WESTLAND DISTRICT COUNCIL

Drinking Water

Activity Management Plan 2021-2031

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Document Control

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Update (April 2020): COVID-19

The recent international COVID-19 virus pandemic and lockdown of New Zealand's borders will undoubtedly have a huge impact on tourism. The full impacts cannot be predicted due to the huge level of uncertainty.

However, it is reasonable to expect that this may significantly impact the resident population in Franz Josef and Fox Glacier (the majority of whom are employed either directly or indirectly via the tourism sector).

As many small businesses may be unable to remain financially viable if the lockdown continues for an extended period of time, the availability of contractors may also change.

Central Government is currently offering Territorial Authorities the opportunity to put together funding applications for "shovel-ready" projects to kick start the economy once these restrictions lift.

Westland District Council is submitting several applications across a variety of infrastructure areas. These have been based on known projects already listed in this document, however, it is worth noting that the timings and costings of projects listed in this Plan could change as a result of COVID-19, due to supply chain shortages and cost increases.

Glossary of Terms

Term	Definition
Asset Management	The process applied to manage assets over each stage of their service life including asset needs analysis, creation, operation, maintenance, renewal and disposal. The objective of asset management is to ensure the assets deliver the required level of service in the most effective and efficient manner now and into the future.
Asset/Activity Management Plan (AMP)	A plan developed for the management of one or more infrastructure assets that combines multi-disciplinary management techniques (including technical and financial) over the life cycle of the asset in the most cost effective manner to provide a specific level of service.
Condition Monitoring	Continuous or periodic inspection, assessment, measurement and interpretation of resulting data, to indicate the condition of a specific component to determine the need for some preventive or remedial action.
Critical Asset	Assets for which the financial, business or service level consequences of failure are sufficiently severe to justify proactive inspection and rehabilitation. Critical assets have a lower threshold for action than non-critical assets.
Depreciation	The wearing out, consumption or other loss of value of an asset whether arising from use, passing of time or obsolescence through technological and market changes. It is accounted for by the allocation of the historical cost (or revalued amount) of the asset less its residual value over its useful life.
DWO	Drinking Water Online. This is a national database that is a web based compliance tool for entering water sampling data and running compliance reports. The Ministry of Health strongly recommends all water supplier to use this tool.
DWSNZ	Drinking Water Standards for New Zealand. The standard which all water suppliers must comply with for drinking water quality.
Economic Life	The period from the acquisition of the asset to the time when the asset, while physically able to provide a service, ceases to be the lowest cost alternative to satisfy a particular level of service. The economic life is at the maximum when equal to the physical life however obsolescence will often ensure that the economic life is less than the physical life.
ERP	Enterprise Resource Planning: integrated management of main business processes, often in real time and mediated by software and technology.
e-TXT	Internet service provided by Spark New Zealand that allows Council to send SMS text messages to customers from a web platform to communicate urgent updates.
GIS	Geographic Information System. This is a conceptualized framework that provides the ability to capture and analyse spatial and geographic data. i.e. Mapping tool.
IIMM	International Infrastructure Management Manual is a global how to guide in terms of applying the standards for infrastructure asset management.
IPWEA	Institute of Public Works Engineering Australasia is a professional association for persons who deliver public works and engineering services to communities in Australia and New Zealand. IPWEA provides professional development, technical publications, and promotes knowledge sharing among its member base. It also lobbies for policy change and for grants to undertake projects that benefit the public works industry.
KPI	Key Performance Indicator: a measurable target against which Council can evaluate the success of its delivery of Levels of Service standards.
Level of Service (LOS)	The defined service standard particular to an activity or service area (i.e. interior) against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, regulatory and environmental acceptability and cost.

Term	Definition
Lifecycle Management	A process of managing an asset from initial construction through to disposal. Lifecycle cost is the Total expenditure required throughout the life of an asset in order to fund the creation, design, construction, operation, maintenance, renewal and disposal so that the asset can deliver the desired service level over its life.
Long Term Plan (LTP)	Council's main strategic planning document. Documents projects and budgets over a 10-year period to ensure consistency and coordination in both making policies and decisions concerning the use of Council resources. This document is reviewed every three years and in non-LTP years, an Annual Plan is produced to cover the strategic direction and any amendments to the Long Term Plan for the upcoming financial year.
Maintenance Standards	The standards set for the maintenance service, usually contained in preventive maintenance schedules, operation and maintenance manuals, codes of practice, estimating criteria, statutory regulations and mandatory requirements, in accordance with maintenance quality objectives.
NAMS	National Asset Management Support, provides technical guidance and support for management of community and infrastructure assets.
PCBU	"Person Conducting a Business or Undertaking": broad concept used throughout the Health and Safety Work Act to define who has a duty of care in relation to health and safety.
Performance Monitoring	Continuous or periodic quantitative and qualitative assessments of the actual performance compared with specific objectives, targets or standards.
Rehabilitation	Works to rebuild or replace parts of components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. Generally, involves repairing the asset to deliver its original level of service without resorting to significant upgrading or renewal, using available techniques and standards.
Renewal	Works to replace existing facilities with facilities of equivalent capacity or performance capability (re-instating existing asset).
Risk Management	The application of a formal process to the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probability of occurrence.
SCADA	An acronym for supervisory control and data acquisition; essentially a computer system for gathering and analysing real time data. SCADA systems are used to monitor and control a plant or equipment, e.g. water and waste control.
Sustainability	The process of meeting the needs of the present community without compromising the ability of future generations to meet their own needs.
Upgrade	The replacement of an asset or addition/ replacement of an asset component, which materially improves the original service potential of the asset.
UV	Ultraviolet light: Light emitted with wavelengths outside the visible range to the human eye. A key component in treating drinking water.
Valuation	Estimated asset value that may depend on the purpose for which the valuation is required, i.e. replacement value for determining maintenance levels or market value for life cycle costing.
WCRC	Abbreviation for West Coast Regional Council, the regional authority for the West Coast region with key roles in environmental management, hazard management, biosecurity and regional economic development.
WSP	Water Safety Plan. A plan that documents a public health risk-based assessment and management process that aims to ensure a "safe" and secure supply of drinking-water for consumers, protecting public health.
WTP	Water Treatment Plant. A building which houses components for water treatment.

Section 1 Executive Summary

1.1 Introduction

The drinking water activity comprises the provision of potable water (i.e. water suitable for use and consumption by people). Westland District Council (WDC/Council) supplies nine communities with drinking water and has 2,660 service connections across the District. Council aims to provide a continuous supply of water to its users, but this cannot always be guaranteed.

This Drinking Water Activity Management Plan (AMP) has undergone significant change since the previous combined Three Waters AMP (2014 edition). There have been changes and improvements in the knowledge-based information as a result of changes with operational procedures, water treatment plant upgrades and legislative changes.

The key issues for managing the drinking water assets identified in this plan are:

- implications of the Government's three waters reforms and changes to legislation are likely to result in higher standards for water treatment and compliance costs
- increased disruption to water services by extreme storm events (i.e. climate change)
- challenge to meet the Drinking Water Standards for New Zealand (DWSNZ)
- poor quality of asset information available for asset management (AM) planning and decision-making
- risk of responsibility for raw/private water supplies under potential Three Waters Review criteria
- improving Council's ability to report on mandatory performance measures
- investigating network water loss.

Meeting the challenges of the pending three waters reforms, freshwater management reforms and Climate Change (Zero Carbon) Amendment Act will be significant issues for Council to address in the 2021 Long Term Plan (LTP). The pending water reforms will impact the way we deliver three waters to our communities and the cost of providing these services. The Government's latest three waters reform programme is strongly encouraging councils to aggregate at regional/sub-regional level to be considered for the funding package. Regional approaches will be favoured for the funding with conditions attached.

Key achievements over the past few years have been installation of generators for resilience, water meter replacements, water treatment plant upgrades, critical mains replacements in Hokitika and Fox Glacier and improving the reliability of Hokitika river intake. Council has been building internal AM capability since 2018 and has gained approval for three dedicated roles.

Council has been successful in securing external funding including $6.8 million as part of the Government's three waters reform package. Six out of the nine Water Safety Plans have been approved and the remaining three require amendments before approval. With the Water Services Bill, the requirements for water safety planning are changing from the development of Water Safety Plans to continuous planning.

Council's water treatment plants are modern, with up-to-date technology. Most treatment plants have been upgraded within the last few years to improve compliance with the DWSNZ and the final two new treatment plant upgrades are currently underway for the outstanding systems at Arahura and Fox Glacier.

1.2 What we do

This activity comprises the provision of potable water (i.e. water suitable for use and consumption by people). Council's supplies nine communities with drinking water and has 2,660 service connections across the District. Council aims to provide a continuous supply of water to its users, but this cannot always be guaranteed. The major drinking water asset classes are presented below.

Figure 1 Major drinking water asset classes

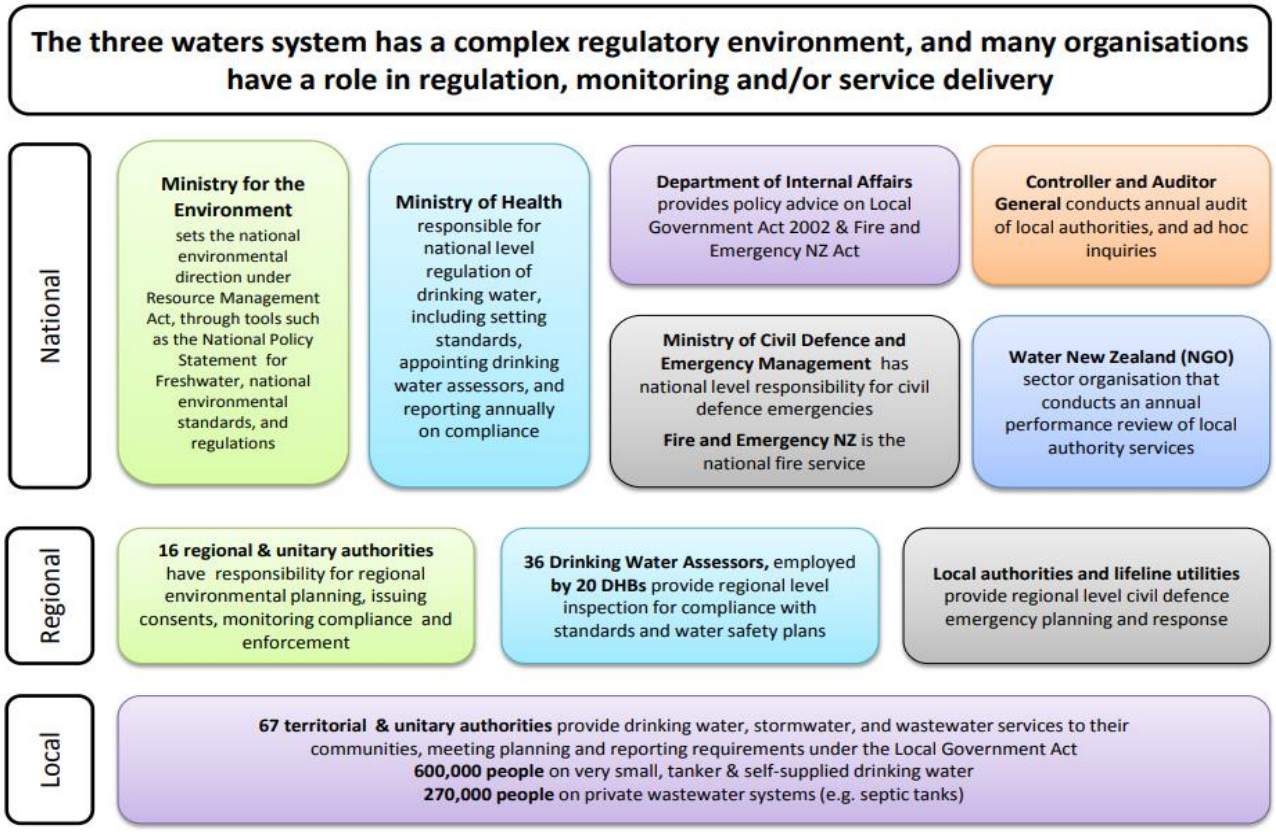
1.3 Why we do it

Clean and safe drinking water is essential to public health. High quality drinking water also facilitates economic growth. In addition, the drinking water activity enables the protection of property by ensuring a pressurised water supply adequate for firefighting purposes.

Council intends to retain ownership of the drinking water activities identified in this AMP (excluding raw water supplies) as considers it to be a core function of Council and provides public benefit. This plan summarises Council's management of, and strategic long-term approach to, the provision, maintenance, renewal and upgrading of drinking water services throughout Westland District.

Figure 2 shows the complexity of three waters delivery (including drinking water) in New Zealand, with various national, regional and local authorities involved across service delivery, environmental compliance and health regulation.

Figure 2 Three waters complexity



1.4 Levels of service

The current level of service (LOS) statements are included in Section 5 of this plan. These measures align with the mandatory reporting required by the Department of Internal Affairs (DIA) for this activity. Council is continuing to work on improving its levels of service gaps including knowledge of water demand, water leaks and losses and achieving full compliance with the DWSNZ.

At this point in time, Council is only providing levels of service to meet the DIA mandatory performance measures. Meeting some of these is a challenge as a small and remote district council, particularly drinking water quality.

1.5 Key issues

The most important issues for this activity and how Council is planning to respond are summarised below.

Table 1 Key drinking water issues

Key Issue	Council Response
Implications of the Government's three waters reforms and changes to legislation are likely to result in higher standards for water treatment and compliance costs	• Continue to work with other West Coast councils on regional aggregation model • Explore joining Canterbury region aggregation model
Increased disruption to water services by extreme storm events (i.e. climate change)	• Strengthen critical assets • Build community resilience to supply disruptions • Prepare and test emergency response plans

Key Issue	Council Response
	• Set up contractor availability for range of events • Use pragmatic solutions to resolve physical barriers and to ensure compliance monitoring can be undertaken as much as practical
Challenge to meet the DWSNZ	• Compliant treatment equipment installations and new Water Treatment Plants (Kumara, Fox, Whataroa) designed to meet DWSNZ • Capital works to meet protozoa criteria
Poor quality of asset information available for AM planning and decision-making	• Appointment of a dedicated Asset Manager to focus on improvements and not distracted by operational activities
Risk of responsibility for raw / private water supplies under potential three waters review criteria	• Divestment of rural water schemes in accordance with legislative requirements and consultation
Improving Council's ability to report on mandatory performance measures	• Telemetry installation / upgrades at all plants • Dedicated resource to input data and liaise with Drinking Water Assessor, Community and Public Health
Investigating network water loss	• Water flow monitoring • Develop leakage management programme consistent with good industry practice • Leaks and losses programme to be implemented • Implementing new water meters on commercial and industrial properties as well as monitoring for potential extraordinary consumers and improved metering to determine daily and peak volume demand

1.6 Financial summary

The total projected expenditure for operations, maintenance and capital for the drinking water activity for the next ten years is $47.5 million. Approximate 21% of this projected expenditure is capital expenditure, which equates to $9.8 million. Renewals make up most of the capital expenditure followed by growth projects.

The operational expenditure is approximately $3.8 million per annum. Due to new equipment installed at water treatment plants that have been recently upgraded, more operational maintenance requirements have been added to the Preventative Maintenance Schedule. This has resulted in an increase in operational expenditure when compared to the 2018 LTP. The projected expenditure is shown below.

Table 2 Financial summary – drinking water (uninflated)

Water Supply Scheme	Projected Expenditure				
	Year 1	Year 2	Year 3	Year 4-10	10 year Total
	2021/22	2022/23	2023/24	2024-31	
Operational expenditure	$3,505,175	$3,660,651	$3,728,386	$26,791,282	$37,685,494
Capital expenditure					
Renewals	$1,128,570	$160,000	$295,000	$5,381,000	$6,964,570
LOS	$1,120,000	$30,000	$0	$90,000	$1,240,000
Growth	$100,000	$0	$0	$1,500,000	$1,600,000
Total	**$5,853,745**	**$3,850,651**	**$4,023,386**	**$33,762,282**	**$47,490,064**

Source: Council's draft LTP budget (as at May 2021)

1.7 Key improvements identified

Improvement opportunities have been identified throughout the development of this AMP. The focus for the next three years is to bed in the new dedicated internal resources for AM then set up the basic building blocks needed.

The main improvement objectives to be achieved in the next three years due to their priority and importance for achieving core asset management status for the drinking water activity include:

- Performance management – Set up the measurement systems for the two environmental performance measures (leakage and average water consumption) as a priority as required for mandatory performance measurement reporting.
- Data quality – Monitor and report on data accuracy and completeness to assess improvements and bed in good practices.
- Asset condition – Verify the asset condition of the critical drinking water assets (above ground). Implement regular condition assessments and asset inspection programmes for non-critical assets (above ground).
- Renewal planning – Develop a risk based water renewal programme based on analysis of break histories, condition and taking into account criticality, material type, resilience and other factors, to be consistent with good industry practice.
- Quality management – Undertake the various quality management improvements to strengthen the underlying processes for the activity.

Section 2 Introduction

2.1 Drinking water activity

The drinking water activity provides and maintains public drinking water supplies that meet sufficient levels of service, complies with the DWSNZ and protects public health.

This activity comprises the provision of potable water (i.e. water suitable for use and consumption by people). Council supplies nine communities with drinking water and has 2,660 service connections across the District. Council aims to provide a continuous supply of water to its users, but this cannot always be guaranteed.

2.2 Purpose

The purpose of developing this AMP is to ensure that the creation, operation, maintenance, repairs and replacement of Council's drinking water assets are managed in a cost-effective manner and provides an appropriate level of service to meet the needs of present and future customers. The AMP also clearly states the direction and approach that Council intends to follow to achieve the strategic goals and statutory responsibilities for the drinking water activity.

The reliable provision of clean and safe drinking water is essential to the wellbeing of Westland's communities and is a core public health function of local government that councils have always provided.

The AMP provides a means through which the Council can demonstrate its responsible management of public drinking water supplies by including the following aspects:

- Consistency with WDC's governing strategic plans, objectives and policies
- Consistency with WDC's other tactical plans
- Compliance with legislative requirements
- Environmental responsibility
- Translating the needs of the community into agreed Levels of Service
- Providing a sound basis to justify funding requirements, now and in future years
- Providing a basis for the development of operational plans and contracts.

This plan provides the information required for good asset management (AM) planning as set out in:

- LGA 2002 Schedule 10 and amendments
- Office of the Auditor General (OAG) industry advice notes and reports
- International Infrastructure Management Manual (IIMM) published by the New Zealand Asset Management Support (NAMS).

This Drinking Water AMP covers all activities associated with the provision of drinking water. It is a tactical, infrastructural plan that gives effect to a range of other strategic and tactical planning documents including Council's strategic direction set out in the LTP.

2.3 Asset description

Council has a variety of different types of water sources, treatment options and users as summarised below.

Table 3 Key components of drinking water activity

Water Sources
• Bores (groundwater)
• Surface water takes
Treatment Options
• UV
• Filtration
• Chlorination
• pH correction
• Flocculant
Reticulation Infrastructure
• Pipes
• Hydrants
• Valves
• Backflow prevention
• Reservoirs
• Booster pump stations
Connections (by water billing type)
• Urban domestic water (Hokitika and Kaniere) – treated
• Rural domestic water – treated (Arahura, Kumara, Ross, Harihari, Whataroa, Franz Josef, Fox Glacier, Haast)
• Rural stock water schemes – untreated
• Unconnected rating units
• Commercial treated water – urban
• Commercial treated water – rural
• Metered water (for extraordinary users)
Population
• Approximately 8,000 people served
Industrial Users*
• Westland Milk Products
• Silver Fern Farms

* *Council notes that there is also extraordinary water consumption from some users connected to schemes. These are known to be rural connections (untreated water). Not of all these potential offenders have been followed up by Council to date.*

Council also owns the following raw, rural water supplies:

- Harold Creek in Harihari (for stock water)
- Jacksons Bay (for small settlement)

The Mint Creek in Whataroa has recently been divested by Council to the community. There are discussions underway to divest Harold Creek raw water supply scheme with the concerned property owners. Council holds the resource consents for these schemes. Only the Jackson Bay raw water supply scheme will likely be retained in Council ownership.

The rural water connections are supplied with untreated water and may need to be treated in future with the Water Services Bill. This is a risk to Council for funding the upgrade of the schemes for them to be compliant with DWSNZ.

There are nine registered community water supply schemes managed by Council. A full description on each scheme is detailed in Section 8.1. Council's response to meeting the DWSNZ is discussed further in Section 5.2.

Table 4 below provides an overview of the drinking water network assets and valuation data (as at 30 June 2019).

Table 4 Summary of drinking water valuation

Water supply	Optimised Replacement Cost ($)	Depreciated Replacement Cost ($)	Annual Depreciation ($)
Lines	30,872,738	19,070,363	366,776
Points	3,080,131	1,269,490	65,529
Plant	18,043,571	11,048,573	746,488
Total	**$51,996,440**	**$31,388,426**	**$1,178,794**

Source: Council's AssetFinda (as at 30 June 2019)

2.4 Key issues

The key issues relating to the drinking water activity are identified below along with Council's management response.

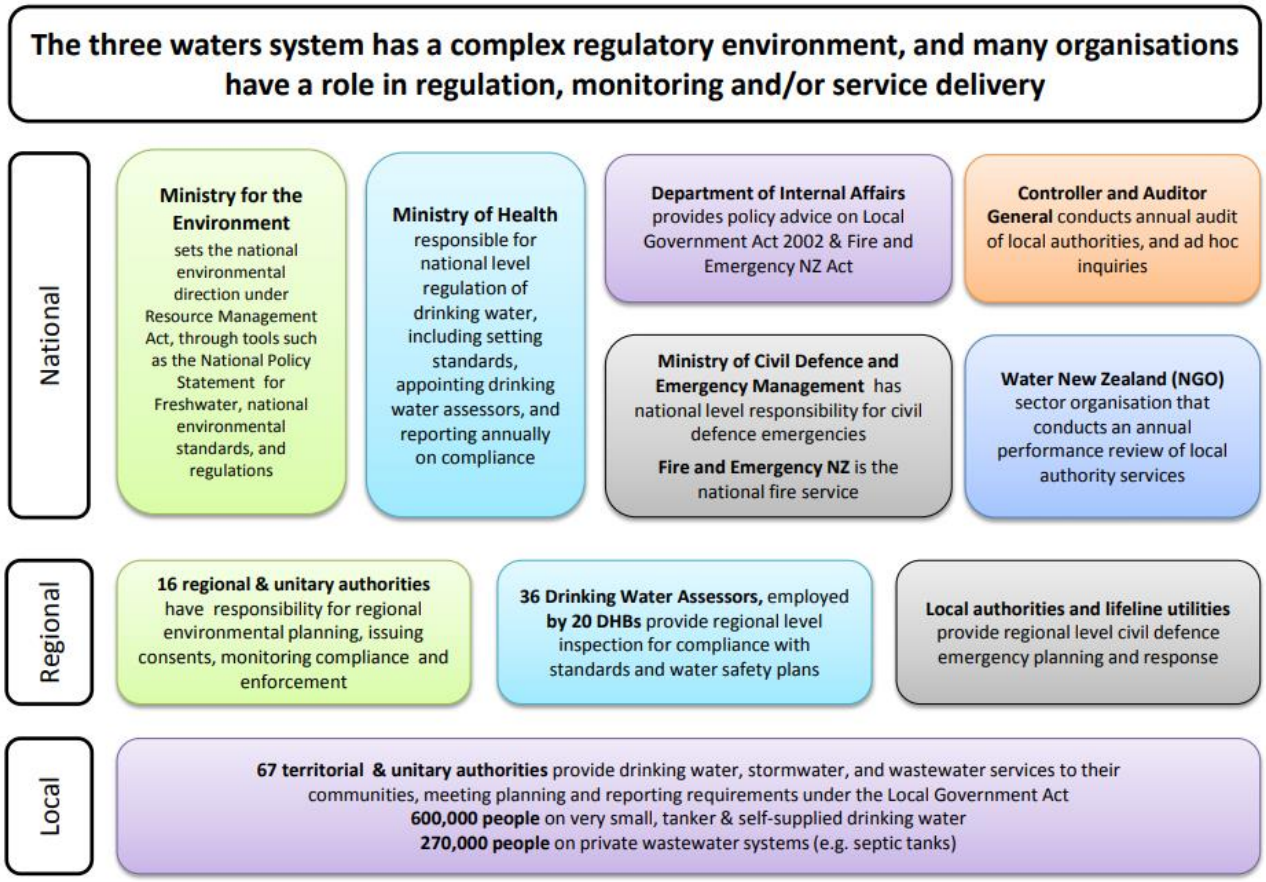
Table 5 Discussion and response to key issues

Key Issue	Discussion	Our Response	Refer to AMP section
Implications of the Government's Three Waters Reforms and changes to legislation are likely to result in higher standards for water treatment and compliance costs.	The most significant emerging issue is the recently released three waters reforms. We will maintain a watching brief on the Government's Three Waters Reform Programme and evaluate other options as information becomes available.	• Continue to work with other West Coast councils on regional aggregation model • Explore joining Canterbury region aggregation model	Section 4.2 Legislation framework
Increased disruption to water services by extreme storm events (i.e. climate change)	Communities can be isolated and water services interrupted with more frequent storm events. With the major March 2020 flood event and the destruction of the Waiho River Bridge, sampling of the Fox Glacier and Haast water supplies was disrupted.	• Strengthen critical assets • Build community resilience to supply disruptions • Prepare and test emergency response plans • Set up contractor availability for range of events	Section 10.4 Climate change and resilience

Key Issue	Discussion	Our Response	Refer to AMP section
		• Use pragmatic solutions to resolve physical barriers and to ensure compliance monitoring can be undertaken as much as practical	
Challenge to meet the DWSNZ	Compliance with the DWSNZ is challenging for Council due to the geographical area with its remoteness and distance between communities. Sampling is often impossible due to road outages, weather events and community isolation. In general, the quality of water provided is good for at least 99% of the time.	• Compliant treatment equipment installations and new Water Treatment Plants (WTP) (Kumara, Fox, Whataroa) designed to meet DWSNZ • Capital works to meet protozoa criteria	Section 8.4 Asset condition and performance
Poor quality of asset information available for asset management planning and decision-making	Internal resourcing focused on day to day operational activities. Difficult to attract and retain suitable candidates in a remote district.	• Appointment of a dedicated asset manager to focus improvements not distracted by operational activities	Section 12 AM Practices
Risk of responsibility for raw / private water supplies under potential three waters review criteria	Rural water supply schemes (including Harold Creek and Mint Creek) have a variety of challenges affecting water capacity and quality. The rural schemes were originally designed as agricultural schemes not intended for domestic purposes; and as such none of the schemes meet the DWSNZ.	• Divestment of rural water schemes in accordance with legislative requirements and consultation	Section 0 Asset disposal
Improving Council's ability to report on mandatory performance measures	Improved reporting structure required including change to maintenance contract reporting to reflect mandatory measures.	• Telemetry installation / upgrades at all plants • Dedicated resource to input data and liaise with Drinking Water Assessor, Community and Public Health	Section 12 AM Practices
Investigating network water loss	There is currently poor knowledge for each of the schemes on leakage.	• Water flow monitoring • Develop leakage management programme consistent with good industry practice • Leaks and losses programme to be implemented • Implementing new water meters on commercial and industrial properties as well as monitoring for potential extraordinary consumers and improved metering to determine daily and peak volume demand.	Section 8.4 Asset condition and performance

The figure below shows the complexity of three waters delivery (including drinking water) in New Zealand, with various national, regional and local authorities involved across service delivery, environmental compliance and health regulation.

Figure 3 Three waters complexity



Section 3 Strategic Direction

Strategic direction provides overall guidance to 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. The strategic direction for Council's AM function is set by the AM Policy and the 30-year Infrastructure Strategy (which includes the Asset Management Strategy). Refer to Section 4 (Key Linkages) for other documents and policies that guide the drinking water activity.

3.1 Vision and community outcomes

Council's vision statement is:

We work with the people of Westland to grow and protect our communities, our economy and our unique natural environment.

Council undertook an extensive engagement process in 2020 with the local Westland communities to define community outcomes, indicators and descriptors for each of the four wellbeings: economic, environmental, social and cultural. Following on from this work, Council adopted the following definitions and measures of success:

Diverse Economy	Sustainably Managed Environment	Resilient Communities
This means…	***This means…***	***This means…***
• **We work to find sustainable, diverse and resilient options for encouraging economic growth.** • **Innovation supports diversity from traditional district industries and sustainable economic growth.** • **We collaborate with other stakeholders to achieve common outcomes.** • **Economic growth has a minor / reduced impact on the natural environment.**	• The district is involved in sustainable waste management practices. • We support sustainable environmental practices. • We support strategies to enhance and protect the district's ecosystems. • Development is sustainable, meeting the needs of the present without compromising the ability of future generations to meet their own needs.	• All areas of the district have access to quality recreational and cultural facilities. • A community that cares for all members at all life stages to reduce isolation and promote inclusion. • Communities less vulnerable to natural hazards and climate change. • All voices are enabled and heard, power is more evenly distributed, and the community can share its strengths.
This is measured by…	***This is measured by…***	***This is measured by…***
• **Retention of residents in the district** • **Housing and employment for all life stages** • **Growth in small businesses** • **Growth in businesses outside of traditional Westland industries, i.e. technology based.** • **Fewer tourists who stay longer for high value activities.**	• Recycling increases and waste to landfill decreases. • Council meets central government environmental targets including 3 waters and carbon. • Zero tolerance for unsustainable and polluting practices. • Proactive planning around climate change. • Communities prepared for severe weather events and natural disasters.	• More opportunities for walking and cycling, connecting our communities safely and healthy. • Community participates in engagement and consultation opportunities. • Reduced social isolation. • Reduced crime and harm. • Community sees definitive action from local and central government after participating in engagement and consultation opportunities.

The drinking water activity relates to all three Community Outcomes: Diverse Economy, Sustainably Managed Environment and Resilient Communities.

3.2 Infrastructure and financial strategies

Council's 30 Year Infrastructure Strategy covers the core infrastructure activities including drinking water, wastewater, stormwater, flood control and land transport. It also covers to a lesser extent parks, reserves, cemeteries, solid waste, the West Coast Wilderness Trail, buildings and pensioner housing.

The Infrastructure Strategy identifies significant challenges and scenarios that Council faces. It outlines Council's strategy for managing these assets including how we intend to:

- Sustainably and responsibly manage the replacement of existing assets over their lifetime
- Financially plan for increases in levels of service or growth activities
- Manage and / or improve public health and environmental health responsibilities, natural hazard risks and infrastructure resilience.

The Financial Strategy outlines Council's financial goals and trade-offs for the next ten years and the impacts on rates, debt, levels of service and investments. It will guide Council's future funding decisions and, along with the Infrastructure Strategy, inform Council's capital and operational spending for the period covered by the Long Term Plan 2021-2031. The Financial Strategy should demonstrate that the Council's proposed approach is financially prudent.

The Infrastructure and Financial Strategies need to be consistent and integrated and be informed by the AMPs.

3.3 Prioritisation

It is not pragmatic or financially prudent for Council to undertake works on all identified needs and address every priority at once. Council has to balance a number of considerations when allocating priority ratings for planned programmes of work. Generally, mandatory requirements such as statutory compliance take priority over discretionary activities. Other factors that affect the priority level of different works include:

- Public health risks
- Strategic fit for the organisation
- Planning for future demand, e.g. population growth
- Benefits versus risks
- Co-funding opportunities
- District distribution
- Readiness of contractors, employees, machinery, resource consents to implement works.

Where co-funding opportunities are available and there is a strategic fit for the organisation, Council generally gives these priorities. This enables Council to undertake activities for community benefit (increasing existing levels of service), or to meet future demand (growth) while minimising the cost to the ratepayer. As external funding sources available to Council change quite quickly, it has proactively sought external funding for relevant projects while such avenues of financial support are available, especially given the small number of rateable units within our geographically large rating district. In some cases, these external funding sources allow us to create new infrastructure in other areas of our district, enabling us to extend the district distribution of services in ways that otherwise would not be financially possible.

3.4 Strategic aspirations for each scheme

The table below details the issues and strategic approach affecting each drinking water network.

Table 6 Strategic approach for each drinking water scheme

Water Supply Scheme	Issues and Proposed Approach
Kumara	• New WTP is compliant with no foreseeable issues except surety of raw water quality. • Upgrade required to some sections of the piped network to address aged infrastructure. • Reservoir sealing is required to minimise losses. • Some sections of the network containing old AC pipework need replacing.
Arahura	• Current bore water scheme is subject to sea water infiltration and mechanical failure. • The risk posed by stock in close proximity to the shallow bore is also unacceptable. • An upgrade of the WTP is currently underway.
Hokitika	• WTP is in good condition. • Some sections of the network containing old AC pipework need replacing. • Additional metering and network monitoring are required.
Ross	• New intake required; options have been investigated. Working through process with landowner to secure approval for methodology to satisfy environmental requirements. • Some sections of the network containing ageing AC pipework need replacing. • Membranes at WTP will need replacement within the next five years.
Harihari	• Harihari WTP is in relatively good condition. • Some sections of the network containing old pipework need replacing. • Ridermain connectivity needs upgrading. • The current reservoir is situated in remote location. This presents accessibility issues. Consideration to be given to alternative location.
Whataroa	• Whataroa WTP is new and compliant with DWSNZ. • Some sections of the network containing ageing pipework need replacing.
Franz Josef	• WTP is in good condition. • Upgrade of sections of pipe network required to cater for growth. • Some ageing pipework will need replacing. • Variation to resource consent required to increase water take limit during peak season. • Additional metering and network monitoring are required. Consideration of Future Franz township location and connectivity with existing water network and potential growth.
Fox Glacier	• Existing plant is in poor condition and currently periodic E. coli transgressions occur. • A contract has been let for design and build of a new WTP. • New plant will have increased water take limit and continuous monitoring installed. • Some ageing pipework will need replacing. • Potential for growth and expansion requires water catchment boundary review.
Haast	• WTP is in good condition. • A new water reservoir is programmed (contract is let; installation pending) to replace existing tank which was in poor condition. This will also increase the storage capacity. • Some sections of the network containing old AC pipework need replacing. • Consideration for potential catchment boundary adjustment (subject to the water regulator).

Section 4 Key Linkages

4.1 Overview

AMPs are key inputs into the LTP which is Council's major planning document, mandated under the Local Government Act (LGA) 2002. The LTPs are prepared every three years to cover a period of ten years. The diagram below shows Council's planning cycle, including how the Community Outcomes feed into the LTP.

The AMPs are used as the reference point to inform the LTP and 30 Year Infrastructure Strategy. In addition, the AMP demonstrates to our stakeholders, including our regulators and customers, the effectiveness of our AM decision-making processes.

The plan covers a period from 1 July 2021 to 30 June 2031, with a particular focus on the work programmes planned for the next three to five years. It reflects Council's focus on achieving an optimal balance between the key elements of AM, which are service levels, cost and risk. As it is a working document, the AMP also describes the areas where we believe our AM processes, systems and data can be improved.

Figure 4 Strategic planning framework

There is a need to ensure that the AMP is consistent with all other relevant plans and policies, and that it complies with external legal constraints and obligations Council has to meet in undertaking this activity. Some of these aspects are listed in the following sections.

4.2 Legislation framework

The key legislation affecting the drinking water activity are summarised in the following table.

Table 7 Legislative requirements

Key Legislation	Implications for the Activity
Health Act 1956 and Health (Drinking Water) Amendment Act 2019	The Health Act focuses on improving, promoting, and protecting public health. The Drinking Water Amendment Act requires drinking-water suppliers to take all practicable steps to ensure they provide an adequate supply of drinking-water that complies with the New Zealand Drinking-Water Standards (DWSNZ). Suppliers must introduce and implement Water Safety Plans (WSP) for the water supply (if serving more than 500 people). It is a written document that helps identify and eliminate potential water contaminants which could cause water quality to deteriorate and become unsafe to drink. Water Safety Plans encourage the use of risk-management principles during treatment and distribution to reduce the risk of contamination. The existing WSP will transition from the existing MoH system to the new regulator system under the Water Services Bill. The key change is that the reasonableness provisions in the Health Act 1956 will not apply. Cost will not be a factor. The requirement to comply from the commencement date. Refer to Section 5.2.7 for details on Council's WSPs.
Utilities Access Act 2010	Outlines the processes and rules for coordinating infrastructure work being undertaken within road corridors by utility operators or where the works will affect the assets of utility operators.
Civil Defence Emergency Management Act 2002	Sets the expectation that Council services must continue to function at the fullest extent possible, during and after an emergency, while noting that this may represent a reduced level of service for a period of time.
Climate Change Response (Zero Carbon) Amendment Act	This Act allows the Minister to require specific central and local government organisations and 'lifeline utility providers' to produce an adaptation report covering climate change responses for essential services to the community, such as water, wastewater, transport, energy and telecommunications. The Climate Change Response (Zero Carbon) Amendment Act includes a target of reducing methane emissions by 24 to 74% below 2017 levels by 2050, and an interim target of 10% by 2030. It also has a target of reducing net emissions of all other greenhouse gases to zero by 2050.
Fire and Emergency New Zealand Act 2017	Section 195A sets out the legal obligation for local authorities to supply firefighting water within urban areas. Also outlines the flow, storage and volume requirements.
Health and Safety at Work Act 2015	Health and Safety legislation and associated regulations requires that the PCBU has an obligation to ensure that staff and contractors are kept safe at work. Also notes that this responsibility is shared as staff and contractors also have a duty of care. Ongoing changes to this act and associated new regulations means that health and safety measures will need continual improvement and monitoring.
Local Government Act (LGA) 2002	LGA requires Council to prepare a ten year LTP and 30 year infrastructure strategy which are reviewed in full every three years. The Act requires Council to identify all relevant practicable options for dealing with infrastructure issues (including drinking water) and assessing those options in terms of benefits and costs to current and future community wellbeing.

Key Legislation	Implications for the Activity
Taumata Arowai Water Services Regulator Act (2020) and Water Services Bill	The Taumata Arowai Water Services Regulator Act has been passed and the complementary Water Services Bill is expected to be passed in August 2021. The standalone Crown entity Taumata Arowai has been created to regulate drinking water. The objectives of Taumata Arowai are to: • Protect and promote drinking water safety and related public health outcomes • Effectively administer the drinking water regulatory system • Build and maintain capability among drinking water suppliers and across the wider industry • Give effect to Te Mana o te Wai, to the extent that Te Mana o te Wai applies to the functions and duties of Taumata Arowai • Provide oversight of, and advice on, the regulation, management, and environmental performance of wastewater and stormwater networks. A Water Service Bill will provide the regulatory system that Taumata Arowai will administer. The entity will have a holistic approach for water safety planning instead of focusing on the development of Water Safety Plans. For each water supplier, it is the anticipated that the planning activities will be a continuous process that evolves as external environment changes.
Public Works Act 1981	Gives Council the statutory mandate to acquire necessary land for public infrastructure.
Resource Management Act (RMA) 1991	Describes Council's responsibilities to protect natural resources including land, air, water, plants, ecology and stream health. This includes avoiding, remedying or mitigating any adverse effect on the environment. Also requires Council to obtain a resource consent for infrastructure works in certain scenarios. Council is also required to comply with resource consents for discharges and land use (i.e. designations for certain activities such as treatment plants) and to take into account the principles of the Treaty of Waitangi in exercising functions and powers under the Act.
National Policy Statement for Freshwater Management 2020	The National Policy Statement (NPS) for Freshwater Management 2020 directs local authorities how to carry out their responsibilities under the RMA for managing freshwater. Specifically, it requires regional councils to set objectives for the state of freshwater bodies in their regions and to set limits to meet these objectives. The Government is proposing a suite of legislative and regulation changes to improve the current management of freshwater. It is proposing amendments to the RMA, an updated NPS for Freshwater Management, an updated National Environmental Standard (NES) for Sources of Human Drinking Water, and new NES for Freshwater and Wastewater. This may mean that environmental protection will have priority over water intakes for public drinking water purposes. The potential reduction in water intakes may impact the existing treatment plant capacity.
Te Tiriti o Waitangi – Treaty of Waitangi	Agreement between Māori and Crown signed in 1840. Section 4 of the Local Government Act 2002 requires local authorities to 'recognise and respect…the principles of the Treaty of Waitangi and to maintain and improve opportunities for Māori to contribute to local government decision-making processes.' Sections 77 and 81 outline in more detail the expectations in terms of seeking contribution and involvement from Māori in consultation and decision-making processes.

4.3 Key standards and guidelines

The primary documents that guide service standards for the drinking water activity are summarised in the following table.

Table 8 Key drinking water standards and guidelines

Key standards / guidelines	Implications for the Activity
Drinking Water Standards for New Zealand (DWSNZ) 2005 (revised 2008, 2015, 2018)	Prescribes quality requirements for drinking water provided to consumers including maximum allowable concentrations of potentially harmful contaminants. Outlines the duty of care for Councils to take all practicable steps to provide water that consistently meets the desired quality standard. The two themes of the DWSNZ are: • Maximum acceptable values (MAVs) or water quality standards, which define the quality specifications for all drinking-water • Compliance criteria which specify monitoring requirements and remedial actions to be followed when a transgression of a MAV occurs.
Asset Management Policy (2019)	This policy gives guidance and direction on the development of Asset / Activity Management Plans.
Risk Management Policy 2011	Policy about how to appropriately address and manage organisational risks.
Engineering standards	Council uses the NZS 4404 as its engineering standard. This document has not been formally adopted as Council's formal engineering standard rather than the existing Council engineering standard (1999).
Water Safety Plans (WSP)	Prepared to meet the requirements of the Ministry of Health's drinking water assessors. The Water Safety plans cover the following: • Description of the supply, including the existing barriers to contamination and critical control points • Risk identification • Improvement schedule • Contingency plans to follow in event of failure of supply element • Plan for assessing water supply performance.
WDC Water Supply Bylaw 2016	Water supply bylaw sets out conditions for drinking water connections and outlines the responsibilities of Council and anybody connecting to the scheme for protection of water supply assets. It is recommended that the Water Supply Bylaw is updated to include catchment maps.
West Coast Regional Council Operative Land and Water Plan	Applies rules and conditions to various activities concerning the Region's lakes, rivers, groundwater, wetlands, geothermal water and river and lake beds.
Water New Zealand Best Practice Guidelines and Technical Documents	Water New Zealand is a national not-for-profit sector organisation that provides best practice guidelines in the provision of water supply. The guidelines include (but are not limited to) modelling, standards for treatment plants and water loss calculations, guides for occupational health and safety and underground utilities-seismic assessment and design guidelines. They also coordinate national performance benchmarking on an annual basis. Council may consider participating in the annual benchmarking to allow it to compare its performance with other small District Councils in its peer group.
Fire Fighting Standards (SNZ PAS 4509:2008)	This Code of Practice was developed to provide direction on what constitutes a sufficient supply of water for firefighting in urban fire districts. Refer to Section 8.4 Asset Condition and Performance on firefighting capability.

Note: Council currently does not have a boundary backflow prevention policy, and the development of such policy has been identified as an improvement action in this AMP.

4.4 Strategic studies

Relevant strategic studies that have been used to understand the current state of the network and to develop work programmes are summarised in the following table.

Table 9 Relevant strategic studies

Study Name	Network/Area	Brief description	Conducted by	Date of study
Fox Glacier Township Potable Water Network Model Report	Fox Glacier	Preparation of network model to enable Council to understand limitations of network and make more informed decisions relating to increased demand from tourism growth	Stantec	May 2019
Health and Safety Assessments and Review	Hokitika, Franz Josef and Haast	Audit of health and safety risks at existing facilities and recommendations for modifications to mitigate or remove risks	Council's Health and Safety Officer	2019
Hokitika Water Supply Model	Hokitika	Detailed description of the various stages involved in producing a fully calibrated model of Hokitika, alongside an operator's User Manual to support the Average Daily Demand and Average Day Peak Week working models.	Opus	May 2012
Hokitika Water Supply Capacity Review	Hokitika	An identification of the current capacity of the Hokitika system's raw water line, capacity of the Blue Spur Water Treatment Plant, storage and trunk main capacity to assess feasibility of providing increased town water supply to Westland Milk Products.	Opus	November 2013
Westland Milk Products Water Use	Hokitika	Water usage patterns of Westland Milk Products from 2001 to 2013 with projections for water use from 2014-2020.	Opus	January 2014

Section 5 Levels of Service

5.1 Our levels of service

A key objective of this plan is to match the levels of service provided by this activity and the associated assets with the realistic expectation of our customers and their willingness to pay for that level of service. These levels of service underpin the lifecycle management strategies identified in Section 8 and the forward works programme outlined in this Plan.

Levels of service can be strategic, technical or operational and in alignment with current industry standards. Levels of service may be based on:

- customer/stakeholder research and expectations regarding quality of service or types of services
- statutory requirements – legislation such as the Health (Drinking Water) Amendment Act 2019 automatically impacts on the way drinking water assets are managed as a minimum level of service is required for compliance
- corporate goals also guide the direction for the scope of current and future services and how they are delivered
- best practice and industry standards specify design and construction requirements and help to meet levels of service and quality benchmarks that customers need.

Levels of service were provisionally reviewed by Council's Engineering staff in 2020.

Levels of service and any changes to performance measures are consulted on as part of the LTP process. At this point in time, Council is only providing LOS to meet the DIA mandatory performance measures. Council wishes to focus on achieving the mandatory performance measures. Meeting some of these is a challenge as a small and remote district council, particularly drinking water quality.

The LOS and performance measures for the drinking water activity are summarised in the following table. A full description of LOS targets, measures and metadata over the next ten years is included in Appendix 14.1.

Table 10 Service level summary

Community Outcomes	Customer Outcomes	LOS Statement	Performance measure	Baseline results 2019/20 actuals	Current Year 2020/21 Target	2021/22 Target (year 1)
Resilient communities	Safety - water quality	Council supplied potable water is safe to drink	The extent to which the Council's drinking water supply complies with:			
			a) Part 4: Bacterial Compliance Criteria:	Not achieved - six out of the nine supplies are fully compliant with bacterial compliance criteria at both the water treatment plant and in the distribution zone (refer to note 1 below)	Seven out of the nine supplies (with Hokitika and Franz Josef compliant)	Nine out of the nine supplies
			b) Part 5: Protozoal Compliance Criteria:	Not achieved - Zero out of the nine supplies compliant with protozoal compliance criteria (refer to note 2 below)	Five out of the nine supplies (Hokitika, Ross, Harihari, Franz Josef and Haast)	Nine out of the nine supplies
		Customers are generally satisfied with the Council supplied water	The total number of complaints received by Council about any of the following (per 1,000 connections): • Drinking water clarity • Drinking water taste • Drinking water odour • Drinking water pressure or flow • Continuity of supply	Achieved 16 complaints per 1,000 connections (45 complaints and 2,755 connections)	<25 complaints per 1,000 connections	<25 complaints per 1,000 connections
Diverse Economy	Responsiveness	Request for service are dealt with promptly	Where Council attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times are measured:			

Community Outcomes	Customer Outcomes	LOS Statement	Performance measure	Baseline results 2019/20 actuals	Current Year 2020/21 Target	2021/22 Target (year 1)
			Attendance for urgent call-outs:	No data for attendance time (refer to note 3 below)	100% (2 hours)	100% (2 hours)
			Resolution for urgent call-outs:	Not achieved - 76%	100% (12 hours)	100% (12 hours)
			Attendance for urgent call-outs:	No data for attendance time	100% (24 hours)	100% (24 hours)
			Resolution for urgent call-outs:	Not achieved - 50%	100% (72 hours)	100% (72 hours)
Sustainably Managed Environment	Sustainable - Environmental performance	Council supplied water is reliable	The percentage of real water loss from Council's networked reticulation system	Not measured (refer to note 4 below)	*Target to be set*	*Target to be set*
			The average consumption of drinking water per day per resident within the District	Not measured (refer to note 5 below)	<500 litres per person per day	<400 litres per person per day

Notes:

1. Bacterial Compliance for 2019/20 - eight out the nine supplies comply with bacterial compliance in the distribution zone only. Fox Glacier was issued 4 boil water notices over the 2019-2020 year. Fox Glacier and Haast had E-coli detected in the After Plant (before consumers). E-Coli was not detected in the Haast distribution zone when the After Plant E-coli's were detected so there was no need to issue a boil water notice in these instances. While Arahura is compliant in the distribution zone, samples cannot be taken at the plant because there is no treatment plant.
2. Protozoal Compliance for 2019/20 - The data set for the Blue Spur plant in Hokitika was incomplete due to an equipment malfunction. A complete set is required for compliance. Ross failed part of the protozoal criteria due to turbidity being out or range for an extended period of time. Out of the remaining seven, Arahura and Fox Glacier treatment plants await upgrades to comply. Kumara, Whataroa, Harihari, Franz Josef and Haast require UV Pro-forma's to be lodged with the Drinking Water Assessor before compliance can be obtained. UV Pro-forma's relate to disinfections equipment at the water treatment plants. Kumara and Whataroa still require the correct plant data to be recorded and logged for compliance.
3. Responsiveness for 2019/20 - Council staff continue to work alongside contractors to review the Service Request process and system to ensure it is utilised correctly.
4. Percentage of real water loss for 2019/20 - Not currently measured, monitored in a number of ways including telemetry, water meters, repair programme, mains replacements and pressure management. This is in context with the Benchloss NZ Manual.
5. Council does not have the equipment to measure average consumption hence a new three yearly measurement was not performed in 2019/20.

5.2 LOS performance and analysis

This section discusses the performance measures that Council is currently not meeting. As well as levels of service reported on in each year's Annual Report, Council also has certain targets and limits to meet under the resource consents it holds for drinking water activities.

5.2.1 Compliance with resource consents

Improving resource consent reporting is a key operational priority for Council. Improved SCADA and telemetry are needed to better report on water take volumes. Take volumes in some townships (e.g. Franz Josef) may need revision and new consent applications filed to increase the volume of water take permitted to better meet demand.

Kumara and Franz Josef water supplies are likely to need a need resource consent to be lodged to allow for increased water take to service the demands of the respective communities. The list of existing resource consents is detailed in Section 10.3.

5.2.2 Water loss

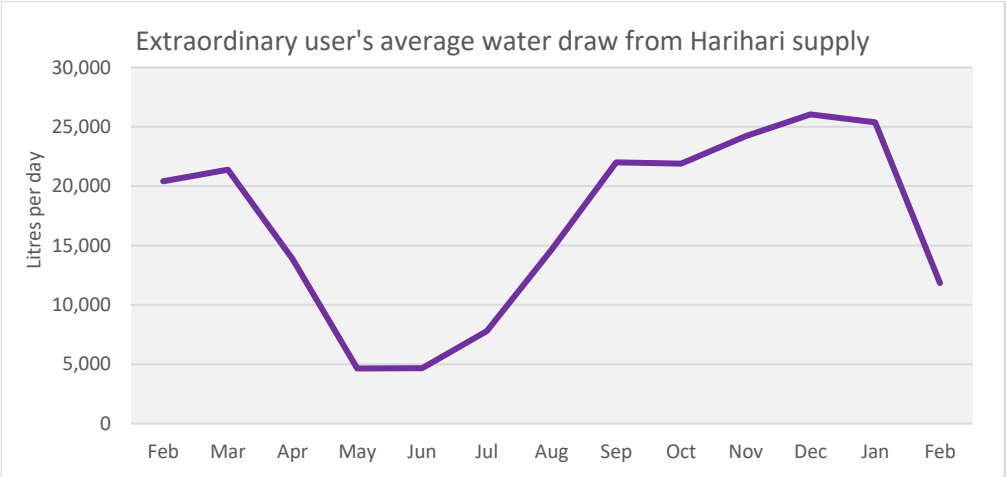
Council has not historically directly measured the percentage of real water loss (i.e. leakages) from the local authority's networked reticulation system due to the associated costs and resourcing needed. Council has recently installed some water meter devices at the WTPs and reservoirs to better measure for losses.

Real water loss excludes water loss due to other factors such as authorised unbilled use (e.g. for firefighting purposes or flushing) and apparent losses (e.g. meter inaccuracy or theft). The Kumara water supply network has a known water loss at present due to a leaking reservoir. This is scheduled for remediation in 2021/22. This means that, at present, the system cannot operate at any more than 80-85% storage capacity.

In the last few years, Council has identified a number of rural properties that were unmetered/using more than the allocation connections to the scheme. Further investigation is necessary for each scheme to better identify and manage unauthorised extraordinary usage by consumers.

The following graph shows the average daily draw from one unauthorised consumer was taking from the Harihari water supply scheme. At its peak over the summer season in December 2019 and January 2020, this exceeded 25,000 litres per day. This connection has since been removed from the scheme.

Figure 5 High usage for an unauthorised Harihari consumer



5.2.3 Average water consumption

The figures listed for average water consumption in the scheme overview table in Section 8.1 are based on operator data and on-line telemetry information where applicable. The accuracy of these figures cannot be guaranteed.

The only township with a higher degree of data confidence in average water consumption is Hokitika where seasonal variances have been identified. Winter water usage is estimated at 253 litres of water per person per day and summer water usage at 440 litres per person per day (once Westland Milk Products' and Silver Fern Farm's usage data have been excluded). Council intends to undertake further analysis to improve the confidence in usage information.

5.2.4 Temporary advisories

The requirements for monitoring water quality were recently amended and all samples must now be enumerated at the time of initial samples. Council typically places a temporary boil water notice on any scheme that tests positive for E. coli in the plant or distribution zone area. These notices are sent immediately via e-Txt to consumers and a notice is placed on Council's website.

Temporary boil water notices are infrequent but most commonly affect Arahura and Fox Glacier schemes. Both of these treatment plants have upgrades scheduled.

5.2.5 Bacterial compliance

DIA requires Council to collect data and report on compliance with Part 4 of the DWSNZ (refer to Table 11). This relates to bacterial water contamination and provides consumers with information on whether their water supply is deemed potable. Water samples are taken at the treatment plants and within the distribution zone and reported on separately by each township and scheme.

E. coli samples are also taken as part of the testing regime. The table below shows Council's community water supplies' bacterial compliance results for 2019/20 at plant and zone levels.

Table 11 Compliance with Part 4 of DWS

	Plant Compliance			Zone Compliance	
Bacterial Compliance	**Technical sampling compliance?**	**Water quality compliance?**	**Reason for Non-Compliance**	**Bacterial Compliance in Zone?**	**Reason for Non-Compliance**
Kumara	Yes	Yes	E. coli	Yes	
Arahura	No	Unknown	Insufficient sampling	Yes	
Hokitika	Yes	Yes		Yes	
Ross	Yes	Yes		Yes	
Harihari	Yes	Yes		Yes	
Whataroa	Yes	Yes		Yes	
Franz Josef	Yes	Yes		Yes	
Fox Glacier	Yes	No	E. coli	No	E. coli
Haast	Yes	No	E. coli	Yes	

Source: Ministry of Health's DWO (as at June 2020)

It is noted that improvement works to construct a new bore and build a treatment plant at Arahura and to upgrade the treatment plant and processes at Fox Glacier are progressing.

5.2.6 Protozoal compliance

Part 5 of the Drinking Water Standards relates to protozoal compliance. The table below shows Council's water supplies' protozoal compliance results for 2019/20. As part of the 2020/21 Annual Plan projects, seven out of the nine WTPs will have the implementation of exception reporting on transgressions which forms part of the protozoal compliance. The WTPs with UV treatment require confirmation from the DWA that the UV proformas submitted (or will be submitted) are validated.

Table 12 Compliance with Part 5 of DWS

Plant	Protozoal Compliance?	Reasons for Non-Compliance	What's being done to comply in future?
Kumara	No	lack of reporting of continuous turbidity, UV intensity (UVI) and flow monitoring data	Implementation at new water treatment plant will solves these issues along with updated sampling schedule to meet compliance
Arahura	No	No Particle removal barrier	Treatment plant upgrade pending
Hokitika	No	lack of collection, analysis and reporting of continuous turbidity monitoring data	Improvements with SCADA have solved this issue
Ross	No	lack of collection, analysis and reporting of continuous turbidity monitoring data	N/A
Harihari	No	lack of reporting of continuous turbidity, UV intensity (UVI) and flow monitoring data	Ongoing improvements planned with telemetry/SCADA for compliance reporting
Whataroa	No	lack of reporting of continuous turbidity, UV intensity (UVI) and flow monitoring data	Implementation at new WTP will solves these issues along with updated sampling schedule to meet compliance
Franz Josef	No	lack of reporting of continuous turbidity, UV intensity (UVI) and flow monitoring data	Improvements in SCADA have solved this issue
Fox Glacier	No	Did not have a complete particle removal barrier, had a reported filtration failure/turbidity incident at the time when there were a series of E. coli detections	Treatment plant upgrade pending
Haast	No	lack of reporting of continuous turbidity, UV intensity (UVI) and flow monitoring data	Improvements in SCADA have solved this issue

Source: Ministry of Health's DWO (as at June 2020)

Table note:
UVI = UV intensity
UVT = UV transmittance

The main reason for non-compliance is lack of continuous monitoring. All WTPs will have suitable telemetry in place by 2022. This will ensure the compliance reports can be prepared.

5.2.7 Water Safety Plans

The Healthy (Drinking Water) Amendment Act 2019 requires all drinking water suppliers to demonstrate that they are providing safe water. WSPs are a compliance tool used as a key element of a drinking water supplier's quality assurance. These plans promote a risk management culture to the drinking water industry for New Zealand communities. Council completed a review of its WSPs following the Havelock North incident. This review informed the update of the activity risk register for the development of the 2018 AMP, but the detailed improvement report was not available for this AMP.

WSPs have a holistic view from the catchment to the consumer considering predicted changes in demand for water services, current state of the water supply assets, identified risks and regulatory requirements.

There are transition arrangements with the Water Services Bill. Large suppliers (serving 500 or more) must have a WSP one year after the legislation commences (i.e. July 2022). Small suppliers (serving less than 500) have a five-year transition period. All suppliers must register by the end of the first year following commencement.

Suppliers must prepare and implement a WSP and continuously review it. Taumata Arowai has a responsibility to review plans according to their scale, complexity and risk profile. They will not be approved as under the current framework. Suppliers will also need a Source Water Risk Management Plan.

Regional councils must contribute to the plan and share information about risks. Taumata Arowai will review the WSPs and monitor compliance. Implementation of the plan will be considered during audits.

The current status of the WSPs is summarised in the following table. Six out of the nine WSPs have been approved and the remaining three require amendments before approval. Engineering consultants WSP have been engaged to complete the remaining three plans under the new format now required.

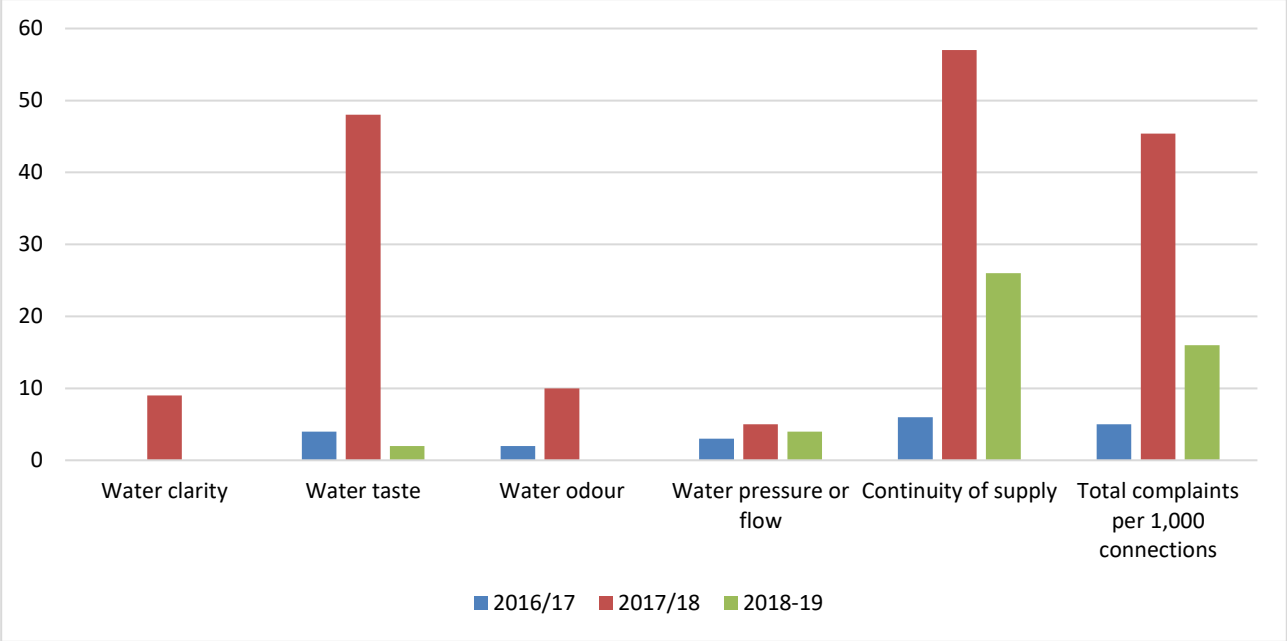
Table 13 Summary of water safety plans

Supply Scheme/Area	Water Safety Plan Status			Date of most recent approved version	Update due
	In place	Expired	Approved		
Kumara	Yes	No	Yes	December 2019	2022
Arahura	Yes	No	Yes	July 2019	2022
Hokitika	Yes	Yes	No	February 2017	Pending
Ross	Yes	No	Yes	July 2019	2022
Harihari	Yes	Yes	No	March 2013	Pending
Whataroa	Yes	No	Yes	December 2019	2022
Franz Josef	Yes	No	Yes	June 2019	2022
Fox Glacier	Yes	No	Yes	August 2019	2022
Haast	Yes	Yes	No	March 2011	Pending

5.2.8 Customer satisfaction

DIA requires Council to report information related to customer satisfaction and complaints. The number of total complaints from any of the issues for the past three years is shown in the following graph.

Figure 6 Drinking water complaints



Source: AssetFinda (as at June 2019)

The number of reported issues were very low in 2016/17. During this time, the staff utilisation rate of the correct technology for logging complaints was poor. This improved during the 2017/18 year. However, the number of complaints in 2017/18 was unusually high due to a number of extraordinary events. These included:

- a district-wide drought
- mining incident resulting in contamination of the Ross water supply catchment
- ACH chemical dosing issue at the Hokitika WTP.

At the same time, Council improved its external communications and actively encouraged the public to report issues and offered an added mechanism for them to report issues online using the Council website.

Further improvements were made with reporting mechanisms to the public with the implementation of 'e-texts' to advise customers in specific supply zones when issues had arisen and precautions. This included boil water notices or general statements where the supply would be impacted or turned off due to a leak or watermains break. This process made customers more aware of issues that were being worked through, and in most instances was seen as a beneficial as they were kept informed in real-time.

The 2018/19 year is most likely more reflective of an average year.

Section 6 Our Customers and Stakeholders

6.1 Customers and stakeholders

There are many individuals and organisations that have an interest in the management and operation of Council's drinking water assets and the provision of these services.

Council's Significance and Engagement Policy lists the drinking water treatment and storage infrastructure and reticulation network as being strategic assets. Council's Consultation Policy document further outlines when, why and how we consult, what decisions we consult on and whom we consult with.

Some of the key customers and stakeholders Council consults or (more informally) liaises with for drinking water activity are:

- **Elected members and Council committees**: Tenders and Operations Committees
- **Iwi partners**: Te Rūnanga o Ngāti Waewae and Te Rūnanga o Makaawhio
- **Regulatory authorities**: Ministry of Health including Drinking Water Assessors, West Coast Regional Council, Taumata Arowai, DIA and Audit New Zealand
- **Environmental agencies**: Department of Conservation and Fish and Game New Zealand
- **Funding Agencies**: Ministry of Business, Innovation and Employment (e.g. for Tourism Infrastructure Funding), DIA, CIP (Crown Infrastructure Partners)
- **Water customers**: Residential, commercial/industrial and rural water users
- **Community groups and Incorporated Societies** and special interest or working groups in townships that have a Council-run drinking water supply, including:
    - Kumara Residents' Association
    - Te Rūnanga o Ngāti Waewae and Arahura Marae
    - Destination Hokitika
    - Hokitika CBD Masterplan Working Group
    - Ross Community Society Inc.
    - Harihari Community Association
    - Whataroa Community Association
    - Franz Josef Community Council Inc.
    - Franz Josef/Waiau Community Forum
    - Franz Josef Governance Group
    - Fox Glacier Community Development Society
    - Glacier Country Tourism Group
    - Haast Promotions Group.
- **Service providers and suppliers** (including Westroads Limited who currently hold the three waters maintenance contract)
- **Westland Milk Products** (as the biggest individual user of water from the Hokitika water supply)
- **Neighbouring Territorial Authorities:** Buller District Council and Grey District Council
- **Internal stakeholders:** Transportation and Finance Managers.

Due to the small population of Westland, there are relatively open channels of communication between community groups and Council, thus enabling Councillors and staff to stay attuned to customer expectations.

There is also a relationship with the Department of Conservation in the form of concessions as some Council WTPs are located in National Parks.

6.2 Consultation

6.2.1 Purpose of consultation and types of consultation

Consultation with the community serves the purpose of gaining a better understanding of customer expectations and preferences.

Council's knowledge of customer expectation and preferences primarily is based on:

- Biennial formal residents survey undertaken by phone from independent research organisation (although this has not traditionally asked questions about drinking water)
- Alternate years' online customer survey conducted by Council's Strategy and Communications Officer
- Feedback direct from public via service requests, staff liaison with community groups or individuals or via elected members
- Levels of service consultation on specific issues via the Annual Plan and LTP processes
- Periodic Mahitahi Roopu meetings (with representatives from Department of Conservation, Te Runanga Papatipu, West Coast Regional Council etc.).

6.2.2 Consultation outcomes

The nature and extent of public consultation for this activity is highly prescriptive as defined by the relevant provisions of the LGA 2002 and other associated legislation. Council's main consultation for this activity is for individual projects through the Annual Plan and LTP consultation documents, submissions and hearings process. In addition to formal consultation, better communication with the public regarding drinking water issues is strongly recommended, in particular:

- To advise developers and their agents about any financial inputs or implications that may impact on the scheme; and
- Public notices about water meter installs to educate the public on the role of water metering in helping Council identify extraordinary consumers that are having an impact on the quality (due to potential backflow) and quantity of water available to ordinary consumers.

Section 7 Current and Future Demand

7.1 Demand drivers

The future demand for drinking water in Westland may change over time in response to a number of factors including:

- residential usage/population growth
- industrial/commercial usage patterns
- tourism trends and impact of COVID-19
- climate change and weather patterns
- implications of technological change.

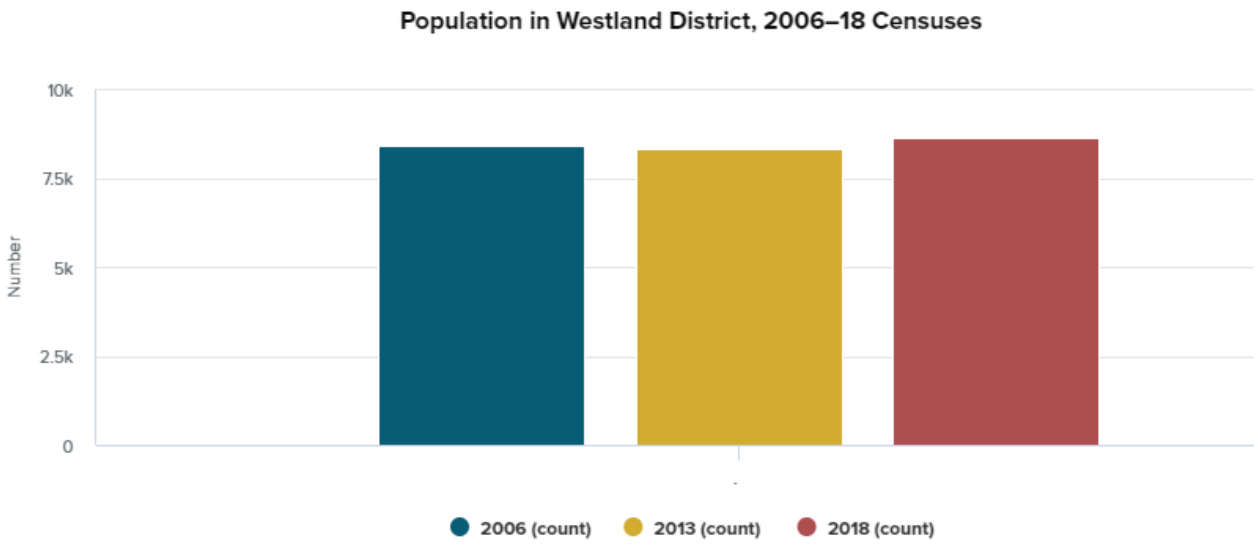
In addition, while legislative changes do not directly affect the demand for drinking water, they can alter the level of service requirements and/or the monitoring and reporting requirements. An example of this is revisions to the DWSNZ. For a full list of the main legislative inputs to drinking water, refer to Section 4.2.

7.1.1 Residential usage and population

Demographic changes such as an increase in population impacts the demand for water services. More people create more demand for drinking water. The geographic spread of population and residential growth can also lead to water supply boundary extensions.

The usually resident population in the district has remained relatively constant but is expected to decline in future years. Statistics New Zealand's 2018 Census showed 8,640 people as usually resident in the district when the data was released in September 2019, compared to 8,304 in 2013. This is a 4.05% increase in resident population since the 2013 census. The graph below shows the change in population numbers between the 2006, 2013 and 2018 censuses.

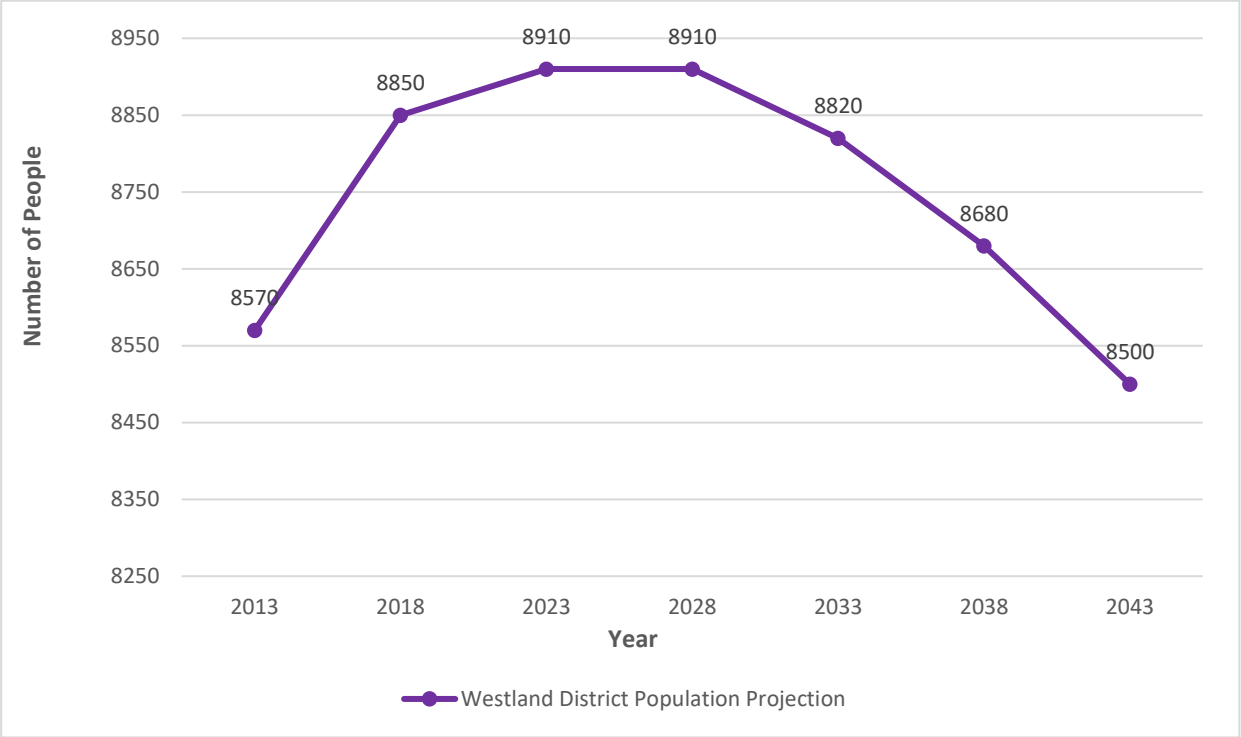
Figure 7 Population in Westland District – 2006, 2013 and 2018 census



Source: Statistics New Zealand

Figure 8 predicts population growth of approximately 0.7% for the ten years between 2018 and 2028, followed by a decline of approximately 4.6% by 2043, reducing the population below the 2013 level.

Figure 8 Westland medium growth projected population 30 June 2013 – 30 June 2043



Source: Statistics New Zealand

7.1.2 Industrial/commercial usage patterns

Approximately 70% of the average daily volume of treated water produced by the Hokitika WTP is consumed by Westland Milk Products, which is a major contributor to the Gross Domestic Product (GDP) of our District. Westland Milk Products have a dedicated supply pipeline and on-site storage reservoirs to ensure sufficient water is available.

The primary raw water source for Hokitika is from Lake Kaniere and at times when this is insufficient, water is also pumped from the Hokitika River to the treatment plant. This ensures there is always adequate water supply for the town even during peak periods of production at the milk factory, although this requires careful management to the township supply.

At this stage, industrial demand within the District is minimal. Major economic contributors are tourism (via accommodation and food services) and farming (via manufacturing activities such as through companies such as Silver Fern Farms and Westland Milk Products).

While there may be changes in the local industrial sector in the future, it is not expected that these will have a significant impact on the drinking water schemes, as most are adequately sized to absorb minor water demands from small to medium sized industrial activities.

Franz Josef has been the main area with commercial growth signals. However, the actualisation of these plans is very much in a holding pattern as outcomes of the Future Franz become clear and in light of the recent prevalence of serious storm, rainfall and flooding events which have cut off road access to both Franz Josef and Fox Glacier for weeks at a time. It has also been impacted by the global pandemic with no international tourists allowed into the country.

With Franz Josef now the only township with viewing access to a glacier from the road, it is likely that future tourism businesses will be set up in Franz Josef (once/if weather patterns stabilise, and Future Franz outcomes become clear). Staff accommodation needs may affect nearby Fox Glacier (only 30 minutes away) but it is unlikely that many new businesses such as hotels, retail and food outlets will take place in Fox Glacier at a significant level.

There are horticulture (market gardening) operators within our District, however, most are small-scale and/or abstract their water from private bores. Their water quality will also need to be reviewed in the future by Public Health and Environmental Health officers/agencies.

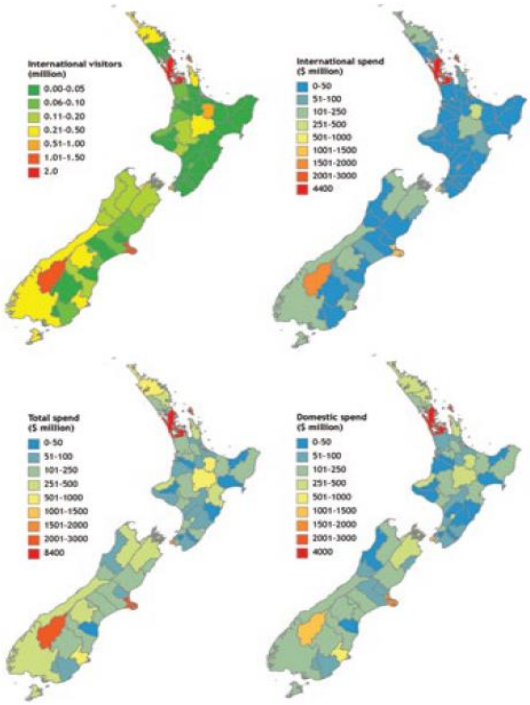
In Hokitika, Franz Josef and Fox Glacier there are commercial businesses that are on metered supplies and billed volumetrically. In addition, there are a few farms in Harihari that are also on metered supplies for water consumption monitoring purposes. It is intended that these activities are further removed and monitored for other water consumers.

7.1.3 Tourism trends

Annual international visitors to Westland District for year ended March 2019 was between 210,000 and 500,000 visitors based on the MBIE's International Visitor Survey 2019.

The annual spend of international visitors was between $101 to $250 million. The annual spend of domestic visitors was in the same bracket, making the combined annual spend of all visitors in our District for year ended March 2019 between $251 to $500 million. The geographic distribution of domestic and international tourists in shown below.

Figure 9 Geographic distribution of tourists



Source: International Visitor Survey and Monthly Regional Tourism Estimates, MBIE

Figure 3.1: Geographic distribution of international visitors, international tourism expenditure and domestic tourism expenditure for the year ended March 2019 by territorial authority. Distribution of domestic visitors is unavailable. Expenditure data is grouped by magnitude, except for Auckland (red in all maps), which is actual expenditure.

Although the international tourist numbers have dramatically stopped with the border closure due to the global pandemic, there has been relatively strong domestic tourist market in the District. It is expected that the tourist numbers will be moderate for the next two to three years until the international borders open again. The opening of the trans-Tasman border is expected earlier and will boost tourist numbers to the District. Some tourist operators and businesses (such as accommodation and businesses related to the Wilderness Trail) have not been impacted by the global pandemic and other have closed (such as souvenir shops).

The global pandemic event has disrupted the national and local economies with the national lockdown and closing of international borders. The economic impact is expected to be smaller on Westland District than others. To date, the Westland District has thrived in the national lockdowns in 2020 with an increase in the domestic tourism market due to the closure of the international borders. The Wilderness Trail and associated support network has experienced strong demand even during the 2020 winter months, with a 10.5% increase for 2019/20. However, some tourist towns have suffered, particularly Franz Josef.

7.1.4 Climate change and weather patterns

The anticipated effects from climate change on Westland District include the following:

- An increase in seasonal mean temperature and high temperature extremes.
- A significant increase in rainfall in winter and spring for the entire district and more extreme rainy days.

- Increase in number of extremely windy days, potential change in wind direction with more Westerly winds in winter and spring.
- Seasonal snow decrease, duration of snow cover at lower elevation will decrease significantly.
- Some increase in storm intensity and thunderstorms (although minimal compared to rest of country).
- Franz Josef Glacier may retreat approximately five kilometres and lose 38% of its mass by 2100.

More detailed climate change predictions sourced from the Ministry for the Environment is in Section 10.4.

Climatic factors including rainfall, temperature and evaporation have potential to affect water supply and demand. The detailed implications of climate change are not clear, but it could impact security of supply in the future.

7.1.5 Council controls/regulation tools

Council has several tools that influence demand including metering and pricing, restrictions and public conservation and education programmes. Council monitors and manages the district's water resource. When conditions are dry, Council considers and introduces water restrictions, as necessary. In the 2017/18 summer season, Council introduced a water conservation levels system, which has four levels of conservation/restriction (refer below).

Figure 10 Council water restriction alert system

Alert Level	Alert Description	Locations
	Conservation: Residents are advised that the water supply is expected to come under duress. Please reduce non-essential water usage and be aware that this alert level may increase.	NIL
	Water on alternate days The water supply is under considerable pressure and large water savings are necessary. Hoses, sprinklers and garden irrigation systems can only be used on alternate days (even street numbers on even days; odd street numbers on odd days).	NIL
	Sprinkler Ban The water supply is under extreme pressure. Hand held hoses should only be used on alternate days (even street numbers on even days; odd street numbers on odd days). Sprinklers, garden irrigation systems, water blasting and other non-essential water use is banned.	NIL
	Total Watering Ban The water supply level is critical. All use of water outside the house is banned (except for emergency purposes e.g. firefighting). **Take all practical steps to reduce water usage immediately.**	NIL

The use of Council's e-TXT system allows staff to send text messages to consumers to alert of the water conservation status at times of high demand or water shortage.

7.2 Assessing demand

7.2.1 Current demand

There are various methods for assessing current demand. The primary methods used to assess and analyse demand include:

- Bulk water take (abstraction) and production – abstraction volumes are recorded from source water 'take' by flow meter and production is measured from meters at the WTP. Further reporting is needed by Council to better understand this correlation and align with resource consent conditions. The measure of water leaving the WTP and reservoir levels determine the peak demand in context of possibly needing to adopt any water restrictions.
- Non-revenue water and leakage are high-level assessments using calculations to estimate by volume produced per capita usage and also possible leakage. Further monitoring is also needed in this area to better understand peak demand and night flows as possible losses.
- High water user - More than half the total daily volume of water production in Hokitika is taken by one consumer, being Westland Milk Products. They provide monthly reports of their consumption which is used as a check against the total network consumption and confirms the current demand needs.
- Mandatory performance measure reporting – The two environmental performance measures (leakage and average water consumption) are currently not measured and reported on (refer to Section 5.2). Setting the measurement systems up is a priority and identified as improvement actions.

There are no capacity issues at WTPs as most have been recently upgraded for compliance with the DWSNZ. The possible exceptions to this are:

- Hokitika WTP - due to the effect of Westland Milk Products draw and their continual desire for higher volumes or levels of water quality (beyond those mandated by DWSNZ)
- Ross WTP – due to throughput affected by membrane damage from mining incident in 2017. These were scheduled for replacement in Years 3 and 4 of the 2021 LTP but with the 3 Waters Reform this project has been bought forward to the 20/21 and 21/22 year.

7.2.2 Future Demand

To identify future water demands, Council uses the following tools:

- Population growth data (Statistics New Zealand).
- Household and subdivision dwelling growth data (derived from building consents numbers and Planning Department resource consent applications).
- Research into tourism growth patterns (Ministry of Business, Innovation and Employment and Tourism West Coast).
- Research into growth expectation in industrial, commercial and rural sectors.
- Westland Milk Products projected trend use as this is more than half the total daily water production. Due to the 2019 sale to Chinese company, Yili, the future of Westland Milk Products in Hokitika is more secure and effectively guaranteed for the next 10 years. Therefore, this is expected to continue to be a major source of future water demand for the foreseeable future.

Council will monitor future tourist demand (domestic and international) on the drinking water activity.

7.3 Demand management

In addition to capital improvements, which alter the capacity of the water systems, there are also certain non-asset measures that can be taken to manage the demand for water services. This can include:

- policies to control consumer demand and guide investment decisions
- public education and consumer behaviour change programmes that encourage prudent and efficient usage of the existing water
- creation of water demand management plans and growth strategies
- restrictions to the Westland Milk Products usage at times of emergency or when community demand exceeds production capacity and there has been a possible issue with a raw water source ability to 'take' water.

Due to the static/slow population growth of the District historically, minimal attention has previously been devoted to demand management and has been reactive as required.

7.3.1 Council's approach to demand management

Council's current demand management strategies are:

- metering commercial and extraordinary consumers' properties
- advertising need for water conservation at times of high demand or water shortage
- maintaining a close working relationship with Westland Milk Products Ltd on their water use, particularly at times when demand exceeds supply.

A further breakdown can be found in the table below.

Table 14 Current water demand management measures

Demand Management Measures and Instruments	Currently Used
Reactive leakage repair	☑
Bulk metering of reservoir outlets to improve night flow monitoring	☑
Customer meter testing and replacement programme (Hokitika only at present)	☑
Ongoing capital upgrades and renewals programme	☑
Building new drinking water supply infrastructure	☑
Asset renewal planning (based on depreciation over useful life)	☑
Water modelling to improve system performance and monitor pressure – Franz Josef and Fox Glacier	☑
Information on Council's website and e-TXT	☑
Instruments – Regulatory Control	
Water conservation restriction system	☑
Water Bylaw 2016	☑

District flow pressure testing is not currently an item in the Utilities Management Contract. However, this is intended to be added into the new contract for 2021 onwards (frequency still to be determined –

possibly annually or biennially). The option to install restrictors on some connections must also be considered if future demands increase, including Westland Milk Products supply.

7.4 Assumptions

The key growth and demand assumptions are as follows:

- Population growth projections have been based on Statistics New Zealand data.
- Westland Milk Products will remain in Hokitika.
- Domestic tourist demand will continue to be moderate.
- International tourist demand will continue to be impacted by the global pandemic in the short to medium term.
- Raw water and untreated water supplies remain in Council ownership and management in the short to medium term.

Section 8 Lifecycle Management

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

8.1 Water asset summary

The major water asset classes are summarised in the following table.

Table 15 Water asset summary

Water asset class	Quantity
Pipelines (excluding service lines)	149km
Water treatment plants	8
Pump stations	3
Fire hydrants	346
Valves	581
Reservoirs	44
Water meters	210
Backflow prevention devices	18

Source: Council's AssetFinda (as at 30 June 2019)

8.1.1 Critical assets

Asset criticality is an essential measure for prioritising maintenance and renewal activities. Council has defined criticality according to the IIMM which defines critical assets as "those that have a higher consequence of failure and can potentially have a more significant impact on the organisation's objectives".

Drinking water assets have been classified in terms of criticality as very high, high, medium, low and very low, as summarised in the following table.

Table 16 Criticality ranking for drinking water assets

Criticality ranking		Water line assets	Water point assets
Most critical	1 – Very high	Major watermain - 300mm in diameter and greater	Treatment plants
	2 - High	Watermain – 100mm to 300mm in diameter	Reservoirs
	3 - Medium	Watermain – 100mm in diameter	Valves, fire hydrants, backflow preventer
	4 - Low	Ring/ridermain (50mm in diameter)	
Least critical	5- Very low	Service connections	Blank cap, dummy node

Assets are categorised in AssetFinda at component level based on the 1 to 5 ranking as described above. This practice is well established (in place for about eight years).

However, criticality is currently not used in the day to day operations mainly due to the contractor not using AssetFinda in the field. This will be a requirement with the new contract (refer to Section 8.5). It is intended to use asset criticality in operations as well as asset planning for renewals and new works. It is recognised that it takes time to build internal and external capability.

8.2 Water scheme overview

There are nine registered community water supply schemes managed by Council. The following table provides a summary of the schemes, and the size of the scheme (as defined by section 69G of the Health Act (1956)).

This shows that only the Ross scheme fully meets the DWSNZ. This is discussed further in Section 5.2.

Table 17 Overview of Council's water supply schemes

Water Supply Scheme	Installation date of Water Treatment Plant	Installation date of reticulation network	Age of Scheme (years)	Population supplied (per DWO database)	Water source	Size of scheme (per Health Act 1956)[1]	Treatment	Meets full DWSNZ	Length of reticulation network (km)	Consented daily take (m^3)	Storage Capacity (m^3)	Number of reservoirs
Kumara	2019	1976	0-43 years	318	Unnamed spring	Small	Mixed media and cartridge filtration and UV disinfection	No	8.2	130	247	1
Arahura	Pending 2021	2003	16 years	105	Bore	Small	Chlorination	No	2.8	86*	60	2
Hokitika	2008	1970	11-49 years	3,447	Lake Kaniere & Hokitika River	Minor	Chlorination and membrane	No	91.1**	12,100	7120	11
Ross	2012	1984	7-35 years	291	Jones Creek	Small	Membrane filtration and UV disinfection	Yes	10.6	518	540	2 x $270m^3$ (one treated, one raw)
Harihari	2009	1979	10-40 years	348	Bore	Small	Mixed media and cartridge filtration, UV disinfection and caustic soda	No	15.8	2,160	255	1
Whataroa	2019	2004	0-15 years	405	Bore	Small	Mixed media and cartridge filtration and UV disinfection	No	5.8	1,296	150	6
Franz Josef	2013	1970	6-49 years	2,611	Unnamed creek	Minor (seasonal variances)	Rapid Sand Filtration, UV disinfection and chlorination	No	11.1	200***	1800	3 x $600m^3$ (treated) + 8 x $30m^3$ (raw)
Fox Glacier	Pending 2020	1972	47 years	252	Carters Creek	Small	Chlorination and Filters (multimedia + cartridge)	No	8.9	150****	900	2 x $450m^3$ (treated) + $50m^3$ (pre-treatment)
Haast	2015	1983	4-36 years	110	Bore	Small	Mixed media and cartridge filtration and UV disinfection	No	5.0	216	227	1 x $227m^3$ + 2 x $30m^3$

** A capital project for new water treatment plant at Arahura is underway (March 2021 completion date). A resource consent for the new plant has been gained which has an increased daily take of up to $259m^3$*

*** Including Kaniere*

**** There is also an emergency water supply for Franz Josef drawing from the Tatare River, which allows for up to $803m^3$ to be drawn for a maximum of six weeks per year during summer droughts*

***** $750m^3$ is the consented daily take limit set under the resource consent granted for new Fox Glacier Water Treatment Plant (to be constructed in 2021). Current limit for existing water treatment plant is $150m^3$*

[1] Small drinking-water supply (the Act, section 69G) means a drinking-water supply that: supplies drinking-water to 101 to 500 people for at least 60 days per year; and is not a drinking-water supply to which paragraph (a) or paragraph (b) of the definition of neighborhood drinking-water applies. Minor drinking-water supply (the Act, section 69G) means a drinking-water supply that is used to supply drinking water to between 501 and 5,000 people (inclusive) for at least 60 days per year.

8.3 Water supply scheme descriptions

8.3.1 Kumara

The Kumara water supply scheme services the township. Water is sourced from an unnamed spring and supplies mostly residential properties. There are a small number of commercial properties and accommodation providers serviced by the water supply that are on metered supply and others yet to be metered.

The new Kumara WTP was commissioned in late 2019 and includes a multiple barrier approach to water treatment. This includes granular media filtration, cartridge filtration and UV disinfection. The operation of the new plant can be monitored remotely, and a number of online instruments are installed to monitor key treatment parameters including pressure, flow, turbidity, pH and UVT. Alarms are sent to the on-call plant operator in the event of a plant fault or parameter out of a set range. Water that has passed through the treatment plant is pumped to the town reservoir before it is conveyed to the township by gravity. The network reticulation length is 6km in length.

8.3.2 Arahura

The Arahura water supply scheme services the township. Water is currently sourced from a shallow bore, approximately 3 metres deep, located on Old School Road. Water from the bore is dosed with chlorine (sodium hypochlorite) as it is then pumped up to two 30m^3 reservoirs located on the terrace above Kumara Junction Highway. Water is then conveyed to the township by gravity.

Council is installing a new bore on land adjacent to the Arahura River and Old Christchurch Road. The new water source and associated WTP will be commissioned in 2021 and will provide a number of benefits including addressing issues with sea water intrusion. It will also allow for the Arahura Marae to connect to the scheme.

8.3.3 Hokitika

The Hokitika water supply is Council's largest water supply scheme serving the town and major commercial operator Westland Milk Products. Water is sourced from Lake Kaniere (the primary source) and also the Hokitika River (as a supplementary source during times of peak demand). During the Westland Milk Products' processing off-season, only the Lake Kaniere water source is needed as water demand is not high enough to require extracting water from the Hokitika River also.

Water sourced from the Hokitika River is more prone to fluctuations in pH and turbidity. Therefore, the pH is corrected during the treatment process and a flocculent (aluminium chlorohydrate) is added prior to water going through membrane filtration and chlorine disinfection processes.

Water is treated at the Blue Spur WTP. The plant has a new 165kVA emergency power generator that has sufficient capacity to run the entire WTP during a prolonged power failure. Treated water is then stored in the following three locations:

- Reservoirs adjacent to the treatment plant is where water is held for most residential and CBD businesses in Hokitika.
- A separate main directly supplies water to Westland Milk Products who have their own water storage facilities onsite.
- Brickfield Reservoir. This supplies properties located on Cement Lead Road, Brickfield Road, Hokitika Airport and other subdivisions on the terrace above the racecourse.

8.3.4 Ross

The Ross water supply scheme services the township located approximately 25km south of Hokitika and is accessible from Mount Greenland Road. Water is now sourced from Jones Creek after the Minehans Creek source was abandoned in 2017 following a slip from the bank above that pushed significant volumes of sediment and clay into the water source.

The creek is prone to flooding and can result in a loss or restriction of supply to the raw water reservoir. Water flows under gravity to a 270m^3 raw water reservoir located alongside the WTP. The reservoir also acts as a settling tank to allow sediment to settle. The frequency of major rainfall events and sedimentation can require frequent reservoir cleaning.

Plans for installation of a new water intake structure to improve capture of the creek flow are underway. This is expected to be installed and commissioned in 2021.

Water is treated at the plant by way of membrane filtration and UV disinfection. Treated water is then supplied to the township of Ross under gravity. The plant can be managed remotely by dialling into the plant computer. This will enable the plant operators and Council's engineers to view the current operation of the plant. The telemetry function also sends alarms to the on-call plant operator in the event of a fault within the plant.

8.3.5 Harihari

The Harihari water supply scheme is drawn from a 27m deep bore on Robertson Road in Harihari (approximately 70km south of Hokitika). The existing plant was commissioned in 2009. Water is treated by way of cartridge filtration, UV disinfection and pH correction (using a caustic soda solution). Treated water is stored in a 225m^3 storage reservoir above the township. Water is delivered to the reservoir under pressure and then to the township of Harihari under gravity. The plant is managed remotely via a VPN link to the plant computer. A generator is based at the Harihari plant to ensure its operation during a power failure. This is set up to automatically start when a power failure occurs.

A number of properties in Harihari are not connected to the treated township water supply but receive a raw water supply from the Harold Creek water source. There are discussions underway to divest Harold Creek raw water supply scheme with the concerned property owners.

8.3.6 Whataroa

The existing Whataroa WTP was commissioned in 2019 and developed in the same contract as the Kumara WTP. It has a similar multiple barrier water treatment process to Kumara and the same remote monitoring and alarm capabilities of the Kumara plant. Unlike Kumara, raw water for the Whataroa supply is drawn from a bore located on Whataroa Flat Road.

Treated water is stored in six 25m^3 plastic storage tanks located at the treatment plant site. These tanks were newly installed in 2019 and the pipework connecting the tanks has been configured to promote the circulation of water through the tanks and minimise potential stagnation.

8.3.7 Franz Josef (Waiau)

The Franz Josef water supply scheme services the township approximately 130km south of Hokitika. It is the second largest Council supply. Water is sourced from an unnamed creek in the hills above the plant and township.

The water is treated by being passed through a rapid sand filter before being disinfected with UV and dosed with chlorine (sodium hypochlorite). Water is then stored in treated water reservoirs before it is conveyed to the township under gravity.

An emergency supply system exists where water storage tanks in Cron Street can be filled with an alternative supply. Council holds a resource consent which allows for water to be drawn from the Tatare River for up to six weeks during instances of summer drought or periods of low flow in the creek. Water is pumped from the Cron Street storage tanks up to the raw water storage tanks at the plant site and then treated and distributed to connected properties in the same manner as usual.

A new water intake unit was installed and commissioned in 2018 to improve the capture of creek flow.

8.3.8 Fox Glacier (Te Moeka o Tuawe)

The Fox Glacier water supply scheme services the township in South Westland, approximately 160km south of Hokitika. Raw water for the water supply is drawn from Carters Creek, located approximately 400m east of the township of Fox Glacier, within Westland National Park. This water supply services private and commercial properties, including a few accommodation providers located in the township.

Water is fed via gravity from Carters Creek to a pre-treatment storage tank alongside the plant. Water is currently treated by way of multimedia and cartridge filtration and chlorine dosing and is then stored in two treated water reservoirs before being conveyed to the township under gravity. The operation of the plant is unable to be monitored remotely. However, alarms can be sent via text message to alert plant operators in case of high or low reservoir levels or if the main power supply goes off.

The procurement process is underway for a design/build contract to construct a new water treatment plant for the township of Fox Glacier. Due to the age and condition of the existing plant, it is necessary to provide a modern facility to meet DWSNZ criteria. Analytical equipment has been installed which will provide necessary data to enable contractors to further progress designs. The project is expected to be completed late 2021.

8.3.9 Haast

The Haast township water supply is Council's southernmost treated water supply. It supplies a small number of residential homes, businesses and accommodation providers located directly in the township of Haast. However, it does not service the larger holiday parks, visitor centre, airport or hotel located on the State Highway 6 junction to the north of the township. In the future, subject to need, potential connectivity of these premises by extension of the Haast water catchment boundary may be investigated.

Raw water is drawn from a bore on the western bank of the Haast River, approximately 450m to the east of the township. Water is pumped from the bore to the adjacent water treatment plant and is treated by way of multimedia filtration (gravel, coarse garnet, fine garnet, sand and anthracite) and UV disinfection. Treated water is pumped up to a reservoir located on Zillian Hill and then conveyed to the township by gravity. Operation of the plant is managed remotely via a satellite broadband link to the plant computer. Alarms are also sent via this technology to alert plant operators to the breach of any conditions set within the plant computer. The existing plant was commissioned in July 2015 and has a maximum design flow of $6m^3$ per hour. The installed componentry allows for water to be dosed with coagulant if needed, however, this is not required currently.

There are some water restrictions required during peak season due to the recent increase in tourism numbers.

8.4 Asset condition and performance

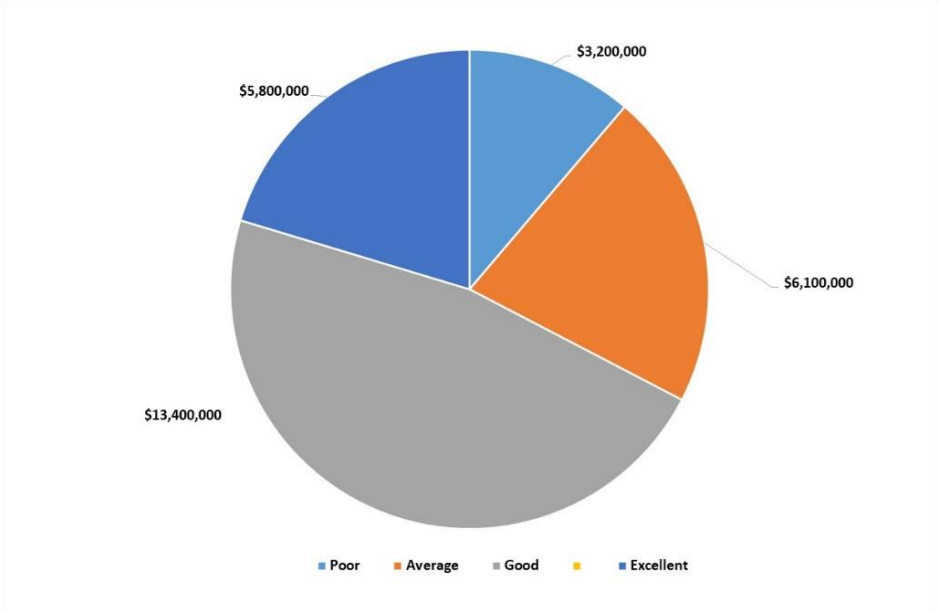
8.4.1 Asset condition

Understanding the condition of Council's drinking water assets helps inform better decision-making.

The condition rating recorded in AssetFinda is currently based on age (about 98% of the assets) and not physical site assessment. It is intended to verify the asset condition with additional internal resources starting. The initial focus will be on the critical drinking water assets (above ground assets). Good industry practice is to survey asset condition about every three to five years. For below ground water assets, condition is assessed through analysing break data. These practices still need to be adopted and implemented and identified as improvement actions.

The condition rating of the pipeline assets district-wide is shown below. This shows that about half (or 47%) of pipeline assets rated in good condition and about 11% rated in poor condition. The site verification will investigate the assets initially assessed as poor.

Figure 11 Water pipeline condition



Source: AssetFinda age data (as at August 2020)

Council's drinking water assets and their age-based condition by geographic areas are shown in Table 18.

Table 18 Age-based drinking water assets condition assessment

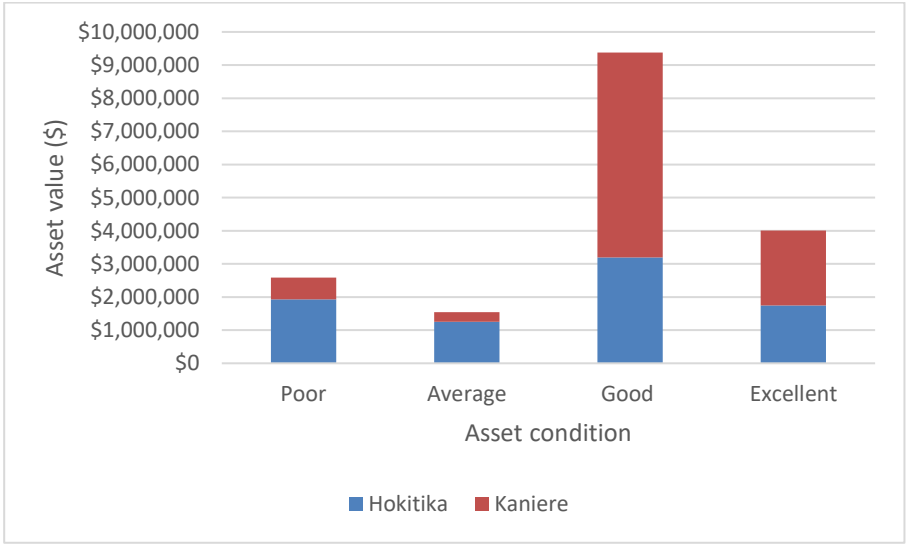
Sub Group	Geographic Area	Age-Based Infrastructure Condition				
		Very Poor	Poor	Average	Good	Excellent
Pipelines	Arahura				99.7%	0.3%
	Fox Glacier		11%	1%	83%%	5%
	Franz Josef		14%	20%	51%	15%
	Haast			0.2%	96.%	3.8%
	Harihari			0.5%	98.7%	0.8%
	Hokitika (includes Kaniere)	2%	11%	12%	62%	13%

Sub Group	Geographic Area	Age-Based Infrastructure Condition				
		Very Poor	Poor	Average	Good	Excellent
	Kumara		10%	10%	72%	8%
	Ross	6.4%		5.3%	88%	0.3%
	Whataroa			0.3%	99.6%	0.1%
Treatment Plants, Pump Stations & Reservoirs	Arahura	15%	23%	24%	38%	
	Fox Glacier	54%		14%	29%	3%
	Franz Josef	9%	4%	7%	78%	2%
	Haast	26%	2%	12%	48%	12%
	Harihari	6%		65%	29%	
	Hokitika (includes Kaniere)	6%	17%	36%	37%	4%
	Kumara	16%		42%	42%	
	Ross	5%	5%	26%	59%	5%
	Whataroa	25%	13%	12%	25%	25%
Fittings	Arahura				100%	
	Fox Glacier	31%	1%	7%	59%	2%
	Franz Josef	44%	4%	4%	35%	13%
	Haast	3%	63%		14%	20%
	Harihari		70%		30%	
	Hokitika (includes Kaniere)	14%	9%	18%	38%	21%
	Kumara	3%	22%	11%	61%	3%
	Ross		53%	4%	42%	1%
	Whataroa				100%	

Source: AssetFinda age data (as at August 2020)

The condition rating of the Hokitika town's watermains and pipelines (including Kaniere) is shown below. This shows that the Kaniere pipework is generally in much better condition that Hokitika. This would be expected as Kaniere is a much newer area.

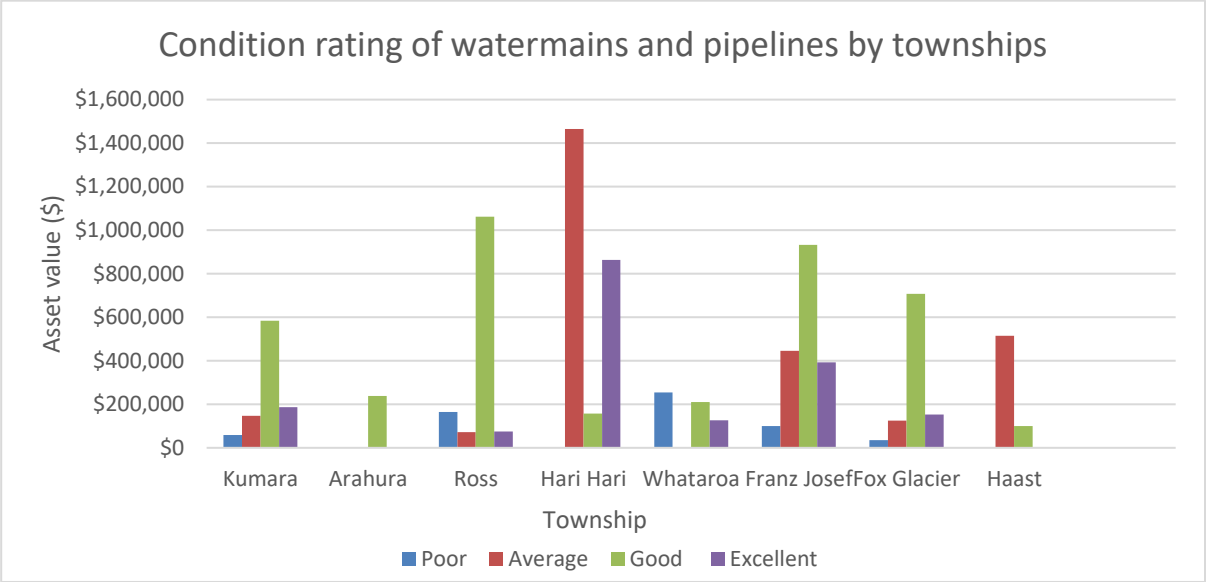
Figure 12 Condition of Hokitika pipelines including Kaniere



Source: AssetFinda age data (as at August 2020)

The condition rating of the watermains and pipelines in Westland's smaller townships is shown below.

Figure 13 Condition of pipelines for smaller townships



Source: AssetFinda age data (as at August 2020)

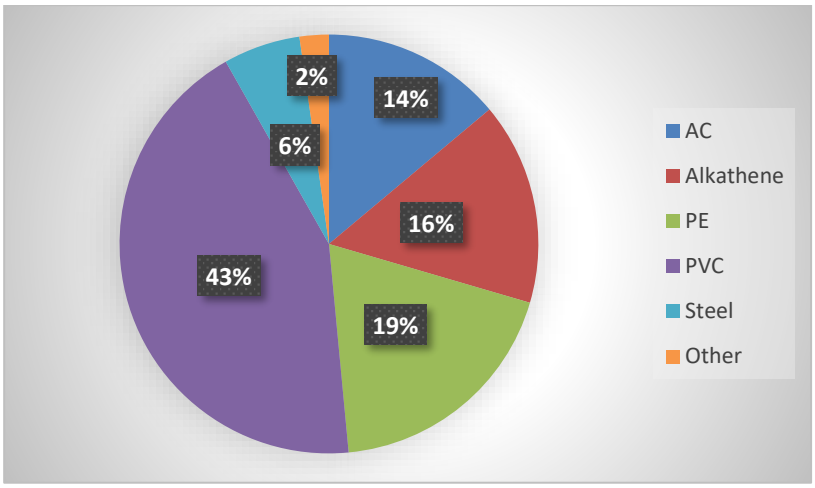
A summary of the asset condition and material type in each scheme is detailed in Appendix 14.2. Hokitika pipe material is shown below as it is the largest township.

Hokitika

While there is a high proportion of good condition pipework in Hokitika, there is also a significant proportion of pipework that is aged. Some of these require urgent renewal. The varying pressure zones in the network place greater risk where high pressures exist. Most leakage issues experienced are at the connection point of service laterals with the watermain.

The length of reticulation in Hokitika is 92km and nearly 13km is Asbestos Cement (AC) pipe material.

Figure 14 Pipeline material breakdown for Hokitika



Source: AssetFinda age data (as at August 2020)

8.4.2 Asset performance

Council uses pipe material as a proxy for asset performance. For drinking water assets, asset performance is also considered in terms of:

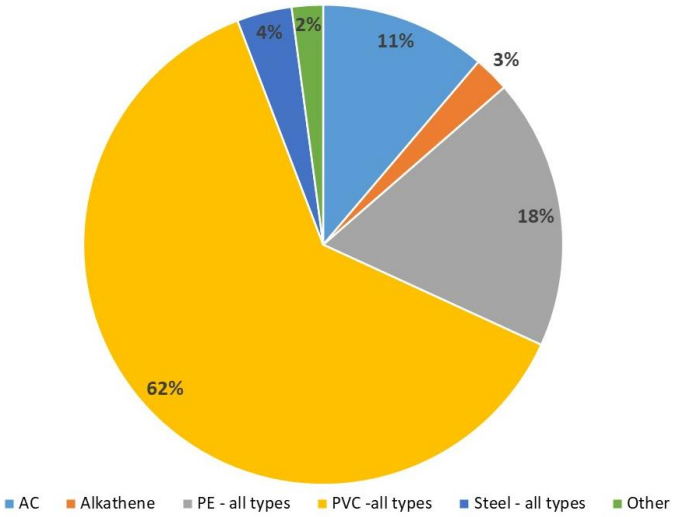
- Water quality (refer to Section 5.2)
- Resource consents (refer to Section 5.2)
- Firefighting (refer below)
- Leakage management (refer to Section 5.2)
- Backflow (refer below).

It is noted that Council currently does not have a boundary backflow prevention policy and its development has been identified as an improvement action.

In AssetFinda, Council's water assets have performance ratings assigned to them. However, it is believed that in most cases the classifications are default settings, rather than based on performance tests. Improving knowledge of asset performance and updating AssetFinda accordingly is a recommended future action.

Overall, most of Council's drinking water pipelines are made of either PVC (62%), polyethylene (PE) (18%) or asbestos cement (AC) (11%).

Figure 15 Pipe material breakdown for all townships



Source: AssetFinda age data (as at August 2020)

It is noted that most unplanned pipe repairs are generally on old AC pipes (e.g. rider mains and service laterals), therefore asset performance of these assets is considered poor. Where major critical AC pipes have been identified, these have been prioritised for renewal.

In Hokitika, the majority of pipe failures occur at the junction of the lateral and mains in the middle of the road, or near the State Highway, due to vibration from railway line and truck loads.

8.4.3 Firefighting

Council is still working through checking compliance with FW2 Standard from the New Zealand Fire Service Firefighting Water Supplies Code of Practice (SNZ 4509:2008). In highly commercial, central business district areas in Hokitika and Franz Josef, a FW3 standard will be provided at the discretion of Council. Council considers it the responsibility of business owners to provide their own systems if their building requires a higher firefighting standard to be met.

GIS mapping of fire hydrants in Hokitika and Franz Josef to validate spacing of fire hydrants will be undertaken to check compliance against the code. There are two low pressure zones within our existing reticulation as follows:

- Kaniere from Pine Tree Road to the Eastern end of our reticulation. This could be remedied with a possible booster pump station or pipeline upgrade.
- Whitcombe Terrace – No low pressure service requests are received from residents in this area, but it is known that the flow rates are only marginally above the fire safety minimum levels.

8.5 Operations and maintenance

8.5.1 Key maintenance and operational themes

The key operations and maintenance themes are:

Compliance

This involves water sampling, monitoring and testing to meet the conditions of DWSNZ and resource consents.

Mains breaks and networks failures

These occur for a variety of reasons including system over pressure, aged pipes and fittings, surges and water hammer, ground movement and contractor damage. Council's maintenance contractor provides a 24/7 service which covers the operation and maintenance of the network including water treatment plants and reticulation.

Operation of Treatment Plants

Water treatment plants are operated by Council's maintenance contractor. All treatment plants are essentially un-manned but can be monitored remotely via SCADA/Telemetry. Both Contractors and Council Engineers have access to this. The plants are visited three times per week to ensure correct operation and water sampling is carried out to achieve compliance with the DWSNZ.

Preventive maintenance checks include operating generators and standby equipment, and data collection are also carried out during these site visits. Council's contractor also undertakes water meter reading.

8.5.2 Maintenance contract

The operation and maintenance of the drinking water networks is part of the Westland District Utilities (3 Waters) Maintenance Contract. The current maintenance contract was awarded to Westroads Hokitika Limited in 2013. It was extended in 2018 for one year. Due to uncertainty regarding the exact requirements of the pending three waters reforms from Central Government, it was extended again to avoid letting a new tender and then needing to make potentially costly variations to contract. It now expires on 30 June 2021.

Council intends to go to the market with revised work scope.

8.5.3 Maintenance strategies

Maintenance works can be broken down into reactive maintenance and routine maintenance. The two main types of reactive maintenance are described above.

Routine maintenance is generally more proactive in nature. Some of the main activities carried out under routine maintenance are captured in the table below. The frequencies are indicative and specific instructions in the maintenance contract vary by locality.

Table 19 Summary of routine maintenance activities

Frequency (indicative)	Maintenance Activities (Check or Report)
Weekly or several times a week	Weekly maintenance programme includes: • Transfer and bore pumps • Inflow and Outflow meters • Reservoir levels • Intake checks • Membrane check • Chlorinator and chemicals • UV calibration • Check SCADA operational • Reporting urgent items to Council
Monthly maintenance	Monthly maintenance programme includes: • Generator operation • Flush mains in peak tourist season at critical locations • Flush all dead end lines • UV clean sensor • Reporting to Council
Quarterly and annual maintenance / checks	Annual maintenance programme includes: • Full electrical check by qualified electrician • Visual check for leaks in reticulation with listening device • Test, check, repair and paint all hydrants • Drain and clean reservoirs • 'Pig' Hokitika lakeline • Vegetation clearing lakeline • WTP building check

8.5.4 Historical operations and maintenance expenditure

The historical operational costs by township are summarised below for the last three years. The large operational cost for Franz Josef in 2017/18 was due to repairing damage after the cyclone and carting water while damaged mains were out of service.

Table 20 Historical water operational costs by township

Township	2017/18	2018/19	2019/20
Kumara	$30,752.05	$24,662.60	$19,556.30
Arahura	$15,806.70	$14,175.58	$12,236.18
Hokitika	$389,127.08	$251,107.35	$389,698.62
Ross	$86,249.86	$28,949.13	$37,346.59

Township	2017/18	2018/19	2019/20
Harihari	$85,650.30	$46,319.03	$58,972.34
Whataroa	$34,415.52	$32,367.23	$25,950.47
Franz Josef	$115,844.61	$42,230.92	$71,479.56
Fox Glacier	$34,292.00	$34,546.72	$55,148.14
Haast	$30,870.12	$25,420.57	$25,717.32
Total	**$823,008.24**	**$499,779.13**	**$696,105.52**

8.5.5 Forecast operations and maintenance expenditure

The operations and maintenance expenditure covers all day to day activities that are required to manage the drinking water activity. Due to new equipment installed at water treatment plants that have been recently upgraded, more operational maintenance requirements will be added to the Preventative Maintenance Schedule (subsequently increasing maintenance costs).

It is proposed that a maintenance budget of $1.2 million per annum would be sustainable for Council going forward.

Table 21 Forecast drinking water operational costs by township

Township	2021/22	2022/23	2023/24
Kumara	$35,708	$35,708	$35,708
Arahura	$22,247	$26,847	$26,847
Hokitika	$689,714	$690,114	$690,114
Ross	$51,568	$51,568	$56,568
Harihari	$84,356	$84,356	$84,356
Whataroa	$43,661	$43,661	$43,871
Franz Josef	$105,867	$105,867	$105,867
Fox Glacier	$38,477	$55,377	$70,377
Haast	$44,075	$44,075	$44,375
General Operating	$62,887	$62,887	$62,887
Total	**$1,178,560**	**$1,200,460**	**$1,220,970**

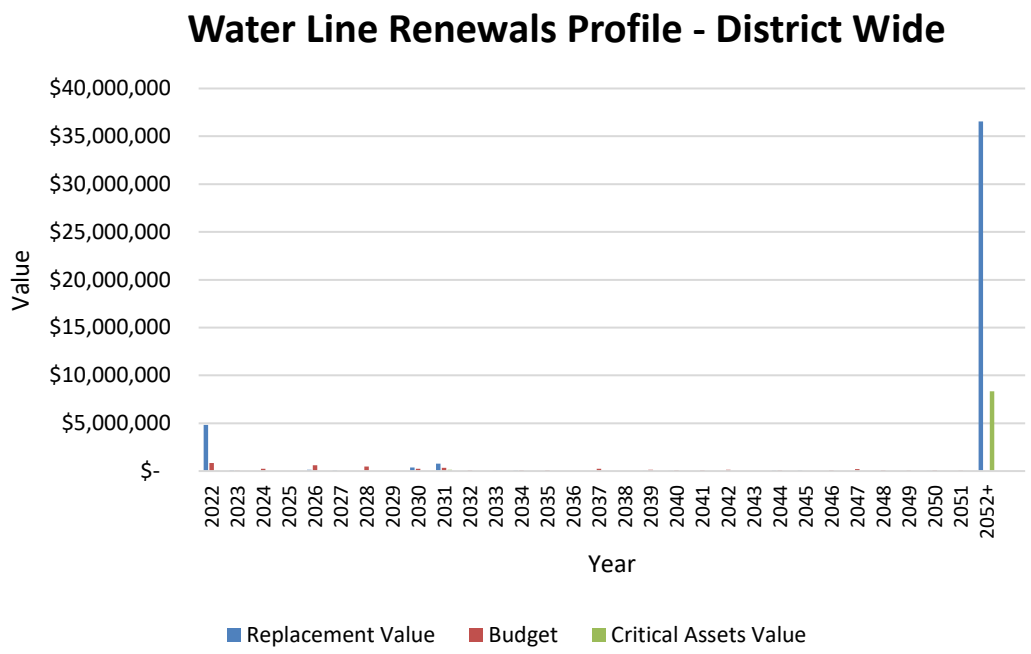
Source: Council's draft LTP budget (as at May 2021)

8.6 Asset renewal/replacement

Asset replacement expenditure that does not increase the asset's design capacity but instead restores, rehabilitates, renews or replaces an existing asset to its original capacity, using like-for-like materials is considered to be capital (maintenance) expenditure. Funding of work over and above an asset's original function or capacity is considered capital works (levels of service) expenditure.

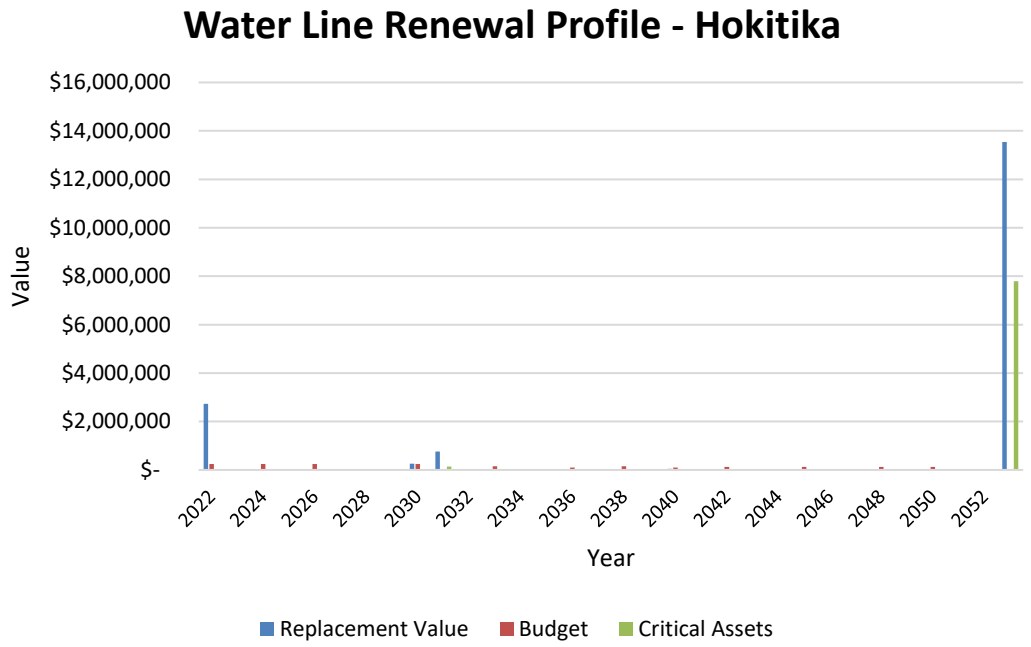
Council is in the process of making a stepped change from ad-hoc to proactive renewals and is continuing to improve its asset data practices allowing for better information to drive the renewals forecasts. The following figures show the renewal profile for drinking water pipeline and treatment plant assets based on age.

Figure 16 Water line renewals based on age versus planned budget



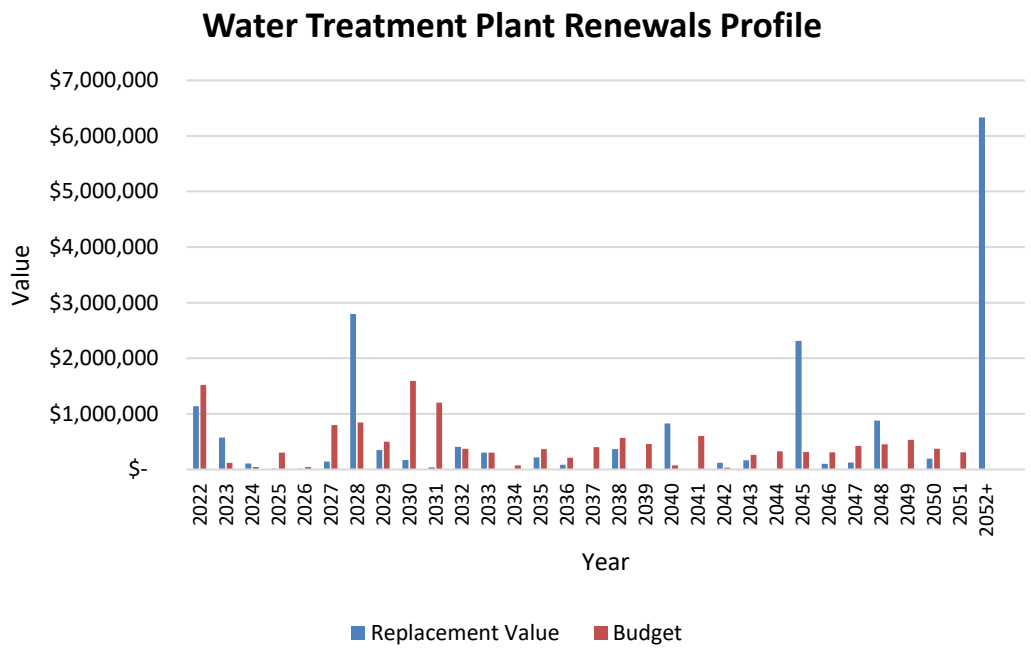
Source: AssetFinda age data (as at August 2020)

Figure 17 Water line renewals based on age versus planned budget – Hokitika only



Source: AssetFinda age data (as at August 2020)

Figure 18 Water Treatment Plant renewals based on age versus planned budget



Source: AssetFinda age data (as at August 2020)

8.6.1 Key asset replacement themes

Asset age, condition and performance is the primary consideration for determining asset end of life cycles driving the asset replacement programme. The asset criticality level is also considered when deciding which assets are a higher priority for replacement.

8.6.2 Asset replacement strategies

Assets are considered to need replacement when:

- health and safety concerns
- they near the end of their effective useful life
- cost of maintenance becomes uneconomic and it would cost less to renew the asset than keep maintaining
- risk of failure of critical assets is unacceptable.

Council's current renewal strategy is based on:

- asset failures
- undersized reticulation
- improving network resilience (LOS driven)
- operational knowledge.

Council wishes to move to a risk based water renewal programme based on analysis of break histories and taking into account criticality, material type, condition, resilience and other factors, to be consistent with good industry practice. This new approach requires internal capability and better information to make decisions. It is recognised that this step up in maturity will take time.

8.6.3 Forecast renewal expenditure

In Summary, the planned water supply renewals are about $630k per annum (on average over ten years). Refer to Section 9.4 for financial details.

8.6.4 Forecast renewals versus depreciation

Comparison with annual depreciation, historical and forecast renewal expenditure at major asset class level is summarised below. The forecast renewal expenditure of $700k per annum is approximately two-thirds the annual depreciation of $1.2 million. Given the overall good condition of the drinking water assets, wastewater renewals will be a focus of Council for the next ten years as these assets require accelerated investigation and increased investment.

Table 22 Renewal expenditure versus annual depreciation comparison

Asset class	Annual Depreciation (2019) ($)	Historical renewal (last three year average)	Ten year renewal forecast (average per year)
Lines	$366,776	$341,561	$696,457
Points	$65,529	$48,035	
Plant	$746,488	$0	
Total	**$1,178,794**	**$389,596**	

8.6.5 Key renewal projects

The key renewal projects planned for the next ten years are outlined in Table 23. We will focus on the replacement of WTP components and watermains renewals in Hokitika and Kumara for the first three years. In summary, the planned renewals are as follows:

Table 23 Key renewal projects

Township	Description	Year 1	Year 2	Year 3	Year 4-10	Ten-year Total
		2021/22	2022/23	2023/24	2024-31	
Districtwide	Replacement of Water Treatment Plant Components	✓		✓	✓	$225,000
Districtwide	SCADA/Telemetry at WTPs (50%)	✓			✓	$65,000
Fox Glacier	Watermain replacements	✓			✓	$254,500
Franz Josef	Mains replacement	✓			✓	$550,000
Franz Josef	WTP and reservoir upgrades (50%)				✓	$1,500,000
Haast	Mains replacement	✓				$40,000
Harihari	Mains replacement	✓			✓	$200,000
Hokitika	Brickfield reservoirs replace/repair		✓			$90,000
Hokitika	Blue Spur RTU - external logging for compliance (50%)	✓				$10,000
Hokitika	WTP improvements - modules 3				✓	$1,600,000
Hokitika	Mains replacement	✓		✓	✓	$1,250,000
Kumara	Mains replacement	✓	✓		✓	$320,000
Kumara	Reservoirs replacements				✓	$264,000

Township	Description	Year 1	Year 2	Year 3	Year 4-10	Ten-year Total
		2021/22	2022/23	2023/24	2024-31	
Ross	Mains replacement	✓			✓	$220,000
Ross	Replace WTP pumps (80%)	✓			✓	$162,500
Ross	Replace WTP membranes	✓				$213,570

Source: Council's draft LTP budget (as at May 2021)

8.7 Asset development

Expanding the scope of services by creation of new assets (growth) or increasing the capacity of existing assets (increased levels of service) is classified as asset development activities.

8.7.1 Capex projects to support increasing levels of service

For compliance with the DWSNZ, the WTPs at Ross, Harihari, Whataroa, Kumara and Franz Josef have recently been upgraded. Treatment plant upgrades are scheduled for Arahura and Fox Glacier to meet the standards in the next few years. There are no other treatment plant projects identified to support increasing levels of service.

These are projects that involve the creation of a new asset or alterations to an existing asset that means a higher level of service is delivered. These projects will be funded by loan and repaid from the operational funding sources. This includes addressing firefighting capability and strengthening resilience.

Table 24 outlines Council's drinking water LOS capex projects for the next ten years.

Table 24 LOS capex projects

Township	Description	Year 1	Year 2	Year 3	Year 4-10	Ten-year Total
		2021/22	2022/23	2023/24	2024-31	
Arahura	WTP upgrade	✓				$400,000
Arahura	New Generator (30%)	✓				$400,000
Districtwide	SCADA / Telemetry at WTPs (50%)	✓			✓	$65,000
Haast	WTP improvements (security camera, extenal logging, flow meters, generator)	✓				$60,000
Harihari	Seismic valves (main outlet)				✓	$40,000
Harihari	New reservoir	✓				$125,000
Hokitika	Reconfigure Blue Spur reservoirs	✓				$15,000
Hokitika	Blue Spur WTP renewals	✓				$10,000
Hokitika	Blue Spur new 1500m^2 reservoir	✓				$305,000
Kumara	Seismic valve install		✓			$30,000
Kumara	WTP remedial work	✓				$50,000
Ross	WTP Generator	✓				$40,000
Whataroa	WTP Generator	✓				$40,000
Whataroa	New bore	✓				$20,000

Source: Council's draft LTP budget (as at May 2021)

8.7.2 Capex projects to support growth

The district is not experiencing any significant population growth. However, the resident population in Glacier Country (Fox Glacier and Franz Josef) appears to have increased by 22.7% over the last five years. Smaller levels of population growth are being experienced in Kumara and the rural outskirts of Hokitika.

Any projects to support growth would likely be contained to these areas. Projects to support growth are generally loan funded. However, depending on the type of project, some funding assistance may be obtained from Central Government funding streams (although Council generally needs to cost-share and commit to 25%-50% of the total cost).

The only growth project currently forecast is for a new WTP for Franz Josef to coincide with the relocation of the township under the Future Franz development. The current location of the Franz Josef township is prone to flooding from the Waiho River and is situated in the Alpine Fault Avoidance Zone.

Table 25 Growth capex projects

Township	Description	Year 1	Year 2	Year 3	Year 4-10	Ten-year Total
		2021/22	2022/23	2023/24	2024-31	
Franz Josef	WTP and reservoir upgrades (50%)				✓	$1,500,000
Franz Josef	New raw water reservoir (70%)	✓				$100,000

Source: Council's draft LTP budget (as at May 2021)

8.8 Asset disposal

Council has no plans to abandon any of the treated, potable drinking water schemes in totality, except the possible relocation of Franz Josef township as noted above.

Assets within the system that are replaced or made redundant following renewal or upgrade projects are either abandoned, disposed of, or held in stock as spare.

A priority for Council was to investigate options for divesting raw water supplies (such as Harold Creek) and untreated water supplies for which rates are not collected (e.g. Jacksons Bay). The Mint Creek in Whataroa has recently been divested by Council to the community. There are discussions underway to divest Harold Creek raw water supply scheme with the concerned property owners.

Generally, it is not practical to extract buried pipelines, so these are capped and abandoned in situ. Most obsolete assets are removed or demolished to clear the site for their replacement or other use. Given the specialist nature of drinking water equipment and the fact that assets are generally not replaced until they reach the end of their serviceable life, it is not common for Council to have a redundant asset with a significant residual value. In the unlikely event that a redundant asset is available for sale, it is disposed of in accordance with Council policy. Most redundant assets are either disposed of to landfill or via recycling.

Section 9 Financial Summary

9.1 Overview

This section contains the financial strategy, valuation forecasts, financial forecasts, key assumptions and requirements resulting from all the information presented in previous sections.

The total projected expenditure for operations, maintenance and capital for the drinking water activity over the next ten years is $47.5 million, as outlined in Table 26. Section 9.3 and 9.4 provide further details of these expenditures. The expenditure cash flow projections are founded on:

- providing services that are appropriate, fit for purpose and represent value for money
- protecting the integrity of the asset
- continuing to maintain appropriate levels of service
- seeking to achieve the best investment on behalf of the community and general ratepayers.

Table 26 Financial summary – drinking water (uninflated)

Description	Projected Expenditure				
	Year 1	Year 2	Year 3	Year 4-10	Ten-year Total
	2021/22	2022/23	2023/24	2024-31	
Operational expenditure	$3,505,175	$3,660,651	$3,728,386	$26,791,282	$37,685,494
Capital expenditure					
Renewals	$1,128,570	$160,000	$295,000	$5,381,000	$6,964,570
LOS	$1,120,000	$30,000	$0	$90,000	$1,240,000
Growth	$100,000	$0	$0	$1,500,000	$1,600,000
Total	**$5,853,745**	**$3,850,651**	**$4,023,386**	**$33,762,282**	**$47,490,064**

Source: Council's draft LTP budget (as at May 2021)

9.2 Expenditure categories

Expenditure types are defined and reported as follows:

- Operating expenditure is used to fund the ongoing day to day activities and services of the Council. It is expensed (not capitalised) work that continues the provision of services provided by assets.
- Capital expenditure is used to replace existing deteriorated assets or components of assets to restore their remaining life and service potential and/or to increase the level of service or capacity provided.

Council categorises its capital expenditure projects as renewals, extending level of service or growth related projects. The following funding sources are used for each category under normal circumstances, with any alternative funding sources specifically resolved by the Council.

Renewal projects

Renewal projects restore or replace components of an asset or the entire asset to meet the current level of service (to its original size, condition or capacity). These projects will be funded from capital reserves built up from funded depreciation. Where the reserve is not sufficient to meet the programmed renewals, then loans will be utilised and repaid from a contribution from the reserve that best fits intergenerational equity and/or the operating funding sources for the particular activity as per the policy.

Extending level of service projects

The creation of a new asset or alterations to an existing asset that means a higher level of service is delivered. These projects are generally loan funded and repaid from the operational funding sources (i.e. rates). Where possible, applications for Central Government funding assistance will be lodged.

Growth projects

Additional assets required to serve growth in existing services due to new areas being served. These projects are generally loan funded and repaid from the operational funding sources (i.e. rates). Where possible, applications for Central Government funding assistance will be lodged where eligible funding schemes exist. Growth-related projects should go through a comprehensive business case process, including a cost/benefit analysis and risk assessment before being initiated.

Table 27 outlines the implications of meeting each of the expenditure category.

Table 27 Implications of expenditure category – drinking water

Expenditure programme	Justification	Consequences if budget reduced
Opex	To meet LOS for public health	Increased risk of public health issues with reduced service
Capex renewals	Adequate renewals to optimise life of assets	Increase in backlog that may never be addressed adequately
Capex new works	To meet the likely new legislative requirements for Drinking Water Standards	Investments in WTP upgrades will not meet future mandatory requirements

9.3 Operational expenditure summary

Table 28 outlines the drinking water operational expenditure for the next ten years. This shows that the annual operating expenditure is around $3.5 million per annum.

Table 28 Operational expenditure – drinking water (uninflated)

Description	Projected Expenditure										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Ten-year Total
	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	
Depreciation	$1,306,212	$1,400,020	$1,401,520	$1,401,545	$1,436,385	$1,436,385	$1,434,411	$1,469,144	$1,477,478	$1,503,006	$14,266,106
Overheads	$935,212	$968,873	$1,003,678	$967,173	$966,761	$1,013,674	$972,972	$972,691	$1,012,885	$966,363	$9,780,282
Interest and finance costs	$85,192	$91,299	$102,219	$108,119	$103,300	$105,335	$104,614	$100,711	$114,841	$170,988	$1,086,618
Operating costs											
Electricity	$254,100	$257,600	$257,900	$257,900	$257,900	$257,900	$257,900	$257,900	$257,900	$257,900	$2,574,900
Insurance Premiums	$116,831	$116,831	$116,831	$116,831	$116,831	$116,831	$116,831	$116,831	$116,831	$116,831	$1,168,310
Condition Assessments	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$10,000
Repairs & Maintenance	$673,880	$688,880	$707,880	$750,225	$750,225	$753,270	$753,270	$753,270	$790,934	$790,934	$7,412,768
Materials & Maintenance	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$1,800	$18,000
Advertising	$1,800	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$2,200	$21,600
Consultants Fees	$2,000	$2,000	$2,000	$2,000	$2,000	$4,500	$4,500	$4,500	$4,500	$4,500	$32,500
Monitoring	$59,140	$62,140	$63,350	$63,350	$64,100	$64,450	$64,450	$64,450	$64,450	$64,450	$634,330
Rates Expense	$68,008	$68,008	$68,008	$68,008	$68,008	$68,008	$68,008	$68,008	$68,008	$68,008	$680,080
Total operating costs	$1,178,559	$1,200,459	$1,220,969	$1,263,314	$1,264,064	$1,269,959	$1,269,959	$1,269,959	$1,307,623	$1,307,623	$12,552,488
Total	**$3,505,175**	**$3,660,651**	**$3,728,386**	**$3,740,151**	**$3,770,510**	**$3,825,353**	**$3,781,956**	**$3,812,505**	**$3,912,827**	**$3,947,980**	**$37,685,494**

Source: Council's draft LTP budget (as at May 2021)
Note that the overheads include staff costs.

9.4 Capital expenditure summary

Table 29 outlines the drinking water renewal expenditure for the next ten years. This shows a large capital programme in the first year due to Government funding.

Table 29 Renewal expenditure – drinking water (uninflated)

Description	Projected Expenditure										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Ten-year Total
	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	
Districtwide - Replacement of Water Treatment Plant Components	$45,000		$45,000		$45,000		$45,000		$45,000		$225,000
Districtwide - SCADA / Telemetry at WTPs (50%)	$15,000								$25,000	$25,000	$65,000
Fox Glacier - Watermain replacements	$142,500						$112,000				$254,500
Franz Josef - Mains replacement	$50,000				$250,000					$250,000	$550,000
Franz Josef - WTP and reservoir upgrades (50%)								$250,000	$750,000	$500,000	$1,500,000
Haast - Mains replacement	$40,000										$40,000
Harihari - Mains replacement	$100,000									$100,000	$200,000
Hokitika - Blue Spur RTU - external logging for compliance (50%)	$10,000										$10,000
Hokitika - Brickfield reservoirs replace/repair		$90,000									$90,000
Hokitika - Mains replacement	$250,000		$250,000		$250,000		$250,000		$250,000		$1,250,000
Hokitika - WTP improvements - modules 3						$800,000	$800,000				$1,600,000

Description	Projected Expenditure										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Ten-year Total
	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	
Kumara - Mains replacement	$150,000	$70,000					$100,000				$320,000
Kumara - Reservoirs replacements				$264,000							$264,000
Ross - Mains replacement	$100,000				$120,000						$220,000
Ross - Replace WTP membranes	$213,570										$213,570
Ross - Replace WTP pumps (80%)	$12,500									$150,000	$162,500
Total	**$1,128,570**	**$160,000**	**$295,000**	**$264,000**	**$665,000**	**$800,000**	**$1,307,000**	**$250,000**	**$1,070,000**	**$1,025,000**	**$6,964,570**

Source: Council's draft LTP budget (as at May 2021)
Note that the nature of renewal projects might also include a component that would increase the LOS.

Table 30 outlines the drinking water levels of service capex expenditure for the next ten years.

Table 30 Levels of service capex expenditure – drinking water (uninflated)

Description	Projected Expenditure										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Ten-year Total
	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	
Arahura - WTP upgrade	$400,000										$400,000
Districtwide - SCADA/Telemetry at WTPs (50%)	$15,000								$25,000	$25,000	$65,000
Franz Josef - New Generator (30%)	$40,000										$40,000
Haast - WTP improvements (security camera, external logging, flow meters, generator)	$60,000										$60,000
Harihari - New reservoir	$125,000										$125,000
Harihari - Seismic valves (main outlet)				$40,000							$40,000
Hokitika - Blue Spur new 1500m^2 reservoir	$305,000										$305,000
Hokitika - Blue Spur WTP renewals	$10,000										$10,000
Hokitika - Reconfigure Blue Spur reservoirs	$15,000										$15,000
Kumara - Seismic valve install		$30,000									$30,000
Kumara - WTP remedial work	$50,000										$50,000
Ross - WTP Generator	$40,000										$40,000
Whataroa - New bore	$20,000										$20,000
Whataroa - WTP Generator	$40,000										$40,000
Total	**$1,120,000**	**$30,000**	**$0**	**$40,000**	**$0**	**$0**	**$0**	**$0**	**$25,000**	**$25,000**	**$1,240,000**

Source: Council's draft LTP budget (as at May 2021)

Table 31 outlines the drinking water growth capex expenditure for the next ten years, which are all related to Franz Josef.

Table 31 Growth capex expenditure – drinking water (uninflated)

Description	Projected Expenditure										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Ten-year Total
	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	
Franz Josef - WTP and reservoir upgrades (50%)								$250,000	$750,000	$500,000	$1,500,000
Franz Josef - New raw water reservoir (70%)	$100,000										$100,000
Total	**$100,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$250,000**	**$750,000**	**$500,000**	**$1,600,000**

Source: Council's three waters opex and capex budget (as at May 2021)

9.5 Asset valuation and depreciation

9.5.1 Asset valuation

The value of the drinking water activity is shown in Table 32 at township level. Refer to Table 4 asset valuation by major asset class level.

Assets are revalued every three years. Drinking water assets were last revalued as at 30 June 2019.This process was undertaken by Council staff using information and inputs from Buller and Grey District Councils to update unit rates prior to generating new valuation data.

This process was peer reviewed by Beca Consultants. Most information for valuing the assets was obtained from Council's AssetFinda database.

Table 32 Water asset valuation summary by township (as at 30 June 2019)

Water Supply Township	Optimised Replacement Cost ($)	Depreciated Replacement Cost ($)	Annual Depreciation Rate ($)
Arahura	475,121	336,706	8,998
Fox Glacier	2,226,453	1,277,210	43,655
Franz Josef	4,499,489	2,841,028	102,338
Haast	1,645,412	929,909	36,805
Harihari	3,372,963	2,139,574	53,621
Hokitika	10,168,584	5,277,863	145,749
Kaniere	21,950,858	14,118,308	596,056
Kumara	1,850,638	916,885	57,158
Ross	2,922,261	1,830,456	92,579
Rural Untreated Schemes	1,852,143	1,100,745	19,422
Whataroa	1,032,519	619,742	22,412
Total	**$51,996,440**	**$31,388,426**	**$1,178,794**

Overall, the water assets have increased in optimised replacement cost by 4.18% since the 2016 valuations (refer to table below). The increase in the replacement values is due to the following reasons:

- The addition of new assets to the utilities since 2016
- Increases in unit rates based on both local and regional evaluation.

There is a percentage increase in annual depreciation of 12.86%.

Table 33 Water supply valuation summary: 2019 versus 2016

Drinking Water Assets (Values by Year)	Optimised Replacement Cost ($)	Depreciated Replacement Cost ($)	Annual Depreciation Rate ($)
Total 2019	51,996,440	31,388,426	1,178,794
Total 2016	49,909,080	34,282,190	1,044,458
Total 2014	38,478,658	22,394,079	1,060,636

9.5.2 Depreciation

Depreciation of assets must be charged over their useful lives to ensure an availability of funds for when assets need to be replaced. Council calculates depreciation on a straight-line basis for infrastructural assets (other than land), at rates that will write off the cost (or valuation) of the assets to their estimated residual values over their useful lives.

The useful lives and associated depreciation rates of the most common types of drinking water assets have been listed below according to the depreciable life set in Council's AssetFinda database:

Table 34 Useful lives

Asset Type	Depreciable Life (years)
Pipelines	60 to 80*
Connections	60
Reservoirs and Tanks	20 to 50*
Pump Stations	15 to 20*
Fire Hydrants	50
Valves	50
Water meters	10
Multi-media filters	20
UV, Instrumentation, SCADA & telemetry equipment	5-20*

**Dependent on material.*

Council funds depreciation on drinking water assets to ensure the integrity and service potential of these assets continues to be maintained. However, it does not fully fund depreciation where any of the following apply:

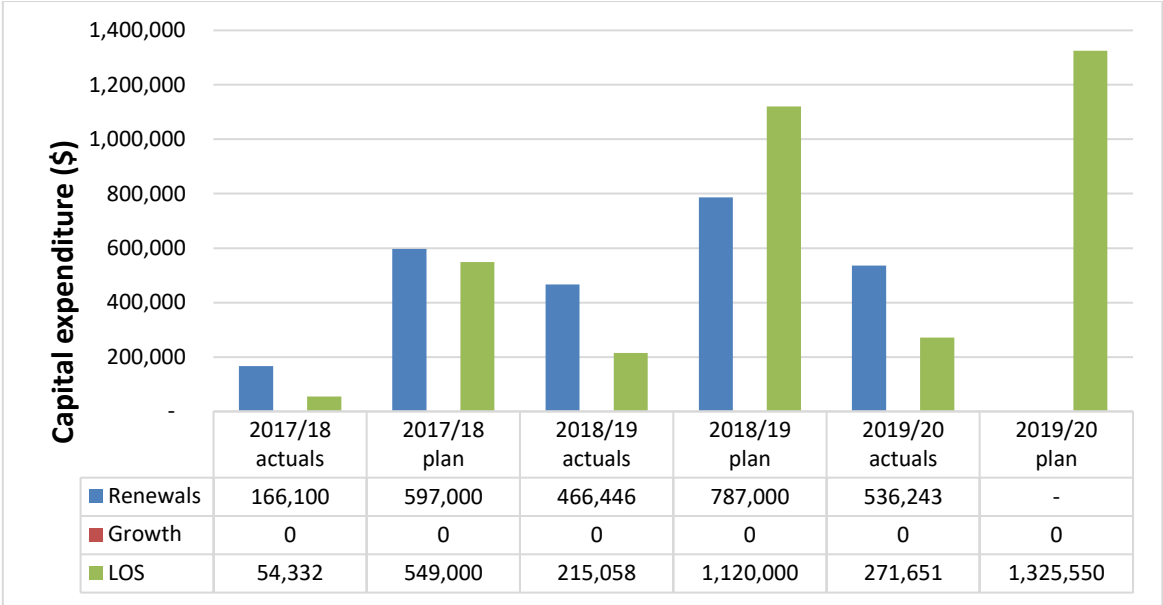
- Where it is assumed that the asset will not be replaced; or
- Where the asset replacement is likely to be funded from external sources.
- In the event of new assets and upgrades funded through external debt, Council will not fund depreciation of the amount of the principal loan repayment*

**As Council funds depreciation expenses and principal loan repayments both through rates, this avoids duplication of the charge.*

9.6 Financial performance

The actual achievements against the 2018 LTP budgets for the drinking water supply capital programme are presented below. This shows that delivery of the capital programmes in 2017/18 in 2018/19 was low due to internal resourcing issues (less than half in both years). It improved in 2019/20 with 61% achievement.

Figure 19 Capital programme achievement



	2017/18 actuals	2017/18 plan	2018/19 actuals	2018/19 plan	2019/20 actuals	2019/20 plan
Renewals	166,100	597,000	466,446	787,000	536,243	-
Growth	0	0	0	0	0	0
LOS	54,332	549,000	215,058	1,120,000	271,651	1,325,550

Source: Annual Reports (2017/18 and 2018/19) and NCS (for actuals)

9.7 Funding sources

The Council has a mix of funding mechanisms with the bulk of the revenue coming from targeted water rates. In general, only people directly and regularly using water services pay for them within their rates.

Where financial assistance (including funded depreciation or central government funding) are not available, capital projects are generally loan-funded to spread the costs more effectively over the life of the asset and provide better intergenerational equity.

The drinking water activity will be funded in accordance with the financial policies of Council as indicated below. Council also obtains funding from various Government funding streams such as the Tourism Infrastructure Fund and Crown Infrastructure Partners.

Table 35: Funding strategy for drinking water

Programme	Funding mechanism
Operational	Targeted water rates and billing of metered water connections
Renewal	Provided through depreciation reserves
LOS	Loan funded
Growth	Recovered through development contributions

Council will be reviewing the development contribution requirements in the District Plan so better reflects new infrastructure required for development (or growth) versus burdening existing ratepayers. It is intended Council will consider contributing to a development at consent stage on a case by case basis.

9.7.1 Water rates classifications

Council's nine community drinking water schemes and the Harold Creek raw water supply are divided into different water rating classifications.

Water rates are set and assessed as a fixed amount per connection for connected rating units. Unconnected properties that have the ability to connect to a Council funded water supply service are charged an unconnected water rate per rating unit at 50% of the connected charge.

The levels that rates are set at depend on the location of the rateable property, whether the property is connected or unconnected to the available water supply scheme, whether the water is treated or untreated, and the property use type. For example, commercial properties generally have a higher water rate per location than domestic properties. Commercial water rates are differentially applied, where they are not subject to a water meter.

The breakdown of locations and categories is as follows:

- Hokitika and Kaniere treated water – Connected (all rating units other except for commercial)
- Hokitika and Kaniere treated water – Commercial connections
- Hokitika and Kaniere water – unconnected
- Rural Townships treated water – Connected (all rating units other except for commercial)
- Rural Townships treated water – Commercial connections
- Rural Townships treated water – unconnected
- Rural Townships (raw, untreated supply) – Connected (all rating units other except for commercial
- Rural Townships (raw, untreated supply) – Commercial connections
- Rural Townships (raw, untreated supply) – unconnected.

In addition, there is also a Hannahs Clearing water supply capital repayment rate. Hannahs Clearing was a small community water supply that Council divested in the 2011-2012 financial year by installing self-sufficient rainwater tanks for the small number of properties previously connected to the scheme. The capital repayment rate is levied on households who elected not to pay for their rainwater tank by way of a singular invoice. Instead, they repay the capital costs of their individual rainwater tank via rates (including interest) over a maximum term of 21 years.

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

Section 10 Sustainability and Business Continuity

Sustainability means that we effectively balance the needs of present and future communities. In terms of asset management, sustainability is important, as many assets have a long lifespan and should be 'future-proofed' where possible. The LGA 2002 requires local authorities to take into account the current and future needs of their communities for good quality local infrastructure and effective, cost-efficient delivery of services.

Council has a responsibility to manage the drinking water activity and assets in a way that protects economic, social, environmental and cultural wellbeing. This includes planning for business continuity in the event of emergencies and being mindful of environmental trends like climate change that could affect land and infrastructure in the district and the way it can be used in the future.

10.1 Potential negative effects

The drinking water activity provides safe drinking water and firefighting capability but also may have negative effects particularly on the environment. These effects are managed through a variety of processes, summarised below.

Table 36 Potential negative effect summary

Effect	Description	Mitigation Measures
Noise	Sometimes repairs to drinking water assets (or installation of new assets) may create noise that affects surrounding households or businesses. Such noise is temporary, and a result of construction machinery used.	Maintenance work is undertaken during normal operating hours except in emergency situations.
Disruption to service	Prolonged disruption (outages) to service can have an economic impact on businesses.	Prolonged outages are extremely rare and would only normally occur as a result of storms or force majeure events. The operations and maintenance contract has clearly defined repair timeframes that must be adhered to. Timeframes for site attendance and resolution of issues are also reported on in Council's annual reports. If a long-term fix is unable to be made immediately, quick temporary repairs will often be made to restore services while a longer-term repair is being sought.
Increase in rates	Improving the level of service delivered can result in rates increases	Council uses competitive tendering processes to achieve best value for money for most capital works it undertakes.
Water restrictions	During times of infrequent seasonal low water levels at the intake, water conservation alerts may be introduced to ensure adequate supply for the community. This may temporarily restrict non-essential water usage e.g. washing cars or watering the garden.	Restrictions are temporary and assist to make water usage more sustainable for all users for essential water needs. Council has, in the last 18 months, identified some rural scheme users drawing excessively large volumes of water for agricultural purposes from the town drinking supplies. Some of these users have since been disconnected from the scheme and this has made a difference in improving demand management for all other users.

10.2 Positive effects

The positive effects provided by the drinking water activity are summarised below.

Table 37 Potential positive effect summary

Effect	Description
Public health benefits	Safe drinking water provides numerous critical public health benefits including sanitation and sustenance.
Protection of life and property	Council's urban water supply schemes can typically accommodate firefighting water demand thus providing residents and buildings with safety and security.
Economic development	Provision and maintenance of township drinking water supplies allows for development of new commercial businesses, residential homes and industrial activities thus contributing to economic growth to occur by providing for new developments where capacity exists. In addition, by managing drinking water assets responsibly and using competitive tendering we can provide value for money for ratepayers and stimulate the economy with work for contractors.

10.3 Environmental management

The statutory framework detailing what activities require resource consents is the RMA (1991). The RMA is administered locally by the West Coast Regional Council. The following sections contains a list of the resource consents that Council holds in relation to its drinking water activities.

Resource consents for the drinking water activity are held for abstraction via bores, surface water takes, land use (for installation/construction) associated with water assets and water course structures (e.g. weirs) and detailed below. This shows that there are no resource consents expiring in the next ten year period.

Table 38 Summary of resource consents

Resource Consent No.	Location	Description	Expiry Date
RC11028	Old School Rd, Arahura	To take groundwater from an existing bore for the purposes of a community water supply for Arahura	16 March 2046
RC-2019-0046-01	Arahura	To take and use groundwater for a community water supply Arahura (to be constructed soon).	2 September 2054
RC01164/1	Haast	Water permit to take groundwater via bore for the purposes of town supply, Haast.	21 August 2036
RC01164/2		Land use consent for earthworks to deepen existing bore used to provide water for the purposes of town supply	
RC03068/1	Whataroa	To take groundwater from a bore, Whataroa	22 August 2038
RC06273/1	Harihari	To take groundwater for the purposes of a community water supply for Harihari	22 March 2042

Resource Consent No.	Location	Description	Expiry Date
RC01167/1	Harihari	To take surface water from an un-named creek for the purpose of household supply (raw untreated Harold Creek scheme)	21 August 2036
RC11033	Lake Kaniere	To take water from Lake Kaniere for the purposes of a community water supply for Hokitika.	29 September 2046
RC11031	Hokitika	To discharge reservoir overflow containing contaminants (residual chlorine) to an unnamed creek, Hokitika	16 September 2046
RC2015-0077-01	Hokitika River	To disturb bed of Hokitika River to install intake structure to maintain diversion channel	15 July 2050
RC2015-0077-02		To divert water in Hokitika River to undertake construction works and maintain flows over intake structure.	
RC2015-0077-03		To take surface water from the Hokitika River for community water supply	
RC03076/1	Lake Kaniere Road	To discharge water from the town supply piping to land, in circumstances where it may enter water	06 May 2038
RC03076/2		To disturb the bed of McKay's Creek for the purpose of water supply upgrade.	
RC00359/1	Jones Creek, Ross	Water permit to take surface water from Jones Creek for the Ross township water supply.	30 January 2036
RC00359/2		Land use consent to install a V-notch weir in the bed of Jones Creek	
RC00390/1	Franz Josef	To take surface water from an unnamed tributary of the Waiho River for the Franz Josef township water supply	21 September 2036
RC-2015-0055-01	Tatare River, Franz Josef	To take and use surface water from the Tatare River for an emergency town water supply, Franz Josef.	24 April 2050
RC00391/1	Fox Glacier	Water permit to take surface water from Carters Creek for the Fox township water supply.	22 March 2036
RC00391/2		Discharge permit to discharge filter backwash to Carters Creek.	

Resource Consent No.	Location	Description	Expiry Date
RC-2019-0045-01	Fox Glacier	Ton take and use surface water from Carters Creek for the purpose of a community water supply, Fox Glacier.	01 November 2054
RC01165/1	Jackson Bay	Water permit to take surface water from an un-named creek for the purpose of running a community water supply at Jackson Bay.	27 November 2036
RC01165/2		Land use consent to disturb the bed of the un-named creek while maintaining an intake structure for a community water supply.	
RC10159/1	Kumara	To take and use surface water from a spring for a community water supply (Kumara).	23 August 2045

10.4 Climate change and resilience

10.4.1 Changes in weather patterns

Council is using climate change projections for the West Coast Region (sourced from the Ministry for the Environment's website). The anticipated effects from climate change on the West Coast (including Westland District) include:

Table 39 Climate change projections for West Coast Region

Climate Aspect	Description	Future Projections
Temperature	Compared to 1995, temperatures are likely to be 0.7˚C to 1.0˚C warmer by 2040 and 0.6˚C to 3.0˚C warmer by 2090.	By 2090, the West Coast is projected to have up to 30 extra days per year where maximum temperatures exceed 25˚C. The number of frosts could decrease by around 7 to 18 days per year.
Rainfall	Rainfall will vary locally within the region. The largest changes will be for particular seasons rather than annually.	The West Coast is expected to become wetter, particularly in winter and spring. Winter rainfall in Hokitika is projected to increase by 8 to 29 per cent by 2090. According to the most recent projections, extreme rainy days are likely to become more frequent throughout the West Coast region by 2090 under the highest emissions scenario.
Wind	Changes in wind direction may lead to an increase in the frequency of westerly winds over the South Island, particularly in winter and spring.	The frequency of extremely windy days in the West Coast by 2090 is likely to increase by between 2 and 5 percent.
Storms	Future changes in the frequency of storms are likely to be small compared to natural inter-annual variability.	Some increase in storm intensity, local wind extremes and thunderstorms is likely to occur.
Snowfall	The West Coast region is likely to experience significant decreases in seasonal snow. By the end of the century, the number of snow days experienced annually could decrease by as much as 30-40 days in some parts of the region. The duration of snow cover is also likely to decrease, particularly at lower elevations.	Less winter snowfall and an earlier spring melt may cause marked changes in the annual cycle of river flow in the region. Places that currently receive snow are likely to see a shift towards increasing rainfall instead of snowfall as snowlines rise to higher elevations due to rising temperatures. So for rivers where the winter precipitation currently falls mainly as snow and is stored until the snowmelt season, there is the possibility for larger winter floods.
Glaciers	Overall glacier ice mass has decreased by 25 per cent over the last 60 years in New Zealand and is expected to continue to do so into the future. Some of our most iconic glaciers (such as Franz Josef) have advanced in recent times. This is a result of more precipitation falling at their glacier heads.	Whether these glaciers continue to advance into the future will depend on the balance between increased melting due to warmer temperatures and increased precipitation in the mountains. For example, one climate modelling study suggests the Franz Josef glacier may retreat approximately 5 km and lose around 38 per cent of its mass by 2100.
Sea-level rise	The Ministry for the Environment provides guidance on coastal hazards and climate change, including recommendations for sea level rise.	New Zealand tide records show an average rise in relative mean sea level of 1.7 mm per year over the 20th century. Globally, the rate of rise has increased, and further rise is expected in the future.

Impacts by season

By 2090, seasonally the region could expect*:

Spring	0.6°C to 2.5°C temperature rise 4 to 9 per cent more rainfall in Hokitika
Summer	0.6°C to 3.2°C temperature rise 2 to 4 per cent more rainfall in Hokitika
Autumn	0.7°C to 3.1°C temperature rise 2 to 5 per cent more rainfall in Hokitika
Winter	0.7°C to 3.1°C temperature rise 8 to 29 per cent more rainfall in Hokitika

* *Projected changes are relative to 1995 levels. The values provided capture the range across all scenarios. They are based on scenario estimates and should not be taken as definitive.*

Potential effects

Coastal hazards– Coastal roads and infrastructure may face increased risk from coastal erosion and inundation, increased storminess and sea-level rise.

Flooding and landslides– More heavy rainfall will increase the risk of flooding, erosion and landslides, which is already high in many parts of the region. Many West Coast communities are located along narrow coastal and river strips beneath mountain ranges, leaving them exposed to increased risks of storms, flooding and landslides.

Biosecurity– Warmer, wetter conditions could increase the spread of pests and weeds.

Agriculture– Warmer temperatures, a longer growing season and significantly fewer frosts could provide opportunities to grow new crops and farmers might benefit from faster growth of pasture and better growing conditions. However, these benefits may be limited by negative effects of climate change such as increased flood risk or greater frequency and intensity of storms.

10.4.2 At National level

A National Climate Change Risk Assessment (August 2020) has recently been released by Ministry for the Environment. The setting of the framework for effective adaption is required by the Climate Change Response (Zero Carbon) Act. The risk assessment is a national overview of how New Zealand may be affected by climate change related hazards.

New Zealand‘s ten most significant climate change risks based on consequence and urgency were identified. This includes risk to potable water supplies (availability and quality) due to changes in rainfall, temperature, drought, extreme weather events and ongoing sea-level rise. At a local level, we need to understand what this means on the drinking water activity.

10.4.3 At local and activity levels

These likely climate change impacts on the drinking water network will need to be considered with any long-term planning. The main schemes that could be affected by climate change in the next ten years are:

- Arahura (current location) - The new Arahura bore site (as part of upgrade) is situated further away from the coastline and should alleviate this risk.
- Ross - The township of Ross has very high groundwater tables and this therefore could pose a risk.

10.4.4 Building resilience

The 2017 report on improving resilience to natural disasters, West Coast Lifelines Vulnerability and Interdependency Assessment[2] outlines the risks to Council's drinking water schemes from various types of natural disasters. While some of the information regarding each scheme is dated and no longer relevant, this document is still a good overview of the main emergency management risks for drinking water.

Climate change directly impacts the water supply activity. Council has undertaken the following measures to improve the resilience of the activity in disruption events:

- Building our knowledge based on latest thinking nationally and participating in forums where appropriate
- Specify more resilient design and materials for the replacement programmes
- Enhanced collaboration with Westroads to have robust communication protocols and procedures for keeping the network resilient
- Council proactively prepares for emergencies by investing in equipment such as standby power generators at WTPs, and installation of seismic valves on the key storage reservoirs. This preserves reservoir storage capacity in the event that an earthquake damaged the downstream reticulation.
- New watermains are generally PE pipes with welded joints. These offer greater likelihood of being structurally resilient in the event of ground movement from an earthquake or similar.
- An emergency supply system exists for Franz Josef where water storage tanks in Cron Street can be filled with an alternative supply. This is used instances of summer drought or periods of low flow in the creek.
- Working with NZ Transport Agency (Waka Kotahi) on state highway closures and ensuring service continuity for water operations (refer to next section).

Council's future actions in response to climate change to improve the resilience of the activity are:

- Exploring relocating new Franz Josef to existing township location as prone to flooding from the Waiho River and situated in the Alpine Fault Avoidance Zone. This will need a new WTP.
- Explore alternative water sources to increase security and future quantities of supply (may need to be brought forward).

10.4.5 Transport network/access vulnerabilities

One of the main resilience issues that the district faces is due to the vulnerability of the transport network. Westland is 350km long and serviced by only one major road, State Highway 6. This leaves the district vulnerable in the event of road closures. The frequency of State Highway 6 road closures south of Hokitika is increasing, as shown below. This has implications for Council workers and contractors in reaching and attending to drinking water issues south of Hokitika (where six of the nine community treated water schemes are located). This is out of Council control as there are no bypass roads and the state highway is controlled by Waka Kotahi.

[2] https://westcoastemergency.govt.nz/wp-content/uploads/2018/04/12-Westland-Lifelines-Assets.pdf

Figure 20 State highway 6 unplanned road closures greater than 10 hours, south of Hokitika, 2010 – 2020[3]

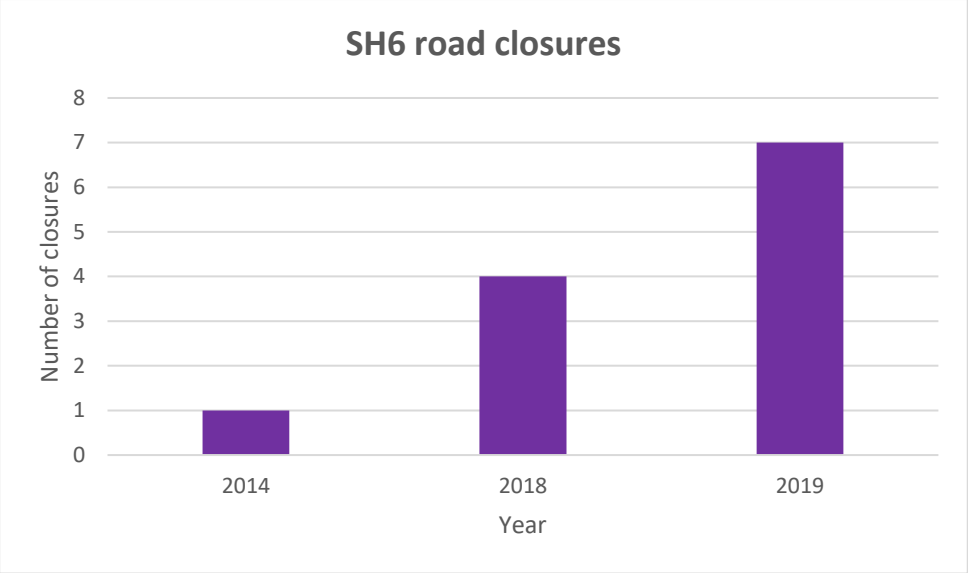


Table 40 Details of state highway 6 unplanned road closures greater than 10 hours, south of Hokitika, 2010 – 2020[4]

Date	Location	Reason	Hours closed
17/04/2014	Whataroa to Fox	Strong Winds	20
1/02/2018	Whataroa to Haast	Slip	48
11/02/2018	Fox Hills	Slip	20
20/02/2018	Ross to Haast	Strong winds	17
8/11/2018	Ross to Haast	Surface flooding	28
8/11/2018	Hokitika to Fox	Slips and washouts	26
8/11/2018	Harihari to Franz	Slips and washouts	15
26/03/2019	Franz to Fox Glacier	Waiho Bridge	800
26/03/2019	Hokitika to Franz	Flooding and slips	24
26/03/2019	Fox to Haast	Slips and flooding	24
26/03/2019	Haast Pass	Slips and flooding	24
10/04/2019	Diana Falls	Washout	17
12/08/2019	Haast Pass	Rockfall	45
5/12/2019	Fox to Haast	Storm Damage	73
6/12/2019	Haast Pass	Clarke Bluff	42
7/12/2019	Franz to Fox	Storm Damage	88
7/12/2019	Harihari to Whataroa	Storm Damage	295
7/12/2019	Whataroa to Franz	Storm Damage	63
7/12/2019	Hokitika to Harihari	Storm Damage	55

[3] Ten year closures SH6, Waka Kotahi, West Coast Maintenance Contract Manager
[4] Ten year closures SH6, Waka Kotahi, West Coast Maintenance Contract Manager

10.4.6 Zero carbon

The Zero Carbon Act means that Council will be considering opportunities for reducing the carbon emissions it generates. Preliminary opportunities identified include:

- We will continue to seek new technology and opportunities to reduce our carbon footprint where appropriate for our district size, learning from other water utilities in New Zealand and internationally
- Improve the efficiency of pumps as this will reduce power consumption costs as well as prolonging the asset component lives.

10.5 Emergency management

10.5.1 Lifelines

Water supply is classified as a lifeline utility. Council is a member of the West Coast Lifelines Group, along with other West Coast local authorities and other service providers. The West Coast Lifelines Group currently meets quarterly with all other special interest groups meeting separately.

In the event of an emergency, all Lifeline Utility Providers, emergency services and welfare agencies work together to ensure essential services are restored as soon as possible. Organisations may call upon resources from within or outside of region.

10.5.2 Emergency response planning

Water supply emergency risk events occur when they escalate from a routine event affecting an isolated network and before it is declared needing Civil Defence control. Council does not have an Emergency Response Plan, and this is identified as an improvement action. There is a West Coast Civil Defence Group Emergency Management Plan, and a dated Council Disaster Recovery Plan. No overarching Business Continuity Plan exists, although the IT Department is in the process of putting one together specific for the organisation's Information Management needs.

There were valuable lessons learnt with the lockdowns due to the global pandemic. For the drinking water activity, this includes:

- Overall Council's operational staff and the contractor still provided essential services uninterrupted and generally agile to the lockdown changes
- There were additional contractor costs due to staff not able to travel together, daily toolbox meetings and additional personal protective gear
- There were no issues with supplies to perform the duties.

Section 11 Risk Management and Assumptions

11.1 Our approach to risk management

A risk is defined in *AS/NZS ISO 31000:2009 – Risk management: Principles and guidelines* as the "effect of uncertainty on objectives". Each of those terms is further defined below:

- **Effect:** Deviation from the expected – positive or negative.
- **Uncertainty:** The state, even partial, of deficiency of information related to, understanding or knowledge of an event, its consequence, or likelihood.
- **Objectives:** i.e. risk types and risk hierarchy levels.

Therefore, risks are characterised by reference to potential events and consequences and ranked/rated in terms of the combination of both the probable consequences of an event and the likelihood of the event occurring. The combination of these two factors gives the overall risk rating.

Council's approach to Risk Management is outlined in Council's Risk Management Policy. The policy is being revised.

Council's risks are documented in Quantate, an electronic risk register, and broken down by activity area. It is noted that for many infrastructure areas, risks listed in Quantate are not complete or up-to-date. Updating Quantate is a recommended improvement action for the drinking water activity. It will be completed, and high risk events provided in the next update of this AMP.

11.2 Activity risks and mitigation

Risks and mitigation strategies specific to an individual water supply scheme are outlined in the relevant WSP.

Council's main risks to drinking water assets' activity are adverse events and sufficient funding.

Flooding is the most frequently experienced natural hazard in the District, and the likelihood of a major flood occurring in any year is high. Other natural hazards occur less frequently but have the potential to cause significant adverse effects and pose a risk to people and property. Unpredictable natural disasters and other catastrophic events could have an adverse effect on drinking water assets, potentially disrupting operations or the ability to provide required services. The incidence and severity of catastrophes are inherently unpredictable. Although Council carries insurance to mitigate its exposure to certain catastrophic events, catastrophic events can significantly affect Council's financial situation or operational activities.

Sufficient funding is needed to keep the drinking water assets performing adequately. With a very small ratepayer base and drinking water schemes dispersed over a land area hundreds of kilometres apart, Council actively lobbies and applies for external funding and seeks new opportunities to gain value-for-money and improve cost efficiencies.

Council has been successful in securing external funding including $6.8 million as part of the Government's three waters reform package. The funding covers three waters and mix of projects and specialist equipment. The projects are mainly for strengthening resilience and are not all construction. There is a tight timeframe to deliver these projects as part of the funding agreement.

11.3 Key assumptions and uncertainties

A number of assumptions have been made for forecasting the ten year expenditure and activity improvements. These are detailed below:

Table 41 Key assumptions

Significant assumptions	Risk and impact	Level of uncertainty	Implications and mitigation
Asset lives The useful asset life reflects the best estimate available as at forecast date and is based on current asset information held.	That the useful asset life information held is incomplete or inaccurate and subsequent depreciation calculations will result in incorrect revenue setting meaning rates are either too high or too low. Insufficient funds may not be available.	Medium	Details relating to the Council's current estimates of useful lives are recorded within the depreciation note in the accounting policies.
Costs Capital expenditure costs are based on Council's best estimates and known planned expenditure.	Capital expenditure varies from budget. There may be increased operation and maintenance costs associated with maintaining assets that are beyond their useful life and a potential impact and risk to levels of service.	Medium	Council will review its budget annually through the LTP/Annual Planning process and may adjust work programmes/budgets where necessary.
Depreciation Depreciation for the revalued asset values has been calculated annually using the Council's inflation factors as a proxy for the adjusted revalued asset values.	Revaluation adjustments are different to those forecasts. That detailed components of new assets will be different from the inflation factors, requiring different depreciation rates.	Low	
Funding renewals That Council will choose to Strengthen its assets and infrastructure and fund depreciation on renewals to provide its community with financial stability and financially sustainable infrastructure and services over the long term.	That the funds will not be available.	Low	The Council funds asset replacement through a variety of sources, as detailed in the Revenue and Financing Policy, with loans being utilised for major capital works. The Council operates within the prudent parameters of its Liability Management Policy.
Funding sources Funding sources (including external funding) sources do not change over the life over this Plan	Levels and sources of funding differ from those forecast, resulting in projects being revised or alternative funding sources used.	Low	Funding for projects is considered before the commencement of each project or asset. A significant impact from changes in funding or funding sources may result in revised capital works programme.

Significant assumptions	Risk and impact	Level of uncertainty	Implications and mitigation
Levels of Service Some increases in levels of service have been proposed and provisionally budgeted (subject to public consultation and Council approval). Service level increases are mainly to meet legislative compliance and minimise risks. In most other cases, service levels remain unchanged. Levels of Service increases will increase cost to ratepayers.	That the community demands or central government imposes additional significantly enhanced service levels. This will lead to increased costs to ratepayers and also possibly require increased in-house resourcing.	Medium	Council to regularly monitor service provision. Minor changes may be made to service levels where contracts and resources allow. Major changes in service levels will be confirmed with the community via consultation and will generally require an increase to fees or rates.
Natural hazards The prevalence of heavy rainfall events (as seen in last few years) is likely to continue causing periodic disruption. Other natural hazards such as tsunami, Alpine Fault earthquakes are possible but have not been factored into the life of this Plan.	An alpine fault earthquake, tsunami event or other surprise natural disaster occurs that has a significant impact on drinking water services resulting in unbudgeted costs beyond the capacity of Council to cope.	Medium	Council has a Civil Defence Emergency Plan that will be implemented in the event of an emergency. Council has insurance which can be claimed for the replacement of infrastructure damaged in the event of a natural hazard. In addition, Central Government has a role in providing financial aid for disaster recovery.
New legislative requirements The Three Waters reform will introduce new legislative requirements from Central Government.	Three waters are likely to be managed by a regional entity.	High	Council is working with other West Coast councils on a local approach to three waters. It is also working with the wider Canterbury Group.
Population change The population of the District will remain static or grow slightly during the period of the Plan. The population statistics are based on Statistics New Zealand medium growth forecast (from 2013; no updated populations projections available from 2018 Census yet).	Population growth is significantly higher than forecast in a localised area, putting pressure on infrastructure. Or population significantly declines resulting in under-utilisation of infrastructure.	Low	Council will continue to monitor population change in the District. Generally, small changes in population can be managed within the existing Level of Service.

Significant assumptions	Risk and impact	Level of uncertainty	Implications and mitigation
Tourism Tourism growth will be static or decline in the first three years of the plan and then begin to grow again as the NZ borders reopen and international tourism resumes. Once tourism begins to grow it will be a major economic contributor to the district's GDP. The impact of tourism on Council infrastructure and services might not be severe as growth will be slow and Council will have improved infrastructure and services during the early part of the plan	That tourist numbers increase more quickly than expected when international travel resumes. Potential asset failure due to unsustainable growth of tourism result in service outages and need for new unbudgeted infrastructure that would increase Council's debt.	Medium	Council will continue to monitor tourism growth. Where growth requires additional infrastructure, Council will apply for financial contributions for this work.
Untreated stock water supplies Council is currently in the process of divesting these schemes. Therefore budgets have not factored in future needs for these schemes.	The rural water connections are supplied untreated water and may need to be treated in future with the Water Services Bill. This is a risk to Council for funding the upgrade of the schemes to be compliant with DWSNZ.	Medium	The Mint Creek in Whataroa has recently been divested by Council to the community. There are discussions underway to divest Harold Creek raw water supply scheme with the concerned property owners.
Westland Milk Products The 2019 sale of Westland Milk Products to Yili Group has improved the security of this company in Westland for at least the next ten years. Consequently, water demand from Westland Milk Products is expected to be constant, if not increase over this period.	Westland Milk Products is Council's largest water user and revenue would be impacted if they closed operations.	Medium	Continue to plan for the current and future water demand.

Section 12 Asset Management Practices

Good quality data and asset management processes form the basis of effective long –term planning. This section details Council's approach to asset management processes, data management systems and strategies relating to the drinking water activity and associated assets.

12.1 Asset Management Policy

Council approved an Asset and Activity Management Policy in 2019 to guide the preparation of AMPs. The policy sets out the expectations for this activity. It also outlines related policies, legislation and a clear, concise methodology for achieving the objectives.

12.2 Asset management maturity levels

The Office of the Auditor General (OAG) uses the IIMM as the benchmark for measuring New Zealand councils' performance in asset management practices. There are five maturity levels in the IIMM: Aware, Basic, Core, Intermediate and Advanced. Each level has clear descriptions of the requirements for each area of asset management.

The AM Policy has set the maturity level at Core as it is considered to be an appropriate level for districts with a rating population of less than 10,000 people. The aspirational level for most drinking water functions has been set at 70% (middle of intermediate category). This reflects the higher level priority Council places on drinking water compared to other infrastructure areas, while noting that asset management across the organisation is still developing due to past under-resourcing in this area.

12.3 Asset management capability

Council's main asset management improvement area identified was the limited in-house resource for this function. Internal asset management resources were set up in 2020/21 with the approval of three dedicated roles:

- Asset Manager
- Project Manager
- Asset Engineer

It is recognised that a formal Asset Management Steering Group needs to be established. This will be the responsibility of the new Asset Manager.

12.4 Service delivery

The LGA was amended in 2014 to include Section 17A requiring councils to review at regular intervals the cost effectiveness of all provision of local infrastructure, services and regulatory functions. These are normally conducted every three years during the preparatory work for the upcoming Long Term Plan.

Tonkin & Taylor was contracted in July 2019 to complete a Service Delivery Review, consistent with the requirements of Section 17A, for all three West Coast Territorial Authorities for all 3 waters areas. Their brief was to identify one or more preferred options to help the Councils effectively meet future delivery requirements with the 3 waters reforms. Council joined with Buller District Council and Grey District Council to cost-share on this project.

The preferred option from the S17A review for Council is to share procurement projects with the other West Coast councils.

12.5 Asset management systems and data

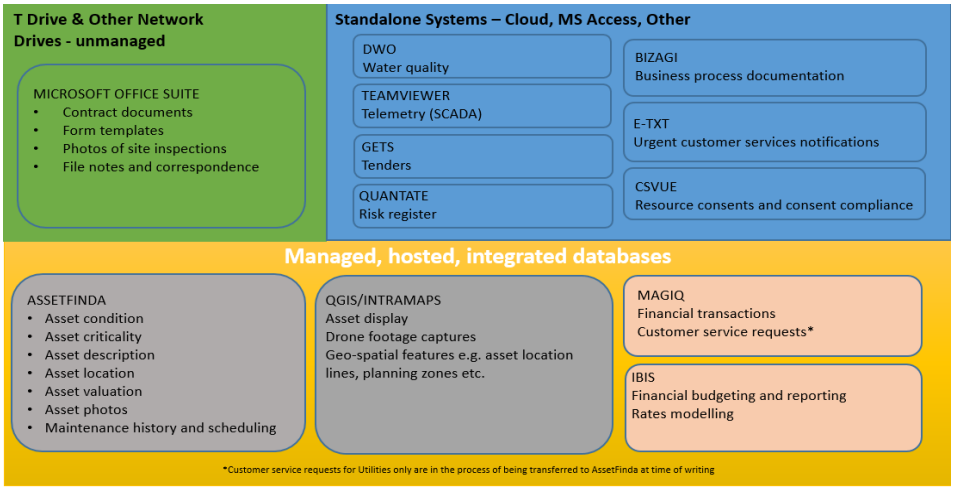
12.5.1 Information systems and tools

Council has a variety of systems and tools that support effective operation and maintenance and that record asset data. These are detailed in the figure below. Many of these systems do not integrate well with others and Council is continually reviewing how to ensure all asset data is entered into the core asset management systems where possible. Where this is not achievable, attempts are made to integrate of link systems so they can be easily accessed. Inconsistencies have been noted by asset data held in Council's financials systems versus asset data held in Council's asset management systems and more cross-departmental work needs to be encouraged to ensure consistency.

In summary:

- AssetFinda is used as the primary technological system for AM. The GIS linked to AssetFinda is updated with alterations and/or additions to capital works. However, original hardcopies and electronic plans are also retained.
- QGIS is used by some staff as an interface through which to edit and update AssetFinda.
- Quantate software is used for Council's organisational risk register including governance and compliance risks.
- MAGIQ/NCS software holds customer requests and contains financial transaction information such as payment to creditors to debtors.
- IBIS software: financial budgeting and reporting is done in IBIS Breeze. This imports transactional informational from the MagiQ ERP system and makes sense of the figures to produce various reports. At the time of writing, the system was not fully operational and did not yet include projects reporting. IBIS Rates Modelling is used for rates and this also interacts with MagiQ.
- No formal process is in place for as-builts. However, these are generally saved against the property files and relevant contracts. A link is also added to AssetFinda through the QGIS interface by using the media button.
- Contract Files: Copies of all tender and contract documents are retained for each project. Unit rates from these tenders form the basis of the replacement costs recorded in the Asset Valuations.
- Operational Data: A number of parameters are constantly monitored (e.g. pump hours) and these records only need be referred to as part of specific performance investigations.
- Performance Records: The performance of key assets is regularly monitored, but not formally graded or classified.
- Council uses SCADA technology and can log in to plants remotely and view real-time data through TeamViewer.

Figure 21 Systems used for asset management



12.5.2 Asset data

Table 42 summarises the data accuracy and completeness of Council's drinking water asset information. Data completeness will be assessed as new dedicated resources start at Council and improve processes, data and systems.

Table 42 Asset data accuracy

		Asset condition and age	Asset performance	Data completeness	Overall confidence in asset data	Identified gaps
Drinking water	Point					Data missing for valve, hydrant and tee details; valves missing or failing to function
	Lines					No serial numbers recorded for new pipes; performance data unreliable/missing
	Plant					Some plant equipment missing or believed to be duplicated in point category.

Key

A	Highly reliable data based on sound records, procedures, investigations and analysis, which is documented properly and recognised as the best method of assessment.
B	Reliable data based on sound records, procedures, investigations and analysis, which is documented properly but has minor shortcomings, for example the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation.
C	Uncertain data based on sound records, procedures, investigations and analysis, which is incomplete or unsupported, or extrapolation from a limited sample for which grade A or B data is available
D	Very uncertain data based on unconfirmed verbal reports and/ or cursory inspection and analysis. Dataset may not be fully complete and most data is estimated or extrapolated.
N/A	Data does not exist or is not relevant

12.6 Quality management

Audits, checks and reviews are carried out but are managed on a case-by-case basis. Table 43 below summarises the main quality management approaches to support Council's asset management processes. It also identifies gaps/deficiencies and proposed improvements to address these:

Table 43 Quality management approaches

Activity	Current Practice	Proposed Outcome
Asset creation	Asset Creation form to be filled in for Finance team. Assets separately created in AssetFinda database by District Assets staff.	AssetFinda to be single point of truth for all asset management including financial.
Asset data Integrity	Data is incomplete and not based on standard data dictionary.	Database to be cleansed and standardised with improved linkage for GIS outputs. Contractors to have more regular involvement in data assessment with maintenance contract process. Service Request information to have direct linkage with specific asset.
Asset valuations	Asset valuations are coordinated by Council Finance Department.	The various data improvements are key to improving the robustness of future valuations.
Capital programme delivery	Poor base information and assessment of why projects need to be carried out.	Project Priority Forms to be reviewed for work scope and budget. Potential delays are documented prior to funding being approved and each stage clearly structured. Business case prepared and approved before project progression and financial approval given.
Levels of Service	Key performance indicators are reported annually via the Council's Annual Report. This is audited by Audit New Zealand. Mandatory performance data and reporting is limited for some measures.	Continue to report with greater levels of clarity. Set up systems and processes to measure real water losses and attendance to site times.
Operations	At present, the drinking water contractor is not formally audited. This is due to past vacancies in the three waters role within Council. Informal weekly Operations and Maintenance meetings are held with the contractor to ensure things are going smoothly and address any issues that arise.	In the next financial year, it is intended to start an annual formal audit process against the Preventative Maintenance Schedule outlined in the contract document. If the audit reveals that tasks have not been achieved, financial penalties may be applied to the contractor.

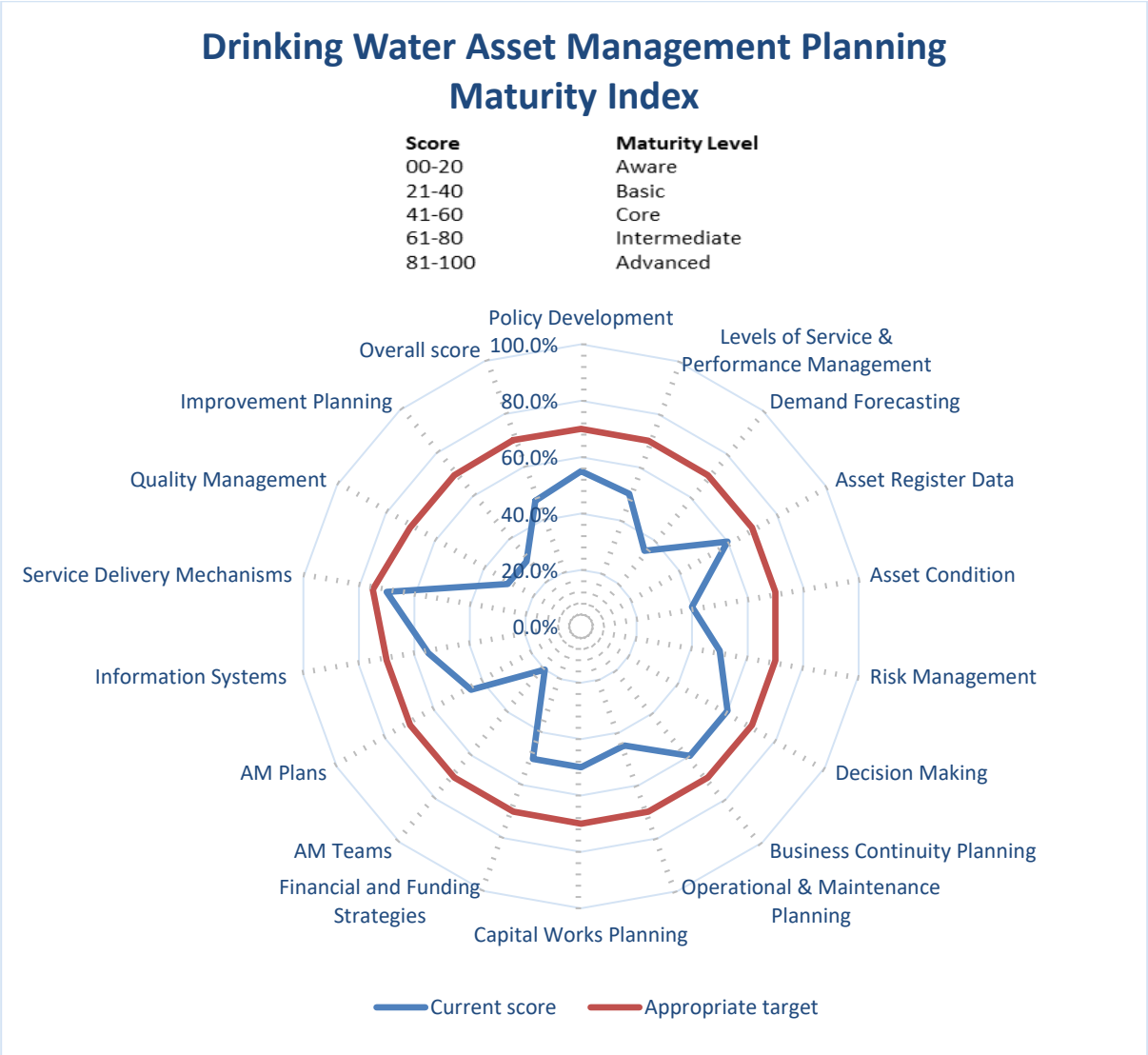
Section 13 Improvement Planning

AMPs require continual updating and improvements to ensure Council achieves the appropriate planning to manage assets on behalf of the community, deliver agreed levels of service and identify the expenditure and funding requirements of each activity.

13.1 Assessment of asset management maturity

A self-assessment of Council's AM maturity for drinking water based on IIMM definitions is shown in the spider map below.

Figure 22 Asset management maturity results (as at May 2020)



The graph above shows that overall score for drinking water AM planning is 47. The highest area is service delivery mechanisms (currently at 70%), while the lowest area is Asset Management Teams (currently at 20%).

The aspirational level for most drinking water activities has been set at 70% (middle of intermediate category). This reflects the higher level priority Council places on drinking water compared to other infrastructure areas, while noting that asset management across the organisation is still developing due to past under-resourcing in this area.

13.2 Peer review

Council's draft Quality Assurance Plan for the 2021 LTP recommends consideration of an external review for AMPs. The LTP Steering Group agreed at its inaugural meeting on 4 December 2019 that all three waters AMPs would be peer reviewed.

Council engaged Morrison Low to undertake this work. The peer review was progressive to enable changes to be made during the plan preparation rather than at the end of the process. Their main recommendations for improvement for the Drinking Water AMP are as follows:

- Overall plan:
  - The draft plan is generally complete and covers most aspects of the activity. It tells an honest story of a rural District Council in a remote area as well as the ongoing challenges with in-house capability and capacity.
  - However, it misses the significant challenges with the water and freshwater management reforms. The water reforms will be the most significant issue Council will need to consider with the 2021 LTP.
  - There is a short introduction at the start of each section which makes it a readable plan. The front section should be scene setting with technical detail in later sections. Suggestions have been identified to move this content.
  - Only a few sub-sections need strengthening or adding (LOS summary table and monitoring and review). Most findings are suggestions to improve the robustness of the plan and are easy to implement.
  - The draft plan provided for review still needs the financial forecasts to be included. It is important that the investment required is clearly articulated including the drivers and the consequences if the budgets are reduced. Ensure the impact of COVID-19 are discussed.
  - The Improvement Programme will be very important for this activity. We have identified many through the review to help you prepare a complete programme.
- Plan structure:
  - The plan structure broadly follows IIMM. There are many sections at 14 in total. We understand Council adopted the structure from two other councils that received favourable audits in the 2018 LTP process.
  - Consider consolidating the number of sections into natural groupings, consistent with traditional AMPs.

13.3 Improvement plan

Key improvement programmes and associated projects have been developed through a review of the gaps identified during the development of this AMP and the issues identified, and the peer review. The three year improvement programme is summarised in the following table.

Table 44 Improvement plan summary

No.	AM Improvement Area	Project no	Action	Responsibility	Priority (High/ Medium/Low)	Status (underway/ completed/ deferred/on hold/ limited progress)	Indicative Timeframe		
							2021/22	2022/23	2023/24
1	AM Policy and Strategy	1.1	Review the Water Supply Bylaw and consult with public in accordance with statutory timeframe (June 2021). Update Water Bylaw to include maps of each township's catchment area for connections.	Group Manager District Assets	High	To start (new project added in)			
		1.2	Update Water Safety Plans to ensure their compliance with the new legislation (Water Services Bill).	Asset Manager	High	To start (new project added in)			
		1.3	Adopt NZS 4404 as Council's formal engineering standard (to supersede its 1999 document).	Group Manager District Assets	Medium	To start (new project added in)			
2	Levels of Service and Performance Management	2.1	Set up the methodology for real water loss from Council's networked reticulation system to meet mandatory performance measurement purposes. Set targets and start monitoring.	Asset Manager	High	To start (new project added in)			
		2.2	Review resource consent limits for water supplies in growth areas and apply for a larger daily water take volumes where necessary (e.g. Franz Josef).	Group Manager District Assets	High	To start (new project added in			
		2.3	Set up the measurement systems for the two environmental performance measures (leakage and average water consumption) as a priority as required for mandatory performance measurement reporting.	Group Manager District Assets	High	To start (new project added in)			
3	Forecasting Demand	3.1	Monitor the tourist demand and impact on the drinking water activity with the pandemic lockdown.	Asset Manager	Medium	To start (new project added in)			
		3.2	Improve the monitoring and reporting for the abstraction volumes at the WTP and correlate and align with resource consent conditions.	Asset Manager	High	To start (new project added in)			
		3.3	Identify average daily water demand for all schemes including seasonal variances**.**	Asset Manager	High	To start (new project added in)			
		3.4	Consider developing a demand management plan	Group Manager District Assets	Medium	To start (new project added in			
4	Asset Register Data	4.1	Establish formal process for updating the asset inventory with as-builts.	Asset Manager	Medium	To start (new project added in)			

No.	AM Improvement Area	Project no	Action	Responsibility	Priority (High/ Medium/Low)	Status (underway/ completed/ deferred/on hold/ limited progress)	Indicative Timeframe		
							2021/22	2022/23	2023/24
		4.2	Monitor and report on data accuracy and completeness to assess improvements and bed in good practices.	Asset Engineer	Medium	To start (new project added in)			
		4.3	Restructuring of asset information in AssetFinda system to ensure no duplications and to enable users to search accurately by filter. The initial focus will be on treatment plants as critical for the activity.	Asset Engineer	Medium	To start (new project added in)			
5	Asset Performance and Condition	5.1	Verify the asset condition of the critical drinking water assets (above ground).	Asset Manager	High	To start (new project added in)			
		5.2	Implement regular condition assessments and asset inspection programmes for non-critical assets (above ground). Inspection programme shall be about every three to five years.	Asset Manager	Medium	To start (new project added in)			
		5.3	Obtain reliable data on asset performance and update AssetFinda accordingly.	Asset Manager	Medium	To start (new project added in)			
		5.4	Undertake GIS mapping of fire hydrants in Hokitika and Franz Josef to validate spacing of fire hydrants to check compliance against the firefighting code.	Asset Manager	Medium	To start (new project added in)			
		5.5	Start analysing break data for below ground water assets to understand network performance.	Asset Manager	High	To start (new project added in)			
6	Decision Making	6.1	Start to use asset criticality in operations as well as asset planning for renewals and new work decision making, as internal and external capability is built.	Asset Manager	High	To start (new project added in)			
7	Managing Risk	7.1	Develop an Emergency Response Plan for the drinking water activity as a priority.	Group Manager District Assets	Very high	To start (new project added in)			
		7.2	Update Quantate risk register for the drinking water activity. Use the high level findings for the next AMP.	Asset Manager	High	To start (new project added in)			
		7.3	Undertake the future climate change actions to ensure the drinking water activity is resilient to potential disruptions.	Group Manager District Assets	High	To start (new project added in)			
8	Operational Planning	8.1	Review the Service Request process and system to ensure it is fit for purpose and can measure KPIs of attendance to site times for the mandatory performance measurement purposes.	Asset Manager	High	To start (new project added in)			

No.	AM Improvement Area	Project no	Action	Responsibility	Priority (High/ Medium/Low)	Status (underway/ completed/ deferred/on hold/ limited progress)	Indicative Timeframe		
							2021/22	2022/23	2023/24
		8.2	Update easement agreement with Department of Conservation for equipment (reservoirs, water treatment plant) on their land.	Group Manager District Assets	Medium	To start (new project added in)			
9	Capital Works Planning	9.1	Develop a risk based water renewal programme based on analysis of break histories, condition and taking into account criticality, material type, resilience and other factors, to be consistent with good industry practice.	Asset Manager	Very high	To start (new project added in)			
10	Financial Planning	10.1	None identified at this stage.						
11	Asset Management Leadership and Teams	11.1	Establish in-house AM team and resources to support future AM initiatives	Group Manager District Assets	High	Completed			
12	Asset Management Plans	12.1	None identified at this stage.						
13	Management Systems	13.1	Undertake the various quality management improvements to strengthen the underlying processes for the activity.	Asset Manager	Medium	To start (new project added in)			
14	Asset Management Information Systems	14.1	None identified at this stage.						
15	Service Delivery Mechanisms	15.1	Review the maintenance schedule in preparation for tendering of new Utilities Contract.	Group Manager District Assets	High	To start (new project added in)			
16	Audit and Improvement	16.1	Consider participating in Water New Zealand's national performance benchmarking to compare with water industry best practice.	Group Manager District Assets	Medium	To start (new project added in)			
		16.2	Establish a formal Asset Management Steering Group to provide oversight of the infrastructure activities.	Asset Manager	Medium	To start (new project added in)			

13.4 Improvement monitoring schedule

The following template is proposed to be used to drive improvement actions and reporting. The Asset Manager will be responsible in ensuring the review tasks are undertaken.

Table 45 Monitoring and review summary

Frequency	Review task	Action	KPI	Report name	Audience
Three yearly	AMP Development	Formal adoption of the plan by Council	100% Achievement	Council AMP Report	Council and Audit New Zealand
Annually	AMP Review (internal)	Revise plan annually to incorporate new knowledge from the AM improvement programme	100% Achievement	Internal Report	District Assets and Executive Team
Three Yearly	AMP Peer Review	The plan will be formally reviewed three yearly to assess adequacy and effectiveness.	100% Achievement	External Consultant Report	District Assets, Executive Team, Asset Management Steering Group & Audit New Zealand
Annually	Monitoring and Reporting	The KPIs identified in this table will be monitored and reported on annually through Annual Reports.	100% Achievement	Annual Report	General Public, Council and Audit New Zealand
Quarterly	Implementation of the Improvement Programme	Tracking the progress of implementing the improvement programme quarterly particularly of projects in the short term improvement programme.	100% Achievement	Quarterly Report	District Assets, Executive Team, Asset Management Steering Group & Council

Section 14 Appendices

14.1 Full level of service

Community Outcomes	Customer Outcomes	LOS Statement	Performance measure	Baseline results 2019/20 actuals	Current Year 2020/21 Target	2021/22 Target (year 1)	2022/23 Target (year 2)	2023/24 Target (year 3)	2024/25 to 2030/31 Target (years 4 to 10)	Measurement procedure
Resilient communities	Safety - water quality	Council supplied potable water is safe to drink	The extent to which the Council's drinking water supply complies with:							
			a) Part 4: Bacterial Compliance Criteria:	Not achieved - 6 out of the 9 supplies are fully compliant with bacterial compliance criteria at both the water treatment plant and in the distribution zone (refer to note 1 below)	7 out of the 9 supplies (with Hokitika and Franz Josef compliant)	9 out of the 9 supplies	9 out of the 9 supplies	9 out of the 9 supplies	9 out of the 9 supplies	MOH compliance database Drinking Water Online
			b) Part 5: Protozoal Compliance Criteria:	Not achieved - 0 out of the 9 supplies compliant with protozoal compliance criteria (refer to note 2 below)	5 out of the 9 supplies (Hokitika, , Ross, Harihari, Franz Josef and Haast)	9 out of the 9 supplies	9 out of the 9 supplies	9 out of the 9 supplies	9 out of the 9 supplies	As above
		Customers are generally satisfied with the Council supplied water	The total number of complaints received by Council about any of the following (per 1,000 connections): • Drinking water clarity • Drinking water taste • Drinking water odour • Drinking water pressure or flow • Continuity of supply	Achieved 16 complaints per 1,000 connections (45 complaints and 2,755 connections)	<25 complaints per 1,000 connections	<25 complaints per 1,000 connections	<25 complaints per 1,000 connections	<25 complaints per 1,000 connections	<25 complaints per 1,000 connections	MAGIQ
Diverse Economy	Responsiveness	Request for service are dealt with promptly	Where Council attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times are measured:							
			Attendance for urgent call-outs:	No data for attendance time (refer to note 3 below)	100% (2 hours)	100% (2 hours)	100% (2 hours)	100% (2 hours)	100% (2 hours)	MAGIQ
			Resolution for urgent call-outs:	Not achieved - 76%	100% (12 hours)	100% (12 hours)	100% (12 hours)	100% (12 hours)	100% (12 hours)	
			Attendance for urgent call-outs:	No data for attendance time	100% (24 hours)	100% (24 hours)	100% (24 hours)	100% (24 hours)	100% (24 hours)	
			Resolution for urgent call-outs:	Not achieved - 50%	100% (72 hours)	100% (72 hours)	100% (72 hours)	100% (72 hours)	100% (72 hours)	
Sustainably Managed Environment	Sustainable - Environmental performance	Council supplied water is reliable	The percentage of real water loss from Council's networked reticulation system	Not measured (refer to note 4 below)	*Target to be set*	*Target to be set*	<25%	<25%	<20%	Measurement based on Water NZ water loss benchmarking methodology - Current Annual Real Losses.
			The average consumption of drinking water per day per resident within the District	Not measured (refer to note 5 below)	<500 litres per person per day	<400 litres per person per day	<400 litres per person per day	<400 litres per person per day	<300 litres per person per day	

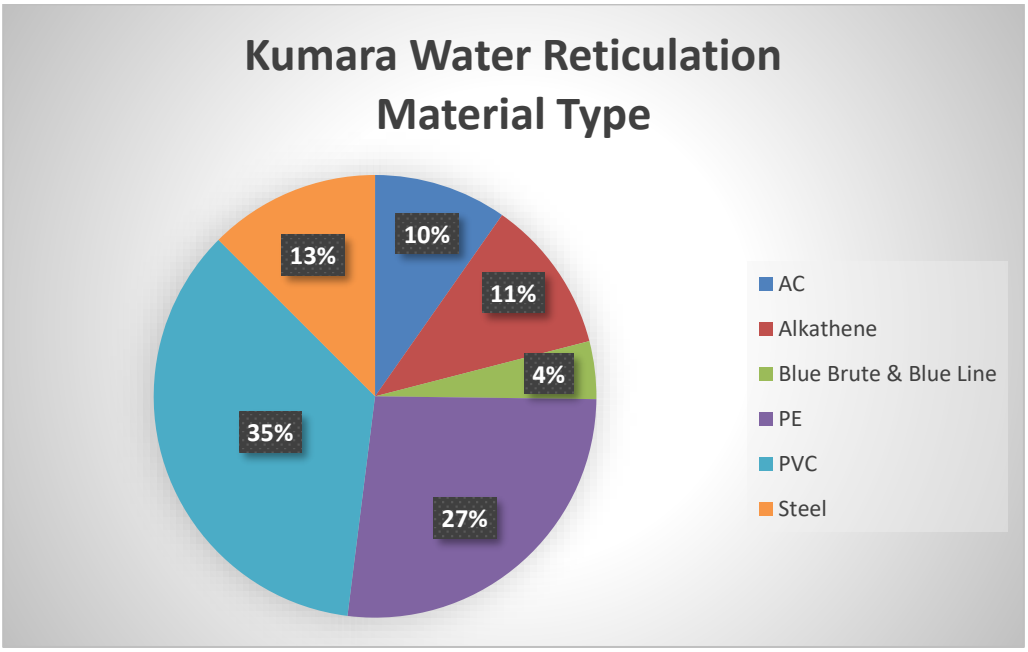
Notes:

1. Bacterial Compliance for 2019/20 - 8 out the 9 supplies comply with bacterial compliance in the distribution zone only. Fox Glacier was issued 4 boil water notices over the 2019-2020 year. Fox Glacier and Haast had E-coli detected in the After Plant (before consumers). E-Coli was not detected in the Haast distribution zone when the After Plant E-coli's were detected so there was no need to issue a boil water notice in these instances. While Arahura is compliant in the distribution zone, samples cannot be taken at the plant because there is no treatment plant.
2. Protozoal Compliance for 2019/20 - The data set for the Blue Spur plant in Hokitika was incomplete due to an equipment malfunction. A complete set is required for compliance. Ross failed part of the protozoal criteria due to turbidity being out or range for an extended period of time. Out of the remaining seven, Arahura and Fox Glacier treatment plants await upgrades to comply. Kumara, Whataroa, Harihari, Franz Josef and Haast require UV Pro-forma's to be lodged with the Drinking Water Assessor before compliance can be obtained. UV Pro-forma's relate to disinfections equipment at the water treatment plants. Kumara & Whataroa still require the correct plant data to be recorded & logged for compliance.
3. Responsiveness for 2019/20 - Council staff continue to work alongside contractors to review the Service Request process and system to ensure it is utilised correctly.
4. Percentage of real water loss for 2019/20 - Not currently measured, monitored in a number of ways including telemetry, water meters, repair programme, mains replacements and pressure management. This is in context with the Benchloss NZ Manual.
5. Council does not have the equipment to measure average consumption hence a new three yearly measurement was not performed in 2019/20.

14.2 Asset condition by township

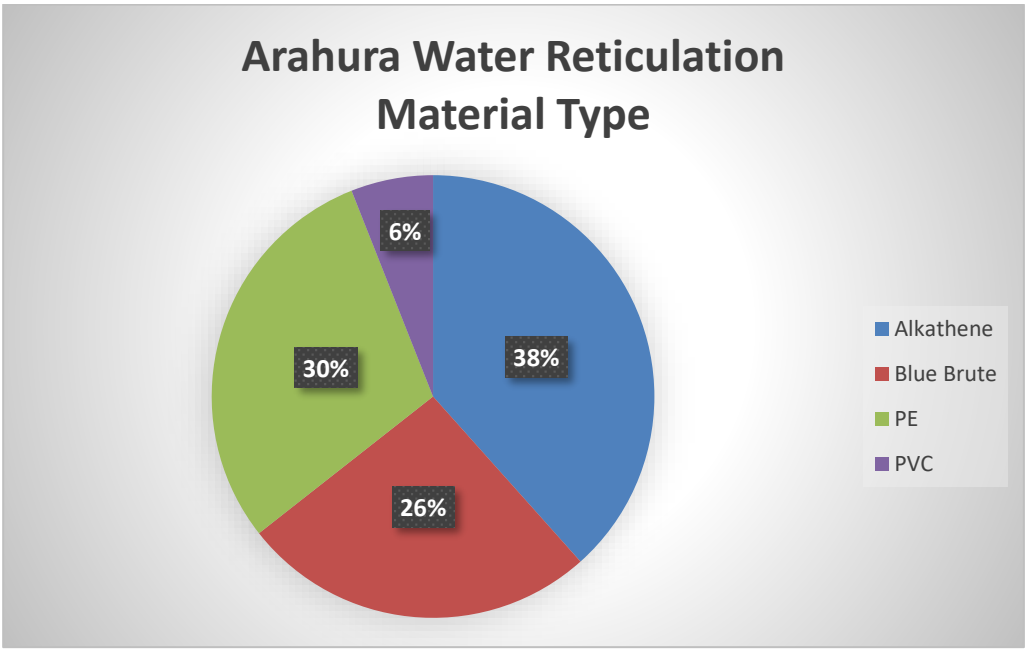
Kumara

Assets in Kumara are generally in good condition. The length of the reticulation in Kumara is 8,295 metres. This is comprised of the following pipe materials, including approximately 800 metres of AC pipe:



Arahura

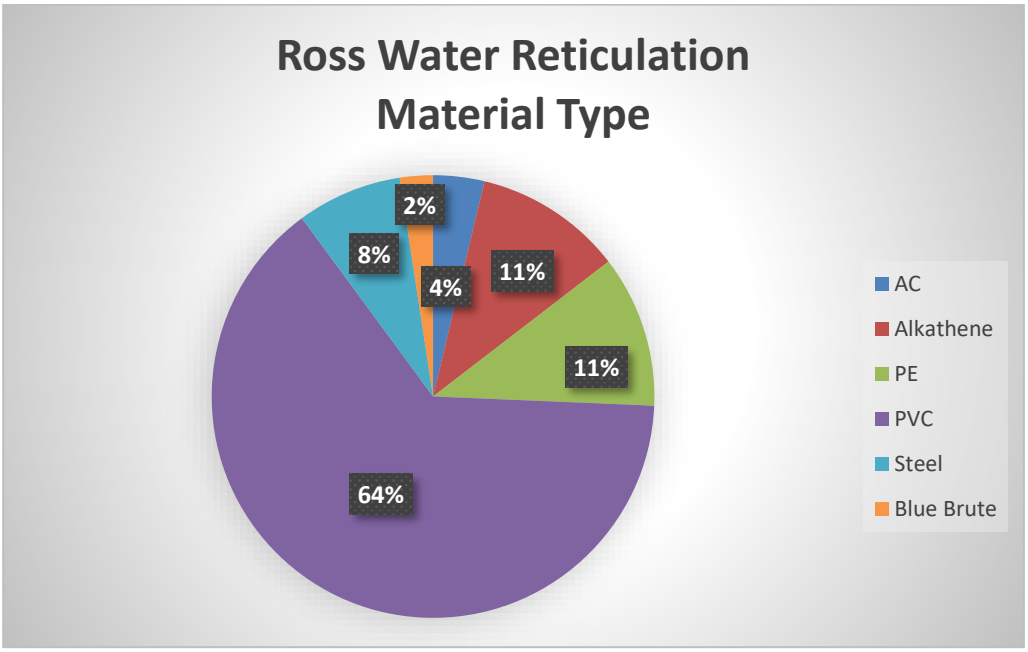
The length of reticulation in Arahura is 2,835 metres. This is comprised of the following pipe materials:



Ross

The pipe condition in Ross appears to be generally in very good condition. However, there are known leaks and issues with some critical mains located within State Highway 6.

The length of reticulation in Ross 10,616.37 metres. This is comprised of the following material types including approximately 400 metres of AC pipes:

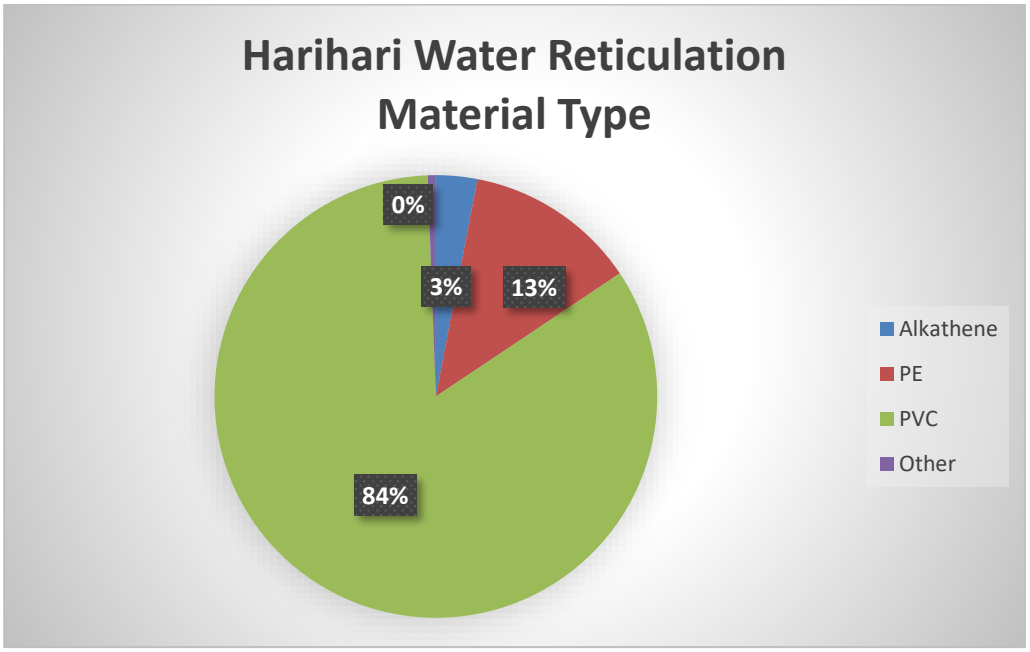


Harihari

A project to upgrade sections of watermain in Harihari along the main road (State Highway) was scheduled for the 2019/20 financial year. This will provide improved flow and pressure to consumers with rider main improvements and more valves to minimise the number of properties affected when outages occur.

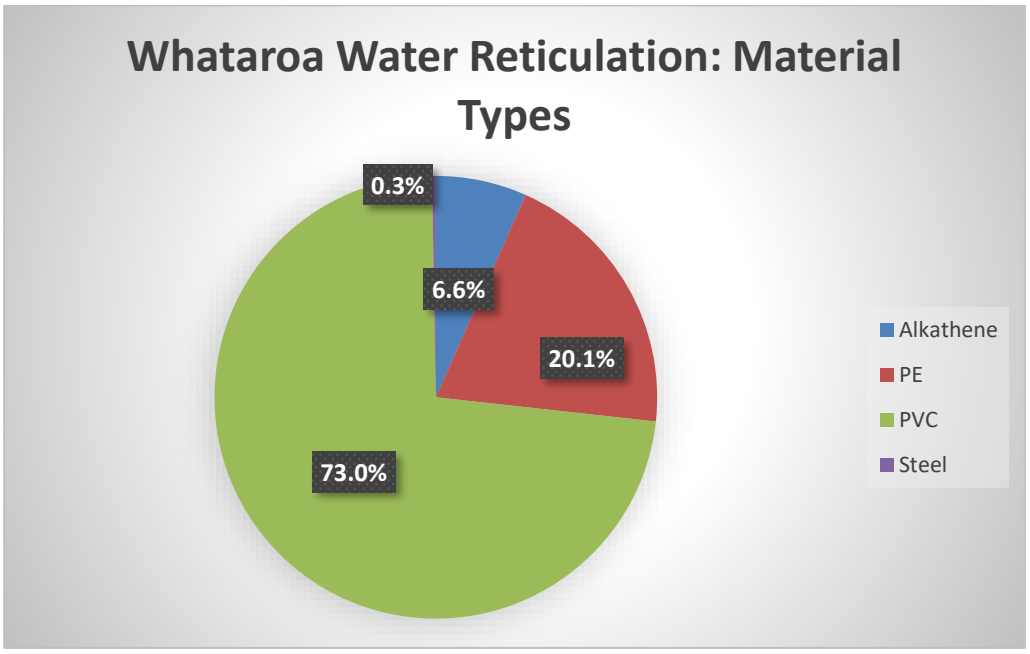
Two pipe sample condition assessment reports were undertaken in July 2019 by WSP Opus from uPVC pipes recovered in Harihari after repair works following a pipeline failure. Both reports found that the recovered pipe samples were assessed as being Grade 2 – Good Condition. Both pipe samples were deemed likely to meet the performance requirements of NZS7648. However, it is noted that this did not include any tests for crack growth resistance or splitting fractures due to point loads or repetitive pressure cycling. Both could contribute to premature pipe failure. The findings of the report were that the pipelines could remain in service for 50 years or more providing the risk and consequences of failure are acceptable. Further tests would be worthwhile, e.g. reports on mode and cause of failure for any future PVC pipeline failures and pipe samples recovered, including a bedding sample. However, these preliminary investigations suggest that the PVC pipe in Harihari.

The length of reticulation in Harihari is 15,771 metres. This is comprised of the following material types:



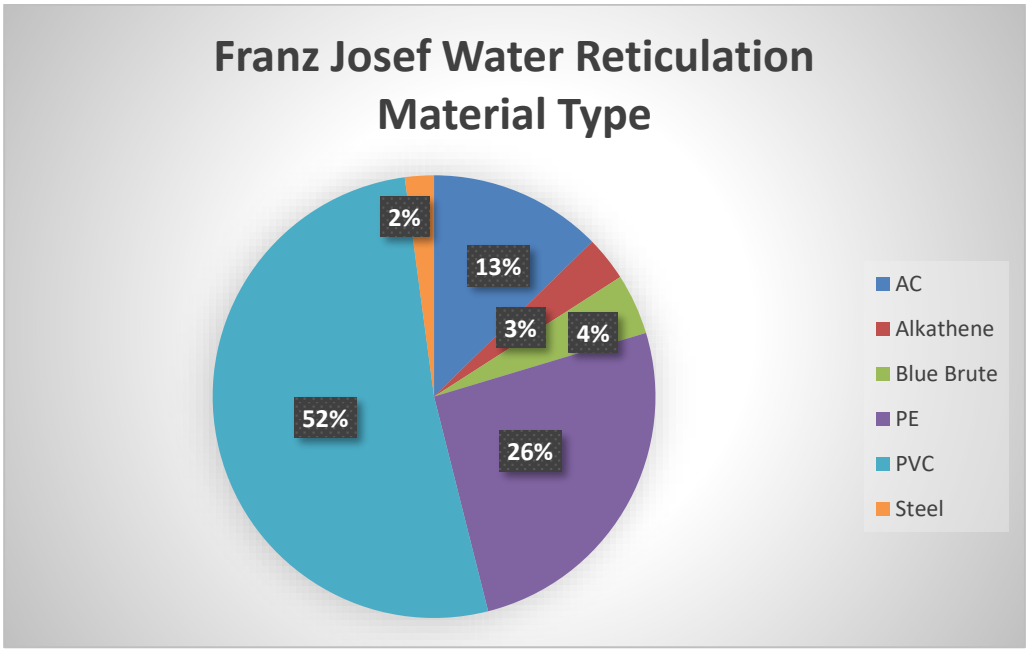
Whataroa

The majority of the township reticulation with high proportion of PVC material as it is relatively new. The length of the reticulation in Whataroa is 5,732 metres. This is comprised of the following pipe materials:



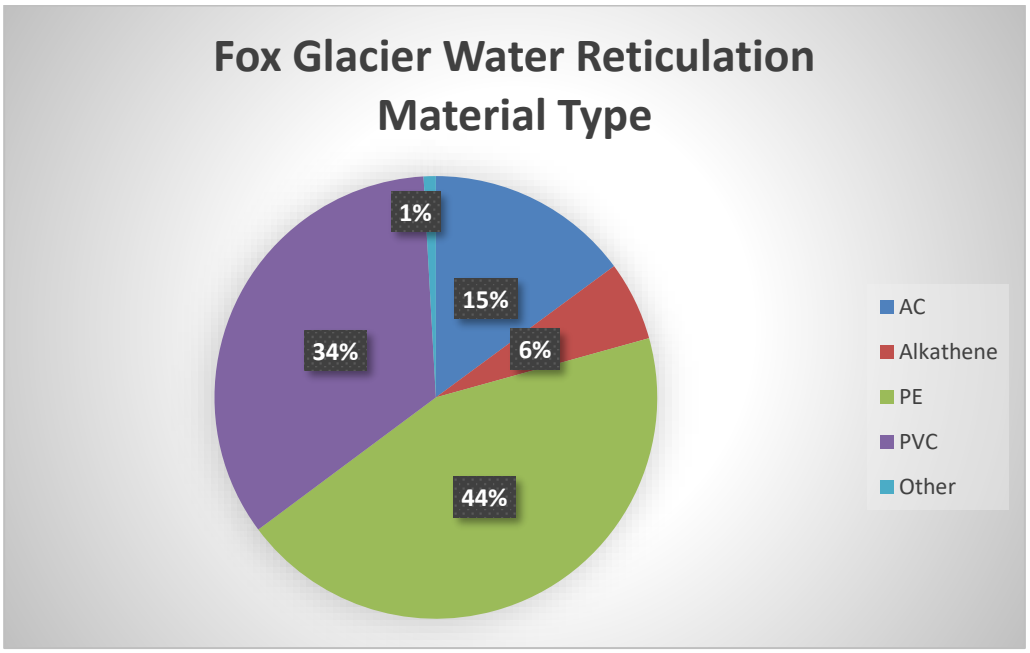
Franz Josef

The length of the reticulation in Franz Josef is 11,572 metres. This is comprised of the following pipe materials, including nearly 1.5 kilometres of Asbestos Cement pipework:



Fox Glacier

The length of the reticulation in Fox Glacier is 8,645 metres. This is comprised of the following pipe materials including nearly 1.3 kilometres of Asbestos Cement pipework:



Haast

Haast township was built in 1980s; most of the pipework dates to that time. Most pipes are PVC which theoretically have an asset life of up to 100 years. However, it is known that some of the pipes are smaller diameter PVC which may need more frequent replacement.

The length of the reticulation in Haast is 4,968.21 metres. This is comprised of the following pipe materials: