treatment upgrade project; • Planned solutions for Eight-Eight Valley; • Planned solutions for Redwood Valley • General rate subsidy applied to Dovedale and Eight-Eight Valley users; and • Contacted local MP to highlight the issues.

Key Issue	Response
The majority of water from Eighty-Eight Valley and Redwood Valley schemes is used for domestic purposes and would not meet the criteria for RADWS approval. As part of the Three Waters Reform and Covid-19 response, the Government has provided funding to support the Council's planned water improvement projects. The Council has nominated the Dovedale source and treatment plant upgrade project to receive funding and have accelerated the timing of the project. To address allocation and drought challenges, the Council is proposing to reconfigure the Eighty-Eight Valley scheme to supply domestic and lifestyle block customers with water from the Wakefield supply. The few large farms near the existing intake could remain on the Eighty-Eighty Valley supply and would more likely meet the criteria to be approved as a RADWS. To reconfigure the scheme, a series of infrastructure upgrades would need to be completed including new reticulation and pump station upgrades. To address treatment challenges on the Redwood Valley scheme, The Council is proposing provisional treatment solutions to meet the DWSNZ. The project includes short-term interim upgrades for the O'Connor's Creek and Golden Hills water treatment plants. The Council is proposing a longer term and more resilient solution by building a new centralized treatment facility within 10 years in 2031.	

Growth
 	
The Council expects the population will grow by approximately 7,700 residents over the next 10 years. This means we need to strategically plan essential water infrastructure for new houses and business.
 	
In July 2019, The Council adopted the *Nelson Tasman Future Development Strategy*. The strategy sets out how to accommodate future housing and business needs for the long-term benefit of the community and the environment. Well-managed growth can bring opportunity, prosperity, and enrich our communities.
 	
Enabling Tasman's communities to grow is a priority for the Council.
 	
Development is already occurring in Richmond, Motueka, Māpua, Brightwater and Wakefield. These settlements require significant investment in water infrastructure to meet growth demand. The Council can accommodate growth through:
	~~The Council is planning to spend $XXM on infrastructure to accommodate growth.~~
	
	The Council have planned various growth related project for respective settlements, including:
	
	• Richmond
	  ○ New Richmond South Reservoir
	  ○ Completion of new trunk main.
	• Motueka
	  ○ New WTP at Parker Street.
	• Māpua

Key Issue	Response
• using existing infrastructure where there is capacity (infill); • upgrading existing infrastructure; and • providing new infrastructure where required. The Council can supply some growth demand through existing infrastructure where capacity is available. Sometimes this can put pressure on existing assets and can be challenging to manage especially in particular location and during summer months. An example of this is in Richmond, where growth is putting pressure on the capacity of storage reservoirs. During the summer it can be challenging to manage Brightwater, Eighty-Eight Valley and Wakefield water demand. To address this, the Council has undertaken strategic planning to determine the best solution to manage existing demand and accommodate growth in this area. The Council is planning to provide Brightwater with surplus water from Richmond. This can be accommodated through existing infrastructure and capacity. The Council is also planning new source bores near Brightwater that can supply water to Wakefield. Eighty-Eight Valley will be reconfigured and most domestic users will be supplied from Wakefield. A programme of infrastructure investment will be required to complete this. Currently there is no capacity for growth in Māpua/Ruby Bay and there is a moratorium on new water connections until a programme of upgrades has been completed. We are currently stretching the capacity of existing assets during increased summer demand and when there is a mains break. Once the trunk main and reservoir upgrades are completed the moratorium can be lifted and growth can occur. We anticipate this to occur in late 2021. In some cases, the Council needs to provide completely new infrastructure to deliver water services for growth. The Council plan to complete a multi-year project for the development of new trunks main in Richmond and Motueka. The Council is also planning to build a large reservoir in Richmond South in 2023/24 to meet growth demand. One risk we face is development uncertainty: where actual developments may differ from the plans in regards to location, timing, type, size and rate of development.	○ Upgrades to WTP ○ Completion of Aranui/Stafford trunk main ○ Upgrade to Pomona Reservoir ○ Upgrades to Stage Coach PS and Reservoir ○ Completion Rabbit Island and Best Island trunk main. • Brightwater ○ Upgrades to trunk main ○ New WTP ○ Upgrades to Bird Road PS. • Wakefield.

Key Issue	Response
Climate Change and Resilience The investment required to ensure our water supply infrastructure can withstand the effects of climate change and natural hazard shock events will be significant. The Council expects changes to Tasman's climate will broadly include: • Changing temperatures and seasonality; • Changing rainfall patterns and intensity; and • Changes to sea level and coastal hazards. Tasman is susceptible to a range of natural hazards including: • Earthquakes, tsunami; • Flooding, slips, landslides; and • Coastal Inundation and salt water intrusion. The Council is responsible for providing infrastructure that is resilient to events that disrupts 'business as usual' water supply. Examples of disruption will likely include: • Inadequate drinking water due to drought; • A major break in water mains pipes. Both these types of events can limit our ability to provide adequate and reliable water supply to our community. Water Security Parts of Tasman will likely suffer from more extreme climate conditions like low rainfall and drought. This means water security and storage opportunities will become increasingly important. Water supplies may be impacted and reduction in demand may be required. The Council is investing in water security projects including the regionally significant Waimea Community Dam, a supplementary water source for the Wai-iti Dam, new bores at Clover Road, upgrading the existing intake at Dovedale. At the other end of the climate spectrum is intense or prolonged rainfall events. Often during these events, river become turbid and surface takes in creeks and rivers and bores located	The Council is investing in water security through projects including • Waimea Community Dam; • Supplementary source for Wai-iti Dam; • New bores at Clover Road; • New inland bores in Richmond; • New storage reservoirs at Richmond South; • Upgrades to Pomona Road and Stage Coach Reservoirs; • Kaiteriteri Reservoir Improvements; and • New Motueka Reservoir at Recreation Centre; and • Filtration systems at WTPs; • Dovedale WTP to remove sediment. In addition to investing in infrastructure, the Council has other tools and levers available to manage demand. These measures include a Water Restrictions Protocol, promoting sustainable water use behaviours, education programmes, leak detection and network modelling. Initiatives for improved resilience • Energy initiatives (solar power, ongoing investigation into battery and fuel cell technology); • Seismic strengthening of WTPs.

Key Issue	Response
adjacent to rivers can be affected making it unsafe to drink. The Council is investing in filtration systems at some treatment plants to remove sediment so we can provide safe and reliable and safe supply. Network Redundancy The Council also considers and plans for network redundancy- when there are service outages from either power cuts or asset failure. This means we are able to provide service continuity or resume service quickly. The Council is planning to invest in providing in interconnected loops mains for our major piped networks and emergency backup generation at critical infrastructure such as WTPs and pump stations. In 2019, the Council adopted the *Climate Change Action Plan*. The plan sets out goals, targets and actions relating to three key themes: • Mitigation - how we can reduce greenhouse gas emissions from the Council's activities; • Adaption - ways we can respond to our changing environment, including positive opportunities; and • Leadership – how we can lead by example, advocate; • and encourage others to take action. Sea level Rise (SLR) SLR means that some coastal infrastructure will become more vulnerable to inundation. The Council needs to consider and strategically plan if, how and when to move critical infrastructure inland. This is a major conversation to be had with the community and will take some time. In the shorter term, the Council have identified that the existing Richmond bores located on the coastal margin and have historically experienced salt-water intrusion in times of extreme drought when the aquifer level is low. There are plans to more these bores further inland. Although the Waimea Community Dam is being built and once operational the dam will top up aquifers, we are still planning to move the Richmond bores further inland. Seismic investigations reservoirs and WTP restore service after major event.	

3.6 Responding to reform and legislation changes

As discussed in Section 3.5 Key Issues, the Government is in the process of developing the Three Waters reform and legislative changes. The Government has signaled that of the Three Waters, drinking water regulation is a priority for immediate reform.

The Council acknowledge that major change is certain and there is a legislative requirement for the Council to meet the current DWSNZ in prescribed timeframes, with no affordability exemptions. However we are not in a position to know exactly what all the reform will be and when it will occur. By the time this Water Supply AMP is adopted (June 2021) full details on the reforms and proposed timeframes will be available.

The Council need to make step changes to respond to reform and legislative changes. Most importantly in the short term, we are planning to build new and upgrade existing water treatment plants to address long term problems of non-compliance with the DWSNZ. The Council take a risk based approach to prioritise investment. The government have also advised that water supplies serving larger population be prioritized first.

Table 10: List of priority investment to build new and upgrade existing WTPs

Water Supply	AMP ID	Timing	Comment
Brightwater Wakefield	86123	2021 and 2031+	To meet the DWSNZ interim upgrades to existing Brightwater and Wakefield WTP in short term; and a new Clover Road WTP in medium to Long Term to meet growth needs. In 10+ years.
Motueka	86064	2021-22	New water treatment plant at Parker Street to meet DWSNZ.
Dovedale	86018	2021-2022	Dovedale - source and treatment upgrades.
Pohara	86031	2021/22	New membrane treatment plant added on to existing site to meet DWSNZ.
Redwoods	86037, 86039, 86146	2022/24; 2031-33	Interim upgrades to O'Connor's Creek and Golden Hills WTPs to meet DWSNZ in short term; longer-term solution is new WTP near River Road.
Tapawera	86059	2024-26	Install two new bores; construct new WTP building with filtration and UV; reuse of existing pH and Chlorination equipment to improve DWSNZ and resilience.
Murchison	86033	2024-26	WTP upgrade including electrical, UV, filters, UVT meter and valves to improve DWSNZ and resilience.

* Timing may change depending funding arrangements.

3.6.1 Current Legislation

Currently there are different pieces of legislation that governs drinking water in New Zealand.

Figure 2: Legislation governing the drinking water supply

Figure 2 above illustrates the different statutory obligations and standard currently governing drinking water in New Zealand.

Although, the Council takes a 'source to tap' approach for managing drinking water quality, we acknowledge the law governing drinking water extends across three Acts and is applied to regional and territorial authorities, including:

- The Council, as a regional authority, has obligations under the ***Resource Management Act 1991*** to protect sources of human drinking water from becoming contamination. The RMA governs source water where it is taken from the environment; either below ground or from surface catchments. The regional council through the RMA are responsible for natural and physical resources, for water permits and land activity resource consents. There is a hierarchy with this. Regional council build their policy and plans from National policy statement and NES. The Regional Plan control the actual or potential effects and contain the enforceable rules to achieve objectives and policies. The district council policies and plans are supposed to incorporate these regional requirements set by the regional council
- The Council as a supplier of drinking water (territorial authority) has obligations under the ***Local Government Act 2002*** and the ***Health Act 1956*** to provide safe drinking water from the source to the point of supply (to a restrictor or meter that is typically on the property boundary)
    - This involves the Council contributing towards protecting raw source water form contamination and ensuring water stays safe when it is abstracted, treated, stored and distribution to consumer's point of supply.

- The connection between LGA authority and the Health Act 1956 are all the obligations (that refer to the "Water Supplier") - which is the district council because they have the infrastructure and build the plants to run the supply, but it is the Regional Council who decides what sources can be used (for how long) and how much water can be used (based on their qualitative and quantitative assessment).

- Consumers also have responsibility for managing water quality from the point of the supply to the tap, however the Council has a role in providing information to consumers to help them meet that responsibility. It is the consumers' responsibility to maintain the pipes across the boundary of the property and a clean tank for the water to go into. If the water comes from a private bore then under the building act it is the consumers responsibility to ensure that they adequate treatment systems in place to treat their own water. It is the Council's responsibility to ensure that the provisions of the building Act and the building code are met by the consumer.
- The Council as a Building consent authority, has obligations under the ***Building Act 2004*** for ensuring that the relevant requirement of the Building code are met. This Act takes over responsibility for water once it leaves a public networked supply and enters the building-owner's property (usually at the water meter or restrictor, and also applies to water distributed within a building from its own self-supply (e.g., a roof tank or bore).
- While the Taumata Arowai Act was passed in July 2020, Taumata Arowai will not become fully operational until enactment of the Water Services Bill, projected to in the second half of 2021. Until then, the Ministry of Health will remain the regulator for drinking water safety.

For the purposes of developing this AMP, we have assumed our statutory obligations remain the same.

3.6.2 Havelock North Drinking Water Inquiry – findings and recommendations

In 2016 the town drinking water supply at Havelock North was contaminated. This resulted in a community wide outbreak of gastroenteritis, which made 5000 people ill and resulted in the death of four people. Today there are ongoing health issues for many people associated with the Havelock North outbreak. The event prompted a Government Inquiry and Three Waters Review. Recommendations culminated in comprehensive reform to the drinking water regulatory system. In December 2017, the Report of the Havelock North Drinking Water Inquiry - Stage 2 was published. The Inquiries key findings included:

- Systematic failures in the industry at all levels
- ~700,000 New Zealanders potentially exposed to unsafe drinking water
- Industry competency, training and certification is lacking
- Enhanced compliance monitoring to demonstrate compliance with DWSNZ is required
- Water Safety Plans require significant improvement; and
- A risk based multiple barrier approach should be applied.

The Inquiry report also contained comprehensive and wide-ranging recommendations for improvement to reticulated water supplies across New Zealand.

In particular the inquiry recommended six fundamental principles of drinking water safety are adhered to in New Zealand. These include:

- Principle 1: A high standard of care must be embraced.
- Principle 2: Protection of source water is of paramount importance.
- Principle 3: Maintain multiple barriers against contamination.
- Principle 4: Change (including changes to processes and hazardous events) precedes contamination.
- Principle 5: Suppliers must own the safety of drinking water.
- Principle 6: Apply a preventive risk management approach.

Applying these principles requires a change in the way the Council manages of some drinking water supplies and implementing these principles comes at a cost. This section (3.6 regulation and legislation discusses these changes in more details.

In particular, an approach from 'source to tap' is recommended to take the utmost care in the protection of the water supply, including multi-barrier treatment, which will provide a last barrier to the reticulation network itself.

3.6.3 Drinking Water Policy and the Multiple Barrier Approach

One of the recommendations of the Inquiry saw the Director General of Health encourage local authorities to provide effective water treatment. The Council has received written correspondence advising new expectations with regards to meeting the new Water Safety Plan framework. The framework represents international best practice consisting of ten components considered essential to demonstrating organisation commitment.

In response the Council has developed and implemented (May 2020) a Drinking Water Quality Management Policy which sets out the principles, policies and engagement with stakeholders to ensure council meets its obligations for safe drinking water.

The policy outlines that the Council will apply and maintain robust multiple barriers against contamination appropriate to the level of potential contamination and harm. The Policy sets the overarching framework for the Council's Water Safety Plans, and is an important component of the New Zealand Drinking Water Safety Plan Framework published by the Ministry of Health in 2018, following the Havelock North Inquiry. The Policy allows the Council to be consistent with the requirements of the Health (Drinking Water) Amendment Act 2007 and the Drinking Water Standards for New Zealand. It also makes it easier to seek approval from the Regulator for its Water Safety Plans and summarises in one document many requirements in a Water Safety Plan.

Applying the holistic perspective of the multi-barrier approach also incorporates the many stakeholders into the goal of keeping drinking water safe. The Council demonstrates its commitment to water safety by hosting a quarterly 'Drinking Water Working Group' meeting. This brings together key stakeholders involved with water safety including staff from the Ministry of Health, local Drinking Water Assessors, regional authority, politicians. The Council also hold monthly Water Safety meetings with the maintenance contractor to raise and discuss any concerns or issues related to water safety.

3.6.4 UV / Residual disinfection using chlorine

The Council has prioritised capital investment to build new or upgrade existing water treatment plants to meet the current DWSNZ (see Table 10) above. We anticipate that higher standards are likely in future including mandatory residual disinfection.

Residual disinfection is a concept that ensures water within a distribution network is microbiologically safe. It is clean or disinfected (free of pathogens that cause waterborne diseases) by treating it to remove and inactivate pathogens. The easiest and most common way of achieving a residual disinfectant is by using chlorine. By adding chlorine, a residual amount (low level of chlorine) remains in network after its initial application at the treatment plant. This constitutes an important safeguard against the risk of subsequent microbial contamination after treatment- for example a crack in a reservoir or a broken pipes and backflow where contamination can re-enter the network.

For that reason the Council have planned that all new and upgraded WTPs will have chlorination equipment that is capable of providing permanent chlorination as a treatment barrier and not just for temporary emergencies.

We also recognise there will be increased operational costs in the future to meeting high standards Therefore the Council has planned for increased staff resources for planning, compliance, monitoring and testing requirements.

The Council recently consulted the community about Water Safety.

3.6.5 Source Protection Zones

As a regional and territorial authority, the Council has obligations under the Health Act and the Resource Management Act to protect the quality of sources of drinking water in Tasman District. Section 69U of the Health Act, outlines water suppliers duty to take reasonable steps to contribute to protection of source of drinking water. Obligations currently include:

Table 11: Obligations under the Health Act 1956

Obligation	How we address the obligation	Part of the Council's responsibility
Effective monitoring and assessment of overall risks to the water supply	Develop Water Safety Plans (WSP), which identifies hazards and the events that could affect a water supply and gives an assessment of the degree of risk posed and the measures taken to mitigate this.	Territorial Authority (Engineering)

Obligation	How we address the obligation	Part of the Council's responsibility
	As part of the reform, the Council will now have Source water management plans which will sit alongside the WSP and will concentrate and provide a more in depth management of source waters	Territorial Authority (Engineering) Regional Authority
Statutory framework for incorporation of SPZs into Tasman Resource Management Plan	This will be addressed by the National Policy Statement for fresh water management giving effect to Te Mana o te Wai, New legislation to replace to RMA, the NES updated to give effect to Te Mana o te Wai and then the new Water Services Bill.	Regional
Assist with requirements of the NES – Protection of Sources of Human Drinking Water	New legislation to replace to RMA, the NES updated to give effect to Te Mana o te Wai and then the new Water Services Bill.	Regional

The recommendations of the Government Inquiry in the Havelock North Contamination Event states the "protection of source water is of paramount importance" and is the first, and most significant barrier against drinking water contamination and illness.
Source Water Management (Schedule 4) sit alongside WSPs to work towards developing in 2021.

Current sources used by the Council include surface water and groundwater. Through the Drinking Water Safety Policy, the Council committed to:

- Embrace a high standard of care to manage water quality at all points along the delivery chain
- Maintain an organisational sense of responsibility and dedication to providing consumers with safe drinking-water
- Monitor and manage land use activities upstream of abstraction points to ensure they do not impact on downstream drinking-water quality
- Maintain robust multiple barriers against contamination appropriate to the level of potential contamination and harm
- Ensure, where appropriate, source protection is enabled in the Tasman Resource Management Plan
- Development of source water management plans; and
- Develop, maintain and review Water Safety Plans (WSPs) for each supply scheme, that identify:
    - The critical control points for managing water quality

- The needs and expectations of key stakeholders who could affect, or be affected by, decisions or activities to do with the drinking-water supply
- Robust risk assessments and mitigation measures
- Detailed improvement plans; and
- Contingency plans to be implemented in respect of outages or contamination events.

Section 11 (a) (i) of the new Taumata Arowai – the Water Services Regulator Act 2020 states that one of the regulatory bodies function is to manage risk to sources of drinking water. The new Water Services Bill (currently going through the parliamentary process to become an Act) contains all of the details of the new drinking water regulatory system, and has very specific provisions relating to and including Source Water Risk Management. The introduction states:

- The Bill proposes new arrangements relating to sources of drinking water—that is, the freshwater bodies from which water is abstracted before treatment. These new arrangements are based on a preventive risk management approach, alongside open flows of information between local authorities, drinking water suppliers, and Taumata Arowai. Key measures for this approach include:
  - Drinking water suppliers must have a source water risk management plan, which identifies the risks to a source of drinking water and manages, controls, or eliminates those risks as part of a drinking water safety plan.
  - Local authorities must contribute to source water risk management plans by sharing information about risks and undertaking actions to address them on behalf of a drinking water supplier.
  - Drinking water suppliers must monitor source water quality, and regional councils must assess the effectiveness of regulatory and non-regulatory interventions relating to source water every three years.
  - A new provision in the Resource Management Act 1991 to require consent authorities to have regard to risks, or potential risks, to source water when considering applications for resource consents.

In order to implement this direction, we are planning to develop source water risk management plans as part of our Water Safety Plans. In addition, we are planning to investigate and develop GIS source water protection zones around our water supply bores and intakes based on catchment activities, land use activities and other relevant datasets.

3.6.6 Te Mana o te Wai

Through the National Policy Statement (NPS) for Freshwater Management 2020 (Freshwater NPS), the Government has issued local authorities with new direction on how to manage freshwater under the Resource Management Act 1991. Central to this new direction is the concept of *Te Mana o te Wai*.

Te Mana o te Wai is a concept and framework which is derived out of Te Ao Māori (the Māori world view that acknowledges the interconnectedness and interrelationship of all living and non-living things) and reflects the recognition of freshwater as a natural resource whose health is integral to the social, cultural, economic and environmental wellbeing of communities.

The framework of Te Mana o te Wai is rooted in the development of the National Policy Statement for Freshwater Management since 2014 by the Iwi Leaders Group and has been a key part of the current NPS-FM since 2014. It establishes a set of guiding principles and a hierarchy of obligations, and refers to the essential value of water, and the importance of sustaining the health and wellbeing of water before providing for human health needs, and then to other uses.

It expresses the special connection all New Zealanders have with freshwater. By protecting the health and well-being of our freshwater we protect the health and well-being of our people and environments.

There is a hierarchy of obligations in *Te Mana o te Wai* that prioritises (in order) the:

- Health and well-being of water bodies and freshwater ecosystems
- Health needs of people (such as drinking water); and
- Ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

The six principles of Te Mana o te Wai in the NPS-FM 2020 inform its implementation, the principles include:

1. **Mana whakahaere**: the power, authority, and obligations of tangata whenua to make decisions that maintain, protect, and sustain the health and well-being of, and their relationship with, freshwater
2. **Kaitiakitanga**: the obligation of tangata whenua to preserve, restore, enhance, and sustainably use freshwater for the benefit of present and future generations
3. **Manaakitanga**: the process by which tangata whenua show respect, generosity, and care for freshwater and for others
4. **Governance**: the responsibility of those with authority for making decisions about freshwater to do so in a way that prioritises the health and well-being of freshwater now and into the future
5. **Stewardship**: the obligation of all New Zealanders to manage freshwater in a way that ensures it sustains present and future generations
6. **Care and respect**: the responsibility of all New Zealanders to care for freshwater in providing for the health of the nation.

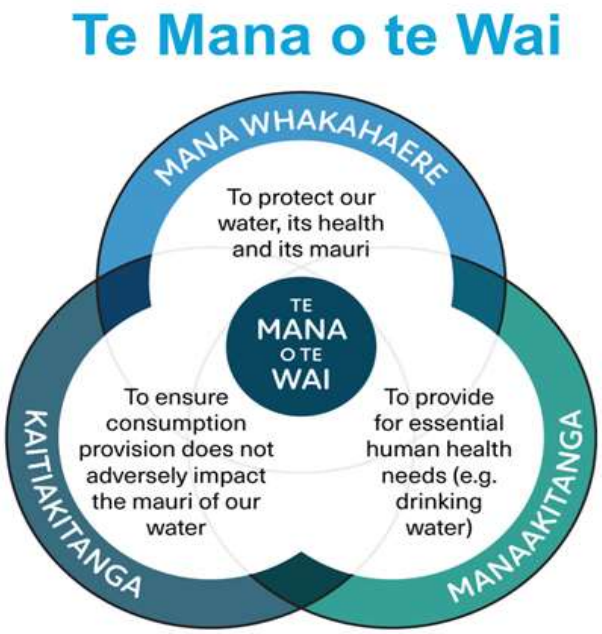


Figure 3: illustrates the interconnected principles of Te Mana o te Wai

Section 3.2(2) NPS-FM 2020 states every regional Council must give effect to Te Mana o te Wai. This will have implications on how the Water Supply Activity is managed and will likely impact water takes and discharges in the future. There is a lot of uncertainty around how and when Te Mana o te Wai will be implemented across New Zealand and the Council will work with the Government and our treaty partners to better understand and implement Te Mana o te Wai.

Although *Te Mana o te Wai* has its roots in the Freshwater NPS, the Government has clearly signaled through Taumata Arowai–the Water Services Regulator Act 2020 and the Water Services Bill that Maori interest and knowledge will be embedded throughout Taumata Arowai and it has the capability to uphold the principles of the Treaty of Waitangi and engage with Māori. One of Taumata Arowai's statutory objectives is to give effect to Te Mana o te Wai.

Taumata Arowai is currently engaging with iwi/Māori to work through how it will embed *Te Mana o Te Wai* in its decision making and how it behaves. A Māori Advisory Group will provide a support and guidance organisation on Māori interests and knowledge, as they relate to Taumata Arowai's objectives, functions, and operating principles. This includes advising Taumata Arowai on how to interpret and give effect to Te Mana o te Wai in its functions and duties, and how to enable mātauranga Māori and tikanga Māori to be exercised.

In due course, the Council will engage with local iwi on how to give effect to Te Mana o te Wai

3.7 Prioritisation

The Council provides many services on behalf of Tasman's residents and there is often competing demands for the Council's investment across and within these services. The Council needs to decide how much, and when, to invest in these services in a way that maintains affordability for customers and ratepayers.

There are multiple factors that affect the priority of individual projects or work streams. These include:

- The need to protect public health and safety
- The need to conserve and enhance the natural environment
- Statutory compliance
- Meeting the needs of tomorrow's population
- Readiness to implement works
- Co-funding opportunities
- Creating functional and attractive public places
- Benefits and risks
- District distribution
- Strategic fit.

The Council has applied the following principles when developing its programme of works:

- To continue to meet its fiscal prudence, sustainability and environmental sustainability obligations.
- To keep the medium to long term in focus i.e. rather than being overly diverted by the shorter term recovery from the Covid-19 pandemic.
- To understand the trade-off's or benefits across all of the well-being domains (social, environmental, economic and cultural).
- To capitalise on the economic environment (i.e. enhanced borrowing terms, and increased labour and skills availability).
- To make the most of the enhanced opportunities of Government funding, subsidies and other incentives to advance the community outcomes.
- To right size the Council staffing and operational expenditure.

Council has taken all of the above into consideration in order to present a programme that is achievable and affordable. Generally, mandatory requirements such as statutory compliance take priority, and discretionary activities have been programmed second to this.

4 Key Linkages

There are multiple factors that influence how the Council manages this activity. They can be internal or external and include legislation, policies, regulations, strategies and standards. This section summarises these key linkages.

4.1 Overview

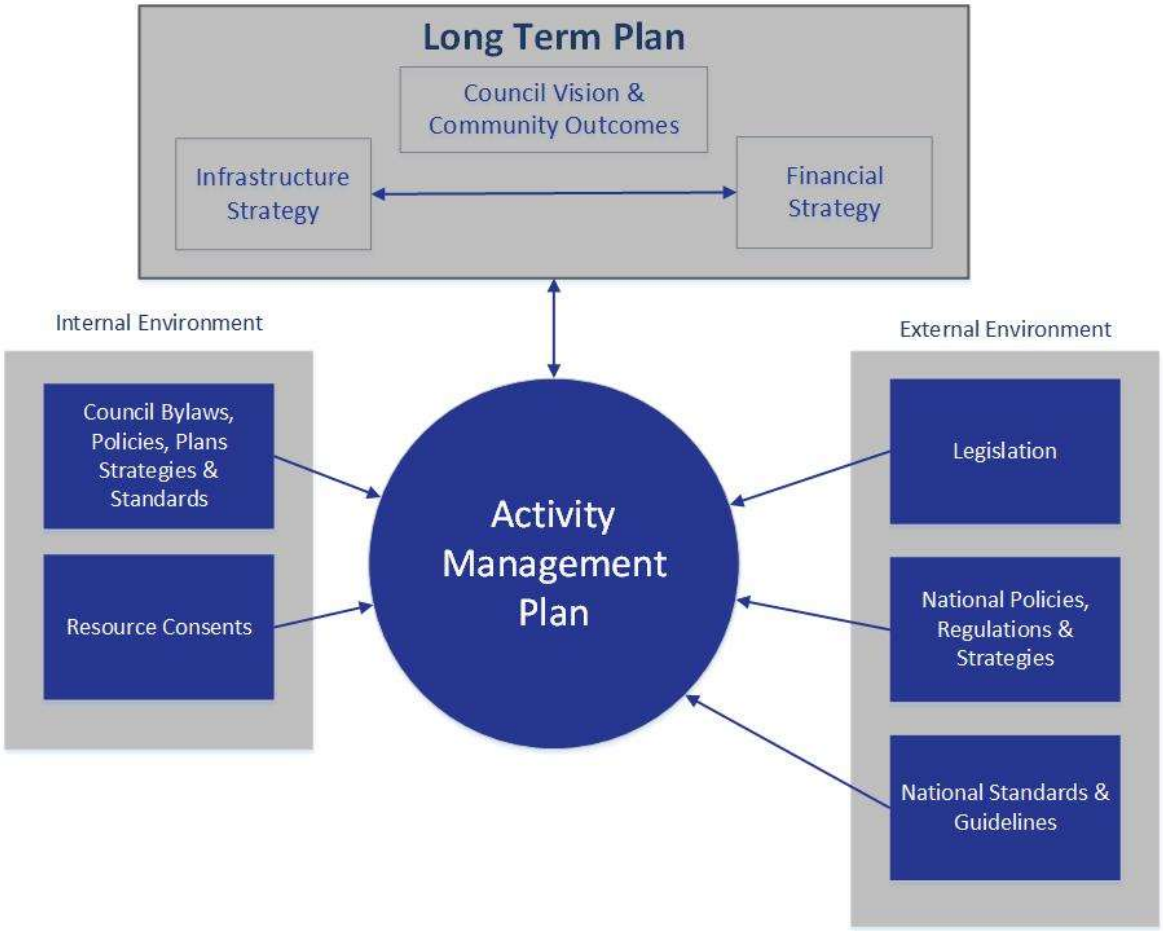


Figure 4: How the Water Supply Activity relates to other documents

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.
- Local Drivers – community desire for increased level of service balanced against the affordability.
- Industry Guidelines and Standards.
- 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.

4.2 Key Legislation

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

Table 12: Summary of Key Legislation that relates to the Water Supply Activity

Key Legislation	How it relates to Water Supply Activity
Taumata Arowai—the Water Services Regulator Bill	The bill establishes Taumata Arowai - the Water Services Regulator as a new Crown Agent and provides for its objectives general functions, operating principles, and governance arrangements. Taumata Arowai is responsible for administering and enforcing a new drinking water regulatory system including the management of risks to sources of drinking water.
Water Services Bill (2021)	The Bill contains all of the details of the new drinking water regulatory framework that Taumata Arowai will administer and is going through the parliamentary process, it will likely be enacted later in 2021.
The Health Act 1956 Health (Drinking Water) Amendment Act 2007	Places responsibilities on the Council as a water supplier to protect the quality and safety of drinking water. Responsibilities include the duty to take reasonable steps to contribute to protection of source of drinking water by preparing and implementing Water Safety Plans (WSP) for schemes supplying over 500 people.
Local Government Act 2002	The Local Government Act requires local authorities to prepare a ten-year Long Term Plan and 30-year Infrastructure Strategy, which are to be reviewed every three years. The Act requires local authorities to be rigorous in their decision-making by identifying all practicable options and assessing those options by considering the benefits and costs in terms of the present and future well-being of the community. This activity management plan provides information to support the decisions considered in the Long Term Plan.
Resource Management Act 1991	The Resource Management Act 1991 (RMA) is the principal legislation that sets out how we manage our environment sustainably. As well as managing air, soil, freshwater and the coastal marine area (and the effects of human activity on these resources), the RMA regulates land use and the provision of infrastructure, which are integral components of New Zealand's planning system.
COVID-19 Recovery (Fast-track Consenting) Act 2020	This Act shortcuts the current resource consent process under the RMA to support New Zealand's recovery from the impacts of COVID-19. The Act's purpose is to urgently promote employment to support New Zealand's recovery and the certainty of ongoing investment across New Zealand, while continuing to promote the sustainable management of natural and physical resources.

Key Legislation	How it relates to Water Supply Activity
Infrastructure Funding and Financing Act 2020	Provides a new legislative tool to enable private capital to support the provision of new infrastructure for housing and urban development. The Act provides opportunities for local councils, Māori and iwi, and developers to partner and deliver infrastructure, free of the council's debt limits or from charging high upfront costs to developers.
Public Works Act 1981	The Public Works Act provides the statutory authority to procure land for a public infrastructure where necessary.
Civil Defence Emergency Management Act 2002	Sets an expectation that the Council's services will function at the fullest possible extent during and after an emergency, even though this may be at a reduced level of service.
Health and Safety in Employment Act 1992 & 2015	Health and Safety legislation requires that staff and contractors are kept safe at work. New legislative changes to the act will mean improved health and safety measures will be required.
Utilities Access Act 2010	The processes and rules for coordinating work done in transport corridors by utility operators, or that affects utility operators' assets
Fire Service Act 1975	Sets out of the legal obligation for local authorities to supply fire-fighting water within urban areas and section 30 outlines the flow, storage and volume requirements.
Building Act 2004	This Act provides a legislative framework for the building standards in the Building Code. Buildings must be safe and sanitary and must not threaten the water supply through contamination.
Te Tiriti o Waitangi – Treaty of Waitangi	The Treaty of Waitangi is an agreement between Māori and the Crown. Under Section 4 of the Local Government Act 2002 local authorities are required to 'recognise and respect the Crown's responsibility to take appropriate account of the principles of the Treaty of Waitangi and to maintain and improve opportunities for Māori to contribute to local government decision-making processes'. Further sections of the Act, particularly 77 and 81, detail the scale of requirement for local authorities to seek contributions and involvement from Māori in consultation and decision-making processes.

4.3 Key Planning, Policies and Strategies

The planning policies and strategies are listed below

Table 13: Key National Policies and Strategies that relate to this activity

National Polices, Regulations and Strategies	How it relates to Water Supply Activity
National Policy Statement on Urban Development Capacity 2016 (NPS-UDC)	Sets out the objectives and policies for providing development capacity under the Resource Management Act 1991 and came into effect on 1 December 2016.
National Policy Statement for Freshwater Management 2020 (Freshwater NPS)	The Freshwater NPS came into force on 3 September 2020. It provides local authorities with direction on how to manage freshwater under the Resource Management Act 1991.
National Environmental Standards for Freshwater (Freshwater NES)	The regulations came into force on 3 September 2020. Regulates activities that pose risks to the health of freshwater and freshwater ecosystems.
National Environmental Standard for Sources of Human Drinking Water (NES)	The regulation came into force on 20 June 2008 and sets requirements for protecting sources of human drinking water from becoming contaminated. As part of the Government's Three Water Review, there are proposed amendments to the NES with the aim to strengthen the ability of regional councils and territorial authorities to manage risks to drinking water posed by activities in drinking water catchments. Further consultation is expected later in 2021. Contaminants such as microorganisms can pose a risk to human health when they enter drinking water supplies and that water is then consumed. Taking steps to prevent such contaminants from entering drinking water sources is part of a multiple barrier approach to reduce this risk to people.

National Polices, Regulations and Strategies	How it relates to Water Supply Activity
Resource Management (Stock Exclusion) Regulations 2020	The regulations came into force from 3 September 2020 and prohibit the access of cattle, pigs and deer to wetlands, lakes, and rivers more than one metre wide. The regulations will help with protect the zone around drinking water sources. Livestock can carry disease-causing organisms like campylobacter, which can make people sick when they come into contact with water contaminated with livestock dung. When livestock enter water bodies they contaminate the water and damage the banks. This compromises New Zealanders' ability to use waterbodies for recreation and mahinga kai (food gathering).
The Local Government (Financial Reporting) Regulations 2011	Sets out the content of local authorities' annual reports and financial reporting framework and standards.
Sustainable Development for New Zealand - Programme of Action (Ministry of Social Development)	Sets out the Government's approach to achieving sustainable development and specifies an improved provision of infrastructure and services (including water supply, wastewater treatment transport, energy and housing).
Climate-related financial discloser (Ministry for the Environment)	
National Climate Change Risk Assessment for New Zealand (Ministry for the Environment)	
Exposed: Climate change and infrastructure (LGNZ)	

4.3.1 National Standards and Guidelines

For the latest standards information, refer to http://www.standards.govt.nz.

Table 14: Summary of National Standards and Guidelines

National Standards	How it relates to Water Supply Activity
Drinking-water Standards for New Zealand (DWSNZ) 2005 (Revised 2018)	DWSNZ direct the quality requirements for drinking water provided to consumers. It prescribes the maximum allowable concentrations of potentially harmful contaminants in the water. Drinking water suppliers have a duty to take all practicable steps to provide water of a quality consistent with the standards.

National Standards	How it relates to Water Supply Activity
Ministry of Health: Guidelines for Drinking-water Quality Management for New Zealand (updated 2019)	Explain the development of the Standards and provide advice for achieving high level of water quality management. The Guidelines will help water suppliers to achieve the Standards. The guidelines complement the DWSNZ.
Ministry of Health: New Zealand Drinking –water Safety Plan Framework (2018)	A water safety plan is essential to the good management of a drinking-water supply. The New Zealand Water Safety Plan Framework outlines what the Ministry of Health expects water suppliers to include in their water safety plans
Ministry of Health: Handbook for preparing a Water Safety Plan (2019)	A water safety plan is essential to the good management of a drinking-water supply. The Handbook for Preparing a Water Safety Plan is designed to be used alongside the New Zealand Drinking-water Safety Plan Framework and provides additional guidance and information
Rural Agricultural Drinking water Supply Guidelines (2015)	Guideline will give water suppliers flexibility in demonstrating compliance with the requirements of the drinking-water provisions of the Act.
Small Drinking –water Supplies (2014)	This document has been developed to help prepare a water safety plan for small drinking-water supplies.
Ministry of Health: Water Safety Plans Guides for Drinking water Supplies (2014)	A series of water safety plan guides covering the system elements (e.g., filtration, disinfection, water storage, distribution etc.) that are most frequently found in drinking-water supplies, for reference in preparing a water safety plan.
Ministry for the Environment - Technical Guidelines for Drinking Water Source Protection Zones 2005 (Revised 2018)	Guidelines are based on current national and international best practices for delineating and implementing source protection zones for drinking water sources.
Controller and Auditor General publications: • Local government: Examples of better practice in setting local authorities performance measures. • Local authorities: Planning to meet the forecast demand for drinking water • Getting the right information to effectively manage public assets: Lessons from local authorities	Discussion paper that provides examples of better practice in performance measures within local authorities long term plans. Performance audit report to determine how well prepared local authorities are to meet demand for drinking water. Discussion paper examining how local authorities approach identifying and gathering the asset information.

National Standards	How it relates to Water Supply Activity
Ministry for the Environment: National Environmental Standards Sources of Human Drinking Water (2007)	Guidelines intend to reduce the risk of contaminating drinking water sources by requiring regional councils to consider the effects of activities on drinking water sources in their decision-making.
New Zealand Fire Service Fire Fighting Water Supplies Code of Practice: SNZ PAS 4509:2008	Requirements to enable the Fire Service to have access to sufficient water during emergencies. Provides up-to-date practices for planning and approving a subdivision, sizing a water storage facility, and when replacing or renewing a water main. Guidance has been provided on water storage facilities in rural areas and detail is included about alternative firefighting water sources.
NZS 4404:2010	Land Development and Subdivision Infrastructure
AS/NZS ISO 9001:2016	Quality Management Systems
AS/NZS 3917:2013	Fixed Term Contract Management
AS/NZS 4801:2001	Occupational Health and Safety Management Systems
AS/NZS 2032:2006	Installation of PVC Pipe Systems
AS/NZS 2280:2012	Ductile Iron Pressure Pipes and Fittings
AS/NZS 3725:2007	Design for Installation of Buried Concrete Pipes
AS/NZS 2566.1:1998	Buried flexible pipelines - Structural design
AS/NZS 2566.2:2002	Buried flexible pipelines – Installation
NZS 3101.1&2:2006	Concrete Structures Standard
NZS 3910:2013	Conditions of contract for building and civil engineering construction
NZWWA New Zealand Infrastructure Asset Grading Guidelines 1999	Provide practical methods for assessing the condition and performance of infrastructure assets, and for determining long-term investment needs for maintaining, enhancing and extending those assets to meet defined levels of service.
New Zealand Pipe Inspection Manual 3rd edition (2006)	An overview of tasks that can be completed using CCTV and how these activities can be used to manage pipe assets.
Department of Internal Affairs publications: Supporting guidance for drinking-water What is Water Loss?	Guidance to help local authorities when setting levels of service and targets related to mandatory performance measures. Guidance to help local authorities define water loss and outline methods to measure it.

National Standards	How it relates to Water Supply Activity
Water New Zealand Publications 1. Code of Practice for Fluoridation of Drinking-water Supplies in New Zealand 2. Water Loss Guidelines (2010)	Specifies good practice for the design and operation of water fluoridation plants to ensure fluoride is added safely and effectively to water supplies. Resources and guidance tools necessary to firstly analyse the level of water losses in a network and move forward in reducing the level of water losses to an appropriate reasonable level for the individual supply.

4.3.2 The Council Local Bylaws, Polices, Plans, Strategies and Standards

Table 15: The Council Bylaws, Polices, Plans, Strategies and Standards documents relating this activity.

The Council Documents	How it relates to Water Supply Activity
Drinking-Water Quality Management Policy (21 May 2020)	Sets out the Council's commitment to managing its water supplies effectively in order to provide safe, high quality drinking water and meet agreed levels of service. The Policy outlines the framework for Water Safety Plans, and is an important component of the New Zealand Drinking Water Safety Plan Framework published by the Ministry of Health in 2018, following the Havelock North Inquiry.
Tasman District Council District Plan – 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. Part V applies to all uses of water including taking, diverting and damming.
Tasman Regional Policy Statement (TRPS)	An overview of significant resource management issues with general policies and methods to address these. Part 7 Fresh Water Resources outlines the control of land use for the purposes of water management.
Tasman District Council Engineering Standards and Policies 2013	Sets out the standards for the design of engineering works associated with the development of urban supplies, eg, material types, capacity of pipes.
Land Development Manual 2019	Provides standards and guidance for the design and construction of network assets and infrastructure that are or will be owned by the Council.
Tasman District Council Financial Strategy	Sets out the how the Council funds its activities, projected population growth rates, funding expenditure, projected debt levels and management of investments.
Tasman District Council's Infrastructure Strategy	Identifies infrastructure issues, principal options for managing issues and implications of those options.

The Council Documents	How it relates to Water Supply Activity
Tasman District Council's Procurement Strategy	The procurement strategy dictates the process for all procurement at the Council. The strategy does cater for scale and size of the acquisition.
Water Bylaw 2016 (Amended 2018)	Enable the Council to manage the provision of public water supply. Protect the public water supply network from damage, misuse, and interference; and protect the environment and the health and safety of the public and persons using the public water supply.
Long Term Plan	The Local Government Act 2002 requires the Council to produce a Long Term Plan (LTP) every three years. The LTP outlines activities and priorities for ten years, providing a long-term focus for decision-making.
Water and Sanitary Services Assessments(WSSA) 2005	A WSSA was last undertaken in 2005. The two-volume assessment evaluated all Council-owned, community and some private water and wastewater services. Volume 1: An overview of the water and sanitary services in Tasman District with recommendations and priority rankings for future improvements Volume 2: The detailed assessments.
Water Safety Plans (WSP)	Encourage the application of risk management principles to water-treatment and distribution to minimise controllable risks of contamination.
Climate change and impacts on agriculture in Tasman (NIWA, 2019)	This report expands on the 2015 NIWA climate change report for Tasman District by introducing six additional climate change variables. These variables have been found to give the most accurate results when compared to historical climate and circulation patterns in the New Zealand and southwest Pacific region. The report describes changes that may occur to Tasman's climate over the next 80 years, and describes the impacts of these changes on agricultural systems.
Climate Change and Variability Report (NIWA, 2015)	In 2015, NIWA released a climate change and variability report for Tasman District Council. The report describes changes which may occur over the coming century in the climate of the Tasman region, and outlines some of the possible impacts of these changes.

4.4 Strategic Studies

Table 16: Strategic Studies related to this activity

	Strategic Studies	Date
Brightwater	Richmond, Wakefield, Waimea and Māpua Water Supply Network Model	2007
	Brightwater Network Model	2021
	Richmond and Brightwater/Hope Water Demand Management Plan	2010
	Brightwater/Hope Water Demand Management Plan	2018
	Brightwater Water Safety Plan	2011
Collingwood	Water Demand Management Plan for the Tasman District	2011
	Leak detection monitoring	2011
Dovedale	Water Demand Management Plan for the Tasman District	2011
	Developing a basic network model	2021
Eighty Eight Valley	Water Demand Management Plan for the Tasman District	2011
Hamama	Limited studies have been undertaken to date for the Hamama water supply system. If the system is retained by the Council, then a Water Safety Plan will need to be developed.	
Kaiteriteri/Riwaka	Water Demand Management Plan for the Tasman District	2011
Māpua /Ruby Bay/ Māpua Rise	Richmond, Wakefield, Waimea and Māpua Water Supply Network Model	2007
	Māpua /Ruby Bay Water Demand Management Plan	2018
	Māpua /Ruby Bay and Waimea Industrial Zone Water Safety Plan	2011
	Motueka Costal Community Water Supply Demand Projection	2011
	Coastal Pipeline and Tasman View Road Upgrade	2011
	Coastal Pipeline – Reservoir Siting Investigation	2010
	Coastal Pipeline – Preliminary Hydraulic Design Report	2010
	Programme Business Case – Māpua Water and Wastewater	2017

	Strategic Studies	Date
	Māpua Hydraulic Model	2018
Motueka	Motueka Town Water Supply Coastal Scheme Water Safety Plan	2009
	Water Demand Management Plan for the Tasman District	2011
	Motueka Coastal Community Water Supply Demand Projection	2011
Murchison	Water Demand Management Plan for the Tasman District	2011
Pōhara	Water Demand Management Plan for the Tasman District	2011
Redwoods (1& 2)	Water Demand Management Plan for the Tasman District	2011
Richmond	Richmond Water Supply Network Model	2011
	Richmond and Brightwater/Hope Water Demand Management Plan	2010
	Richmond Water Safety Plan	2010
	Water Demand Management Plan for the Tasman District	2011
	Māpua /Ruby Bay and Waimea Industrial Zone Water Safety Plan	2011
	Richmond Water Treatment Plant Design	2011-2015
	Richmond Hydraulic Master Plan (currently being updated 2018)	2018
Tapawera	Water Demand Management Plan for the Tasman District	2011
Upper Takaka	Upper Takaka Water Safety Plan	2011
	Water Demand Management Plan for the Tasman District	2011
Waimea	Waimea 100-Year Water Demand And Supply Modelling	2017
	Evaluation of Options for Waimea Basin Urban Water Supplies in the Event Waimea Community Dam Does Not Proceed	2015
	Assessment of Base Case for Waimea Basin Urban Water Supplies in the Event Waimea Community Dam Does Not Proceed	2015
Wakefield	Wakefield Water Supply Network Model	2007
	Water Safety Plan for the Wakefield Water Supply	2012
	Wakefield Water Demand Management Plan	2018

Strategic Studies		Date
	Wakefield Hydraulic Model	2017

5 Levels of Service

A key objective of this plan is to match the levels of service provided by this activity with the agreed expectations of our customers and their willingness to pay for that level of service. These levels of service provide the basis for the life cycle management strategies and works programmes identified in this Plan.

Levels of service can be strategic, tactical or operational. They 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 the Council bylaws that impact on the way assets are managed (e.g., 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.

5.1 Local Government Mandatory Performance Measures

In 2010, the Local Government Act 2002 was amended to require the Secretary for Local Government to make rules specifying non-financial performance measures for local authorities to use when reporting to their communities. The aim was to help the public to contribute to discussions on future levels of service for their communities and to participate more easily in their local authority's decision-making processes.

The performance measures provide information about the levels of service for five groups of activities carried out by local authorities including:

- Stormwater drainage
- Sewerage and the disposal of sewage
- Flood protection and control works
- Water supply
- Provision of footpaths and roads.

The performance measures came into force in 2014 and local authorities were required to incorporate them in their 2015-2025 long-term plans. The DIA provides local authorities guidance for the implementation of the Local Government Mandatory Performance Measures.

5.2 Our Levels of Service

Table 17 summarises the Levels of Service and performance measures for this activity. The light blue shaded rows show those that are included in the Long Term Plan and reported in the Annual Report. Unshaded white rows are technical measures that are only included in the Activity Management Plan.

Table 17: Levels of Service

Levels of Service	Performance Measure	Current Performance	Future Performance Targets			
			Year 1	Year 2	Year 3	Year 10
			2021/22	2022/23	2023/24	2024-2031
Our water takes are sustainable.	Compliance with resource consent is achieved, as measured by the number of: • abatement notices • infringement notices • enforcement orders • convictions • received in relation to those resource consents. All resource consents are held in DORIS.	Achieved. In 2019/2020 compliance was achieved with all consents. (Target: 0).	0	0	0	0
Our water takes are sustainable.	The volume and percentage of real water loss from the network is less than the target. Total real loss= total water provided - water metered - non-revenue water. % = L real loss divided by average L usage per connection as yearly average. Mandatory measure 2.	Achieved 2019/2020: weighted district average of 25% total network water loss (Target: ≤25%)	≤25%	≤25%	≤25%	≤25%
Our use of the water resource is efficient.	Water loss does not exceed 4.00 as measured by the Infrastructure Leakage Index (ILI).	Measure was introduced 2018 and for the 2019/20 period a weighted District wide 3.2 ILI.	<4.00	<4.00	<4.00	<4.00

Levels of Service	Performance Measure	Current Performance	Future Performance Targets			
			Year 1	Year 2	Year 3	Year 10
			2021/22	2022/23	2023/24	2024-2031
Our water takes are sustainable.	The average urban consumption of drinking water per person per day is less than the target. Mandatory measure 5.	Achieved. We achieved a total urban average of 219L per person per day in 2019/20.	<250L per person/day	<250L per person/day	<250L per person/day	<250L per person/day
Our water is safe to drink.	Minimise the number of temporary advisory notices issued to customers to boil water.	Not Achieved. There was one temporary boil water notice in 2019/2020 Upper Tākaka. (Target 0).	0	0	0	0
Our water is safe to drink.	We comply with Part 4 (bacterial compliance criteria) of the Drinking Water Standards. As measured by the number of schemes with • plant compliance, and • zone compliance. As determined by the Ministry of Health - Annual Drinking Water Survey. Mandatory measure 1.	Not Achieved. 2019/2020: For the last compliance year (ending June 30, 2020), four plants did not comply (Collingwood, Dovedale, Eight-Eight Valley and Pohara); and one distribution zone (Dovedale) did not comply. The reason for plant non-compliance: **Collingwood**: E coli detected. **Dovedale**: High turbidity and	Plant compliance 100% compliance	Plant compliance 100% compliance	Plant compliance 100% compliance	Plant compliance 100% compliance

Levels of Service	Performance Measure	Current Performance	Future Performance Targets			
			Year 1	Year 2	Year 3	Year 10
			2021/22	2022/23	2023/24	2024-2031
		chlorine levels <0.2mg/l. Eighty-Eight Valley: High turbidity. **Pohara**: E.coli transgression at the plant. The reason for zone non-compliance: **Dovedale**: E.coli detected. There is a permanent boil water notice on the Dovedale supply. See table 20 below. Refer to table below.				
Our water is safe to drink.	We comply with Part 5 (protozoal compliance criteria) of the Drinking Water Standards. As measured by a number of schemes with compliant protozoa treatment determined by the Drinking Water Assessor. Mandatory measure 1.	Not Achieved 2019/2020: 12 zones failed compliance Refer to table below.	100% compliance	100% compliance	100% compliance	100% compliance
Our water supply systems provide fire protection to a level that is consistent with	Annually test, and achieve at least 95% compliance with FW2 standards, for 15 randomly selected fire hydrants in Richmond, and not less than five randomly selected fire	2019/2020: 87% in the random sampling were compliant.	95%	95%	95%	95%

Levels of Service	Performance Measure	Current Performance	Future Performance Targets			
			Year 1	Year 2	Year 3	Year 10
			2021/22	2022/23	2023/24	2024-2031
the national standard.	hydrants in each of the other urban supplies in our District.					
Our water supply systems are built, operated and maintained so that failures can be managed and responded to quickly.	Planned service interruptions do not exceed eight hours as required under section 69S (3) of the Health Act 1956. As measured through the maintenance contract reporting.	Not achieved. In 2019/20 there was one planned service interruption that exceeded 8 hours. (Target <8 hours).	<8 hours	<8 hours	<8 hours	<8 hours
Our water supply activities are managed at a level that the community is satisfied with.	Percentage of customers (who receive a service) are satisfied with the water supply. Measured through the annual residents' survey.	Not Achieved. 80% of customers (who receive a service) were satisfied or very satisfied. (Target: 80%).	≥80%	≥80%	≥80%	≥80%

Levels of Service	Performance Measure	Current Performance	Future Performance Targets			
			Year 1	Year 2	Year 3	Year 10
			2021/22	2022/23	2023/24	2024-2031
Our water supply activities are managed at a level that the community is satisfied with.	Complaints per 1000 connections are less than the target - relates to clarity, taste, odour, pressure or flow, continuity of supply and the Council's response to these issues. Justified complaint defined as a notification of a drop in LOS. Measured Confirm database and NSC system. Mandatory measure 4.	Not Achieved. 43 complaints per 1000 connections. (Target: <20).	<20	<20	<20	<20
Our water supply activities are managed at a level that the community is satisfied.	Median response times are within targets for urgent call-outs (<2 hours). Median response times are within targets for non-urgent call-outs (<48 hours). Mandatory measure 3.	Achieved 2019/2020: response times of 1.6 hours for urgent call-outs, and 3.4 hours for non-urgent call-outs.	<2 hours <48 hours	<2 hours <48 hours	<2 hours <48 hours	<2 hours < 48 hours
Our water supply activities are managed at a level that the community is satisfied with.	Median resolution times are within targets for urgent call-outs (<24 hours). Median resolution times are within targets for non-urgent call-outs (<8 working days). Mandatory measure 3	2019/2020: resolution times of 6.8 hours for urgent call-outs, and 22.1 hours for non-urgent call-outs.	<24 hours <3 working days	<24 hours <3 working days	<24 hours <3 working days	<24 hours <3 working days

Levels of Service	Performance Measure	Current Performance	Future Performance Targets			
			Year 1	Year 2	Year 3	Year 10
			2021/22	2022/23	2023/24	2024-2031
Our water supply systems are designed and operated to be resilient.	Urban water supply networks have sufficient reservoir storage capacity. Defined as one day at average annual demand. As measured through annual demand figures vs. actual storage.	Not Achieved. Motueka does not have reservoir storage. (Target 12/13).	12/13	12/13	12/13	12/13

5.3 Levels of Service Changes

The Council is not planning to make any changes to our Levels of Service as a thorough review was completed in 2018. Instead, we will continue to collect data on the new performance measures introduced last AMP cycle.

A new government regulator is expected to be fully in place by mid-2021. It is possible that this new regulatory will require further measure to be reported.

Table 18~~Table 18~~ below summaries the key changes the Council has made during development of the Long Term Plan 2021 – 2031.

Table 18: Summary of areas where we are making minor performance measure changes

LOS Theme	Performance Measure	Summary of change
Our water supply activities are managed at a level that the community is satisfied with.	Median resolution times are within targets for non-urgent call-outs (<3 working days).	Changed target from 8 days to 3 days.

This AMP review has incorporated some recommendations from external agencies, these are summarised in Table 19~~Table 19~~.

Table 19: External agency recommendations

External Agency	Guidance Support
Department of Internal Affairs	Define the non-financial performance measures rules and provide supporting guidance and examples.
Water New Zealand	Water New Zealand publish the National Performance Review (NPR), an annual voluntary reporting initiative, benchmarking the provision of drinking water, wastewater and stormwater services (3 Waters). This is an optional exercise, but Tasman District Council have submitted annual performance data since 2015.
Controller and Auditor General	Controller and Auditor General publishes several documents including: • Local government: Examples of better practice in setting local authorities' performance measures. • Matters arising from 2015-25 local authority long-term plans. • Water and roads: Funding and management challenges.

5.4 Levels of Service Performance and Analysis

5.4.1 Reporting of mandatory measures

The DIA require that councils report on various non -financial performance measures every year. Advice regarding water supplies is provided on the DIA website here: https://www.dia.govt.nz/diawebsite.nsf/wpg_URL/Resource-material-Our-Policy-Advice-Areas-Local-Government-Policy#performance-measures

A standardised reporting structure allows councils to be compared to each other; however this document has not been updated since 2014. There have been some major changes to drinking water legislation since this time, and it is likely that these performance measures will change in the near future. Mandatory measures include:

- Safety of drinking water: 1a Part 4 see 5.4.7 1b Part 5, see 5.4.8
- Maintenance of reticulation (water loss) see section 5.4.3
- Fault response times see section 5.4.14
- Customer satisfaction see section 5.4.12
- Demand management see section 5.4.5.

Mandatory measure One (1) only details Parts 4 and 5 of the DWS, which deal with bacteria and protozoa contamination/treatment respectively. These are not the only options when assessing compliance for water supplies; with Section 10 also being an option for small supplies. Small supplies <100 are also not reported on in the same way.

The number of plants assessed year to year may changed depending on how many new treatment plants have been built/commissioned and what compliance methods is being used that year. Some small plants can use both Section 4 and Section 10.

5.4.2 Compliance with Resource Consent

In 2015/16, one infringement notice was issued when the Brightwater water take exceeded the allowed limit. In 2016/17 and 2017/18 there were no notices issued; however during the drought in January-March 2019, the Eighty-Eight Valley water supply exceeded the allowable take on 2 occasions and was issued 2 separate infringements notices.

The performance target will remain at 100% compliance in the future.

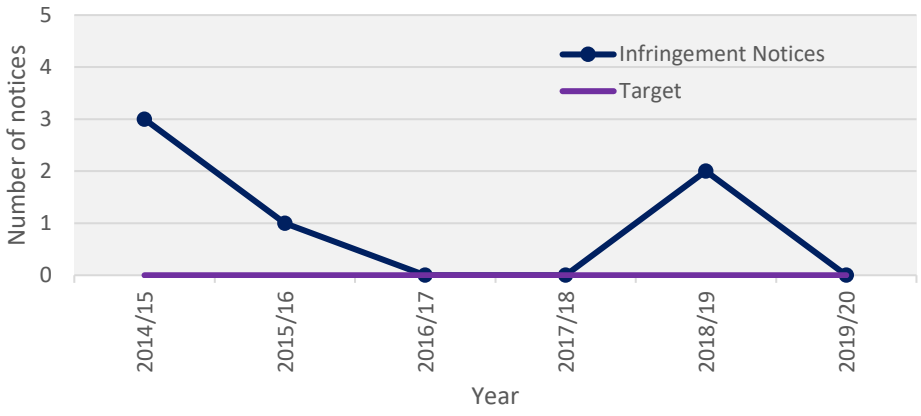


Figure 5: Compliance with resource consents illustrated by the number of notices issued since 2015

5.4.3 Volume and Percentage of Water Loss

Water loss is a critical factor in managing all water supply schemes and is an indicator of network efficiency. At any given time, there will be losses occurring in some part of our network and measurements used simply represent a snapshot in time. There are various tools available to monitor losses. The Council use the Benchloss NZ tool to calculate water loss. Identifying changes in water use is an important part of the ongoing network maintenance. Water loss can occur due to a number of factors including:

- Authorised unbilled use (Fire Service, flushing)
- Apparent Losses (meter inaccuracy or theft)
- Real losses (leakage).

There are a number of methods for expressing network water loss, but for simplicity, The Council compare the loss as a percentage of water input making an allowance for unbilled consumption and meter inaccuracies. Currently, The Council do not report on water loss in the rural networks, as these systems are not metered. Measures are taken to monitor flows and help identify anomalies and any losses. The tools currently used to monitor losses include:

- Changes in daily water production which is graphed and reported on each week.
- Night flow monitoring through our SCADA system by looking at flow into the system during the period from approximately 1am to 5am when normal usage should be at a minimum.

The 2015 AMP set a decreasing water loss target of 31% for the 2015/16 period, 29% for the 2016/17 period and 28% for the 2017/18 period. The 2018 AMP set the target of under 25% from 2018/19 onwards.

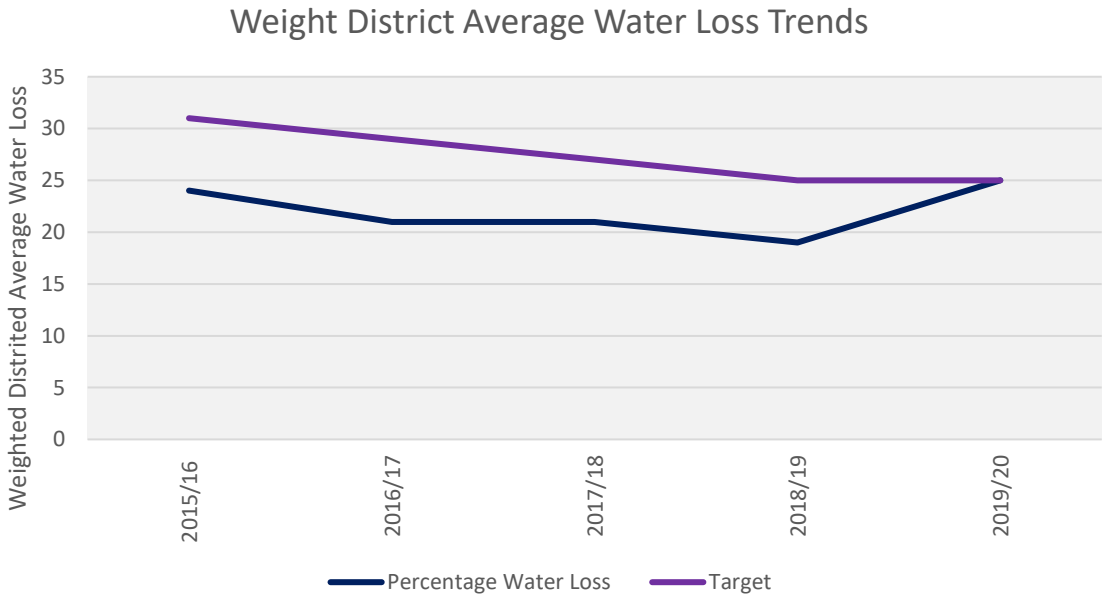


Figure 6: Weighted District Average Water Loss

Figure 6 above shows the weighted district average water loss over five years, during that time we have managed to keep below the target.

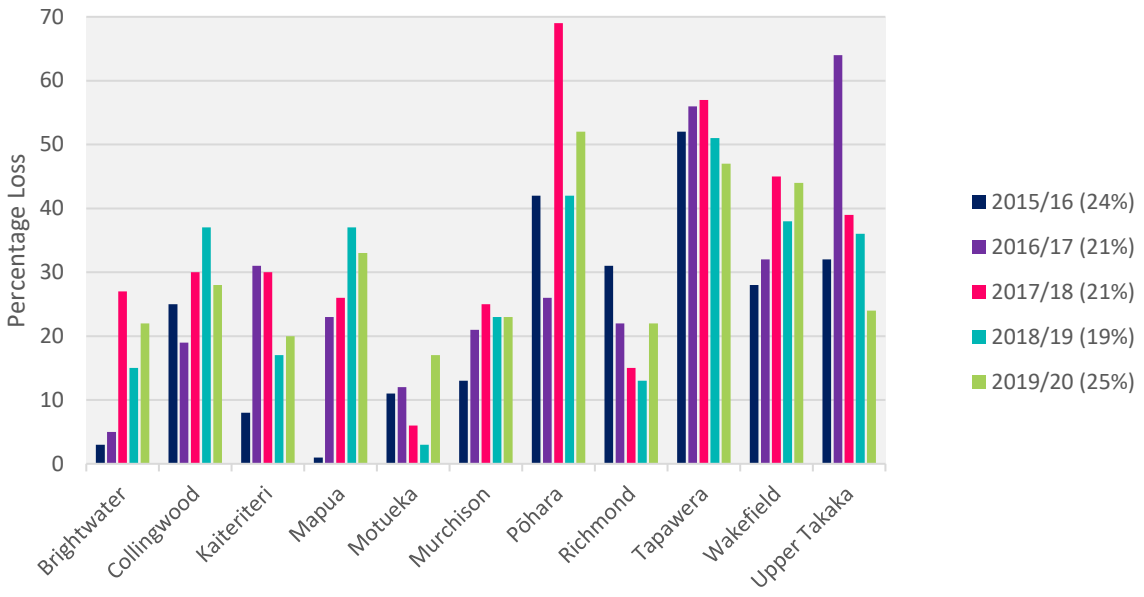


Figure 7: Percentage water loss for metered supplies

Figure 7 above illustrates the percentage of input water loss for each metered water supply. Very small supplies are unlikely to achieve the target however we aim to achieve a weighted District average of ≤25% actual water loss.

We monitor weekly water usage in each water supply. When usage begins to trends upwards this indicates a potential leak in the network. At this point targeted leak detection is conducted to locate leaks. The Council take a proactive approach by repairing leaks immediately. The Council undertook leak detection surveys over the past four years:

Table 20: Leak Detection Survey

Leak Detection Surveys				
2015/16 (24%)	**2016/17 (21%)**	**2017/18 (21%)**	**2018/19 (19%)**	**2019/20 (25%)**
Brightwater	Māpua	Brightwater	Brightwater	Māpua
Collingwood	Murchison	Māpua	Māpua	Tapawera
Pohara	Wakefield	Motueka	Murchison	Wakefield
Upper Takaka		Murchison	Richmond	
Wakefield		Pōhara*	Wakefield	
		Tapawera		
		Richmond		

The Council has planned an ongoing budget of $150,000 per annum for leak detection and day/night flow monitoring and network modelling to help identify and address the water loss issue. The Council intends to continue to target poor performing urban water schemes to reduce water loss.

The Council endeavor to fix all leaks when reported but prioritise fixing largest leaks first. The Council rely on the public to be vigilant when a leak is found and to ensure they report a leak as soon as possible. Extra vigilance is taken during dry periods when water is particularly precious.

Water New Zealand publish water loss data in The National Performance Review (NPR). This provides an ongoing performance assessment and serves as a benchmarking exercise to compare water loss against other water supply authorities. Tasman has reported 2 years of water loss data in the NPR, this is expressed as annual real losses (litres/meter/day).

There are many challenges and variables associated with collecting, interpreting and comparing water loss data. Some of these include:

- Meter reading calendar is different to financial/reporting calendar
- Supply meters are not all read on the same date
- Meters become less accurate over time
- Length of pipe reticulation
- Network pressure; and
- Large pipe breaks.

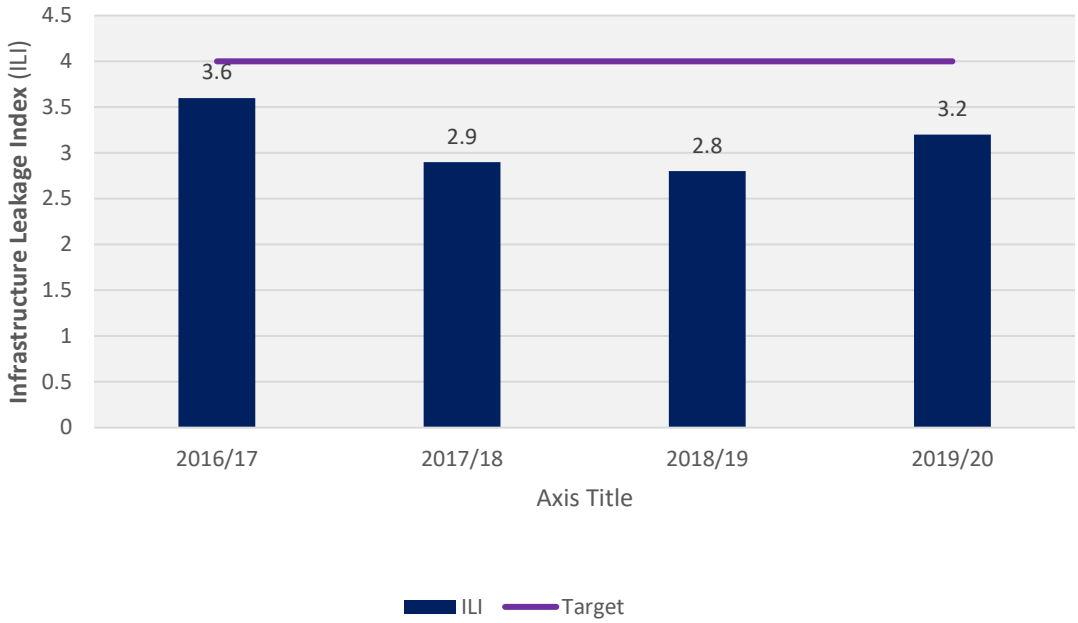
Large bursts in the reticulation can account for significant water volumes lost and reflect in large variations in data year on year. This is suspected to be the case for the water supply scheme in Māpua, where several large bursts have occurred, particularly during 2016/17. Similarly, a large leak was found and fixed on the Pōhara Water Supply Scheme in June 2018. This particular leak had a substantial effect on the overall water loss for the year.

Water loss specialists are encouraging the sector to move away from using percentage water loss, however as percentage water loss is a Department of Internal Affairs mandatory measure, the Council is obliged to report on it. Percentage water loss is a performance measure that is easy for customers to understand so it serves the purpose of being a customer focused measure.

5.4.4 Water loss as measured by the Infrastructure Leakage Index (ILI).

As previously discussed, percentage water loss is not an ideal performance measure to demonstrate network efficiency. For this reason, the Council introduced a new technical performance measure in 2018 that measures the Infrastructure Leakage Index (ILI). The ILI is a preferred key performance indicator used for comparing the operational management of real water losses and is considered best practice by the European Benchmarking Commission and Water New Zealand.

In the 2016/17 NPR, Tasman District Council reported a weighted District average of 3.6 ILI. This level is considered 'Moderate' water loss. However in the 2017/18, we reported a 2.9 ILI; although there is possibilities for further improvement, it does show an improvement.



5.4.5 Demand Management Measured by Average Urban Consumption

The Council collects information to determine whether the water supply system is being managed to ensure demand does not outstrip capacity. This performance measure illustrates the water consumption for individual metered schemes but does not report on rural or smaller community schemes.

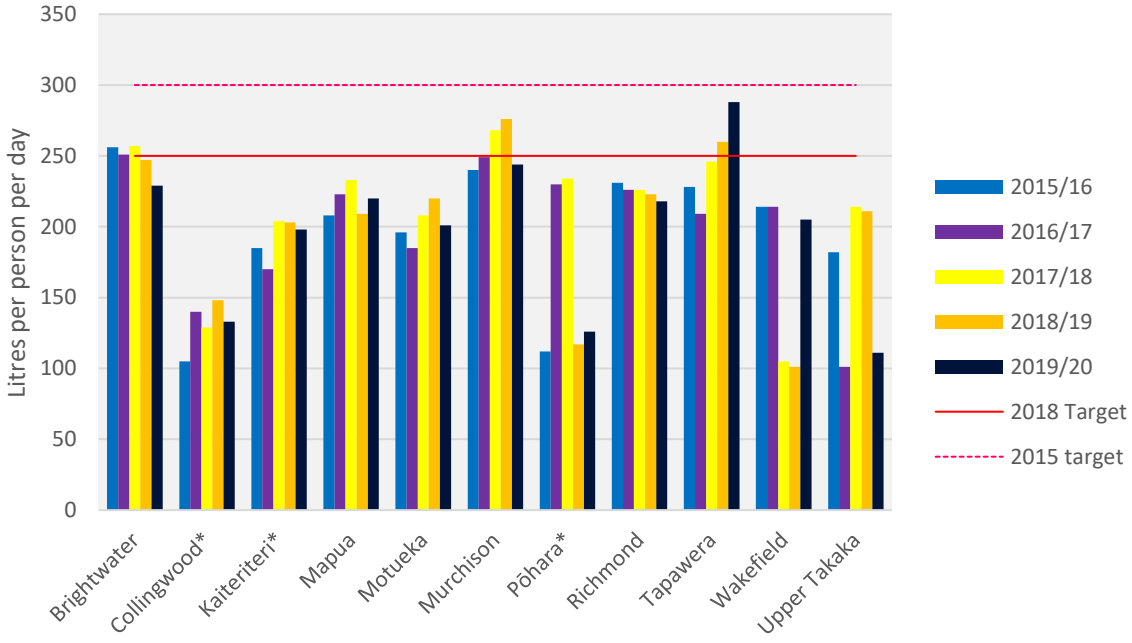


Figure 8: Average water consumption for each metered water supply schemes

Currently, some settlements are increasing, and some are decreasing. Decreasing demand may be due to a combination of several factors including household appliance and fittings efficiencies, water conservation publicity, sustainable development techniques, and water-saving behavior.

There are seasonal changes in water use. Water use in summer is higher than in winter because of increased water use in gardens. Demand for water tends to be highest between December and March. There are seasonal variations in settlement such as Kaiteriteri, Pōhara and Collingwood that experience an influx of visitor's particularly in the summer months. The * in Figure 5 above indicates settlements with low occupancy rates and high numbers of holiday homes.

This performance measure was introduced in the in the 2015 AMP and the initial target was set at <300L per person per day. The Council was comfortably achieving the target in most settlements and determined to lower the target in 2018 to <250L per person per day accordingly. We expect that the Brightwater, Murchison and Tapawera may not meet the performance target based on their recent performance.

5.4.6 Temporary Advisories (Boil Water Notices)

A performance measure related to the number of temporary advisories gives an indication about the safety record of this performance measure. There is a permanent boil water notice in place at Dovedale, which is not covered in the targets as it is permanently in place.

Figure 9 shows the number of temporary advisories issued over recent years are low. In 2019/20 a boil water notice was issued for Upper Takaka when E.coli was detected due to a bird found in the reservoir. No temporary advisories were reported in 2017/18 and 2018/19.One temporary boil water notice was issued in Brightwater in April 2017. This was due to heavy rain causing the Wairoa River to rise and become dirty with high sediment loads. This affected the groundwater quality in the supply bores. In 2015/2016 there were no temporary advisories issued. In 2014/2015, three boil water notices were issued in Eighty-Eight Valley, Motueka and Richmond. The boil water notice in Richmond was in relation to an incident where a bird entered the Richmond Water Treatment Plant storage tank during commissioning. Since the chlorination system at this water treatment plant was fully commissioned there have been no boil water notices issued.

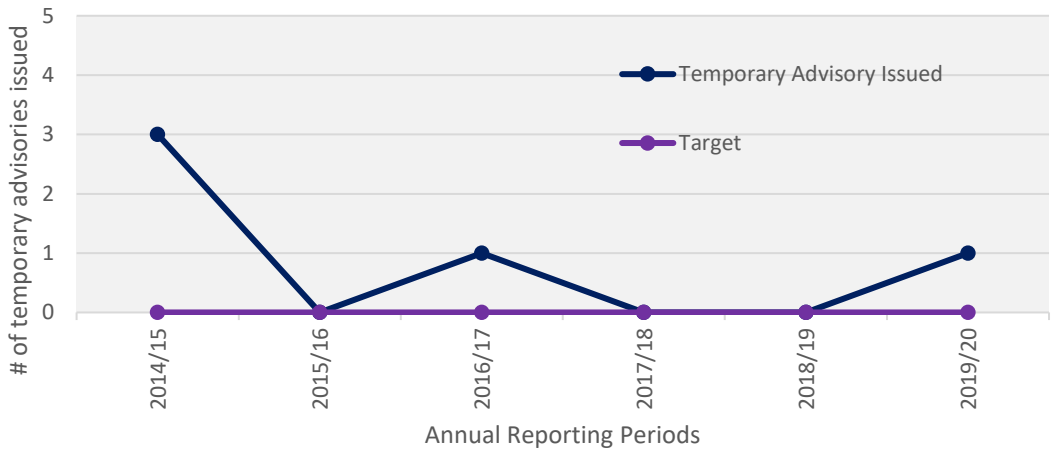


Figure 9: Number of temporary advisories issued per year

Non-chlorinated water supplies have a higher risk of contamination in the reticulation than chlorinated supplies. Richmond WTP has had emergency chlorination in place since 2015. Kaiteriteri WTP was completed in 2019 and the Council took a proactive approach to chlorinate during the summer period when there was an influx of tourists to the area. The Council plan to have emergency chlorination in the new Motueka WTP which is due to be completed in 2021. The Upper Takaka water supply does not have chlorination.

The Havelock North Inquiry identified the need for planning improvements around boil water notices. It found that better planning and preparedness of boil water notices will save time when notifying residents of the need to boil water. The Council staff will be reviewing the existing planning mechanisms and intend to improve our processes and document these in an emergency operation file.

We are planning to keep the performance target for temporary advisories at zero.

5.4.7 Compliance with Part 4 of the DWSNZ

This performance measure provides consumers with information on whether their water supply is safe to drink. It can also help the Council and communities make informed decisions on whether to upgrade existing WTPs or build new WTPs.

The Council have recently changed the way it carries out and reports on water sampling to match the Ministry of Health's (MoH) annual drinking-water survey as requested by Audit NZ.

Water samples are taken at treatment plants and within the distribution zone and each scheme is reported on separately. *E.coli* samples are part of this testing regime. From January 2018, all water samples have been processed as Most Probable Number counts (MPN) for total coliforms and *E.coli*. Prior to this, only a Presence /Absence (P/A) test was done for *E.coli.* The P/A test would only tell you if bacteria was present, not the number. The MPN test provides a count.

Bacteria test results used to be stored in the national Water Information New Zealand (WINZ) database (administered by the MoH) but since July 2017, results have been stored in the Online MoH database 'Drinking Water Online'.

Table 20 below shows compliance results for the year ending June 30, 2020. Four of the 13 assessed treatment plants (Collingwood, Dovedale, Eight-Eight Valley, Hope/Brightwater, Pohara) did not comply. The reason for plant non-compliance:

- Collingwood: High turbidity during maintenance works
- Dovedale: High turbidity and low chlorine levels, with bacteria detected
- Eight-Eight Valley: low chlorine level
- Pōhara : Bacteria detected.

Two distribution zones (Dovedale and Colllingwood did not comply. The reasons for zone non-compliance:

- Dovedale: E.coli detected. There is a permanent boil water notice on the Dovedale supply
- Collingwood E.coli detected.

Table 21: Results of 2019/20 bacterial compliance (Part 4 DWSNZ) for water supply schemes

Scheme	Plant Compliance			Zone Compliance	
	Bacterial Sampling Complied	Water Quality Compliance[1]	Reason for non-compliance	Bacterial Compliance In zone?	Reason for Non-compliance
Collingwood	Yes	No	T	No	T
Dovedale[2]	Yes	No	NTU, T, Chlor, TT	No	T
Eighty Eight Valley Rural	Yes	No	TTT	Yes	Complied
Hope/ Brightwater	Yes	Yes	Complied	Yes	Complied
Kaiteriteri	Yes	NAC	Complied	Yes	Complied
Motueka	Yes	NAC	Complied	Yes	Complied
Murchison	Yes	Yes	Complied	Yes	Complied
Pōhara	No	NAC	T	No	T
Redwood Valley 1	Yes	Yes	Complied	Yes	Complied
Redwood Valley 2	Yes	Yes	Complied	Yes	Complied
Richmond	Yes	NAC	Complied	Yes	Complied
Waimea Industrial[3]	N/A			Yes	Complied
Māpua Ruby Bay	Yes	Yes	Complied	Yes	Complied
Wakefield	Yes	Yes	Complied	Yes	Complied
Māpua Rise	N/A- Not in Operation				

1 Physical water quality parameters: pH, turbidity and free available chlorine (FAC).

2 Dovedale has a permanent Boil water Notice

3 Waimea Industrial is a zone only and has no separate plant. It is supplied from the Richmond treatment plant.

KEY

T Transgression: E.coli detected

TT Transgression: Free Available Chlorine

TTT Transgression: Turbidity

IS Insufficient sampling (technical non-compliance)

Tech Technical non-compliance (e.g. data collection failure due to server outage)

NTU High turbidity

Chlor chlorine level (<0.2mg/l)

NAC non-applicable criteria (Compliance criterion 1 or criterion 5 from Part 4 of the NZDWS applies. All other plants use compliance criteria 2).

5.4.8 Compliance with Part 5 of the Drinking Water Standards

Currently only one (Upper Takaka) of our 15 water treatment plants fully comply with the Drinking Water Standards.

Because it is not as easy to test continually for protozoa (like bacteria), protozoa compliance requires the water supplier to prove that acceptable treatment is in place and is functioning. All of the Council's water supplies, other than Māpua Rise, require protozoa treatment to be in place. Compliance is only calculated at the plant.

Murchison, Tapawera, Richmond, Upper Takaka and Kaiteriteri all have protozoa treatment in place, in the form of UV disinfection. Upper Takaka is not reported on in this section as it is not assessed against Part 5. Small schemes may be assessed against Section 10 (instead of Parts 4 and 5) as long as they have protozoa treatment and an approved water safety plan in place (see Section 5.4.9 for details). Therefore, schemes such as Murchison and Kaiteriteri may be reported on under Section 10 and not Part 5, and this may differ from year to year. Murchison is unlikely to consistently comply as they currently only have one UV unit in place, which does not allow downtime for maintenance.

Table 22~~Table 22~~below shows in the 2019/2020 compliance period, of the 14 plants assessed, only two (Richmond and Tapawera) met the protozoa requirements and complied fully for the whole year.

The Murchison plant did not comply with monitoring requirements in accordance with the DWSNZ2005/18. The Kaiteriteri plant did not comply with DWSNZ2005/18 due to intermittent turbidity events which are being investigated. The Tapawera scheme was identified in this target under the LTP 2018-2028, the Tapawera and Upper Takaka are small water supplies (under 500 people) and will elect to comply with Section 10 of the Drinking Water Standards NZ.

The Māpua Rise plant is not currently in use.

Table 22: Bacterial and Protozoal Compliance for 2019/2020 – Water Supplies

Scheme	Plant protozoal compliance	Reasons for non-compliance
Collingwood	No	NT
Dovedale	No	NT
Eighty Eight Valley Rural	No	NT
Hope/ Brightwater	No	NT
Kaiteriteri	No	NTU

Scheme	Plant protozoal compliance	Reasons for non-compliance
Māpua Rise	Not in operation	Not in operation
Māpua- Ruby Bay	No	NT
Motueka	No	NT
Murchison	No	
Pōhara	No	NT
Redwood Valley 1	No	NT
Redwood Valley 2	No	NT
Richmond	Yes	Complied
Tapawera	Yes	Complied
Wakefield	No	NT

KEY

NT	No protozoa treatment in place yet
NA	Not applicable
TF	Treatment failure
NTU	High Turbidity
Tech	Technical non-compliance (e.g. data collection failure due to server outage)

Compliance with Section 10 of the DWSNZ and community supply compliance.

Small supplies (less than 500 people) do not need to be assessed against Part 4 and 5 of the DWS. An option for these supplies is to use Section 10. A prerequisite for using this section is that the scheme has an approved water safety plan and has protozoa treatment in place. If these two conditions are not met, the plant must be assessed against Parts 4 and 5.

Very small water supplies i.e. schemes with <100 people, are currently classified as a 'community' supplies. Schemes of this size are not reported on in the MoH Annual Drinking Water Survey so this report's results cannot be carried through into Council's Annual Report, this will change with the new Water Services Bill currently under review with the Governments select committee. Upper Takaka is Tasman District Council's only community water supply.

Whilst Upper Takaka is not assessed as part of the survey process, the Council monitors this supply via telemetry and routine E.coli testing. Rather than being prescribed by the DWS, the maintenance, testing and monitoring regime is set out in the Water Safety Plan. The key indicators for performance for Upper Takaka are in Table 23 below:

Table 23: Upper Takaka water supply performance

Compliance Year	2019/2020
Approved water safety plan in place?	Yes

Compliance Year	2019/2020
Bacteria Treatment in place all year?	Yes
Protozoa treatment in place all year?	Yes
E.coli monitoring carried out as per plan?	Yes
E.coli monitoring resulted in any positives?	Yes
Remedial actions taken after positive result? *	Yes

* Remedial action includes notification to the DWA, follow up sampling and investigation of cause.

For Section 10 schemes, compliance is included in the Annual Drinking Survey and reported on as per Table 24 below.

Table 24: Section 10 compliance for Tapawera

Compliance Year	2018/2019	2017/2018
Approved water safety plan in place and implemented?	Yes	Not attempted under Section 10 (see part 4 and 5)
Appropriate treatment in place?	Yes	N/A
Appropriate monitoring carried out?	Yes	N/A
Appropriate remedial actions taken after positive result?	No-dose not high enough for significant periods of time	N/A
Overall compliance	Non-compliant	N/A
Approved water safety plan in place and implemented?	Yes	Not attempted under Section 10 (see part 4 and 5).

5.4.9 Water Safety Plans

This performance measure related to Water Safety Plans (WSPs) indicates that the Council ensures practicable steps are taken to ensure public safety. The World Health Organization (WHO) defines water safety plans as the 'use of a comprehensive risk assessment and risk management approach that encompasses all steps in water supply from catchment to consumer', and promotes them as 'the most effective means of consistently ensuring the safety of a drinking-water supply'.

The Council's WSPs are reviewed by a drinking-water assessor and endorsed on behalf of the Ministry of Health and the Nelson-Marlborough District Health Board. These plans provide the benefit of reducing the likelihood and consequence of contaminants entering into water supplies and specifically outlines how the Council intend to meet the requirements of the Health Act. Table 25~~Table 25~~ below list illustrates the status of WSPs that a required for supply schemes.

Table 25: Summary of water safety plans including status and expiry date

Supply Scheme/Area	Water Safety Plan Status			Last Updated	Update Due
	In place	Expired	Approved		
Brightwater/Hope	√		√	2017	2022
Collingwood	√		√	2019	2024
Dovedale	√				
Eighty-Eight Valley	√				
Kaiteriteri/Riwaka	√	√		2020	2020
Māpua /Ruby Bay	√		√	2017	2022
Motueka	√		√	2017	2022
Murchison	√	√		2020	2022
Pōhara	√		√		2024
Redwood Valley 1	√		√		2024
Redwood Valley 2	√		√		2025
Richmond	√		√	2018	2021
Tapawera	√		√	2017	2022
Wakefield	√	√	√	2012	2017
Upper Takaka	√	√	√	2011	2016

The Kaiteriteri/Riwaka WSP was prepared using the new template and framework and was submitted for approval in July 2020. The local Drinking Water Assessor returned it with comments and recommendations on 22 December 2020, it is currently being reworked. The Murchison WSP expired in 2017 and is currently being drafted. It will be submitted once all information has been collated. The Pōhara WSP was approved on 3 October 2019, but requires an implementation audit. The Redwood Valley 1 WSP was submitted 11 December 2019 and approved on 19 December 2019 and now requires an implementation audit. The Redwood Valley 2 WSP was approved on 20 Jan 2020 and now requires an implementation audit. The Tapawera WSP was approved in 2017 and its implementation report was received on 16 December 2019. The report considered highlighted a non-compliance that requires P2 chemical testing, this issue remains unresolved.

5.4.10 Compliance with Fire Fighting Pressure

The Council adopted a different approach to measuring the firefighting service levels in the 2018 AMP. The new approach followed the Auditor General's suggestion for better practice and simplified the way the Council previously measured service levels (in 2015 there were two performance measures related to firefighting).

The performance measure introduced in 2018 is applicable to metered supplies only. Rural and smaller community water supplies do not currently provide sufficient firefighting capability and are therefore not covered by this measure. Takaka has a reticulated firefighting scheme in the town centre only and Motueka has a network of fire wells which provided a limited level of service.

2018/19 period was the first year, the Council started measuring this target. Of the 60 fire hydrants tested, seven failed to achieve the minimum flow of 12.5l/sec with residual pressure level. These were in Richmond (1), Māpua (2), Kaiteriteri (1) and Pōhara(1) meaning 88% overall compliance. For the 2019/20 period, 87% compliance.

New Zealand Fire Service Firefighting Water Supplies Code of Practice (SNZ 4509:2008) outlines water requirements including flow rate and pressure for firefighting purposes and recommends appropriately located pressured connections and water volume from fire hydrants which are regulated and in the building standard. As a minimum firefighting supplies need to comply with the code. Firefighting infrastructure such as hydrants need to be maintained and tested to ensure suitability and compliance.

5.4.11 Planned Service Interruptions

The Council adopted this performance measure in 2018 as a customer focused level of service. The performance target reflects the (8 hours) timeframe guidelines that are recommended in section 69S (3) of the Health Act 1956.

Since 2018, the operations and maintenance contractor has started collecting and maintaining records on all planed service interruptions. The 2018/19 period was the first year the Council started measuring this planned service interruptions. Of the 28 planned water shutdowns 26 were completed within the targeted 8 hours. Of the two shut downs that exceeded the 8-hour timeframe one (on Lower Queen Street- 5 July 2018 was planned for 10 hours and took 10 hours to complete. The other on Bateup Road (29 August 2018) was planned for 6 hours, but took 8.5 hours due to services in the way. In 2019/20 there was only planned service interruption that exceeded 8 hours.

For the 2019/20 period, of the 32 planned water shutdowns, 31 were completed within the 8-hour timeframe. One interruption in Brightwater was a very technical job and went over the target by 12 minutes.

5.4.12 Customer Satisfaction

The public has high expectations that the Council's water supplies will operate continuously and adequately.

The Council undertake regular surveys to get feedback on a range aspects related to water supply. Information in the survey results inform the Council use when considering performance measures targets and determining when improvements or new infrastructure is required.

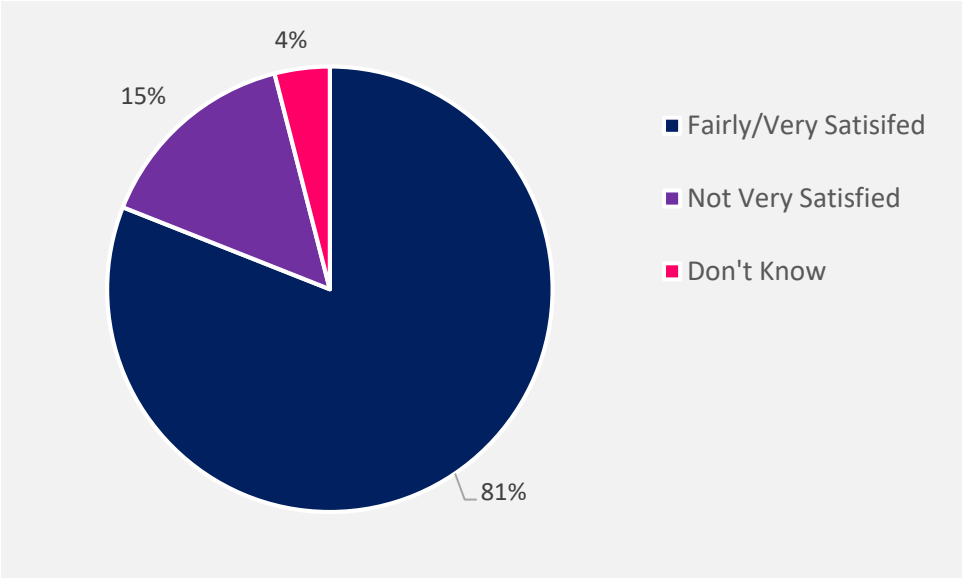


Figure 10: Customer satisfaction (service provided)

Figure 10 shows the breakdown of satisfaction results from the 2020 Communitrak™ Survey. It is important to note that this data represents satisfaction of customers that receive a water supply service. ~~53~~81% were satisfied or very satisfied. 15% of residents were not very satisfied and ~~33~~4% didn't know.

The results may reflect the period of drought in early 2019 where some customers were impacted by extended periods of water restrictions.

There is a range of reasons why some residents were not satisfied with the water supply, these are grouped into broad categories and include:

- Costs of supplying water
- Reticulation network needs upgrades
- Standard of water quality
- Inadequate supply
- Water chlorination
- Poor water pressure
- Lack of public water supply network.

The Council has 10 years of customer satisfaction data that provides good comparative information about how the water supply service is perceived. Figure 11 shows percentage of customers satisfied with the service. Satisfaction levels peaked in 2009/2010 appears to be declining over time.

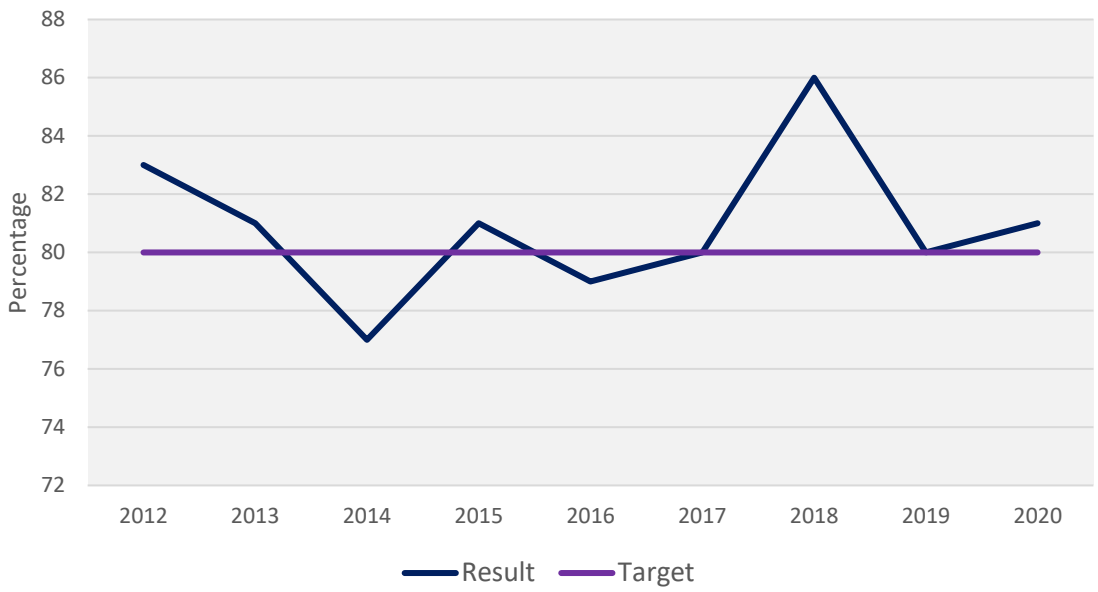


Figure 11: Customer satisfaction trends with Water Supply over time

5.4.13 Customer Satisfaction and Complaints

The Department of Internal Affairs also requires the Council to report information related to customer satisfaction and complaints about the following:

- Drinking-water clarity
- Drinking-water taste
- Drinking-water odour
- Drinking-water pressure or flow
- Continuity of supply
- Response to any of the above issues.

This mandatory measure provides information on complaints and how satisfied customers are with the way in which the Council respond to requests to fix problems. The Council need to consider whether customers are satisfied with the adequacy and reliability of the water supply service. Where there is more than one complaint per event, each complaint is counted separately, not each event or occurrence. The benefit of this approach means the measure records the public's response to the event.

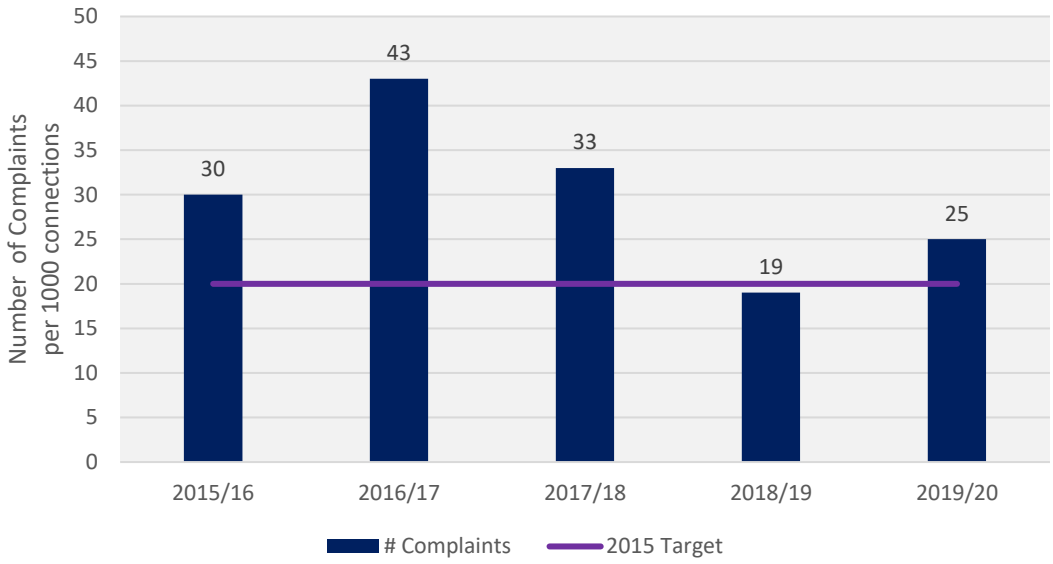


Figure 12: Number of annual complaints

Since the measure was introduced 2015, complaints appear to be decreasing. Many of the complaints are related to the Dovedale and 88 Valley schemes (rural water supplies with higher levels of sediment) where the customer's restrictor has been blocked.

For the purpose of this measure, a complaint is defined as a drop in level of service experienced by the customer. The system and process to systematically extract data is not possible and as a result it is currently a subjective and inconsistent process that needs improvement. The Council staff are exploring an alternative approach to improve address this.

5.4.14 Response and Resolution Times

Attendance and resolution timeframes are a Department of Internal Affairs mandatory measure.

Historically, accurate reporting on these timeframes has been difficult due to system limitations. Improvements in June 2019 to our asset management system (Confirm) and in-the-field time recording means we now have accurate attendance and resolution time reporting for service requests received during the Council's office hours.

These service requests are lodged directly into Confirm and automatically forwarded to our maintenance contractor where they are reassigned to an appropriate service person via a mobile device. Attendance and resolution times are captured in real time via the mobile device.

After hours calls are switched to the Council's after hour's service provider (Call Care) and are also entered directly into Confirm but as our maintenance contractor's offices are unattended outside the Council's office hours, they do not get re-assigned to a mobile device.

In these instances Call Care phone the on-call service person directly. Service resolution data is then retrospectively recorded in Confirm at resumption of normal office hours. Attendance time for these requests is not captured in real time. The Council monitors its contractor performance and has contractual KPI and performance measures and formal audit and feedback processes in place.

We expect data for response times for calls received within office hours to be reliable. We expect data for response times for calls received outside of office hours to be less reliable and we plan to refine the data collection process to improve data reliability.

5.4.15 Water Storage

Storage reservoirs provide water supply in times of network outages or for firefighting purposes. Currently, there are no storage reservoirs in the Motueka supply scheme. There is a backup generator at the scheme source that is located by the Motueka Recreation Centre. This generator can power one of the two bores in a power outage. Additionally, there is alternative supply bore site located on Fearon Street and this backup supply which also has a generator.

6 Our Customers and Stakeholders

The Council engages and consults with iwi partners, customers, and stakeholders to gain an understanding of their needs, expectations and preferences. This enables the Council to provide outcomes that better meet the community's needs.

6.1 Iwi Partners

Māori are tangata whenua of Aotearoa / New Zealand. They have a long and rich association with Te Tauihu o te Waka-a-Māui (Te Tauihu) / the Top of the South Island. There are eight iwi that whakapapa and have Statutory Acknowledgements to places within Te Tauihu and Tasman District. They are represented by the following post settlement governance entities:

- Ngāti Apa ki te Rā Tō
- Ngāti Koata Trust
- Te Rūnanga o Ngāti Kuia Trust
- Te Rūnanga a Rangitāne O Wairau
- Te Rūnanga o Ngāti Rārua
- Ngāti Tama ki te Waipounamu Trust
- Te Ātiawa o te Waka-a-Māui
- Te Rūnanga o Toa Rangatira

The Tasman District also covers the northern-western part of the Ngāi Tahu takiwā (tribal area/territory). Murchison is within the Ngāi Tahu takiwā and Ngāti Waewae are the Papatipu Rūnanga on this northwestern side.

Each iwi has their own unique history and association with places across Tasman District. These areas are not easily defined and do not match or stay entirely within the boundaries of Tasman District.

Māori have a close relationship with water in all its forms and consider it a taonga (treasure). The health and wellbeing of some iwi is closely related to the health of local water bodies, therefore any decision related to water will likely be of high interest to Māori.

The new drinking water regulator (Taumata Arowai) has clearly indicated that Māori interests will be reflected in new legislation and the concept of Te Mana o te Wai will be supported. The legislation will also specify that the operating principles of the regulator will include the need to engage early with Māori; and that it will need to understand, support, and enable mātauranga Māori and tikanga Māori and kaitiakitanga to be exercised. A Māori Advisory Group will be established to advise the regulator on these matters.

The Council expect iwi / Māori to have a strong interest in the planning and delivery of the projects related to water source improvements and water discharge.

The Council staff aim to engage with iwi / Māori on matters that are of interest and importance to them. For the above projects, extra care will be taken to consider and apply the principles of the Tiriti o Waitangi / Treaty of Waitangi. The Council acknowledge that it is important to agree the appropriate level of engagement with iwi / Māori at the outset of a project. This may range from informing through to opportunities for co-governance.

More information about iwi of Te Tauihu can be found on the Council's website at https://www.tasman.govt.nz/my-region/iwi/ and their own websites and social media channels.

6.2 Stakeholders

There are many individuals and organisations that have an interest in the management and / or operation of the Council's assets and services. The Council has a Significance and Engagement Policy which is designed to guide the expectations of 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:

- 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 (Community Board members)
- Regulatory (consent compliance, Public Health)
- Fisheries organisations
- 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); and
- Neighbours.

6.3 Consultation

6.3.1 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 residents surveys
- Other customer/user surveys, such as Yardstick Visitor Measures
- Levels of service consultation on specific issues
- Feedback from staff customer contact
- Ongoing staff liaison with community organisations, user groups and individuals
- 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 processes.

The Council commissions residents surveys on a regular basis to assess the levels of satisfaction with key services, including provision of community facilities, and the willingness across the community to pay to improve services. Other informal consultation is undertaken with community and stakeholder groups on an issue by issue basis, as required.

6.3.2 Consultation Outcomes

The most recent survey was undertaken in May 2020. This asked whether residents were satisfied with the water supply service 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 13 and Figure 14.

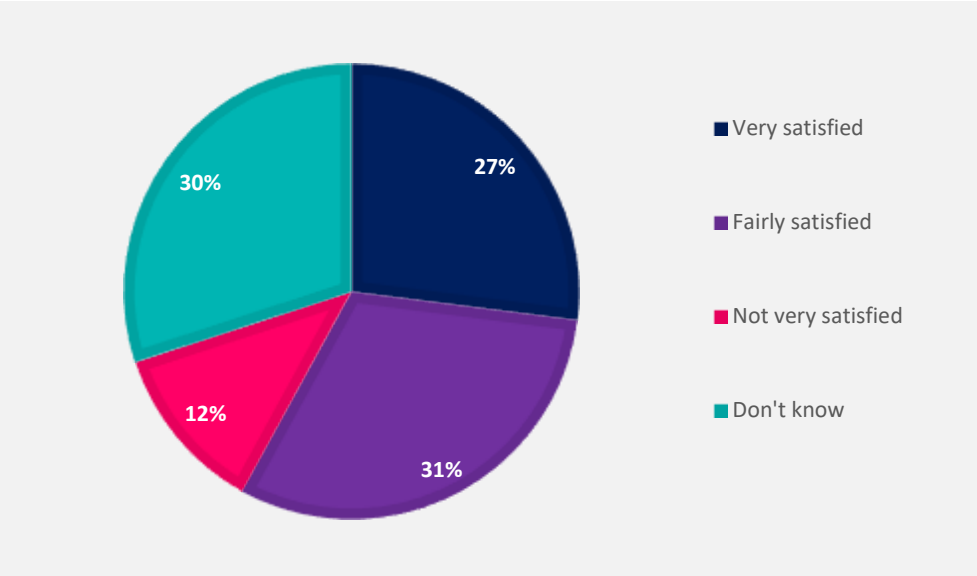


Figure 13: Overall satisfaction with water supply service

Figure 13 shows 58% of residents are satisfied with the water supply (54% in 2019), including 27% who are very satisfied, while 12% are not very satisfied and 30% are unable to comment (33% in 2019). Tasman District residents are similar to their Peer Group counterparts, residents nationwide and the 2019 reading with regards to the percentage not very satisfied with the water supply.

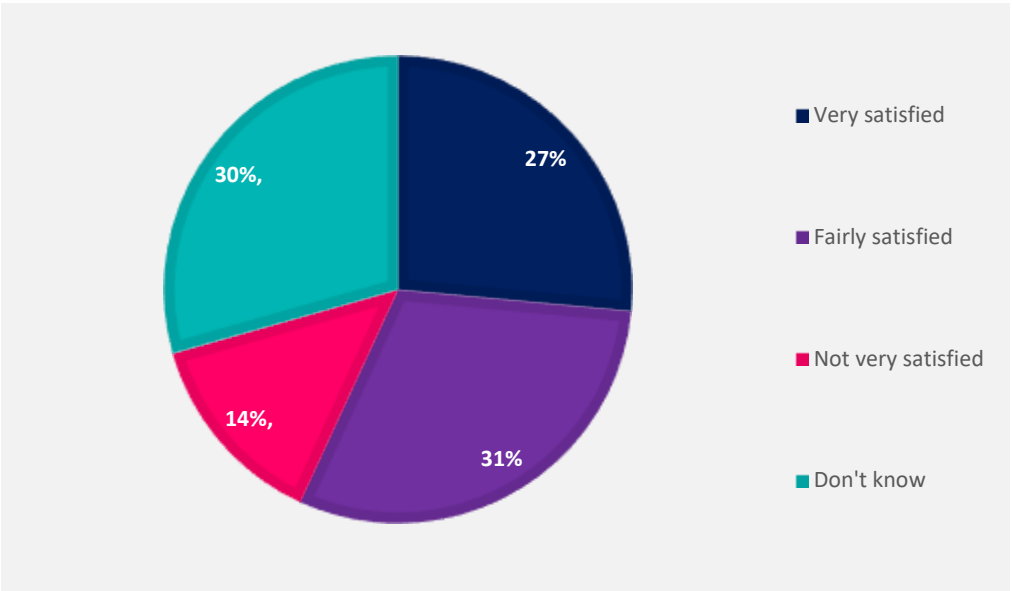


Figure 14: Satisfaction where a service is provided

58% of residents that were surveyed receive a piped water supply from the Council. Figure 14 shows of these, ~~8~~1~~2~~7% are very satisfied and 1~~5~~4% are not very satisfied. There are no notable differences between Wards and between socio-economic groups, in terms of those residents not very satisfied with the water supply. However, it appears that the following residents are slightly more likely to feel this way:

- Moutere-Waimea Ward residents; and
- Shorter-term residents, those residing in the District 10 years or less.

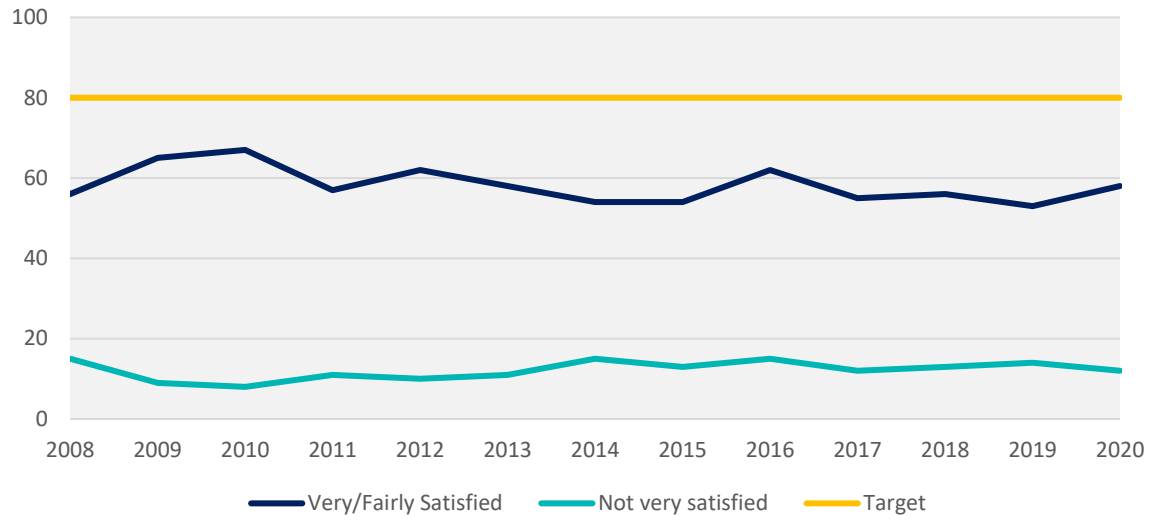


Figure 15: Shows longer-term trends in customer satisfaction since 2008

The main reasons residents are not very satisfied with the water supply in Tasman District are:

- Cost issues/too expensive/paying for water we don't use.
- Too much chlorine.
- Inadequate supply/limited supply/need a new dam; and
- No water supply/own supply.

7 Current and Future Demand

The ability to predict future demand for services enables the Council to plan ahead and identify the best way of meeting that demand. That may be through a combination of demand management and investing in improvements. This section provides and overview of key drivers of demand and what demand management measures the Council has planned to implement.

Water demand forecasting involves predicting how much drinking water will be required in the future and identifying where it will be needed. A reliable forecast can help to ensure that there are enough supplies for domestic, commercial and industrial use, while allowing for future growth and development. It can also contribute to a more efficient use of ratepayers funds, because the infrastructure is the right size to meet the need, including an appropriate level of surplus capacity (OAG, 2010). Historically, The Council have demonstrated a proactive approach to demand management as recognised in an 2010 OAG performance audit report where Tasman were considered to be effectively managing demand.

7.1 Demand Drivers

The future demand for water supply will change over time in response to a wide range of influences, including:

- Residential use
- Irrigation for horticultural/agricultural use
- Industrial/Commercial Use
- Tourism
- Climate change/weather patterns
- Social and Behavioural Factors/Environmental Awareness
- Reticulation network characteristics and efficiency
- The Council's Controls/Regulation Tools
- Implications of technological change.

7.1.1 Residential Use

There is an increasing demand for water in some urban settlements due to population growth. Rural schemes are fully allocated and any new developments in these areas must be self-serviced. The Council has not planned to upgrade the rural networks to meet demand due to high costs.

Population growth is assessed through the Council's growth modelling. The purpose of the growth model is to provide predictive information (demand and supply) for future physical development, to inform the programming of a range of services, such as network infrastructure and facilities, and district plan reviews. The model generates residential and business projections for 17 settlement areas and 5 ward remainder areas.

The key demographic assumptions affecting future growth are:

- Ongoing population growth over the next 30 years with the rate of growth slowing over time. The overall population of Tasman is expected to increase by ~~4,420~~ 7,700 residents between 20~~18~~21 and 20~~28~~31, to reach ~~55,690~~64,300.

- Higher growth in Richmond, Motueka, Māpua, Brightwater, and Wakefield for 2018~~21~~-2028~~2031~~. For 2021~~18~~-2031~~28~~, the Council has used Statistics New Zealand's high growth projections for Richmond, Brightwater, Wakefield, Motueka, and Māpua/Ruby Bay, and medium growth projections for the rest of the District. Medium growth projections have been used for the whole District for 2028-2048.
- An ageing population, with population increases in residents aged 65 years and over. The median age of the Tasman District population is projected to increase from 44 years in 2013 to 54 years by 2043. The proportion of the population aged 65 years and over is expected to increase from 18% in 2013 to 37% by 2043.
- A decline in average household size, mainly due to the ageing population with an increasing number of people at older ages who are more likely to live in one or two person households.

The following provides a summary of the outputs from the growth model that have been determined by using the above input assumptions and parameters.

- Residential growth is measured in the number of new dwellings. The Council has estimated demand for 2,955 new dwellings over the next ten years, and a further 3,040 dwellings between 2028 and 2048. This is based on population and household size projections, and also allow for demand for dwellings for non-residents, such as holiday houses or temporary worker accommodation. The growth model projects demand for new dwellings to be an average of 365 a year for Years 1-3 (2018-2021), dropping to 266 a year for 2021-2028. In recent years, Tasman has experienced increased growth in the number of new dwellings, with an average annual increase in the last three years of 365 new dwellings. The average over the last ten years was 291 new dwellings a year.
- Business growth is measured in the number of new business lots. The Council has estimated demand for 243 new business lots in our settlements over the next ten years, and a further 212 new lots between 2028 and 2048. This is based on a business land forecasting model from Property Economics using medium population projections, national and regional economic trends, employment projections and employment to land ratios.

7.1.2 Irrigation for Horticulture/Agricultural Use

Tasman's location, climate and soils mean it is one of New Zealand's major horticulture areas. Traditional horticulture sectors in Tasman include fruit (berries, pears apples, and pip fruit) and market garden vegetable operations. Tasman is New Zealand's main commercial hop growing area and there is growth in the viticulture sector. Most horticultural operations are highly reliant on irrigation. Generally, large-scale irrigators abstract their water from private bores and this activity puts pressure on the limited water resources in rivers and aquifers. Water resources are already over-allocated in Waimea Basin. This over allocation is being address through the construction of the Waimea Community dam. The dam will provide for current and future irrigation needs.

7.1.3 Industrial/Commercial Use

The District is growing and with it comes an increasing demand for water from industrial and commercial users. Generally, the industry type and process use will determine the amount of the water these users will consume.

A summary of the existing industrial and commercial water users in the region are listed in Table 26~~Table 26~~.

Table 26: Industrial and Commercial Users

Large Industrial Users	Large Commercial Users
Nelson Pine Industries (manufacturer)	Retirement homes
ENZA (food manufacturer and cool stores)	Schools (swimming pools)
Alliance (meat processor)	Richmond Aquatic Centre (swimming pool)
AICA (chemical manufacturer)	Cool stores (refrigerated warehousing)
Fonterra (dairy cooperative)	Seafood, fruit and food processing plants

Although the industrial/commercial sector is small in proportion to the other users, it is growing and particularly in aquaculture and food processing sectors.

Large industrial users are billed on a volumetric rate and their pricing structures provide incentive to use water efficiently. The Council have approached industrial water users to discuss conservation and some have responded. Nelson Pine is the largest water user. Water efficiency improvements and re-use measures are described on Nelson Pines website that illustrate their approach to water savings.

7.1.4 Tourism

Tasman is a popular tourist destination and tourist numbers are increasing. There is an increased seasonal demand for water due to an influx of visitors. Settlements including Pōhara, Kaiteriteri and Māpua already experience significant increases in demand because of the number of baches, camping grounds and holiday homes that are used during the summer months. There is also an influx of seasonal workers in the District to support the horticulture sectors. These seasonal visitors increase demand, though to what extent the Council is uncertain.

7.1.5 Climatic Influences and Weather Patterns

The anticipated effects from climate change in Tasman District include:

- An increase in seasonal mean temperature and high temperature extremes
- A significant increase in rainfall in winter for the entire district and varying increases of rainfall in other seasons in different areas
- Rising sea levels, increased wave height and storm surges
- Floods, landslides, droughts and storm surges are likely to become more frequent and intense.

Climatic factors including rainfall, temperature and evaporation will affect water supply and demand. The detailed implications of climate change are not clear, but will increase the uncertainty in security of supply and the variability of weather patterns.

Climate change will have longer-term implications for water supply (in terms of magnitude and timing) will change and river discharge will be altered and effect water availability.

Increases in evaporation have implications for water resources: the amount of freshwater available for abstraction diminishes (in rivers and aquifers) and the amount of water that needs to be abstracted to irrigate a given area of land or to produce a given crop yield increases. Higher rates of evaporation also contribute to more frequent, more intense, or longer droughts.

7.1.6 Social and Behavioural Factors/Environmental Awareness

There is a growing awareness that water resources may not be as abundant as previously perceived. Access to consumer information about products that use water is improving and education campaigns are common place. Consumers are also becoming more aware of water efficiency methods and technology such as rainwater harvesting, grey water and stormwater reuse and they are starting to be used in the District. These changes in attitudes and behaviours are likely to have a gradual effect on water demand and could help to reduce average water consumption.

Best practices guidelines for water reduction and efficiency are being developed and implemented by Central Government and industry sectors. An example of this is the New Zealand Water Efficiency Labelling Scheme that was introduced to provide information to consumers buying products that use water. The labelling provides clear information on water efficiency and consumption in a standardised form. Similarly, commercial and industrial organisation are becoming more aware of water efficiency and taking measures to reduce consumption and promoting their initiatives publically.

7.1.7 Reticulation Network Characteristics and Efficiency

Non-revenue water (NRW) accounts for a significant portion of water demand. NRW includes unbilled authorised consumption (fire-flows, hydrants etc.), apparent losses (meter inaccuracies and unauthorised consumption) and real losses (leakage). Real losses though leakage could be improved to reduce wastage and lower demand. The Council expects unbilled authorized consumption to be fairly static.

7.1.8 Council's Controls/Regulation Tools

Council has several tools that influence demand, these include metering and pricing, consent conditions, restrictions, and public conservation education programmes. The Council monitors and manages the District's water resource and when conditions are dry, the Council considers restrictions. Water rationing, and restrictions can be placed on both domestic users and users drawing water as part of a resource consent. Rating and restriction can lower demand in summer months. The Council introduced water metering for all of its urban water supplies in the early nineties. A move to universal metering means user pays for the volume consumed. A secondary benefit is that water consumption decreases. The Council can also provide public conservation and education programmes aimed at reducing water consumption, these programmes are often done during restrictions.

7.2 Assessing Demand

7.2.1 Current Demand

There are various methods for assessing current demand, the primary methods used to asses and analyse demand include:

- Bulk water abstraction and production – abstraction volumes are derived from bore field flowmeters) and production flow is derived from meters at WTPs. Data is compared against abstraction limits and analysed to determine peak demand in context to possible water restrictions
- Customer consumption data – based on the six-monthly billing records for customer meters and the monthly billing records for the large industrial customers. This is compared with other Tasman schemes and water usage per capita is calculated and compared against targets
- Non-revenue water and leakage- an assessment using the standard water balance method estimates network leakage to determine an Infrastructure Leakage Index (ILI). Calculations are conducted to estimate unbilled revenue loss, treatment and energy cost.

7.2.2 Future Demand

To identify the future water demands, it is important that the current demands are accurately identified so that they can be used as a baseline for the future projections. The Council uses the following to determine future demand:

- Council's Growth Supply Demand Model
- Population growth (Statistic New Zealand)
- Household dwelling growth derived from building consents numbers
- Research into growth expectation in industrial and commercial sectors
- Research into growth expectations in the rural
- Modelling that enables the Council to examine the potential effect of strategies on future demand

7.3 Demand Management

The objective of demand management (sometimes called non-asset solutions) is to actively seek to modify customer demands for services in order to:

- optimise utilisation/performance of existing assets
- reduce or defer the need for new assets
- meet the Council's strategic objectives
- deliver a more sustainable service; and
- respond to customer needs

Demand management also includes both asset and non-asset strategies to manage demand across the water supply activity. Examples of asset strategies include response times, renewals programmes, codes of practice, technical standards, use of approved standards materials and quality assurance measures. Non-asset strategies include education materials/campaigns, promotion of new technologies and efficiencies, leak detection and property inspection.

Prudent management includes managing water demand by best using the water that is already available. Water demand management involves the adoption of policies to control consumer demand or investment to achieve efficient water use by all members of the community.

7.3.1 Council's Approach to Demand Management

7.3.1.1 Water Demand Management Plans

The objective of a Water Demand Management Plan (WDMP) is to provide a framework and action plan to continuously improve water efficiency to achieve a level of water demand management that is consistent with good performance in New Zealand.

In 2013, an overarching Water Demand Management Plan (WDMP) was developed for the District. WDMP have been developed for major urban schemes including: Brightwater/Hope, Collingwood, Kaiteriteri/Riuwaka, Māpua /Ruby Bay, Motueka, Murchison, Richmond, Tapawera and Wakefield.

Council engaged Stantec to assist with the preparation of the WDMPs. Over time, the plans have improved in quality and the analysis of data is more detailed. Each plan:

- Identifies scheme issues and historical demand
- Provides water demand analysis of bulk water supply, metered consumption and an assessment of water loss
- Identifies where to target leak detection and repair to address water losses
- Benchmarks bulk water usage with other comparable suppliers from National Performance Review
- Summarises previous and current demand measures; and provides potential future demand measures.

7.3.1.2 Other Demand Management Measures

Council have a wide range of demand management measures in place throughout the District. Water demand management options can be categorised into two key areas: measures and instruments. Measures describe 'what to do' to achieve a reduction in water-use (e.g. conversion of inefficient showers to efficient star rated showerheads). Instruments describe 'how to do it' (how to ensure that the chosen measures are put into place or taken up). Table 27~~Table 27~~ below provides a summary of existing demand management measures and potential or future measures that could be considered for adoption. These measures and instruments were largely collated from the more recent WDMPs with a few additions:

Table 27: Current Water Demand Management Measures Used in Schemes

Demand Management Measures and Instruments	Currently Used	Potential to be used in the Future
Measures Infrastructure Management		
Active leakage control programme	√	
Reactive leakage repair	√	

Demand Management Measures and Instruments	Currently Used	Potential to be used in the Future
Bulk metering of rural-restricted areas to improve understanding of demands		√
Bulk metering on parts of the rural schemes fitted with advanced technologies connected to a low power wide area network to transmit data		√
Bulk metering of reservoir outlets to improve night flow monitoring.	√	
Customer meter testing and replacement programme	√	
Investigating new sources of water (bores and dam)	√	
Ongoing capital upgrades and renewals programme	√	
Building new drinking water supply infrastructure	√	
Asset renewal planning programme to prioritise infrastructure replacement	√	
Network Efficiencies		
Water modelling to improve system performance and leakage	√	
Pressure management	√	
Measures - Community Engagement		
Passive education programme with information on the Council website	√	
Community education programmes		√
Educational resources and programmes for schools		√
Targeted education programmes for specific users (rural properties and top commercial users)		√
Advice for residential water efficiency methods		√
Provision of shower timers for people to limit their shower time		√
Green gardener – water efficient landscaping workshops and free advice		√
Water advisory service and audits for water users (rural and commercial users)		√
Instruments - Regulatory Control		

Demand Management Measures and Instruments	Currently Used	Potential to be used in the Future
Restricted connections (trickle feed) to rural properties	√	
Water restrictions during peak summer periods including developing water restriction protocols to guide the Council decision making and provide to customers with information	√	
Active enforcement of water restrictions during peak summer periods		√
Proposing district plan changes or resource consents to require mandatory water efficient fixtures in new construction (mandatory dual-flush toilets in all new toilet installations, grey water, rainwater tanks etc.)		√
Requirement for large customers to prepare demand management plans		√
Water Bylaw (amended 2018)		√
Preparing a general water conservation policy or demand management policy		√
Introduce Time Of Use Tariffs to target high water users to reduce demand on the system		√
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 e.g. showerheads or dual flush toilets)		√
Retrofit of water-efficient technologies into the Council properties		√
Rebate or subsidy programme for automatic timers for residential irrigation systems		√
Mandatory rain/soil moisture sensors for properties with high garden watering.		√
Assessing non potable sources of supply (grey water)		√
Metering, Pricing and Other Financial Initiatives		
Metering and charging (volumetric pricing) for urban supplies	√	
Increasing volumetric charges for metered customers		√
Increasing seasonal volumetric charges for metered customers (like Carterton District Council)		√

Demand Management Measures and Instruments	Currently Used	Potential to be used in the Future
Measures - Water Capture, Reuse and Recycling		
Rainwater tank rebate or subsidy programme.		√
Grey water recycling rebate or subsidy programme.		√

8 Lifecycle Management

Lifecycle cost is the total cost to the Council of an asset throughout its life including, creation, operations and maintenance, renewal, and disposal. The Council aims to manage its assets in a way that optimises the balance of these costs. This section summarises how the Council plans to manage each part of the lifecycle for this activity.

8.1 Asset Condition and Performance

Council needs to understand the condition of its assets as this helps inform asset management decision making. Condition monitoring programmes consider how critical an asset is, how quickly it is likely to deteriorate, and the cost of data collection.
Where condition rating is done, a 1-5 scale is used, as per the NZQQA Infrastructure Asset Grading Guidelines, as shown in Table 28~~Table 28~~ below.

Table 28: 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.
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, overheating.

Condition Grade and Meaning	General Meaning	
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.

Asset condition surveys were completed on above ground assets in 2016/17 and the dataset is considered relatively complete. Default values have been assigned where there is still unknown condition data based on material, age and operational history and are generally condition grade 3. This is clearly shown in Confirm. The overall asset condition of the Three Waters systems has been assessed as reasonable with most assets in condition grade 3 or better.

Council's maintenance contractor undertakes asset condition assessments in accordance with the Three-Waters Operation and Maintenance, July 2018 as follows:

- Condition of all above ground assets is assessed every three years to confirm or otherwise determine their appropriate condition grading and update asset management systems as required.
- Assessing the condition of below ground assets is difficult due to the cost of excavating and the risk of introducing a contamination risk. Condition data will be progressively captured as part of the contractor's day to day operation and maintenance when excavation of buried assets occurs.
- All new assets (less than six months old) and all assets with a condition grading of one or two are managed and maintained to at least condition grade 2 or better.
- All other existing assets are managed and maintained to at least condition grade 3 or better.

Council undertakes periodic sample audits of the condition assessments data provided by the contractor.

The following sections provide a high-level overview about the condition and performance of the water supply networks. Further details about specific assets is captured in Confirm and ActiveManuals™.

~~Above ground assets include pump stations and water treatment plants that can be accessed or inspected without the need for digging. Below ground assets include pipelines, and underground valves (excluding air valves on pressure pipelines).~~

~~The condition of below ground assets is not well known and there is no formal process for gathering this data as the cost of excavating, sampling and analysing is prohibitive and introduces a contamination risk. However, when pipe failures do occur the condition and mode of failure are investigated and compared with pipe age and pressure ratings to determine if pipe life expectancy assumptions are valid in similar circumstance across the district. Current practice is to assign water assets a default grade of 2 unless new information has come to hand following pipe failures, in which case the grade is changed to reflect actual condition. If the asset is less than five years old it is assigned a grade of one. As new condition information is made available the gradings are amended.~~

~~A key objective of the Three-Waters Operation and Maintenance Contract that commenced on 1 July 2018, is improving asset condition data. The contractor will:~~

- ~~Undertake condition assessments of all above ground assets to confirm or otherwise determine their appropriate condition grading every three years.~~
- ~~Manage and maintain all new assets (less than six months old) and all above ground assets with a condition grading of one or two to at least condition grade 2 or better.~~
- ~~Manage all other existing assets to at least condition grade 3 or better.~~

~~Council will also undertake random audits of the condition data provided by the contractor.~~

~~The following sections provide a high-level overview about the condition and performance of the water supply networks. Further details about specific assets is captured in Confirm and ActiveManuals™.~~

8.1.1 Brightwater

Assets in the Brightwater scheme are generally in good condition. Some of the assets in the treatment plant have been recently upgraded 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. An inline meter near the bores, 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 polyethylene (PE rider mains and service laterals)) and AC pipes. Many of the original PE rider mains have been renewed through the process of breakage and repair.

8.1.2 Collingwood

Since the water supply for Collingwood has only recently (2003) been commissioned the assets are in good condition.

8.1.3 Dovedale

The Dovedale scheme was not designed to be a domestic supply, its original purpose was to be a stock water scheme. The majority of the reticulation in the Dovedale scheme is unreliable. There have been continual problems with Polyvinyl chloride (PVC) pipe joints and splitting of polythene pipes since the scheme was vested in the Council. 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. Pipe failures often relate to low quality materials that were poorly installed.

8.1.4 Eighty-Eight Valley

The scheme assets are in mixed condition. The intake and pipe have been subjected to storm damage on several occasions and are repaired as necessary. Many of the pipes have little cover and actual locations are not known and are therefore subject to damage from agricultural activities, such as ploughing and installing fence posts. The pipe near the treatment plant in Wantwood is visible is several places. There are no known ongoing issues with leakage but leaks may go unnoticed for a long time.

8.1.5 Kaiteriteri/Riwaka

The condition of most of the pipework in the system is good. There are no known specific condition concerns for the assets. Most of the infrastructure is of an age where condition problems are not expected and inspections by the Council staff, maintenance contractors and consultants have not identified any specific problems except an upgrade required to the pumping station surrounds. The two wooden reservoirs that provide storage for the scheme present some problems and one has been relined. These assets have a shorter life than concrete reservoirs.

8.1.6 Māpua Rise

The equipment and reticulation on the Māpua Rise scheme are brand new and were vested to the Council in 2016/17 but is currently not used except as a backup supply for emergencies. They are in a very good condition. Issues related to this scheme are related to water quality rather than asset condition.

8.1.7 Māpua/Ruby Bay

The reticulation is mostly in average condition but there are large areas of poor quality, fragile pipeline in Māpua , in particular, Aranui Road, Stafford Drive, Pomona Road, Rabbit Island and Best Island Road., most of which will be replaced by a current upgrade project, expected to be completed in 2021. A section of trunk main from the treatment plant to the Pomona Road reservoir has burst a number of times since its construction. The first kilometre section of this main has been replaced.

8.1.8 Motueka

The majority of pipelines in the Motueka supply are considered to be in average condition. There are some areas with pipes in poor condition that suffer from frequent mains failures namely High Street South, Fearon Street, Old Wharf Road, Thorp Street and central High Street. Some of the reticulation in Thorp Street is Class B uPVC, is approximately 25 years old and is due for replacement in 2021. 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.

8.1.9 Murchison

The assets are generally in good condition and the reservoirs are in good structural condition. The majority of the reticulation is AC with PE for the smaller rider mains . Repairs are managed through the operations budget until the major renewal programme commences. Repairs following regular leak detection surveys succeeded in reducing daily water demand and many rider mains have been replaced since 2010. Two new bores were installed in July 2011.

8.1.10 Pōhara

The condition of the pipework in the system is variable. Some pipework was installed during subdivision construction in the 1990s but a large part of the system is older and of poorer quality. There are not many breaks reported.
After the 2011 flood, damaged pipes were replaced and improved the average system condition.

8.1.11 Redwood Valley 1 and 2

Some of the reticulation in the Redwood Valley (1 and 2) scheme is unreliable. Redwoods 1 reservoir is in poor condition and is leaking. Repairs were undertaken in 2010 to reduce this leakage. The reservoir was replaced with twin 30,000L plastic tanks either on the existing site or on an adjacent property, as there are access issues. The associated booster pump station will be renewed due to its poor condition. Most of the assets are of an age where condition problems are occasionally expected. As breaks occur pipelines are repaired, and short sections replaced. Some of the pipelines in the poorest condition have been renewed or upgraded. This reticulation renewals programme is ongoing. A 3km section of pipeline along the ridge was replaced following the Pigeon Valley fire.

8.1.12 Richmond

The condition of most of the pipework in the system ranges from a good to moderate condition. There are sections 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 many breaks in AC mains over the last few years, and as such recent AC pipe renewals have been completed in Fauchelle, Darcy, Florence, Herbert and Elizabeth Street.

Some other 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. Cast iron mains also require replacement. Cambridge and Wensley were completed in 2016/17.

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 was low and considered 'aggressive'. The construction of the new Richmond WTP was completed in 2015 and the treatment plant blends both the Waimea and Richmond water sources and doses the water with caustic soda to address the aggressive pH issue. The mixing of water sources dilutes the high nitrate levels in the Richmond source.

To improve security of the supply the wellheads were protected from stock access in 2012 and later upgrades. 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.

8.1.13 Takaka

A new FW2 standard firefighting reticulation was installed in Takaka CBD in 2011. It consists of 2 bores and pumps with an emergency generator.

8.1.14 Tapawera

The majority of the reticulation is AC and PE for the smaller rider mains with problems typical to those material pipes and may be a source of the high water loss reported. Some PE rider mains have been replaced as part of the renewals programme and copper laterals were replaced as part of the meter renewals programme. Regular leak detection inspections and repairs have resulted in improved daily water consumption volumes, however private water leaks have been known to cause daily usage for the township to double. The bore head works, reservoir power supply and telemetry system were upgraded in the 2006-2008 period.

UV was installed in 2013 for protozoa treatment to meet the DWSNZ and a new contact tank and lime dosing shed was installed in 2016/17.

8.1.15 Upper Takaka

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

8.1.16 Wakefield

The scheme assets are in average condition. High leakage and unaccounted water have been ongoing issues. The majority of the reticulation is AC and PE 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.

Initial leak detection was carried out in 2014, and a large leak (137 m3/day) was identified and repaired. Several line meters now exist to better identify leaks. Further leak detection was carried out in the 2016/17 period and repairs were made.

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.

8.2 Operations and Maintenance

8.2.1 Key Maintenance and Operational Themes

~~Age, Condition and Performance~~
~~Generally, age, condition and performance data in conjunction with operator and staff knowledge of assets is used to make decisions about how the water supply activity is operated and maintained. Sometime this data is lacking, and the Council has determined that improvements to data, processes and systems is required to enhance our ability to manage the network.~~

8.2.1.1 Three Waters Reform

Council anticipates that the outcomes and recommendations from the Havelock North Water Inquiry / Three Waters reform will change the way the Council operate the water supply schemes. Changes may include:

- Legislation
- DWSNZ
- Assessing and managing risk (water safety plans)
- Source and catchment protection
- Philosophy and approach related Te Mana o te Wai.

Although details of the changes are finalised, the Council are making some minor operational changes to the way the Council sample and monitor water from all supplies. It is likely that more minor operational changes may occur as rules come in to effect.

8.2.1.2 Rural Reticulation

The costs to operate and maintain the rural supplies is increasing. The new Water Service Bill is unclear about how point of entry treatment on rural supplies will be maintained. This could potentially have very large costs implications and be an unrealistic way to manage our rural supplies.

Some sections of the reticulation are in poor condition due the pipe materials used and installation techniques. In some cases, it costs less to renew rather than maintain. In cases like this, the Council will prematurely renew the pipes instead of continuing to repair defect pipes.

8.2.1.3 Water Loss

There is an ongoing leak detection programme to identify sources of water loss. In all cases, repairs are made to any leaks is found. Information collated from the detection surveys can assist with informing the pipe renewals programme.

8.2.2 Maintenance Contract

The operation and maintenance of the water supply systems has been incorporated into a collaborative/partnering approach. The contract was awarded in July 2018 for a five year term plus two years and another two years subject to performance.

The key outcomes of the new contract include:

- A high degree of reliability of all services, systems, network and supply
- Improved routine maintenance programmes leading to less reactive maintenance
- Best value to the ratepayer
- Consistently meeting regulatory requirements – no breaches of resource consents
- High levels of customer satisfaction
- Assets sustainably maintained to meet asset condition ratings
- Innovations introduced that add value
- Accurate and timely reporting to meet statutory requirements and contract targets; and

- Up-to-date and accurate asset information.

8.2.3 Maintenance Strategies

Routine and Reactive Programme
There are different types of maintenance strategies and approaches for the water supply activity. The two major maintenance programme categories include routine and reactive work. Typically, reactive work includes responding to day-to-day asset failures. Examples of this type of work include pipeline breaks, valve and meter replacements etc. Generally, routine work is more proactive and include activities listed in table below:

Table 29: Summary of routine maintenance activities

Maintenance activity	Description
WTP	Regular maintenance and inspections of WTP facilities including equipment. Routine testing of water quality.
Rural storage	Council conduct pro-active maintenance activities by cleaning and flushing rural reservoirs and break pressure tanks twice yearly, first in early summer and then in late autumn.
Reticulation flushing	Council maintain a water reticulation-flushing programme to remove sediment and inappropriate material from the network. Low-level rural areas in Dovedale and Eighty-Eight Valley are flushed and dead-end mains in the urban areas are regularly flushed to remove stale water.
Rural restrictor checks	Every two years rural restrictors have a maintenance inspection to check for tampering flow rates and flush blockages if required.
Shut valve checks	Twice yearly all shut valves are checked to ensure good working order. On a three-year cycle, all large valves (100mm+) are exercised to ensure they can open and shut correctly.
Surface intake inspections	Monthly inspections of all surface water intakes are undertaken including: Eighty-Eight Valley, Upper Takaka, Pōhara and Dovedale.

8.2.4 Forecast Operations and Maintenance Expenditure

The 10-year forecasts for operations and maintenance costs are shown in Figure 16~~Figure 16~~ below. For detailed breakdown forecast operations and maintenance expenditure, see Appendix A.

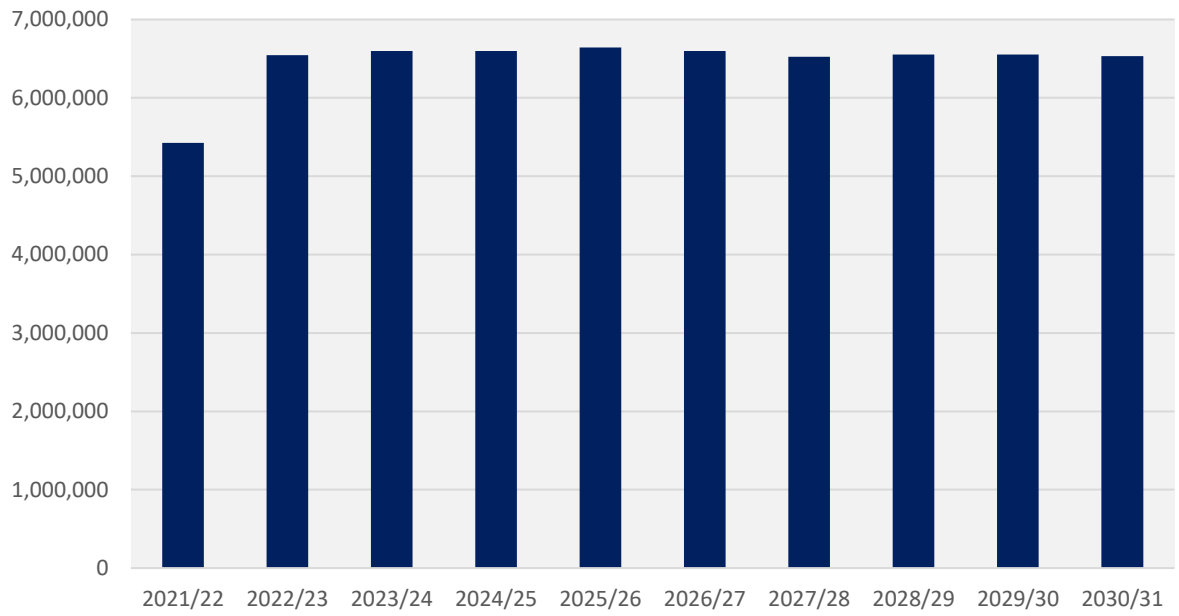


Figure 16: 2021 – 2051 Direct Operations and Maintenance Expenditure Excluding Inflation

8.3 Asset Renewal/Replacement

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. Funding of work over and above restoring an asset to its original capacity is considered to be new capital works expenditure.

8.3.1 Key Renewal Themes

8.3.1.1 Water Loss

Information and data gathered during leak detection surveys and their associated repairs helps collate knowledge about the condition and performance of assets. In turn, this information will help to inform the prioritisation of the renewals programme.

8.3.1.2 Annual Budgets

Annual budgets are planned in advance however sometimes unexpected failures occur where the asset needs immediate renewal. In some cases, it can be more cost effective to wait until an asset completely fails, depending on its criticality, rather than renew on its life expectancy. In some cases, when other roading works are undertaken, a situation arises where there is an opportunity to renew an existing assets and avoid re-excavation of new road works. This can reduce life of roading asset and annoys the public.

8.3.2 Renewal Strategies

Assets are considered for renewal when:

- They near the end of their effective useful life
- The cost of maintenance becomes uneconomical
- Part become obsolete and spares are no longer available; and
- The risk of failure of critical assets becomes unacceptable.

The renewal programme has generally been developed by the following:

- Taking asset age and remaining life predictions, calculating when the remaining life expires and converting that into a programme of replacements based on valuation replacement costs. Care needs to be taken to ensure a bow wave of replacements is not built up by extending asset lives to ensure a smooth renewals programme
- 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 and performance through the asset management system
- The renewal programme is reviewed in detail every three years, by planning advisors, asset engineers and engineering management; and crossed referenced with other activities to determine if other projects are occurring in the same location. Timings may be tweaked to optimise overall programme to minimise disruptions to the public and realise potential costs saving in the reinstatement and preliminary and general works where possible
- Every year the annual renewal programme is reviewed and planned with the input of the maintenance contractor.

8.3.3 Delivery of Renewals

Generally renewal projects are carried out by the operations and maintenance contractor, however, contracts for large value renewal projects are tendered in accordance with the Procurement Strategy.

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 pipe failure information, staff knowledge and assistance from the maintenance contractor.

Identification of pipeline renewals in the urban areas is targeted to link in with pipeline upgrades assets (e.g. wastewater). The identification, design and construction of pipe renewals is staged over a two to three period.

A water meter renewal programme is ongoing and is based on age. Generally this occurs on a 15 year cycle.

8.3.4 Deferred Renewals

Deferred renewal 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.

Figure 17~~Figure 17~~ compares the Council's cumulative renewal expenditure and cumulative depreciation for this activity. If the renewals expenditure starts falling behind the accumulative depreciation, it can indicate that the assets may not be 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.

For the first 10 years, the Council's investment in renewals tracks slightly below depreciation. At about Year 11, the Council's investment in renewal starts to fall behind deprecation more significantly. This divergence is due primarily to the long useful life and age profile of the Council's current assets. Most of the Council's water assets are not due for replacement within the next 30 years. When new assets are constructed, it contributes to the divergence between renewals and depreciation. The new assets contribute to higher depreciation but most will not need replacing within the next 30 years. While not shown here, the Council has compared the likely renewal requirements for 100 years with depreciation over the same time. This assessment shows that the gap closes in the long run.

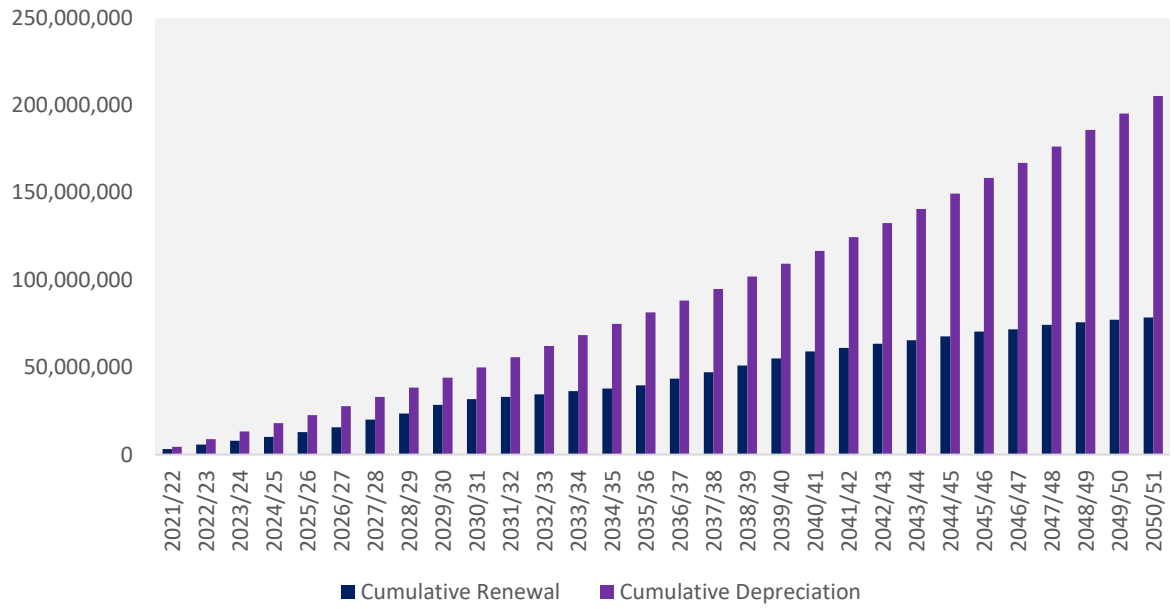


Figure 17: Cumulative Depreciation and Renewal Expenditure Comparison Including Inflation

8.3.5 Forecast Renewal Expenditure

Figure 18~~Figure 18~~ provides a summary of forecast renewal expenditure for the next 30 years.

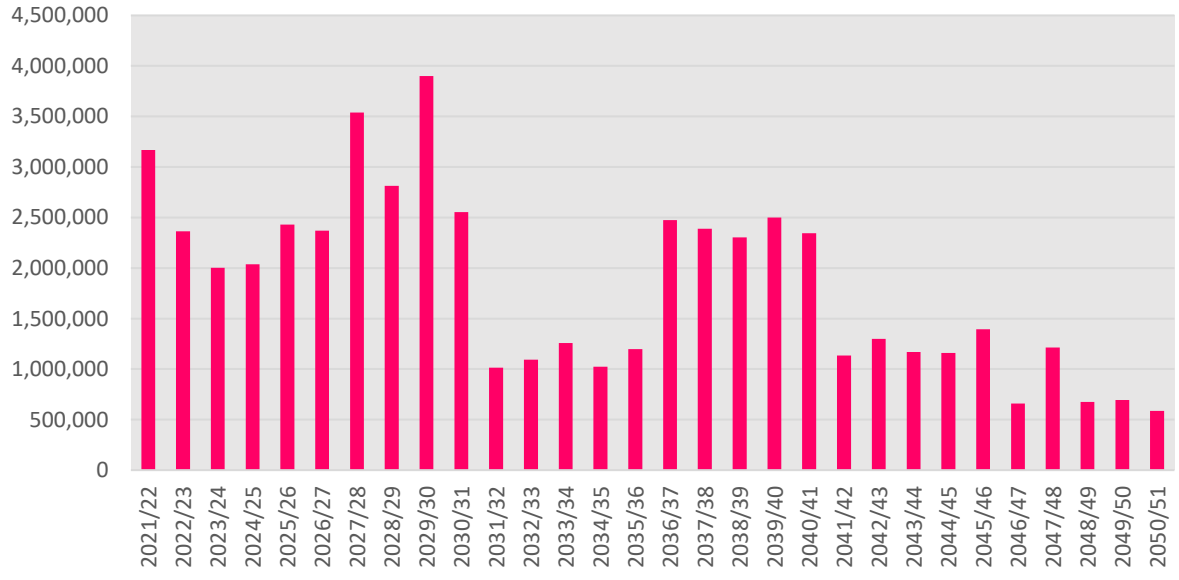


Figure 18: 2021 – 2051 Direct Renewals Expenditure Excluding Inflation

8.4 Asset Development

New capital expenditure is used to create new assets, expand or upgrade existing assets, or increase the capacity of existing assets beyond their original design capacity or service potential. This section summarises future new capital work requirements for this activity.

8.4.1 Key Asset Development Themes

8.4.1.1 DWSNZ

In order to comply with the DWSNZ, the Council need to upgrade existing or build new water treatment plants (WTP). There are several WTP projects planned between 2021-2028. The first new WTPs for Motueka and Dovedale. Upgrades are planned for Brightwater, Wakefield, Mapua/Ruby, Pohara, Tapawera and Murchison

8.4.1.2 Growth

Enabling growth is a priority for the Council. The plan is to provide new water infrastructure in Richmond and Motueka and infrastructure upgrades in Māpua /Ruby Bay.

8.4.1.3 Technology Improvement

As technology improves, we acquire new assets like SCADA, analytical testing equipment, water take and water metering devices.

8.4.2 Projects to Support Improving Levels of Service

Council is planning the following key projects to improve levels of service and comply with DWSNZ:

- 88 Valley WTP and Pump Stations - Treatment Upgrades
- Dovedale Source - New Motueka River Valley Water Source
- Redwood Valley WTP and PS - Treatment Upgrades Golden Hills
- Redwood Valley WTP and PS - O'Connor's Creek Treatment Upgrade
- Motueka WTP (Parker Street)
- Brightwater WTP Upgrade
- Wakefield WTP - New plant at Spring Grove
- Collingwood WTP - Treatment Upgrade
- Richmond Source - Waimea Bore Pump Upgrade
- Richmond Reticulation - Nelson Pine Water Main Relocation
- Motueka Reticulation - Zone of Effect around Parker Street WTP.

8.4.3 Projects to Support Growth

Council is planning the following key projects to address growth:

- Richmond South Low Level Reservoir Stage 1
- Richmond South Low Level Water Main
- Wakefield Reticulation - Upsize of Bird Lane water pipe

- Māpua Reticulation - Pomona Road Reservoir Upgrade
- Māpua Reticulation - Stage Coach Road Reservoir Upgrade
- Motueka Reticulation - Motueka West Water Main Stage 1.

8.4.4 Forecast New Capital Expenditure

Council's forecast for new capital expenditure for this activity is shown in Figure 19~~Figure 19~~ below.

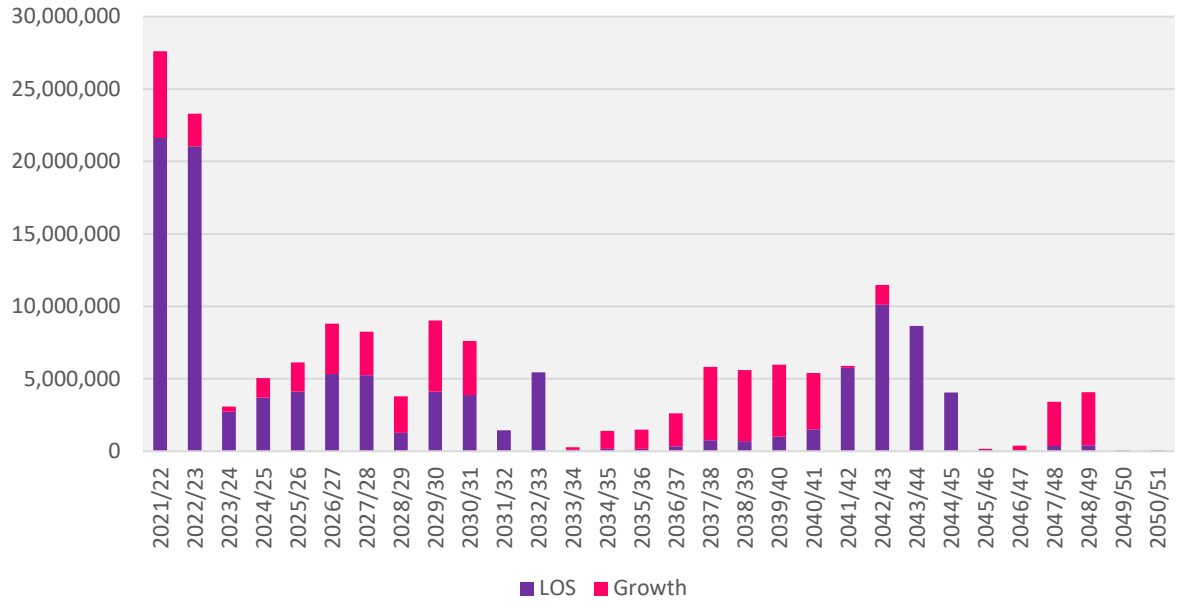


Figure 19: Direct New Capital Expenditure Excluding Inflation

8.5 Asset Disposal

Council does not have a formal strategy on asset disposal 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:

- Underutilisation
- 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 (e.g. 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 parties by agreement

In most situations, assets are replaced at the end of their useful lives and are generally in poor physical condition. Consequently, the asset will be disposed of. In some situations, redundant pipes and associated infrastructure is abandoned and left in the ground. These pipes are decommissioned and capped at each end, and in some cases filled with grout or mortar. The Council endeavor to capture the status and decommissioning treatment of abandoned pipes in the asset management systems. Typically, this information is provided in as built data.

Occasionally the opportunity arises when abandoned pipes can be used as conduit or relined for other purposes.

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, disposed of or demolished.

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.

Significant water assets programmed for decommissioning and disposal of include:

- Decommission Fearons Bush WTP planned for 2024/25 once the new Parker Street WTP is operational (2021/22)
- Brightwater and Wakefield WTP once Clover Road WTP is operational (2021/2022)
- Exiting wooden Pomona Road Reservoir may have component that can be recycled.

9 Financials

The Council has planned a prudent financial approach to managing its assets and services. This section provides a summary of the total value of the activity and the investment that the Council has planned to make over the next 30 years.

9.1 Funding Sources

The Water Supply activity is funded through a mixture of the following sources. The sources and their proportion of contribution is shown in Figure 20~~Figure 20~~ below.

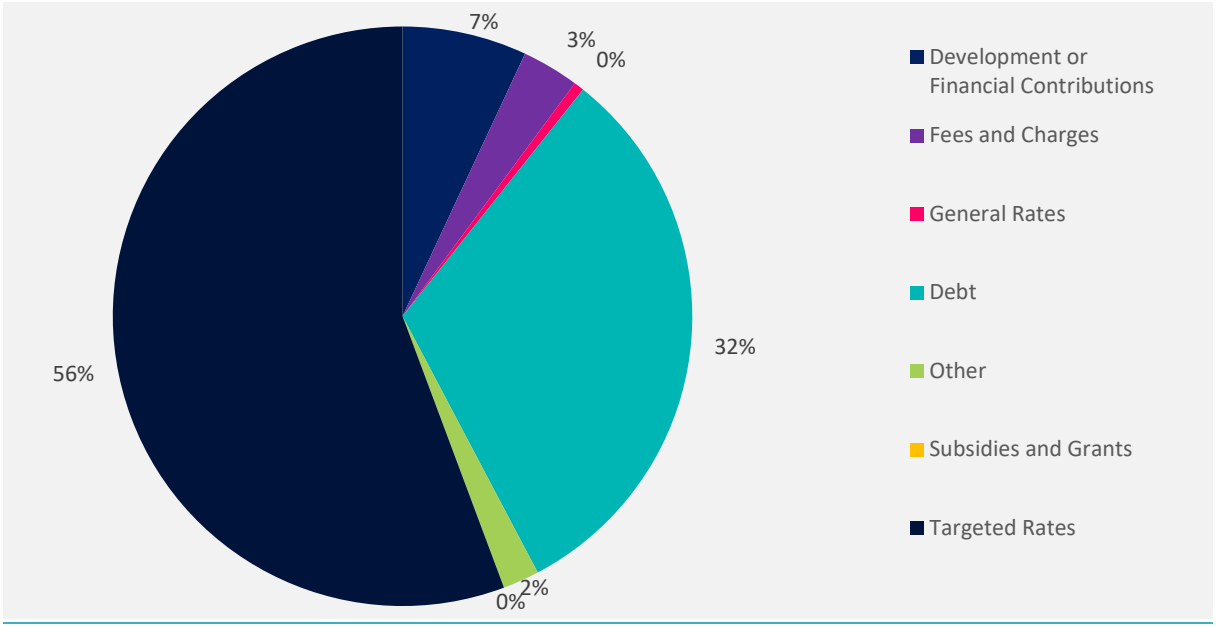


Figure 20: Sources of Water Supply Funding

9.1.1 Development Contributions

Council's Development and Financial Contributions Policy can be found on our website at www.tasman.govt.nz/policy/policies/development-contributions-policy

The next update of the Policy will be adopted in conjunction with the Council's Long Term Plan and will come into effect on 1 July 2021.

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 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 are three water supply development contributions in place. Which charge is applicable depends on what catchment the development is located in.

Table 30: Water Supply Development Contribution Charges as at 1 July 2018

Catchment	Development Contribution per HUD $ (incl GST) *
Waimea	$8,907
Motueka	$5,456
Golden Bay	Nil
Rest of District	Nil

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.

9.1.2 Water Clubs

Council's water supply schemes are divided into different clubs for the purposes of rating. The clubs include:

- Urban Water Club
- Motueka
- Dovedale
- Eighty-Eight Valley; and
- Redwood Valley

Further information regarding the funding of this activity can be found in the Council's Revenue and Financing Policy.

9.2 Asset Valuation and Depreciation

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

Council requires its infrastructure asset register and valuation 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 2017.

- 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).

9.2.1 2020 Valuation

Assets are valued every three years. The water supply assets were last revalued on 30 June 2020 and are reported under separate cover1. Key assumptions in assessing the asset valuations are described in detail in the valuation report.

The majority of information for valuing the assets was obtained from the Council's Confirm database. The data confidence is detailed in Table 31~~Table 31~~ below.

Formatt

Table 31: Data Confidence

Asset Description	Confidence	Comments
Water Supply Assets	B – Good	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.

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 32 following.

Table 32: Asset Lives

Item	Life (years)	Minimum Remaining Life (years)
Pipelines		
PVC critical pipes	50	5
AC critical pipes	55	5
AC, unknown pipe	60	5
AC non-critical pipes	65	5
DI, CI, PVC (non-critical), PE, Steel pipe	80	5
Miscellaneous pipeworks and fitting associated with treatment plants and pump stations	15	2
Valves, hydrants	50	5
Water meters, restrictors	15	2
Non Pipeline Assets		
Bore/ wells, tanks	50	5

[1] Tasman District Council Valuation of Non-Roading Infrastructure Assets as at 1 April 2017

Item	Life (years)	Minimum Remaining Life (years)
Pump chambers, reservoirs	80	5
Buildings	50	5
Backflow preventer	25	2
Small plant – pumps, chlorinating/UV equipment, generators	20	2
Electrical, control cabinets, telemetry, flow meters	15	2
Variable speed drives	10	2

9.2.2 Depreciation

Depreciation of assets must be charged over their useful life. The Council calculates depreciation on a straight line basis on most infrastructural assets at rates which will write off the cost (or value) of the assets to their estimated residual values, over their useful lives.
The optimised replacement value, optimised depreciated replacement value, total depreciation to date, and the annual depreciation of the water supply assets are summarised in Table 33~~Table 33~~ and Table 34~~Table 34~~ below.

Table 33: Water Asset Valuation Summary 30 June 2020

Asset Type	Optimised Replacement Value ($000)	Optimised Depreciated Replacement Value ($000)	Annual Depreciation ($000/yr)
Water Pipes	124,109	77,911	1,648
Water Non Pipe Assets	72,524	43,011	2,178
Total	196,633	120,922	3,826

Table 34: 2017 / 2020 Water Valuation Comparison

Year	Optimised Replacement Value ($000)	Optimised Depreciated Replacement Value ($000)	Annual Depreciation ($000/yr)
2017	171,347	104,827	3,002
2020	196,633	120,922	3,826
% Increase	15%	15%	27%

Overall the water assets have increased in optimised replacement value by 15% since the 2017 valuations. The increase in the replacement values is due to the following reasons:

- increases in the unit rates of assets over the period;
- the addition of new assets to the utilities since 2017.

The percentage increase in annual depreciation is higher due to higher unit rate increases for lower life assets, e.g.supply meters, valves and control cabinets.

9.3 Financial Summary

9.3.1 Funding Impact Statement

Council's Funding Impact Statement (FIS) for this activity is included in the table below. It summarises in one place how this activity will be funded and how those funds will be applied over the next 10 years.

Table 35: Water Supply Funding Impact Statement

	2020/21 AP $000	2021/22 Budget $000	2022/23 Budget $000	2023/24 Budget $000	2024/25 Budget $000	2025/26 Budget $000	2026/27 Budget $000	2027/28 Budget $000	2028/29 Budget $000	2029/30 Budget $000	2030/31 Budget $000
SOURCES OF OPERATING FUNDING											
General rates, uniform annual general charges, rates penalties	56	152	262	337	201	158	147	147	147	147	147
Targeted rates	11,463	12,756	14,363	15,328	16,812	17,998	18,920	19,656	20,583	21,782	22,849
Subsidies and grants for operating purposes	0	0	0	0	0	0	0	0	0	0	0
Fees and charges	1,134	1,137	1,130	1,110	1,091	1,068	1,039	1,002	965	928	888
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	673	~~673~~ 614	~~614~~ 641	~~641~~666	~~666~~ 667	~~667~~ 668	~~668~~670	~~670~~ 671	~~671~~ 673	~~673~~674	~~674~~ 676
Total operating funding	**13,326**	**14,659**	**16,396**	**17,441**	**18,771**	**19,892**	**20,776**	**21,476**	**22,368**	**23,531**	**24,560**
APPLICATIONS OF OPERATING FUNDING											
Payments to staff and suppliers	5,640	6,181	7,612	7,936	8,133	8,396	8,556	8,698	8,974	9,228	9,450
Finance costs	2,592	2,521	2,635	2,703	2,784	2,779	2,708	2,673	2,674	2,653	2,658
Internal charges and overheads applied	1,696	2,003	2,494	2,695	2,860	2,989	3,242	3,448	3,699	4,028	4,477
Other operating funding applications	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**9,928**	**10,705**	**12,741**	**13,334**	**13,777**	**14,164**	**14,506**	**14,819**	**15,347**	**15,909**	**16,585**
Surplus/(deficit) of operating funding	**3,398**	**3,954**	**3,655**	**4,107**	**4,994**	**5,728**	**6,270**	**6,657**	**7,021**	**7,622**	**7,975**
SOURCES OF CAPITAL FUNDING											
Subsidies and grants for capital expenditure	0	7,890	3,500	0	0	0	0	0	0	0	0
Development and financial contributions	1,866	2,428	2,428	2,428	2,174	2,174	2,174	2,174	2,133	2,133	2,346
Increase (decrease) in debt	8,935	25,545	15,706	(2,309)	635	(3,510)	1,741	3,051	(4,621)	1,790	(4,405)
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
Other dedicated capital funding	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**10,801**	**35,863**	**21,634**	**119**	**2,809**	**(1,336)**	**3,915**	**5,225**	**(2,488)**	**3,923**	**(2,059)**
APPLICATIONS OF CAPITAL FUNDING											
Capital expenditure											
- to meet additional demand	1,459	2,818	26	27	28	28	29	511	3,242	3,463	33
- to improve the level of service	7,352	5,543	1,106	59	50	51	23	24	25	25	26
- to replace existing assets	7,927	4,480	3,137	4,863	6,995	8,700	11,731	12,300	4,068	11,283	11,893
Increase (decrease) in reserves	(4,481)	(12,164)	(147)	(723)	730	(4,387)	(1,598)	(953)	(2,802)	(3,226)	(6,036)
Increase (decrease) in investments	1,942	39,140	21,167	0	0	0	0	0	0	0	0
Total applications of capital funding	**14,199**	**39,817**	**25,289**	**4,226**	**7,803**	**4,392**	**10,185**	**11,882**	**4,533**	**11,545**	**5,916**
Surplus/(deficit) of capital funding	**(3,398)**	**(3,954)**	**(3,655)**	**(4,107)**	**(4,994)**	**(5,728)**	**(6,270)**	**(6,657)**	**(7,021)**	**(7,622)**	**(7,975)**
Funding balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

9.3.2 Project Drivers

All expenditure must be allocated against at least one of the following project drivers.

- Operation and Maintenance: operational activities that do not involve the renewal or upgrade of assets, or work that is necessary in order to provide on-going services at the agreed levels.
- Renewals: significant work that restores or replaces an existing asset towards its original size, condition or capacity.
- Increase Level of Service: works to create a new asset, or to upgrade or improve an existing asset, beyond its original capacity or performance.
- Growth: works to create a new asset, or 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.

- Schedule 13(1) (a) and section 106 of the Local Government Act requires the Council 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 Council 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.

All new works have been assessed against these project drivers. Some projects may be driven by a combination of these factors and an assessment has been made of the proportion attributed to each driver.

9.3.3 Scope Risk and Funded Capital Programme

When developing this work programme, the Council needs to estimate how much to budget for each project. Often, the Council cannot be certain what the actual costs or scope of the project will be because the design is yet to be completed. Typically, the Council has more confidence in the cost and scope of projects that are planned within the first three years. After this, estimates are usually based on simple concept designs.
To address this uncertainty, the Council has incorporated funding of scope risk into capital project budgets. The amount of scope risk included varies from 10% to 40% of the project estimate, depending on the expected complexity of the individual project. Based on history, it is unlikely that all individual projects will need the full amount of allocated scope risk funding, in reality there will be some under and over spending.

It is also unrealistic to assume that we will deliver all of our projects on time. There are often delays associated with land access and consenting and other unforeseen issues that prevent us achieving on time delivery for some projects.

For the water, wastewater, stormwater, and rivers activities, we have made an overall downward adjustment to the total capital programme of 10% per year. This adjustment accounts for uncertainties in scope risk and programme delivery. By including this adjustment, we avoid over-funding the activities. Where we have applied the 10% adjustment, we refer to this adjusted budget as the total funded capital programme.

9.3.4 Total Expenditure

Figure 21~~Figure 21~~ and Figure 22~~Figure 22~~ show the total expenditure for this activity over the next 10 and 30 years respectively.

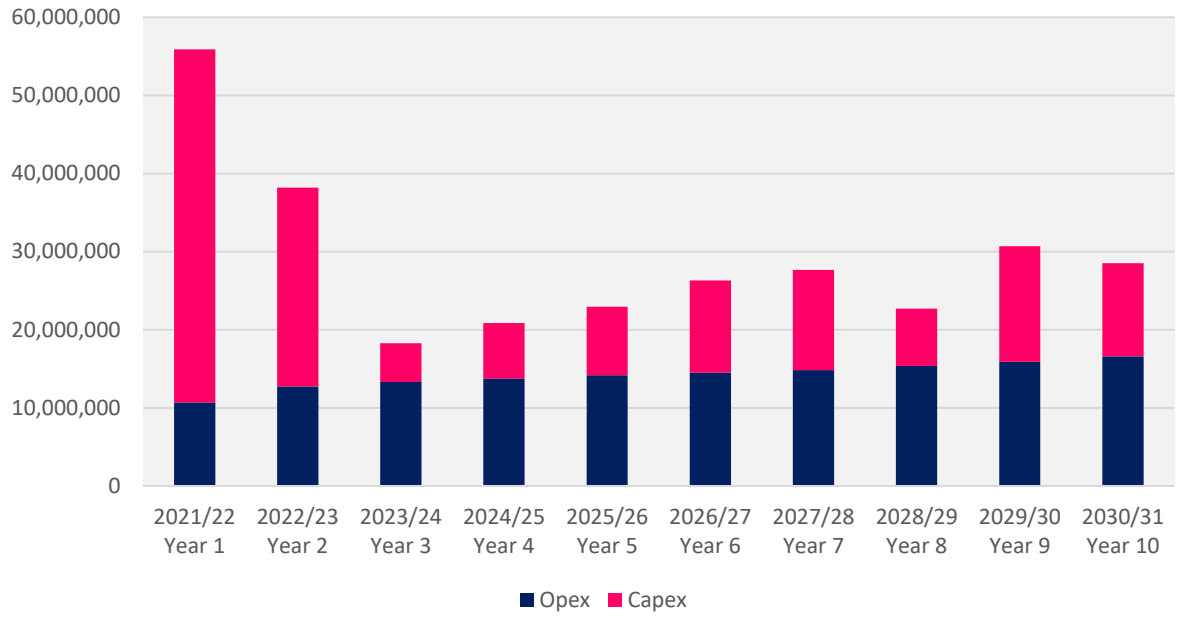


Figure 21: Total Annual Expenditure Years 1 to 10 Including Inflation

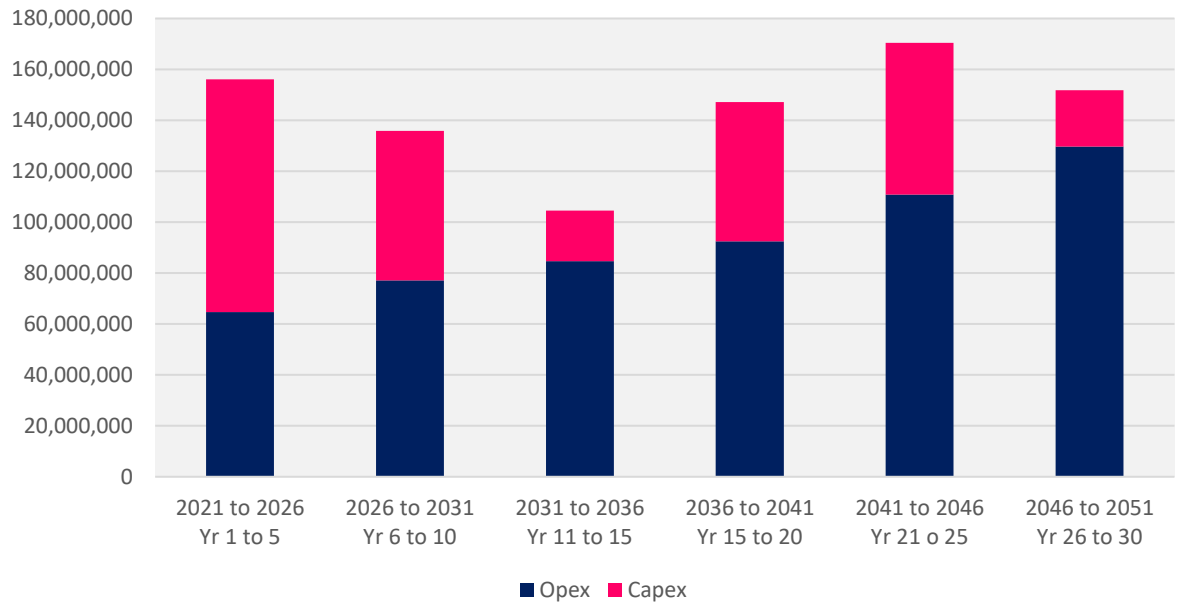


Figure 22: Five Yearly Total Expenditure Years 1 to 30 Including Inflation

9.3.5 Total Income

Figure 23~~Figure 23~~ and Figure 24~~Figure 24~~ show the total income for this activity over the next 10 and 30 years respectively.

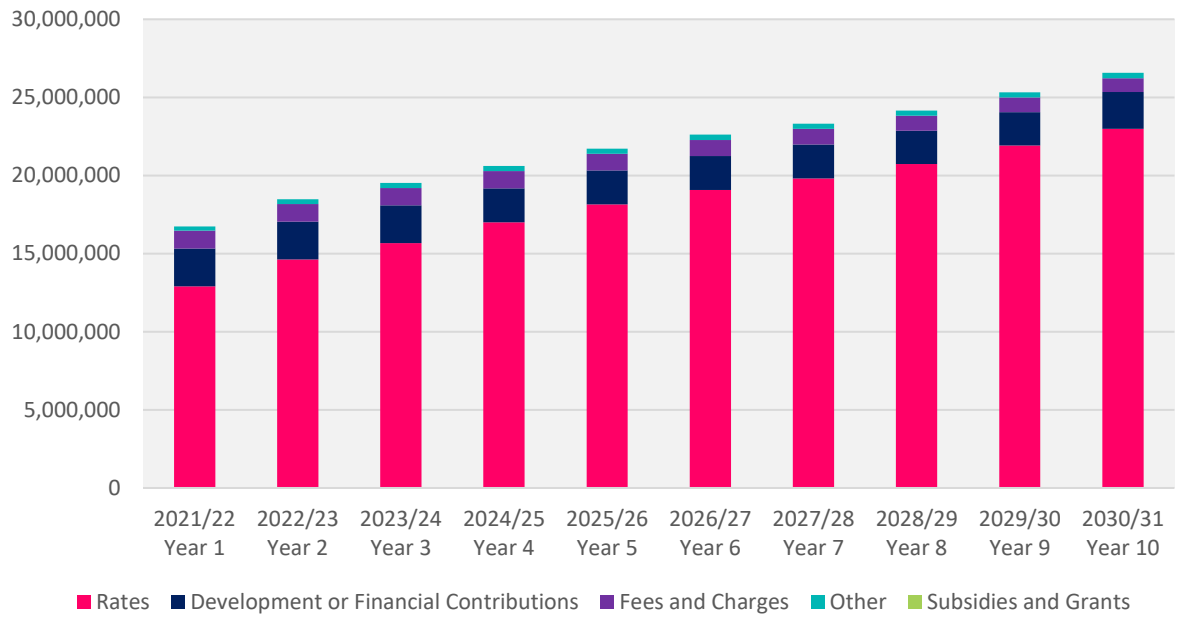


Figure 23: Total Annual Income Years 10

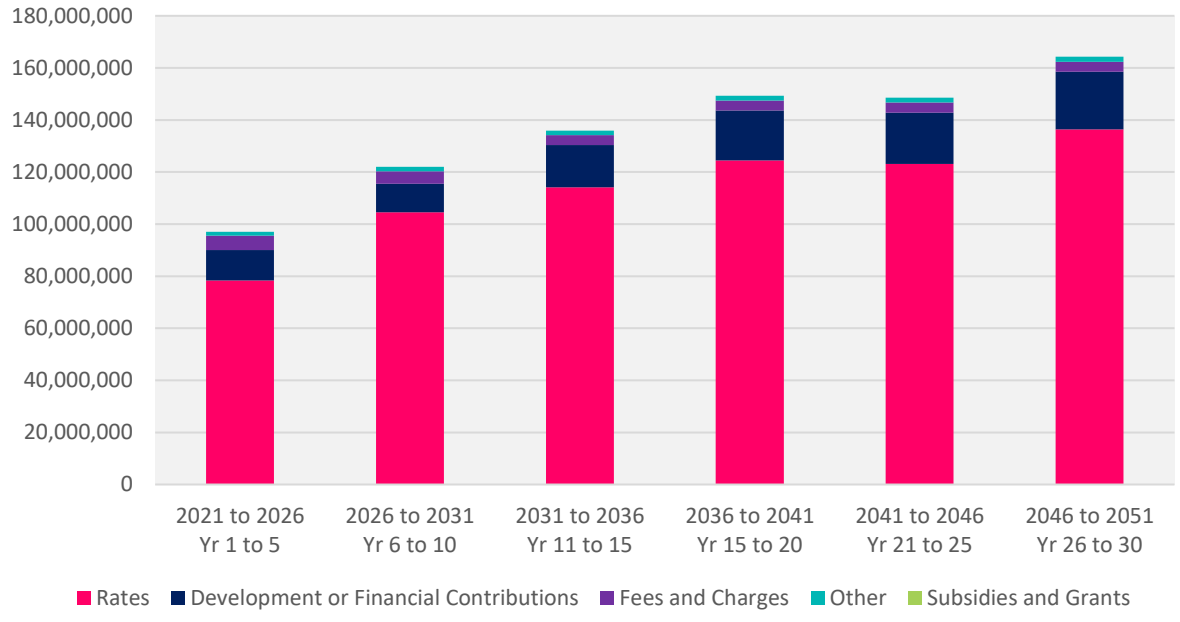


Figure 24: Five Yearly Total Income Years 1 to 30

9.3.6 Operational Costs

Figure 25 and Figure 26 show the total operating expenditure for the Water Supply activity for the first 10 and 30 years respectively.

Operational costs for the water supply activity are forecast to increase by an average of 5.~~45~~% per year for the first 10 years, and an average of 5.2% per year over 30 years. The most notable increases within the next 10 years occur between Year 1 and Year 2. At this time, direct operating costs are increasing due to the expected completion and operation of the Waimea Community Dam. Indirect costs increase primarily due to increasing loan interest costs associated with the capital programme for this activity. On top of this, both direct and indirect expenditure gradually increase due to inflation.

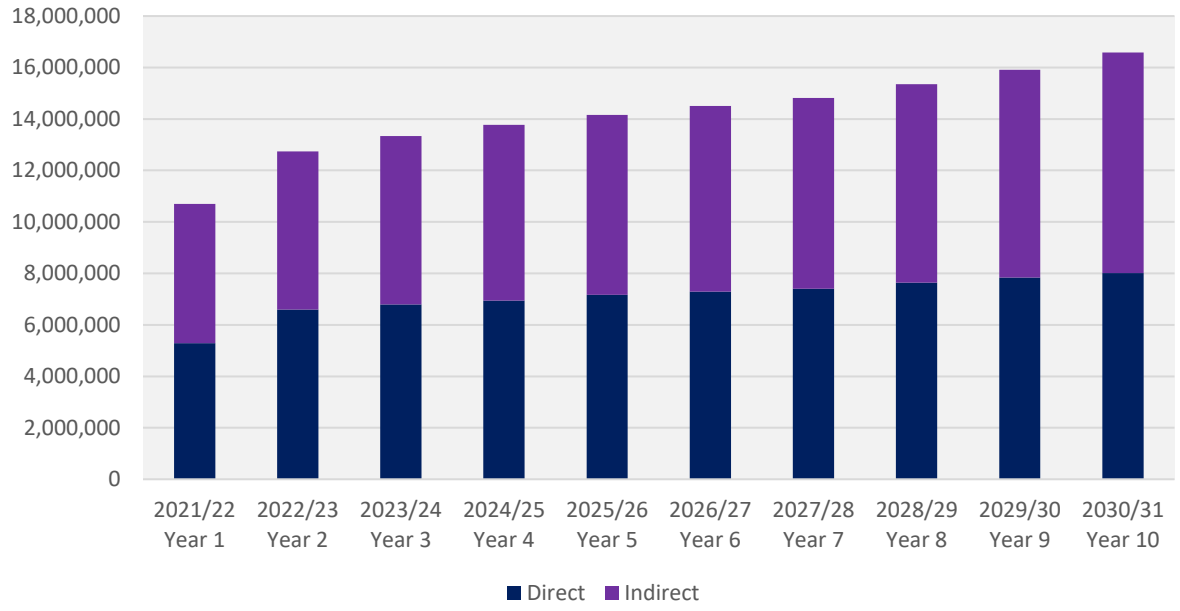


Figure 25: Direct and Indirect Annual Operating Costs Years 1 to 10 Including Inflation

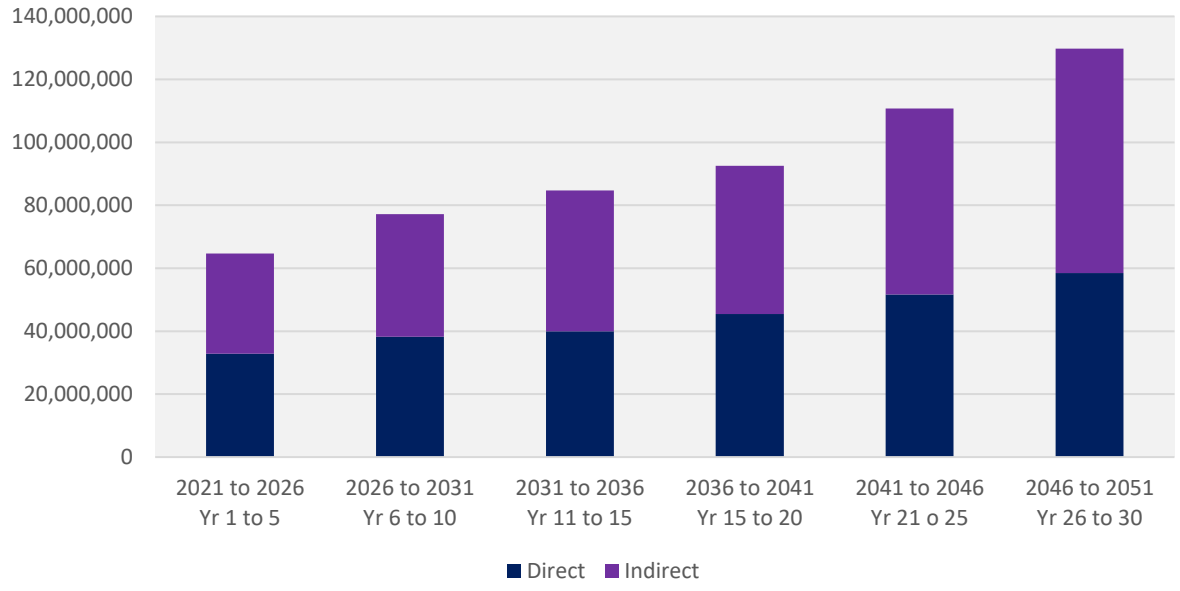


Figure 26: Direct and Indirect Five Yearly Operating Cost Years 1 to 30 Including Inflation

9.3.7 Capital Expenditure

The Council has planned to spend $1~~28~~50 million on capital improvements over the next 10 years. Of this, ~~25~~22% is attributable to growth, ~~52~~58% for level of service improvements, and ~~23~~20% for asset renewal. We will invest most in level of service improvements for the first two years. This is due to the planned water treatment plant upgrades that are required to meet the NZ Drinking Water Standards.

Over the next 30 years, the total funded capital programme is $~~284~~306 million.

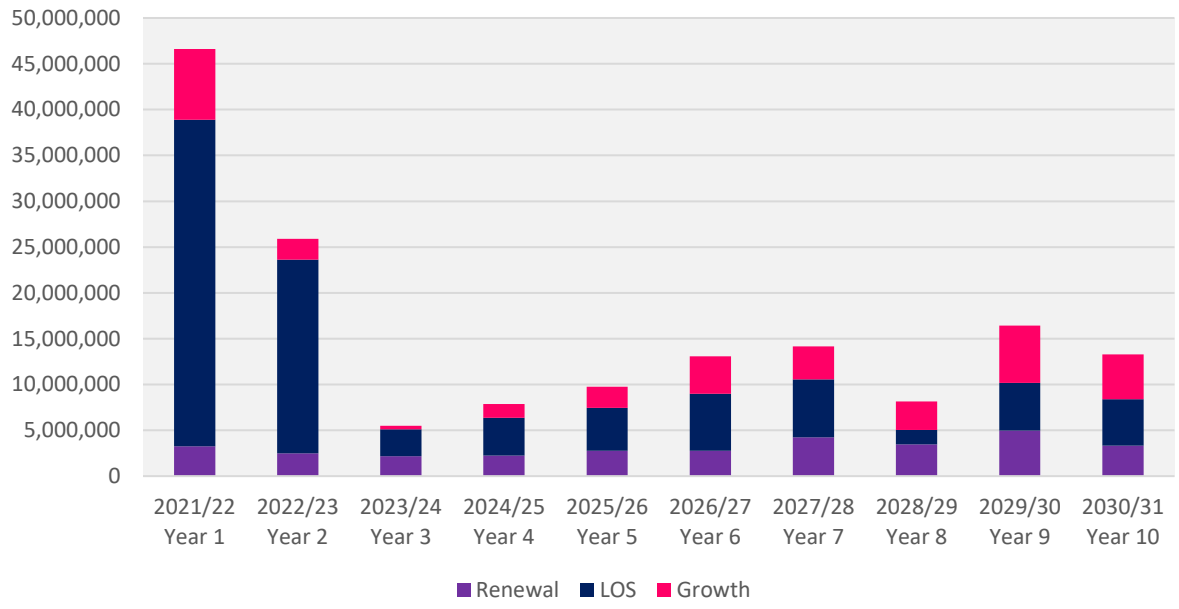


Figure 27: Annual Capital Expenditure Years 1 to 10 Including Inflation

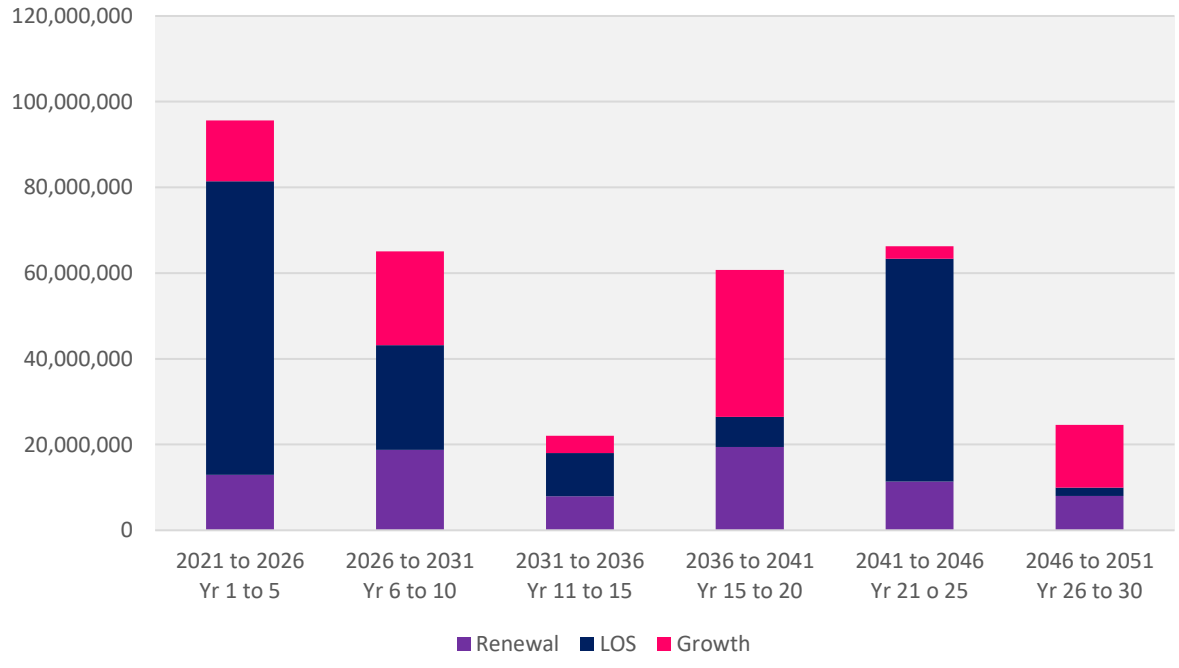


Figure 28: Five Yearly Capital Expenditure Years 1 to 30 Including Inflation

10Sustainability

Sustainability means that we effectively balance the needs of present and future communities. From an asset management perspective, sustainability is critical, as many assets have a long lifespan and must be 'future-proofed'. The Council has a responsibility to manage this activity in way that supports the environmental, social, cultural and economic well-being of current and future generations. This section focuses on social, cultural and environmental sustainability.

The Local Government Act 2002 requires local authorities to take a sustainable development approach while conducting their 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 the Council's Vision, Mission and Objectives, and is reflected in the Council's community outcomes. The levels of service and the performance measures that flow from these inherently incorporate the achievement of sustainable outcomes.
We measure sustainability against the triple bottom line framework that aims to create a balance between the three dimensions of performance, often referred to as people, planet and profit (3P's).

People – The effects of the activity on the social and cultural wellbeing of our community.

The Council is guided by the Community Outcomes to assist in determining how our decisions affect the social wellbeing of our community. The Council undertake the activity to meet the level of service that is required to enhance community well-being.

Planet – The effects of the activity on the environment.

Water supply resources are taken from our groundwater aquifers or river surface takes. These water takes may affect river base flows and the aquatic habitat particular during droughts.

Profit – The financial and overall long-term economic viability of the activity.

The Council operates, maintains and improves the water supply infrastructure assets on behalf of its ratepayers. The Council uses its Financial Strategy to guide the development of an affordable work programme. The Council's finances are managed within the set debt limits and rates income rises to ensure economic viability for current and future generations.

10.1 Tasman Climate Action Plan

In 2019, the Council adopted the 'Tasman Climate Action Plan' (Action Plan). The Action Plan is the Council's initial response to the urgent need to take action on climate change, to build climate resilience and reduce greenhouse gas emissions.

The Action Plan sets out goals, targets and actions relating to three key themes:

- Mitigation – how we can reduce greenhouse gas emissions from the Council's activities.
- Adaptation – ways we can respond to our changing environment, including positive opportunities.
- Leadership – how we can lead by example, advocate and encourage others to take action.

The following goals are the long-term aspirations of the Council. They represent the first step towards a cohesive package of activities that address climate change issues.

1. Council contributes to New Zealand's efforts to reduce greenhouse gas emissions (including net carbon emissions).
2. Tasman District becomes more resilient to the impacts of climate change.
3. The Tasman Community is informed of climate change actions and options for response.
4. Council shows clear leadership on climate change issues.

Goals will be measured via the targets and achieved by implementing the actions set out in the following Action Plan. The goals, targets and actions seek to balance the need for change with the interests of current and future residents of Tasman District, the environment and the economy.

10.2 Negative Effects

Potential significant negative effects and the proposed mitigation measures for the Water Supply activity are listed below in Table 36~~Table 36~~ below.

Table 36: Negative effects from water supply activity

Effect	Description	Mitigation Measures
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.	Council is investing in the Waimea Community Dam project and has made allowances in the AMP for new water sources (such as the upgrades to the Dovedale intake, relocation of Richmond bores, and a new bore field at Clover Road). The Council has made allowances for improving demand

Effect	Description	Mitigation Measures
		management which will assist with making water usage more sustainable. In 2019, the Council adopted an amended Water Supply Bylaw that includes a new water restrictions protocol.
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 Abstraction	All of our water schemes take water from our environment (via surface or groundwater) and require a resource consent. We aim to manage water takes so the impact is not detrimental to our surrounding environment. . Water extraction, especially during times of drought, has an impact on our natural water body. Through compliance with our resource consent conditions, we ensure this impact is only minor. 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.	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.
Costs to meet the	Requiring significant capital investment and	

Effect	Description	Mitigation Measures
DWSNZ	ongoing	

10.3 Positive Effects

Potential positive effects are listed and described below in Table 37~~Table 37~~.

Table 37: Significant positive effects from water supply activity

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 firefighting requirements and supports protection of life and property.

10.4 Environmental Management

The statutory framework defining what activities require resource consent is the Resource Management Act (RMA) 1991. The RMA is administered locally by Tasman District Council, as a unitary authority, through the Tasman Resource Management Plan (TRMP). The following section discusses key consents that the Council holds in order to undertake this activity.

10.4.1 Resource Consents

Council's Engineering Services Department has over 200 consents to manage and the number and type of resource consents relating to the water supply activity has increased over recent years. Some consents require active management to ensure reporting and monitoring conditions are met and allow the timely management for lodging new applications before existing consents expire. A register of all active consents including their conditions, compliance actions and expiry dates are managed in Bravegen.

The following list identifies resource consents that are either currently in the consent application/renewal process* or due to expire within the term that this activity management plan covers:

Table 38: Consents under Renewal or Application

Water Supply Scheme	Consent No.	Consent Type	Expiry
Brightwater	NN020022	Water take and use	31/05/2017*

Water Supply Scheme	Consent No.	Consent Type	Expiry
Collingwood	NN020325	Water take and use	31/05/2019
Redwoods (O'Connor's Creek)	RM110191V1	Water take and use	31/05/2017*
Redwoods (River Road)	RM110193V1	Water take and use	31/05/2017*
Redwoods (Golden Hills)	NN970139	Water take and use	31/05/2017*
Maupu/Ruby Bay	RM110192V1	Water take and use	31/05/2017*
Upper Takaka		Water take and use	31/05/2019

The following sections describe the different types of resource consents that are applicable to the water supply activity.

10.4.1.1 Water Takes

The TRMP sets the framework for water management and Chapter 31 (Rules for Water Take, Diversion, Use or Damming) outlines the legal rules for taking water. The Council requires a consent to take water from surface or groundwater sources for provision of water to the Council's 18 water supply schemes.

10.4.1.2 Land Use

Part II of the TRMP applies to land in the District including land that is the bed of any river, stream or lake. Chapter 16-18 states the general, zone, and areas rules applying to land uses. Resource consents may be required for the installation and maintenance of any water supply infrastructure including bores, WTP, and pipelines. Some WTPs have been designated to ensure future works can be carried out for future development.

10.4.1.3 Water Course, Dam and Weir Structures

As mentioned previously, Chapter 31 of the TRMP outlines the legal rules for using water. Separate resource consents are required for water supply infrastructure that diverts, alters or dams water. Such infrastructure may include dams and weir structures.

10.4.1.4 Discharge

Under the RMA and TRMP, resource consents in the form of discharge permits are required for all discharges of water and contaminants to the environment. Chapter 33 (Discharging to Land and Fresh Water) of the TRMP outlines the legal rules for discharging. The Council has a legal obligation to manage the adverse effects from discharges from its network including untreated water and treated water. Chlorine is considered a contaminant to land and fresh water bodies. Water supply infrastructure such as bypass pipelines in WTP require a discharge consent (e.g. PōharaWTP).

10.4.1.5 Coastal Permit

Part III of the TRMP applies to the coastal marine area and some water supply infrastructure such as pipelines buried in an estuary require a costal permit to disturb and occupy the foreshore and seabed. A separate permit is required for constructing infrastructure and another permit is required to undertake maintenance and repair work to existing infrastructure.

10.4.2 Resource Consent Reporting and Monitoring

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.

10.4.3 Property Designations

Designations are a way provided by the RMA of identifying and protecting land for future public works. There is a suite of designations held in the TRMP and these allows the Council to plan and conduct water supply activities. Once given effect, a designation remains valid for the life of the TRMP or until the requiring authority removes or alters the designation. It is not always necessary to retain the designations for sites where water supply facilities have been developed, unless there is a likelihood of future expansion or other upgrades being required. 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 ongoing need for regional resource consents (e.g., discharge permits) required for the designated site. Table 39~~Table 39~~ provides a summary of current designations. The Council have an indefinite designations for most WTP, reservoirs and pump station sites. Exceptions are listed in Table 39~~Table 39~~ below.

Table 39: Summary of Public Water Supply Designations

ID	Location	Site Name/Function	Duration of Designation
D175	Hamama Road	Hamama Water Supply Intake	Indefinite – given effect
D188	Pigeon Valley Road, Wakefield	Wakefield Pump Station and well	Indefinite – given effect
D196	Unnamed Stream, Torrent Bay	Torrent Bay Water Supply Intake	Indefinite – given effect
D199	Haile Lane, Pōhara	PōharaValley Water Supply Intake	Indefinite – given effect
D206	State Highway 60, Takaka Hill	Upper Takaka Water Supply Intake	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 East High Level	20 years (Built 2015)

ID	Location	Site Name/Function	Duration of Designation
	Richmond	Reservoir	

11 Risk Management and Assumptions

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 the Council considers could have a significant effect on the financial forecasts, and discusses the potential risks that this creates.

11.1 Our Approach to Risk Management

A risk is any event that has the potential to impact on the achievement of Council's objectives. The potential impact of a risk is measured by a combination of the likelihood of the risk occurring, and the magnitude of its consequences on objectives if it does. The Council has adopted both a Risk Management Policy that aligns with the Australian/New Zealand Standard AS/NZ ISO 31000:2009, and a Risk Management Framework which provides guidance and tools to apply to ensure a consistent approach to analysing and managing risks across the organisation. All risks described and managed in this Activity Management Plan comply with the principles and requirements of the policy and framework.

11.2 Activity Risks and Mitigation

The key risks and mitigation measures for this activity are summarised in Table 40.

Table 40: Key Risks

Risk Event	Mitigation Measures
Water contamination	Current • Source waters are protected by the National Environmental Standard (NES) for Drinking Water and National Policy Statement for Freshwater. • Individual scheme risks documented in Water Safety Plan for that scheme. WSPs contain contingency plans for emergency events Proposed • Changes to some rules within TRMP around bores • Create centralized emergency response plans (ERPs)
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

Risk Event	Mitigation Measures
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 e.g., iwi, Heritage New Zealand, community groups	Current • Council holds regular meetings with iwi • The Council's GIS software includes layers identifying cultural heritage sites and precincts. The 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
Growth greater than expected	Current • monitor subdivision and building consent data • monitor forecast with each growth model review
Motueka Groundwater contamination	Current • monitor groundwater quality • maintain liaison with Medical Officer of Health

11.2.1 Natural Hazards and Resilience

The size and diverse nature of the Tasman landscape makes the region susceptible to a wide range of natural hazards. Tasman lies within a seismically active zone, has five major river catchments and a large coastal environment. As a result, Tasman residents have experienced the damaging effects of landslides, flooding and coastal inundation.

Some hazards have a slower onset period, for example sea level rise associated with the effects of climate change, and other hazards such as earthquakes can have little to no warning. Regardless of these timeframes, the Council needs to plan for these hazards and determine whether adaption, mitigation, or retreat is appropriate.

Council's Infrastructure Strategy provides details of the relevant natural hazards in context to the Council infrastructure and outlines how we intend to manage risk and improve resilience. In addition to this, the Regional Civil Defence Emergency Management Group Plan provides a risk profile that outlines and ranks these natural (and other) hazards. The risk assessment determines the likelihood and consequence of the hazard occurring ranges between low to very high likelihood and insignificant to catastrophic consequences. For example on the extreme end of the scale, an Alpine Fault earthquake is considered possible and would result in catastrophic consequences for both people and infrastructure.

Council needs to ensure it has robust planning in place and provides infrastructure that is resilient. The Council is taking a long-term strategic approach by undertaking risk, resilience and recovery planning to provide better information on infrastructure resilience requirements. This planning will cover Transportation and Three Waters activities and includes a total budget of $160,000 over the next two years (2018-20). The Council will also continue to focus on planning and managing its critical assets and lifelines networks to ensure that the appropriate level of effort is being made to better manage, maintain and renew them.

As well as ensuring its assets are resilient, the Council has a range of financial provisions to assist with response to and recovery from major damaging events. These include:

- Annual emergency funding;
- An established Emergency Fund that the Council aims to maintain to a value of $12.8 million;
- Ability to reprioritise the Council's capital programme;
- Insurance cover of 40% of the costs of a catastrophic disaster event, up to $125m;
- Central Government support of up to 60% through the Local Authority Protection Programme;
- NZ Transport Agency subsidy of at least 51% for subsidies transportation asset reinstatement.

11.3 Assumptions and Uncertainties

The uncertainties and assumptions are outlined in Table 41that the Council consider could have a significant effect on the financial forecasts, and discusses the potential risks that this creates.

Table 41: Generic Assumptions and Uncertainties

Type	Uncertainties	Assumption	Discussion
Financial	Unless stated it can be unclear whether financial figures include inflation or not, as well as whether GST has been included or not.	That all expenditure has been stated in 1 July 2020 dollar values and no allowance has been made for inflation and all financial projections exclude GST unless specifically stated.	The LTP will incorporate inflation factors. This could have a significant impact on the affordability of each activity if inflation is higher than allowed for. The Council is using the best information practically available from Business and Economic Research Limited (BERL) to reduce this risk.
Asset Data Knowledge	Council has inspection and data collection regimes in place for assets. These regimes do not allow for entire network coverage at all times. The Council's aim is to strike the right balance between adequate knowledge and what is practical.	That the Council has adequate knowledge of the assets and their condition so that planned renewal works 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.

Type	Uncertainties	Assumption	Discussion
Growth Forecasts	Growth forecasts are inherently uncertain and involve many assumptions. The Council commissioned population projections for the LTP 2021-2031 as the basis for its growth planning. However, growth will vary depending on actual birth and death rates, as well as net migration.	That the district will grow or decline as forecast in the Council's Growth Model. The overall population of Tasman is expected to increase by 7,700 residents between 2021 and 2031, to reach 64,300. The District will experience ongoing population growth over the next 30 years but the rate of growth will slow over time. Based on these assumptions, the Council is planning a further 4,300 dwellings and 160 new commercial or industrial buildings will be required by 2031.	Growth forecasts are used to determine infrastructure capacity and when that capacity will be required. If actual growth varies significantly from what was projected, it could have a moderate impact on the Council's plans. If growth is higher than forecast, additional infrastructure may be required quicker than anticipated. If growth is lower, the Council may be able to defer the delivery of new or additional infrastructure.
Project Timing	Multiple factors affect the actual timing of projects e.g.: • Consents • Access to and acquisition of land • Population growth • Timing of private developments • Funding and partnership opportunities	That projects will be undertaken when planned.	The risk of the timing of projects changing is high due to factors like resource consents, third party funding, and land acquisition and access. The Council tries to mitigate these issues by undertaking the investigation, consultation and design phases sufficiently in advance of when construction is planned. If delays occur, it could have an impact on the levels of service and the Council's financing arrangements.

Type	Uncertainties	Assumption	Discussion
Project Funding	Council cannot be certain that it will receive the full amount of anticipated subsidy or contribution. It depends on the funder's decision making criteria and their own ability to raise funds.	That projects will receive subsidy or third party contributions at the anticipated levels.	The risk of not securing funding varies and depends on the third party involved. If the anticipated funding is not received it is likely that the project will be deferred which may impact levels of service.
Accuracy of Cost Estimates	Project scope is often uncertain until investigation and design work has been completed, even then the scope can change due to unforeseen circumstances. Even if the scope has certainty there can be changes in the actual cost of work due to market competition or resource availability.	That project cost estimates are sufficiently accurate enough to determine the required funding level.	The risk of large underestimation is low; however, the importance is moderate as the Council may not be able to afford the true cost of the project. The Council tries to reduce this risk by undertaking reviews of all estimates and including an allowance for scope risk based on the complexity of the project.
Land Access and Acquisition	Land access and acquisition is inherently uncertain. Until negotiations commence, it is difficult to predict how an owner will respond to the request for access or transfer.	That the Council will be able to secure land and/or access to enable completion of projects.	The risk of delays to projects or changes in scope is high due to the possibility of delays in obtaining access. Where possible, the Council undertakes land negotiations well in advance of construction to minimise delays and scope change. If delays do occur, they may affect the level of service that the Council provides.

Type	Uncertainties	Assumption	Discussion
Legislation Changes	Often Central Government changes legislation to respond to emerging national issues and opportunities. It is difficult to predict what changes there will be to legislation and their implications for the Council.	Council assumes that it will be affected by changes to Government legislation. However, as the nature of these changes is not known no financial provision has been made for them except where noted elsewhere in the LTP 2021-2031 forecasting assumptions.	The risk of major changes that impact the Council is moderate. If major changes occur, it is likely to have an impact on the required expenditure. The Council has not planned expenditure to specifically mitigate this risk. It may be necessary for the Council to reprioritise planned work to respond to future legislation.
Emergency Reserves	It is impossible to accurately predict when and where a natural hazard event will occur. Using historic trends to predict the future provides an indication but is not comprehensive. The effects of climate change are likely to include more frequent emergency events.	That the level of funding reserves combined with insurance cover and access to borrowing capacity will be adequate to cover reinstatement following emergency events.	Funding levels are based on historic requirements. The risk of requiring additional funding is moderate and may have a moderate effect on planned works due to reprioritisation of funds.

Type	Uncertainties	Assumption	Discussion
Network Capacity	Council uses a combination of as built data, network modelling and performance information to assess network capacity. The accuracy of the capacity assessment is based on the accuracy of asset and performance data.	That the Council's knowledge of network capacity is sufficient enough to accurately programme works.	If the network capacity is higher than assumed, the Council may be able to defer works. The risk of this occurring is low, however it should have a positive impact on the community because the level of service can be provided for longer before requiring additional capital expenditure. If the network capacity is lower than assumed, the Council may be required to advance capital works projects to provide the additional capacity sooner than anticipated. The risk of this occurring is low, however it could have a significant impact on expenditure.

Type	Uncertainties	Assumption	Discussion
Climate change	Continued greenhouse gas emissions will cause further warming and changes in all parts of the climate system. The level of continued emissions of greenhouse gases and the effectiveness of worldwide efforts to reduce them are not known. The full extent of the impacts of climate change and the timing of these impacts are uncertain.	Council uses the latest climate predictions that have been prepared by NIWA for the Tasman District. Council assumes that it is not possible to reduce the mid-century warming, due to the amount of carbon dioxide already accumulated in the atmosphere – i.e. that the projections for mid-century are already 'locked in'. As a consequence of climate change, natural disasters will occur with increasing frequency and intensity. The weather-related and wildfire events the District has experienced in recent years are consistent with predictions of climate change impacts. For low lying coastal land there will be increasing inundation and erosion from sea level rise and storm surge. Adaptation can help reduce our vulnerability and increase our resilience to natural hazards. We assume that sea levels will continue to rise and are likely to rise at an accelerated rate over time. Our plans assume a sea level rise (SLR) of up to 0.3m by 2045, 0.9m by 2090 and 1.9m to 2150 (metres above 1986-2005 baseline), in line with the Ministry for the Environment's Coastal Hazards and Climate Change Guidance (2017). For coastal subdivisions, greenfield developments and major new infrastructure, we are planning for 1.9m SLR by 2150. All sea-level rise assumptions are based on the RCP8.5H+ scenario set out in the MfE guidance (2017).	It is likely that risk of low lying land being inundated from the sea, and damage to the Council property and infrastructure from severe weather events, will increase. Council will need to monitor the level of sea level rise and other impacts of climate change over time and review its budgets, programme or work and levels of service accordingly. Council will continue to take actions to mitigate its own greenhouse gas emissions, to work with the community on responses to climate change and show leadership on climate change issues.

Table 42: Water Specific Assumptions and Uncertainties

Type of Uncertainty	Description
Secure Water Source for Waimea Basin	Council cannot be certain what the actual climatic conditions of the future will be, nor the demand for community water supplies, but has assumed both will increase. The Council has instigated a process to secure an augmented water source in the Waimea Basin to address the risks associated with drought, increasing demand, and existing over subscription of the aquifers. The Council's solution is its investment in the construction of the Waimea Community Dam. The Council has assumed that the dam will be built as planned and become fully operational by the end of 2022.
Chlorination of Water Supplies	An inquiry into the Havelock North drinking water contamination incident has been undertaken by the Government. Recommendations have been released but uncertainty remains about which recommendations will be made mandatory. One recommendation relates to residual disinfection. Council is planning to incorporate chlorination in its water treatment plant upgrades. The Council is also currently considering permanently chlorinating the remaining unchlorinated supplies but a decision has not yet been made despite signals from Government that it may become mandatory. If residual disinfection becomes mandatory, there will be a minor increase in annual operating expenditure.
Fluoridation of Water Supply	Central Government is currently considering a Bill, which if passed would give power to District Health Boards to make decisions and give directions about the fluoridation of local government drinking water supplies in their areas. It is unclear whether the Bill will be successful and what the actual implications for the Council will be. For this AMP, the Council has assumed that its drinking water supplies will not be fluoridated. If the bill is passed and the Nelson Marlborough District Health Board instructs the Council to fluoridate its supplies, it will create additional capital and operating costs.
Industrial Water Usage	Council cannot be certain about the quantity of water that industrial users will require. The Council has assumed that future consumption by existing industries will be in line with historic use. The Council has planned for one additional wet industry in a medium growth scenario and two wet industries in a high growth scenario. If consumption is significantly different than assumed, it may have an impact on the Council's funding requirements. If growth is significantly different to the medium or high projections, the number of wet industries may be different.
Asset information	Council is uncertain about the impact that improved asset information (condition and performance data) will have on asset management. The Council assumes that planned data, process and systems improvements will be realised. Improvements will likely affect the renewals budget and programme in the future.
Renewals	Council cannot be certain how long each individual asset will last. To address this uncertainty, the Council assigns an average expected life for types of assets to assist with renewal planning. Some assets will fail before reaching the end of their expected life useful life, and some will last longer. The Council has assumed that it will be able to manage this variance within its budges it set by prioritizing renewals annually.

Type of Uncertainty	Description
Three Waters Review and Water Sector Reform	The Government is not expected to make final decisions on the Three Waters Reform until about May 2021. As part of the review, the Government is considering changes to the current water service delivery models from the Council owned authorities into larger scale multi regional model providers. The nature of service delivery upon implementation of the reforms is uncertain. For the development of this LTP, we have assumed no change in service delivery for the Water Supply activity. Tasman District Council has signed a MoU and is participating in the explorations of a future service delivery options. The Council expects to engage on the out decision in later 2021 and any decision to participate is likely to be given effect in 2023/24. More information on the Governments Reform Strategy can be found Three Waters Reform Programme - dia.govt.nz

12 Asset Management Processes and Practices

Good quality data and asset management processes are the heart of effective planning. This section describes our approach to asset management, defines the appropriate practice levels, and provides an overview of our asset management systems and data that underpins the water supply activity.

12.1 Appropriate Practice Levels

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 activity management practices. There are five maturity levels in the IIMM: Aware, Basic, Core, Intermediate and Advanced. The IIMM sets out what the requirements are for each level against each area of the activity management system.

In February 2017, the Council reviewed its Activity Management Policy and adopted an updated version. The Policy sets out the Council's activity management objectives and appropriate levels of practice. For the water supply activity, the Council has determined that the appropriate level of practice is an 'intermediate level' with 'advanced level' of practice for demand forecasting, asset register data and asset condition.

12.2 Service Delivery

12.2.1 Activity and Asset Management Teams

Council has an organisational structure and capability that supports effective asset management planning. Multiple teams across the Council are responsible for the different aspects of activity and asset management. The focus of the teams ranges from a strategic focus at the Long Term Plan/Infrastructure Strategy level, which involves a cross-Council team, through to detail/operational focus at the Operational team level.

Council acknowledge that as part of the Three Waters Review, the Government is considering reform of the current water service delivery models from the Council owned authorities into larger scale multi regional model providers. The nature of service delivery upon implementation of the reforms is uncertain. For the development of this LTP, we have assumed no change in service delivery for the water supply activity.

Within the Engineering Services department, the asset management planning function is managed by the Activity Planning team. Operations are the responsibility of the Utilities and Transportation teams, while Projects and Contracts are managed by the Programme Delivery team.

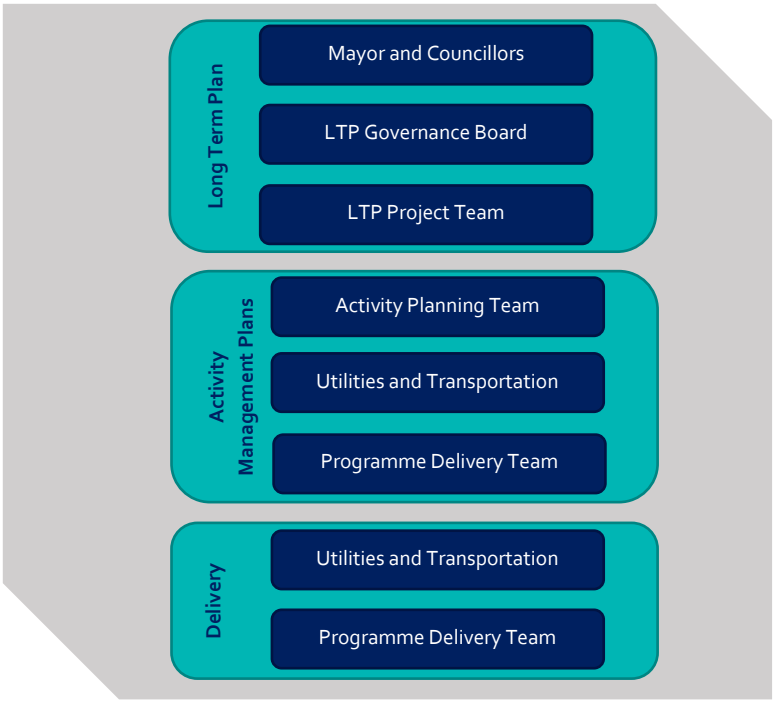


Figure 29: Teams Involved in Activity and Asset Management

The Activity Planning Team is responsible for the update of the activity management plans every three years, as well as implementation of the improvement plan. Each plan is assigned to the respective Activity Planning Advisor who is responsible for updating it. The Activity Planning Advisor works in with the activity's Asset Engineer to ensure that the current and future operating and maintenance aspects of the activities are adequately incorporated into the document. All activity management plans are reviewed by the Activity Planning Programme Leader who holds a National Diploma in Infrastructure Asset Management. The quality assurance process for the Engineering Services activity management plans is provided below.

- Preparation Activity Planning Advisor
- Check Utilities or Transportation Manager, and relevant Asset Engineer
- Review Activity Planning Programme Leader
- Approve Engineering Services Manager
- Adopt Full Council

12.2.2 Staff Training

Council maintains an annual budget for staff training that is managed by the Engineering Services Manager for the Engineering Services department. This budgets allows for continued development of staff to ensure that best practice is maintained and that the Council retains the skills needed to make improvements in asset management practices. This includes on-going technical and professional training as well as specific asset management training.

12.2.3 Professional Support

The Council's 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 water supply activity. 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 (now Stantec NZ), beginning on 1 July 2014 with an initial three-year term and two three-year extensions to be awarded at the Council's sole discretion. In 2017, the first of these discretionary three-year extensions was granted, with the proportion of the Council's professional services programmes reduced to 50%. In addition to this, a secondary professional service panel was also appointed through an open market tender process for a period of three years, to provide professional services that will not be supplied by Stantec.

12.2.4 Procurement Strategy

Council has a formal Procurement Strategy that it follows in order to engage contractors and consultants to assist the Engineering Services department. This strategy describes the procurement environment that exists within the Tasman District. It was developed following a three-year review of the strategy and was approved in November 2013. It principally focuses on Engineering Services and is consistent with whole-of-government procurement initiatives.

12.2.5 Service Delivery Reviews

In 2014, Section 17A was inserted into the Local Government Act, which requires the Council to review the cost effectiveness of its current arrangements for providing local infrastructure, services, and regulatory functions at regular intervals. Reviews must be undertaken when service levels are significantly changed, before current contracts expire, and in any case not more than six years after the last review. In addition to the regular reviews, the Act requires the Council to complete an initial review of all functions by August 2017.

Table 43~~Table 43~~ below summarises the review that have been completed to date and when the next review is required for this activity.

Table 43: Summary of review

Scope of Review	Summary of Review	Review Date	Next Review
Three Waters Operations and Maintenance Contract	An initial review found that current operations and maintenance contract arrangements were appropriate and that the new contract would be procured on a similar basis. A full review is to be conducted in collaboration with Nelson City Council at a later date.	2017	2022

In addition to the Section 17A reviews, the Engineering Services department reviewed its current capability and capacity against the requirements of the future programmes of work set out in its activity management plans. To enhance the department's ability to deliver the capital works programme the following actions have been taken:

- Undertaken a detailed review of the capital programme for the next five years to better understand project complexities and delivery requirements.
- Implemented Planview a new project management system to track and report project delivery progress.
- Increased the number of Project Managers from four to 5.5 full time equivalent staff resources.
- Introduced enhanced performance requirements for our lead technical consultant for delivery of technical advice and engineering design.
- Tendered for a new supporting professional service paned with enhanced performance requirements.

12.3 Asset Management Systems

12.3.1 Information Systems and Tools

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 optimised life-cycle management. These are detailed below in Figure 30~~Figure 30~~ below. There is a continual push to incorporate all asset data into the core asset management systems where possible; where not possible, attempts are made to integrate or link systems so that they can be easily accessed.

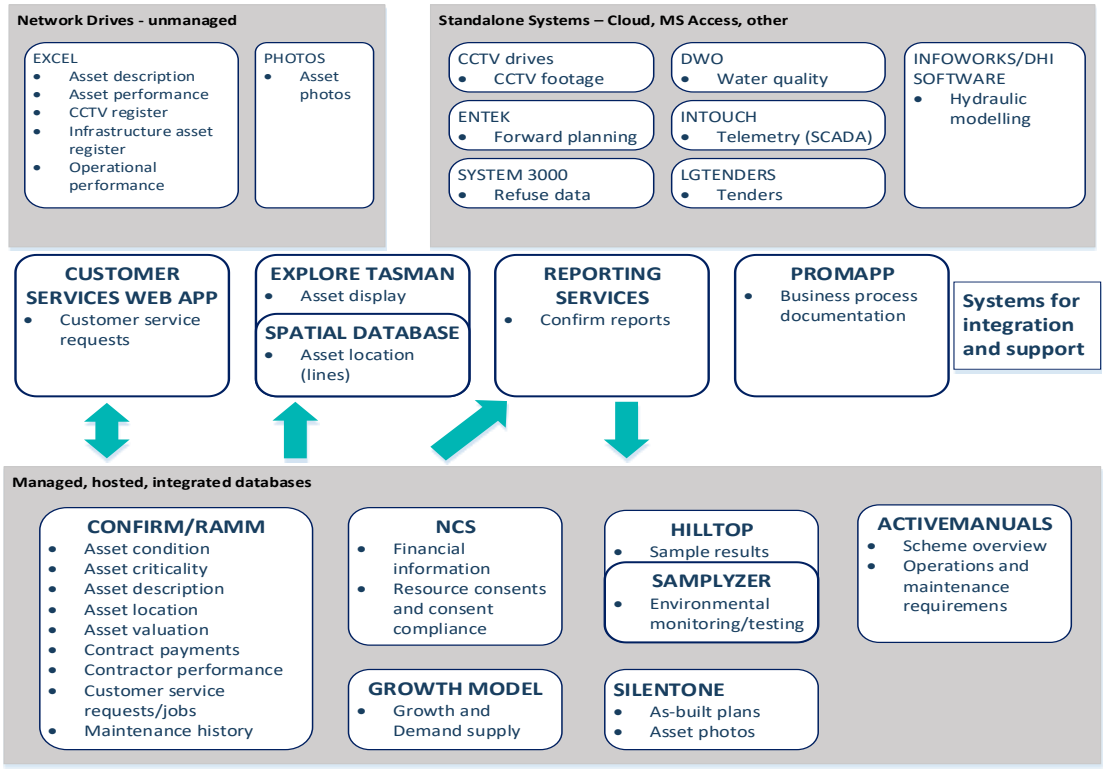


Figure 30: Systems Used for Asset Management

12.4 Asset Data

What is it? Why it important? It provides vital information so that assets can be managed efficiently and cost effectively. This information will form the backbone of evidenced-based investment decision-making. Good planning relies on good quality data meaning data consistency, accuracy, has metadata etc. Having good quality asset data means understanding the limitations of the data and integration between asset management and financial management processes - required for making evidenced-based investment decisions. Gathering data on the current condition and performance of an asset provides a basis for planning its renewal

12.4.1 Data Types

Table 44~~Table 44~~ summarises the various data types, data source and how they are managed within the Council. It also provides a grading on data accuracy and completeness where appropriate.

Table 44: Data Types and Information Systems

Data Type	Information System	Management strategy	Data Accuracy	Data Completeness
As-built plans	DORIS	As-built plans are uploaded to DORIS, allowing digital retrieval. Each plan is audited on receipt to ensure a consistent standard and quality.	2	2
Asset condition	Confirm	Assets are inspected by a consultant or staff and the inspection information in entered directly into Confirm using the Connect mobile application.	N/A	N/A
Asset criticality	Confirm	When a new asset is created, the activity planner and engineer will make an assessment on criticality. Criticality of asset can be modified by authorized users should circumstances change.	N/A	N/A
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; 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

Data Type	Information System	Management strategy	Data Accuracy	Data Completeness
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 Confirms 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
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
Environmental monitoring / testing	Hilltop / spreadsheet	Laboratory test results performed on monitoring and testing samples (from treatment plants and RRCs) are logged direct into Hilltop via an electronic upload from the laboratories. Due to historical difficulties in working with Hilltop data, it is duplicated in spreadsheets.	2	2

Data Type	Information System	Management strategy	Data Accuracy	Data Completeness
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	Spreadsheets GIS Mapping	Forward programmes for the Council's activities are compiled in excel, These are loaded onto GIS based maps for information and in order to identify clashes and opportunities.	N/A	N/A
Growth and Demand Supply	Growth Model	A series of linked processes that underpin the Council's long term planning, by predicting expected development areas, revenues and costs, and estimating income for the long term.	2	2
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

Data Type	Information System	Management strategy	Data Accuracy	Data Completeness
Maintenance history	Confirm	Contractor work is issued via Confirms Maintenance Management module. History of maintenance is stored against individual assets. Prior to 2007 it was logged at a scheme level.	2	2
Photos	Network drives/ DORIS	Electronic photos of assets are mainly stored on the Council's network drives. Coastal Structures and Streetlight photos have been uploaded to DORIS 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 the Council's process diagrams and documentation is stored. It was implemented in 2014 and there is a phased uptake by business units.	2	5
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 DORIS and NCS).	N/A	N/A
Tenders	GETS (New Zealand Government Electronic Tenders Service)	Almost all New Zealand councils use this system to advertise their tenders and to conduct the complete tendering process electronically.	N/A	N/A

Data Type	Information System	Management strategy	Data Accuracy	Data Completeness
Operations and Maintenance Information	ActiveManuals™	ActiveManuals™ is a repository of operations and maintenance manuals, manufacturer manuals, technical documents, drawings and photographs. The system enables shared access for the Council staff and its partners responsible for operating and maintaining the Council assets.	N/A	Ongoing

Table 45: Data Accuracy and Completeness Grades

Grade	Description	% Accurate
1	Accurate	100
2	Minor Inaccuracies	+/- 5
3	50 % Estimated	+/- 20
4	Significant Data Estimated	+/- 30
5	All Data Estimated	+/- 40

Grade	Description	% Complete
1	Complete	100
2	Minor Gaps	90 – 99
3	Major Gaps	60 – 90
4	Significant Gaps	20 – 60
5	Limited Data Available	0 – 20

12.4.2 How do we maintaining/updating asset data

Asset data is constantly being collected, updated and checked. Sources of new or updated information include:

- As builts drawing supplied when asset was constructed
- DURFs (repairs and maintenance records)
- Field Surveys (for modelling)
- Applications for new connections.

The Council staff capture new or update existing information into a digital format in GIS and the Confirm. The spatial information on the location of assets, zones and catchments area is kept in the GIS whilst the individual asset attributes are stored in the Confirm AMIS.

12.4.3 Improvement programme

We are constantly trying to improve the quality and reliability of the data we collect because its helps inform the nature and ting of significant investment. Recent efforts have been made to improve quality of source data.

12.4.4 As-built standards

- As-builts requirements are defined in the Nelson Tasman Land Development Manual. The Council are currently planning to develop an improved as built data standard as a stand along document.

12.4.5 Modelling

Quality asset data underpins the spatial representation of asset attributes and lifecycle information. This core data also provides the technical basis for the hydraulic modelling capability of the Council for the three waters activities.

12.4.6 Asset Data Quality

- Consistent quality data is vital to be make reliable evidence based decisions.

The Council holds extensive asset inventories for three waters related infrastructure assets. Three waters asset data is managed in Confirm Asset Management System. Asset data quality is a measurement of how well the data satisfies the business needs across the Council's infrastructure operations, including:

- Day to day service delivery and operations
- Reactive and planned maintenance activities
- Upgrade and renewal planning (including modelling)
- Financial forecasting, management and valuation; and
- Contract performance management

Council has not completed development of an asset data Quality Framework, Policy and QA processes and does not yet have any formal data quality analysis processes or reporting in place to assess the overall quality of asset data, however some data quality sampling has been undertaken for specific Confirm asset classes.

There are no industry (or otherwise) defined acceptable quality levels (AQL) for asset data and until we have developed a data quality framework, it is difficult to ascertain and provide a rating or score for specific data quality dimensions or overall data quality.

Three Waters Asset Data Quality Database sampling and some small physical asset surveys of three waters asset data has been undertaken to assess:

The completeness of asset data, in terms of:

- Whether all assets in the real physical world exist in the asset inventory
- Whether all the attribute data for a given asset /class/ type is populated (material, age, dimensions, condition etc.)
- The Accuracy of the data and how well does it reflect the real world state of the asset.

Summarised results indicate that overall, three waters asset data is of sufficient quality to support day to day operations, but there are gaps around network modelling, asset risk profile and timeliness of capture of new assets for valuation purposes. Improvement across the completeness, accuracy and timeliness data quality dimensions would provide benefits across all aspects of asset management.

12.4.7 Asset Data Standards

Across New Zealand data is collected in different ways and described differently. Sometimes the right data to make informed decisions is not captured. To help address this issues, Land Information New Zealand and the Ministry of Business Innovation and Employment commissioned the development of the National Metadata Standards for the three waters (potable, waste and storm) networks.

The original standards, published in 2017, cover as-built data which is information that can be collected when infrastructure is constructed (e.g. physical data such as pipe material). The standards also define common asset management schema for defining and reporting on aspects such as condition, performance, criticality, financial performance. How the standards can be applied to their organisations in a manner that provides the national consistency intended by the standards whilst addressing the particular characteristics and challenges of individual networks.

12.5 Critical Assets

Knowing what's most important is fundamental to managing risk well. By knowing this, the Council can invest where it is needed most, and it can tailor this investment at the right level. This will avoid over investing in assets that have little consequence of failure, and will ensure assets that have a high consequence of failure are well managed and maintained. For infrastructure, this is knowing Tasman's critical assets and lifelines. These typically include:

- Source water bores and intake structures
- Water treatment plants
- Trunk mains
- Main pump stations
- Key water reservoirs
- Detention dams

During 2016, the Council in partnership with Nelson City Council, the Regional Civil Defence Emergency Management Group and other utility providers, prepared the Nelson Tasman Lifelines Report. This report summarises all lifelines within Nelson and Tasman. Within the report there was a number of actions identified to improve the Region's infrastructure resilience.

Council also recently developed an asset criticality assessment framework for water supply, waste water and stormwater. The frameworks is defined by:

- A 'Criticality Score' from 1 (very low criticality asset) to 5 (very high criticality asset)
- A set of 'Criteria' against which each asset will be assessed and assigned a Criticality Score (see 1 above); and
- A set of straightforward, logical rules, measures and proxies under each criteria that can be assessed for each asset and enable a criticality Score to be assigned in a spatial (i.e. GIS) context.

For each asset, the criticality has been assessed against the following five criteria:

1. Number of people that would be effected if the asset failed.
2. Asset failure would prevent/impair use of a critical facility.
3. Ease of access/complexity of repair.
4. Asset failure has potential for environmental/health/cultural impacts.
5. Asset failure has potential to initiate cascading failures and/or asset has interdependencies with other assets.

Based on the above, asset criticality has been assessed for all assets across the district and mapped spatially in a GIS viewer. The vulnerability of critical assets to natural hazards has been identified through the overlay of natural hazards information such as coastal inundation and sea level rise, stormwater and river flooding, fault lines, tsunami risk and liquefiable soils.

The asset criticality framework will help to ensure that the appropriate level of effort is being made to manage, maintain and renew them, and will extend to ensuring that the Council has adequate asset data to enable robust decisions to be made regarding the management of those assets.

12.6 Quality Management

Council has not implemented a formal Quality Management system across the organisation. Quality is ensured by audits, checks and reviews that are managed on a case by case basis. Table 46~~Table 46~~ outlines the quality management approaches that support the Council's asset management processes and systems.

Table 46: Quality Management Approaches

Activity	Description
Process documentation	Council uses Promapp software to document and store process descriptions. Over time, staff are capturing organisational knowledge in an area accessible to all, 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.
Planning	The Long Term Plan and associated planning process are formalised across the Council. There is a LTP project team, LTP governance team, and AMP project team that undertakes internal reviews prior to the Council approval stages. Following completion of the AMPs, a peer review is done, and the outcomes used to update the AMP improvement plans.
Programme Delivery	This strictly follows a gateway system with inbuilt checks and balances at every stage. Projects cannot proceed until all criteria of a certain stage have been completely met and formally signed off.
Subdivision Works	Water Supply infrastructure is inspected throughout its installation and pressure tested before the Council sign-off and acceptance. Defects and poor workmanship will not be accepted. All work is bonded for a 2-year maintenance period.
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.

Activity	Description
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 often linked to financial penalties for the contractor.
Levels of Service	Key performance indicators are reported annually via the Council's Annual Report. This is audited by the Office of the Auditor General.
Reports to the Council	All reports that are presented to the Council by staff are reviewed and approved by the Senior Management Team prior to release.

13 Improvement Planning

The activity management plans have been developed as a tool to help the Council manage their assets, deliver on the agreed levels of service and identify the expenditure and funding requirements of the activity. Continuous improvements are necessary to ensure the Council continues to achieve the appropriate level of activity management practice along with delivering services in the most sustainable way while meeting the community's needs.

Establishment of a robust, continuous improvement process ensures that the Council is making the most effective use of resources to achieve an appropriate level of asset management practice.

13.1 Assessment of our Activity Management Practices

In 2017, the Council undertook an assessment of its current asset management practices for the water supply activity. This was a self-assessment with the targets developed in consultation with Waugh Infrastructure Management Ltd to ensure they were appropriate for the activity given:

- Criticality of the Assets
- Value of the Assets
- Value spent on maintaining the assets

The maturity levels were based on the IIMM definitions.

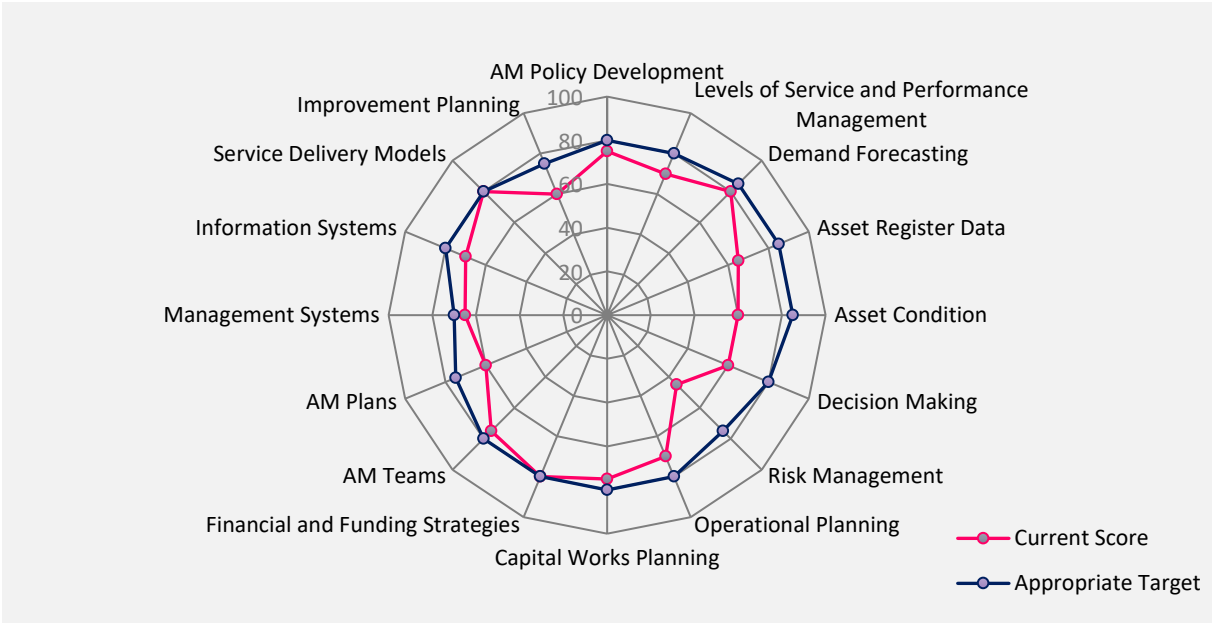


Figure 31: Water Supply Activity Maturity Levels

Figure 31 shows that there are some gaps between where the Council's current practice is and where it is desired to be. Focus areas for improvements are Asset Register Data, Asset Condition, Decision Making, and Operational Planning. The actions required to close these gaps have been included in the Improvement Plan.

13.2 Peer Reviews

13.2.1 Waugh Peer Review

In early 2018, the Council engaged Waugh Infrastructure Management Ltd to undertake a peer review on the consultation version of this activity management plan. The peer review considered all Engineering Services activities and included the following analysis:

- Overview analysis and consideration of AMP progress completed since the Waugh Infrastructure detailed 2011 AMP Compliance Report (in summary not detail)
- Review of AMPs against general industry practice as observed by Waugh Infrastructure in the past 12 months
- Review and commentary on the adequacy of the AMP structure against current industry practice and requirements, as set out in IIMM 2015, ISO 55000
- Analysis of AMP individual section strengths and emphasis, including analysis of overall AMP 'message' verses issues identified
- Overview analysis of AMP status against appropriate asset management practice levels adopted in the Council's Activity Management Policy (summary not detail)
- Analysis of the AMPs against Local Government Act 2002 amendment requirements, both 2012, and 2014 – identification of any issues or 'misses'
- Provide review comments of AMP strengths and weaknesses identified, with commentary on any suggested priority changes to be completed before LTP 2018.

It is important to note that the peer review only considered what was included in the consultation version of this activity management plan. There are aspects of the Council's asset management processes that are not discussed in this activity management plan and are therefore not incorporated into the scoring.

The overall findings of the Peer Review were that the Council's AMPs are well developed to support the Council's Long Term Plan. Some of the AMPs had sections that required completion, but overall missing elements noted were relatively minor.

The AMP template has been updated to incorporate recent Local Government Act changes. The AMP template developed and used by the Council has allowed clear, concise presentation of information in a logical manner.

The overall compliance status is shown below in Figure 32.

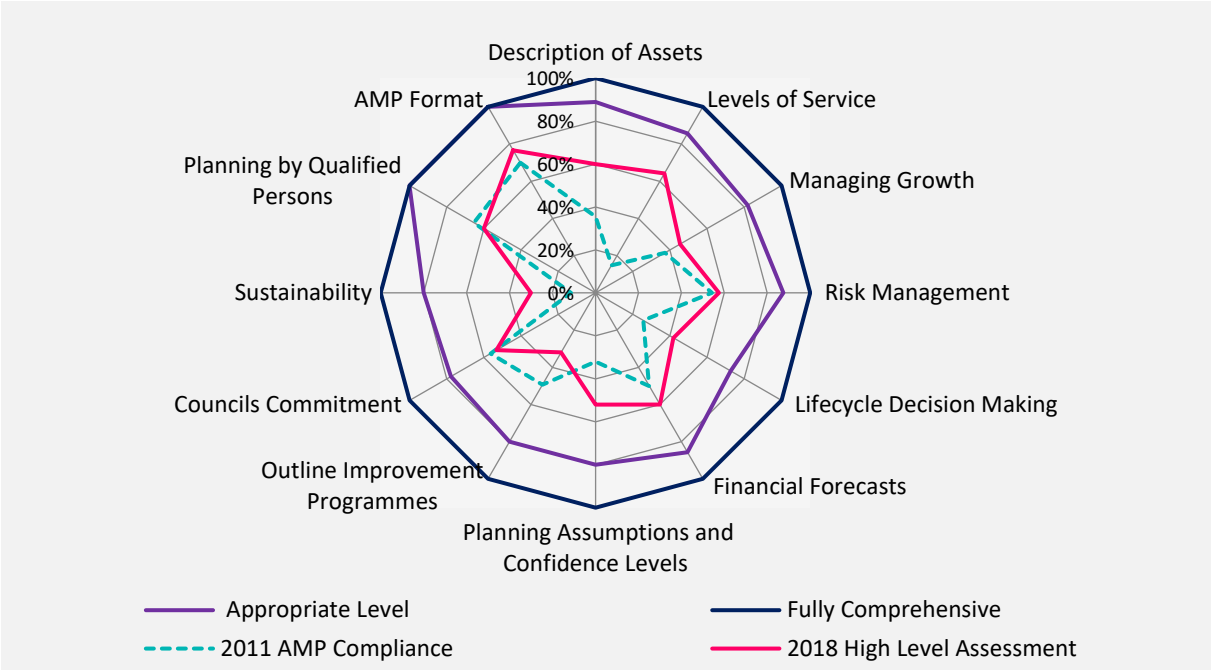


Figure 32: 2018 Peer Review Compliance Status Summary

Council staff have reviewed and prioritised the feedback received in the peer review report. Improvements that could be made immediately have been incorporated into the final version of this activity management plan. Other improvements have been ranked and included in the Improvement Plan.

There has been a minor decrease in scores for Outline Improvement Programmes, the Council's Commitment, and Planning by Qualified Persons. This is not due to a change in the Council's practice or performance, but due to a change in the activity management plan template. After receiving the peer review feedback, additional discussion has been included in Section 12 and Section 13 to address these issues.

13.2.2 Water New Zealand's National Performance Review

Council voluntarily participate in Water New Zealand's National Performance Review (NPR). It is an annual benchmarking exercise of the Three Waters (water supply, wastewater and stormwater) service delivery. NPR benchmarks are used to identify potential opportunities to improve service delivery and compare specific performance results against other District, City Council and Council-Controlled Organizations. The report provides decision makers and the public with a transparent picture of the Council's performance within the sector. The Council has incorporated guidance from the review in preparation of this AMP.

13.3 Improvement Plan

Establishment of a robust, continuous improvement process ensures that the Council is making the most effective use of resources to achieve the appropriate level of asset management practice. The continuous improvement process includes:

- Identification of improvements
- Prioritisation of improvements
- Establishment of an improvement programme

- Delivery of improvements
- On-going review and monitoring of the programme.

All improvements identified are included in a single improvement programme encompassing all Engineering Services activities and is managed by the Activity Planning Programme Leader. In this way opportunities to identify and deliver cross-activity or generic improvements can be managed more efficiently, and overall delivery of the improvement programme can be monitored easily.

13.3.1 Summary of Recent Improvements

Based on the peer review by Waugh Infrastructure Management Ltd and internal evaluations and reviews, the Council has made improvements to its activity management plan and asset management processes. For the Water Supply activity, areas of strengths include:

- Asset descriptions
- Robust demand forecasting
- Summary and discussion of key issues
- Discussion of levels of service and performance analysis
- Well documented assumptions, uncertainties and risks
- Well defined financial forecasting
- Identification of appropriate asset management maturity;
- Sustainability is well defined, progressed and audited (including achievement of milestones)
- Acknowledgement of NZ Metadata Standard and progress of improving As-built standards

Since the 2015 AMP review, staff have focused on the following improvements:

- Hydraulic modelling
- Updating water demand management plans
- Inspection of key reservoirs and buildings;
- Public information brochure
- Development of system operation plans;
- Development of network maps and schematics
- Improved levels of service and performance measures discussion

13.3.1.1 Hydraulic Modelling

Hydraulic models for high growth settlements (including Māpua, Motueka, Richmond, and Wakefield) have been updated and recalibrated. Current and future demand scenarios were modelled to determine the impact of development and identify network deficiencies. A master plan report has been prepared for each model and presents possible solutions to address these deficiencies. The outputs of the modelling and reports help inform and plan future capital expenditure.

13.3.1.2 Water Demand Management Plans

Several Water Demand Management Plans have been updated since 2015. These include Brightwater (2018), Māpua (2018), Motueka (2017), Richmond (2016, Richmond-Waimea (2017), Tapawera (2017) and Wakefield (2018). These plans provide an improvement framework to promote water efficiency that is consistent with best practice in New Zealand.

13.3.1.3 Structure Inspections

A District wide inspection of all water retaining structures was conducted in 2016 to assess compliance with the current building code. The assessment identified five concrete reservoirs that were likely to perform poorly during a seismic event. A further detailed seismic analysis outlined the appropriate strengthening requirements to make the reservoir code compliant.

13.3.1.4 Public Information Brochure

A 'Rural Water Supply' public information brochure has been developed to set out the Council's and private landowner responsibilities. The brochure describes and illustrates the typical components of a rural connection and explains the specific requirements for backflow protection and adequate storage. The brochure was sent out to all rural customers and is also available on the Council's website.

13.3.1.5 System Operation Plans

System operation plans (SOP) have been drafted for each water supply scheme and put on a cloud based application that is accessible to both staff and the maintenance contractor. The SOP's are to be reviewed updated and finalised over the next year.

13.3.1.6 Maps and Schematics

A series of network schematics have been produced to illustrate the main components of each water supply scheme. These schematics include the source, treatment, storage and reticulation infrastructure. These schematics are mainly for illustrative purposes as they are not spatially accurate. A series of GIS (spatially accurate) maps have also been produced to show the location and distribution extent of each scheme. These maps identify the difference between rural and urban connections. Network schematics are included in Appendix C and network maps are included in Appendix D.

13.3.1.7 Levels of Service/Performance Measure Discussions

The 2018 AMP has taken more customer-focused approach to levels of service and performance measures with the intention of making them more meaningful and relevant to the wider public. A more in depth analysis and discussion about performance has been presented. This provides more details about how the Council intends to meet targets and timeframes.

13.3.2 Summary of Planned Improvements

A list of the Water Supply activity specific improvement items is summarised in Table 47~~Table 47~~ below.

Table 47: Water Supply Improvement Items

Improvement Item	Further Information	Need for Improvement	Priority	Status	Expected Completion Date	Team Responsible	Cost/Resource Type
Improve asset condition data	New operations and maintenance contact set up includes more responsibility to contractor to collect and populate condition data	Some asset condition data is incomplete. Improved understanding of condition data will help the Council with the renewals programme.	High	Commences July 2018	Ongoing	Maintenance Contractor and Asset Information Team	Maintenance Contract and Staff time
Improve data, processes and systems	Council is planning to develop as built standards, and asset data and metadata standards	Improved data standards will enhance data reliability and accuracy.	Medium	Started	June 2019	Asset Information Team	Staff time
Refine and improve renewals forecasting	Council is trialing a statistical modelling process with a consultant (Morrison Low) to test the theory of asset design lives and service levels against available data.	Optimise and refine renewals forecasting to enhance long term planning	Medium	Started	June 2019	Activity Planning and Utilities Team Data Analyst	Consultants and staff time

Improvement Item	Further Information	Need for Improvement	Priority	Status	Expected Completion Date	Team Responsible	Cost/Resource Type
Improve planning around boil water notices	Better planning and preparedness around boil water notices will save time when notifying residents of the need to boil water. The Council staff are reviewing the existing planning mechanisms and intend to improve our processes and document these in an emergency operation file.	The Havelock North Inquiry identified the need for planning improvements around boil water notices.	High	Started	2018/19	Engineering Services – Utilities and Activity Planning Team	Staff time
Provide a snapshot of water supply network pipe size and material distribution	Extract data from asset management system to further illustrate the nature of the reticulated pipe network	Adding these details to AMP will further enhance reader understanding	Low	Not started	2021 AMP	Engineering Services – Data Analyst	Staff time

Improvement Item	Further Information	Need for Improvement	Priority	Status	Expected Completion Date	Team Responsible	Cost/Resource Type
Develop contingency plans and emergency response plans	An outcome of the Water Supply Bylaw changes may be a district wide water shortage plan. A water supply contamination exercise is planned for 2018, and the outcome may result in an updated water contamination emergency response plan.	Improved readiness for and response to an emergency	High	Not started	2021	Activity Planning and Utilities Team	Staff time

A list of general across activity improvement items is provided in Table 48~~Table 48~~ below

Table 48: General Activity Management Improvement Items

Improvement Item	Further Information	Need for Improvement	Priority	Status	Expected Completion Date	Team Responsible	Cost/Resource Type
Create Critical Asset Framework	Describe in AMP how it is used to prioritise asset information and condition assessments, adjust economic lives (renewal profiles) prioritise renewals and expenditure, operation and maintenance	Only the initial assessment has been undertaken, the framework was never re-tested.	High	In Progress	June 2020	Activity Planning	Staff Time

Improvement Item	Further Information	Need for Improvement	Priority	Status	Expected Completion Date	Team Responsible	Cost/Resource Type
Provide data confidence ratings for groups of assets within the valuation for each activity.		In the valuation reports data confidence is only assessed across the activity and not for the different types of asset groups. It is likely that data confidence varies considerably between buried assets and above ground assets and this is not reflected in the reports.	Medium	Not started	June 2020	Utilities- Data Analyst	Consultants and staff time Budget $33,500 in 2019/20
Consider how levels of service options are presented to the community	Consider how to better engage the community in agreeing appropriate levels of service through specific work streams (e.g. Risk, Resilience, Recovery).	Engagement is required to determine an appropriate level of service	Medium	Not started	2021	Activity Planning	Staff Time

Improvement Item	Further Information	Need for Improvement	Priority	Status	Expected Completion Date	Team Responsible	Cost/Resource Type
Capture and track maintenance data	Historical costs should be analysed to calculate forward budgets	Improve the consistency and confidence when planning operations and maintenance budgets	Medium	Not started	Ongoing	Activity Planning and Utilities Data Analyst	Staff Time

Appendix A: Detailed Operating Budgets

ID	Name	Description	Total Budget	Financial Year Budget ($)										Total Budget	
			2021-51	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	3030/31	2031-41	2041-51
82001	H&S assessments	Health & Safety site assessments	150,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	50,000	50,000
82003	Consultants	Professional service support	2,500,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	1,000,000	1,000,000
82004	O&M Contract Tender	Every 9 years the 3 Waters contract is re-tendered and professional services are required for contract preparation	450,000	0	0	0	0	100,000	50,000	0	0	0	0	150,000	150,000
82005	Corridor Access / Easements	Activities associated with Corridor Access Requests (CAR) and easement consents	300,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	100,000	100,000
82006	Takaka electricity	Electricity costs of Council's infrastructure	114,000	3,800	3,800	3,800	3,800	3,800	3,800	3,800	3,800	3,800	3,800	38,000	38,000
82007	Strategic Planning Consultants	Peer reviews and external support with preparing estimates for Asset Management Plans	650,000	5,000	30,000	30,000	5,000	30,000	30,000	5,000	30,000	30,000	5,000	225,000	225,000
82008	Water Safety Plans	Professional services to assist with preparing and reviewing Water Safety Plans	720,000	50,000	50,000	50,000	50,000	20,000	20,000	20,000	20,000	20,000	20,000	200,000	200,000
82011	Resource Consents	Application and renewal of Urban Water Club & Motueka schemes resource consents	600,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	200,000	200,000
82013	Reticulation Other O&M	Other non-contract miscellaneous works	1,500,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	500,000	500,000
82014	Treatment Plant Other O&M	Other non-contract miscellaneous works	450,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	150,000	150,000
82015	Pump Stations Other O&M	Other non-contract miscellaneous works	150,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	50,000	50,000
82016	Reservoirs Other O&M	Other non-contract miscellaneous works	150,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	50,000	50,000
82017	Bores Other O&M	Other non-contract miscellaneous works	150,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	50,000	50,000
82019	Reticulation Contract Routine	Routine Works under 3 Waters Contract	3,450,000	115,000	115,000	115,000	115,000	115,000	115,000	115,000	115,000	115,000	115,000	1,150,000	1,150,000
82020	Treatment Plant Contract Routine	Routine Works under 3 Waters Contract	16,800,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	560,000	5,600,000	5,600,000
82021	Pump Stations Contract Routine	Routine Works under 3 Waters Contract	1,800,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	600,000	600,000
82022	Reservoirs Contract Routine	Routine Works under 3 Waters Contract	2,700,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	900,000	900,000
82023	Bores Contract Routine	Routine Works under 3 Waters Contract	1,650,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	550,000	550,000
82024	Hamama Rates	Rates and water usage for Council owned properties connected to the Hamama supply	155,440	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	72,720	72,720
82025	Wai-iti Dam Rates	Rates and water usage for Council owned properties in the Wai-iti supply	360,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	120,000	120,000
82029	Reticulation Contract Reactive	Reactive works under 3 Waters Contract	33,000,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	11,000,000	11,000,000
82030	Treatment Plant Contract Reactive	Reactive works under 3 Waters Contract	1,500,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	500,000	500,000
82031	Pump Stations Contract Reactive	Reactive works under 3 Waters Contract	1,500,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	500,000	500,000
82032	Reservoirs Contract Reactive	Reactive works under 3 Waters Contract	2,100,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	700,000	700,000
82033	Bores Contract Reactive	Reactive works under 3 Waters Contract	1,050,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	350,000	350,000
82034	Club Schemes Electricity	Electricity costs of Council's infrastructure that covers Urban Water Club schemes	12,900,000	430,000	430,000	430,000	430,000	430,000	430,000	430,000	430,000	430,000	430,000	4,300,000	4,300,000
82035	Water Asset Insurance	Local Authority Protection Programme Disaster Fund	6,883,970	258,848	276,967	296,355	317,100	317,100	317,100	317,100	317,100	317,100	317,100	1,982,100	1,850,000
82036	Rates and Water	Rates and water usage for Council owned properties in Urban Water Club schemes	6,750,000	225,000	225,000	225,000	225,000	225,000	225,000	225,000	225,000	225,000	225,000	2,250,000	2,250,000
82037	General Operations	Additional operation and maintenance plans, professional membership fees, auditing, annual survey and NCC water purchase	600,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	200,000	200,000
82038	SCADA/Telemetry	Maintenance of telemetry and SCADA components	1,200,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	400,000	400,000
82039	Condition Assessment	Inspection of assets to determine condition	569,110	56,911	56,911	56,911	56,911	56,911	56,911	56,911	56,911	56,911	56,911	0	0

ID	Name	Description	Total Budget	Financial Year Budget ($)										Total Budget	
			2021-51	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	3030/31	2031-41	2041-51
82041	Backflow Prevention Testing	Testing of key sites to prevent potential backflow in to water supply	1,050,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	350,000	350,000
82042	Demand, Flow, Leakage Modelling	Leak detection, day/night flow monitoring and network modelling	4,800,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	1,600,000	1,600,000
82043	Meter Reading	Customer meter reading - Urban Water Club	1,950,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	650,000	650,000
82044	Fire Hydrant audit and flow tests	Flow and pressure testing of hydrants	7,000	7,000	0	0	0	0	0	0	0	0	0	0	0
82045	Conservation	Activities associated with water conservation initiatives	300,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	100,000	100,000
82046	Consent Monitoring	Resource Consent Monitoring for Urban Water Club & Motueka schemes	450,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	150,000	150,000
82047	88 Valley Contract Routine	Routine Works under 3 Waters Contract	1,500,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	500,000	500,000
82049	88 Valley Contract Reactive	Reactive works under 3 Waters Contract	2,250,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	750,000	750,000
82050	88 Valley Other O&M	Other non-contract miscellaneous works	30,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	10,000	10,000
82051	Dovedale Contract Routine	Routine Works under 3 Waters Contract	4,200,000	140,000	140,000	140,000	140,000	140,000	140,000	140,000	140,000	140,000	140,000	1,400,000	1,400,000
82053	Dovedale Contract Reactive	Reactive works under 3 Waters Contract	7,800,000	260,000	260,000	260,000	260,000	260,000	260,000	260,000	260,000	260,000	260,000	2,600,000	2,600,000
82054	Dovedale Other O&M	Other non-contract miscellaneous works	60,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	20,000	20,000
82055	Redwoods Contract Routine	Routine Works under 3 Waters Contract	3,300,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	110,000	1,100,000	1,100,000
82056	Climate Change Action Plan (Operational)	Energy Savings Initiatives	750,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	250,000	250,000
82057	Redwoods Contract Reactive	Reactive works under 3 Waters Contract	4,800,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	1,600,000	1,600,000
82059	Reticulation Other O&M	Other non-contract miscellaneous works	5,065	507	507	507	507	507	507	507	507	507	507	0	0
82060	Treatment Plant Other O&M	Other non-contract miscellaneous works	5,055	506	506	506	506	506	506	506	506	506	506	0	0
82061	Pump Stations Other O&M	Other non-contract miscellaneous works	5,055	506	506	506	506	506	506	506	506	506	506	0	0
82062	Reservoirs Other O&M	Other non-contract miscellaneous works	5,055	506	506	506	506	506	506	506	506	506	506	0	0
82063	Bores Other O&M	Other non-contract miscellaneous works	5,055	506	506	506	506	506	506	506	506	506	506	0	0
82065	Reticulation Contract Routine	Routine Works under 3 Waters Contract	300,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	100,000	100,000
82066	Treatment Plant Contract Routine	Routine Works under 3 Waters Contract	1,200,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	400,000	400,000
82075	Reticulation Contract Reactive	Reactive works under 3 Waters Contract	1,500,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	500,000	500,000
82076	Treatment Plant Contract Reactive	Reactive works under 3 Waters Contract	900,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	300,000	300,000
82080	Motueka Electricity	Electricity costs of Council's infrastructure in the Motueka scheme	600,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	200,000	200,000
82082	Rates and Water	Rates and water usage for Council owned properties in Motueka scheme	60,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	20,000	20,000
82083	Redwoods Other O&M	Other non-contract miscellaneous works	60,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	20,000	20,000
82084	Wai-iti Dam Contract Routine	Routine Works under 3 Waters Contract	150,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	50,000	50,000
82086	Wai-iti Dam Contract Reactive	Reactive works under 3 Waters Contract	270,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	90,000	90,000
82087	Wai-iti Dam Other O&M	Other non-contract miscellaneous works	30,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	10,000	10,000
82088	Takaka Contract Routine	Routine Works under 3 Waters Contract	300,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	100,000	100,000
82089	Meter Reading	Customer meter reading - Motueka	150,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	50,000	50,000
82091	Takaka Contract Reactive	Reactive works under 3 Waters Contract	300,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	100,000	100,000
82092	Takaka Other O&M	Other non-contract miscellaneous works	30,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	10,000	10,000
82096	Dovedale Electricity	Electricity costs of council infrastructure in the Dovedale water scheme	960,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000	320,000	320,000
82097	88 Valley Electricity	Electricity costs of council infrastructure in the 88 Valley water scheme	93,000	3,100	3,100	3,100	3,100	3,100	3,100	3,100	3,100	3,100	3,100	31,000	31,000

ID	Name	Description	Total Budget	Financial Year Budget ($)										Total Budget	
			2021-51	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	3030/31	2031-41	2041-51
82098	Redwoods Electricity	Electricity costs of council infrastructure on the Redwood Valley supply	1,260,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	420,000	420,000
82102	Hamama Maintenance	All Maintenance work for Hamama scheme	450,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	150,000	150,000
82103	Legal Costs	Procurement of legal advice	1,500,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	500,000	500,000
82104	Motueka Fire Wells - Decommissioning	Decommission existing fire wells in Motueka Decommission existing fire wells in Motueka	148,000	0	0	50,000	50,000	0	0	0	0	0	0	0	48,000
82105	Dovedale Rates	Rates and water usage for Council owned properties in the Dovedale scheme	24,000	800	800	800	800	800	800	800	800	800	800	8,000	8,000
82106	Redwood Rates	Rates and water usage for Council owned properties connected to the Redwood Valley supply	45,000	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	15,000	15,000
82109	Waimea Dam Operations	Operating Costs Waimea Dam - consolidation of all operating costs.	35,093,478	460,965	1,569,162	1,552,970	1,555,678	1,558,320	1,560,898	1,563,511	1,566,152	1,568,725	1,571,139	10,191,459	10,374,499
-	Feasibility Studies	Feasibility Studies	402,650	26,450	0	0	0	0	0	0	0	0	0	347,200	29,000
-	Wai-iti Dam consultants	Professional service support	900,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	300,000	300,000

Appendix B: Detailed Capital and Investment Budgets

ID	Name	Description	Project Driver %			Total Budget	Financial Year Budget ($)										Total Budget	
			Growth	Inc LOS	Renewals	2021-51	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	3030/31	2031-41	2041-51
86001	88 Valley Reticulation Renewal Programme	Renewal of reticulation within the 88 Valley scheme	0	0	100	500,000	50,000	0	50,000	0	50,000	0	50,000	0	0	50,000	150,000	100,000
86005	88 Valley Reticulation Upgrades	Upgrade Treeton Pump Station, new main from Treeton to Totara, extra storage capacity	0	100	0	3,230,000	250,000	300,000	1,270,000	1,410,000	0	0	0	0	0	0	0	0
86006	Brightwater Reticulation - Factory Road Main Renewal	Replacement of AC main to meet firefighting flows	0	41	59	520,000	0	0	0	0	0	65,000	455,000	0	0	0	0	0
86008	Brightwater Reticulation - SH6 Main Renewal	Replacement of AC main from Ranzau Road to 3 Brothers Corner	24	24	52	2,020,000	0	50,000	120,000	1,850,000	0	0	0	0	0	0	0	0
86013	Dovedale Retic - Break Pressure Tank & Reservoir Renewal	Replacing break pressure tank and reservoirs	0	0	100	300,000	20,000	0	20,000	0	20,000	0	20,000	0	20,000	0	100,000	100,000
86016	Dovedale Reticulation Renewal Programme	Renewal of reticulation within the Dovedale scheme	0	0	100	2,950,000	100,000	100,000	100,000	50,000	50,000	50,000	50,000	150,000	150,000	150,000	1,000,000	1,000,000
86018	Dovedale - New Water Source and WTP	Upgrades to lower intake, treatment barriers, and new pumps backwash and pipes	0	100	0	1,641,795	1,641,795	0	0	0	0	0	0	0	0	0	0	0
86019	New water infratructure to service Jefferies Road Growth Are	New source, treatment, storage and reticulation	90	10	0	6,350,000	0	0	0	0	0	0	0	0	0	0	0	6,350,000
86021	Hamama Reticulation - Reservoir Renewal	Renewal of strainer and settlement tank	0	0	100	30,000	0	0	0	0	0	0	0	0	30,000	0	0	0
86022	Hamama Treatment - Install Household Treatment Units	Install household treatment units in each house on scheme	0	100	0	205,000	0	0	0	0	0	0	0	0	205,000	0	0	0
86023	Hamama Reticulation - Pipe Renewals	Pipeline renewals programme	0	0	100	615,000	0	0	0	0	0	0	0	0	215,000	400,000	0	0
86024	Hamama Reticulation - Valve Renewals	Valve renewals	0	0	100	15,000	0	0	0	0	0	0	0	0	15,000	0	0	0
86027	Mapua Reticulation - Channel Crossing	Install additional water main capacity under Mapua estuary to Rabbit Island	20	80	0	1,010,000	0	0	0	0	0	0	0	0	0	0	1,010,000	0
86030	WTP & Reservoir Internal Pipe Upgrades	Replace corroded fittings and pipes inside contact tanks and reservoirs with non-corroding equipment	0	0	100	195,000	0	0	0	85,000	110,000	0	0	0	0	0	0	0
86031	Pohara WTP & PS - Treatment Upgrades	New membrane treatment plant added on to existing site to meet DWSNZ	0	100	0	1,160,927	1,160,927	0	0	0	0	0	0	0	0	0	0	0
86032	Richmond Reticulation - Waimea WTP Upgrade	Replace tank, strengthen existing building and upgrade to DWSNZ for Mapua	28	26	46	550,000	550,000	0	0	0	0	0	0	0	0	0	0	0
86033	Murchison WTP & PS - Treatment Renewals	Treatment upgrade of parts including electrical, UV, filters, UVT meter & valves to improve DWSNZ and resilience	0	0	100	1,175,000	0	0	0	85,000	1,090,000	0	0	0	0	0	0	0
86035	New water infratructure to service Lower Moutere Growth Area	New source, treatment, storage and reticulation	97	3	0	19,650,000	0	0	0	0	0	0	0	0	0	0	19,650,000	0
86036	Wakefield Reticulation Upgrades	Treeton Place pump station and reservoir upgrades with addition of telemetry	0	100	0	74,649	0	0	0	74,649	0	0	0	0	0	0	0	0
86037	Redwood Valley WTP & PS - Treatment Upgrades Golden Hills	Replace all old components at site and building to meet DWSNZ	0	55	45	955,000	0	95,000	860,000	0	0	0	0	0	0	0	0	0
86038	Redwood Reticulation Renewal Programme	Renewal of reticulation within the Redwoods scheme	0	0	100	1,250,000	50,000	50,000	50,000	50,000	50,000	50,000	100,000	100,000	100,000	100,000	400,000	150,000
86039	Redwood Valley WTP & PS - O'Connor's Creek Treatment Upgrade	Upgrade to meet DWSNZ	0	68	32	800,000	0	80,000	720,000	0	0	0	0	0	0	0	0	0

ID	Name	Description	Project Driver %			Total Budget	Financial Year Budget ($)										Total Budget	
			Growth	Inc LOS	Renewals	2021-51	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	3030/31	2031-41	2041-51
86041	Wai-iti Dam Water Augmentation Pipeline	New intake gallery and gravity main to supplement supply capacity	0	100	0	965,000	0	0	0	0	0	165,000	800,000	0	0	0	0	0
86047	Richmond WTP - Capacity Upgrade	Increase capacity of current WTP including new plant pipe work, pressure cylinder & controls.	100	0	0	53,000	0	20,000	33,000	0	0	0	0	0	0	0	0	0
86048	Richmond Source - Relocation of Bores (Richmond West)	Relocation of bores 400m inland to improve security and resilience	0	100	0	2,645,000	50,000	350,000	0	0	0	0	0	0	0	550,000	1,695,000	0
86049	Backflow Prevention Programme	Installation of backflow preventions at key sites	0	100	0	275,000	100,000	100,000	25,000	25,000	25,000	0	0	0	0	0	0	0
86050	Richmond Reticulation - Edward Street Pipe Renewal	Replacement of cast iron pipes on Edward, Roeske, Wilkes, George, William, Gilbert	0	0	100	4,875,000	0	0	0	0	0	375,000	1,500,000	1,500,000	1,500,000	0	0	0
86051	Richmond Reticulation - Lower Queen Street Trunkmain Upgrade	Upgrade trunk main capacity from AC 350mm to 400mm PVC or PE.	28	39	33	2,550,000	500,000	0	0	150,000	150,000	1,400,000	350,000	0	0	0	0	0
86053	Richmond Reticulation - Queen St / Salisbury Rd Intersection	Renewal of pipes and an opportunity to move assets out of the intersection	0	0	100	550,000	0	0	0	0	0	0	0	50,000	500,000	0	0	0
86056	Richmond South Reticulation - Low Level Reservoir Stage 2	Staged development of a third concrete tank to provide storage for Richmond West development and low level areas of Richmond South	69	31	0	2,200,000	0	0	0	0	0	0	0	0	0	0	0	2,200,000
86057	Richmond Reticulation - Salisbury Road Pipeline Upgrade	Upgrade existing 150mm pipeline to 200mm pipe	0	0	100	2,210,000	160,000	1,500,000	550,000	0	0	0	0	0	0	0	0	0
86059	Tapawera WTP Upgrades	Install two new exterior bores, construct new building with addition of filtration, UV & electrical upgrades. Reuse of existing pH & Chlorination equipment to improve DWSNZ and resilience	0	74	26	1,900,000	0	0	0	450,000	1,450,000	0	0	0	0	0	0	0
86063	Motueka Reticulation - new water reticulation in unservices	New reticulation to supply water to unserviced areas	0	100	0	17,000,000	0	0	0	0	0	0	0	0	0	0	1,600,000	15,400,000
86064	Motueka WTP (Parker Street)	New water treatment plant at Parker Street to meet DWSNZ	30	70	0	1,815,228	1,815,228	0	0	0	0	0	0	0	0	0	0	0
86067	Motueka Reticulation Renewal Programme	Renewal of reticulation within the Motueka scheme	0	0	100	1,045,000	445,000	0	0	0	0	0	0	0	0	0	60,000	540,000
86069	Motueka Reticulation - Thorp Street Water Main Renewal	Direct replacement for 200mm main with uPVC	0	0	100	796,822	796,822	0	0	0	0	0	0	0	0	0	0	0
86071	Occupational Health & Safety	Initiatives to improve health and safety (anchor points, railings and chlorine storage)	0	100	0	670,000	50,000	50,000	30,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	200,000	200,000
86072	Richmond South Reticulation - Low Level Water Main	New 350mm trunk main from Richmond WTP to Low Level Reservoir	88	12	0	1,800,000	1,800,000	0	0	0	0	0	0	0	0	0	0	0
86073	Urban Water Club - Telemetry Upgrade	Scada/Telemetry software upgrades every 5 years	0	100	0	250,000	25,000	0	0	25,000	0	0	25,000	0	0	25,000	75,000	75,000
86074	Motueka Telemetry Upgrade	Scada/telemetry software upgrades every 5 years	0	100	0	30,000	0	5,000	0	0	0	0	5,000	0	0	0	10,000	10,000
86075	88 Valley Telemetry Upgrade	Scada/telemetry software upgrades every 5 years	0	100	0	12,600	0	2,100	0	0	0	0	2,100	0	0	0	4,200	4,200
86076	Dovedale Telemetry Upgrade	Scada/telemetry software upgrades every 5 years	0	100	0	12,600	0	2,100	0	0	0	0	2,100	0	0	0	4,200	4,200
86077	Redwood Telemetry Upgrade	Scada/Telemetry software upgrades every 5 years	0	100	0	12,600	0	2,100	0	0	0	0	2,100	0	0	0	4,200	4,200
86078	Urban Water Club - Telemetry Renewal	Renewal of telemetry within the Urban Club schemes	0	0	100	1,500,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	500,000	500,000

ID	Name	Description	Project Driver %			Total Budget	Financial Year Budget ($)										Total Budget	
			Growth	Inc LOS	Renewals	2021-51	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	3030/31	2031-41	2041-51
86079	Motueka Telemetry Renewal	Renewal of telemetry within the Motueka scheme	0	0	100	150,000	0	25,000	0	0	0	0	25,000	0	0	0	50,000	50,000
86080	88 Valley Telemetry Renewal	Renewal of telemetry within the 88 Valley scheme	0	0	100	100,000	0	0	0	0	0	0	50,000	0	0	0	0	50,000
86081	Dovedale Telemetry Renewal	Renewal of telemetry within the Dovedale scheme	0	0	100	500,000	50,000	0	0	50,000	0	0	50,000	0	0	50,000	150,000	150,000
86082	Redwood Telemetry Renewal	Renewal of telemetry within the Redwoods scheme	0	0	100	150,000	25,000	0	0	0	25,000	0	0	0	0	25,000	50,000	25,000
86086	Upper Takaka Reticulation - Replace Existing Pipework	Install simplified pipework arrangement which no longer goes under houses	0	0	100	365,000	0	0	0	0	0	0	0	0	365,000	0	0	0
86090	Urban Water Club Scheme Monitoring Equipment	Routine replacement of monitoring equipment	0	0	100	900,000	50,000	20,000	20,000	50,000	20,000	20,000	50,000	20,000	20,000	50,000	290,000	290,000
86091	Motueka Monitoring Equipment	Renewal of monitoring equipment in Motueka Scheme	0	0	100	180,000	0	0	0	0	30,000	0	0	0	0	30,000	60,000	60,000
86093	Dovedale Monitoring Equipment	Two deplox units need replacing and turbidity unit old and no longer supported by 2022	0	0	100	50,000	50,000	0	0	0	0	0	0	0	0	0	0	0
86094	Urban Water Club Reticulation - Valve Renewal	Renewal of valves within the Urban Water Club schemes	0	0	100	5,250,000	175,000	175,000	175,000	175,000	175,000	175,000	175,000	175,000	175,000	175,000	1,750,000	1,750,000
86097	Urban Water Club Reticulation - Meter Renewal	Renewal of water meters within the Urban Water Club schemes	0	0	100	1,655,000	400,000	0	0	0	0	35,000	0	20,000	0	725,000	270,000	205,000
86099	Motueka Retic - Flowmeters, Hydrants, Pumps, VSD & Valves	Renewal of flowmeters, hydrants, pumps, variable speed drives, & valve in the Motueka Scheme	0	0	100	66,000	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	2,200	22,000	22,000
86100	88 Valley Flowmeters, Hydrants, Pumps, VSD & Valves Renewals	Renewal of Flowmeters, Hydrants, Pumps, VSD & Valves in 88 Valley Scheme	0	0	100	151,998	1,600	1,600	12,000	1,600	1,600	12,000	1,600	1,600	12,000	1,600	47,200	57,600
86101	Dovedale Retic - Flowmeters, Hydrants, Pumps, VSD & Valves	Renewal of meters, hydrants, pumps, VSD and valves within the Dovedale scheme	0	0	100	523,000	32,000	32,000	17,000	17,000	17,000	17,000	17,000	17,000	17,000	17,000	170,000	153,000
86102	Kaiteriteri Reticulation - Reservoir Improvements	Existing reservoir roof and liners require upgrading	0	100	0	202,000	0	202,000	0	0	0	0	0	0	0	0	0	0
86103	Redwood Retic - Flowmeters, Hydrants, Pumps & Valves	Renewal of meters, hydrants, pumps, VSD and valves within the Redwoods scheme	0	0	100	418,000	27,000	27,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	130,000	130,000
86107	Brightwater Reticulation-Teapot Valley Pump Station Upgrades	New telemetry and tanks	0	0	100	70,000	0	0	0	0	0	70,000	0	0	0	0	0	0
86108	Pohara Reticulation - Centralise Reservoirs	Three new tanks at Haile Lane and re use 3 Falconer Rd tanks at Haile Lane	0	100	0	150,045	150,045	0	0	0	0	0	0	0	0	0	0	0
86109	Redwood Retic - Break Pressure Tank & Reservoir Renewal	Remove old concrete tank and install 30,000L plastic tank	0	0	100	20,000	0	20,000	0	0	0	0	0	0	0	0	0	0
86111	Urban Water Club Reticulation - Renewal	Renewal of reticulation within the Urban Water Club schemes	0	0	100	21,500,000	250,000	250,000	250,000	250,000	250,000	700,000	700,000	700,000	700,000	700,000	12,250,000	4,500,000
86112	Richmond Reticulation - Gladstone Rd Upgrade	New 250mm main from Queen St to Three Brothers Roundabout	34	47	19	3,250,000	0	0	0	75,000	175,000	1,500,000	1,500,000	0	0	0	0	0
86113	Richmond South Reticulation - High Level Water Main	New rising main and pump station from Low Level Reservoir to High Level Reservoir	90	10	0	2,410,000	0	0	0	0	0	0	0	0	0	0	2,410,000	0
86114	Marahau Reticulation - New Town Supply	Allowance for possible future water supply in Marahau	0	100	0	12,500,000	0	0	0	0	0	0	0	0	0	0	250,000	12,250,000
86115	Richmond South Reticulation - Heights Water Main	New rising main and pump station from High Level Reservoir to Heights Reservoir	97	3	0	250,000	0	0	0	0	0	0	0	0	0	0	0	250,000

ID	Name	Description	Project Driver %			Total Budget	Financial Year Budget ($)										Total Budget	
			Growth	Inc LOS	Renewals	2021-51	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	3030/31	2031-41	2041-51
86116	Richmond South Reticulation - High Level Reservoir Link	Upsize of 50mm to 150mm along Hill Street between Hart Rd and White Rd	27	73	0	765,000	0	0	0	0	0	0	0	0	0	0	765,000	0
86118	Richmond South Reticulation - Bateup Rd/White Rd Connection	250mm pipe between connect Bateup Road and White Road	96	4	0	695,000	0	0	0	0	0	0	0	115,000	580,000	0	0	0
86119	Richmond South Reticulation - Heights Reservoir	New reservoir and connecting pipe to High Level Reservoir	97	3	0	1,200,000	0	0	0	0	0	0	0	0	0	0	0	1,200,000
86120	Richmond South Reticulation - High Level Reservoir	New storage reservoir for high level zone and decommission (& re-use) Arizona Tank	90	10	0	2,450,000	0	0	0	0	0	0	0	0	0	0	2,450,000	0
86121	Richmond South Reticulation - Low Level Reservoir Stage 1	Development of two concrete tanks to provide storage for Richmond West development and low level areas of Richmond South	88	12	0	5,700,000	0	0	0	0	0	0	400,000	2,600,000	2,700,000	0	0	0
86123	Waimea Water Strategy - Brightwater & Wakefield Water Retic,	New and upgraded infrastructure including source, treamtent and reticulation to improve level of service and growth capacity to Wakefield and Brightwater	40	60	0	28,545,000	0	0	655,000	1,965,000	4,725,000	6,400,000	5,050,000	250,000	4,500,000	5,000,000	0	0
86124	88 Valley WTP & Pump Station Renewal	Relocate chlorine out of building, new generator to run pump in power outages, replace pipework and install chlorine scales.	0	100	0	26,660	0	26,660	0	0	0	0	0	0	0	0	0	0
86132	Motueka Retic - Decommission Fearons Bush Pump Station	Decommission pump station following a suitable operational period at Parker St WTP	30	70	0	96,831	0	0	0	96,831	0	0	0	0	0	0	0	0
86133	New reservoir and high lift pumps at Motueka Recreation Cent	Additional storage to provide fire-fighting supply and resilience	0	100	0	1,000,000	100,000	900,000	0	0	0	0	0	0	0	0	0	0
86134	Motueka Retic - Connectivity & Resilience Improvements	Internal connections within existing network to maintain resilience	0	100	0	1,800,000	0	0	0	0	0	0	250,000	750,000	800,000	0	0	0
86135	Motueka Reticulation - Motueka West Water Main Stage 1	Installation of 250mm pipe along Grey St to service Motueka West	90	10	0	930,000	930,000	0	0	0	0	0	0	0	0	0	0	0
86136	Motueka Reticulation - Motueka West Water Main Stage 2	Reticulation from Grey Street to King Edward Street	90	10	0	925,000	0	0	0	0	0	0	0	0	50,000	875,000	0	0
86137	Mapua Reticulation - Pomona Road Reservoir Upgrade	Increase storage capacity: replace existing wooden reservoir with concrete and upsize to 1500m³	47	53	0	2,024,472	2,024,472	0	0	0	0	0	0	0	0	0	0	0
86141	Richmond Reticulation - Richmond West Loop Main	New 200mm loop main to service Richmond West North of Borck Creek	84	16	0	1,210,000	0	0	0	0	0	0	0	0	110,000	1,100,000	0	0
86142	Redwood Reticulation - Pipe Re-location	Relocation due to farming/forestry operations or development	0	0	100	150,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	50,000	50,000
86143	88 Valley Pipe Re-location	Relocation due to farming/forestry operations or development	0	0	100	150,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	50,000	50,000
86144	Dovedale Reticulation - Pipe Re-location	Relocation due to farming/forestry operations or development	0	0	100	150,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	50,000	50,000
86146	Centralised Redwood Valley WTP at River Road	New centralised treatment plant	0	100	0	5,110,000	0	0	0	0	0	0	0	0	0	0	5,110,000	0
86147	Climate Change Action Plan (Capital)	Energy Savings Initiatives	0	100	0	750,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	250,000	250,000
86148	Growth Allowance	Growth Allowance	100	0	0	250,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	0	0
89001	Waimea Dam Share Purchase Annual	Council Share of Waimea Dam Capital Costs	21	79	0	-15,500,000	-15,500,000	0	0	0	0	0	0	0	0	0	0	0
89001	Waimea Dam Share Purchase Annual	Council's Share of Waimea Dam Capital Costs	10	90	0	53,500,000	32,333,333	21,166,667	0	0	0	0	0	0	0	0	0	0

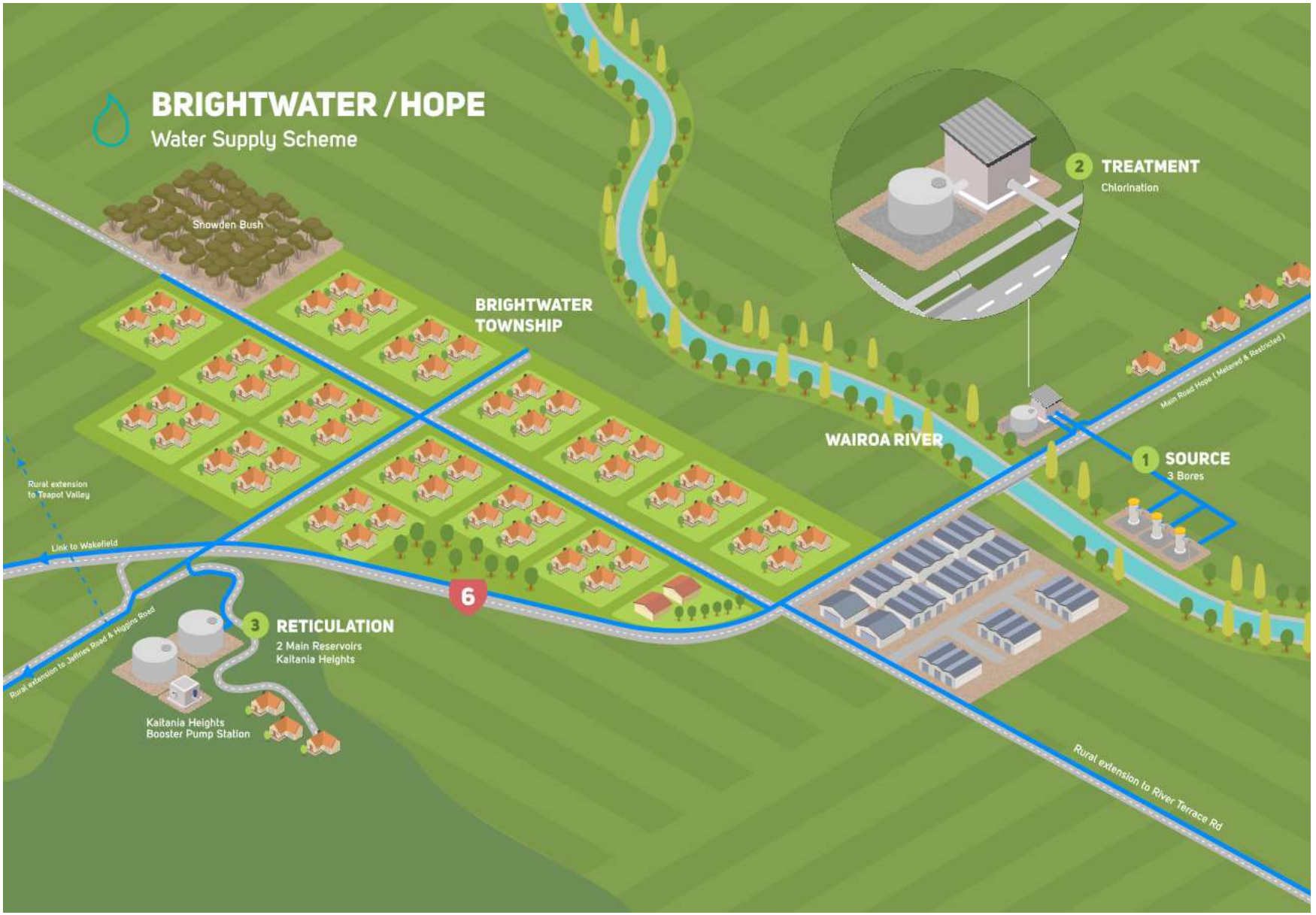
ID	Name	Description	Project Driver %			Total Budget	Financial Year Budget ($)										Total Budget	
			Growth	Inc LOS	Renewals	2021-51	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	3030/31	2031-41	2041-51
-	Capital Programme Scope Risk Adjustment	Capital Programme Scope Risk Adjustment	0	100	0	-9,606,961	-697,354	-225,138	-254,360	-354,264	-428,190	-550,960	-549,005	-329,940	-645,710	-508,690	-2,654,340	-2,409,010

Appendix C: Water Supply Network Schematics

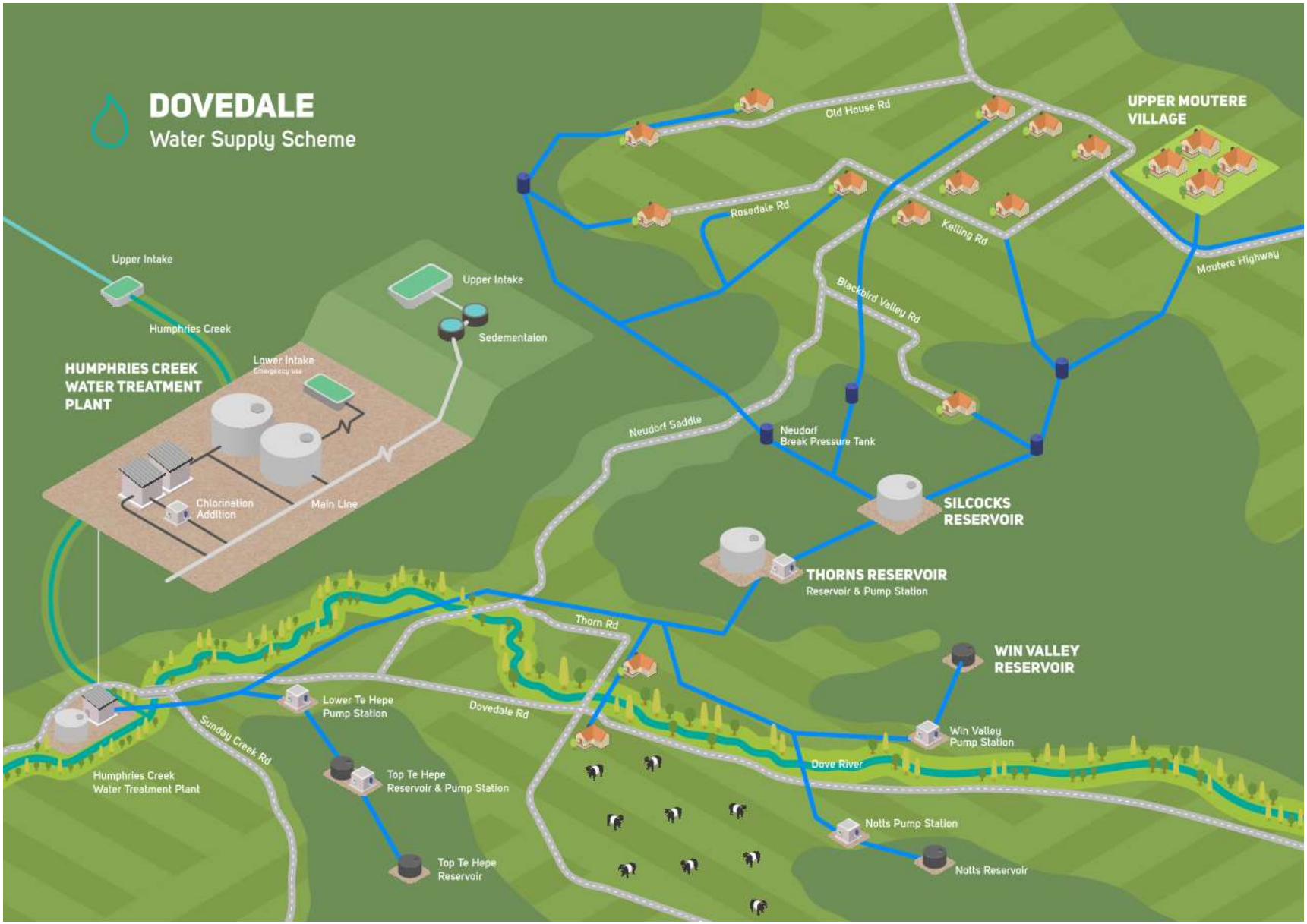
A network schematic has been produced for the following water supply schemes:

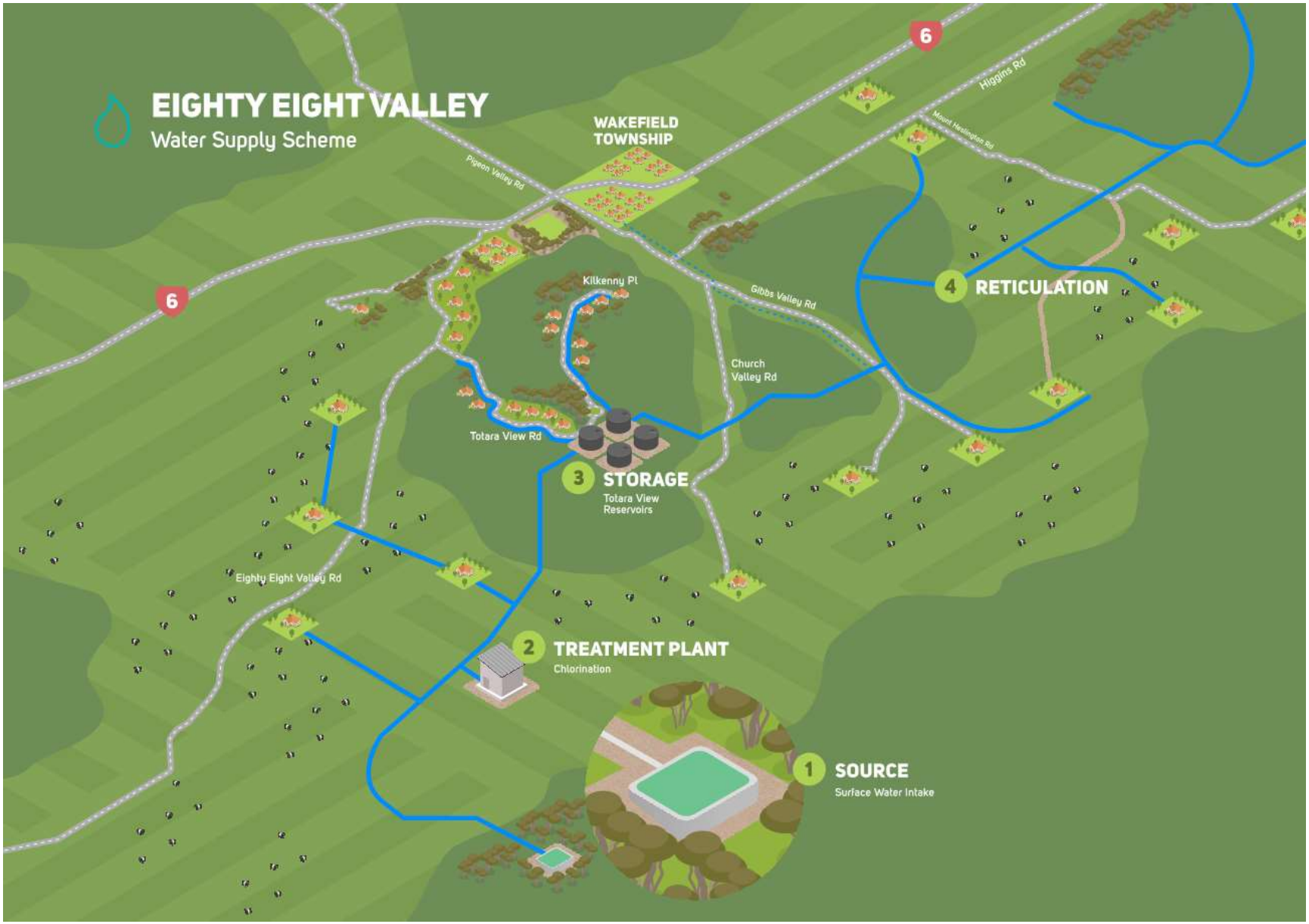
- Brightwater/Hope
- Collingwood
- Dovedale
- Eighty-Eight valley
- Kaiteriteri/Riwaka
- Māpua Rise
- Māpua /Ruby Bay
- Motueka
- Murchison
- Pōhara
- Redwoods 1 & 2
- Richmond
- Tapawera
- Upper Takaka
- Wakefield

Network schematics were not produced for Takaka and Hamama.

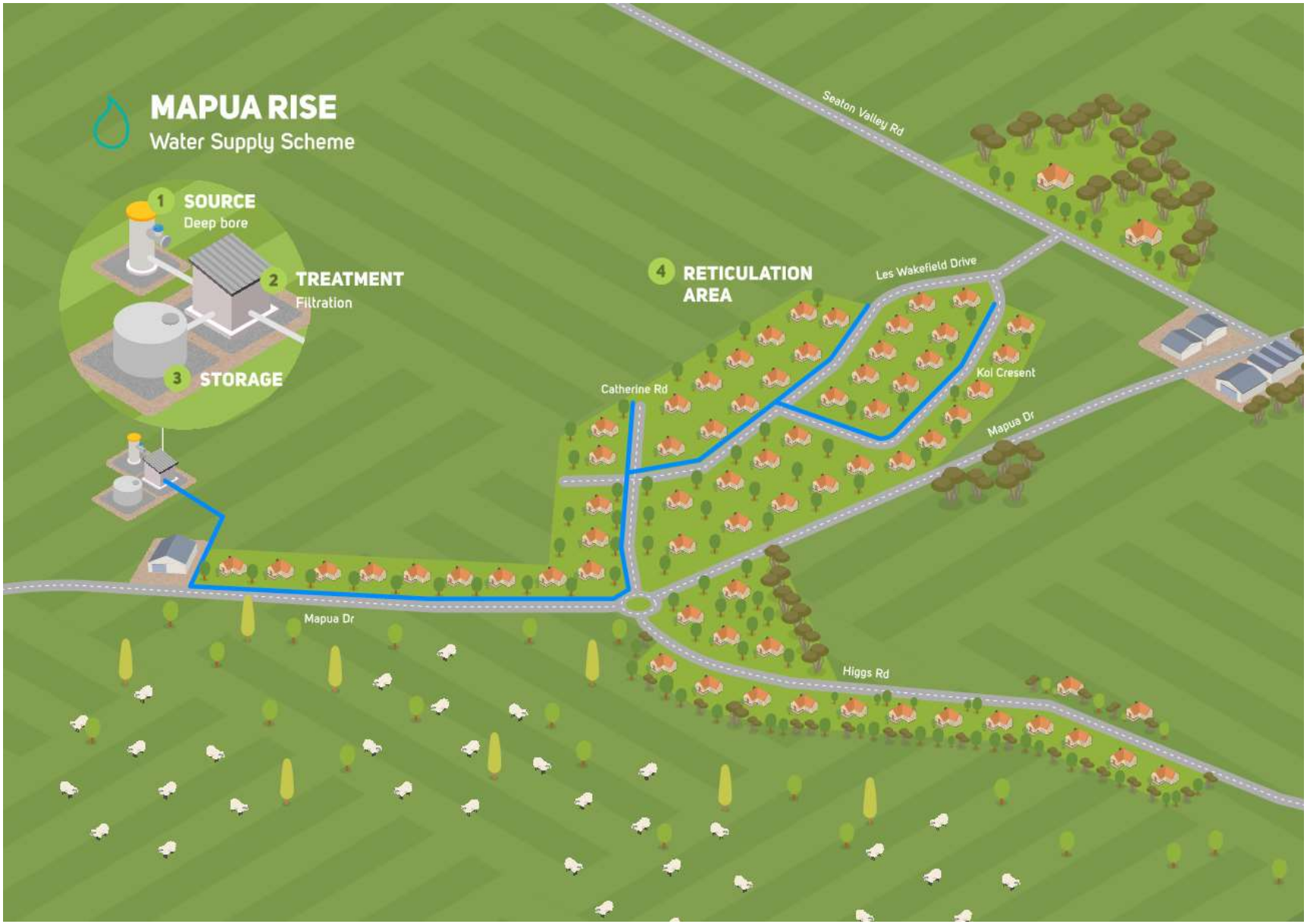

BRIGHTWATER / HOPE
Water Supply Scheme
Snowden Bush
BRIGHTWATER TOWNSHIP
2 TREATMENT
Chlorination
WAIROA RIVER
Main Road Hope (Metered & Restricted)
1 SOURCE
3 Bores
Rural extension to Teapot Valley
Link to Wakefield
6
3 RETICULATION
2 Main Reservoirs
Kaitania Heights
Rural extension to Jeffries Road & Higgins Road
Kaitania Heights Booster Pump Station
Rural extension to River Terrace Rd


COLLINGWOOD
Water Supply Scheme
COLLINGWOOD ESTUARY
Campground
COLLINGWOOD TOWNSHIP
1 SOURCE
2 Bores
3 STORAGE
Reservoir
4 RETICULATION
AORERE RIVER
To Farewell Spit
6
2 TREATMENT
• Aeration
• Lime Saturation (pH Control)
• Chlorination
Takaka-Collingwood Highway
Collingwood Wastewater Treatment Plant
Collingwood-Bainham Main Rd


DOVEDALE
Water Supply Scheme
UPPER MOUTERE VILLAGE
Old House Rd
Rosedale Rd
Kelling Rd
Moutere Highway
Blackbird Valley Rd
Upper Intake
Humphries Creek
Upper Intake
Sedementaion
HUMPHRIES CREEK WATER TREATMENT PLANT
Lower Intake
Emergency use
Chlorination Addition
Main Line
Neudorf Saddle
Neudorf Break Pressure Tank
SILCOCKS RESERVOIR
THORNS RESERVOIR
Reservoir & Pump Station
Thorn Rd
WIN VALLEY RESERVOIR
Lower Te Hepe Pump Station
Dovedale Rd
Sunday Creek Rd
Win Valley Pump Station
Dove River
Humphries Creek Water Treatment Plant
Top Te Hepe Reservoir & Pump Station
Notts Pump Station
Top Te Hepe Reservoir
Notts Reservoir

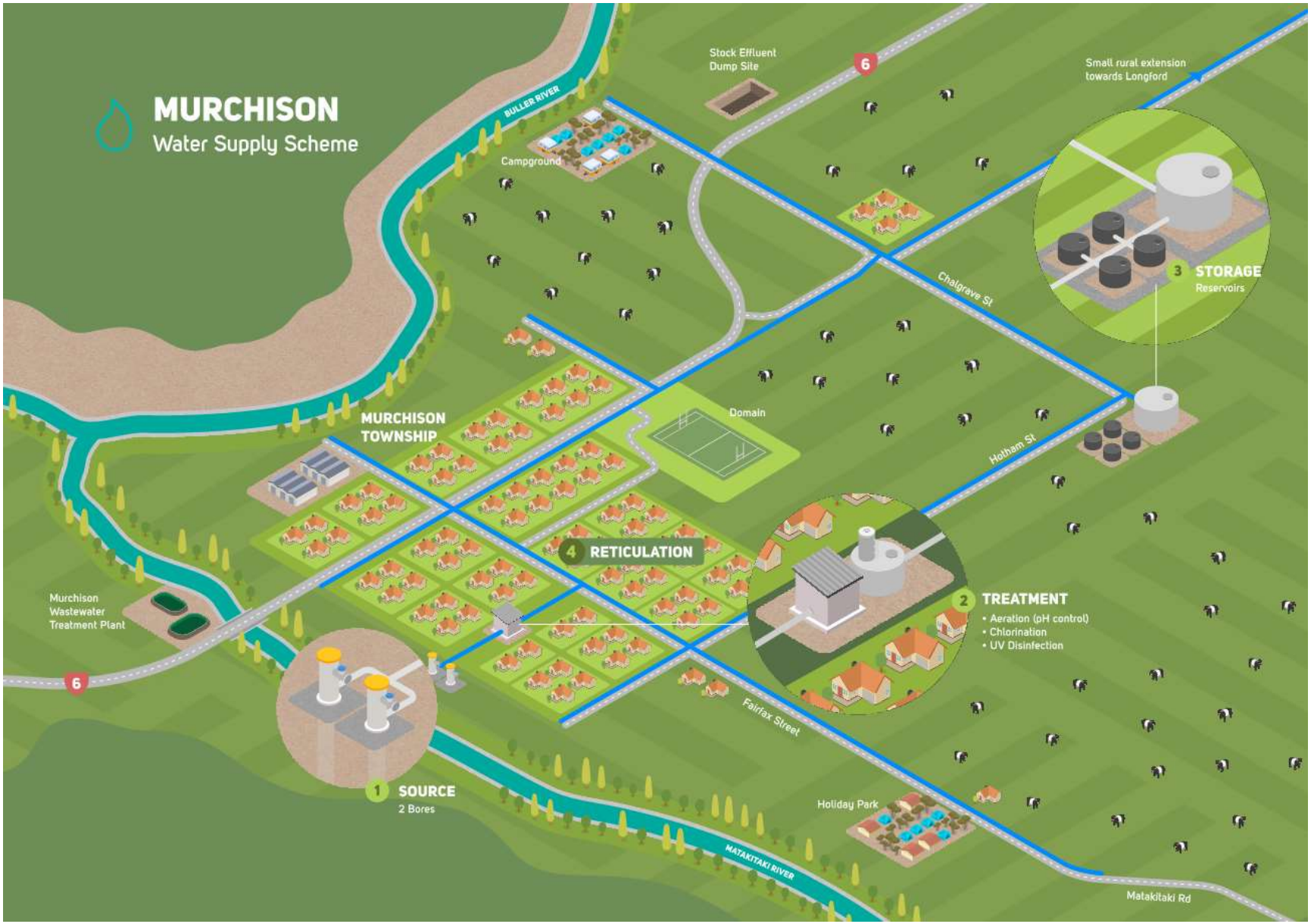

EIGHTY EIGHT VALLEY
Water Supply Scheme
WAKEFIELD TOWNSHIP
Pigeon Valley Rd
6
Higgins Rd
Mount Heslington Rd
Kilkenny Pl
Gibbs Valley Rd
4 RETICULATION
Church Valley Rd
Totara View Rd
3 STORAGE
Totara View Reservoirs
Eighty Eight Valley Rd
2 TREATMENT PLANT
Chlorination
1 SOURCE
Surface Water Intake


KAITERITERI / RIWAKA
Water Supply Scheme
60
TAKAKA HILL
Takaka Hill Highway
Forestry
3
STORAGE
Upper Reservoir
Booster
Pump Station2
KAITERITERI
TOWNSHIP
Campground
3
STORAGE
Main Reservoir
Kimi Ora Resort
Campground
RETICULATION
4
RIWAKA
VALLEY
Bike Tracks
Booster
Pump Station 1
Little
Kaiteriteri
RETICULATION
4
1
SOURCE
2 Bores
RIWAKA
TOWNSHIP
2
TREATMENT PLANT
2
TREATMENT
• UV Disinfection
• Emergency Chlorination
• Caustic Soda Dosing (pH Correction)
MOTUEKA RIVER
60

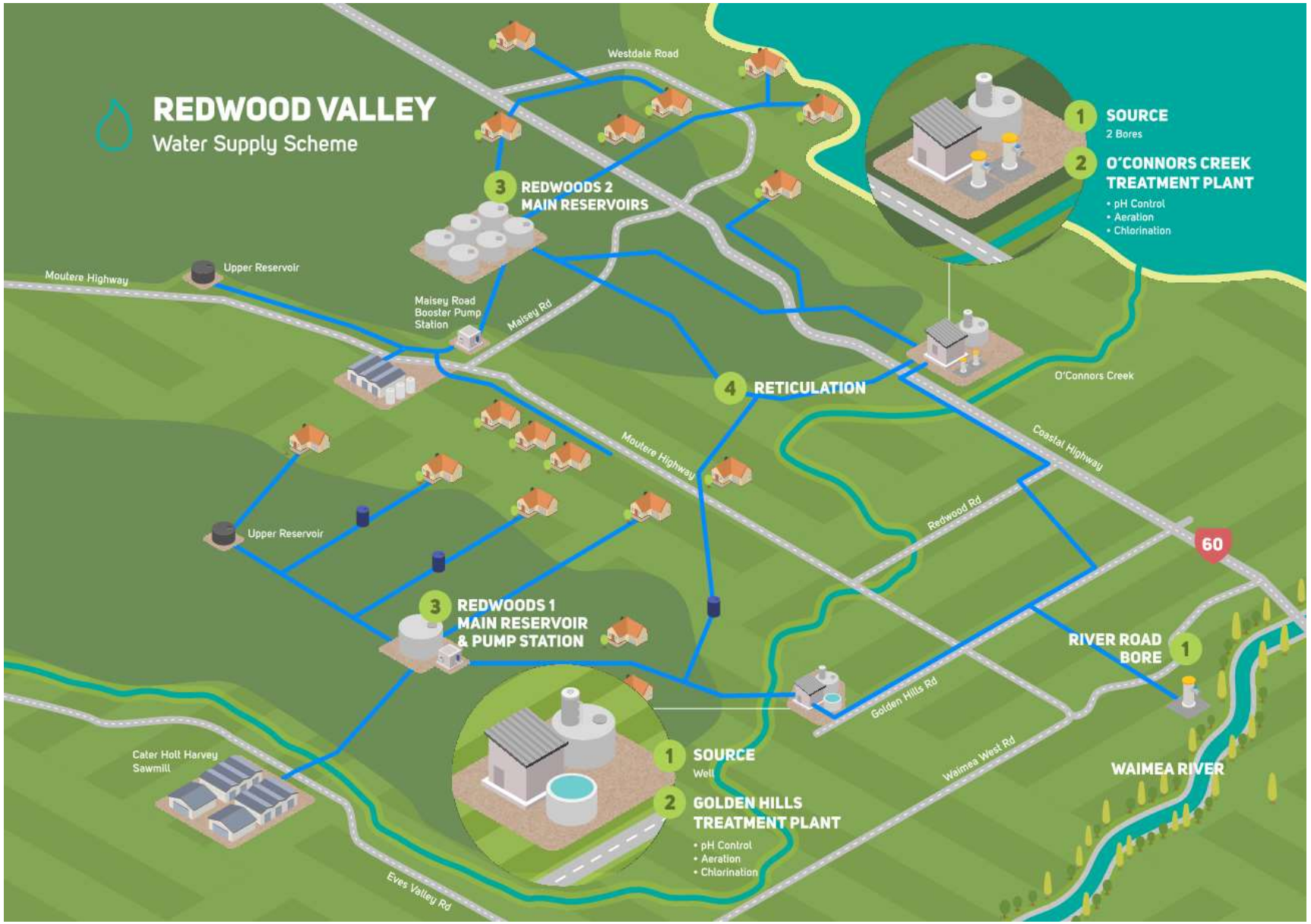

MAPUA RISE
Water Supply Scheme
1 SOURCE
Deep bore
2 TREATMENT
Filtration
3 STORAGE
4 RETICULATION AREA
Seaton Valley Rd
Les Wakefield Drive
Koi Cresent
Catherine Rd
Mapua Dr
Mapua Dr
Higgs Rd

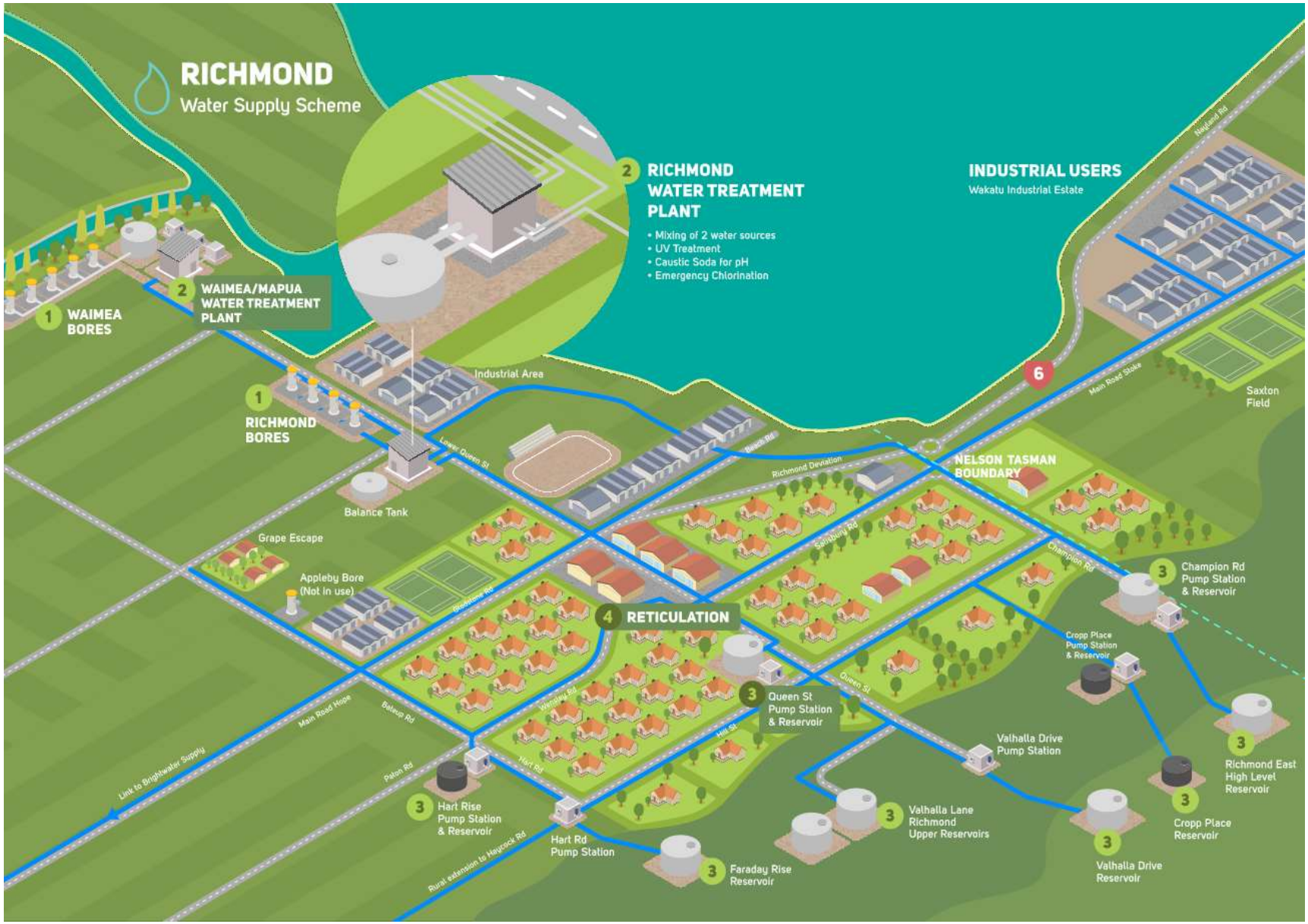

MAPUA / RUBY BAY
Water Supply Scheme
1 SOURCE
WAIMEA BORES
Source water is pumped to Waimea WTP
2 WAIMEA
WATER TREATMENT PLANT
Water is then pumped to Pomona Road Reservoirs from Waimea Water Treatment Plant
3 STORAGE
Stagecoach Road Reservoirs
3 STORAGE
Pine Hill Heights Reservoirs & Booster Pump Station
3 STORAGE
Pomona Road Reservoirs & Pump Station
4 RETICULATION
Brabant Drive Booster Pump
McKee Reserve
Apiro Road
Marriages Road
Pine Hill Road
Stagecoach Road
Pomona Road
Stafford Drive
Seaton Valley Rd
Mapua Drive
Higgs Rd
Coastal Highway
60
RABBIT ISLAND
Emergency Booster Pump
From Waimea WTP
Grossi point

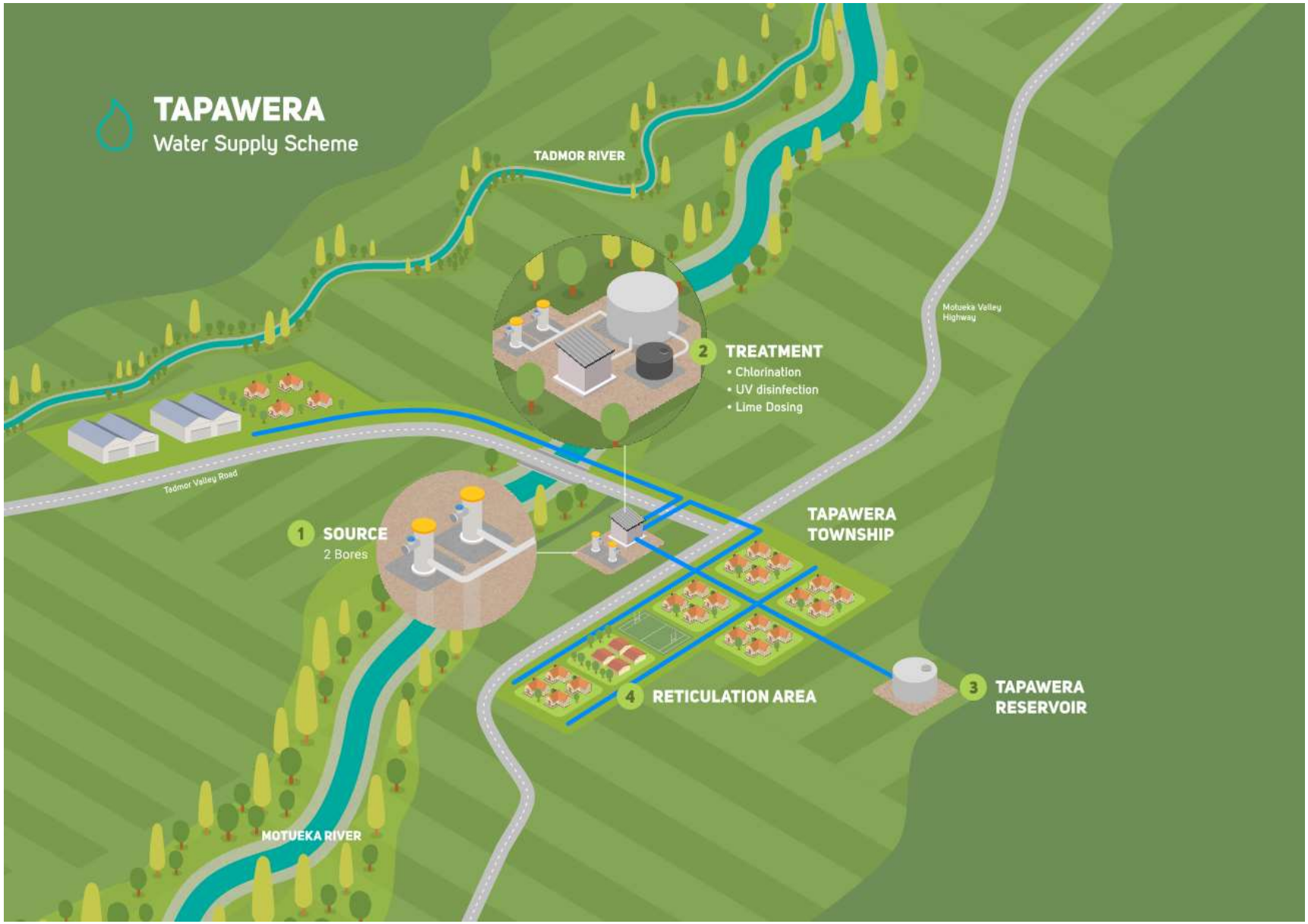

MOTUEKA
Water Supply Scheme
TASMAN BAY
1b SOURCE
Fearon's Bush Pump Station
(To be decommissioned)
Motueka Top 10
Holiday Park
1a SOURCE
Recreation Centre Pump Station
2 Bores
1c PLANNED SOURCE
& TREATMENT SITE
2
Parker St, 2019
3 RETICULATION
Thorp St
High St
Thorp Bush
Old Wharf Rd
Port Motueka
King Edward St
Wharf Rd
Motueka Airport
60
Coastal Highway

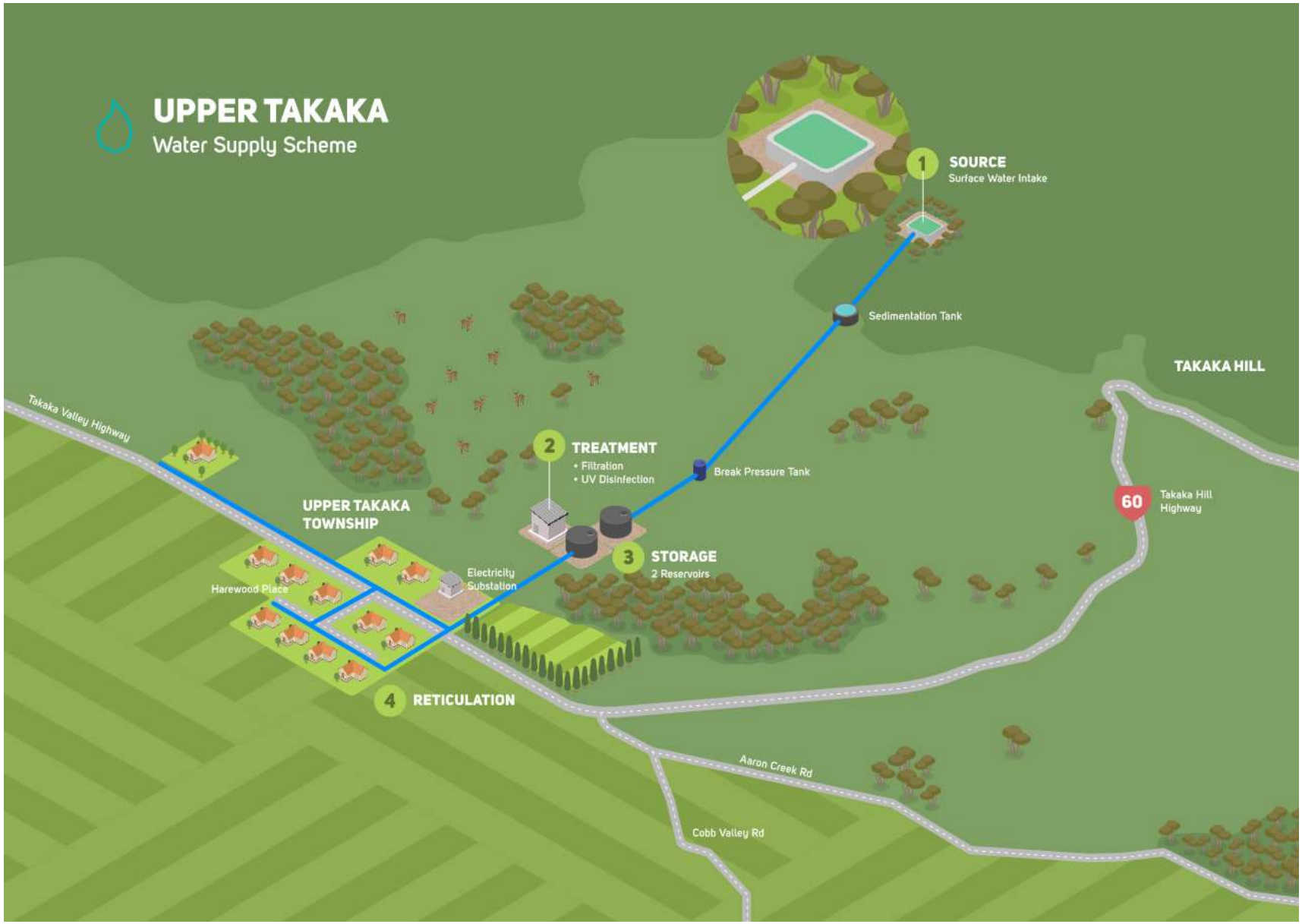

MURCHISON
Water Supply Scheme
BULLER RIVER
Campground
Stock Effluent
Dump Site
6
Small rural extension
towards Longford
3 STORAGE
Reservoirs
Chalgrave St
Domain
MURCHISON
TOWNSHIP
Holham St
4 RETICULATION
2 TREATMENT
• Aeration (pH control)
• Chlorination
• UV Disinfection
Murchison
Wastewater
Treatment Plant
6
Fairfax Street
1 SOURCE
2 Bores
Holiday Park
MATAKITAKI RIVER
Matakitaki Rd

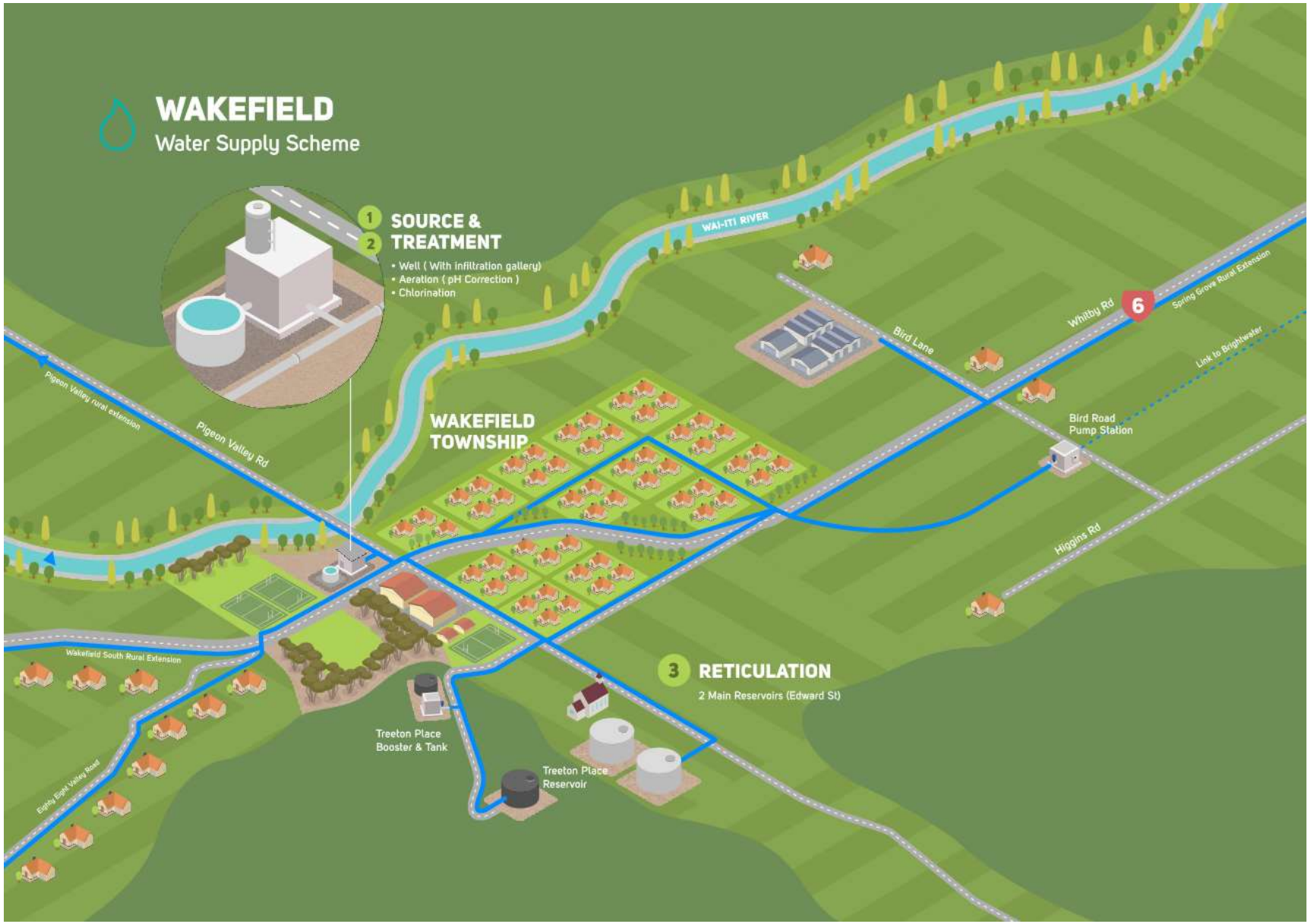

POHARA
Water Supply Scheme
To Tarakohe
STORAGE 3
Falconer Road
Reservoirs
4 RETICULATION
Winter Creek
Pohara Valley Rd
Falconer Rd
Pohara Hall
Bowling Club
Abel Tasman Drive
Campground
2 TREATMENT PLANT
• Chlorination
• Filtration
1 INTAKE
Small Collection
Chamber
Cafe
Hotel
Cafe
Haile Lane
3 STORAGE
Haile Lane Reservoirs
Richmond Rd


REDWOOD VALLEY
Water Supply Scheme
Westdale Road
1 SOURCE
2 Bores
2 O'CONNORS CREEK TREATMENT PLANT
• pH Control
• Aeration
• Chlorination
3 REDWOODS 2 MAIN RESERVOIRS
Moutere Highway
Upper Reservoir
Maisey Road Booster Pump Station
Maisey Rd
4 RETICULATION
O'Connors Creek
Coastal Highway
Moutere Highway
Redwood Rd
60
Upper Reservoir
3 REDWOODS 1 MAIN RESERVOIR & PUMP STATION
RIVER ROAD BORE 1
Golden Hills Rd
Cater Holt Harvey Sawmill
1 SOURCE
Well
2 GOLDEN HILLS TREATMENT PLANT
• pH Control
• Aeration
• Chlorination
Waimea West Rd
WAIMEA RIVER
Eves Valley Rd


RICHMOND
Water Supply Scheme
1 WAIMEA BORES
2 WAIMEA/MAPUA WATER TREATMENT PLANT
2 RICHMOND WATER TREATMENT PLANT
• Mixing of 2 water sources
• UV Treatment
• Caustic Soda for pH
• Emergency Chlorination
INDUSTRIAL USERS
Wakatu Industrial Estate
1 RICHMOND BORES
Industrial Area
Balance Tank
Grape Escape
Appleby Bore (Not in use)
4 RETICULATION
NELSON TASMAN BOUNDARY
6
Saxton Field
3 Champion Rd Pump Station & Reservoir
Cropp Place Pump Station & Reservoir
3 Queen St Pump Station & Reservoir
Valhalla Drive Pump Station
3 Richmond East High Level Reservoir
3 Cropp Place Reservoir
3 Valhalla Lane Richmond Upper Reservoirs
3 Valhalla Drive Reservoir
3 Hart Rise Pump Station & Reservoir
Hart Rd Pump Station
3 Faraday Rise Reservoir
Link to Brightwater Supply
Rural extension to Hayrack Rd


TAPAWERA
Water Supply Scheme
TADMOR RIVER
Motueka Valley Highway
2 TREATMENT
• Chlorination
• UV disinfection
• Lime Dosing
Tadmor Valley Road
1 SOURCE
2 Bores
TAPAWERA TOWNSHIP
4 RETICULATION AREA
3 TAPAWERA RESERVOIR
MOTUEKA RIVER


UPPER TAKAKA
Water Supply Scheme
1 SOURCE
Surface Water Intake
Sedimentation Tank
TAKAKA HILL
Takaka Valley Highway
2 TREATMENT
• Filtration
• UV Disinfection
Break Pressure Tank
60 Takaka Hill Highway
UPPER TAKAKA TOWNSHIP
3 STORAGE
2 Reservoirs
Electricity Substation
Harewood Place
4 RETICULATION
Aaron Creek Rd
Cobb Valley Rd


WAKEFIELD
Water Supply Scheme
1 SOURCE &
2 TREATMENT
• Well (With infiltration gallery)
• Aeration (pH Correction)
• Chlorination
WAI-ITI RIVER
WAKEFIELD
TOWNSHIP
Pigeon Valley rural extension
Pigeon Valley Rd
Whitby Rd
6
Spring Grove Rural Extension
Bird Lane
Link to Brightwater
Bird Road
Pump Station
Higgins Rd
Wakefield South Rural Extension
Eighty Eight Valley Road
Treeton Place
Booster & Tank
Treeton Place
Reservoir
3 RETICULATION
2 Main Reservoirs (Edward St)

Appendix D: Water Supply Network Maps

A water supply network map has been produced for the following schemes and included in the Council's Active Manuals.

- Brightwater/Hope
- Collingwood
- Dovedale
- Eighty-Eight valley
- Kaiteriteri/Riwaka
- Māpua /Ruby Bay
- Motueka
- Murchison
- Pōhara
- Redwoods 1 & 2
- Richmond
- Tapawera
- Upper Takaka
- Wakefield

Network schematics were not produced for Māpua Rise, Takaka and Hamama.