

Long Term Plan 2021-31

Activity Plan

Water Supply

Amended with Annual Plan 2023/24

Adopted 27 June 2023

Approvals

Role	Position	Name	For Draft LTP	
			Signature	Date of sign-off
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1. What does this activity deliver?

We're investing in Christchurch's future

This document explains what we propose to invest in over the next 10 years to manage the supply of water and ensure that it is safe to drink. This includes a summary of the investment required to meet future demand, undertake renewals, operate and maintain the infrastructure to deliver the services, and the steps we are taking to demonstrate safe drinking water without the need for chlorination in Christchurch, Lyttelton Harbour and Wainui. It gives Christchurch residents the opportunity to join the conversation by telling us what matters to them.

What we provide

Christchurch City Council (Council) has a responsibility to ensure that its water services, infrastructure and water are managed in a way that supports the environmental, social, cultural and economic wellbeing of current and future generations. Council is responsible for the supply of water that is safe to drink.

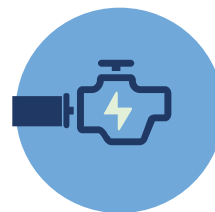
The Council supplies water through approximately 160,000 residential and business connections, through seven urban water supply schemes and six rural water supply schemes. This equates to 50-55 billion litres of water in a typical year, which is the equivalent of around 22,000 full Olympic size swimming pools.

Key assets that Council manages in relation to water supply include:



Reticulation

- 1,813 km of water supply mains
- 1,510.9 km of water supply sub-mains
- 219 km of water supply laterals
- 14,412 fire hydrants
- 133,367 metered connections



Station

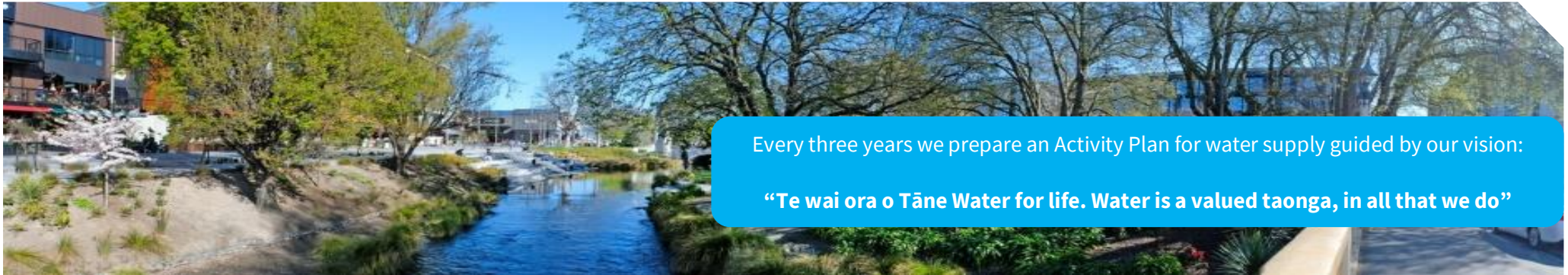
- 689 pump sets
- 154 buildings
- 170 wells and wellheads
- 155 reservoirs and tanks



Treatment Assets

6 Water Treatment Plants:

- Akaroa
- Birdlings Flat
- Duvauchelle
- Little River
- Pigeon Bay
- Wainui



Every three years we prepare an Activity Plan for water supply guided by our vision:

“Te wai ora o Tāne Water for life. Water is a valued taonga, in all that we do”

Achieving the vision will mean that water resources and taonga are managed in an integrated way to provide people, communities and future generations with access to safe and sufficient water resources, maintain the integrity of freshwater ecosystems and manage hazards from flooding and sea level rise.

The key water supply activities that Council undertakes include:

Water supply pressure, flow and water source level monitoring

Ongoing monitoring for resource consent compliance, billing, network analysis, leak detection and transient mitigation.

Pressure management

Operating the networks within minimum and maximum pressures to balance customer water pressure, operational costs and sustainable water use.

Security of water supply

Water sources are managed, within consent limits, to ensure sufficient water is available to customers. This involves the management of long term water availability and also short term (seasonal) fluctuations. Informing customers of planned outages or any limitations on supply volumes.

Water meter management

Commercial and industrial water meters measure consumption so that customers can be charged appropriately. Domestic meters are not used for direct charging but provide consumption information. Water meter management includes meter reading, repair and replacement. Replacing old meters with smart meters provides an opportunity to improve data analysis.

Water quality management

Routine sampling provides compliance with the Drinking-water Standards for New Zealand. Routine flushing is carried out in some parts of the network. Specific testing and flushing is done in response to water quality complaints or adverse sampling results.

Backflow prevention

Commercial and industrial customers require certified backflow prevention devices to prevent contaminants from entering the public water supply network. Backflow monitoring and enforcement forms a key part of New Zealand Drinking Water Standards and is a requirement of the Building Act.

Leak detection and management

Water loss in the network is managed by detecting and fixing leaks. Reducing leakage means that current supply volumes can reach more customers and demonstrates Council’s approach to sustainable water use.

Laboratory services

Laboratory services analyse water samples to check treatment processes and demonstrate compliance with New Zealand Drinking Water Standards.

2. Community Outcomes – why do we deliver this activity?

	Community Outcomes	Describe in 2-3 sentences how the activity effects the Community Outcome
Primary Outcome 1	Safe and healthy communities	<p>1. We manage the public drinking water supplies to protect human health. In doing so we:</p> <ul style="list-style-type: none"> • Protect the community from water-borne diseases • Ensure the public water supplies meet safety and health risk standards.
Primary Outcome 2	High quality drinking water	<ul style="list-style-type: none"> • Ensure that public drinking water has no objectionable or offensive taste, odour or appearance.
Secondary Outcome 1	Sustainable use of resources and minimising waste	<p>2. We sustainably manage drinking water sources by :</p> <ul style="list-style-type: none"> • Limiting the quantity of water abstracted so as to prevent waterway health deterioration; • Promoting sustainable use of drinking water through water conservation measures and education. • Limiting resource use, both for water abstraction and for water treatment.
Secondary Outcome 2	Modern and robust city infrastructure and community facilities	<p>3. We strive for a resilient public drinking water supply network, to support a healthy community, healthy environment and prosperous economy by:</p> <ul style="list-style-type: none"> • Minimising damage from natural disasters by setting minimum requirements for new infrastructure. • Gathering an evidence base to support asset lifecycle decision making. • Performing lifecycle management to minimise whole of life costs. • Minimising disruptions to the water supply service.
Secondary Outcome 3	Great place for people, business and investment.	<p>4. We strive to manage costs and intergenerational debt by:</p> <ul style="list-style-type: none"> • Controlling costs to minimise rates increases • Maintaining networks to prevent future generations inheriting a network in need of significant expenditure.

The information below summarises how the water supply activity contributes to

PRIMARY OUTCOME - SAFE AND HEALTHY COMMUNITIES

Council's community outcomes.

We manage the public drinking water supplies to protect human health by:

- Protecting the community from water-borne diseases
- Aiming to ensure that public water supplies meet safety and health risk standards

SECONDARY OUTCOME - SUSTAINABLE USE OF RESOURCES AND MINIMISING WASTE

We sustainably manage drinking water sources by:

- Limiting the quantity of water take to prevent deterioration of waterways and aquifers
- Promoting sustainable use of drinking water through water conservation measures and education
- Limiting resource use, both for water take and for water treatment

SECONDARY OUTCOME - GREAT PLACE FOR PEOPLE, BUSINESS AND INVESTMENT

We strive to manage costs and intergenerational debt by:

- Controlling costs to minimise rates increases
- Maintaining networks to prevent future generations inheriting a network in need of significant expenditure



We manage the quality of public drinking water by:

PRIMARY OUTCOME - HIGH QUALITY DRINKING WATER

- Ensuring that public drinking water has no objectionable or offensive taste, odour or appearance

SECONDARY OUTCOME - MODERN AND ROBUST CITY INFRASTRUCTURE AND COMMUNITY FACILITIES

We strive for a resilient public drinking water supply network, to support a healthy community, healthy environment and prosperous economy by:

- Minimising damage from natural disasters by setting minimum requirements for new infrastructure to improve network resilience
- Gathering an evidence base to support asset lifecycle decision making
- Performing lifecycle management to minimise whole of life costs
- Aiming to minimise disruptions to the water supply service

3. Strategic Priorities – how does this activity support progress on our priorities?

Strategic Priorities	Activity Responses
Enabling active and connected communities to own their future	<p>Active citizenship supported and promoted via</p> <ul style="list-style-type: none"> • the Community Water Partnership (assuming that it will incorporate not only surface water and stormwater matters but also water conservation and efficiency) • support to water management zone committee activities • contributing to annual residents surveys, including views on the public water supply
Meeting the challenge of climate change through every means available	<p>How the asset base itself will be affected by rising groundwater, sea level rise, sand accretion, coastal erosion, increased flooding, and changes to rainfall patterns, frequencies and intensities needs to be understood, as do the changing conditions the system will need to manage. Understanding is essential in developing and implementing strategies which relate capital expenditure on assets to the threats of climate change impacts such as the effects of rising sea level on coastal infrastructure. This will enable prudent levels of infrastructure investment in areas under threat, assist in adaptation planning and resilience building, and avoid wasted investment in assets which will become redundant through climate change effects well before the end of their economic life.</p> <p>Adjusting the water supply activity to account for climate change adaptation and mitigation will be undertaken as follows.</p> <ol style="list-style-type: none"> 1. Adaptation will be in response to impacts such as: <ul style="list-style-type: none"> • increased peak demand with predicted warmer and drier weather • changing groundwater levels, and availability • reduced flows in surface water sources of some Banks Peninsula water supplies • rising shallow groundwater levels in parts of the city affecting underground horizontal infrastructure and construction costs • saltwater/freshwater interface in groundwater and saltwater intrusion 2. Mitigation will be in response to impacts such as: <ul style="list-style-type: none"> • Where the changes will not reduce reliability or water quality, reducing carbon footprint through changes in design, material choice and construction methods of infrastructure assets

Strategic Priorities	Activity Responses
	<ul style="list-style-type: none"> reducing carbon footprint through changes in water supply activity operation (pumping requirements and energy efficiency, fuel use and alternative fuels)
Ensuring a high quality drinking water supply that is safe and sustainable	<p>Safe and sustainable water supply is the primary purpose of this activity and includes:</p> <ul style="list-style-type: none"> preparing water safety plans that assess the risks to our water supply and the improvements needed to address unacceptable risks, and implementing those improvements undertaking upgrades so that water supplies comply with the drinking water standards starting to roll out a smart water monitoring system, including smart water meters, real time water quality data, and sensors to detect leaks and rapid pressure fluctuations that can damage our network undertaking annual water conservation campaigns, implementing water restrictions when needed undertaking infrastructure renewal and replacement programmes that minimise the decline in network condition to reduce risk of contamination and catastrophic failure using modern and resilient methods and materials for new infrastructure
Accelerating the momentum the city needs	<p>A healthy economy is supported by:</p> <ul style="list-style-type: none"> providing a safe, reliable and sustainable water supply that caters for growth a modern and resilient infrastructure base
Ensuring rates are affordable and sustainable	<p>Providing the essential service of water supply where financial decisions are prioritised using an evidence base that accounts for:</p> <ul style="list-style-type: none"> risk public health, safety and security of supply levels of service (e.g. disruption to customers) asset lifecycle cost considerations

Our water supply initiatives over the next 10 years also support Council’s strategic priorities by:



Enabling active and connected communities to own their future

- Supporting the Community Water Partnership, which educates and empowers communities to help resolve water issues
- Supporting water management zone committee activities
- Increasing customer engagement and consultation through the Long Term Plan process and annual resident surveys to help inform levels of service



Meeting the challenge of climate change through every means available

- Adapting to increased peak demand with predicted warmer and drier weather
- Reducing our carbon footprint through changes in design, material choice and construction of new assets, without compromising water quality or reliability
- Reducing our carbon footprint through changes in pumping requirements, energy efficiency and the use of alternative fuels
- Understanding the impacts of sea level rise and changing rainfall patterns on our infrastructure network.



Ensuring a high quality drinking water supply that is safe and

- Preparing water safety plans that assess the risks to our water supply and the improvements needed to address unacceptable risks, and implementing those improvements
- Undertaking upgrades so that water supplies comply with the drinking water standards
- Improving water efficiency and conservation through education, leak detection and demand management
- Implementing a renewal and replacement programme that limits the decline in network condition to reduce the risk of contamination
- Using modern and resilient methods and materials in water supply infrastructure projects.



Accelerating the momentum the city needs

- Providing a safe, reliable and sustainable water supply that caters for growth
- Investing in modern and resilient infrastructure for water supply



Ensuring rates are affordable and sustainable

- Financial decisions are prioritised using an evidence base that accounts for risk, public health and safety, security of supply, disruption to customers, and asset lifecycle cost considerations to optimises expenditure and minimises building intergenerational debt

4. Increasing Resilience

Council monitors and manages a number of risks in relation to water supply and undertakes improvements to improve resilience to human-made and natural hazards.

Natural Disasters

Leaks: The water supply network is vulnerable to water loss through leakage or breaks across the network. The water supply renewal programme will target assets that need replacing to reduce water loss, improve the efficiency of the network and enable Council to continue to provide safe drinking water. Historic underinvestment means that our water supply network is deteriorating and leakage is increasing. Based on funding available we expect to take 18 years before our pipe network reaches the national average of 6% very poor condition pipes in 2039.

Earthquakes: Earthquakes can cause damage to infrastructure and cut off or reduce access to safe drinking water. Council is investing in pipes, made from modern materials, through the renewal programme that are more resilient in the event of an earthquake.

Tsunamis: A tsunami event could result in large quantities of debris or sediment (small particles) entering our waterways, which may cause damage to assets (e.g. pipes and pump stations).

Climate Change

Drought: An increased risk of drought, coupled with rising demand for water use puts pressure on water sources. Land use intensification in source areas for Christchurch's groundwater also increases the risk of nitrates from farming entering Christchurch's

drinking water supply. Council monitors the quality of water and continues to forecast likely future demand for water supply.

Flooding: Wellheads have been raised above ground and above flood levels, reducing the risk of contaminating the water supply in a flood.



Sea Level Rise: Sea level rise and coastal erosion may make it difficult to service some properties in the future. Salt water, increased sediment and coastal erosion may also damage surface assets in coastal areas. Council modelling shows that sea level rise could impact up to ten percent of the planned water main and sub-main renewals by 2065 and a further four percent by 2120.

Societal Changes

Population Health: Declining water quality can lead to potential health risks. To provide safe

drinking water, permanent chlorination may be required. Fluoridation may be mandated to improve dental health.

Housing and Social Inequity: Homeowners currently pay the cost of water through general rates. Council is considering charging for water supply based on usage. This means those who use less water will pay less. It is expected that the ongoing cost of upgrading water supply infrastructure will be spread across current and future generations.

Business as Usual

Historical Land Use Contamination: Historical land contamination has the potential to contaminate the water supply and increase the rate of asset deterioration. Design and material selection in renewal and upgrade projects aims to minimise this risk.

Technical Obsolescence: Failure of assets where replacements and parts are unavailable will potentially cause lengthy shutdowns. Electronic assets and control systems are especially susceptible to this. Projects avoiding obsolescence can be costly as significant upgrades of associated assets are often required.

Network Calming: Network rezoning and pressure reduction accompanied by installation of soft starting pumps will reduce the occurrence of potentially destructive pressure transients.

5. Specify Levels of Service

Council's Levels of Service (LoS) measures enable us to monitor and report against our outcomes and service performance. To support the Activity Plan for water supply we have produced a set of quantitative outcomes and outputs to track the contribution of water supply over time. In this Long Term Plan the LoS are grouped under each of the five community outcomes to clearly demonstrate the linkage between what we do, why we do it and to measure progress towards the overall vision for water supply in Christchurch. The following pages provide an overview of the LoS for each community outcome. These are the community facing LoS and will be published in our Statement of Service Provision. Council also has a number of internal management performance measures to assess service delivery.

Safe and Healthy Communities

LoS: Council water supplies are safe to drink

Proportion of High Risk connections with compliant backflow prevention device	Proportion of Medium Risk connections with compliant backflow prevention device	Water supplied is compliant with the DWQA Rules in the Distribution System (Bacteria compliance)
Water supplied is compliant with the DWQA Rules in the Treatment System (Protozoal compliance)	Proportion of customers connected to water supply zones with an up to date Water Safety Plan	

High Quality Drinking Water

LoS: Council provides high quality water

Proportion of residents satisfied with quality of Council water supplies	The total number of complaints received by Council
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Modern and Robust City Infrastructure and Community Facilities

LoS: Council operates water supplies in a reliable manner

Proportion of residents satisfied with the reliability of water supplies	The number of unplanned interruptions
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LoS: Council operates water supplies in a responsive manner

Median time from notification to attendance of urgent call-outs	Median the time from notification to resolution of urgent call-outs	Median time from notification to attendance of non-urgent call-outs
Median time from notification of non-urgent call-outs	Proportion of residents satisfied with the responsiveness of Council water supplies	

Sustainable Use of Resources and Minimising Waste

LoS: Council water supply networks and operations are sustainable

Average consumption of drinking water per day in litres per resident per day	Percentage of real water loss from Council's water supply network
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Community outcome: Safe and Healthy Communities

Level of service: Council water supplies are safe to drink

A key level of service (LoS) for the water supply activity is that Council provides water that is safe to drink.

Water Safety Plans are used to demonstrate that the drinking water is safe. They assess and manage risks to the safety of drinking water associated with a particular drinking water supply.

One of the biggest risks to our water supply is backflow. This is caused when water pressure drops in the water distribution system causing water to flow in the opposite direction from private property back into the public water supply network. Because both homes and businesses use chemicals and other potential contaminants, backflow can be a major threat to the health and wellbeing of residents and visitors.

Backflow prevention devices (like the one in the image opposite) prevent potentially contaminated water flowing from private property back into the public water supply.

Backflow Prevention Device



LoS Performance Measures	Current Performance	Benchmark	Performance Targets			
			Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31
12.0.2.2 – Proportion of High Hazard commercial connections with compliant backflow prevention device tested within the last year	New	None found	100%	100%	100%	100%
12.0.2.20 – Proportion of Medium Hazard commercial connections >38mm diameter with compliant backflow prevention device tested within the last year	New	None found	95%	98%	100%	100%
12.0.2.1 – Proportion of customers connected to water supply zones with an up to date Water Safety Plan	2018/19: 100%	98.3% (Ministry of Health Annual Report on drinking water quality 2018-2019)	100%	100%	100%	100%
12.0.2.9 – Water supplied is compliant with the DWQA Rules in the Distribution System (Bacteria compliance)	2019/20: 100% urban / 100% rural Equivalent to 100% overall.	95.3% (Ministry of Health Annual Report on Drinking-water Quality 2018-2019)	100%	Compliant	Compliant	Compliant
12.0.2.10 – Water supplied is compliant with the DWQA Rules in the Treatment System (Protozoal compliance)	2019/20: 0% urban / 8.5% rural Equivalent to 0.2% overall.	78.7% (Ministry of Health Annual Report on Drinking-water Quality 2018-2019)	≥ 0.3%	Compliant	Compliant	Compliant

Community outcome: High Quality Drinking Water

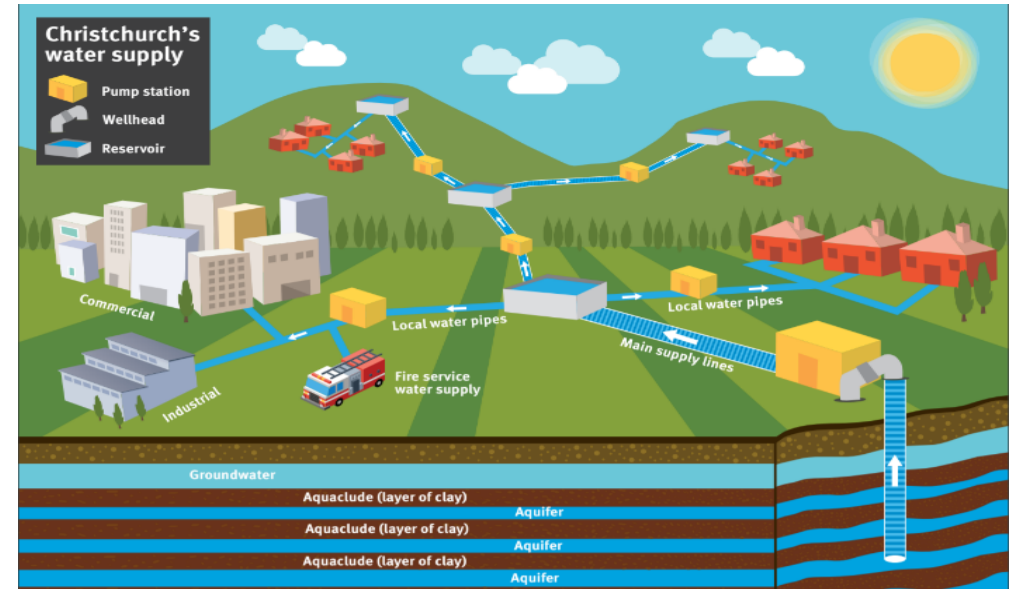
Level of service: Council provides high quality drinking water

A key level of service (LoS) for the water supply activity is that Council provides high quality drinking water. In the water industry, water quality refers to taste, smell and appearance. High quality drinking water therefore does not have any unpleasant taste or smell and appears clear.

Council monitors performance through an annual resident satisfaction survey and also reports the number of customer complaints related to water clarity, odour and taste.

The image opposite provides an overview of the Christchurch water supply system. It shows how water is drawn from a series of aquifers and reservoirs and distributed to residential, commercial and industrial customers via a network of local pipes and pump stations.

Christchurch's Water Supply



Outputs

LoS Performance Measures	Current Performance	Benchmark	Performance Targets			
			Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31
12.0.2.19 – Proportion of residents satisfied with the quality of Council water supplies	2019/20 = 48%	Watercare: 84%	≥50%	≥50%	≥50%	≥50%
12.0.1.16 – Number of water complaints received by Council about: <ul style="list-style-type: none"> - Drinking water clarity - Drinking water taste - Drinking water odour - Pressure or flow - Continuity of supply - Council's response to any of these issues Per 1,000 properties served per year	2019/20 = 3.14	2018/19 = 6.07 (Water NZ National Performance Review)	≤ 6.6	≤ 6.6	≤ 6.6	≤ 6.6

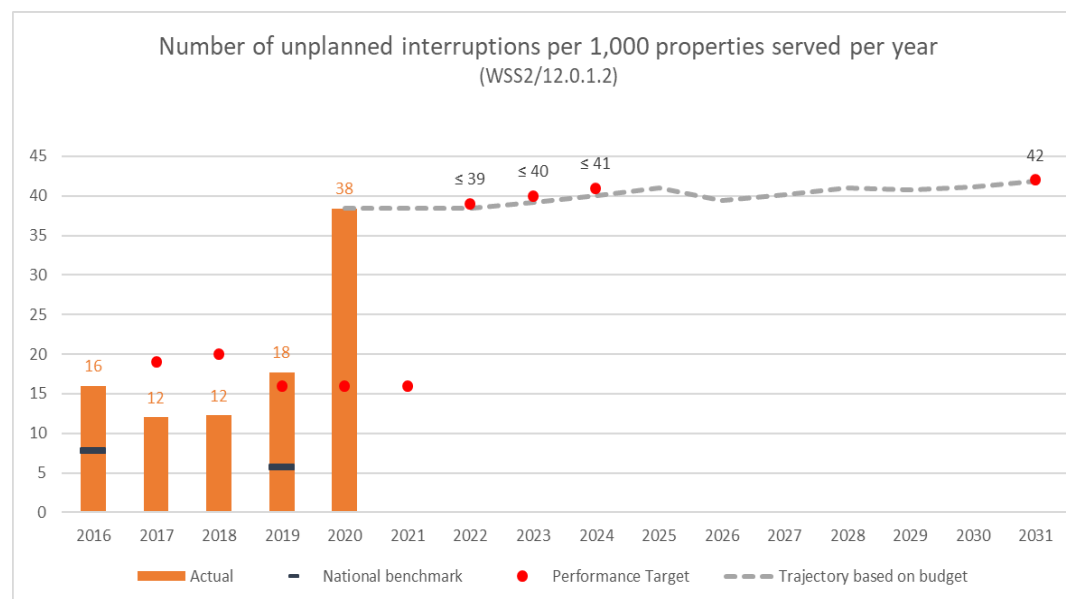
Community outcome: Modern and Robust City Infrastructure and Community Facilities

Level of service: Council operates water supplies in a reliable manner

A key level of service (LoS) for the water supply activity is that Council operates water supply networks, such as drinking water, in a reliable manner. This means that water is available when users need it. This contributes to the community outcome of modern and robust city infrastructure and community facilities.

The graph opposite shows the number of unplanned interruptions per 1,000 properties served per year for the last five financial years. The data shows increase in unplanned interruptions in 2019 and 2020 as a result of the deteriorating network.

The graphs also shows the performance targets that Council have set based on the number predicted number of unplanned interruptions over the next three years based on the level of funding available.



Outputs

LoS Performance Measures	Current Performance	Benchmark	Performance Targets			
			Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31
12.0.1.2 – Number of unplanned interruptions per 1,000 properties served per year	2020/21 = 38.43 interruptions	2018/19 = 7.9 (Water NZ National Performance Review)	≤39	≤40	≤41	≤42
12.0.1.13 – Proportion of residents satisfied with reliability of water supplies	2019/20 = 72%	Watercare: 84%	≥75%	≥80%	≥80%	≥60%

Community outcome: Modern and Robust City Infrastructure and Community Facilities

Broken Water Main

Level of service: Council operates water supplies in a responsive manner

Council has a responsibility to operate the water supply network in a responsive manner. This means Council staff and contractors respond to customer feedback and quickly resolve issues as they arise. This contributes to the community outcome of modern and robust city infrastructure and community facilities.

The image opposite shows a broken water main, illustrating the need for quick resolution of urgent call-outs. By operating in a responsive manner, Council can reduce the loss of water and the disruption caused to nearby residents.



LoS Performance Measures	Current Performance	Benchmark	Performance Targets			
			Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31
12.0.1.10 – Median time (in hours) from notification to attendance of urgent call-outs	2019/20 = 0.41 hours	(Water NZ National Performance Review) 2018/19 = 0.5 hrs	≤ 1 hour			
12.0.1.12 – Median time (in hours) from notification to resolution of urgent call-outs	2019/20 = 2.37 hours	2018/19 = 2.4 hours (Water NZ National Review)	≤ 5 hours			
12.0.1.9 – Median time (in hours) from notification to attendance of non-urgent call-outs	2019/20 = 19.0 hours	2018/19 = 6.2 hours (Water NZ National Review)	≤ 72 hours			
12.0.1.11 – Median time (in hours) from notification to resolution of non-urgent call-outs	2019/20 = 21.1 hours	2018/19 = 20.2 hours (Water NZ National Review)	≤ 96 hours			
12.0.1.14 – The proportion of residents satisfied with Council responsiveness to water supply problems	2019/20 = 54%	Watercare: 84%	≥55%	≥60%	≥65%	≥60%

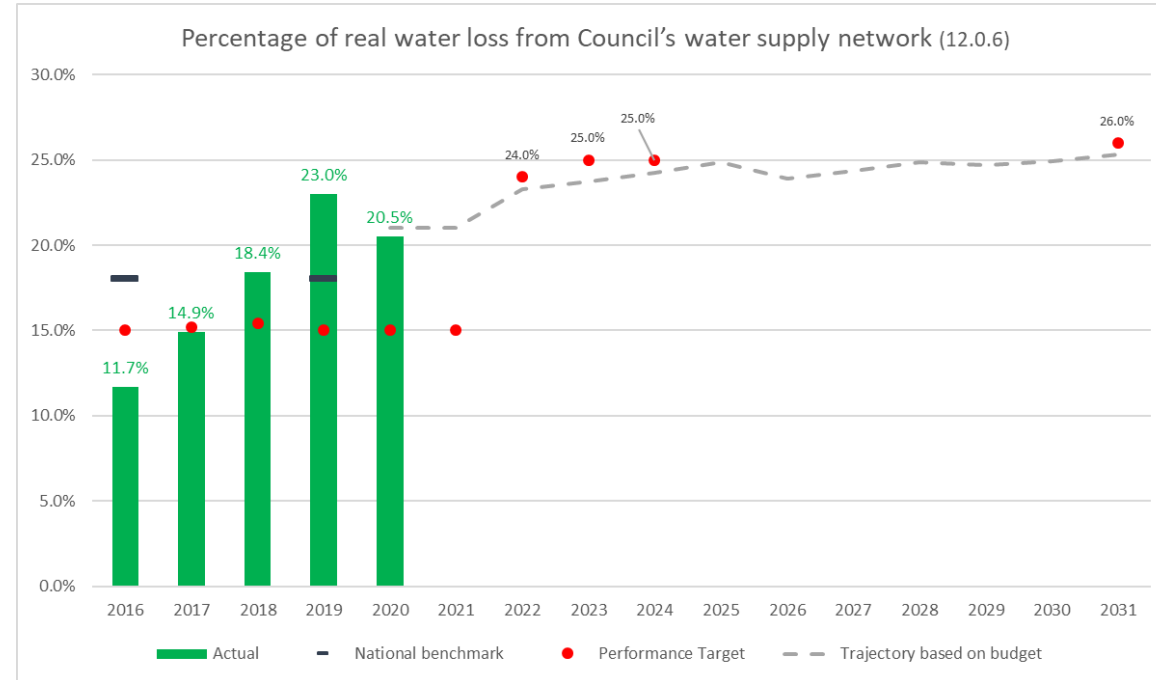
Community outcome: Sustainable Use of Resources

Level of service: Council water supply networks and operations are sustainable

Council seeks to operate water supply networks in a way that protects the environment through sustainable practices and demonstrating environmental stewardship. Council measures progress towards this outcome by monitoring and reporting the average consumption of drinking water per person, and the percentage of water lost through leaks in the water supply network. This contributes to the community outcome of the sustainable use of resources.

The graph opposite shows the percentage of real (physical) water loss from Council's water supply network. This is calculated from the night time flow and total water abstraction. In 2019/20 it was estimated that 20% of water loss occurred from the Council's water supply network in the FY2019/20. Ideally the target is to significantly reduce this water loss to 10% or less. Funding in the LTP will see an increase in water loss over the 10yr period.

Council operates a water conservation programme to encourage efficient use of water and private property leak repair.



Outputs

LoS Performance Measures	Current Performance	Benchmark	Performance Targets			
			Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31
12.0.7 – Average consumption of drinking water in litres per resident per day	2019/20 = 229 Litres	2018/19 = 294 Litres (Water NZ National Performance Review)	≤220	≤215	≤210	≤180
12.0.6 – Percentage of real water loss from Council's water supply reticulated network	2019/20 = 20.2%	2018/19 = 18% (Water NZ National Performance Review)	≤24%	≤25%	≤25%	≤26%

LOS number	C/M ¹	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Primary Community Outcome
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31		
Council water supplies are safe to drink										
12.0.2.2	C	Proportion of High Hazard commercial connections with compliant backflow prevention device tested within the last year	New metric, no past performance.	None found.	≥100%	≥100%	≥100%	≥100%	Water Services team report on the properties assessed and required to install backflow prevention devices	Safe and healthy communities
12.0.2.20	C	Proportion of Medium Hazard commercial connections >38mm diameter with compliant backflow prevention device tested within the last year	New metric, no past performance.	None found.	≥95%	≥98%	≥100%	≥100%	Water Services team report on the properties assessed and required to install backflow prevention devices	Safe and healthy communities
12.0.2.9	C	Water supplied is compliant with the DWQA Rules in the Distribution System (Bacteria compliance)	Urban 2019/20: 100% 2018/19: 99.8% 2017/18: 98.9% Rural 2019/20: 100% 2018/19: 98.5% 2017/18: 89.4%	Ministry of Health Annual Report on Drinking-water Quality 2018-2019: 95.3%	100%	Compliant	Compliant	Compliant	Report on compliance with the Drinking-water Standards for NZ (DWSNZ) and Drinking Water Quality Assurance Rules (DWQA Rules) from Taumata Arowai. The DWQA Rules primarily impose requirements relating to drinking water supplier duties to: (1.) supply safe drinking water (2.) ensure that drinking water complies with the Water Services (Drinking Water Standards for New Zealand) Regulations 2022. Department of Internal Affairs, Water Supply non-financial performance measure 1a	Safe and healthy communities
12.0.2.10	C	Water supplied is compliant with the DWQA Rules in the Treatment System (Protozoal compliance)	Urban 2019/20: 0% 2018/19: 0%	Ministry of Health Annual Report on Drinking-water	≥ 0.3%	Compliant	Compliant	Compliant	Report on compliance with the Drinking-water Standards for NZ (DWSNZ) and	Safe and healthy communities

¹ C/M – Community or Management level of service (LOS)

Community LOS - Previously known as LTP LOS. These are LOS that are community facing and will be published in our Statement of Service Provision.

Management LOS - Previously known as Non-LTP LOS. These are LOS that are measured in the organisation to ensure service delivery.

LOS number	C/M ¹	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Primary Community Outcome
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31		
			2017/18: 0% Rural 2019/20: 8.5% 2018/19: 0% 2017/18: 0%	Quality 2018-2019: 78.7%					Drinking Water Quality Assurance Rules (DWQA Rules) from Taumata Arowai. The DWQA Rules primarily impose requirements relating to drinking water supplier duties to: (1.) supply safe drinking water (2.) ensure that drinking water complies with the Water Services (Drinking Water Standards for New Zealand) Regulations 2022. Department of Internal Affairs, Water Supply non-financial performance measure 1b.	
12.0.2.1	C	Proportion of customers connected to water supply zones with an up to date Water Safety Plan	2019/20: 100% 2018/19: 100% 2017/18: 100% 2016/17: 100% 2015/16: 100%	Ministry of Health Annual Report on Drinking-water Quality 2018-2019: 98.3%	100%	100%	100%	100%	Quality & Compliance team report on water safety plans	Safe and healthy communities
12.0.2.21	M	Proportion of microbiological drinking water samples collected and analysed by an IANZ accredited and Ministry of Health registered laboratory.	2019/20: 100% 2018/19: 100% 2017/18: 100% 2016/17: 100% 2015/16: 100%	None found.	100%	100%	100%	100%	Number of samples analysed in an IANZ lab / Total number of samples analysed * 100	Safe and Healthy Communities
Council provides high quality water										
12.0.2.19	C	Proportion of residents satisfied with quality of Council water supplies	2019/20: 48% 2018/19: 37% Not measured prior to 2018.	Overall Resident Satisfaction: Watercare: 84% Wellington Water: 57% Dunedin: 74%	≥ 50%	≥ 50%	≥ 50%	≥ 50%	Residents Satisfaction Survey	High quality drinking water
12.0.1.16	C	Total number of complaints received by Council about: a) Drinking water clarity	2019/20: 3.14 2018/19: 4.02 2017/18: 2.40	Water NZ National Performance Review 2018/19: 6.07	≤ 6.6	≤ 6.6	≤ 6.6	≤ 6.6	Total number of complaints received through Council's call centre about clarity, taste, odour, pressure, flow, continuity of	High Quality Drinking Water

LOS number	C/M ¹	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Primary Community Outcome
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31		
		b) Drinking water taste c) Drinking water odour d) Pressure or flow e) Continuity of supply f) Council's response to any of these issues per 1,000 properties served per year.	2016/17: 4.25 2015/16: 4.12	2015/16: 9.38					supply, or responses to complaints, multiplied by 1000/number of connections. Department of Internal Affairs, Water Supply Non-Financial Performance Measure 4.	
12.0.2.13	M	Number of water clarity complaints per 1,000 connections per year	2019/20: 0.33 2018/19: 0.35 2017/18: 0.54 2016/17: 0.82 2015/16: 0.63	Water NZ National Performance Review 2015/16: 1.84	≤ 1.0	≤ 1.0	≤ 1.0	≤ 1.0	The number of complaints about water clarity received through the call centre, expressed per 1,000 properties connected to the Council's water supply system. Department of Internal Affairs, Water Supply Non-Financial Performance Measure 4a.	High quality drinking water
12.0.2.14	M	Number of water odour complaints per 1,000 connections per year	2019/20: 0.28 2018/19: 0.44 2017/18: 1.34 2016/17: 0.15 2015/16: 0.14	Water NZ National Performance Review 2015/16: 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	The number of complaints about water odour received through the call centre, expressed per 1,000 properties connected to the Council's water supply system. Department of Internal Affairs, Water Supply non-financial performance measure 4c	High quality drinking water
12.0.2.15	M	Number of water taste complaints per 1,000 connections per year	2019/20: 0.45 2018/19: 0.81 2017/18: 1.12 2016/17: 0.53 2015/16: 0.34	Water NZ National Performance Review 2015/16: 0.21	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	The number of complaints about water taste received through the call centre, expressed per 1,000 properties connected to the Council's water supply system. Department of Internal Affairs, Water Supply Non-Financial Performance Measure 4b.	High quality drinking water

Council operates water supplies in a reliable manner.

LOS number	C/M ¹	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Primary Community Outcome
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31		
12.0.1.1	M	Weekly average of the number of unplanned interruptions of greater than 4 hours duration each year	2019/20: 0.98 2018/19: 1.3 2017/18: 0.94 2016/17: 1.63 2015/16: 0.82	Watercare : 2.56	≤ 1.0	≤ 1.0	≤ 1.2	≤ 2.0	Monthly Contractor reports giving the total number of unplanned interruptions longer than 4 hours from notification to resolution each week divided by weeks to date.	Modern and robust city infrastructure and community facilities
12.0.1.2	C	Number of unplanned interruptions per 1,000 properties served per year	2019/20: 38.43 2018/19: 17.72 2017/18: 12.24 2016/17: 11.52 2015/16: 15.8	Water NZ National Performance Review 2018/19 : 7.9 2015/16 : 4.89	≤ 39	≤ 40	≤ 41	≤ 42	Monthly Contractor reports giving the total number of unplanned interruptions to date in a year divided by the number of properties served multiplied by 1,000.	Modern and robust city infrastructure and community facilities
12.0.1.13	C	Proportion of residents satisfied with reliability of water supplies.	2019/20: 72% 2018/19: 81% Not measured prior to 2018.	Overall Resident Satisfaction: Watercare: 84% Wellington Water: 57% Dunedin: 74%	≥ 75%	≥ 80%	≥ 80%	≥ 60%	Resident satisfaction surveys	Modern and robust city infrastructure and community facilities
12.0.1.7	M	Number of continuity of supply complaints per 1,000 properties served per year	2019/20: 1.27 2018/19: 1.57 2017/18: 1.13 2016/17: 1.3 2015/16: 1.24	Water NZ National Performance Review 2015/16: 4.17	≤ 2.0	≤ 2.0	≤ 2.0	≤ 2.0	Number of complaints divided by the total number of properties connected to the water supply network divided by 1,000. Department of Internal Affairs, Water Supply non-financial performance measure 4e	Modern and robust city infrastructure and community facilities
12.0.1.8	M	Number of pressure or flow complaints per 1,000 connections per year	2019/20: 0.80 2018/19: 0.85 2017/18: 1.27 2016/17: 1.45 2015/16: 1.77	Water NZ National Performance Review 2015/16: 2.66	≤ 2	≤ 2	≤ 2	≤ 2	The number of complaints about water flow or pressure received through the call centre, expressed per 1,000 properties connected to the Council's water supply system Department of Internal Affairs, Water Supply non-financial performance measure 4d	Modern and robust city infrastructure and community facilities

Council operates water supplies in a responsive manner.

LOS number	C/M ¹	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Primary Community Outcome
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31		
12.0.1.10	C	Median time (in hours) from notification to attendance of urgent call-out	2019/20: 0.41 2018/19: 0.62 2017/18: 0.55 2016/17: 0.55 2015/16: 0.55	Water NZ National Performance Review 2018/19: 0.5 2017/18: 0.51 2016/17: 0.50	≤ 1	≤ 1	≤ 1	≤ 1	The median response time measured from the time that the Council receives notification of the issue to the time that service personnel reach the site. Reported in monthly contract reports from the Contractor. Department of Internal Affairs, Water Supply non-financial performance measure 3a	Modern and robust city infrastructure and community facilities
12.0.1.12	C	Median time (in hours) from notification to resolution of urgent call-outs	2019/20: 2.37 2018/19: 2.01 2017/18: 1.78 2016/17: 1.71 2015/16: 1.72	Water NZ National Performance Review 2018/19: 2.4 2017/18: 2.5 2016/17: 2.3	≤ 5	≤ 5	≤ 5	≤ 5	The median resolution time measured from the time that the Council receives notification of the issue to the time that service personnel confirm resolution of the issue. Reported in monthly contract reports from the Contractor. Department of Internal Affairs, Water Supply non-financial performance measure 3b	Modern and robust city infrastructure and community facilities
12.0.1.9	C	Median time (in hours) from notification to attendance of non-urgent call-outs	2019/20: 19.0 2018/19: 4.6 2017/18: 50.4 2016/17: 33.6 2015/16: 4.6	Water NZ National Performance Review 2018/19: 6.2 2017/18: 13.9 2016/17: 6.4	≤ 72	≤ 72	≤ 72	≤ 72	The median response time measured from the time that the Council receives notification of the issue to the time that service personnel reach the site. Reported in monthly contract reports from the Contractor. Department of Internal Affairs, Water Supply non-financial performance measure 3c.	Modern and robust city infrastructure and community facilities
12.0.1.11	C	Median time (in hours) from notification to resolution of non-urgent call-outs	2019/20: 21.1 2018/19: 6.0 2017/18: 52.3 2016/17: 39.1 2015/16: 11.5	Water NZ National Performance Review 2018/19: 20.2 2017/18: 20.4 2016/17: 23.0	≤ 96	≤ 96	≤ 96	≤ 96	The median resolution time measured from the time that the Council receives notification of the issue to the time that	Modern and robust city infrastructure and community facilities

LOS number	C/M ¹	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Primary Community Outcome
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31		
									service personnel confirm resolution of the issue. Reported in monthly contract reports from the Contractor. Department of Internal Affairs, Water Supply non-financial performance measure 3d	
12.0.1.14	C	The proportion of residents satisfied with Council responsiveness to water supply problems	2019/20: 54% 2018/19: 60% Not measured prior to 2018.	Overall Resident Satisfaction: Watercare: 84% Wellington Water: 57% Dunedin: 74%	≥ 55%	≥ 60%	≥ 65%	≥ 60%	Resident satisfaction surveys	Modern and robust city infrastructure and community facilities
12.0.1.15	M	Number of complaints regarding Council's response to complaints about drinking water taste, odour, clarity, pressure or flow, or continuity of supply per 1,000 properties connected to the Council's water supply system per year	2019/20: 0.01 Not measured prior to 2019.	None found	≤ 0.6	≤ 0.6	≤ 0.6	≤ 0.6	The number of complaints about the Council's response to complaints received under 12.1.1 Target 4, 12.1.1 Target 10, 12.3.1 Target 2 and 12.3.1 Target 3 received through the call centre, expressed per 1,000 properties connected to the Council's water supply system. Department of Internal Affairs, Water Supply non-financial performance measure 4f	Modern and robust city infrastructure and community facilities
Council water supply networks and operations are sustainable										
12.0.4	M	Annual average power (kWh of electricity) used to pump each cubic metre of water	2019/20: 0.37 2018/19: 0.34 2017/18: 0.33 2016/17: 0.33 2015/16: 0.29	Water NZ National Performance Review 2015/16: 3.37	≤ 0.35	≤ 0.35	≤ 0.35	≤ 0.35	Total power used from all water supply pump stations divided by total volume of water pumped	Sustainable use of resources and minimising waste
12.0.5	M	Number of infringement notices for major or persistent breaches of resource consents regarding the operation of the water supply	2019/20: 0 2018/19: 0 2017/18: 0 2016/17: 0	Wellington Water: 0	0	0	0	0	Number of infringement notices received in relation to resource consents for water supply	Sustainable use of resources and

LOS number	C/M ¹	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Primary Community Outcome
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31		
		network, as reported by ECan or Council	2015/16: 0							minimising waste
12.0.9	M	Total volume of water abstracted for urban water supplies in millions of cubic metres per year	2019/20: 56.0 2018/19: 52.02 2016/17: 46.8 2015/16: 50.8	Christchurch specific measure, no benchmarks available.	≤ 55	≤ 55	≤ 55	≤ 55	Total volume of water abstracted from resource consent compliance reports to ECan.	Sustainable use of resources and minimising waste
12.0.7	C	Average consumption of drinking water in litres per resident per day	2019/20: 229 2018/19: 209 2017/18: 201 2016/17: 230 2015/16: 272	Water NZ National Performance Review 2018/19: 294 2017/18: 314 2016/17: 292	≤ 220	≤ 215	≤ 210	≤ 180	Total volume of water abstracted minus the leakage from the public network divided by the total population served by Council's water supply networks Department of Internal Affairs, Water Supply non-financial performance measure 5	Sustainable use of resources and minimising waste
12.0.6	C	Percentage of real water loss from Council's water supply reticulated network	2019/20: 20.2% 2018/19: 23.0% 2017/18: 18.4% 2016/17: 14.9% 2015/16: 11.7%	Water NZ National Performance Review 2015/16: 24%	≤ 24%	≤ 25%	≤ 25%	≤ 26%	Calculated from night time flow measurement and total water abstraction. Department of Internal Affairs, Water Supply non-financial performance measure 2	Sustainable use of resources and minimising waste
12.0.6.2	M	Average Infrastructure Leakage Index (ILI) for all Council water loss zones.	2018/19: 3.73 2017/18: 2.81 2016/17: 2.55 2015/16: 2.35	Water NZ National Performance Review 2018/19: 3.125	≤ 3.21	≤ 3.28	≤ 3.28	≤ 3.35	Infrastructure Leakage Index = Real losses (L/connection/day)/ Unavoidable real losses (L/connection/day).	Sustainable use of resources and minimising waste
12.0.10	M	Peak day demand of drinking water in L per connection per day	2019/20: 1,617 2018/19: 1,402 2017/18: 1,667 2016/17: 1,360	None found.	≤ 1500	≤ 1450	≤ 1400	≤ 1000	Total volume of water abstracted from the public network on the peak day divided by the total number of properties served by Council's water supply networks	Sustainable use of resources and minimising waste

LOS number	C/M ¹	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Primary Community Outcome
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31		
12.0.11	M	Peak hour demand of drinking water in L per connection per hour	2019/20: 103 2018/19: 96 2017/18: 115 2016/17: 92	None found.	≤ 105	≤ 100	≤ 95	≤ 85	Total volume of water abstracted from the public network on the peak hour divided by the total number of properties served by Council's water supply networks	Sustainable use of resources and minimising waste
12.0.15	M	10 year rolling historic ratio of renewals to depreciation	New Metric 2018/19: 32.6%	IPWEA Asset management financial indicator : 100%	≥50%	≥60%	≥70%	≥85%	Historic 10 year average renewals expenditure / Historic 10 year average depreciation	Great place for people. Business and investment
12.0.16	M	Increase Water Supply Asset Management Maturity towards agreed, appropriate level (Advanced 93)	New Metric 2019/20: 82 2018/19: 76 2015/16: 72	NZ Treasury Investor Confidence Rating (ICR) Asset Management Maturity Assessment (AMMA) Tool	82	82	82	93	Conduct assessment on alternate years Asset Management Maturity assessment (AMMA) to be conducted every two years by an external assessor until appropriate level of maturity target is achieved.	Modern and robust city infrastructure and facilities network

6. Does this Activity Plan need to change as a result of a Service Delivery Review (S17A)?

A Section 17A Service Delivery Review (S17A) is a legal requirement under the Local Government Act and determines whether the existing means for delivering a service remains the most efficient, effective and appropriate approach. The legislation requires that a S17A Service Delivery Review should periodically assess:

“The cost-effectiveness of current arrangements for meeting the needs of communities within its district or region for good quality local infrastructure, local public services, and performance of regulatory functions”.

A review of water supply activities was initiated in July 2109 for two key reasons:

- the expiry of the existing 3 waters maintenance contracts and a desire to go out to market for these services
- to enable Council to be prepared for the outcomes of the Department of Internal Affairs' 3 Waters review

The section 17A review was completed in June 2020 and presented to Council in August 2020. The review confirmed that there were underlying challenges with the status quo. Central Government's water reform programme gained significant momentum in mid-2020 and Council agreed to sign a non-binding Memorandum of Understanding with the Crown at the same extra ordinary Council meeting in August 2020 regarding water reform. Due to the increasing pace of water reform, the

status quo was the recommended way forward for the section 17A review. The reform is going to lead to significant changes to water service delivery across the country and adding in further structural change during the reform process was not seen to add value to Christchurch.

The Government has announced a new national water regulator and is reviewing how to improve the supply arrangements of drinking water, wastewater and stormwater, including financing provisions and decision-making capability. Any changes implemented at a national level will have an impact on Council's service delivery.

Given the uncertainty in terms of the outcomes and timing water reform, it is difficult to predict the impacts on the water supply activity service delivery structure. The AMP is prepared on a "business as usual" assumption. Potential outcomes include:

- Regional or larger asset owning 2 waters entity
- Regional, top of the South Island or full South Island entity that includes storm water and waterways

7. What levels of service are changed from the LTP 2018-28 and why?

A number of levels of service performance measures have been removed, modified or added from the previous LTP as summarised below.

LOS number	C/M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Rationale for Addition	Options for consultation and engagement
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31			
Amendments as adopted on 22 Feb 2023 & 27 June 2023											
12.0.2.9	C	<p>Proportion of residents (with supplies of > 100 customers) supplied water compliant with the DWSNZ bacterial compliance criteria</p> <p>Water supplied is compliant with the DWQA Rules in the Distribution System (Bacteria compliance)</p>	<p>Urban 2019/20: 100% 2018/19: 99.8% 2017/18: 98.9%</p> <p>Rural 2019/20: 100% 2018/19: 98.5% 2017/18: 89.4%</p>	<p>Ministry of Health Annual Report on Drinking-water Quality 2018-2019: 95.3%</p>	100%	100% Compliant	100% Compliant	100% Compliant	<p>Report to the Drinking Water Assessor on compliance with the Drinking water Standards for NZ</p> <p>Report on compliance with the Drinking-water Standards for NZ (DWSNZ) and Drinking Water Quality Assurance Rules (DWQA Rules) from Taumata Arowai.</p> <p>The DWQA Rules primarily impose requirements relating to drinking water supplier duties to: (1.) supply safe drinking water (2.) ensure that drinking water complies with the Water Services (Drinking Water Standards for New Zealand) Regulations 2022.</p> <p>Department of Internal Affairs, Water Supply non-financial performance measure 1a.</p>	<p>Two mandatory Water Supply levels of service and targets are being changed to reflect updated guidance recently received from the Department of Internal Affairs (DIA) and the Office of the Auditor General (OAG), following findings from the audit of our Annual Report 2022.</p> <p>Reporting against our existing targets is based on the percentage of drinking water supplied that meets DWSNZ (protozoal and bacterial – targets variously between 0.4% and 100%).</p> <p>The updated guidance from DIA and OAG requires CCC to report against whether the water supplied is safe to drink - in other words compliant or not compliant with DWSNZ.</p>	

LOS number	C/M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Rationale for Addition	Options for consultation and engagement
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31			
12.0.2.10	C	<p>Proportion of residents (with supplies of > 100 customers) supplied water compliant with the DWSNZ protozoal compliance criteria</p> <p>Water supplied is compliant with the DWQA Rules in the Treatment System (Protozoal compliance)</p>	<p>Urban 2019/20: 0% 2018/19: 0% 2017/18: 0%</p> <p>Rural 2019/20: 8.5% 2018/19: 0% 2017/18: 0%</p>	<p>Ministry of Health Annual Report on Drinking-water Quality 2018-2019: 78.7%</p>	≥ 0.4%	≥ 0.4% Compliant	≥ 0.4% Compliant	≥ 99.8% Compliant	<p>Report to the Drinking Water Assessor on compliance with the Drinking water Standards for NZ</p> <p>Report on compliance with the Drinking-water Standards for NZ (DWSNZ) and Drinking Water Quality Assurance Rules (DWQA Rules) from Taumata Arowai</p> <p>The DWQA Rules primarily impose requirements relating to drinking water supplier duties to: (1.) supply safe drinking water (2.) ensure that drinking water complies with the Water Services (Drinking Water Standards for New Zealand) Regulations 2022.</p> <p>Department of Internal Affairs, Water Supply non-financial performance measure 1b.</p>	<p>Two mandatory Water Supply levels of service and targets are being changed to reflect updated guidance recently received from the Department of Internal Affairs (DIA) and the Office of the Auditor General (OAG), following findings from the audit of our Annual Report 2022.</p> <p>Reporting against our existing targets is based on the percentage of drinking water supplied that meets DWSNZ (protozoal and bacterial – targets variously between 0.4% and 100%).</p> <p>The updated guidance from DIA and OAG requires CCC to report against whether the water supplied is safe to drink - in other words compliant or not compliant with DWSNZ.</p>	

LOS number	C/M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Rationale for Addition	Options for consultation and engagement
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31			
Amendments											
12.0.2.19	C	Proportion of residents satisfied with quality of Council water supplies	2019/20: 48% 2018/19: 37% Not measured prior to 2018.	Overall Resident Satisfaction: Watercare: 84% Wellington Water: 57% Dunedin: 74%	≥ 50%	≥ 50%	≥ 50%	≥ 50%	Residents Satisfaction Survey	Amendment to proposed target from draft LTP (≥ 75%/≥ 80%/≥ 80%/≥ 60%) to ≥ 50% across the 10-year period, in the final LTP. Residents continue to express poor satisfaction with the quality of Council water supplies. 2020/21 results show a resident satisfaction with water quality of 45%. Chlorination of the water is the main cause of dissatisfaction. As chlorine is likely to remain in the supply until the reservoir and suction tank remediation is complete, increases in the resident satisfaction are unlikely and it will remain approximately constant for the near future.	
12.0.1.14	C	The proportion of residents satisfied with Council responsiveness to water supply problems	2019/20: 54% 2018/19: 60% Not measured prior to 2018.	Overall Resident Satisfaction: Watercare: 84% Wellington Water: 57% Dunedin: 74%	≥ 65%	≥ 70%	≥ 75%	≥ 85%	Resident satisfaction surveys	Amendment to proposed target from draft LTP (≥ 65%/≥ 70%/≥ 75%/≥ 85%) to ≥ 55%/≥ 60%/≥ 65%/≥ 60% across the 10-year period, in the final LTP. Residents continue to express poor satisfaction with the responsiveness of Council to water supply faults. 2020/21 results show a resident satisfaction with water quality of 52%. Reasons for poor	

LOS number	C/M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Rationale for Addition	Options for consultation and engagement
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31			
										<p>satisfaction are the failure to remove chlorine from the water supply in the timeframe initially supplied and delays in repairing low priority leaks.</p> <p>We predict short-term increases in resident satisfaction with responsiveness to faults as:</p> <ul style="list-style-type: none"> • Wording changes in the 2021 activity plan make clear that the performance measure covers responsiveness to problems/faults. • Collaboration with maintenance contractors is giving faster responses to faults and issues. <p>Long term, resident satisfaction will decrease again as the renewals backlog and failures peak in 2031-2037.</p>	
Additions											
12.0.2.20	C	Proportion of Medium Hazard commercial connections >38mm diameter with compliant backflow prevention device tested within the last year	New metric, no past performance.	None found.	≥95%	≥98%	≥100%	≥100%	Water Services team report on the properties assessed and required to install backflow prevention devices	The Water Safety Plan identifies lack of backflow prevention and uncertainty about testing of backflow preventers as an unacceptable risk. This new measure measures the extent of this risk and Council efforts to eliminate it.	Management Level of service - None required

LOS number	C/M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Rationale for Addition	Options for consultation and engagement
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31			
12.0.2.21	M	Proportion of microbiological drinking water samples collected and analysed by an IANZ accredited and Ministry of Health registered laboratory.	2019/20: 100% 2018/19: 100% 2017/18: 100% 2016/17: 100% 2015/16: 100%	None found.	100%	100%	100%	100%	Number of samples analysed in an IANZ lab / Total number of samples analysed * 100	This performance measure ensures our water testing complies with DWSNZ and water safety plan requirements.	Management Level of service - None required
12.0.1.16	C	Total number of complaints received by Council about: a) Drinking water clarity b) Drinking water taste c) Drinking water odour d) Pressure or flow e) Continuity of supply f) Council's response to any of these issues Per 1,000 properties served per year.	2019/20: 3.14 2018/19: 4.02 2017/18: 2.40 2016/17: 4.25 2015/16: 4.12	Medians from WaterNZ National Performance Review 2018/19: 6.07 2015/16: 9.38	≤ 6.6	≤ 6.6	≤ 6.6	≤ 6.6	Total number of complaints received through Council's call centre about odour, system faults, blockages or responses to complaints multiplied by 1000/number of connections. Department of Internal Affairs, Water Supply Non-Financial Performance Measure 4.	This is a combination of 6 old performance measures. We propose to change the six existing performance measures from community to management Levels of Service for internal reporting but only report the overall complaint number externally. Combining the six minimises the number of community performance measures and aligns us with other councils as well as aligning to national benchmarking.	None required
12.0.6.2	M	Average Infrastructure Leakage Index (ILI) for all Council water loss zones.	2018/19: 3.73 2017/18: 2.81 2016/17: 2.55 2015/16: 2.35	Median from WaterNZ National Performance Review 2018/19: 3.125	≤ 3.21	≤ 3.28	≤ 3.28	≤ 3.35	Infrastructure Leakage Index = Real losses (L/connection/day)/ Unavoidable real losses (L/connection/day).	Percentage water loss is a very poor measure of leakage as the percentage changes with water use even if leakage does not change. ILI is a recognised measure of leakage used for benchmarking.	Management Level of service - None required

LOS number	C/M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Rationale for Addition	Options for consultation and engagement
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31			
12.0.10	M	Peak day demand of drinking water in L per connection per day	2019/20: 1,617 2018/19: 1,402 2017/18: 1,667 2016/17: 1,360	None found.	≤ 1500	≤ 1450	≤ 1400	≤ 1000	Total volume of water abstracted from the public network on the peak day divided by the total number of properties served by Council's water supply networks	Water shortages depend not only on the availability of water but also on the ability to transport water to customers. This performance measure provides a measure of the demand for water delivery. Demand informs upgrade requirements and measures performance of demand management measures.	Management Level of service - None required
12.0.11	M	Peak hour demand of drinking water in L per connection per hour	2019/20: 103 2018/19: 96 2017/18: 115 2016/17: 92	None found.	≤ 105	≤ 100	≤ 95	≤ 85	Total volume of water abstracted from the public network on the peak hour divided by the total number of properties served by Council's water supply networks	Water shortages depend not only on the availability of water but also on the ability to transport water to customers. This performance measure provides a measure of the demand for water delivery. Demand informs upgrade requirements and measures performance of demand management measures.	Management Level of service - None required
12.0.15	M	10yr rolling historic ratio of renewals to depreciation	New Metric 2018/19 : 32.6%	Institute of Public Works Engineering Australasia (IPWEA) Asset management financial indicator : 100%	≥50%	≥60%	≥70%	≥85%	Historic 10yr average renewals expenditure / Historic 10yr average depreciation	This performance measure indicates if the network is being replaced/renewed at the rate at which it is wearing out. Adding this performance measure shows if the past renewals expenditure was sufficient.	Management Level of service - None required

LOS number	C/M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Rationale for Addition	Options for consultation and engagement
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31			
12.0.16	M	Increase Water Supply Asset Management Maturity towards agreed, appropriate level (Advanced 93)	New Metric 2019/20: 82 2018/19: 76 points 2015/2016 : 72 points	NZ Treasury Investor Confidence Rating (ICR) Asset Management Maturity Assessment (AMMA) Tool	82	82	82	93	Conduct assessment on alternate years Asset Management Maturity assessment (AMMA) to be conducted every two years by an external assessor until appropriate level of maturity target is achieved.	Historically the Improvement Plans identified and promoted every LTP never receive funding and resource. This LoS it is hoped will drive change to support improvements in AM and the way the Water supply services are delivered.	Management Level of service - None required

LOS number	C/M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Rationale for Deletion	Options for consultation and engagement
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31			
Deletions											
12.0.2.7	C	Proportion of rural residents supplied water compliant with the DWSNZ bacterial compliance criteria	2018/19 : 100% 2017/18 : 98.9% 2015/16 : 100%	Ministry of Health Annual Report on Drinking-water Quality 2014-2015: 96.8%	≥ 99.8%	≥ 99.8%	≥ 99.8%	≥ 99.8%	Report to the Drinking Water Assessor on compliance with the Drinking-water Standards for NZ Department of Internal Affairs, Water Supply non-financial performance measure 1a	We previously had separate LoS for bacterial compliance in rural and urban networks. As the DIA Non-Financial Performance Measures do not have the urban/rural split, we are now discarding one LoS and changing the other to cover all networks	None required
12.0.2.4	C	Proportion of rural residents supplied water compliant with the DWSNZ	2018/19 : 0% 2017/18 : 0%	Ministry of Health Annual Report on	≥ 19%	≥ 19%	≥ 19%	≥ 19%	Report to the Drinking Water Assessor on compliance with the	We previously had separate LoS for bacterial compliance in rural and urban networks. As the DIA Non-Financial Performance Measures do	None required

LOS number	C/M	Performance Measures Levels of Service (LOS)	Historic Performance Trends	Benchmarks	Future Performance Targets				Method of Measurement	Rationale for Deletion	Options for consultation and engagement
					Year 1 2021/22	Year 2 2022/23	Year 3 2023/24	Year 10 2030/31			
		protozoal compliance criteria		Drinking- water Quality 2014-2015: 80.0%					Drinking-water Standards for NZ Department of Internal Affairs, Water Supply non-financial performance measure 1b	not have the urban/rural split, we are now discarding one LoS and changing the other to cover all networks.	

LOS number	Old Wording	New Wording	Historic Performance Trends	Old Targets	New Targets	Rationale for Changes	Options for consultation and engagement
Modifications							
12.0.1.1	Weekly average of the number of unplanned interruptions of greater than 4 hours duration each year	No change	2019/20: 0.98 2018/19: 1.3 2017/18: 0.94 2016/17: 1.63 2015/16: 0.82	Year 1: ≤ 1.0 Year 2: ≤ 1.0 Year 3: ≤ 1.0 Year 10: ≤ 1.0	Year 1: ≤ 1.0 Year 2: ≤ 1.0 Year 3: ≤ 1.2 Year 10: ≤ 2.0	We propose increasing the targets to align with the expected increased number of failures as shown by renewals models.	Management Level of service - None required
12.0.1.2	Number of unplanned interruptions per 1,000 properties served per year	No change	2019/20: 38.43 2018/19: 17.72 2017/18: 12.24 2016/17: 11.52 2015/16: 15.8	Year 1: ≤ 16 Year 2: ≤ 15 Year 3: ≤ 14 Year 10: ≤ 8	Year 1: ≤ 39 Year 2: ≤ 40 Year 3: ≤ 41 Year 10: ≤ 42	We propose increasing the targets to align with the expected number of failures as shown by renewals models.	Target moved in line with projections. Consultation not required.
12.0.1.7	Number of continuity of supply complaints per 1,000 properties served per year	No Change	2019/20: 1.27 2018/19: 1.57 2017/18: 1.13 2016/17: 1.30 2015/16: 1.24	Year 1: ≤ 2.0 Year 2: ≤ 2.0 Year 3: ≤ 2.0 Year 10: ≤ 2.0	No Change	We propose changing this from a community to a management level of service. External reporting will replace this and five other levels of service with a single level of service for total complaint numbers. This change would align Council with other councils and national benchmarking.	Management Level of service - None required
12.0.1.8	Number of pressure or flow complaints per 1,000 connections per year	No Change	2019/20: 0.80 2018/19: 0.85 2017/18: 1.27 2016/17: 1.45 2015/16: 1.77	Year 1: ≤ 2.0 Year 2: ≤ 2.0 Year 3: ≤ 2.0 Year 10: ≤ 2.0	No Change	We propose changing this from a community to a management level of service. External reporting will replace this and five other levels of service with a single level of service for total complaint numbers. This change would align Council with other councils and national benchmarking.	Management Level of service - None required

LOS number	Old Wording	New Wording	Historic Performance Trends	Old Targets	New Targets	Rationale for Changes	Options for consultation and engagement
12.0.1.13	Proportion of residents satisfied with reliability of water supplies.	No Change	2019/20: 72% 2018/19 : 81% Not measured prior to 2018	Year 1: ≥85% Year 2: ≥85% Year 3: ≥85% Year 10: ≥85%	Year 1: ≥75% Year 2: ≥80% Year 3: ≥80% Year 10: ≥60%	We propose reducing the target to a level likely to be achievable given past performance and the anticipated increase in failures.	Target moved in line with historic performance levels. Consultation not required.
12.0.1.14	Proportion of residents satisfied with the responsiveness of Council water supplies	The proportion of residents satisfied with Council responsiveness to water supply problems	2019/20: 54% 2018/19 : 60% Not measured prior to 2018	Year 1: ≥85% Year 2: ≥85% Year 3: ≥85% Year 10: ≥85%	Year 1: ≥65% Year 2: ≥70% Year 3: ≥75% Year 10: ≥85%	We propose amending the performance measure to improve understanding in resident surveys. We also propose to reduce the target to a level likely to be achievable given past performance ramping up to the previous target with time.	Target moved in line with historic performance levels. Consultation not required.
12.0.1.15	Number of complaints regarding Council's response to complaints about drinking water taste, odour, clarity, pressure or flow, or continuity of supply per 1,000 properties connected to the Council's water supply system per year	No Change	2019/20: 0.01 Not measured prior to 2019.	Year 1: ≤ 0.6 Year 2: ≤ 0.6 Year 3: ≤ 0.6 Year 10: ≤ 0.6	No Change	We propose changing this from a community to a management level of service. External reporting will replace this and five other levels of service with a single level of service for total complaint numbers. This change would align Council with other councils and national benchmarking.	Management Level of service - None required

LOS number	Old Wording	New Wording	Historic Performance Trends	Old Targets	New Targets	Rationale for Changes	Options for consultation and engagement
12.0.2.13	Number of water clarity complaints per 1,000 connections per year	No Change	2019/20: 0.33 2018/19: 0.35 2017/18: 0.54 2016/17: 0.82 2015/16: 0.63	Year 1: ≤ 1.0 Year 2: ≤ 1.0 Year 3: ≤ 1.0 Year 10: ≤ 1.0	No Change	We propose changing this from a community to a management level of service. External reporting will replace this and five other levels of service with a single level of service for total complaint numbers. This change would align Council with other councils and national benchmarking.	Management Level of service - None required
12.0.2.14	Number of water odour complaints per 1,000 connections per year	No Change	2019/20: 0.28 2018/19: 0.44 2017/18: 1.34 2016/17: 0.15 2015/16: 0.14	Year 1: ≤ 0.5 Year 2: ≤ 0.5 Year 3: ≤ 0.5 Year 10: ≤ 0.5	No Change	We propose changing this from a community to a management level of service. External reporting will replace this and five other levels of service with a single level of service for total complaint numbers. This change would align Council with other councils and national benchmarking.	Management Level of service - None required
12.0.2.15	Number of water taste complaints per 1,000 connections per year	No Change	2019/20: 0.45 2018/19: 0.81 2017/18: 1.12 2016/17: 0.53 2015/16: 0.34	Year 1: ≤ 0.5 Year 2: ≤ 0.5 Year 3: ≤ 0.5 Year 10: ≤ 0.5	No Change	We propose changing this from a community to a management level of service. External reporting will replace this and five other levels of service with a single level of service for total complaint numbers. This change would align Council with other councils and national benchmarking.	Management Level of service - None required
12.0.2.9	Proportion of urban residents supplied water compliant with the DWSNZ bacterial compliance criteria:	Proportion of residents (with supplies of > 100 customers) supplied water compliant with the DWSNZ bacterial compliance criteria	Urban 2019/20: 100% 2018/19: 100% 2017/18: 98.9% Rural 2019/20: 100% 2018/19: 98.9% 2017/18: 89.4%	Year 1: ≥ 99.8% Year 2: ≥ 99.8% Year 3: ≥ 99.8% Year 10: ≥ 99.8%	Year 1: 100% Year 2: 100% Year 3: 100% Year 10: 100%	We previously had separate LoS for bacterial compliance in rural and urban networks. As the DIA Non-Financial Performance Measures do not have the urban/rural split, we are now discarding one LoS and changing the other to cover all networks. Addition of the 100-customer minimum water supply size is proposed to align with the DWSNZ.	Adjusted in accordance with DIA requirements. Consultation not required.

LOS number	Old Wording	New Wording	Historic Performance Trends	Old Targets	New Targets	Rationale for Changes	Options for consultation and engagement
12.0.2.10	Proportion of urban residents supplied water compliant with the DWSNZ protozoal compliance criteria:	Proportion of residents (with supplies of > 100 customers) supplied water compliant with the DWSNZ protozoal compliance criteria	Urban 2019/20: 0% 2018/19: 0% 2017/18: 0% Rural 2019/20: 8.5% 2018/19: 0% 2017/18: 0%	Year 1: ≥ 99.8% Year 2: ≥ 99.8% Year 3: ≥ 99.8% Year 10: ≥ 99.8%	Year 1: ≥ 0.3% Year 2: ≥ 0.4% Year 3: ≥ 0.4% Year 10: ≥ 99.8%	We previously had separate LoS for protozoal compliance in rural and urban networks. As the DIA Non-Financial Performance Measures do not have the urban/rural split, we are now discarding one LoS and changing the other to cover all networks. Addition of the 100-customer minimum water supply size is proposed to align with the DWSNZ. Duvauchelle Treatment plant completion late 2021 means compliance records will not be complete until late 2022 so year 1 target excludes Duvauchelle Bay. Uncertainty surrounding secure status of City groundwater supplies mean we cannot assume these supplies will meet requirements. Therefore the City population has been excluded from year 1-3 targets but assume to be included by year 10.	Adjusted in accordance with DIA requirements. Consultation not required.
12.0.2.2	Number of highest risk properties assessed and required to install backflow prevention devices each year.	Proportion of High Risk connections with compliant backflow prevention device tested within the last 12 months	2019/20: 475 2018/19: 110 2016/17: 100 2015/16: 106	Year 1: ≥ 100 Year 2: ≥ 100 Year 3: ≥ 100 Year 10: ≥ 100	Year 1: ≥ 100% Year 2: ≥ 100% Year 3: ≥ 100% Year 10: ≥ 100%	The Water Safety Plan identifies lack of backflow prevention and uncertainty about testing of backflow preventers as an unacceptable risk. This changed measure measures the extent of this risk and Council efforts to eliminate it.	Management Level of service - None required

LOS number	Old Wording	New Wording	Historic Performance Trends	Old Targets	New Targets	Rationale for Changes	Options for consultation and engagement
12.0.2.19	Proportion of residents satisfied with quality of Council water supplies	No Change	2019/20: 48% 2018/19: 37%	Year 1: ≥ 70% Year 2: ≥ 71.5% Year 3: ≥ 73% Year 10: ≥ 85%	Year 1: ≥ 55% Year 2: ≥ 60% Year 3: ≥ 65% Year 10: ≥ 85%	We propose reducing the targets to an achievable level given the recent past performance.	Target moved in line with historic performance levels. Consultation not required.
12.0.7	Average consumption of drinking water per day in litres per resident per day	No Change	2019/20: 229 2018/19: 209 2017/18: 201 2016/17: 230 2015/16: 272	Year 1: ≤ 298 Year 2: ≤ 298 Year 3: ≤ 298 Year 10: ≤ 298	Year 1: ≤ 220 Year 2: ≤ 215 Year 3: ≤ 210 Year 10: ≤ 180	Usage has been significantly less than the target since last LTP therefore the targets are reduced to close the gap between the target and our actual performance.	Target moved in line with historic performance levels. Consultation not required.
12.0.6	Percentage of real water loss from Council's water supply network	No Change	2019/20: 20.2% 2018/19: 23.0% 2017/18: 18.4% 2016/17: 14.9% 2015/16: 11.7%	Year 1: ≤ 15% Year 2: ≤ 15% Year 3: ≤ 15% Year 10: ≤ 15%	Year 1: ≤ 24% Year 2: ≤ 25% Year 3: ≤ 25% Year 10: ≤ 26%	The backlog of water mains past their end of life is large and predicted to increase. Given this deteriorating network condition it is likely leakage will increase as the backlog grows.	Target moved in line with historic performance levels. Consultation not required.

8. How will the assets be managed to deliver the services?

Council staff undertake ongoing water supply planning work to determine what is required by the community now and in the future, what the options are, how works should be prioritised and the best way to deliver them. An Infrastructure Strategy is developed every three years to identify the significant infrastructure issues across all Council assets over the next thirty years. The significant infrastructure issues identified over the next thirty years are:



Managing assets through a global recession



Managing operational expenditure requirements



Managing and meeting the expectations of a growing and changing population



Adapting to and mitigating the impacts of climate change



Protecting our environment through reducing greenhouse gas emissions



Managing the risks posed by a rapidly changing regulatory and commercial environment

One important shift from the 2018-48 Infrastructure Strategy is that earthquake recovery and regeneration is no longer a stand-alone significant issue. Earthquake recovery and regeneration continues to provide important context for infrastructure issues, investment planning and decision making. Although much of the rebuild is now complete, some of the issues the Council faces are in part a consequence of the earthquake's legacy.

How repair or renewal works are identified and prioritised?

Horizontal infrastructure refers to the network of pipes (typically below ground), and accounts for around 90% of the value of Council's water supply assets. Piped assets have a finite life. As pipes are buried underground, routine inspection and planned maintenance are costly and impracticable. Proactive inspections are carried out only on the pipes where failure would potentially have high or very high consequences on the network, community and environment. Reactive maintenance is carried out when issues are identified on the network, generally through service requests logged by the public. The process for repair or renewal of horizontal infrastructure is outlined below, and is explained in more detail in chapters 7 and 8 of the [Asset Management Plan](#).

Calculation of an objective condition grade, failure/maintenance grade, deterioration grade and consequence of failure (criticality) grade for each pipe based on set rules in the asset management system.

A multi-criteria analysis assigns each pipe to a three-year renewal period based on the condition, failure/maintenance, deterioration and risk of failure grades. Risk is mitigated by prioritising the renewal of pipes with the highest risk and consequences of failure.

Theoretical data and actual failure data are used to calculate a priority score for each pipe.

The draft programme is calculated by fitting the required renewals to the budget based on renewal year and priority score. This is then checked for conflict/alignment with wider infrastructure programmes, such as wastewater, stormwater and transport projects.

The list is finalised, and agreed remedial actions are programmed and delivered within the financial year.

Vertical infrastructure refers to the pump stations and treatment plants (typically above ground). The key issues related to the management of both horizontal and vertical water supply infrastructure are summarised below. This section also includes an overview of the measures we are taking to respond to these issues.

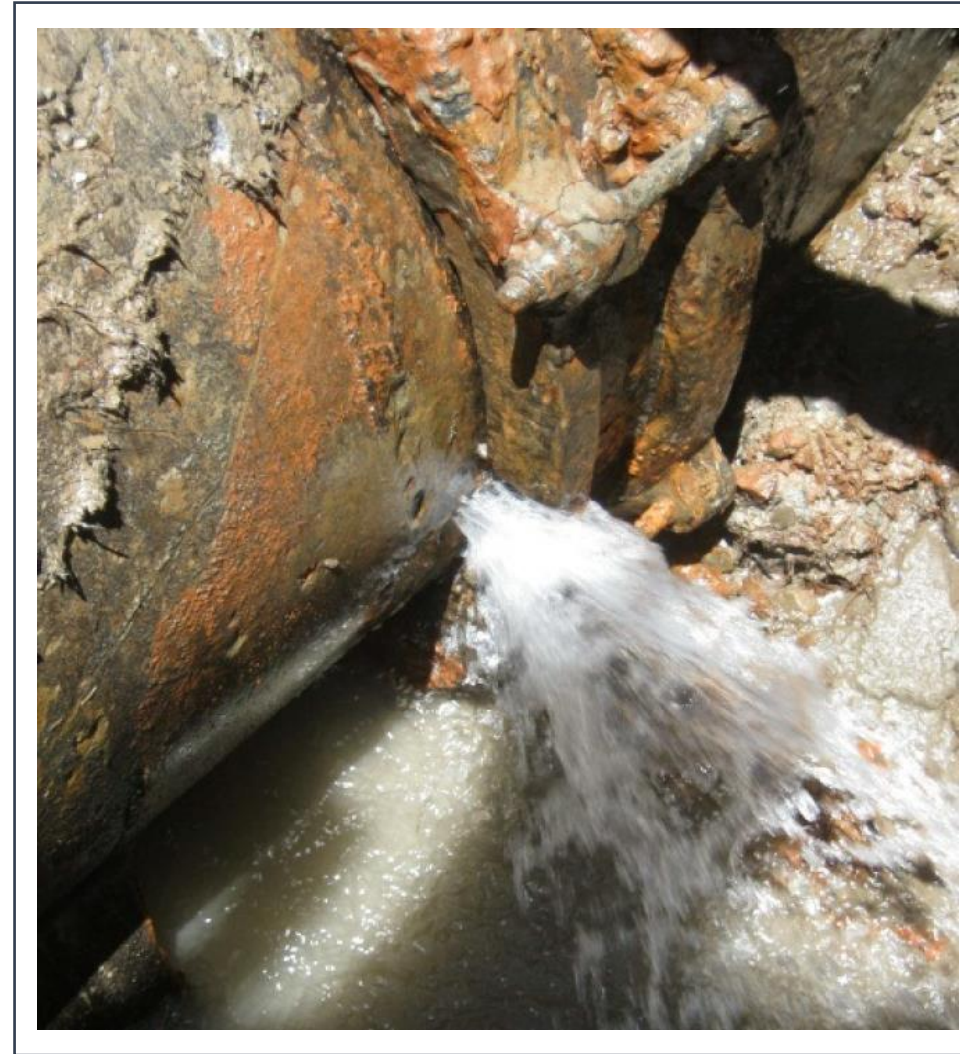
HORIZONTAL INFRASTRUCTURE - Reticulation Network

Renewals: Around 3% of below ground assets were repaired or replaced as part of the earthquake rebuild, at a cost of \$58million. The length of pipes requiring replacement in Council water supply networks has been increasing each year. Over the past ten years, investment has been less than a third of what is required to maintain the current standard. As a result 13.6% of water mains & sub-mains are now classified as being in a 'very poor' condition and have a high chance of failure.

Planned Expenditure: Returning the network to an acceptable condition as quickly as possible would achieve 8.9% very poor condition pipes by 2031 but require significant investment and unacceptable rates rises. Conversely, under a zero rates increase scenario, investment will be insufficient to maintain the current network condition and the network is predicted to deteriorate to 18.2% poor or very poor condition by 2031. Proposed investment is between the two options requiring a small rates increase but improving condition to 11.8% by 2031.

Deferral of Renewals: Deferral of renewal projects will increase service interruptions and operational costs. This will be managed by renewal/replacement of pipes with the highest risk of failure first. Prioritisation is continually reassessed so that pipes failing more frequently than others can move up the priority list and be replaced sooner. Leak detection will continue to focus on areas within the network with the highest leakage rates as shown by night flow data.

New Infrastructure Growth: Developers are responsible for supplying water infrastructure in new developments. However, projects to provide or increase water supply to growth areas will continue to be undertaken in consultation with developers.



VERTICAL INFRASTRUCTURE - Pump Stations and Treatment Plants

Pump Station Renewals: Twenty-five pumping stations were created, repaired or replaced as part of the earthquake rebuild, at a cost of \$102million. Renewals at pump stations and treatment plants are required to maintain the supply of water and fall into five main areas:

- Water safety projects
- Health and safety projects
- Network calming projects
- Obsolescence projects
- End of life renewals

Historical Underinvestment: Underfunding has also occurred in vertical infrastructure assets. This renewals backlog increases the risk of service interruptions and water shortages to customers.

Contamination Risk: We have upgraded most of our wellheads, with just a small number still requiring improvements. These wellhead improvements reduce the risk of our groundwater becoming contaminated before it enters the pump station. Once the water enters pump stations there is still a risk of contamination. To prevent contamination there is a need to repair, refurbish or renew a number of reservoirs and suction tanks.

Health and Safety Requirements: Due to increasing health and safety requirements Council need to replace or upgrade assets that no longer comply and mitigate any sites containing asbestos. Guards for rotating equipment are also being assessed and it is expected that investment will be required to bring these up to standard.

Technical Obsolescence: Technical obsolescence occurs where a product is no longer produced or supported. This issue affects our control systems. Projects for obsolescence can be costly as significant upgrades are often required



9. What financial resources are needed?

Water Supply 000's	Annual Plan										
	2020/21	LTP 2021/22	LTP 2022/23	LTP 2023/24	LTP 2024/25	LTP 2025/26	LTP 2026/27	LTP 2027/28	LTP 2028/29	LTP 2029/30	LTP 2030/31
<i>Activity Costs before Overheads by Service</i>											
Supply Potable Water	15,417	16,503	17,041	17,720	18,591	18,729	19,655	20,571	20,834	21,649	22,588
Secure and Protect Water	3,076	3,528	3,432	3,513	3,607	3,696	3,789	3,885	3,988	4,096	4,203
Monitor Water Quality	110	88	89	90	92	96	97	99	103	105	107
	18,604	20,119	20,563	21,324	22,291	22,520	23,541	24,554	24,925	25,850	26,898
<i>Activity Costs by Cost type</i>											
Direct Operating Costs	5,725	6,432	6,340	6,506	6,683	6,874	7,069	7,276	7,506	7,742	7,977
Direct Maintenance Costs	8,312	9,933	9,204	9,705	10,330	10,234	10,906	11,576	11,574	12,109	12,768
Staff and Contract Personnel Costs	4,549	3,736	5,000	5,094	5,258	5,392	5,545	5,681	5,823	5,978	6,130
Other Activity Costs	18	18	19	19	20	20	21	21	22	22	23
	18,604	20,119	20,563	21,324	22,291	22,520	23,541	24,554	24,925	25,850	26,898
Activity Costs before Overheads	18,604	20,119	20,563	21,324	22,291	22,520	23,541	24,554	24,925	25,850	26,898
Overheads, Indirect and Other Costs	13,772	14,501	15,394	16,077	16,471	17,140	17,326	17,857	18,552	18,855	19,298
Depreciation	39,631	40,329	42,113	44,199	46,431	48,461	48,719	50,976	53,405	56,178	55,028
Debt Servicing and Interest	3,468	3,346	3,743	4,238	5,108	5,893	6,770	7,539	8,281	8,711	8,598
Total Activity Cost	75,475	78,296	81,813	85,838	90,301	94,014	96,356	100,925	105,163	109,595	109,821
Funded By:											
Fees and Charges	4,550	4,832	6,976	7,129	7,293	7,468	7,647	7,839	8,050	8,268	8,482
Grants and Subsidies	-	1,155	-	-	-	-	-	-	-	-	-
Cost Recoveries	-	-	-	-	-	-	-	-	-	-	-
Other Revenues	-	-	-	-	-	-	-	-	-	-	-
Total Operational Revenue	4,550	5,987	6,976	7,129	7,293	7,468	7,647	7,839	8,050	8,268	8,482
Net Cost of Service	70,924	72,308	74,837	78,708	83,008	86,546	88,709	93,087	97,113	101,328	101,339
Funding Percentages:											
Rates	94.0%	92.4%	91.5%	91.7%	91.9%	92.1%	92.1%	92.2%	92.3%	92.5%	92.3%
Fees and Charges	6.0%	6.2%	8.5%	8.3%	8.1%	7.9%	7.9%	7.8%	7.7%	7.5%	7.7%
Grants and Subsidies	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cost Recoveries	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Capital Expenditure											
Replace Existing Assets	22,444	53,351	41,499	64,117	63,067	65,622	67,812	66,925	66,251	65,625	66,688
Improve the Level of Service	11,199	9,126	21,286	10,944	13,245	11,563	14,539	15,276	18,779	16,942	16,035
Meet Additional Demand	1,818	2,366	6,134	10,274	5,081	5,058	5,372	7,319	6,844	8,417	11,702
Total Activity Capital	35,462	64,843	68,919	85,336	81,393	82,244	87,722	89,521	91,874	90,984	94,425

Funding Consideration

Local Government Act 2002 Section 101 Funding Consideration. The following tables are based on the financials from the previous page.

Funding Policy

Funding Principles

User-Pays	Exacerbator-Pays	Inter-Generational Equity	Separate Funding?
High	Low	Low	High

The table above shows how Council has considered funding in relation to the Activity, using a simple high / medium / low scale:

- User-pays – the degree to which the Activity can be attributed to individuals or identifiable groups rather than the community as a whole;
- Exacerbator-pays – the degree to which the Activity is required as a result of the action (or inaction) of individuals or identifiable groups;
- Inter-generational equity – the degree to which benefits can be attributed to future periods; and
- Separate funding – the degree to which the costs and benefits justify separate funding for the Activity.

Where an Activity is paid for through a number of funding mechanisms, Council’s practice is to meet its operating costs in the first instance from fees & charges and grants & subsidies (subject to the considerations outlined above). If the Activity requires further operational funding, this remainder is funded through rates.

This capital programme will be funded in accordance with the following principles:

Investment type	Initial funding	Serviced and/or repaid by:
<ul style="list-style-type: none"> • Renewal / replacement • Service Improvement and other assets • Growth 	<ul style="list-style-type: none"> • Rates and debt • Debt • Debt and Development Contributions 	<ul style="list-style-type: none"> • Rates • Rates • Rates and Development Contributions

Operating Cost Funding Policy

This table below shows Council’s broad funding target for the Activity (i.e. how much is paid for by individuals / groups, and how much by the community as a whole), and the associated funding mechanism used (i.e. general rates, targeted rates, user charges, etc.). As the precise balance between individual / group and community funding may vary in practice (particularly for volumetric fees and charges), the funding target for each of the below tables is expressed in broad terms rather than specific percentages:

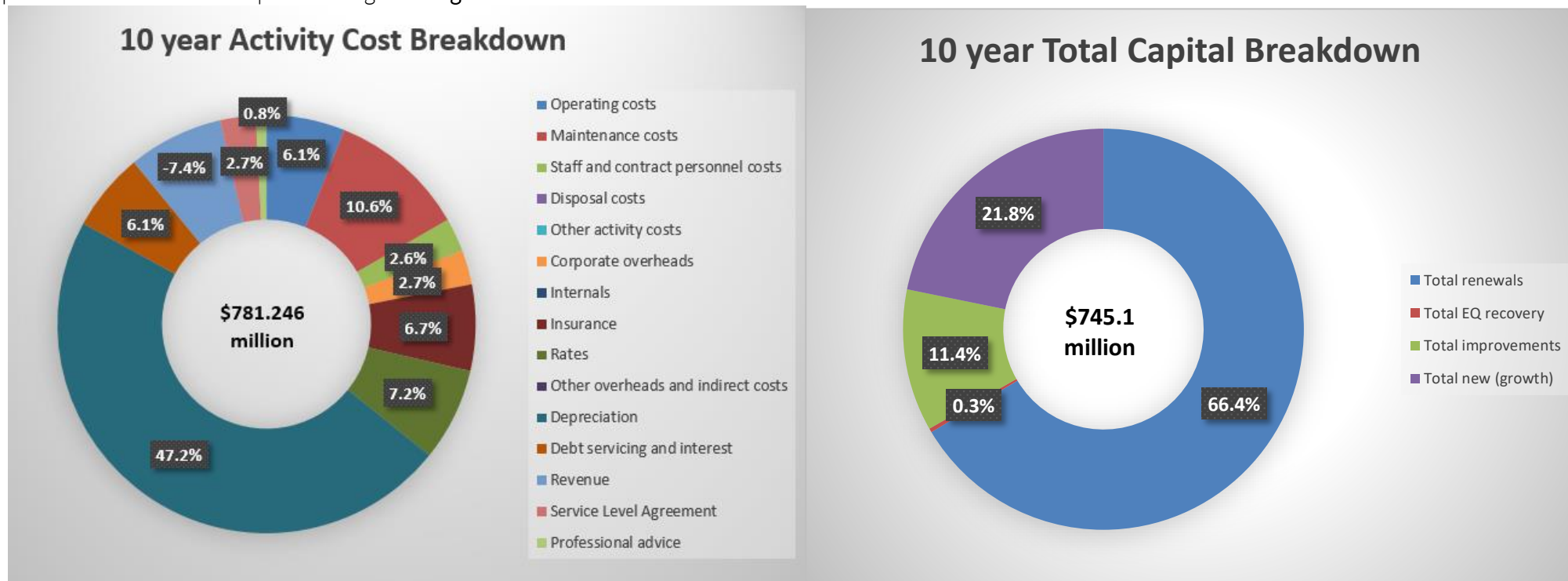
- Low = this source provides 0%-25% of the funding for this Activity;
- Medium = this source provides 25%-75% of the funding for this Activity; and
- High = this source provides 75%-100% of the funding for this Activity.

Funding Target		Funding mechanism	
Individual / Group	Community	Individual / Group	Community
High	Low	<ul style="list-style-type: none"> • Targeted Rate (High) • Fees & Charges (Low) 	<ul style="list-style-type: none"> • Grants and Other (Low)

Capital Cost Funding Policy for this Activity

Rates	Borrowing	DC s	Grants and Other
Medium	Medium	Low	Low

The charts below illustrate the proposed spending over the next ten years. The chart on the left shows significant a breakdown of activity costs and the chart on the right provides a breakdown of capital funding. All budgets are un-inflated






The projected cost of providing the necessary core services covered by this activity, including operations, maintenance, renewal, upgrade and earthquake recovery over the 10 years of the Long Term Plan (LTP) from Financial FY22 – FY32 is **\$1,771 million** to address a backlog of deferred renewals and deliver improvements to meet water safety plan requirements. The historic expenditure for the 10 year period FY2011 to FY2020 was **\$604 million**.

The significant projected increase is primarily due addressing a backlog of deferred renewals and improvements needed to meet water safety plan requirements.

The funding allocated to providing the necessary core services covered by this Activity plan over the 10 years of the LTP is **\$1,526 million**. This is **86%** of the cost (as outlined above) to provide optimised asset management at the lowest lifecycle cost.

The allocated funding leaves a shortfall of **\$245million** over the 10 years of the LTP (**all values exclude inflation**). The resultant effect will be a reduction in levels of service to the community which will be reflected in the updated performance measure targets.

A snapshot of key financial indicators is shown below, including the historic ten year average and how this compares with the next LTP period.

	Historic	Recommended	Proposed	Change	Explanation
Asset Renewal funding ratios	2011-20 33.4%	10yr 100% 5yr 100% 3yr 100%	10yr 78% 5yr 71.3% 3yr 71.3%		Shows what percentage of total recommended renewal cost will be funded.
Rate of annual asset renewal (FY22-24)		2.74%	1.87%		How much of the asset stock will be renewed / replaced each year.
Rate of annual asset creation (FY22-24)		0.67%	0.59%		This is an indicator of how much is been added to the asset stock each year.

Valuation Data

Annual Depreciation Expense (AD)			Replacement Cost (ORC)			Annual Rate of Asset Consumption	
2020	\$38.1 million	+ 12%	2020	\$2,873 million	+ 13%	2020	1.33%
2017	\$33.6 million	+ 28%	2017	\$2,496 million	+ 29%	2017	1.35%
2015	\$24.3 million		2015	\$1,777 million		2015	1.37%

10. How much capital expenditure will be spent, on what category of asset, and what are the key capital projects for this activity?

Activity	Driver	ID	Project Name	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
Water Supply														
	Asset Renewal		(\$000)											
		51	Programme - WS Mains Renewals	153	1,263	33,249	37,581	37,570	41,601	46,388	47,686	49,069	50,394	344,954
		52	Programme - WS Headworks Well Renewals			72	303	708	2,744	3,062	3,150	983	1,960	12,982
		53	Programme - WS Submains Renewals		171	5,800	3,729	3,967	5,602	6,252	6,431	6,020	6,006	43,978
		73	Programme - WS Pumping & Storage Civils and Structures Renewals								197	737	184	1,118
		89	WS Submains Meter Renewal	350	194	227	213	222	287	320	315	294	294	2,716
		888	WS Lyttelton Rail Tunnel Pipeline Renewals	100	512	5,238	5,369	6,453	3,567					21,239
		2355	WS Pump Stations Reactive Renewals	457	307	314	285	297	384	429	441	412	412	3,738
		14866	WS Ben Rarere Pump Station Bexley Earthquake Replacement	2,117										2,117
		17885	WS Eastern Terrace Trunk Main Renewal	5,304	10,070									15,374
		17924	WS Averill Street Pump Station Renewal (PS1005)	100	859	3,190	5,085	1,811						11,045
		33813	WS Jeffreys Road Pump Station Suction Tank Renewal (PS1076)	3,417	501									3,918
		41874	Programme - WS Mains Renewals Affiliated with Roothing Works		100	1,053	1,017	1,062	1,372	1,531	1,575	1,475	1,470	10,655
		41881	Programme - WS Modelling				176	184	238	266	273	255	254	1,646
		41882	Programme - WS Pumping & Storage Electrical Renewals					238	307	343	353	330	329	1,900
		41883	Programme - WS Pumping & Storage Mechanical Renewals					158	204	228	272	358	254	1,474
		41884	Programme - WS Control Software Renewals (SCADA)					88	113	126	130	121	122	700
		42082	Programme - WS Pumping & Storage Instrumentation, Control & Automation Renewals (ICA)					396	513	572	693	659	656	3,489
		48081	WS Mains Renewal - Halswell Junction Rd Roothing Extension	327										327
		48893	WS Westmont, Bartlett, Peacock & Bridle Path Road Mains Renewals		6									6
		48901	WS Pump & Storage Equipment Renewals 2020 (MEICA)	293										293
		48907	WS Health & Safety Renewals	63	64	66	94	99	128	143	147	137	137	1,078
		50340	WS Grassmere Well Renewal (1)	66										66
		50341	WS Mays Well Renewal (3)	375										375
		50437	WS Treatment Plant Reactive Renewals	39	43	41	24	25	32	36	37	34	34	345
		50446	WS Suction Tank & Reservoir Renewals	260	6									266
		50449	WS Sydenham Suction Tank Replacment	3,126										3,126
		55781	WS Libeau & Chemin Du Nache Mains Renewal	346										346
		55782	WS Riccarton Road Mains Renewal (Hansons to Matipo)	2,492	630									3,122
		55783	WS Scruttons Road Pump Station to Lyttelton Road Tunnel & St Andrews Hill Road Mains Renewal	2,717										2,717
		55784	WS Hackthorne & Dyers Pass Road to Takahē Pump Station Mains Renewal	1,094	300									1,394

Activity	Driver	ID	Project Name	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
		55785	WS Rocking Horse, Heron, Plover, Mermaid & Pukeko Mains Renewal	1,366	1,077									2,443
		55786	WS Purau, Waipapa, Marine, Whero, Rawhiti & Te Ra Mains Renewal	2,068	1,535									3,603
		55788	WS Fenchurch, Grosvenor, Paddington, Ealing, Camden, Uxbridge & Aldgate Mains Renewal	1,918	1,228									3,146
		55789	WS Grahams, Hounslow & Rembrandt Mains Renewal	1,659	1,333									2,992
		55790	WS Puriri, Kilmarnock, Wharenui, Ilam, Maidstone, Wainui, George, Division, Deans & Waimairi Mains Renewal	3,679	2,557									6,236
		55796	WS Bridle Path, Station, Rollin, Marsden & Port Hills Road Mains Renewal	1,395	1,023									2,418
		55797	WS Park, Governors Bay, Cressy, Pages, Buxtons & Gladstone Quay Mains Renewal	1,103	2,046									3,149
		55798	WS Conway, Hollis, Centaurus, Palatine, Herbs & Eastern Terrace Mains Renewal	1,308	440									1,748
		55801	WS Aranui & South New Brighton Area Submains Renewal 2022	1,282										1,282
		55802	WS North New Brighton Area & Bossu Road Submains Renewal	600	35									635
		56060	WS Update Model Base Data	104	114	109								327
		56683	WS Reactive Mains & Submains Renewal	331	450	254	237	248	320	357	367	343	343	3,250
		57144	WS Reactive Water Meter Renewal	1,120	833	1,088	1,329	1,536	2,287	2,551	2,625	2,457	2,452	18,278
		57801	WS Redwood Pump Station Well 1 & Well 2 Renewal (PS1077)	1,435	757									2,192
		57805	WS Birdlings Flat Well		327									327
		58135	WS Ashgrove, Macmillan, Cashmere, Dyers Pass, Victoria, Barry Hogan & Hackthorne Mains Renewals	2,048	1,023									3,071
		58146	WS Port Hills Road Mains Renewals	98	2									100
		58147	WS Cranford, Sherborne & Victoria Mains Renewals	441										441
		58162	WS London, Canterbury, Dublin, Oxford, Norwich, Gladstone, Exeter & Donald Mains Renewals	267	6									273
		58178	WS Hackthorne Reservoir Renewal	968	582									1,550
		58910	WS Quarry Reservoir Renewal	663	367									1,030
		59075	WS Pumping & Storage MEICA Renewals for FY2022	955										955
		60071	Programme - WS Banks Peninsula Pumping & Storage Mechanical Renewals					56	73	253	279	353	242	1,256
		60072	Programme - WS Banks Peninsula Pumping & Storage Electrical Renewals					85	110	123	126	118	117	679
		60073	Programme - WS Banks Peninsula Pumping & Storage Instrumentation, Control and Automation Renewals (ICA)					142	183	247	259	265	237	1,333
		60079	Programme - WS Banks Peninsula Pumping & Storage Civils & Structures Renewals							642	730	1,032	614	3,018

Activity	Driver	ID	Project Name	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
		60096	WS Blighs Road Pump Station Well 3 Renewal (PS1007)	977	22									999
		60152	WS Kerrs Road Pump Station Station Renewal (PS1022)		102	775	2,168	5,175	1,858					10,078
		60153	WS Tara Street Replacement Building, Electrics & Controls			236	1,074	275						1,585
		60154	WS Grampian Street Suction Tank Renewal		26	236	1,074	3,434	2,909	1,909				9,588
		60155	WS Auburn Avenue Pump Station Renewal (PS1068)			105	795	248	1,129	290				2,567
		60158	WS Pump & Storage MEICA Renewals for FY2023		1,182									1,182
		60159	WS Pump & Storage MEICA Renewals for FY2024		10	2,177								2,187
		60160	WS Pump & Storage MEICA Renewals for FY2025		10	1,600	1,008							2,618
		60162	WS Mount Herbert Reservoir Replacement				27	330						357
		60163	WS Scarborough 1 Pump Station Relocation out of Rock Fall Zone				107	330	1,694	696				2,827
		60164	WS Lock Renewals		102	314	322	330						1,068
		60171	WS SCADA Communications Upgrade Works		1,341									1,341
		60200	WS Woolston Well 3 Renewal (PS1065)		10	837	200							1,047
		60257	WS Spreydon Well 2 & Well 3 Renewal (PS1030)	1,221	520	375								2,116
		60261	WS Montreal Street Well 2 Renewal (PS1027)		51	820	175							1,046
		60325	WS Pump Station – Diesel Tank Renewals to Meet Regional Plan		51	393	268							712
		60326	WS Asbestos Removal		143	147	150	154	158	162	167	172	176	1,429
		60375	WS Mains Renewal - Multi-Use Arena - Barbadoes and Madras		315	3,415								3,730
		63039	WS Mains Renewal - Lincoln Rd and Hazeldean Rd	147	1,413									1,560
		64331	WS Sefton, Pascoe, Webb, Walnut, Hutcheson, Bradford, Walsall, Hammond, Willis & Dobs Mains Renewals	153	1,605									1,758
		64690	WS - PS1012 Estuary Reservoir Water Security Renewals & Upgrades	39										39
		64691	WS - PS1014 Grassmere WS-Suction Tank 01 Water Security Renewals & Upgrades	77										77
		64692	WS - PS1026 Mays WS-Suction Tank 01 Water Security Renewals & Upgrades	148										148
		64693	WS - PS1052 Mount Pleasant 3 Reservoir 01 Water Security Renewals & Upgrades	95										95
		64694	WS - PS1108 Halswell 2 Reservoir Water Security Renewals & Upgrades	30										30
		64695	WS - PS1125 Gardiners Suction Tank Water Security Renewals & Upgrades	60										60
		64696	WS - PS1052 Mount Pleasant 3 Reservoir 02 Water Security Renewals & Upgrades	15										15

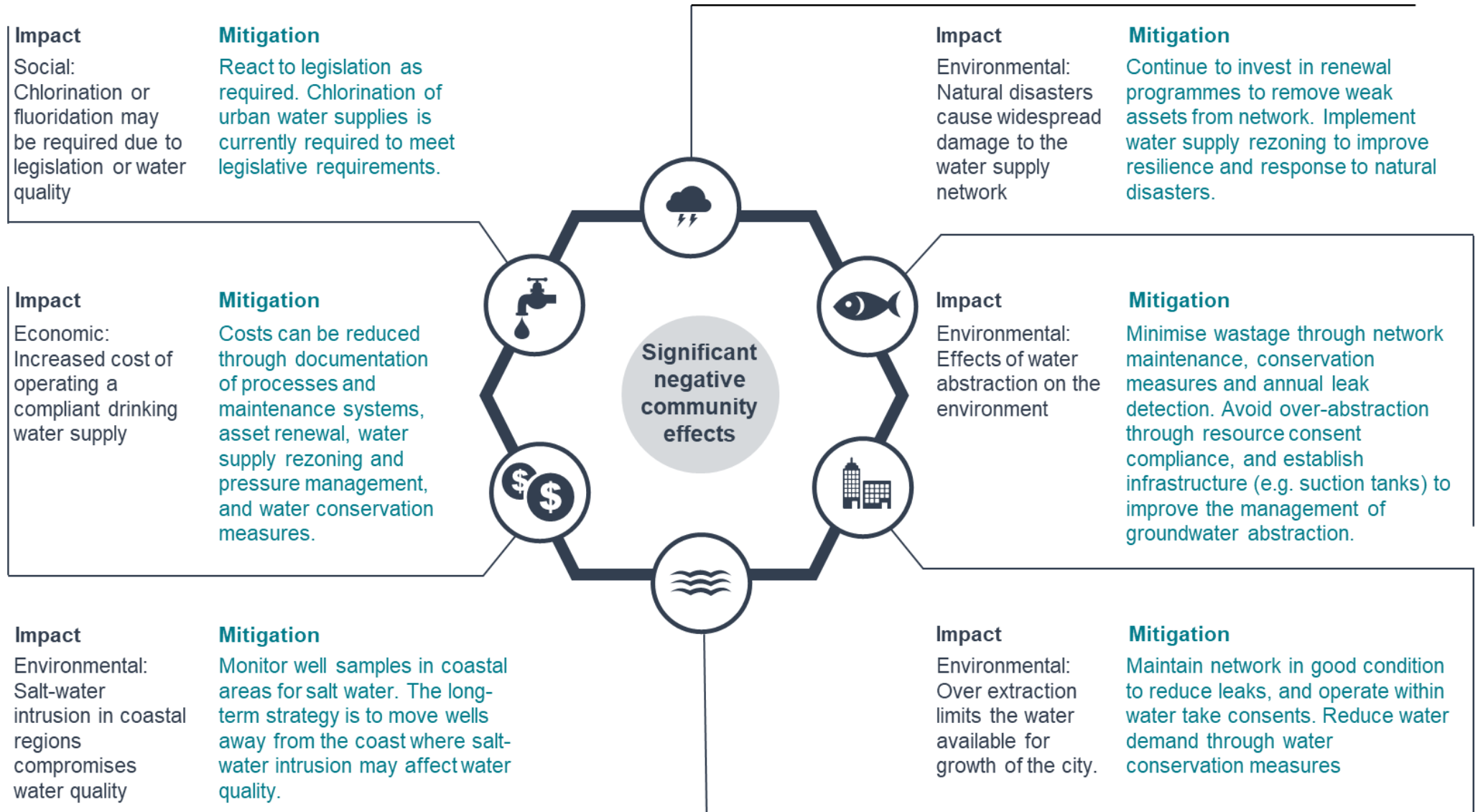
Activity	Driver	ID	Project Name	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
		64986	WS Akaroa L'Aube Hill Reservoir Replacement		815	1,585								2,400
		65002	WS Banks Peninsula Treatment Plant Equipment Renewals FY2023 (MEICA)		369									369
		65032	WS Banks Peninsula Pumping & Storage Equipment Renewals 2023 (MEICA)		217									217
		65033	WS Banks Peninsula Pumping & Storage Equipment Renewals 2024 (MEICA)			501								501
		65038	WS Banks Peninsula Pumping & Storage Equipment Renewals 2025 (MEICA)				272							272
		65039	WS Banks Peninsula Pumping & Storage Reactive Renewal		158	72	135	142	183	204	210	196	197	1,497
		65082	WS Vanguard, Browning, St James, Riverlaw, Worcester, Olivine, Curries & Lismore Submains Renewal	754										754
		65083	WS Mecca, Kearneys, Price, Nicholas, Highbury & Aldwins Submains Renewal	736										736
		65098	WS Carnarvon, Sewell, Gloucester, Wildwood, Odie, Ruru, Chelsea & Nalder Submains Renewal	787										787
		65099	WS McGregors, Keighleys, Walcot, Ferry, Manning, Seaforth, Buckleys & Bordesley Submains Renewal	26	863									889
		65100	WS Tilford, Frensham, Jura, Islay, Staffa, Gow, Bute & Alport Submains Renewal	28	925									953
		65101	WS Maunsell, Worcester, Adams, Bromley, Lane, Bayswater, St Johns, Connal, et al Submains Renewal	26	882									908
		65111	WS Bridle Path, Ticehurst, Hawkhurst, Coleridge, Dublin, Selwyn, Brittan, Charlotte J Mains Renewals	421	2,743									3,164
		65112	WS Grahams, Powell, Pulford, Sunningvale, Bainton, Rolfe, Gregan, Farrington, Hillsbo Mains Renewals	302	3,213									3,515
		65113	WS Mt Pleasant, Moorhouse, Struthers, Troup, Oxford, Kevin, Dalkeith, Cedars & Wyn Mains Renewals	280	2,947									3,227
		65118	WS Petrie, Nicholls & Dulles Mains Renewals		933	35								968
	Growth													
		45	WS New Connections	1,253	1,282	1,149	678	708	915	1,021	1,050	983	980	10,019
		49	WS Subdivisions Add Infrastructure For Development	306	313	296	303	299	307	315	548	564	517	3,768
		50	Programme - WS Reticulation New Mains			826	1,166	1,196	1,227	1,260	1,311	1,349	1,386	9,721
		64	Programme - WS Land Purchase for Pump Stations					1,651			1,788		1,890	5,329
		870	Programme - WS New Wells for Growth					1,205	826	1,696	1,788	1,840	1,890	9,245
		1258	Programme - WS New Pump Stations for Growth						2,098	3,028	358	3,680	5,039	14,203
		56129	WS Highsted Road Water Supply Main	338	8									346

Activity	Driver ID	Project Name	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	Total
New Service													
	20713	WS New Small Supplies								298			298
	52902	WS Okains Bay New Water Supply	1,300	1,227									2,527
Water Supply Total			64,845	68,918	85,335	81,395	82,242	87,722	89,522	91,873	90,981	94,425	837,258

11. Does this activity have any significant negative effects on social, economic, environmental or cultural wellbeing, now or in the future?

Negative Effect	Mitigation
Social	
1. Chemical addition may be required (chlorination or fluoridation) as dictated by legislation and/or water quality	React to Central Government legislation as required. Chlorination of urban water supplies not currently required. Fluoridate water if required by the Canterbury District Health Board.
Economic	
2. Cost of operating a compliant potable water supply	Documented processes and maintenance systems control costs. Improve network efficiency through asset renewal. Water supply rezoning and pressure management to reduce operating and maintenance costs. Reduce demand through water conservation measures. Assess and report cost efficiency and affordability.
Environmental	
3. Salt-water intrusion in coastal regions compromises water quality	Monitor well takes in coastal areas for salinity (conductivity) and investigate any changes. Long term strategy to move wells away from coast where salt-water intrusion may impact on quality.
4. Over extraction limits water available for growth of the city.	Maintain network condition to reduce leaks. Operate within water take consents. Reduce water demand through water conservation measures. Respond to notifications from Environment Canterbury regarding requests for new water takes.
5. Effects of water abstraction on the environment	Network maintenance and water conservation measures to minimise wastage. Annual leak detection programme to monitor and reduce water loss. Maintain resource consent compliance and avoid over-abstraction. Establish infrastructure (e.g. suction tanks) to improve management of groundwater abstraction.
6. Natural disasters cause widespread damage to the water supply network	Earthquake design guidelines incorporated in Council's Infrastructure Design Standard and Construction Standard Specifications. Well, pump station, reservoir and pipeline design more resilient infrastructure than previously. Uphold standards and specifications through the resource and building consent processes. Continue to invest in renewal programmes to remove weaker assets from network (e.g. AC pipes). Water supply rezoning to improve resilience and response to natural disasters.
Cultural	

The following diagram outlines the potential negative effects of water supply on the community, and summarises how these impacts can be minimised or mitigated.



12. What risks are identified and what controls and mitigations are planned?

Council's Risk Policy and assessment framework outlines its approach to managing risk. The framework provides a way to consistently identify, record and assess risks, and prioritise those that need to be mitigated.

Risk management is inherent in all of Council's water supply activity processes. Significant risk management strategies for this activity include:

- **Management escalation and review:** The Water Supply Unit holds a monthly management meeting to review progress on operational activities.
- **Asset design:** For Council delivered projects, all elements are designed and delivered in accordance with Council's Infrastructure Design Standards and Construction Standard Specification. These two documents set in place the expectations of fit-for-purpose design and construction practises.
- **Delivery:** During construction, quality assurance processes are in place to confirm that the works are undertaken in accordance with expectations and guidelines.

It is recommended that the risk tables in Section 5 of the AMP are viewed in conjunction with this Activity Management Plan to understand the challenges that face the water supply activity, the mitigation measures, and the residual risk levels.

In various briefing presentations to the Councillors, the following high level risks were outlined as being key to the activity. There are a number of more specific risks that affect the activity, but they are not presented in this document due to the number of risks and quantity of detail.

Risk Title There is a risk that/of:	Caused By:	Resulting In:	Controls and Mitigations
There is a risk that the groundwater that we use to supply Christchurch/Lyttelton, Wainui, Birdlings Flat, Little River and Akaroa/Takamatua receives microbial or chemical contamination.	<ul style="list-style-type: none"> • Wastewater seeping into the aquifer from broken or leaking pipes, septic tanks or wastewater overflows • Water abstracted from a well that is less than 1 year old. (microbial contamination may still be present) • Chemical or diesel spills seeping into the aquifer, leaching from contaminated sites • Intensive farming in the groundwater source area contaminates the groundwater with nitrate • Contamination of Wells and groundwater source, due to insufficient maintenance and renewals budget, lack of 	<ul style="list-style-type: none"> • Illness and possibly deaths from drinking water contaminated water • Non-compliance with the Drinking-water Standards for New Zealand, which may lead to intervention by the drinking water regulator (e.g. requirement to chlorinate) • Inability to supply sufficient water to meet demand • Additional costs to treat contaminated water reputational damage 	<ul style="list-style-type: none"> • Increased communications and engagement with community through community boards • Programmed wellhead security assessments • Programmed reservoir/suction tank assessments • Programmed CCTV inspections of high consequence of failure pipes • Regular maintenance • Appropriately resourced 3 waters business unit • Adequately funded renewals programmes • Confined aquifer system prevents microbial contaminants from entering the aquifers used for our water supply

Risk Title There is a risk that/of:	Caused By:	Resulting In:	Controls and Mitigations
	<p>staff/contractor capability and capacity, or negligence</p> <ul style="list-style-type: none"> Abandoned or improperly decommissioned wells provide a direct route for contamination to enter the aquifer 		<ul style="list-style-type: none"> Microbial and chemical contamination monitoring, risk assessment and reactive processes Drinking-water source protection zones and associated rules are included in the Land and Water Regional Plan liaising with Environment Canterbury on groundwater protection matters Double skinned heat exchangers to prevent loss of fluids into the aquifer All CCC fuel tanks are above ground Site audits of high hazard sites Appropriate decommissioning and sealing of unused Council bores
<p>There is a risk that the Council, as a water supplier, does not comply with the Drinking-water Standards for New Zealand or the Health Act.</p>	<ul style="list-style-type: none"> Loss of secure bore water status (Christchurch/Lyttelton and Wainui) Not having an approved Water Safety Plan for each water supply that serves more than 500 customers (Christchurch/Lyttelton and Akaroa/Takamatua) Not implementing the preventive measures and improvements in the Water Safety Plans Not operating, maintaining, renewing and upgrading water supply infrastructure (including treatment plants) to meet the required standards A failure to adequately respond to transgressions and escalate breaches of the standards or Act Insufficient trained and experienced staff (Council and Citycare) Inadequate funding of water supply renewals and upgrades and/or operations and maintenance 	<ul style="list-style-type: none"> Illness and possibly deaths from drinking water contaminated water Regulator intervention, including issuing a compliance order, prosecution, fines, declaration of a drinking water emergency with a designated officer of the Ministry of Health taking control of the water supply Increased capital, operational and maintenance costs Reputational damage 	<ul style="list-style-type: none"> Approved Water Safety Plans for water supplies that serve more than 500 customers (Christchurch/Lyttelton and Akaroa/Takamatua) Action plans to implement improvements in the water safety plans Qualified and experienced staff for preparing and implementing Water Safety Plans, operating and maintaining the water supplies, and planning and delivering renewals and upgrades to water supply infrastructure Audits of water supply operations and maintenance activities Operational processes and procedures for the water supplies Providing sufficient funding in the Long Term Plan for operational, maintenance and capital costs to ensure compliance

Risk Title There is a risk that/of:	Caused By:	Resulting In:	Controls and Mitigations
<p>There is a risk that our water treatment plants at Duvauchelle, Little River, Akaroa, Birdlings Flat, Pigeon Bay and Main Pumps do not adequately remove contaminants from the source water.</p>	<ul style="list-style-type: none"> • Contaminant load is greater than the treatment plant was designed for • Treatment plant not properly maintained and/or operated due to insufficient maintenance and renewals budget, lack of staff/contractor capability and/or capacity, or negligence • Break-down of treatment plant 	<ul style="list-style-type: none"> • Illness and possibly deaths from drinking water which has received insufficient treatment to remove contaminants • Non-compliance with the Drinking-water Standards for New Zealand, which may lead to intervention by the drinking water regulator • Increased operational and maintenance costs • Inability to supply sufficient water to meet demand • Reputational damage 	<ul style="list-style-type: none"> • Multi-stage treatment system (coagulation / flocculation, membrane and chlorination) • Use of alternative groundwater source if stream sediment loads are high (Akaroa and Little River) • Turbidity monitoring at the intakes and automatic bypass if stream sediment loads are high • Visual inspections of streams to check for cyanobacteria • Qualified and experienced Maintenance staff to operate and maintain the water treatment plants • Audits of treatment plant operations and maintenance activities • Rules in the Land and Water Regional Plan control activities in Water Supply Protection Zones • Making submissions on resource consents that pose a contamination risk, submitting on changes to the Land and Water Regional Plan and liaising with Environment Canterbury on surface water supply catchment protection matters • Implementation of the Canterbury Water Management Strategy • Treated water storage tanks so that water can still be provided during short outages • Tankering water from another nearby water supply if the treatment plant cannot treat water sufficiently • Planned upgrade to the Duvauchelle water treatment plant included in the Annual Plan • Fire bans during high risk times

As discussed above, there are a number of activity specific risks that were identified as part a robust risk identification process during the Asset Management Plan (AMP) writing process, initially to identify the activity specific related from the ProMapp risk register, and then expand on this with the risks and challenges that face the business. All of these risks are contained in Section 5.3.2 - Activity Specific Risks and relate to risks such as:

1. Major/critical infrastructure failure;
2. Outdated or inadequate hydraulic models to effectively inform planning decisions;
3. Climate change effects on infrastructure;
4. Impacts on economic development ;
5. Insufficient investment of CAPEX and OPEX; and
6. Inability to meet Councils Carbon Neutrality goals - The Government has recognised the pressing need for long-term greenhouse gas emissions reductions, setting national targets in 2019 which CCC have in turn adopted.

These are:

- Net zero gas emissions by 2045
- 50% reduction from 2016/17 baseline levels by 2030 (excluding methane)
- 25% minimum reduction in methane by 2030 and 50% reduction by 2045

There are no specific projects or programmes included in the long term plan currently that specifically target the reduction of our green house gas emissions and address climate change but all projects delivered proactively seek to reduce carbon where opportunities exist.