SOUTHLAND
DISTRICT COUNCIL

Water Supply

2021-2031 Activity Management Plan

Southland District Council
Te Rohe Pōtae o Murihiku

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Quality Assurance Statement				
Draft AMP Template				
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Executive summary

The services provided

Council provides 10 community potable water supplies, two treated rural supplies and nine untreated rural water supplies for stock water only. Based on current information, the schemes have a current valuation in excess of $95 million. Council is the legal entity for the ownership of the assets, the day to day operations reported through the Services and Assets Committee of Council. Rural water supply governance is through Water Supply Committees.

A number of isolated rural townships have individual private supplies, and other small communities have private community water supplies (schools, townships, halls, marae, accommodation, etc).

Council owned and provided facilities are:

Community Supplies: Edendale/Wyndham, Manapouri, Mossburn, Ohai/Nightcaps/Wairio, Orawia, Otautau, Riverton, Te Anau, Tuatapere and Winton.

Treated Rural: Eastern Bush/Otahu Flat and Lumsden Balfour.

Rural (stock): Duncraigen, Five Rivers, Homestead, Kakapo, Matuku, Mount York, Princhester, Ramparts, Takitimu.

What we aim to achieve

Council's Levels of Service (LOS), performance measures and targets are illustrated below.

WATER SUPPLY: The level of service (LoS) we provide	**LoS xx: Our water supply network provides safe, reliable and adequate supply of water.**				
How we measure performance	**Current Performance (19/20)**	**Future Performance Targets**			
		Yr 1 (21/22)	**Yr 2 (22/23)**	**Yr 3 (23/24)**	**Yr 4-10 (25-31)**
KPI xx: **Fault response times** – Where Council attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times are measured:					
(a) attendance for urgent call-outs[1]: from the time Council receives notification to the time that service personnel reach the site;	a) 15 minutes	a) ≤ 1 hour	a) ≤ 1 hour	a) ≤ 1 hour	a) ≤ 1 hour
(b) resolution of urgent call-outs[1]: from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption;	b) 4 hours, 52 minutes	b) ≤ 6 hours	b) ≤ 6 hours	b) ≤ 6 hours	b) ≤ 6 hours
(c) attendance for non-urgent call-outs[1]: from the time that Council receives notification to the time that service personnel reach the site; and	c) 1 hour, 1 minute	c) ≤ 4 hours	c) ≤ 4 hours	c) ≤ 4 hours	c) ≤ 4 hours
(d) resolution of non-urgent call-outs[1]: from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption.	d) 20 hours, 20 minutes	d) ≤ 24 hours	d) ≤ 24 hours	d) ≤ 24 hours	d) ≤ 24 hours
KPI xx: **Customer satisfaction** – The total number of complaints received by Council about any of the following: (a) drinking water clarity; (b) drinking water taste; (c) drinking water odour; (d) drinking water pressure or flow; (e) continuity of supply, and (f) the way Council responds to any of these issues expressed per 1000 connections	16 per 1,000 connections	≤10 per 1,000 connections	≤10 per 1,000 connections	≤10 per 1,000 connections	≤10 per 1,000 connections

to Council's networked reticulation system.					
KPI xx: **Drinking water safety** – The extent to which the Council drinking water supplies complies with:					
(a) drinking water standards (bacteria compliance criteria) and	a) 82%	a) 100%	a) 100%	a) 100%	a) 100%
(b) drinking water standards (protozoal compliance criteria).	b) 82%	b) 100%	b) 100%	b) 100%	b) 100%
KPI 6.1: **Maintenance of the reticulated network** – The percentage of water lost from the Council's networked reticulation system[2]	19.30%	≤25%	≤25%	≤25%	≤25%
KPI 6.2**: Demand management** – The average consumption of drinking water per day, per resident within the territorial authority district.	889 litres	≤ 850 litres per person per day	≤ 850 litres per person per day	≤ 850 litres per person per day	≤ 850 litres per person per day

1 - Attendance means from the time that the Council receives notification to the time that service personnel reach the site. Resolution means from the time that the Council receives notification to the time that service personnel confirm resolution of the fault or interruption. "Urgent" is considered complete loss of drinking-water to an urban drinking water supply. "Non-urgent "includes all other fault/interruptions to an urban drinking water supply
2 - The water loss calculation is the weighted averaged percentage loss reduction per urban drinking water supply

Table 0-1: Water Supply Performance Framework

What we are planning

Over the next 10 years, the aim is to improve performance with respect to managing water loss through continuation of zoned metering, accelerated replacement of ageing asbestos cement water mains, improving water quality compliance with NZDWS, response times for service requests, and investigating options for managing rural water supplies where it is suspected that residents are using this as a source for consumption. With the establishment of Taumata Arowai (Drinking Water Regulator) there is also an emphasis on improving Water Safety Planning, revision of standards and the need to consider future service delivery arrangements with a strong message to consider regional collaboration for the delivery of services.

Managing future demand

Demand for water supply due to population growth is not expected to change significantly over the plan period. Continued growth in townships such as Te Anau, Riverton and Winton is expected, however, at current rates it is anticipated that current infrastructure is capable of dealing with this growth. Demand projects included within previous AMPs and Long Term Council Community Plans have been deferred as a result of slower than previously anticipated growth in these catchments.

Lifecycle asset management

Table 0-2 and Table 0-3 presents an overview of the water supply schemes with condition rating based on joint inspections undertaken by Council staff and Downer NZ and local operations staff.

To achieve Council's intentions, the general asset management strategy is to:

- upgrade the potable water supplies to Drinking-water Standards (2008) by 2018. All but two sites have now been upgraded with work on Riverton at an advanced stage and options being considered for Eastern Bush.
- ensure that the asset management requirements (the maintenance and renewal requirements identified during condition assessments) are appropriately funded, prioritised and scheduled.
- installation of zoned metering to allow real time measurement of water use thus being able to target areas of high water use and proactively manage the network in respect of reducing real losses.

Longer term, consideration will need to be given to the management of some schemes as they reach the end of their asset lives and begin to require significant capital expenditure, especially those showing negative growth. In such areas it is recommended that the focus should be on increased level of

planned/unplanned maintenance rather than complete renewal provided the level of service can be maintained. The expansion of the planning period to 30 years through the infrastructure strategy will provide forward notice of previous horizon projects.

The plan also proposes a strategy for managing renewals of asbestos cement pipes that are failing ahead of life.

Consideration will also be given to what options are available to Council to control properties connecting to rural schemes and using as a source of drinking water.

Financial summary

The following section contains financial information for the activity which has been generated from Council's Fulcrum budget platform. All of the financial shown includes inflation (unless otherwise stated).

Budgets across the water supply activity have been developed based on the following assumptions

Significant changes to capital programme include:

- allowance for failing asbestos cement pipes scheduled to reach end of life during the period of the AMP. Current proposed budget of $1.4M (uniflated) per year which was not in previous plan
- replacement of aging control and monitoring equipment required for controlling water treatment plants and ensuring water safety.
- replacement of other aging plant and equipment.
- introduction of programme to implement backflow prevention on all connections to the network. It is expected this this will become a focus for the new water regulator once it becomes more established.
- further work is required to understand and implement options for improving rural water supplies where it is suspected that untreated stock water is being used to supplement domestic consumption.
- operational costs have been increased by inclusion of further testing and condition assessments across networks to allow prioritization of renewals.
- it is also assumed that new contract arrangements from July 2022 will result in an increase of up to 15% which has been included in the budget. Timing of the renewal of the contract is now likely to be extended by 12 months (subject to Council approval) to more fully understand the implications on 3 waters reforms.

Water Supply	2017/2018 Actual ($000)	2018/2019 Actual ($000)	2019/2020 Actual ($000)	2020/2021 Annual Plan ($000)	2021/2022 LTP ($000)	2022/2023 LTP ($000)	2023/2024 LTP ($000)	2024/2025 LTP ($000)	2025/2026 LTP ($000)	2026/2027 LTP ($000)	2027/2028 LTP ($000)	2028/2029 LTP ($000)	2029/2030 LTP ($000)	2030/2031 LTP ($000)
Sources of operating funding														
General rates, uniform annual general charges, rates penalties	-	-	2	-	638	660	685	699	715	741	746	771	804	804
Targeted rates	3,852	3,832	3,786	4,100	4,873	5,464	5,791	6,056	6,339	6,402	6,665	7,263	7,468	7,769
Subsidies and grants for operating purposes	-	-	-	-	120	-	-	-	-	-	-	-	-	-
Fees and charges	15	5	13	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads applied	48	47	37	47	113	115	116	118	119	121	122	124	126	127
Local authorities fuel tax, fines, infingement fees, and other receipts	6	1	1	1	1	3	3	3	3	3	3	3	3	3
Total operating funding	**3,920**	**3,884**	**3,839**	**4,148**	**5,745**	**6,241**	**6,596**	**6,875**	**7,176**	**7,267**	**7,535**	**8,160**	**8,401**	**8,703**
Applications of operating funding														
Payments to staff and suppliers	2,213	2,367	2,745	2,685	2,623	2,922	2,985	3,063	3,225	3,240	3,329	3,433	3,542	3,655
Finance costs	-	-	-	-	299	378	437	484	526	552	567	578	579	581
Internal charges and overheads applied	615	608	666	804	1,692	1,668	1,799	1,841	1,821	1,796	1,872	2,270	2,361	2,522
Other operating funding applications	(4)	(2)	-	-	-	-	-	-	-	-	-	-	-	-
Total applications of operating funding	**2,823**	**2,974**	**3,411**	**3,489**	**4,614**	**4,968**	**5,222**	**5,388**	**5,572**	**5,588**	**5,768**	**6,280**	**6,482**	**6,758**
Surplus (deficit) of operating funding	**1,097**	**911**	**428**	**659**	**1,131**	**1,273**	**1,374**	**1,488**	**1,604**	**1,679**	**1,767**	**1,880**	**1,919**	**1,945**
Sources of capital funding														
Subsidies and grants for capital purposes	-	-	-	-	2,318	-	-	-	-	-	-	-	-	-
Development and financial contributions	-	7	-	-	-	-	-	-	-	-	-	-	-	-
Increase (decrease) in debt	467	1,081	1,086	4,442	4,467	3,580	3,044	2,907	2,227	1,719	1,551	1,165	1,247	1,147
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other dedicated capital funding	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding	**467**	**1,088**	**1,086**	**4,442**	**6,785**	**3,580**	**3,044**	**2,907**	**2,227**	**1,719**	**1,551**	**1,165**	**1,247**	**1,147**
Applications of capital funding														
Capital expenditure														
- to meet additional demand	-	11	-	-	-	-	-	-	-	-	-	-	-	-
- to improve the level of service	251	561	423	3,428	4,817	2,722	2,133	1,253	122	153	130	134	139	143
- to replace existing assets	1,592	1,463	1,101	1,647	2,721	1,609	1,683	2,465	2,960	2,304	2,198	1,850	1,946	1,849
Increase (decrease) in reserves	(279)	(37)	(11)	26	426	571	649	725	797	989	1,038	1,109	1,130	1,148
Increase (decrease) in investments	(0)	-	-	-	(48)	(48)	(48)	(48)	(48)	(48)	(48)	(48)	(48)	(48)
Total applications of capital funding	**1,564**	**1,999**	**1,514**	**5,101**	**7,916**	**4,853**	**4,418**	**4,395**	**3,831**	**3,397**	**3,317**	**3,044**	**3,166**	**3,092**
Surplus (deficit) of capital funding	**(1,097)**	**(911)**	**(428)**	**(659)**	**(1,131)**	**(1,273)**	**(1,374)**	**(1,488)**	**(1,604)**	**(1,679)**	**(1,767)**	**(1,880)**	**(1,919)**	**(1,945)**
Funding balance	**(0)**	**0**	**(0)**	-	-	-	**0**	-	-	-	-	-	-	-

Purpose of the activity management plan

This Activity Management Plan (AMP) describes the strategies and works programmes for the Water Supply activity so as to meet the objective of delivering the required level of service for the Southland District. It will be reviewed every three years. This AMP informs Council's Long Term Plan (LTP) and contributes to the goals and objectives Council aims to achieve in order to achieve community outcomes. The AMP covers:

- a description of the activity, including the rationale for Council involvement and any significant negative effects of the activity.
- the strategic context for the activity, the key activity management strategies and policies adopted within this environment and the main issues identified for the activity.
- a statement of the intended levels of service and performance targets.

This AMP covers a period of 10 years commencing 1 July 2021. The main focus of the analysis is the first three years and for this period specific projects have been identified in more detail. Beyond this period work programmes are generally based on trends or predictions and should be taken as indicative only. All expenditure is based on unit costs as at 1 July 2021.

Plan limitations

A status review of all AMPs for services provided by the Water and Waste Services department was carried out in 2015. The review found that the plans were meeting the core status with some areas moving towards intermediate for larger schemes. In updating this AMP, the results of the review have been taken into account. It is anticipated that over the course of implementing the projects and programmes in this AMP, progress will be made towards the advanced status in some of the larger townships in the District. Measures to lift the status are discussed further in Section 11.

This AMP attempts to address the most significant water supply asset management issues in the District. It is a living document which will undergo a formal review every three years to make amendments to reflect changes in LOS, demand projections, risk profile, life cycle information, or financial information.

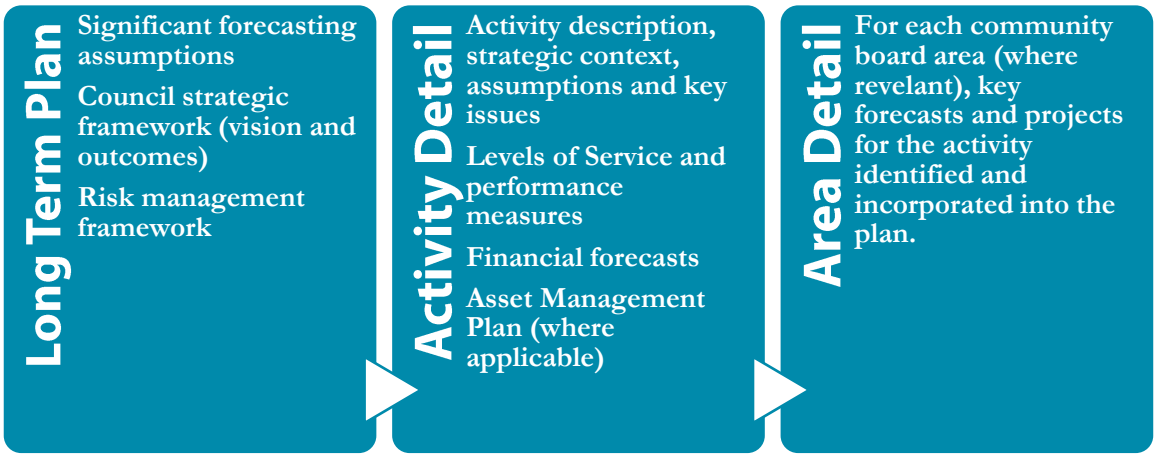
This AMP has b[1]een developed with the following key limitations:

- projects have been identified and scheduled based on the best information available at the time.
- budgets for these projects have been assessed based on the best information available at the time.
- projects towards the end of the 10 year period are flags that work is likely to be needed but it is very much at the concept phase. Options and detailed estimates will be carried out closer to the time. The final 20 years of the 30 year period are for information/assessment only.
- the completion of projects is limited to resourcing of both SDC staff and external engineering support.
- the outcomes from ongoing national inquiry following the Havelock North campylobacter outbreak in 2016 are still being worked through including a review of Drinking Water Standards and may require changes to how services are delivered which have not been allowed for or anticipated in this plan.
- to date there has been limited impact on how the activity is managed as a result of Covid-19.

A wider national review of how the 3 waters activity is managed nationally has previously been undertaken by Central Government and resulted in the setting up of Taumata Arowai which allows for the establishment of a dedicated Regulator who would assume overall responsible for ensuring service providers meet their obligations to comply with the NZ Drinking Water Standards. The review also encourages collaboration between Councils to review service delivery arrangements, something which is currently being considered at an Otago/Southland regional level. .

Plan framework

The AMP framework is illustrated below. The strategic context, significant forecasting assumptions and any activity-specific issues are documented in the main body of this Plan. Information on individual activities and services are included in the appendices to this Plan.



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Activity description

Purpose of this Plan

This Activity Management Plan (AMP) describes the strategies and works programmes for the Water Supply activity so as to meet the objective of delivering the required level of service to existing and future users in the most cost effective way. This AMP informs Council's Long Term Plan (LTP) and contributes to the goals and objectives Council aims to achieve in order to achieve community outcomes. The AMP covers:

- a description of the activity, including the rationale for Council involvement and any significant negative effects of the activity.
- the strategic environment (Council's vision and goals and future demand drivers) for the activity, the key activity management strategies and policies adopted within this environment and the main risk issues identified for the activity.
- a statement of the intended levels of service and performance targets.
- information on the scope of assets involved in delivering services, and statements on:
- the estimated cost for achieving and maintaining the target levels of service
- how Council will assess the manage the implications of demand and service levels and standards, the estimated costs of the provision of additional asset capacity and how these costs will be met
- how the maintenance, renewal and replace of assets will be undertaken, and how they will be funded
- how expenses will be met and the estimated revenue levels and other source of funds.

This AMP covers a period of 10 years commencing 1 July 2021 The main focus of the analysis is the first three years and for this period specific projects have been identified in more detail. Beyond this period work programmes are generally based on trends or predictions and should be taken as indicative only. All expenditure is based on unit costs as at 1 July 2021.

What we do

Water is a valuable resource in Southland District and Council strives to provide a reliable and adequate supply. By doing this, communities have a consistent water supply that is clean and safe to drink which supports the public health and well-being of residents.

Council's supply of water is essential for both personal and operational use across the District. It meets firefighting requirements, which in turn, leads to the increased safety of residents across the District.

The District's water supply consists of 12 drinking-water supplies, as well as nine untreated water supplies for rural (stock) consumption.

Urban and rural areas serviced by public water supplies

Ten townships within the District are reticulated, providing potable water via SDC owned and maintained infrastructure (Figure 2-1); two treated rural water supplies and nine untreated rural water schemes.

Rural water supplies have a different level of service and require customers to have a storage tank (two days capacity) on their property into which they receive a trickle-feed supply. Untreated rural supplies are

provided for stock water only and the use of water for domestic purposes is prohibited. It is known that several of the users on rural schemes are using these as a source of drinking water. Options for managing this significant problem will be investigated in the first three years of this LTP.

The types of infrastructure assets used to deliver this service include:

- water sources (bores and river intake)
- water treatment facilities
- water storage reservoirs
- booster pumping stations
- trunk mains and distribution pipes
- service connections
- valves and fire hydrants
- water meters.

For urban supplies the water supply point of service is the toby or water shut-off valve on the boundary of each property. The Southland District Council owns and maintains all water supply pipelines and other parts of the water supply system up to and including the toby. All pipes, plumbing and fittings beyond the toby are owned by and are entirely the responsibility of the property owner. For rural supplies the point of service is the ball cock on the consumer's tank.

Rural areas and isolated towns

A number of isolated rural communities have individual private supplies, and other small establishments have private community water supplies (schools, townships, halls, marae, accommodation, campgrounds etc). Current rural schemes will stay as rural schemes however some work will be undertaken to determine how much, if any of the water is used for domestic purposes.

The water supply plan does not cover private water supply systems or those not owned by Council e.g. Milford Sound.

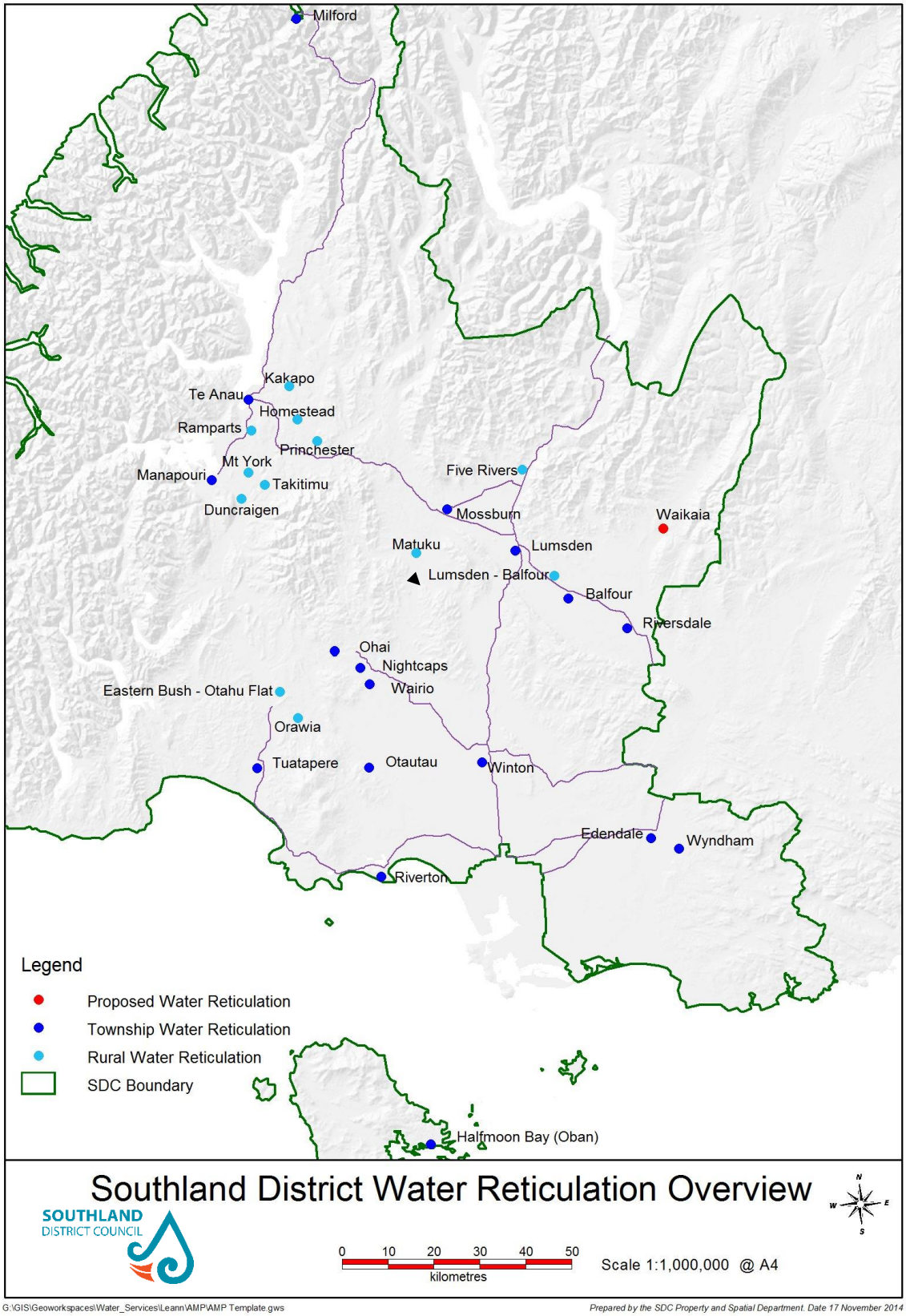


Figure 0-1: Water Supply Locations

Why we do it

By supplying safe and clean water to residents, communities can lead healthy lives. Safe and clean water is also important for many businesses and industry which set up within the District. It also contributes to community safety through the firefighting capability of the water supply system.

As such, the provision of a water supply aligns to the outcome of building **Proud, connected communities that have an attractive and affordable lifestyle.** Water supplies are part of creating a place where people have everything they need to live, work, play and visit; where they are connected to each other, the environment and the world outside Southland; and where they can enjoy a safe and fulfilling life in our unique natural environment.

Objectives of the water supply activity

The water supply activity in the Southland District is focused on providing reliable water supplies that are safe to drink and have adequate supply for use.

Urban supplies have an additional focus on providing adequate pressure and flow for fire fighting and rural water supplies have focus on continuous supply and sufficient capacity for stock. More information about level of services is in Section 5.3.

Strategic considerations

Community outcomes (and community board outcomes where applicable)

Council has adopted a Strategic Framework that identifies where Council wants to be in the future (vision) and the outcomes it aims to achieve to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions (community outcomes). The framework also outlines how it will achieve these (mission and approach) along with the key challenge it faces in doing so and its resulting strategic priorities.

Strategic Framework Component	Proposed 2021-2031 Strategic Framework
Mission	Working together for a better Southland
Vision	"Southland – one community offering endless opportunities"
Community Outcomes	Kaitiakitanga for future generations
	Inclusive connected communities
	A diverse economy creating healthy and affordable lifestyles
	Empowered communities with the right tools to deliver the best outcomes
Strategic Priorities	Improve how we work to build resilience
	Provision of appropriate infrastructure and services
	Better preparing our communities and council for future changes
	Support healthy environments and sustainable communities

The framework guides staff and informs future planning and policy direction and forms the basis for the performance framework. The table below outlines how the Water Supply activity contributes to Council's

community outcomes using a benefits mapping diagram. The full levels of service and performance management framework is presented in a further section later in the document.

Outcomes	Activity contributions	Outcome objective	Benefit	Levels of Service (LoS) and Key Performance Indicators (KPI)	
Activity Objective: Providing reliable water supplies that are safe to drink and have adequate supply for use					
				LoS xx: Provide a reliable and adequate supply of water	
Kaitiakitanga for future generations	Environmental effects are reduced by ensuring that water extractions comply with consent conditions.	2c. Consider the impact on the environment	Reduced environmental Impact	KPI xx: **Fault response times** – Where Council attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times are measured[1]: (a) attendance for urgent[1] call-outs: from the time Council receives notification to the time that service personnel reach the site; (b) resolution of urgent[1] call-outs: from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption; (c) attendance for non-urgent[1] call-outs: from the time that Council receives notification to the time that service personnel reach the site; and (d) resolution of non-urgent[1] call-outs: from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption.	KPI xx: **Customer satisfaction** – The total number of complaints received by Council about any of the following: (a) drinking water clarity; (b) drinking water taste; (c) drinking water odour; (d) drinking water pressure or flow; (e) continuity of supply, and (f) the way Council responds to any of these issues expressed per 1000 connections to Council's networked reticulation system.
Inclusive, connected communities	Where required reticulated supplies are capable of being modified to apply conservation and demand management tools (water meters, flow restrictors, financial incentives), to forcibly reduce demand.	1a. People have everything they need to live, work, play and visit	More convenient and reliable services		
A diverse economy creating healthy and affordable lifestyles	The potential for growth of an area is strongly linked to the availability of water. Without access to reticulated supplies, residential, industrial and commercial development may not be as viable and may face additional difficulties.	1c. People can enjoy a safe and fulfilling life in our unique and natural environment	Safer drinking water Improved public safety	KPI xx: **Drinking water safety** – The extent to which the Council drinking water supplies complies with: (a) drinking water standards (bacteria compliance criteria) and (b) drinking water standards (protozoal compliance criteria).	

Outcomes	Activity contributions	Outcome objective	Benefit	Levels of Service (LoS) and Key Performance Indicators (KPI)	
Empowered communities with the right tools to deliver the best outcomes	The activity provides safe water for drinking as well as water to be used for sanitary services such as showers, toilets, washing and food preparation. In reticulated areas, water is available to support both recreation, such as swimming pools and access to drinking fountains/public toilets, and to improve amenity in areas through use of water for water gardens or for water features. The firefighting capability of the water supply helps improve the safety of people in their homes.	1a. People have everything they need to live, work, play and visit	More reliable access to water More convenient and reliable services	KPI xx: **Maintenance of the reticulated network** – The percentage of water lost from the Council's networked reticulation system[2]	KPI xx**: Demand management** – The average consumption of drinking water per day, per resident within the Council district.

Table 0-1: Activity Contribution to Council Outcomes, Levels of Service and Performance Indicators

Strategic Priorities

Council has identified four priority areas in response to the key strategic challenges facing Council and the community to achieve the vision and community outcomes. The contribution that the activity makes to these strategic priorities are shown in Table 3-2.

Strategic Priorities ▸ / Contribution Area ▾	1. Improve how we work to build resilience	2. Provide appropriate infrastructure/services	3. Better preparing our communities and council for future changes	4. Support healthy environments and sustainable communities
What will be done in the long-term (next 10 years)	Installation of energy efficient pumps and blowers as they are renewed Contribute introduction of appropriate technology to improve how best to deliver service for example mobile field working	Ensure compliance with appropriate national and regional plans	Further understand implications of community futures work on renewal strategy Understand options for management of the water supply activity in such communities	Monitor and trend consumption in areas of known demand particularly Te Anau and Winton
What will be done in the short-term (next 3 years)	Review and improve systems and procedures around data capture, management and storage Understand and implement business case approach during project development Understand implications of climate changes to our communities and how this will impact on the service we deliver Map all critical processes	Understand implications of the draft Proposed Water and Land Plan and how this impact on the service we provide Review contractual arrangements	Undertake increased planned maintenance as a surrogate to planned renewals in communities with limited growth/no growth pending development of policies around how this issue will be managed	Monitor and trend consumption in areas of known demand particularly Te Anau
Key Actions and Projects	Continue embedding IPS and building and improving data knowledge.	Riverton Water Treatment Upgrade Eastern Bush/Otahu Flat Water Treatment Upgrade	None identified specific to water supply activity at this stage.	None identified specific to the water supply activity at this stage
Related strategies / plans / policies	Individual Water Safety Plans Stage 2 Havelock North Inquiry report	Individual Water Safety Plans Proposed Water and Land Plan	None identified	None identified

Strategic context

The purpose of the Southland District Council Long Term Plan 2031 is to:

- provide a long term focus for Council decisions and activities
- provide an opportunity for community participation in planning for the future
- define the community outcomes desired for the District
- describe the activities undertaken by Council
- provide integrated decision-making between Council and the community
- provide a basis for performance measurement of Council.

Strategic direction setting encompasses Council's high-level goals, particularly the vision for the District, what the outcomes for the community may be, and what the strategic priorities will be for delivering work to the community.

Representation framework

Community representation was amended prior to the 2018 triennial elections. There are now nine community boards that provide representation across the district. These are:

Ardlussa	Fiordland	Northern	Oraka Aparima	Oreti
Stewart Island/Rakiura	Tuatapere Te Waewae	Waihopai Toetoe	Wallace Takitimu	

It is important that Council is seen as a leader in service delivery across the District and through this AMP, will ensure its water supplies are fit purpose, in appropriate locations and managed cost effectively. Doing so enables Council to provide and deliver quality, professional services to the ratepayer.

Council aim to have a high level of engagement with its customers and elected members to ensure that the minimum levels of service set out in this document represent their expectations.

Key risks, issues and assumptions for the activity

The following key assumptions have been made through the development of this plan.

Key issues and risks for the next ten years

The most important issues and risks relating to the Water Supply activity for the next ten years are shown in the tables below.

Issue	Context	Implication
Fluoridation	No plans to fluoridate within this AMP	If direction is made by DHB then budgets will be re-visited. The Ministry has announced a capital assistance programme for communities required to provide fluoridation so there may be minimal impact on capex although Opex budgets would need to be increased.

Issue	Context	Implication
Strategic Direction / Industry Management	That expenditure and projects programmed in the LTP (specifically equipment upgrades at Manapouri and Eastern Bush and work related to demonstrating compliance with protozoal status and UV disinfection will mean all of Council's community drinking water supplies provide appropriate protection. It is assumed that no additional expenditure and funding over and above what has been included in the LTP will be required during the plan period.	Currently Council's community drinking water supplies provide multi barrier protection as recommended by the inquiry however Council will continue to monitor requirements identified by the regulator and plan accordingly.
	That Council will continue to be responsible for the management and operation of the Southland District community drinking water supplies until agreement has been reached on arrangements to work towards regional collaboration on service provision.	It is difficult to anticipate how changes to water management could impact on Council. Council has prepared the plan on the basis of how it currently delivers water services noting that this may change in the future. Depending on the nature of any changes, this could impact on service delivery, contracts, staffing and budgets.
Contractual	Current contractual arrangements will end in 2022. A new contract is also proposed to include increased stormwater maintenance conditions.	Given the uncertainty around future service delivery arrangements it is assumed that any future contract would be for a maximum of five years and would essentially be a stop gap until future arrangements become clearer. At the time of writing it is proposed that (subject to council approval) the current contract will be extended for a further 12 months to allow a broader understanding of the wider implications of the water reforms on the activity.
Regulatory	Minimal impact to activity from proposed Water and Land Plan Future amendments to the Drinking Water Standards likely to require further upgrades in particular to improve monitoring and reporting to the Regulator.	Proposed rules around the water supply activity offer a greater degree of protection for community supplies especially when it comes to re-consenting.

Issue	Context	Implication
Asset Data Knowledge	While Council has asset registers and many digital systems, processes and records, Council does not have complete knowledge of the assets it owns. To varying degrees Council has incomplete knowledge of asset location, asset condition, remaining useful life and asset capacities. This requires assumptions to be made on the total value of the assets owned, the time at which assets will need to be replaced and when new assets will need to be constructed to provide better service.	Council considers these assumptions and uncertainties constitute only a small risk to the financial forecasts because: - significant amounts of asset data is known; - asset performance is well known from experience; - there are plans to upgrade significant extents of poorly performing assets. As more knowledge is gained, a better forecast of capital expenditure will be incorporated into future forecasts.
Ageing infrastructure	Some of the pipe networks in the District are approaching the end of their useful life certainly within the thirty year LTP window. Maximising the economic life of the assets and determining the optimal time for replacement are important challenges. **Options:** 1. continue with renewals when assets expire (subject to further condition assessments) 2. rely on increased planned/unplanned maintenance activity in communities with limited growth and accept increased operational costs as result.	Through this plan period it is proposed to undertake accelerated replacement of up to 106km of ageing asbestos cement pipes ahead of their end of life, largely to improve network resilience and reduce levels of reactive maintenance. It is proposed that a programme is included across each year of the 10 year period with budgets included within the proposed forward works programme.
Impact of climate change	Climate change will affect the district over the medium to long term in line with predicted national changes such as increased temperatures, increasing sea levels and more extreme weather conditions characterised by extreme heavy rainfall events as well as prolonged drought periods. Over the medium to long term as the impact of climate change becomes more prevalent Council will need to be proactive in	From a three waters planning perspective the communities likely to be most impacted are the coastal communities of Oban and Riverton although limited Council infrastructure is found at other locations along the coast for example Curio Bay. Through the development of the 2021/31 Long Term Plan Council staff from across a range of activities along with external expertise will more fully evaluate the risks associated with climate change with further planning allowed for in future LTPs/AMP's.

Issue	Context	Implication
	considering implications on communities and infrastructure. Infrastructure planning will need to ensure that future assets are of sufficient standard and have adequate capacity to cater for predicted climate change. Any future infrastructural building work including renewals in coastal areas will be considered against projections of sea level risk. Relocation of assets will also considered if it is believed they are at risk. From a three waters planning perspective the communities likely to be most impacted are the coastal communities of Oban and Riverton although limited Council infrastructure is found at other locations along the coast for example Curio Bay.	

Key Risks and issues for the next ten years

The most important issues and risks relating to the Water Supply activity for the next ten years are shown in the following tables

It is noted that the key issues and risks for the activity align closely with a number of key strategic risks identified at a corporate level the most relevant ones being

- inaccurate data leading to bad decisions/asset failure
- underinvestment in infrastructure
- infrastructure not fit for purpose to withstand climate change
- natural or biosecurity event impacts the wellbeing of the District
- health and safety controls fail to protect staff and contractor safety
- difficulty retaining or recruiting staff affects service levels
- over-commitment leads to inability to deliver agreed work programme

Key risks are summarised in the following table. It is noted that issues and risks are broadly similar across all 3 waters activities.

Risk Event	Current Treatment Details	Proposed Treatment Details
Event - natural disaster causing short term disruption to service provision.	Identification of alternative short term response and recovery arrangements.	Council and Contractor to develop business continuity plans to cover natural disasters.
Event eg natural disaster causing widespread unavailability of activity staff.	Temporary or agency staff either from within Council or through external resourcing	Council and Contractor to develop contingency plans to cover natural disasters.

Risk Event	Current Treatment Details	Proposed Treatment Details
Natural disaster causes significant widespread damage to Council assets and infrastructure.	As Council assets are widespread across the District the risk of significant widespread damage is relatively low however the impact on those areas can be relatively high.	Identify strategic sites at risk and develop plan for their maintenance and return to service. Development of wider emergency management plan. Understand location of vulnerable landfill sites and develop plan for their future management.
Funding of activities will result in significant rates increases impacting on community affordability.	Decisions made with based on a trade-off between 'sweating' assets and targeting investments. Has potential to result in a large number of unbudgeted projects required through the course of the planning cycle.	Development of a well informed capital works programme based on known condition and performance of assets.
Risk to public health as a result of Council activity	Installation of multi-barrier protection on all community water supplies along with review and up-dating of Water Safety Plans. Wastewater and stormwater risks are mitigated through achieving compliance with discharge consent conditions and any investigations that may arise as a result.	As current along with any further requirements that may arise following formation of new drinking water regulator.
Health and safety risks (to staff, contractors and public) associated with operation of Council activity	All Council sites are secure, fenced off and have appropriate signage warning of multiple risks. Higher risk sites have recently been identified and expenditure approved for increasing security.	Further review of fencing and security arrangements will require additional expenditure through future planning cycles.
Breakdown in relationship/communication between Council and Contractor	Regular communications and partnering approach.	More frequent partnering meetings. Review stakeholder management arrangements through new contract. Possible opportunity to develop Alliance type approach.
Failure of co-operation with other Councils that may impact on future potential service delivery arrangements	New risk that may arise following requirement for Councils to work together to review and consider future potential service delivery arrangements.	Agree working protocols among Councils and ensure early and regular engagement with elected members to ensure consistent messaging is being fed through to all Councils.
Lack of resourcing impacts on ability to deliver services through	This is an issue of concern nationally and is currently not one that is well managed. On a	Continue to support local careers based events while pushing at a more national level

Risk Event	Current Treatment Details	Proposed Treatment Details
failure to attract appropriately trained staff into the sector.	local level Council have participated in careers events that succeeded in attracting some graduates into the organisation.	(eg through Water NZ) for a co-ordinated approach to help attract appropriately skilled people into the sector.
Loss of organisational knowledge due to sudden loss of key activity staff resulting in inefficient of inadequate management or operation.	Staff training and succession planning will mitigate risk of frequent staff turnover.	Identify individual staff needs and formulate appropriate training, in conjunction with consultant assistance until skills at appropriate level. Detailed succession planning to ensure institutional knowledge is retained.

In 2017 the Mayoral Forum authorised the establishment of a Working Group comprising Planning staff from the Southland region's Councils to scope and deliver four Region-wide studies. The Group comprised Regional and Local Planning Managers and staff, TAMI staff (Te Ao Marama Incorporated) and other Communications and technical staff from Councils.

The Climate Change Impact Assessment Report ('the Report') was one of the studies commissioned. NIWA (National Institute of Water and Atmosphere) was appointed to undertake the work which commenced in 2017 and was finalised at the end of 2018. The Report utilised a comparable methodology to the Climate Change Projections for New Zealand report and the Intergovernmental Panel on Climate Change scenarios. It used two climate change predictions being RCP (Representative Concentration Pathways) 4.5 – meaning that a large reduction in global carbon emissions is achieved and RCP 8.5 - where no reduction in carbon emissions is achieved.

It is widely accepted that the global climate system is changing and so is New Zealand's. In addition to the impacts on weather there will be impacts on water availability and natural hazard exposure. The Report calculated the potential impacts of climate change on a range of components of climate, hydrology and coastal process across Southland.

Issues

The key findings of the report are summarised as follows:

Temperature

- The projected Southland temperature changes increase with time and emission scenario. Future annual average warming spans a wide range: 0.5-1°C by 2040, and 0.7-3°C by 2090
- Autumn is the season where most of the warming occurs across all time periods and scenarios.
- The average number of hot days (maximum temperature >25°C) is expected to increase in a range spanning from 0-10 days by 2040 to 5-55 days by 2090.
- The related number of heatwave days (i.e., number of consecutive days where the temperature is higher than 25°C) is projected to increase (largest increase with elevation).
- As expected, the number of frost days is expected to decrease by 0-5 days by mid-century, and by 10-20 frost days by the end of the century.

Projected changes in rainfall

- A marked seasonality and variability across the Southland region. Annual rainfall is expected to slightly increase by mid-century (0-5%), while the increase spans 5-20% at the end of the century.

- Seasonally the largest increases are projected during winter, while summer precipitation is expected to decrease in the Waiau catchment (by up to 10% at the end of the century).
- By mid-century, the number of wet days is expected to decrease by up to 10 days across most of the region. However, wet days are then expected to increase by the end of the century for most of the region, except the Waiau catchment where 10-20 fewer wet days are expected.
- By mid-century, decreases in annual maximum 5-day rainfall are projected for the centre of the Southland Region (up to 15 mm) and increases are projected for the rest of the region, with Fiordland facing the largest increases of 15-30 mm in some parts.
- However, at the end of the century, almost the whole Southland Region (except the eastern Waiau catchment under mid-range emission scenario) is projected to experience increases in annual maximum 5-day rainfall of up to 15-30 mm and parts of Fiordland facing possible increases 45 to 105mm.

Dry days

- By mid-century the number of dry days are expected in increase up to 10 more days for much of the region.
- The central part of the region and northern and western Fiordland can expect up to 10 fewer dry days are expected (i.e. will remain wetter)
- By the end of century, a decrease in dry days (up to 10-20 days) is projected for most of the region except for the Waiau catchment (increase up to 10-20 days), eastern Fiordland, and Stewart Island.
- Meteorological drought (a period with abnormal rainfall deficit) – where soil moisture content is reduced and vegetation/pasture growth is hindered. During periods of Potential Evaporation Deficit farms are more likely to need irrigation to maintain crop or pasture growth.
- Central-northern part of the Southland Region is projected to experience the largest increases in Potential Evaporation Deficit in the future across both time slices and all emission scenarios.
- By mid-century, Potential Evaporation Deficit is expected to increase by 40-80mm per year for most of the regions, rising to over 100 m per year for the highest emission scenario by 2090.

Changes in sea level-rise

- Sea level rise is expected to be between 0.2-0.3 m above present levels by 2040 and increasing to 0.4-0.9 m by 2090.
- A present day 1 percent annual exceedance probability (AEP) coastal flood (that is a flood of a size and depth that has a 1 percent chance of happening in any year), will become much more frequent as seas continue to rise, with such large events occurring on average on a yearly basis (100 percent AEP) once sea level rise reaches 0.45 m expected between 2055-2060 and 2100.
- Moderate coastal flooding events will become even more common, occurring several times a year for that same sea-level rise.
- These floods have effects such as salt water on roads and therefore vehicles, saltwater intrusion in underground infrastructure, temporary inundation of open space, agricultural land or natural vegetation. Over time this can the fertility of soils, change plant species or cause accelerated deterioration of public and private infrastructure.
- Considering tides only, putting aside storm events, the rising sea level will result in an increasing percentage of normal high tides exceeding given present day design for coastal infrastructure and roads.
- The replacement costs of buildings exposed in areas where such high resolution LiDAR surveys are already available (mainly low-lying parts of Invercargill City) is considerable at ~$0.6–1.2B (2011 NZ$) for a range from present exposure to 1 percent AEP coastal floods up to a 1.2 m sea-level rise

The report models the effect of climate change on the "mean annual flood" which is a standard measure of floods likely to occur every 2.33 years. The modelling suggests that the mean annual flood is likely to become larger and this may mean an increase in volume for flooding generally. This requires further detailed consideration.

Little appreciable change in water supply reliability across Southland by mid-century. Late-century, however, the decreases become slightly more accentuated, particularly under a high emissions scenario. Water supply reliability is a function of both water availability and water demand to serve urban, agricultural and industrial purposes.

This regional study is a high level starting point for understanding how our climate is likely to change over the next 50 to 90 years. Given the high level of this report additional more targeted reports and internal work will need to be commissioned to better understand how these assumptions are going to impact the management of Council assets and what makes Southland an attractive place to live, do business and visit.

Regulatory considerations

Legislation, regulation and Council's existing strategies and policies mandate or influence some of the LOS and performance targets we set, as illustrated in the table below for the water supply activity.

Below is a list of legislation and regulations that are specific to the outcome of the water supply activity. The table also includes relevant bylaws and policies linked to the activity.

Legislation / Regulation / Planning Documents	**How it affects levels of service and performance standards Outline any changes (implemented or pending) which is impacting the activity and describe how**
Local Government Act 2002	The Local Government Act 2002 requires local authorities enable democratic decision making and action by and on behalf of communities, and to meet the current and future needs of communities for good quality local infrastructure, local public services and performance of regulatory functions in a way that is most cost effective for households and businesses. The act also makes provisions for public ownership and control of water supply services, a and to charge development contributions.
	Changes: None.
Resource Management Act 1991	Promotes the sustainable management of natural and physical resources. Regulates land use and subdivisional activity. Regulates discharges to land, air and water. Recognises the principles of the Treaty of Waitangi. Compliance with District and regional plans.
	Changes: None.
Regional Policy Statement 1997 (RPS) (Environment Southland)	This document's purpose in relation to water supply is to enable the use of water, while protecting its life supporting capacity and availability for future use. It is desirable that such use be efficient and non-wasteful.
	Changes: None.
Regional Water Plan for Southland 2010 (Environment Southland)	The purpose of this plan is to promote the sustainable management of Southland's rivers, lakes, groundwater and wetland resources. The plan is aimed at enabling the use and development of fresh water where this can be undertaken in a sustainable way, providing a framework for activities such as taking and using water.

Legislation / Regulation / Planning Documents	How it affects levels of service and performance standards Outline any changes (implemented or pending) which is impacting the activity and describe how
Proposed Water and Land Plan 2016	Recent or Expected Changes: The proposed Water and Land Plan was notified in 2016 with hearings held through 201. Decisions were released in 2018 with a number of appeals (including Councils) to a number of objectives policies and rules. Following the first stage of appeals in June 2019 an interim ruling was released by the Environment Court in late 2019 with a second round of appeals expected to be heard in 2021. Essentially the plan builds on the provisions of the current active plan but also provides greater certainty and security around provision of water supply for domestic purposes while also placing restrictions on certain activities particularly in the Waiau catchment.
District Plan 2012	Sets out Council's resource management strategy, including designations of water supply schemes. This ensures land use practices maintain, and where appropriate, enhance both the quality and quantity of water within the catchment areas of the water supply schemes to ensure a continues safe and economic supply of water.
	Changes: None.
Infrastructure Strategy	Sets long term direction for the management of assets and infrastructure
	Changes: The updated 2021 strategy signals the need for greater investment required from both capex and opex spending
Subdivision and Land Development Standards Bylaws 2012	Specifies Council's minimum requirements for subdivision and land development for the installation of water supply reticulation, while promoting sustainable development. Sets minimum engineering specifications for infrastructure.
	Changes: None although it may be prudent to review ahead of its approved date.
Utilities Access Amended Act 2011	The purpose of the Code is to enable access by utility operators to transport corridors to be managed in a way that disruptions to roads by water supply pipe installations are kept to a minimum while maintaining safety and maximising the benefits to the public.
	Changes: None.
Water Supply Bylaw 2017	Requires all persons to make application before connecting to the water supply network and outlines conditions for taking water and penalties for illegal tampering of Council property.
	Changes: None.
SNZ PAS 4509:2008 - New Zealand Fire Service Firefighting Water Supplies Code of Practice	Provides direction on what constitutes and adequate supply of water for firefighting in Urban Fire Districts. This includes areas covered by any agreements under Section 38 or 39 of the Fire Service Act.
	Changes: None.
Taumata Arowai – Water Services Regulator Bill	The bill establishes Taumata Arowai the water services regulator as a new crown agent and provide for its objectives functions and operating principles. The Bill is part of a broader package of reforms to the regulatory system for 3 waters. The Government has indicated a separate bill will be proposed to give effect to decisions to implement system wide reforms to the regulation of drinking and source water and targeted reforms to improve the regulation and performance of wastewater and stormwater networks and will include consideration of future service delivery arrangements.

Legislation / Regulation / Planning Documents	How it affects levels of service and performance standards Outline any changes (implemented or pending) which is impacting the activity and describe how
Drinking-water Standards of New Zealand 2005 Revised 2018 (Ministry of Health)	Prescribe the maximum allowable values (MAVs) for determinants of public health significance and compliance criteria. Allows small supplies to have a Public Health Risk Management Plan in place in order to reduce compliance requirements provided risk is well managed.
	Changes: The design of the standards are currently under further review following formation of Tamauta Arowai Establishment Unit. They also include development of a series of 'acceptable solutions' for single use supplies and rural supplies and

Three waters reforms

Reform in the three waters sector has been progressing for some time. However, since the Havelock North incident in 2016 it has become an area of high priority for central government.

Following the Havelock North incident, the government commenced a formal inquiry, which recommended a Three Waters Review be undertaken. The review considered options for improving regulatory and service delivery arrangements for drinking water, wastewater and stormwater services (Three Waters) to better support New Zealand's prosperity, health, safety and environment. Most three waters assets and services, but not all, are owned and delivered by local authorities.

The government's three waters review highlighted that, in many parts of the country, communities cannot be confident that drinking water is safe, or that good environmental outcomes are being achieved. This work also raised concerns about the regulation, sustainability, capacity and capability of a system with a large number of localised providers, many of which are funded by relatively small populations.

Taumata Arowai - the Water Services Regulator Bill has now passed into law with significant work well advance with the establishment of the crown entity. . The bill is relatively simple in that its focus is on establishing the new water regulator as a crown entity, under the Crown Entities Act 2004. The bill also outlines the agencies objectives, functions, operating principles and governance arrangements and is expected to be enacted by mid-2020.

A separate bill will give effect to the decision to implement system-wide reforms to drinking water regulation, alongside targeted reforms to improve the regulation and performance of wastewater and stormwater networks.

The regulatory components of this work are well progressed with the development of new legislation and the creation of Taumata Arowai, the new, independent water services regulator. This new Crown entity is currently being built, and will become responsible for drinking water regulation once a separate Water Services Bill, which is currently before Parliament, is passed (anticipated mid 2021).

Following the onset of Covid-19, central government have reviewed the approach being followed to three waters reform. This review has in part been driven by a number of factors including:

- a risk that a number of local authorities may look to defer operating and capital expenditure in an attempt to manage rate increases in a post Covid-19 environment
- the desirability of creating a broader economic stimulus for local economies in a post Covid-19 environment.

This process led, in July 2020, to the government announcing a funding package of three waters (drinking water, wastewater, stormwater) infrastructure, and to support the reform of local government water services delivery arrangements.

Council has been allocated $7.03 million by the Crown, if it opts in to the reform programme. A further $11.15 million has been allocated to the region to agree an appropriate distribution between participating councils. This funding has been provided as a grant, which does not need to be repaid if Council does not ultimately commit to reform at later stages of the process. The funding must be expended by 31 March 2021. This stimulus funding is central government's approach to kick start economic growth post Covid-19.

Since then Council has developed a delivery plan identifying projects that could be grouped to develop a Delivery Plan which has ultimately been approved by the Department of Internal Affairs and consists of both capital work as well as investing a significant amount to improve knowledge of the condition of assets including wastewater and stormwater condition assessment across targeted networks where known issues have been identified. Further information on work identified under the Delivery Plan is highlighted in further sections within the plan.

In moving into this environment the government has indicated that its starting intention is public multi-regional models for water service delivery to realise the benefits of scale for communities and reflect neighbouring catchments and communities of interest. There is a preference that entities will be in shared ownership of local authorities. Design of the proposed new arrangements will be informed by discussion with the local government sector.

In addition endeavour to proactively address the range of service delivery options that might exist the Otago Mayoral Forum has initiated a working group process, with external consultant assistance, to explore the range of delivery options that might exist in relation to the delivery of water services across the Otago region. They have also invited the Southland councils to participate in this work. Staff have indicated that this Council is keen to participate.

Demand management strategies

This section describes how demand for water supplies is likely to change over the 10 year period of the plan, the impact any changes are likely to have and whether Council is planning to make any changes to the activity as a result.

Predicting future demand for the service

Demand drivers

The factors influencing demand for the service are summarised in the table below. Council has prepared corporate wide assumptions/projections for growth drivers (population, land use, dwellings, tourism) which have been used as the basis for assessing future demand for the service.

Demand Driver	Impact on Future Demand
Growth in population	Expect water consumption to increase in proportion to population and subdivision growth. – although this has slowed down in recent years
Growth in tourism (peak population)	Expect water consumption to increase in proportion to tourism especially in areas such as Te Anau and to a lesser extent Riverton. It is noted that post Covid-19 pandemic that tourism has reduced significantly and is unlikely to recover in the short term and as such it is expected that water consumption will reduce significantly in these areas.

Demand Driver	Impact on Future Demand
Land use change	Quality of water affected due to soil nitrification caused by increased dairying as seen in areas around Balfour and Edendale.
Changes in regulation	Expectation that future applications for water takes will include a comprehensive demand management strategy highlighting steps to be taken to reduce consumption.
Economic changes	Current economic conditions have resulted in a downturn in development. This is anticipated to continue for the short to medium term.
Restrictions for future water abstraction	There are restrictions in the availability of raw water sources to meet future demands in some areas where aquifers are deemed to be over allocated.
Climate change	Prolonged dry periods may result on increased pressure on a number of schemes that may necessitate imposing hose pipe or similar restrictions at times of peak demand.
Technological changes	Two trends which reduce the demand for water from the reticulated water supply system are: • dual water supply systems, where the use of water from the reticulated water supply for potable (drinking water) purposes is supplemented by the use of rainwater collected from impervious surfaces such as roofs for purposes such as garden irrigation, and toilet flushing. • the use of "grey water" (water from washing machines, showers etc.) for garden watering. Councils Sub-division and Land Development Bylaw promotes consideration of such 'low impact' technologies on new developments although there has been no uptake of them to date.

Table 0-1: Demand Drivers for Water Supply

Demand forecasts

Taking into account the key drivers for this activity above, the information in the LTP suggests that – (not necessarily) in urban areas:

- population will increase from 29,613 in 2013 to around 32,992 in 2028 (an increase of around 11%), increasing to 37,021 in 2043.
- the amount of land used for dairy farming is projected to rise from about 164,000 hectares in 2013 to 190,000 hectares in 2028, increasing to 215,000 hectares in 2043 due to the ongoing conversion of sheep and beef (pastoral) farms to dairy.
- the number of tourism visits to Southland is expected to increase from around 1,793,000 in 2015 to 2,712,000 in 2023 and reach 3,046,000 by 2046.

It is expected that demand for the service will remain mostly the same. Growth in Te Anau and Riverton, Winton and Manapouri may need extensions to the water supply reticulation to service new subdivisions, although as present the rate of development across the District has slowed down in response to current economic conditions and reduction in tourism numbers post Covid 19 so the timing of this is uncertain and may extend beyond the current 10 year window covered in the LTP 2021-31.

SCHEME	2013 CENSUS (ACTUAL)	CENSUS FORECAST ONLY 2018	2028	2038	CONNECTIONS 2017	CURRENT DEMAND (2017) Scheme Storage Capacity (m^3)	Mean Demand m^3 / Day	Max Demand m^3 / Day	FUTURE DEMAND 2038 (Max) m^3 / Day
Edendale/Wyndham	1152	1046	1051	1092	561	357	441	543	**515**
Lumsden Balfour	579	610	620	599	438	653	2230	2568	**2,657**
Manapouri	228	332	354	378	248	170	187	264	**438**
Mossburn	201	222	210	208	120	309	254	311	**322**
Ohai/Nightcaps/Wairio	609	606	553	520	374	606	558	645	**551**
Otautau	798	892	884	931	420	438	803	1000	**1,167**
Riverton	1506	1655	1770	1892	1117	1158	999	1203	**1,511**
Te Anau	2628	2938	3383	3785	2002	1155	2855	3706	**5,338**
Tuatapere	561	557	565	585	302	433	500	623	**650**
Winton	2436	2430	2593	2814	1241	3885	1401	1660	**1,918**
	* 2013 Census population used as last varified population count.								

Table 0-2: Water Supply Demand

Implications of growth/demand

The implications of the above trends point to expected increases in both the number of households (in towns with growth).

Growth in population is expected to necessitate an increase in the extraction of water for water supply purposes. This will need to be managed in a way that maintains the health of watercourses from which water is extracted. There are restrictions in the availability of raw water sources to meet future demands in some areas, particularly in the Mataura River catchment and the Lumsden aquifer.

Urban growth and peak growth will also require extensions to the water supply reticulation to service new residential subdivisions and, in some cases, upgrading the capacity of new pipes. In particular, future growth in Te Anau and Winton will require substantial focus on capacity upgrades for intakes, treatment plants, storage and the reticulation.

Care will need to be taken to ensure the quality of raw water is not adversely affected by increased soil nitrification caused by changes to agricultural practices and land use.

Demand management strategies

Water loss management

Through the 2015 LTP Council introduced a programmed of zoned metering to enable future decisions on targeting leakage studies and understanding areas of demand. To date these have been installed on the Ohai Nightcaps, Otautau, Tuatapere and Mossburn schemes. A similar approach is planned across six further schemes. This was the approach adopted following completion of a Water Balance Survey and development of a strategy to manage water losses and is a continuation of a five year programme identified in the previous AMP.

A water balance is a 'top-down' approach to identifying where water supplied into a water supply distribution network is utilised, and is typically used to establish the level of water loss occurring in a water supply network and acts as the starting point to allow development of an overall strategy to manage water losses.

Water loss performance indicators for each of the supply areas are shown in Table 6-3. This includes the Infrastructure Leakage Index (ILI).

The ILI is the ratio of actual water losses (Current Annual Real Losses or CARL) to the Unavoidable Annual Real Losses (UARL) which is a theoretical calculation of what water losses levels can be achieved (at the current pressure) with 'first class' water loss management. The ILI is a proven performance indicator which has been used internationally since 2000.

Supply Area	Current Annual Real Losses (CARL) t/conn/d or m3/km/d*	Unavoidable Annual Real Losses (UARL) t/conn/d or m3/km/d*	Infrastructure Leakage Index (ILI)	Non-Revenue Water (Financial Indicatory)** %
Te Anau	920	56	16.5	45.6%
Winton	210	46	4.6	22.6%
Riverton	121	102	1.2	17.4%
Ohai/Nightcaps/Wairio	6.0*	2.2	2.7	30.2%
Edendale/Wyndham	123	67	1.8	21.1%
Manapouri	137	35	3.9	20.4%
Mossburn	16.2*	1.1	14.6	43.6%
Otautau	1,058	105	10.1	60.0%
Tuatapere	1,102	77	14.2	56.2%
Lumsden Township	354	55	6.4	32.0%
Overall Totals	499	73	6.9	38.4%

Table 0-3: Summary of Water Loss Performance Indicators (and % NRW)

The results indicate that very high water losses are occurring in four supply areas Te Anau, Mossburn, Otautau and Tuatapere, and that high water losses are occurring in Lumsden Township. Subsequent leakage detection programme undertaken in Te Anau identified a number of previously undiscovered leaks which have since been repaired. Following installation of the zoned meters a further balance survey will be undertaken to determine the success of the approach, or how it can be amended.

It is noted that the four supplies are in areas where there are gravels, and where there is likely to be a high number of 'unreported leaks'. Unreported leaks are often the cause of very high leakage as they are not visible above ground and not reported by the public for repair. Hence these leaks have extensive 'run times', until the leaks are located by active leak detection measures.

Water loss strategy

All water networks leak to a certain extent, and over time, leakage typically increases until an unacceptable amount of water is being lost through leakage from both the public water supply network and private plumbing systems. A water loss strategy is necessary to address the issues of what an appropriate and/or economic level of leakage is reasonable for the particular network(s), and how the water supplier is going to achieve and maintain the desired level of water loss. A programme to achieve the target over a desired/affordable timeframe is also necessary, and, as mentioned, as leaks will continue to develop, the strategy should also provide for the on-going efficient monitoring and maintenance of an appropriate level of leakage.

The key actions and main costs outlined in the strategy relate to the monitoring and zoning of the network (by the creation of District Metered Areas (DMAs) for monitoring) and the real time monitoring of minimum night flows in these sectors using telemetry or GSM monitoring. This will allow detailed monitoring of leakage in the system and facilitate effective active leak detection work. The cost estimates for this work is based on typical costs for the work, and an amount for contingencies has also been included in the overall budget.

The current level of water loss in the Southland District network is variable across all schemes with an overall reduction in water loss necessary in a prioritised manner. It is anticipated that water losses will reduce as a renewal programme is accelerated.

It is noted that because the majority of customers are not metered, and customer water use has been assessed when calculating the estimated volume of real losses from the public water supply network, there is a relatively high level of uncertainty in the calculations and also the possibility that a high level of private leakage (or wastage) is contributing to the estimated level of real losses. In any case, identifying areas of the network with high water losses (based on high Minimum Night Flows), and dealing with the water loss issues, whether public or private (including dealing with private water wastage), should result in a significant reduction in the volume of water supplied as indicated above.

There are a number of other benefits (with potential savings) associated with the programme. In particular, for water supply networks with predominantly unmetered connections, obtaining water demand information for zones within each network provides valuable information on customer water use which is very beneficial for future planning and determining demand management initiatives.

This water loss strategy is based on actions which have been proven to effectively reduce water losses.

Improved efficiency of active leak detection will be achieved by identifying and implementing successful strategies for specific DMAs and by using appropriate technologies and equipment. Having schematics and drawings of DMAs increases efficiency, as does documenting specific strategies and work routines.

The continual review (improvement) of SDC's water supply standards covering the selection of pipe materials, fittings and construction standards and on-going watermain renewal programmes are essential components of water loss management to reduce background leakage long term and to minimise water loss from watermain bursts.

The on-going commitment of the organisation to reducing water losses is critical to achieving the proposed water loss target, and staff at all levels of the organisation need to know that their actions and efforts in implementing this water loss strategy are supported and encouraged by management."

Leak detection surveys will demonstrate management of demand for support of resource consent applications. In preparation and expectation of leak detection, all new water plant upgrades have been fitted with modern electronic water meters.

Public education

Although there is no structured education programme, Water and Waste Services (WWS) publish articles promoting water conservation on a regular basis in the "First Edition" quarterly newsletter. The newsletter is distributed to all residents and ratepayers. Important local issues are also advised through the respective Community Board and Water Supply Committee, Such education includes advice on water conservation, rainwater harvesting and management of individual private supplies. Although Council gives advice on such issues it does not directly fund their promotion.

Water metering

To date water metering has only been applied to extraordinary users and they are charged according to usage. Metering (despite charging) could be considered as a demand management technique in townships conscious of water efficiency. Extension of Council's current approach to metering will be re-considered as part of the development of future plans but it is not expected that universal metering and billing will deliver significant short term benefits given lack of growth within most communities.

Households and other users not classed as extraordinary currently pay a District-wide rate. District metering is not being progressed until all schemes are at least bulk metered.

Restricted water supplies

Rural supplies have flows restricted to provide the purchased volume of water to be delivered evenly over a 24 hour period. Removal of restrictors, particularly during the summer periods, has led to schemes running out of water in the past. To counteract this, additional monitoring of these schemes by the

contractor is required and action can be taken under Council's Water Supply Bylaw 2017 against repeat offenders.

Plans programmed to meet growth/demand changes

The list below summarises projects, initiatives, programmes or expenditure that Council is planning to undertake to meet changes in demand (DEM). Where there are capital works projects related to demand (DEM), these are identified in Section 6.

- demand for water supply due to population growth is not expected to change significantly over the plan period. Continued growth in townships such as Te Anau, Riverton and Winton is expected, however, at current rates it is anticipated that current infrastructure is capable of dealing with this growth. Demand projects included within previous AMPs and Long Term Council Community Plans have been deferred as a result of slower than previously anticipated growth in these catchments as well as a drop off in tourism numbers.
- the demand management strategies outlined above will help ensure that the amount of water that Council requires to service the community will not increase substantially over time.

Sustainability

The Local Government Act 2002 requires local authorities enable democratic decision making and action by and on behalf of communities, and to meet the current and future needs of communities for good quality local infrastructure, local public services and performance of regulatory functions in a way that is most cost effective for households and businesses.

At the Water Supply activity level, this approach is demonstrated by the following:

- consider the use of energy efficient motors and blowers on water treatment plants and pump stations as they are renewed
- developed zoned metering programme to identify areas of high consumption
- developed programme of targeted leak detection in areas where consumption is known to be high.
- develop a programme to consider the key impacts of climate change particularly drought on the activity.
- move to new electricity contracts which allow larger consuming schemes to operate more efficiently

Social and cultural

There are concerns from the wider community over the continuance of fluoridation of the water supply. There are also concerns, although at a much lower level, over the practice of chlorination. This plan includes the continuation of chlorination and fluoridation but keeps within bounds as limited by the drinking water standards.

No negative cultural effects have been identified.

Environmental

The potential negative effects of the Water Supply Activity on the environment are:

- the effects on the environment of discharges of chlorinated water from maintenance activities or pipeline failures.
- the environmental effects of asbestos pipes on disposal.
- disposal of water treatment by-products causing environmental degradation.

- degradation of watercourses and groundwater through over extraction of water for treatment.

Council mitigates against these potential negative effects by ensuring:

- discharges of chlorinated water from the water supply system are of short duration. Chlorine levels in the water are low and any effects are likely to be localised and relatively minor.
- the disposal of asbestos pipes is undertaken by qualified people in a safe and approved manner.
- the disposal of water treatment by-products is taken to landfill.
- extraction of water is regulated by resource consent conditions issued by Environment Southland.

Economic and financial

The purpose of the water supply activity is to provide the desired level of service in the most cost effective manner through the management of assets for present and future customers. We do this by:

- recognising the consumption of assets and appropriately funding it (yet to be discussed with Council). Categorising capital versus operational expenditure.
- allocating costs and preparing forecasts over the long-term (30 years or more).
- reporting on financial performance.

Key projects

The following table summarises the key projects that will be delivered across the life of this Activity Management Plan.

LOCATION	DESCRIPTION	BUDGET	YEAR
Eastern Bush OF	Water supply upgrade	$4,010K	21/22 – 23/24
Manapouri	Water Treatment Plant Upgrade	$1,607K	21/22 – 22/23
Lumsden Balfour Rural	Metering- District Metered Areas	$103K	21/22 – 22/23
Riverton	Metered District Areas	$87K	24/25
Te Anau	Sandy Brown Rd- Booster Upgrade	$225K	23/24 – 24/25
Te Anau	Contact tanks upgrade	$436K	24/25
Various sites	Dosing & Monitoring Instrumentation.	$564K	Across life of plan
Various sites	Replacement SCADA to all water schemes	$338K	21/22 – 27/28
Te Anau	Consent Renewal Preparation (Lake & River expires 2024)	$77K	22/23
Riverton	Riverton water replacement of sand filters and pipework	$336K	25/26
Various sites	End of life Water Storage replacement	$327K	24/25

Various sites	End of life Water pumps & electrical	$110K	24/25 – 25/26
Te Anau	Mains replacement ahead of time	$1,086K	21/22 – 22/23
Edendale/Wyndham	Blower replacement	$188K	27/28
Edendale/Wyndham	Consent Renewal preparation	$52K	22/23
Lumsden Balfour Rural	UV and turbidity monitoring	$228K	27/28 – 28/29
Lumsden Balfour Rural	Consent Renewal preparation	$53K	23/24
Te Anau Rural Supply (Mt York)	Consent Renewal Preparation- Mt York	$53K	23/24
Mossburn	Reservoir and chlorine monitoring (subject to condition assessment)	$272K	24/25
Mossburn	Consent Renewal Preparation	$53K	23/24
Ohai Nightcaps Wario	Water main renewal Sinclair Ave Nightcaps	$114K	22/23
Ohai Nightcaps Wario	Switchboard and monitoring Ohai	$58K	26/27
Ohai Nightcaps Wario	Consent Renewal preparation - Ohai	$150K	21/22
Ohai Nightcaps Wario	Tank replacement	$218K	24/25
Otautau	Consent Renewal Preparation (Expires 2024)	$52K	22/23
Riverton	Reticulation Upgrade	$1,222K	25/26 – 26/27
Riverton	Emergency Water Discharge Consent	$50K	21/22
Te Anau Rural Supply (Duncraigen)	Intake screen	$50K	21/22
Riverton	WTP Geobag Alum Sludge Removal	$50K	21/22
Te Anau Rural Supply (Princhester)	Trunk main - Princhester	$54K	24/25
Te Anau Rural Supply (Takitimu)	Switchboards and pumps-Takitimu	$182K	25/26
Te Anau Rural Supply (Takitimu)	Consent Renewal Preparation- Takitimu	$53K	23/24
Various	Auto valving to meet DWS compliance.	$562K	21/22 – 22/23
Various	Replacement of AC Pipe at end of useful life (Residual of $24.8m beyond 2031)	$16.2M	Across life of the plan

Winton	Turbidity and pH monitoring / correction - facility and equipment	$534K	21/22 – 22/23
Districtwide	District wide Double check valves and Accuflo high rise bases	$1,250K	Across life of the plan
Asset Data	Water Wastewater Stormwater Infrastructure Design Standards Development	$100K	21/22 – 22/23
Matuku Rural Supply	Treatment options	$80K	21/22
Te Anau Rural Supply	Treatment options	$150K	21/22
Te Anau Rural Supply	Treatment implementation (Acceptable solution)	$1,594K	22/23 – 24/25

Our levels of service

Levels of service, performance measures and targets

Levels of service (LOS), performance measures and targets form the performance framework for the activity detailing what Council will provide, and to what level or standard:

LOS are the outputs that are expected to be generated by the activity. They demonstrate the value being provided to the community or reflect how the public use or experience the service. A key objective of activity planning is to match the level of service provided with agreed expectations of customers and their willingness to pay for that level of service.

Performance measures are quantifiable means for determining whether a LOS has been delivered.

Performance targets are the desired levels of performance against the performance measures.

The levels of service provide the basis for the management strategies and works programmes identified in the AMP. By clarifying and defining the levels of service for the activity (and associated assets), Council can then identify and cost future operations, maintenance, renewal and development works required of the activity (and associated assets) to deliver that service level. This requires converting user's needs, expectations and preferences into meaningful levels of service.

Table 5-4 details the level of service, performance measures and performance targets for the Water Supply activity. The table sets out Council's current performance and the targets it aims to achieve within the next three years and by the end of the next 10 year period.

WATER SUPPLY: The level of service (LoS) we provide	LoS xx: Our water supply network provides safe, reliable and adequate supply of water.				
How we measure performance	Current Performance (19/20)	Future Performance Targets			
		Yr 1 (21/22)	Yr 2 (22/23)	Yr 3 (23/24)	Yr 4-10 (25-31)
KPI xx: **Fault response times** – Where Council attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times are measured:					
(a) attendance for urgent call-outs[1]: from the time Council receives notification to the time that service personnel reach the site;	a) 15 minutes	a) ≤ 1 hour	a) ≤ 1 hour	a) ≤ 1 hour	a) ≤ 1 hour
(b) resolution of urgent call-outs[1]: from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption;	b) 4 hours, 52 minutes	b) ≤ 6 hours	b) ≤ 6 hours	b) ≤ 6 hours	b) ≤ 6 hours
(c) attendance for non-urgent call-outs[1]: from the time that Council receives notification to the time that service personnel reach the site; and	c) 1 hour, 1 minute	c) ≤ 4 hours	c) ≤ 4 hours	c) ≤ 4 hours	c) ≤ 4 hours
(d) resolution of non-urgent call-outs[1]: from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption.	d) 20 hours, 20 minutes	d) ≤ 24 hours	d) ≤ 24 hours	d) ≤ 24 hours	d) ≤ 24 hours
KPI xx: **Customer satisfaction** – The total number of complaints received by Council about any of the following: (a) drinking water clarity; (b) drinking water taste; (c) drinking water odour; (d) drinking water pressure or flow; (e) continuity of supply, and (f) the way Council responds to any of these issues expressed per 1000 connections to Council's networked reticulation system.	16 per 1,000 connections	≤10 per 1,000 connections	≤10 per 1,000 connections	≤10 per 1,000 connections	≤10 per 1,000 connections
KPI xx: **Drinking water safety** – The extent to which the Council drinking water supplies complies with:					
(a) drinking water standards (bacteria compliance criteria) and	a) 82%	a) 100%	a) 100%	a) 100%	a) 100%
(b) drinking water standards (protozoal compliance criteria).	b) 82%	b) 100%	b) 100%	b) 100%	b) 100%
KPI 6.1: **Maintenance of the reticulated network** – The percentage of water lost from the Council's networked reticulation system[2]	19.30%	≤25%	≤25%	≤25%	≤25%
KPI 6.2**: Demand management** – The average consumption of drinking water per day, per resident within the territorial authority district.	889 litres	≤ 850 litres per person per day	≤ 850 litres per person per day	≤ 850 litres per person per day	≤ 850 litres per person per day

1 - Attendance means from the time that the Council receives notification to the time that service personnel reach the site. Resolution means from the time that the Council receives notification to the time that service personnel confirm resolution of the fault or interruption. "Urgent" is considered complete loss of drinking-water to an urban drinking water supply. "Non-urgent "includes all other fault/interruptions to an urban drinking water supply
2 - The water loss calculation is the weighted averaged percentage loss reduction per urban drinking water supply

Table 0-1: Levels of Service

Changes to the performance framework

The levels of service and key performance indicators have been reviewed following a benefits mapping exercise to ensure Council's performance framework is focussed on measuring the activity benefits at the outcome and objective level. As a number of measures are mandatory they cannot be significantly altered. Other non-mandatory measures are considered fit for purpose

Plans programmed to meet the levels of service

The list below details the main projects, initiatives, programmes that Council is planning to undertake to ensure that the level of service is achieved and/or to address any gaps between the targets and current performance. Where there are capital works projects related to improving levels of service (LoS) or maintaining levels of service (Renewal – REN), these are identified in Section 7.

- upgrades of the Riverton (currently underway) and Eastern Bush Otahu Flat (in the period of the plan) water treatment plants will ensure that all community water supplies are fully compliant with the current Drinking Water Standards.
- over the next 10 years, the aim is to maintain and where practicable improve performance with respect to water quality compliance with NZDWS and response times for service requests. This should also result in reduced numbers of complaints.
- review the level of service to rural supplies with respect to compliance with Drinking Water Standards and identification of acceptable solutions that will demonstrate compliance.

Three waters review and Havelock North inquiry

The Government established an Inquiry into the issues relating to the contamination of the Havelock North Water Supply last year.

Stage 1 of the Inquiry addressed matters relating directly to the Havelock North water contamination incident and the response to that incident. The stage 1 findings were released in May and included:

- contamination of drinking water was confirmed as the source of the outbreak.
- contamination is understood to have arisen from inundation of neighbouring paddocks, resulting in water from a pond entering the aquifer around 90m from the bore identified as the source.
- failings on the part of both the district council and regional council, although not directly responsible for the outbreak, were definitely a contributing factor.
- lack of contingency planning by the district council.
- failure of technical advisers to adequately assess and report on security of bore heads.

Water and waste staff are currently working through understanding the implications of the findings in relation to the 12 community water supplies for which Council has responsibility.

Stage 2 of the inquiry, which was released in December 2017 addressed broader systemic issues and provides recommendations about managing water supplies across New Zealand. It examines the existing statutory and regulatory regimes involved in delivering drinking water to what amendments are required to ensure the public are provided with the maximum level of public health protection.

Some of the key recommendations from the inquiry and how these might impact on Council activities include:

Promotion of the following six principles of drinking water safety:

Principal 1 - A high standard of care must be embraced

Principle 2 – Protection of source water is of paramount importance

Principle 3 – Maintain multiple barriers against contamination

Principle 4 – Change preceded contamination (for example changes in environmental conditions)

Principle 5 – Suppliers must own the safety of drinking water

Principal 6 – Apply a preventative risk management approach

Once the Eastern Bush upgrade is completed in 2018 all supplies will have multi stage treatment with chlorine disinfection on all supplies. Council intends to review other processes to ensure we can thoroughly demonstrate we are meeting the intent identified within these six principles.

Abolition of secure classification system

The only Council source impacted by this recommendation is the Riverton deep bore source. However, it is noted that the supply is currently taken from the Aparima river. As a consequence of this recommendation Council have installed UV disinfection to the supply to ensure the site meets appropriate standards.

Encourage universal treatment

On completion of the work at Riverton and Eastern Bush all community drinking water supplies will have multiple barriers to protect from contamination, including chlorination.

Establishment of a drinking water regulator

This dedicated regulatory body will have responsibility to oversee all other reforms recommended by the panel. It was further recommended that is established early and promptly. The legislation enabling the establishment has now been enacted and the crown entity is in the process of being established (Taumata Arowai).

Interim improvements at and by the Ministry of Health and RMA and health acts

This includes a requirement for improvements of source protection and the requirement for all future bore supplies to have all bore heads above ground. Council has included funding in the current LTP for improvements to bore heads to help meet this requirement.

Establishment of licensing and qualifications system for drinking water suppliers and operators

This recommendation is likely to have an impact on training and development of staff not only within Council but also Contractors and operators. A national body of operators, contractors owners and other stakeholders has been established to determine how this will be set up, operated and audited for compliance. At this stage there are uncertainties around the structure and timing of the body and as a result no funding has been included within the LTP at this stage.

Creation of dedicated and aggregated drinking water suppliers

This matter has been discussed for a number of years among Councils and others within the industry with a number of different operating models proposed. It is anticipated that further amendments to budgets will be required once further information is established on the future direction of the sector as a whole. This document will be updated to reflect these changes as they arise.

The need for regional collaboration has prompted authorities across Otago and Southland to work collaboratively to understand potential opportunities for working together to understand suitable models for future service delivery. Indications from Government are that they would like this to be on a voluntary basis however if they felt that action was not happening or moving too slowly that they may step in and institute changes that they see fit. In order to help develop an indicative business case to drive this the Otago Southland Councils were successful in securing funding to advance the work.

Fluoridation

The Health (Fluoridation of Drinking Water) Amendment Bill received its first reading in Parliament on 29 May 2017. The Bill transfers responsibility for deciding on which community supplies require fluoridation from Councils to the District Health Boards. It is currently anticipated that the Bill will pass before the end of 2017 but remains unclear as to which communities DHBs may identify as requiring

fluoridation. Given the uncertainty around this Council are not currently budgeting any expenditure that may be required at this stage, however this may change in the consultation around the LTP as it has in previous years.

Activity and asset management

Overview of management

The activity and assets covered in this plan are the responsibility of Council's Water and Waste Services Department (WWS) under the strategic direction of Council, the Executive Leadership Team and Services and Assets Committee, and Water Supply Committees in the case of locally rated rural water supplies. Asset management responsibilities are covered in detail in Council's AM Policy. Service delivery is provided as follows:

Operation and maintenance (O&M) is delivered by Downer NZ with technical oversight provided by Council's water and waste department.

Capital works design and procurement is managed by WWS and engineering consultants where required.

Additional information about the how the activity is managed is detailed in Section 2.

Lifecycle asset management means considering all asset management options and strategies to deliver the agreed level of service and to inform decision-making for asset renewal, replacement, upgrade and disposal. Effective lifecycle planning is about making the right investment at the right time to ensure that the asset delivers the desired level of service over its full-expected life, at the minimum total cost. This section explains the approach for:

- providing new or upgraded assets to improve service levels, providing for growth and demand
- operating and maintaining assets
- renewing or replacing assets
- disposing of assets at the end of their useful life.
- all asset data has been extracted/reported as at 30 June 2019

Overview of the water supply assets

Asset value and depreciation

The scheme values and depreciation information below is from the 2020 valuation, excluding SCADA equipment in Invercargill.

SCHEME	REPLACEMENT COST $	DEPRECIATED ASSET VALUE $	ANNUAL DEPRECIATION $
Balfour	905,520	490,442	10,880
Duncraigen	385,732	125,990	8,000
Eastern Bush	1,470,141	652,943	19,542
Edendale/Wyndham	7,116,525	6,200,393	102,667
Five Rivers	245,788	133,146	3,024
Homestead	1,347,850	553,602	24,624
Kakapo	1,985,341	873,935	28,766
Lumsden/Balfour	8,207,631	5,002,379	128,953

SCHEME	REPLACEMENT COST $	DEPRECIATED ASSET VALUE $	ANNUAL DEPRECIATION $
Lumsden	2,146,210	1,199,928	29,916
Manapouri	2,545,904	1,041,936	40,982
Matuku	436,384	199,537	7,613
Mossburn	2,331,299	1,073,966	44,273
Mount York	1,494,969	649,950	24,288
Ohai/Nightcaps Wairio	7,679,685	3,206,706	127,650
Orawia	252,423	169,635	4,065
Otahu Flat	1,542,196	783,662	19,450
Otautau	4,513,714	1,440,663	76,205
Princhester	370,704	118,241	8,184
Ramparts	2,601,815	1,362,400	34,623
Riverton	12,696,412	6,696,440	212,677
Takitimu	1,512,536	677,641	25,967
Te Anau	17,652,796	10,965,856	272,970
Tuatapere	4,571,249	1,929,486	94,194
Winton	11,304,086	7,400,213	171,854
Total	**95,366,441**	**52,951,891**	**1,523,954**

Table 0-1: Asset Value and Depreciation

Asset condition and performance

The condition of the schemes has been rated using the condition and performance table below. Condition rating is based on joint inspections undertaken by SDC staff and Downer's National Asset Manager and local operations staff.

Grades have been assigned by considering information from a number of different sources including:

- IPS Database;
- previous AMPs;
- joint asset inspection
- pipe condition assessments
- Council staff based on institutional knowledge;
- operating staff based on local knowledge.

Table 7-2, Table 7-3 and Table 7-4 indicates the general average condition at a scheme level with details in the Appendices. The assessment criteria showing how these grades (condition and performance and confidence) have been assessed can be found in the Scheme Plans section on page 70.

SCHEME	INSTALLED (DATE)	NUMBER OF CONNECTIONS	OVERALL CONDITION	LEVEL OF SERVICE PERFORMANCE	MEETS DRINKING-WATER STANDARD 2008	COMMENTS
Edendale/ Wyndham	2011	611	1	1	Yes	New scheme. No known condition or performance issues.
Manapouri	1969	228	3	3	Yes	Plant upgraded in 2011, investigations are required for intake upgrade. Further upgrade work planned 2021
Mossburn	1969/13	104	3/1	1	Yes	New Plant installed 2014.
Ohai/Nightcaps/ Wairio	1953	395	3/1	1	Yes	New plant installed 2011/12. Replacement membranes installed in 2020. Ageing network requiring targeted renewals.
Otautau	1963	428	4	4	Yes	Plant upgraded 2014. Well head upgrade 2019. Water main through main street replaced. Network requires further targeted renewals.
Riverton	1972	1,062	4	4	Yes	Network requires further targeted renewals.

SCHEME	INSTALLED (DATE)	NUMBER OF CONNECTIONS	OVERALL CONDITION	LEVEL OF SERVICE PERFORMANCE	MEETS DRINKING-WATER STANDARD 2008	COMMENTS
Te Anau	1968/13	1,985	4	4	yes	LOS - Electrical upgrade in progress. Well head upgrade 2019. Network known to be in poor condition and required further targeted renewals.
Tuatapere	1971/13	304	3/1	3	Yes	Plant upgraded 2012. No known condition or performance issues.
Winton	1956/13	1,188	3/1	1	Yes	Plant upgraded 2014. Second well installed 2015. All AC pipework now replaced with modern equivalent.

Table 0-2: Urban Water Supplies

SCHEME	INSTALLED (DATE)	NUMBER OF CONNECTIONS	OVERALL CONDITION	LEVEL OF SERVICE PERFORMANCE	MEETS DRINKING-WATER STANDARD 2008 (BY)	COMMENTS
Eastern Bush/Otahu Flat (treated)	1972	40	3	3	No, July 2022	Further scoping for upgrade required. Network requires targeted renewals in known identified areas.
Lumsden/Balfour (treated)	1979	433	1/3	1	Yes	New Plant installed 2010.

SCHEME	INSTALLED (DATE)	NUMBER OF CONNECTIONS	OVERALL CONDITIO N	LEVEL OF SERVICE PERFORMANC E	MEETS DRINKING-WATER STANDARD 2008 (BY)	COMMENTS
						Network requires targeted renewals in known identified areas
Orawia	1984/13	8	2	3	Yes	Micro plant installed 2016. No known condition or performance issues.

Table 0-3: Rural Drinking-water Supplies

SCHEME	INSTALLED (DATE)	NUMBER OF CONNECTIONS	OVERALL CONDITION	LEVEL OF SERVICE PERFORMANCE	COMMENTS
Duncraigen	1979	1	3	3	LOS - Electrical upgrade 2011. Currently in process of divesting this scheme back to Landcorp. No known condition or performance issues.
Five Rivers	1979	5	3	3	Community run rural scheme. No known condition or performance issues.
Homestead	1979	21	2	3	LOS - Electrical upgrade 2011. Rising main replacement 2015. No known condition or performance issues.
Kakapo	1979	52	3	3	LOS - Electrical upgrade 2011. Requires targeted renewals in known identified areas.
Matuku	1972	8	2	3	Requirement for fish screen as condition of resource consent. No known condition or performance issues

SCHEME	INSTALLED (DATE)	NUMBER OF CONNECTIONS	OVERALL CONDITION	LEVEL OF SERVICE PERFORMANCE	COMMENTS
Mount York	1972	15	3	2	No known condition or performance issues
Princhester	1970s	3	2	3	No known condition or performance issues
Ramparts	1970s	56	2	2	Pipeline renewal 2017 No known condition or performance issues
Takitimu	1970s	26	2	3	Pipeline renewal 2017 No known condition or performance issues

Table 0-4: Rural Non-Drinking-water Supplies

Data source and confidence

Table 7-5 shows the level of reliability rating of Council's water supply data. The assessment criteria showing how these grades (reliability confidence) have been assessed can be found in the Scheme Plans section on page 70.

ACTIVITY	CURRENT RELIABILITY RATING	COMMENTS
Asset Description	Reliable	Description data is available in IPS and will be reviewed and updated as further information is received.
Valuation	Reliable	Annual valuation now undertaken. As part of the review process we are considering what opportunities are available to refine the valuations process so that more scheme specific information could be utilised, rather than generic information. For example where it is known that the asset life of asbestos cement pipes is adversely affected by ground conditions the valuation process will be altered to reflect this.
Condition and Performance	Reliable	Condition and performance is currently assessed through review of data in IPS relating to planned and reactive maintenance activities. We also rely on local operator knowledge and experience. In addition water quality data is sampled in accordance with DWS requirements and data is stored on the WINZ database. Where required by the DWS a number of community supply schemes will also have a Public Health Risk Management Plan. Age and condition data within IPS will be regularly updated based on best available knowledge at the time. This will result in alterations being made to asset lives within individual schemes.

ACTIVITY	CURRENT RELIABILITY RATING	COMMENTS
Financial Forecasts	Reliable	Currently estimates have been made based on current market rates, annual asset valuations and direct enquiries. Projects within the first three years should be expected to have an uncertainty of up to +/- 25% with projects in the outer years up to +/- 50%. Currently no capital work will be carried out without Council approval. As part of the current plan review an assessment of funding options will be carried out to address issues of sustainability and affordability especially of a number of smaller schemes.

Table 0-5: Data Source and Confidence

Approach to operations and maintenance

The purpose of this section is to outline the broad O&M philosophies for the assets, understand any underlying issues and trends, and set the basis for the O&M financial forecasts.

SDC implement performance based contracts to achieve defined service standards for the operation and maintenance of the water supplies, and undertake monthly audit procedures for monitoring contractor performance and controlling the quality of data (work activity, financial, attribute and spatial data) and physical works.

All operation and maintenance (O&M) is carried out under a contract, currently awarded to Downer. Details of each facility are located in the Downer O&M Manuals which are developed for each site. These are maintained by Downer and located at its offices in Invercargill and periodically reviewed by Council. It is noted that the current contract expires in 2022 with work now underway to start to develop a new contract.

The objectives of this contract are to ensure that:

- the Principal's drinking water, rural water and wastewater systems comprising the contract facilities are managed and operate in compliance with the requirements of resource consents and the New Zealand Drinking-water Standards as appropriate.
- the LOS and Key Performance Indicator target levels contained in the AMPs and the Contract are achieved.
- the condition of the Principal's drinking water, rural water and wastewater assets comprising the Contract Facilities is maintained as specified in the Contract throughout the Contract term.
- the operation and maintenance of the Principal's drinking water, rural water and wastewater services comprising the Contract Facilities are delivered safely and in a cost effective manner.
- drinking water, rural water and wastewater services are provided reliably in the District.
- requests for Service and incidents are responded to and resolved promptly.

In addition to the O&M contract, SDC receive professional services contracts with a number of Infrastructure Service Providers including Stantec and Waugh Infrastructure Management.

There are also a number of services are delivered from other Council units:

- information management department provides assistance with asset management information systems, plans and mapping.
- finance department provides assistance with rates collection and water billing.

Service delivery review

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

In view of the fact that the contract term expires in two years a review was undertaken in November 2020. The review was conducted by Field Force 4 who have significant expertise in undertaking such reviews. Based on feedback from interviews with key staff the review concluded that while it is believed that the current contract arrangements and contractor performance is meeting expectations improvements could be made around contract management, targeted KPIs and proactive asset management.

The review was undertaken in the context of a number of factors coming into play in the nextr 2 years including:

- 3 Waters reform
- Contract expiry in 2 years
- Inclusion of additional O&M work through a variation
- Establishment and embedding of new 3 waters structure
- A desire to better manage stormwater operations and maintenance going forward.

Ultimately the Council contractor model is the preferred method of undertaking the activities. However given the significant degree of change within the sector at present it has been proposed that the contract be extended by a further 12 months to allow a better understanding of the implication of ongoing reforms across all 3 waters activities.

Asset performance monitoring

Council operates the IPS Asset Management System. This computer software records all incidents of work undertaken on water and wastewater assets in the District. The types of work (water leaks for instance) can then be compared to previous years.

The following applications are utilised by WWS to monitor the performance of asset systems and achievement of service standards, manage risks, and support asset management decision-making:

IPS and reporting

Information is stored against each asset in an IPS database including:

- work Orders (WO) and maintenance records (asset failure and developing an expenditure history),
- customer Service (water supply and wastewater) (SR),
- condition reports (recorded by operation and maintenance contractor, critical assets are routinely
- system performance monitoring (flooding, etc.),
- facility/equipment parameters,
- estimated design life,
- valuation information,
- any operator comments.

The O&M contractor has live access to IPS. Their performance is monitored in real-time by NAG and monthly using Crystal reports to interrogate SR and WO response and resolution times.

Other information stored in scheme working folders or SDC's electronic document management system (RM8) includes:

- flow monitoring and network modelling,
- demand forecasts.

Existing asset information has been transferred from hard copy records and supplemented with specific capture projects over the last few years. The asset register is now believed to be 90% complete. An internal audit for accuracy has not yet been carried out.

- condition reports (critical assets are routinely inspected visually and using a variety of invasive and non-invasive surveys with limited CCTV),
- maintenance records (asset failure and expenditure history),
- water quality monitoring at various sites [undertaken by Environment Southland (ES)],
- request for service records,
- demand forecasts.

Geomedia smart client

Council operates Hexagon Geomedia Smart Client. This currently linked to Pathway and IPS.

SCADA

Every water and wastewater facility is equipped with telemetry (SCADA Supervisory Control And Data Acquisition). Station RTU's (Radio Transmitter Units) transmit data either on a change in state or on a 60 minute polling rate to the base-station at SDC Head Office Invercargill. There are two SCADA systems in operation running on two dedicated computers:

Datran system: QTech software (Datran RTU) was installed in 1990. In 2004, SDC were becoming frustrated with the poor service and lack of prompt supply of Datran parts and made enquiries into an

Kingfisher system: Citect software (Kingfisher RTU) was initially installed as part of the Stewart Island Wastewater Upgrade and is now being installed in all new stations.

All radio traffic from the mainland is received to the SDC base station via the Mid-Dome repeater site leased from Jackson & Wills Limited. Traffic from Stewart Island is received via the SDC owned Peterson's Hill repeater site.

The computers manage the information and page any station alarms via the cellular network. Alarms are set to local operators first and escalate if they are not acknowledged. After hours alarms are monitored by Council's Answer Service.

Other applications

Hilltop - used for stores and analysing SCADA data.

Water Information System New Zealand (WINZ) - the national database for storing data for public health services and the Ministry of Health (MOH) purposes.

System critical incidents such as water leaks and sewer blockages are particularly noted. Evidence of increasing numbers (trending up) are further analysed to see if the events are extraordinary and higher than would be normally expected. Such trending and analysis will form the basis of future capital programmes. Recent examples of this include replacement of watermains in Winton and Otautau.

Costs of operation and maintenance have increased each year for several years. These price increases are partially due to inflation, legislation, and ageing assets that require more maintenance to keep going.

Unplanned (reactive) operations and maintenance strategy

All unplanned maintenance expenditure below $5,000 is covered within the O&M contract. Costs for unplanned maintenance above the $5,000 threshold are covered by District funding.

Where repeated breakdowns occur on an asset, the contractor, in agreement with Council, will replace the asset to reduce both the risk and cost associated with unplanned maintenance. In addition where Council defers renewals in favour of increased renewals costs for reactive repairs and increased inspections will be agreed between Council and contractors.

Planned (scheduled) operations and maintenance strategy

Council keeps good records of the installation date for all of its assets. This information is stored in IPS. The information is used to predict the likely replacement date (subject to condition assessment) as utilities wear out. In broad terms, planned or scheduled operations and maintenance schedules are designed to get the longest possible service life while meeting level of service targets and legislative requirements.

As time goes by we continue to collect in field information from inspections and condition assessments. This information is used to moderate basic end of life assumptions to get the longest possible life from the utility.

In this respect, the contractor has written new operation and maintenance schedules for all above ground plant, the purpose of which is to keep this plant at the highest level of reliability. These maintenance schedules are programmed into the IPS asset management system and become automatic "scheduled" maintenance items.

The cost of such maintenance is driven by level of service and legislative requirements of the contract.

In this respect, the contractor has written new operation and maintenance schedules for all above ground plant, the purpose of which is to keep this plant at the highest possibility level of reliability. These maintenance schedules are programmed into the IPS Asset Management System and become automatic "scheduled" maintenance items.

The cost of such maintenance is driven by LOS and legislative requirements of the contract.

Condition assessments

The O&M contract puts particular emphasis on collecting operational information from detailed inspection schedules. As new improved information comes to hand, it is added to the Infor (IPS) IPS data base so as to allow for better decisions to be made on the (in particular) timeliness of capital expenditure.

The most recent round of condition inspections are undertaken jointly by Council staff and Downer operations and asset management staff. These latest inspections indicate that plant and equipment is being maintained as per previous inspections.

Treatment plant inspections

Treatment plants are visited by contract staff at intervals that are appropriate to the system criticality of the process going on there. In this respect, water treatment plants are inspected three times a week and oxidation ponds are inspected once a week. At least one joint inspection will take place every year.

Rural supplies are inspected at varying frequencies; less in winter but more frequently in summer to manage to monitor frequency of removal of restrictors.

Leak detection

Council has instigated Water Balance and Water Loss Strategies for Urban Water Schemes in 2014 and will progressively be carrying out leak detection to achieve its three year goal of an Infrastructure Leakage Index (ILI) of less than 3.

It is likely that leak detection and demand management will become more important in the future as consents for water takes come up for renewal and there will be an increased focus on demonstrating efficiency and active conservation management.. In preparation and expectation, all new water plant upgrades have been fitted with modern electronic water meters.

O&M work is required to be in accordance with best practice and comply with the Subdivision and Land Development Standards 2012.

The location of electrical, telecommunications, and gas services is obtained during contract preparation as part of the professional services contract. It is the responsibility of contractors to verify the location of services as a condition of contract.

Operations and maintenance trends and forecasts

Operations, repairs and maintenance costs have shown an upward trend since 2010/11 largely as a result of new schemes becoming operational (Edendale Wyndham, Lumsden Balfour, and Ohai Nightcaps), existing schemes receiving upgrades most recently Winton, Te Anau Otautau, Mossburn and Riverton, and inflation increases and the move to a new O&M contract. While savings have been realised in a number of areas for example electricity (following change of supplier) the general trend is still increasing. Further upgrades to Eastern Bush Otahu Flat and Manapouri scheme will see further increases in future operating costs largely due to increased power requirements.

Increases relate to inflationary increases and increased operational costs associated with LOS upgrades.

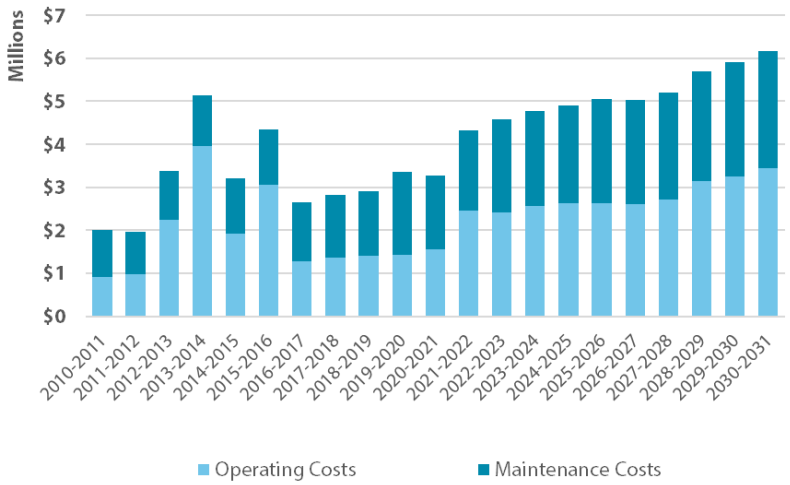


Figure 0-1: Water Opex Forecasts

Approach to renewals

Renewal is the replacement (or rehabilitation) of an existing asset without changing its capacity or level of service beyond the original design.

Renewal strategy

Renewals are considered as they near the end of their effective lives, where the cost of maintenance becomes uneconomical, or when the risk of failure of critical assets is sufficiently high. Renewal decisions are made by asset managers based on the performance and condition of existing assets, the economics of renewing the asset, and their assessment of the acceptability of the risk of asset failure. Renewal decisions are supported by the maintenance contractor based on their knowledge of the systems. The theoretical life expectancies and replacement costs of asset components are used for financial projections.

Non-performing assets are identified by the monitoring of asset reliability, capacity and efficiency during planned maintenance inspections, operational activity and investigation of customer complaints. Indicators of non-performing assets include:

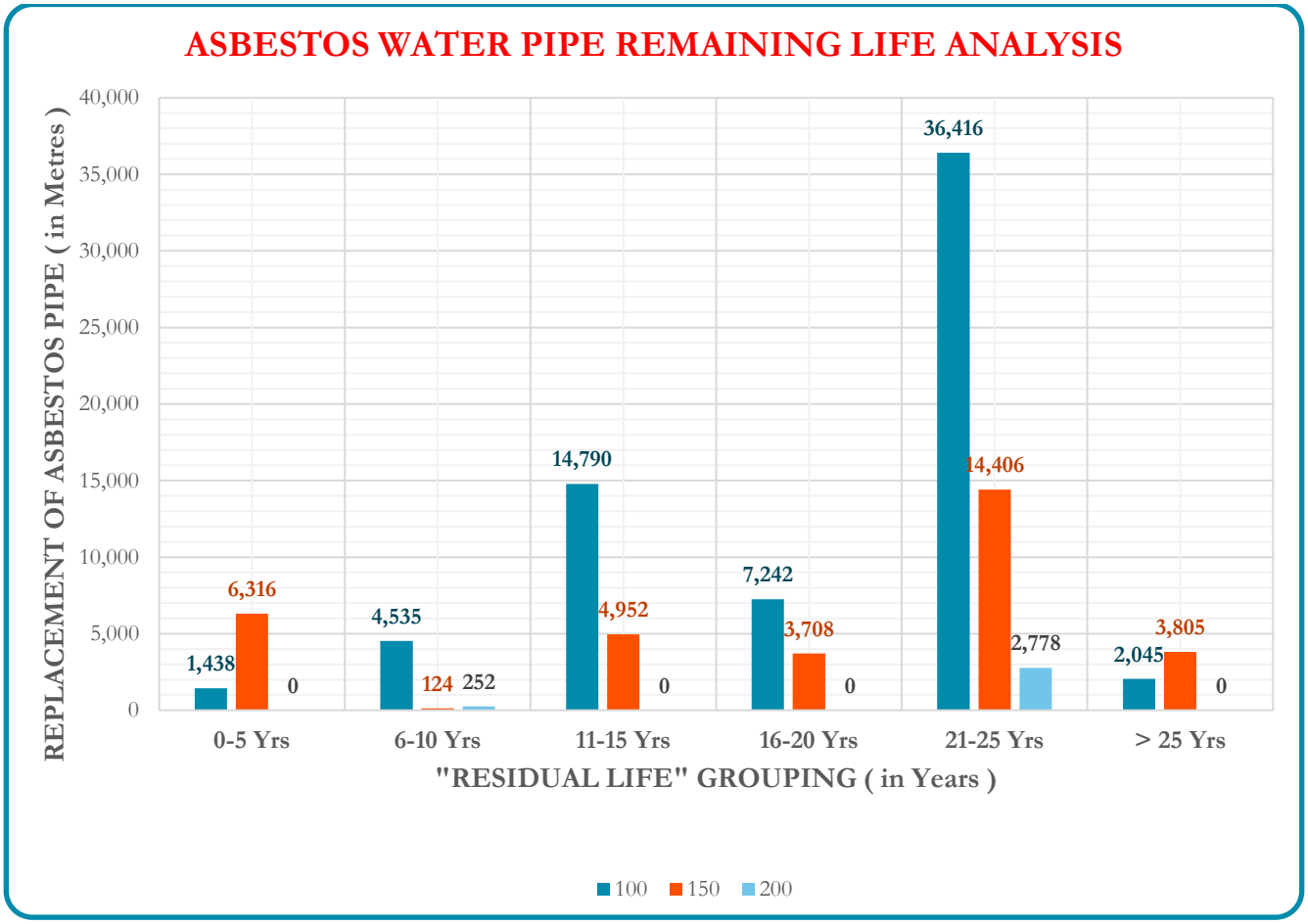
- structural failure,
- repeated asset performance failure,
- significant leakage/mains bursts,
- ineffective and/or uneconomic operation,
- insufficient treatment,
- inefficient energy consumption.

The general renewal strategy is to either replace or rehabilitate assets when justified by:

- age and condition - the age or condition of the asset is or will result in a condition based failure.
- asset performance - when it fails to meet the required level of service. The monitoring of asset reliability, capacity and efficiency during planned maintenance inspections and operational activity identifies non-performing assets.
- risk - the risk of failure of the asset and associated financial, environmental and social impact justifies action (eg impact and extent of loss of wastewater treatment, impact on receiving water body, health risk).
- economics - the cost of maintenance for that asset component is deemed to be uneconomic to continue repairing the asset when the annual cost of repairs exceeds the annual cost of renewal. Economic factors may also come into consideration in order to co-ordinate renewals with the other major works, eg while a tank is empty for inspection or refurbishment/renewal, the associated channels are refurbished at the same time.
- to co-ordinate with work on other utilities, e.g. watermain replacement may be brought forward to coincide with renewals of the footpath under which it runs.
- staff knowledge - staff knowledge of the condition may differ to what is stored in the database.

Replacement strategy for asbestos cement pipes

Analysis of breakage rates on ageing asbestos cement pipes indicates failures appear to be increasing in particular around Otautau, Riverton, Lumsden and Te Anau. Data from IPS indicates approximately 106km of asbestos pipes remain across all Council networks which are due to reach projected end of life as illustrated in the graph. It is noted that areas of the AC network has failed up to 20 years ahead of asset life and consideration should be given to development of an overall replacement programme to ensure levels of service continue to be met.



In the development of this plan and the LTP capital works programme three renewal scenarios were considered.

- staged programme to replace 10% of the remaining network per each year of the LTP period which will result in complete replacement over the life of the current plan. Estimated cost $3-4 Million per year.
- staged programme to replace 5% of the remaining network per each year of the LTP period which will result in complete replacement over a 20 year period. Estimated cost $1.5-3 Million per year.
- staged replacement based on a more smoothed schedule more closely based on expected asset life. This would involve a smoother renewal of approximately 1.5km per year over the term of the LTP with an annual estimated cost of $1.4 Million.

While the first two options will address the issue in a shorter time it would result in a number of areas where pipes may be replaced well ahead of their projected end life. These options are also likely to have a higher capital cost across the life of the plan.

It is proposed to implement the third option while also undertaking further condition assessment on those mains predicted to reach end of life from year 11 onwards to allow a longer term renewals programme to be developed.

By delaying this work places additional stresses on the networks and is likely to result in a drop in level of service provided. Conversely replacement with modern PE/PVC materials will help improve other levels of service including helping reduce water losses and leakage rates which will also have a knock on financial benefit.

Above ground assets

1. IPS renewal forecasts for years 2021 to 2031 of the LTP are generated and exported to an Excel spreadsheet.

2. Annual Condition Reports are prepared by Downers and imported to the Excel spreadsheet, including Downers "Remaining Life" assessment.
3. A Renewal Programme is developed using:
    a. Downer "Remaining Life" assessment.
    b. Reviewing "Asset Criticality" by extending replacement of low criticality assets and prioritising high criticality assets.
    c. While the foregoing forms the basis of the Renewal Programme it may be modified to:
        (a) Spread work out to "smooth" work peaks.
        (b) Allow "bundling" of small projects to allow better economies of scale.
4. Comparison between IPS and Downer reports to assess whether global asset lives need changing.
5. Assets that have reached their predicted expiry date as per IPS asset lives, but are still serviceable will not be automatically replaced but will continue to be operated and inspected annually to ensure they are still fit for purpose.

Inground reticulation assets

At the beginning of LTP Year 1 (2021):

1. Develop a Condition Assessment Programme for assets scheduled for renewal in years 2018 to 2021 which meet the following criteria:
    a. Large diameters or lengths (indicatively more than 500 metres or $75,000 replacement value.)
    b. High criticality assets - particularly rising mains.
    c. Other assets that have historical performance problems, are in aggressive ground conditions or the Contractor is aware of "special" factors relating to premature asset failure.

By the end of LTP Year 1 (30 June 2021):

2. Review renewal budget forecasts, taking into account:
    a. Asset inspection results (which can accelerate or delay projected renewals).
    b. Extend asset lives for criticality 1-3 assets for 5 to 10 years beyond IPS Renewal Date if permitted by the condition assessment.
    c. Schedule criticality 4-5 asset replacements arbitrarily by 10 years from IPS Replacement Date based on condition assessment of criticality 1-3 results.
3. While the foregoing forms the basis of the Renewal Programme it may be modified to:
    a. Spread work out to "smooth" work peaks.
    b. Allow "bundling" of small projects to allow better economies of scale.

Unplanned water renewal

1. Condition assessments undertaken for:
    a. The third pipe break on any length of pipe of 100 metres or less.
2. Renewal decisions will be made based on the findings of the inspection results and the criticality of the asset.

Capital works programme prioritisation process

1. Projects from the following sources are included in the CAPEX project list:

a. Renewal forecasts from IPS, modified as before described.

b. Resource Consent compliance requirements of E.S.

c. Future Demand (Te Anau)

2. Projects are scheduled as follows:

a. Renewals as per Renewals Strategy.

b. Resource Consents to meet expiry dates.

c. Future demand as required by development timing.

3. Prioritisation Rating (1 to 5) applied to projects:

a. All regulatory projects get a priority rating of 1.

b. Priority of 1 to 5 is based on staff judgement of project importance.

c. Priority rating is used to:

i. Prioritise timing of works within a financial year.

ii. Reallocate projects to other financial years in the event that the full programme cannot be delivered.

4. Other scheduling constraints (if any) can be applied to the work programme.

Prioritisation of renewals

Renewals expenditure may be reviewed and prioritised if the total cost of renewal works is beyond the community's current ability to fund it. If deferral of renewal work is necessary, the impact of this deferral and the ongoing achievement of LOS are assessed.

Emphasis is placed on life cycle planning although the deferral of some renewal works may have no immediate or short term impact on operations, continued deferral of renewals will eventuate in a liability in the long term. If work is deferred for any reason, this work will be re-prioritised alongside the next year's renewal projects and a revised programme established.

Assets that have reached their predicted expiry date as per IPS asset lives shown in the following table, but are still serviceable will not be automatically replaced but will continue to be operated and inspected annually to ensure they are still fit for purpose.

ASSET CODE	ASSET NAME	LIFE (YEARS)
WATER		
WPL/ARTR	Aerator	20
WPL/BLGS	Buildings	80
WPL/BPMP	Backwash Pump	30
WPL/CABT	Cabinet	30
WPL/CBLK	Chain Block	40
WPL/CHLT	Chlorinator	20
WPL/CHMN	Chlorine Monitoring	20
WPL/CNTK	Contact Tank	50
WPL/CPMP	Chlorine Pump	20
WPL/DCSC	Design and Supervision Costs	30
WPL/FLMT	Flowmeter	20
WPL/FLMX	Flashmixer	25
WPL/FLTR	Filter	50
WPL/FPMP	Filter Pump	20

ASSET CODE	ASSET NAME	LIFE (YEARS)
WPL/GRND	Grounds	20
WPL/LNDR	Launders	40
WPL/PIPE	Pipework	60
WPL/PWRL	Power Line (Supply)	40
WPL/SCRN	Screen	50
WPL/SDTK	Sediment Tank	80
WPL/SGEN	Standby Generator	40
WPL/SLDY	Sludge Drying	80
WPL/STRC	Structure	80
WPL/STTL	Settling Tanks	80
WPL/SWBD	Switch Board	30
WPL/UVMN	Ultra Violet Monitoring	30
WPL/VLPR	Water Valve Pressure Reducing	40
WPL/VLVM	Water Valve Mech	40
WPL/VLVS	Valves	60
WPL/WPMP	Water Pump	30
WTR/HYD	Water Hydrants	50
WTR/MAIN	Water Mains (All Types)	40 -100
WTR/MTR	Water Meter	35
WTR/VLV	Water Valves	50
WTR/WSL	Water Lateral	80

Table 0-6: Asset Codes and Life

Renewal trends and forecasts

Renewals expenditure fluctuates historically and in the plan. This is driven by age and condition data held within IPS. Constant movement of replacement dates is due to detailed condition assessments allowing extension of effective "life".

Figure 7-2 compares the renewal profile to depreciation in the LTP. A number of treatment plants have been upgraded during the last ten years and will not be due for replacement until after 2031. As underground pipe infrastructure has an expected life of up to 100 years there is limited requirement for renewals over until 2031. In the period from 2031 to 2051 there is an increased level of renewals required.

To ensure that today's ratepayers are contributing to the assets being used Council has implemented a policy during the a previous LTP to phase in the funding of depreciation. Funding of water deprecation is increasing by 10% per annum from 2015-16 to 2020-21 with 5% after that to 2028-29 when 100% depreciation is being funded.

Estimates for renewals in this Asset Plan have been made based on current market rates, the Asset Valuation 2019 as prepared by Waugh Infrastructure with third party establishment of rates and lives.

Projects within the three year "active pane" of the LTP it should be expected to have an uncertainty of up to + 20% with projects in the outer years (years 4 to 10) up to + 50% accuracy.

The 2021 to 2031 LTP is the second 30 year period LTP with years 11 to 30 grouped in five year "bands". The philosophy with projects in the 10 to 30 year period are that they are flags that work is likely to be needed but it is very much at the concept phase.

Once it has been decided to proceed with a project, a detailed scope for small scale projects is generally agreed and quoted with the O&M Contract or larger projects are designed either in-house or by consulting professional engineers with work carried out by preferred contractor generally through the competitive tendering process.

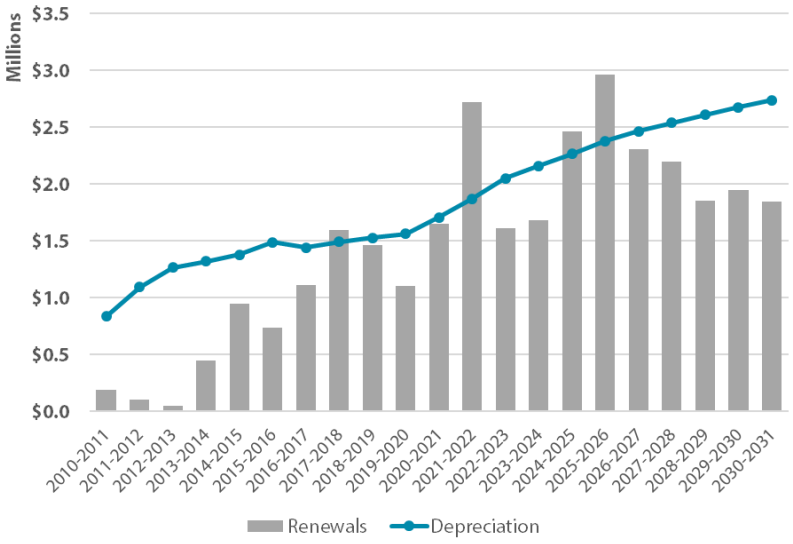


Figure 0-2: Water Renewal Forecasts (showing depreciation)

Capital investment strategy – LOS and demand

Overall the strategy is to complete investment to upgrade schemes to meet requirements of the NZ Drinking Water Standards. Over the first three years of this AMP upgrade Eastern Bush / Otahu Flat will be undertaken. Once complete all sites will be capable of meeting Drinking Water Standards. In addition, two projects have been included in the AMP as a result of the Havelock North water inquiry – one to demonstrate compliance with protozoal status and the other to provide further protection following removal of 'Secure Status' for Riverton water supply through installation of UV disinfection.

In terms of rural water supplies, funding will be set aside for investigations and options around how to deal with those connections who are using the stock water as a source of drinking water. This will be during the next three years of the LTP cycle.

Capital investment trends and forecasts – LOS and demand

LOS expenditure has levelled off significantly over the period, and reflects levels of MOH subsidy funding awarded to Council which has now ceased. Further LOS expenditure is planned over the following AMP period to ensure that DWS are complied with, most notably Eastern Bush/Otahu Flat.

Following the release of stage 2 of the findings from the Havelock North Inquiry, Council has allocated further funding in years 2 and 3 of the LTP to allow further upgrades to our drinking water treatment plants to improve data capture to allow demonstration of compliance with protozoal standards.

Council has also included an additional project to install UV disinfection at the Riverton Water Treatment Plant following removal of 'Secure Status" for groundwater sources ($512k in 2019 - 2021) following release of the inquiry.

There has not been any further demand expenditure over the past five years, and it is further anticipated that this trend will continue over the next three year period.

There is currently little demand growth across any of Council's water supply schemes. As a result, no upgrades or new assets are proposed; the current overall strategy is to maintain and renew the existing asset network as it reaches end of life.

A review of population growth projections within the District has indicated that there is little anticipated growth within the upcoming 10 year period and as a result there is no demand projects in this period. There has been no capital investment for demand over the past five years. It is expected that this trend will continue over the next 10 years and will allow any demand projects to be deferred until the growth occurs.

This increase alone is unlikely to require a demand related project within the 10 year period however sustained slow but steady growth beyond this will trigger the need at some point further in the future.

This is provided tourist numbers do not change significantly and that demand can be managed in other ways ie through education and/or some form of restrictions over the relatively short periods of peak demand.

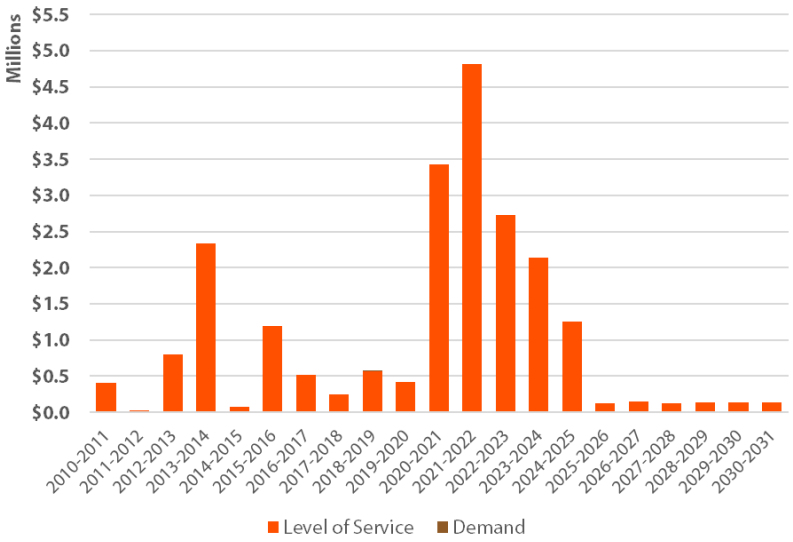


Figure 0-3: Water LoS and Demand Forecasts

Community board area context

The water supply activity is currently district funded i.e funded by those communities connected to Council owned and operated reticulation. There are a number of other communities across the district where there are currently no Council water supply services provided for example a number of communities in Northern Southland. In the event that communities wish to receive reticulated water supply services it is anticipated that they will show the appropriate level of commitment by funding part or all (in the absence of Government or Council subsidy) of initial up front costs for construction after which the ongoing operational costs would be funded through the district rate. No new water supply systems will be constructed without significant community consultation.

It is noted that Community Boards have not been specifically through the development of this plan however they will have the opportunity to be heard through the upcoming Long Term Plan 2021/31 process.

Asset management improvement

This section summarises the AM practices (data, systems, processes) applied to AM planning. It assesses the current and desired level of practice in relation to the 'AM Maturity Index'2 and identifies an improvement programme for the next three years. SDC have engaged Waugh Consulting to provide a "Valuation Improvement Plan" that addressed shortcomings of data associated with Asset Management which is being progressively integrated into Council's management system.

Progress against previous asset management improvement programme

The following table summarises the status of improvement projects identified in the previous improvement plan. While many projects have had some work undertaken, many are incomplete. To support improved delivery of this AMP improvement plan, it will be subject to formal project management and regular reviews.

AM AREA	IMPROVEMENT PROJECT	TASK	STATUS
Capacity Data Demand Forecasting Processes CAPEX Contract Management	Capital development works planning	Understand network capacity.	Partially completed - the capacity of treatment plants and pumping stations is recorded in IPS for most items. Where information is found to be untrue it is amended.
		Document process for determining demand projections considering all demand influences and analysing usage/capacity trend information and identifying implications.	Water Balance and Water Loss Strategy have been developed and will be reviewed and updated.

2 NAMS International Infrastructure Management Manual, 2011

AM AREA	IMPROVEMENT PROJECT	TASK	STATUS
		Develop Project Management Manual/Code.	Project management reported through CAMMS
Condition Data Performance Data Asset Life Data Financial Data Failure Prediction Risk Management Strategy Optimised Decision-making	Capital renewal works planning	Develop and document process for monitoring critical assets.	Monitored via IPS and Operation and Maintenance contract.
		Develop process for predicting condition decay based on pipe failure records.	In conjunction with WSP Opus (and others) condition reporting.
		Identify critical assets and undertake more detailed risk assessment. Develop process for routine review of risk.	To be completed.
		Develop process to analyse maintenance/ renewal options.	Not completed.
Asset Categorisation Location Data Physical Attributes Data O & M Data O & M Monitoring Asset Register System Maintenance Management System	Data Collection and Processes	Develop documented procedures for collection, entry and quality assurance.	Completed - process developed and being implemented.
		Develop standard reports from IPS to readily analyse O&M information.	Completed - Crystal reports developed to assist at O&M Contract meetings.
		Utilise IPS database	Completed
		Encourage O&M Contractor to utilise maintenance function.	Completed - O&M contractor using function.
Risk Management Data AM Improvement	AM improvement	Review the completeness of the O&M plans and update as required.	Partially Completed - Plant sheets revised when major change to facility.
		Develop project task sheets for each planned improvement activity.	To be completed.
Legislative Compliance	AM staff resources	Review processes in place to keep staff abreast of legislative change.	Completed - Library system developed and implemented.

Table 0-7: Progress since 2012 AM Improvement Plan

Assessing current and desired asset management practices

Understanding and defining requirements

	CURRENT STATUS	FUTURE STATUS AND IDENTIFIED IMPROVEMENTS
The AM Policy	Core. Council wide AM Policy has been developed.	Intermediate. Annual reviews.
Levels of Service and Performance Management	Core. Key levels of service have been identified and are monitored and reported against. Performance framework in place and appropriate. LOS have been agreed with the community using the consultative process and communicated through the LTP 2021-2031 processes. Regular monitoring against LOS is carried out through quarterly and annual reporting. LOS have customer agreed service levels underpinned with technical measures.	Intermediate. Develop processes for evaluation of economic, social, environmental impact of offering different levels of service. Develop data collection/reporting process for new measures.
Demand Forecasting	Core. Demand forecast includes latest population projections. Demand drivers are understood. Leakage detection surveys carried out on scheme by scheme basis.	Intermediate/advanced quantify the key factors that make up demand Water Balance and Strategy completed (eg leakage) especially in peak-sensitive areas. Development of District-wide leakage detection programme commenced. District-wide metering not feasible - Demand Strategy is locating zoned metering on all community schemes.
Asset Knowledge and Condition Assessment	Core. Physical attribute and financial information is good for all schemes. All data recorded in IPS. Remaining life information and financial description well understood.	Medium. Development of detailed condition assessment programmes and understanding of performance and capacity is required. Align IPS age and condition data with future renewal programmes.
Risk Management	Minimum activity level key risks identified by operational staff, contractors and consultant. Identification of critical assets is at a very basic level.	Core. Development of Council wide risk policy to allow understanding of Council's appetite for risk. Development for framework for identification of critical assets and subsequent maintenance and recovery plans.

Table 0-8: Understanding and Defining Requirements

Developing asset lifecycle strategies

	CURRENT STATUS	FUTURE STATUS AND IDENTIFIED IMPROVEMENTS
Operational Decision-making	Core. Service level gaps have been identified and projects programmed to address these gaps. Options have been identified to address different issues. Projects have been prioritised (ranked) based on risk and affordability.	Intermediate/ advanced. Develop systems and processes for predicting condition decay based on pipe failure records. Develop processes to analyse maintenance/renewal options based around information within IPS.
Capital Planning and Decision-making	Core All physical work identified for the 20 year period with the 10 year programme included in the budgeting system.	Medium. Develop longer term renewals programme based on renewals data and unit rates. Review and develop plan for improvement of asset valuation process.
Financial Management	As above.	As above.

Table 0-9: Developing Asset Lifecycle Strategies

Asset management enablers

	Current Status	Future Status and Identified Improvements
The AM Team	Core Asset manager leads AMP process with co-ordination occurring across Council. This AM plan has been prepared based on information held within previous plans. The plan has been prepared by SDC with assistance from local operators (Downer), consultants (Stantec, Waugh Consultants, and other SDC staff such as Project Delivery Team.	Medium: Continue with three yearly AM Plan review cycle to flow into the LTP 2021-2051. Internal review (currently underway) to review/clarify asset owner, service provider roles. This will be documented in reviewed job descriptions.
AM Service Delivery	Core Council staff, in conjunction with Governance bodies, determine O&M practices and develop capital programmes in support of these. Provided by a combination of internal and external service providers.	Medium. Develop capability around IPS as an asset management tool
AM Information Systems	Core. Information stored in IPS. Other systems are available to assist with the decision-making process including SCADA, contractors tool (Water Outlook) and financial information is based in JDE and Fulcrum.	Medium. Review IPS/Fulcrum link to refine and develop new process to assist with annual valuation. Develop IPS capability within the organisation in order to allow for more efficient optimised decision-making.

	Current Status	Future Status and Identified Improvements
Quality Management	Core. Three year improvement plan has been prepared.	Medium. Review suitability of KPIs for monitoring against the delivery of the improvement plan.
Improvement Planning	Core. AMP improvement developed based on analysis of current/desired practice.	Medium. Formal Annual Reports on AMP improvement progress and interim informal reviews.

Financial summary

Budgets across the water supply activity have been developed based on the following assumptions

Significant changes to capital programme include:

- allowance for failing asbestos cement pipes scheduled to reach end of life during the period of the AMP. Current proposed budget of $1.4M (uniflated) per year which was not in previous plan
- replacement of aging control and monitoring equipment required for controlling water treatment plants and ensuring water safety.
- replacement of other aging plant and equipment.
- introduction of programme to implement backflow prevention on all connections to the network. It is expected this this will become a focus for the new water regulator once it becomes more established.
- further work is required to understand and implement options for improving rural water supplies where it is suspected that untreated stock water is being used to supplement domestic consumption.
- operational costs have been increased by inclusion of further testing and condition assessments across networks to allow prioritization of renewals.
- it is also assumed that new contract arrangements from July 2022 will result in an increase of up to 15% which has been included in the budget. Timing of the renewal of the contract is now likely to be extended by 12 months (subject to Council approval) to more fully understand the implications on 3 waters reforms.

10 year financial forecast

The following graphs/table summarise the financial forecasts for the activity over the ten years.

1.1.1. Financial summary

Water Supply	2017/2018 Actual ($000)	2018/2019 Actual ($000)	2019/2020 Actual ($000)	2020/2021 Annual Plan ($000)	2021/2022 LTP ($000)	2022/2023 LTP ($000)	2023/2024 LTP ($000)	2024/2025 LTP ($000)	2025/2026 LTP ($000)	2026/2027 LTP ($000)	2027/2028 LTP ($000)	2028/2029 LTP ($000)	2029/2030 LTP ($000)	2030/2031 LTP ($000)
Sources of operating funding														
General rates, uniform annual general charges, rates penalties	-	-	2	-	638	660	685	699	715	741	746	771	804	804
Targeted rates	3,852	3,832	3,786	4,100	4,873	5,464	5,791	6,056	6,339	6,402	6,665	7,263	7,468	7,769
Subsidies and grants for operating purposes	-	-	-	-	120	-	-	-	-	-	-	-	-	-
Fees and charges	15	5	13	-	-	-	-	-	-	-	-	-	-	-
Internal charges and overheads applied	48	47	37	47	113	115	116	118	119	121	122	124	126	127
Local authorities fuel tax, fines, infingement fees, and other receipts	6	1	1	1	1	3	3	3	3	3	3	3	3	3
Total operating funding	**3,920**	**3,884**	**3,839**	**4,148**	**5,745**	**6,241**	**6,596**	**6,875**	**7,176**	**7,267**	**7,535**	**8,160**	**8,401**	**8,703**
Applications of operating funding														
Payments to staff and suppliers	2,213	2,367	2,745	2,685	2,623	2,922	2,985	3,063	3,225	3,240	3,329	3,433	3,542	3,655
Finance costs	-	-	-	-	299	378	437	484	526	552	567	578	579	581
Internal charges and overheads applied	615	608	666	804	1,692	1,668	1,799	1,841	1,821	1,796	1,872	2,270	2,361	2,522
Other operating funding applications	(4)	(2)	-	-	-	-	-	-	-	-	-	-	-	-
Total applications of operating funding	**2,823**	**2,974**	**3,411**	**3,489**	**4,614**	**4,968**	**5,222**	**5,388**	**5,572**	**5,588**	**5,768**	**6,280**	**6,482**	**6,758**
Surplus (deficit) of operating funding	**1,097**	**911**	**428**	**659**	**1,131**	**1,273**	**1,374**	**1,488**	**1,604**	**1,679**	**1,767**	**1,880**	**1,919**	**1,945**
Sources of capital funding														
Subsidies and grants for capital purposes	-	-	-	-	2,318	-	-	-	-	-	-	-	-	-
Development and financial contributions	-	7	-	-	-	-	-	-	-	-	-	-	-	-
Increase (decrease) in debt	467	1,081	1,086	4,442	4,467	3,580	3,044	2,907	2,227	1,719	1,551	1,165	1,247	1,147
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other dedicated capital funding	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding	**467**	**1,088**	**1,086**	**4,442**	**6,785**	**3,580**	**3,044**	**2,907**	**2,227**	**1,719**	**1,551**	**1,165**	**1,247**	**1,147**
Applications of capital funding														
Capital expenditure														
- to meet additional demand	-	11	-	-	-	-	-	-	-	-	-	-	-	-
- to improve the level of service	251	561	423	3,428	4,817	2,722	2,133	1,253	122	153	130	134	139	143
- to replace existing assets	1,592	1,463	1,101	1,647	2,721	1,609	1,683	2,465	2,960	2,304	2,198	1,850	1,946	1,849
Increase (decrease) in reserves	(279)	(37)	(11)	26	426	571	649	725	797	989	1,038	1,109	1,130	1,148
Increase (decrease) in investments	(0)	-	-	-	(48)	(48)	(48)	(48)	(48)	(48)	(48)	(48)	(48)	(48)
Total applications of capital funding	**1,564**	**1,999**	**1,514**	**5,101**	**7,916**	**4,853**	**4,418**	**4,395**	**3,831**	**3,397**	**3,317**	**3,044**	**3,166**	**3,092**
Surplus (deficit) of capital funding	**(1,097)**	**(911)**	**(428)**	**(659)**	**(1,131)**	**(1,273)**	**(1,374)**	**(1,488)**	**(1,604)**	**(1,679)**	**(1,767)**	**(1,880)**	**(1,919)**	**(1,945)**
Funding balance	**(0)**	**0**	**(0)**	-	-	-	**0**	-	-	-	-	-	-	-

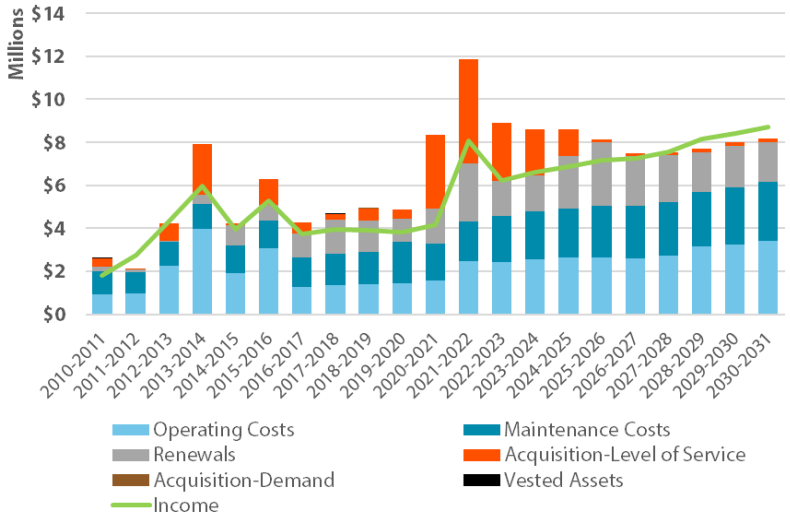


Figure 0-1: Water Supply Total Expenditure (District-wide)

1.1.2. Total income

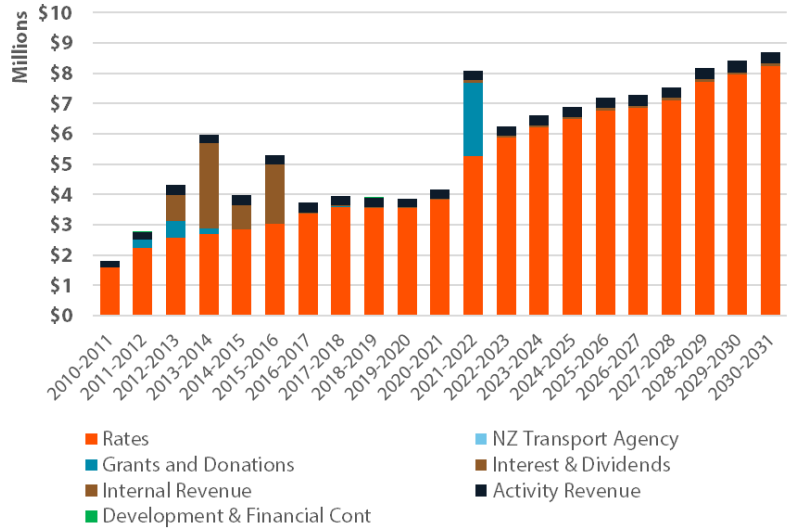


Figure 0-2: Water Supply Total Income

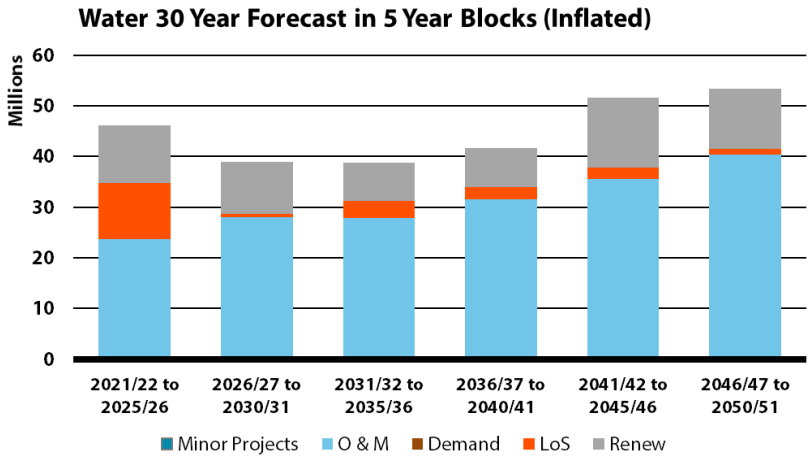


Figure 0-3: 30 Year Expenditure Forecasts (from Infrastructure Strategy)

Financial forecast summary

The following section contains financial information for the activity which has been generated from Council's Fulcrum budget platform as at February 2021. All of the financial shown includes inflation (unless otherwise stated). The costs associated with the Water Supply activity are included in the Water Supply Activity Statement in Council's LTP.

Summary of key financial assumptions

The current activity plan has been developed assuming that:

- forecast renewals within the 10 year period will be subject to additional condition surveys and detailed investigations. Years 11 to 30 will not be subject to survey until they present within the 10 year LTP window. Known problems outside the LTP window may be required to maintain security of supply.
- future changes to operating costs will be influenced by changes to inflation and as a result of scheme upgrades to meet LOS requirements, most notably Drinking-water Standards 2008, but also outcomes from the Havelock North Inquiry and DIA 3 Waters work.
- future demand is likely to remain unchanged (and may decline in places due to Covid-19) and as such any upgrades to meet future demand have been deferred to the last years of the 10 year period and will be further deferred if this demand does not exist.
- MOH subsidy funding is no longer available for scheme upgrades and is unlikely to be unavailable in the future however future tranches of Government Funding (Stimulus) may be available within the first years of the plan.

Key factors that may influence future operating costs that have currently not been budgeted for include:

- significant increase in transportation costs. Transportation costs are recalculated on a quarterly basis as part of the escalations process for re-baselining contract costs. Increases in transport costs are largely dependent on oil and diesel prices which are outside Council's control. Currently budgeted operational costs allow for an increase based largely on historical trends.
- the impact of ES's approach to future consent renewals for water takes could have a significant impact on costs depending on future operating costs which have not been fully budgeted for. These requirements are currently not fully understood but are likely to require the development of demand strategies for each scheme.

Should this be linked to the Finance Strategy? Should there be any new material here?

Valuation approach

Statutory financial reporting requirements require Council to revalue its fixed assets triennially. Water supply infrastructure assets were last valued as at 30 June 2020 in accordance with Public Benefit Entity International Public Sector Accounting Standard 17 Property, Plant and Equipment (PBE IPAS17). All assets have been valued at the component level (maintenance managed item-MMI) where appropriate. A summary of the 2019 valuations is presented in Table 7-1.

The following assumptions have been made in the preparation of the valuations:

- that all asset data has been reviewed and updated.
- that all valuations are based on the "Modern Equivalent Replacement Cost" basis.
- where new technology is available or where present assets do not require full replacement, adjustments have been made.
- that the rates for urban watermains have been set at systematic renewal costs rather than short length replacement costs.
- that previously the rural watermain rates were set based on competitive rates from large replacement contracts recently constructed outside of the District. The 2019 rates have been set at replacement rates similar to recent contract rates associated with a rural main replacement contract in the Southland District.
- the asset lives and unit rates have been peer reviewed by Waugh Consulting and signed off by Audit NZ.

Funding Principles

Section 102(4) (a) of the Local Government Act 2002 requires each Council to adopt a Revenue and Financing Policy. This Policy must state Council's policies in respect of the funding of both capital and operational expenditure for its activities.

In summary, for Water Supply, operational and capital expenditure will be funded as follows:

- operating funding for drinking water supplies is funded on a District-wide basis by all those connected to such a scheme. Rural stock water schemes are funded locally by those connected to the schemes.
- renewals and LoS upgrades on existing schemes are funded by loans and or reserves and contributions where appropriate.
- Depreciation on existing assets is to be funded in increments until 100% funding is reached in 2028-2029. These reserves are to fund the repayment of loans for capital work, followed by capital expenditure for renewal and LoS
- rural water supply capital works are funded solely through local contributions and loans.
- capital works for new urban schemes are funded from communities wanting to receive the service. A previous Council subsidy of 16.67% District contribution related only to those receiving central government subsidy and are no longer available.
- smaller projects not eligible for subsidy may be funded through loans. Local contributions are funded either via rates, loans or from scheme operating reserves.

Further information can be found in Council's Revenue and Financing Policy. The current policy is adopted in 2018 is available online and in Council's document management system (refer R/17/8/18227). The policy is in the process of being reviewed for the 2021 LTP and the updated information regarding the policy will be included in the AMP once finalised.

Fees and charges

Appendix - scheme plans

Introduction

This section introduces the headings found in the following appendices offering explanations and definitions of information sources, methodologies and terminology common to all supplies.

The financial reports provided in this section incorporate the business units that fund the operating activities but exclude business units which contain existing township/ratepayer loans and depreciation.

Description

This area describes the current physical scope, condition and performance (measured against target standards) of the assets used in the Water Supply Activity. This information is the basis for determining future maintenance and capital programmes, and developing appropriate management strategies. Information has been collated from the databases held in SDC's asset.

Connection information has been provided by the Rates Department as a query of how many water rates or units of water are charged for each scheme.

Asset information has been sourced from historical AMPs, IPS, and scheme working folders.

Asset condition, capacity and performance

Measuring

During the development of previous AMPs an assessment of condition and performance was made using grades defined by the New Zealand Water Industry National Asset Grading Standards (see tables below). This revision does not re-grade each asset but instead updates grades based on recent information. These act as a reference for the condition, performance and confidence of individual schemes as discussed in the following sections.

Further asset condition, capacity and performance criteria are revisited following joint inspections. The asset condition and performance information is included

Condition and performance grades

GRADE	CONDITION	PERFORMANCE	DESCRIPTION
1	Very Good	Always meets Technical LOS	No significant adverse short term impact.
2	Good	Almost always meets Technical LOS	Failure will cause localised and serious disruptions to service delivery.
3	Moderate	Generally meets Technical LOS	Failure will cause localised and serious disruptions to service delivery, possible health and safety effects and/or loss of critical data.
4	Poor	Does not generally meets Technical LOS	Failure will cause serious disruption to service delivery over a substantial area, possible health and public safety effects.
5	Very Poor	Never meets Technical LOS	Widespread and serious disruption to service delivery, possible health and public safety effects.

Table 0-1: Asset Condition and Performance Grades (Courtesy of Maunsell Limited)

Confidence grades

GRADE	CONFIDENCE	DESCRIPTION
A	Highly reliable	Data is based on sound records, procedures, investigations and analysis that is properly documented and recognised as the best method of assessment.
B	Reliable	Data is based on sound records, procedures, investigations and analysis that is properly documented but has minor shortcomings; for example the data is old, some documentation is missing and reliance is placed on unconfirmed reports or some extrapolation.
C	Uncertain	Data is based on sound records, procedures, investigations and analysis that is incomplete or unsupported, or extrapolation from a limited sample for which Grade A or B data is available.
D	Poor	Data is based on unconfirmed verbal reports and/or cursory inspection and analysis.

Table 0-2: Data Source and Confidence Gradings (Courtesy of Maunsell Limited)

Assets that have reached their predicted expiry date as per IPS asset lives, but are still serviceable will not be automatically replaced but will continue to be operated and inspected annually to ensure they are still fit for purpose.

Appendix A: Duncraigen Rural Water Supply

Description

The Duncraigen (restricted) Rural Water Supply has one connection (Landcorp Farming Limited) to the scheme with a total of 30.8 units of water allocated (1 unit equals 1,818L/day).

The scheme is not for potable use and therefore not currently registered with the MOH.

The scheme is governed by the Te Anau Rural Water Supply Committee under the guidance of technical staff at the SDC.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise.

1982 - SDC took over responsibility for the scheme.

1995 - Telemetry installed.

1998 - Water Permit granted to extract 120 m^3/day from the Waiau River for 20 years.

2005 - Low river event causing high sediment load through pumps.

2006 - Low river event causing high sediment load through pumps.

2008 - Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

2012 - Telemetry replaced.

Process Description

River water is drawn from the Waiau River and pumped to storage reservoirs and farm storage tanks. Water is not treated. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the farm storage tanks.

(a) Abstraction

Water Permit 94532 granted to take 120 m^3/day from the Waiau River at a rate of 5 m^3/hr. Consent expires 29 May 2028.

(b) Intake headworks

Water is drawn from the Waiau River approximately 1,000 m upstream of the Mararoa control structure. Water is drawn through a 600 mm inclined steel pipe with slots located in the river. Pumps are manually adjusted on guide rails to ensure the inlets are under water. The intake is affected by river quality and quantity issues, however, a turbidity switch owned and operated by the Meridian Energy discharges dirty water through the control gates bypassing the intake.

Pump Controls: Pump control is by a pressure switch with 10 minute delay. The pump station is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

Design: untreated rural water scheme. Restricted supply to farm storage tanks.

Catchment: unconfined catchment.

(c) Water treatment

This is a non-potable untreated supply.

(d) Storage

The main reservoir has a capacity of 90 m^3 equivalent to approximately 18 hours at full demand.

(e) Reticulation

The rising main and gravity main is made up PVC. The pipes should have been installed with rubber-ring joints. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(f) Water meters and hydrants

There are no zone or consumer water meters or hydrants on this scheme.

Asset Condition and Performance

The current condition and performance grading of the water supply system is shown in the table below.

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Inclined pipe	3	3	B	2044
	Primary Pump 1	3	3	B	2041
	Primary Pump 2	3	3	B	2041
	Switchboard	3	3	C	2041
	Telemetry	2	5	A	2041
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Storage	Main Reservoir	2	2	C	2044
Reticulation	Gravity mains	3	3	B	2065
	Rising mains	3	3	B	2084
	Valves	3	3	B	2045
	Hydrants	-	-	-	-
	Meters	-	-	-	-

Appendix Table A: Duncraigen Condition and Performance

Note: New meter installed 2016.

Although the primary pumping equipment is nearing the estimated failure year it was decided to programme replacement of both pumps for 2014/15 as there has been no indication that pump condition is deteriorating. The pipework in the switchboard/intake shed has also been programmed for replacement in the same year due to poor condition.

The switchboard and telemetry is also nearing the end of economic life with SCADA programmed in line with other Te Anau basin SCADA renewals and has been renewed accordingly.

Operation and maintenance

The lines are now requiring flushing four times per year as an increasing amount of sediment is sucked into intake. This work is now scheduled in IPS.

Critical assets

Critical assets identified are:

The rising main from intake to reservoir.

Key issues

- the telemetry unit has been upgraded to Kingfisher/Citect as the SCADA system.
- pumping equipment has been renewed.
- electrical equipment has been renewed.
- suspected that water is being used as a source of drinking water

Capital expenditure plan

The following renewal projects have been programmed as they are either at the end of their design life or due to poor condition/performance.

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation (Duncraigen)	RW39	MS Project 39 in 23/24	REN	23/24	22,540	Reserves

Appendix B: Eastern Bush - Otahu Flat RWS (Treated)

Description

The Eastern Bush leg of the scheme has 35 connections with a total of 134 units of water allocated (1 unit equals 1,818 L/day). The Otahu Flat leg of the scheme 40 connections with a total of 114 units of water allocated (1 unit equals 1,818 L/day).

The scheme registered with the MOH but is currently ungraded.

History

The scheme was installed by Wallace County Council in 1972 with the majority of construction work carried out by consumers to keep costs down.

1982 - SDC took over responsibility for the scheme built by the Wallace County Council.

1995 - Telemetry installed.

1999 - Water Permit granted to extract 6.1 L/s from the Wairaki River for 20 years.

2002 - New intake well constructed and chlorine dosing pump installed to replace the unreliable suction dosing system. New switchboard installed.

2004 - New well pump installed.

2005 - New secondary pump installed for Otahu Flat.

2007 - PHRMP approved by Drinking Water Assessor.

2008 - Five kilometre section of falling main from OF reservoir replaced due to poor condition. Chlorine pump replaced.

2012 - Well pump replaced.

2013 Chlorine dosing replaces HTH solution.

2014 - Investigations on options for treatment upgrade investigated.

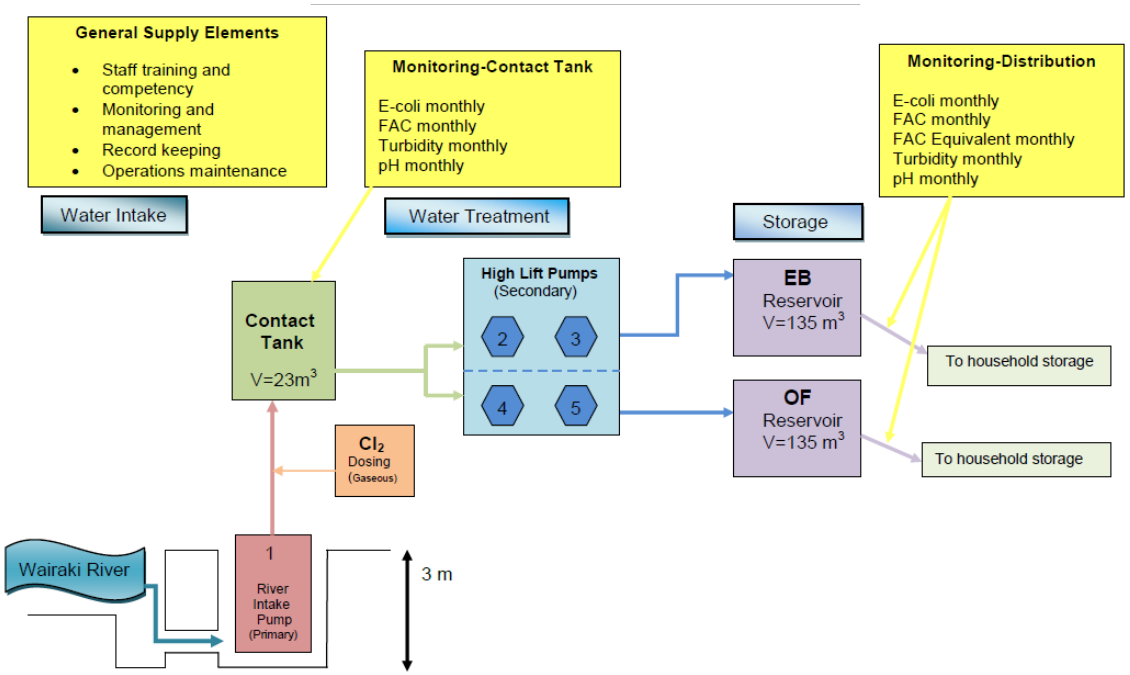
2014 Soft starting of motors incorporated.

2016 - Replacement water main across Clifden Bridge

2017 - Call for tenders for upgrade treatment plant (currently on hold pending outcome from Havelock North inquiry)

2017 - Applications prepared for water take consent and consent for discharge of wastewater from the treatment process.

Process description



River water is drawn from a shared intake in the Wairaki River which pumps water to a clear water tank. The water is treated with chlorine for disinfection. Each leg draws water depending on demand and pumps to respective reservoirs before discharging to household storage tanks. The supply network consists of gravity mains and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the storage tanks.

This scheme is currently on a permanent "Boil Water Notice". This is due to low residual chlorine levels in the reticulation. It is understood this is due to the quality of raw water,
ie the capacity of the treated water to hold chlorine is undermined by the large amount of organic matter in the raw water.

(a) Abstraction

Water Permit 98217 granted to take 6.1 L/s from the Wairaki River when flows are greater than 6.1 L/s and not more than 10% of river flow within 61 L/s or less. Consent expires 24 December 2019.

(b) Intake headworks

Water is drawn from the gravels of the Wairaki River upstream of the Wairaki Road bridge. Water flows under gravity into a pool area with a slotted pipe buried under clean gravel. The pipe carries water to a well containing a submersible pump located in the river reserve.

Land use consent 99177 to divert the Wairaki River and excavate to maintain the diversion channel. Consent expires 24 December 2019.

Design: treated rural water scheme. Restricted supply to household storage tanks.

Catchment: Waiau catchment.

Pump controls: the Eastern Bush pumps are controlled by a solar powered ultrasonic level controller (ultrasonic hawk unit) and transmitted to the treatment plant via UHF link (SALCOM).

The Otahu Flat pumps are controlled by a solar powered pressure transducer level control at the reservoir and transmitted to the treatment plant via UHF link (SALCOM).

The treatment plant is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water treatment

This scheme uses chlorine disinfection automatically dispensed which is made into a solution for dosing by the operator. Each sub-scheme has respective duty and standby pumps.

(d) Storage

The EB reservoir has a capacity of 135 m^3. The time equivalent at current demand is 13.3 hours (134 units). The OF reservoir has a capacity of 135 m^3.
The time equivalent at current demand is 15.6 hrs (114 units).

(e) Reticulation

For Eastern Bush the rising main is a 100 mm diameter asbestos cement pipe.
A sample tested in July 2005 shows this line to be in very poor condition.
Gravity mains are made of polyethylene and PVC. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme. There are no meters or hydrants on this scheme.

The Otahu Flat rising main is made of unknown material. Gravity mains are made of PVC, polyethylene, and asbestos cement. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Well	4	4	C	2031
	Primary Pump 1	3	3	B	2029
Treatment Plant	Chlorine pump	3	3	C	2028
	Deplox	1	1	A	2029
	Switchboard	4	3	C	2031
	Telemetry	2	5	A	2031
Eastern Bush Sub-Scheme					
Pump stations	Secondary Pump 1	1	2	C	2030
	Secondary Pump 2	3	3	C	2018
	Surge Protection Eq.	3	5	C	Unknown
Storage	EB Reservoir	4	4	B	2031
Reticulation	Gravity mains	3	3	B	2031
	Rising mains	5(**)	5(**)	A	2024
	Valves	3	3	B	2024
	Hydrants	-	-	-	-
	Meters	-	-	-	-
Otahu Flat Sub-Scheme					
Pump stations	Secondary Pump 1	1	2	C	2020
	Secondary Pump 2	3	2	C	2018

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
	Surge Protection Eq.	3	5	C	Unknown
Storage	OF Reservoir	4	4	B	2031
Reticulation	Gravity mains	3	3	B	2031
	Rising mains	4	4	B	2019
	Valves	3	3	B	2021
	Hydrants	-	-	-	-
	Meters	-	-	-	-

Appendix Table B: EB and OF Condition and Performance

** AC Pipe Sample Condition Assessment by OPUS dated 6 July 2005.

Note: Upgrade planned 2018/2019.

Operation and maintenance

Increasing maintenance is being carried out on shallow lines. Some areas may need to be deepened especially at driveway/road crossings. There is also increasing maintenance being carried out to divert the river back towards the intake well.

Critical assets

Critical assets identified are:

- the Eastern Bush rising main from intake to reservoir.
- the Otahu Flat rising main from intake to reservoir.
- the well pump.
- the chlorine pump.

Key issues

- this scheme is currently on a permanent "Boil Water Notice". This is due to low residual chlorine levels in the reticulation. It is understood this is due to the quality of raw water, ie the capacity of the treated water to hold chlorine is undermined by the large amount of organic matter in the raw water
- an assessment is needed to establish current and future demand prior to the following reticulation renewals
- the Eastern Bush rising main to the reservoir is in very poor condition and due for replacement (especially area through the swamp)
- the Otahu Flat rising main is likely to be in similar condition and should be replaced pending condition assessment at time of bursts
- the reservoir tanks on both schemes are in poor condition and due for renewal pending a storage assessment
- the secondary pumps are due for renewal medium term
- scheme does not qualify for MOH funding due to low deprivation

- renewal of the resource consent
- the scheme is required to meet the DWS including the development of a PHRMP (completed 2007) and associated infrastructure upgrades
- the majority of the reticulation meets the end of design life in 2031.

Capital expenditure plan

Eastern Bush Otahu Flat is now a combined scheme.

Eastern Bush

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Water Supply Upgrade - Stage 1	WAT62	MS Project WAT62	LOS	18/19	750,000	District Funding
Water Supply Upgrade - Stage 1	WAT62	MS Project WAT62	LOS	19/20	791,611	District Funding

Appendix C: Five Rivers Rural Water Supply

Description

It is understood that the Five Rivers (restricted) Rural Water Supply has five connections to the scheme with approximately 66 units of water allocated (1 unit equals 1,818 L/day).
SDC collect no rates or asset management data from this scheme.

The scheme is not for potable use and therefore not currently registered with the MOH.

The scheme is managed by the Five Rivers Water Supply Committee with support available from technical staff at the SDC. The scheme is maintained by the consumers.

History

It is unknown when the scheme was built but estimated at 1980s. The scheme was built by Council of the day with the assistance of a government subsidy.

1990s - SDC relinquished operation and maintenance of the scheme to the Committee.

1998 - Water Permit granted to extract 120 m^3/day from Tank Creek for 20 years.

2018 - New consent granted

Process description

River water is collected from Tank Creek and gravity fed to farm storage tanks.

From the intake, water gravitates through the reticulation to farm storage tanks. The supply network consists of gravity mains, rising mains, and valves. Council owns service connections from the trunk main to the ballcock on the storage tanks but only carries out maintenance work at the request of the scheme committee. Council collects no rates for this scheme.

(a) Abstraction

Water Permit 97376 granted to take no more than 120 m^3/day from Tank Creek at a maximum rate of 5 m^3/hr. Consent was renewed in 2018.

(b) Intake headworks

Water is collected from the Tank Creek approximately 1,500 m upstream of State Highway 6. Water falls by gravity to a 23 m^3 reservoir. There are no pumps.

Design: restricted supply to farm storage tanks

Catchment: unconfined catchment

Pump controls: there are no pumps and no SCADA

Standby power: no standby power supply is required.

(c) Water treatment

This is a non-potable untreated supply.

(d) Storage

The main reservoir has a capacity of 23 m^3 equivalent to approximately 4.6 hours at current demand (66 units).

(e) Reticulation

The gravity mains are made up of PVC and polyethylene. It is understood that PVC mains are rubber-ring jointed. Service connections are also believed to be PVC. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(f) Water meters and hydrants

There are no zone or consumer water meters or hydrants on this scheme.

Asset capacity

A summary inventory of the water supply assets is given below:

ASSET TYPE		CAPACITY	
Intake	Weir	5 m^3/hr	Sufficient
Treatment Plant	n/a	n/a	n/a
Storage	Main reservoir	23 m^3	Sufficient
Reticulation	6.600 km	Various	Sufficient

Note: Capacity parameters are referred to as the performance ability of the asset as it rates to its function in the structure of the utility asset. This may be expressed as an equivalent population or an achievable design flow.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Weir	3	3	C	2037
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Storage	Main Reservoir	3	3	C	2037
Reticulation	Gravity mains Rising mains Valves Hydrants Meters	3 - 3 - -	3 - 3 - -	B - B - -	2057 - 2027 - -

Appendix Table C: Five Rivers RWS Condition and Performance

Note: Flow meter installed 2015.

Operation and maintenance

No known issues.

Critical assets

None identified.

Key issues

- it is suspected that this is being used as a source of potable water
- resource consent application being prepared in 2017.

Capital expenditure plan

Investigation of point of entry treatment on dwellings on the scheme.

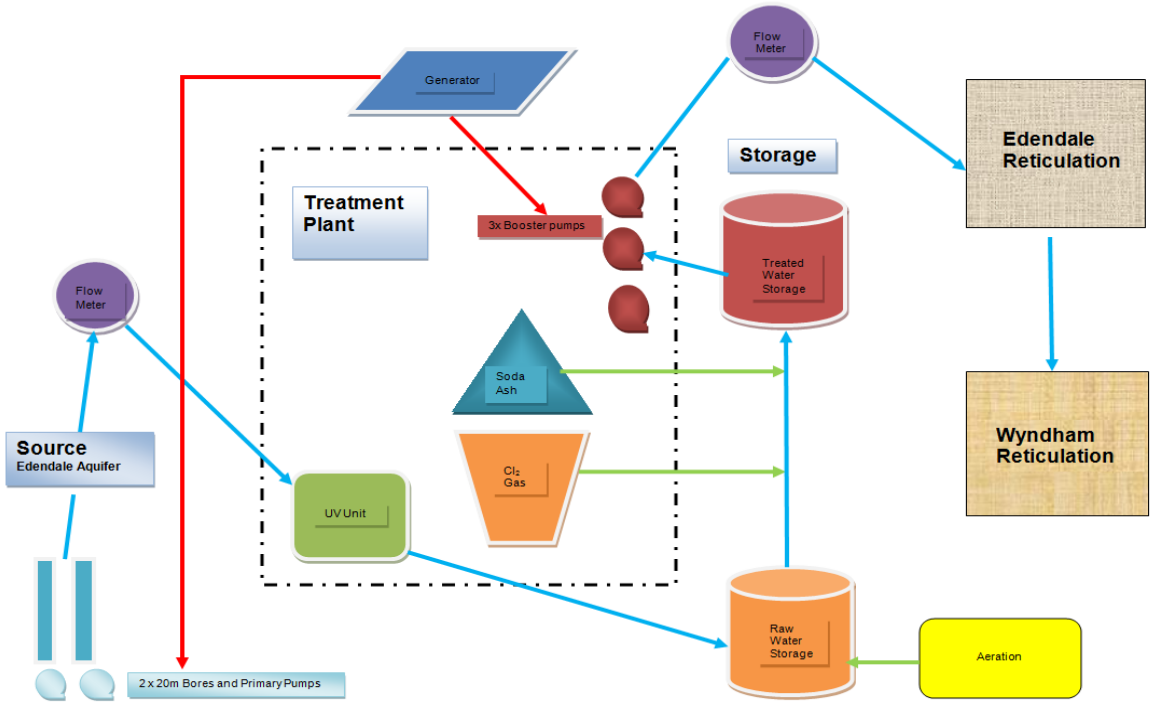
Appendix D: Edendale-Wyndham Scheme

History

The Edendale-Wyndham water supply was constructed between 2007 and 2008 serving the townships of Edendale and Wyndham. The scheme was constructed with the aid of Ministry of Health Funding and Subsidy from Southland District Council with ratepayers funding the balance (33%). The scheme currently has 561 connections serving a population of 1152 as per the 2013 census.

Raw water source

The raw water supply is sourced from a terrace aquifer that lies to the west of Edendale within the Edendale groundwater zone. There are two bores that produce the raw water and these are approximately 20 metres deep. These two bores are located on the west side of Homestead Road approximately 800 metres north of SH 1 on a piece of land owned by Council



Treatment

From the raw water tank the water flows into the treated water tank by gravity (ie, a balancing of levels between the treated water and raw water tanks) as the treated water tank is drawn down by the supply pumps.

The pipe work between the tanks has a static mixer installed. This static mixer allows for the dosing and mixing of:

1. Chlorine dosed from 2 x 70 kg pressurised cylinders in parallel, both chlorine bottles are on scales with the weight being shown on SCADA. There is automatic change-over between chlorine cylinders when one bottle runs out of chlorine.

   Chlorine dosing: Gaseous chlorine is dosed from pressurised 70 kg cylinders to the carry water line via an injector unit, the maximum level of FAC chlorine is not to exceed 5 mg/litre. If the chlorine level in the treated water is outside the range of 0.5 - 1.5 mg/litre an alarm is sent out to the operator.

2. Soda ash dosed by dosing pumps from a liquid (6-10% soda ash solution) form mixed (by aeration) in a 2,500 litre APD (manufacturer) tank.

   Soda ash and chlorine are both dosed via carry water line from the WTP building, the dosing of both is controlled by a Depolox 5 analyser unit.

   Soda ash: the soda ash is mixed in a 2,500 litre bunded tank by use of a blower and air sparge arrangement. From the tank dosing pumps (duty/standby) dose the mixture into the carry water line.

Booster pumps

The water in the raw and treated water tanks are drawn down as required by the booster pumps to meet demand; the treatment system does not have any elevated storage and therefore the pumps must operate continuously to meet all demand requirements (a generator is supplied for emergency power back up to ensure that the pumps keep operating even when a power failure occurs). If one of the three pump units fails then another will immediately activate. The booster pumps are Lowara 15 kW with maximum flow 30l/s with a nominal head 45 m maintained with constant pressure VFD control. The booster pump set design is based upon the operational philosophy of maintaining constant pressure on the supply side of the pump.

There is a generator at the water treatment plant that supplies emergency power primarily to maintain the pumps during a power outage. The generator is a caterpillar GEP110/2 which is 110 kVa and 88 kw rated with a rated frequency of 50 Hz. The generator starts automatically when there is a power cut, an alarm is sent to the operator, notifying them that there has been a power failure. The generator is run and visually checked monthly.

Reticulation

The treated water is transferred from the WTP to Edendale through a PN12 O-PVC pipe. This main is approximately 3 km long and contains a number of air valves and scour points.

The reticulation in both towns is PN 12.5 O-PVC pipe of varying diameters for the mains and the laterals are MDPE 25 mm PN 12.5 (blue coloured pipe) with a tapping band and elbow coming off the main and a aquaflow manifold toby box at each boundary which incorporates twin check valve for backflow prevention.

Water is transferred to Wyndham via the Edendale reticulation system and via a main of PN12 O-PVC main.

Excellent pipe location and size information is available on Council's GIS system. Firefighting capacity is excellent with all hydrants meeting 25l/s as required for Class E firefighting requirements.

Condition and performance

Given that all assets are newly constructed they all classed as grade 1 in terms of both condition and performance.

Note: No Information.

Key issues

None identified.

Capital expenditure plan

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
District Metered Areas	WAT79	MS Project WAT 79 in 19/20	LOS	19/20	19,475	District Funding
Consent Renewal Preparation	WAT789	MS Project WAT789 in 22/23	REN	22/23	21,990	District Funding
Blower Replacement	WAT1679	Additional project in 18-28 LTP	REN	27/28	158,451	District Funding

Appendix E: Homestead Rural Water Supply

Description

The Homestead (restricted) Rural Water Supply has 21 connections to the scheme with a total of 121.7 units of water allocated (1 unit equals 1,818L/day).

The scheme is not for potable use and therefore is not currently registered with the MOH.

The scheme is governed by the Te Anau Rural Water Supply Committee under the guidance of technical staff at the SDC.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise.

1982 - SDC took over responsibility for the scheme.

1995 - Telemetry installed.

- New switchboard installed.
- New transfer pump installed (P1).

1999 - Transfer pump (P2) installed (ex Takitimu).

2000 - Water Permit granted to extract 600 m^3/day from the Whitestone River for 20 years.

2002 - 100 m of old AC rising main was renewed in PVC.

2004 - Well slots cleared and new raw water intake pipe installed.

2005 - Low well protection installed into well.

2006 - New transfer pump installed at pump house (Lowarra SV 3307/2 15 kW).

2008 - Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

2012 - Install Kingfisher SCADA and switchboard.

2014 - Work underway to replace rising main from intake to tanks along realigned route.

2020 – New consent issued

Process Description

River water is drawn from an unconfined aquifer adjacent to the Whitestone River and pumped to storage reservoirs and farm storage tanks. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the storage tanks.

(a) Abstraction

Water Permit 99019 granted to take no more than 600 m^3/day from the Whitestone River at a maximum rate of 25 m^3/day. The previous consent expired in June 2020 with a new one granted for a further 20 year period.

(b) Intake headworks

Water is drawn from the Whitestone River approximately 4 km upstream of State Highway 94. Water is drawn through a 900 mm slotted steel well approximately 3.9 m deep. There are two surface mounted

centrifugal pumps in parallel pumping to the reservoir. Pressure surge equipment protects the pumps comprising of a manually drained pressure vessel.

Design: restricted supply to farm storage tanks.

Catchment: unconfined catchment.

Pump controls: pumps are controlled by solar powered ultrasonic level control (ultrasonic hawk unit) at the reservoir and transmitted to the pump station via UHF link (SALCOM). Low well protection prevents the pumps from running dry. The pump station is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water treatment

This is a non-potable untreated supply.

(d) Storage

The main reservoir has a capacity of 136 m^3 equivalent to approximately 14.8 hours at current demand (121.7 units).

(e) Reticulation

The rising main is constructed of 100 mm diameter asbestos cement and likely to be in poor condition. The gravity mains are polyethylene and PVC. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(f) Water meters and hydrants

There are no zone or consumer water meters or hydrants on this scheme.

Asset condition and performance

The current condition and performance grading of the water supply system is shown in the table below. It was noted in 2006 that three of the reservoir tanks are leaking badly.

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	3.9 m Well	1	2	C	2031
	Transfer Pump 1	2	2	B	2025
	Transfer Pump 2	2	2	A	2026
	Surge Protection eq	4	5	C	2020
	Switchboard	1	1	C	2030
	Telemetry	1	1	A	2030
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Storage	Main Reservoir	1	1	C	2051
Reticulation	Gravity mains	3	3)	B	2031
	Rising mains	4	4	B	2117
	Valves	3	3	B	2031
	Hydrants	N/A	N/A	N/A	-
	Meters	3	3	C	2031

Appendix Table E: Homestead RWS Condition and Performance

Operation and maintenance

No issues.

Critical assets

Critical assets identified are:

- the rising main from the intake to the reservoir.

Key issues

- it is suspected that this scheme is being used as a source of drinking water by some users

Capital expenditure plan

The following renewal projects have been programmed:

Te Anau Rural Water Supply
Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation (Homestead)	RW108	MS Project 108 in 18/19	REN	18/19	20,000	Reserves
Plantroom valves (Homestead)	RW1602	Additional project 18-28 LTP	REN	20/21	7,169	Reserves

There are no LOS or demand projects planned for the 10 year period.

There is currently no disposal plan in place for assets.

Appendix F: Kakapo Rural Water Supply

Description

The Kakapo (restricted) Rural Water Supply has 52 connections to the scheme with a total of 162.6 units of water allocated (1 unit equals 1,818L/day).

The scheme is not for potable use and therefore not currently registered with the MOH.

The scheme is governed by the Te Anau Rural Water Supply Committee under the guidance of technical staff at the SDC.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise.

1982 - SDC took over responsibility for the scheme.

1995 - Telemetry installed.

2000 - Water Permit granted to extract 500 m^3/day from the Upukerora River for 20 years.

2001 - New ultrasonic level control fitted to main reservoir.

2004 - Hydraulic model completed.

2005 - 100 m of faulty glue jointed falling main replaced.

- New booster pump 2.

2008 - Water meters installed on the Kakapo and Dale lines.

- Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

2010 - SCADA and switchboard replaced.

2020 - New consent granted for 20 years

Process description

River water is drawn from the Upukerora River and pumped to storage reservoirs before discharging to farm storage tanks. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the storage tanks.

(a) Abstraction

Water Permit 99017 granted to take 500 m^3/day from the Upukerora River at a maximum rate of 21 m^3/hr. Consent expired 3 May 2020 with a new one granted for a further 20 years.

(b) Intake headworks

Water is drawn from the east bank of the Upukerora River approximately 9 km upstream of State Highway 94. Water is drawn through a 900 mm slotted steel well approximately 5.9 m deep. At the intake there is a main pump station containing two surface mounted centrifugal pumps in parallel pumping to the main reservoir. Pressure surge equipment protects the pumps comprising of a manually drained pressure vessel.

Design: restricted supply to farm storage tanks.

Catchment: unconfined catchment.

Pump controls: pumps are controlled by solar powered ultrasonic level control (ultrasonic hawk unit) at the reservoirs and transmitted to the main pump station via UHF link (SALCOM). The main pump station is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water treatment

This is a non-potable untreated supply.

(d) Storage

The main reservoir has a capacity of 230 m^3, equivalent to approximately 18 hours at full demand.
The booster reservoir has a capacity of 23 m^3, equivalent to approximately 18 hours at full demand.

(e) Booster station

There are two pumps discharging to network reticulation:

Pump controls: pump control is by a pressure switch with a delay and transmitted to the intake via UHF link (SALCOM).

Standby power: no standby power supply is incorporated.

(f) Reticulation

The rising main is made of AC and gravity mains are made of polyethylene and PVC. The PVC and AC pipes are assumed to be rubber-ring jointed. Service connections are also believed to be PVC. No leak detection assessment has been carried out to date. A hydraulic model has been produced for this scheme.

(g) Water meters and hydrants

There are no zone or consumer water meters or hydrants on this scheme.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End of Life (IPS)
Intake	5.9 m Well	2	2	C	2031
	Transfer Pump 1	4	5	C	2023
	Transfer Pump 2	2	1	C	2023
	Pressure Surge eq.	4	5	C	unknown
	Switchboard	1	1	A	2047
	Telemetry	1	1	A	2025
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Booster Station	Booster Pump 1	5	3	C	2022
	Booster Pump 2	2	2	A	2030
	Switchboard	1	1	A	2047
	Telemetry	1	1	A	2025
Storage	Main Reservoir	4	3	C	2031
	Booster Reservoir	4	3	C	2031
	Telemetry	2	5	A	2025
Reticulation	Gravity mains	3	3	B	2031

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End of Life (IPS)
	Rising mains	4	4	B	2031
	Valves	3	3	B	2031
	Hydrants				
	Meters				

Appendix Table F: Kakapo RWS Condition and Performance

Operation and maintenance

No issues.

Critical assets

Critical assets identified are:

- the rising main from the intake to the main reservoir.
- the rising main from the main reservoir to the booster reservoir.
- the booster pump.

Key issues

- the condition of the rising main is unknown but likely to be in poor condition. Replacement has been programmed subject to a condition assessment.
- difficulty supplying consumers with allocated water due to illegal consumption - install water meters on repeat offenders. Consider installing branch meters to monitor flows.
- it is suspected that the water is being used as a source for domestic drinking water

Capital expenditure plan

The following renewal and LOS projects have been programmed:

Te Anau Rural Water Supply
Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation (Kakapo)	RW138	MS Project RW138 in 18/19	REN	18/19	20,000	Reserves
Replacement tanks (Kakapo)	RW139	Replacement of tanks in Kakapo scheme	REN	18/19	40,000	Loan
Plant and Equipment (Kakapo)	RW1605	Additional project in 18-28 LTP	REN	21/22	12,658	Reserves

Appendix G: Lumsden/Lumsden-Balfour Scheme

Description

The Lumsden-Balfour (restricted) Rural Water Supply has 193 connections to the scheme with a total of 766 units of water allocated (1 unit equals 2,000L/day).

The Lumsden township has 245 connections to the scheme and a total of 284 units of water allocated.

The scheme registered with the MOH and currently has a grading Aa (2010).

The scheme services the wider Lumsden area as far as Balfour to the east and Castlerock to the west. Although the population of the townships is projected to decrease over the planning period, the projected number of connections does not follow the same trend.
As farming practices change, the water usage is trending up.

History

The scheme was built with a large local input in the late 1970s by Lands and Survey as part of the government farming enterprise.

1980 - Scheme was commissioned feeding the farming areas surrounding Lumsden and Balfour.

1995 - Telemetry installed.

- Ultra sonic level control installed at the Balfour reservoir.

1996 - AMP produced.

- Water Permit granted to extract 2,480 m^3/day from groundwater under the Oreti catchment for 15 years.

1998 - First large volume dairy consumer joins the scheme.

2000 - Scheme is re-restricted to lower excessive pumping hours.

2003 - AMP revised.

- Scheme Headworks and Capacity Report undertaken.
- Hydraulic Model built by Roly Hayes, Water Engineer.

2004 - Unsuccessful test bore drilled to 61 m at Treatment Plant in search of deep water.

- Clayton Valve was purchased and is ready for installation.
- Longridge Booster Station re-located.

2005 - Solar panel capacity increased at Balfour reservoir.

- Pump control at Balfour reservoir upgraded to pressure transducer.
- AMP produced.

2006 - Switchboard condition assessment.

- Oreti River moved to the far side of its channel causing the well to go dry. Operator had to pump directly from the river into the well.

2007 - River moved again.

- Drilling carried out at three sites looking for deep water to remedy raw water supply issues.
- PHRMP approved by Drinking Water Assessor.
- Installation of break pressure tanks for Lumsden township.

2008 - Drilling continues to the south of Lumsden township.

- Turbidity meter installed at intake.

2009 - AMP reviewed.

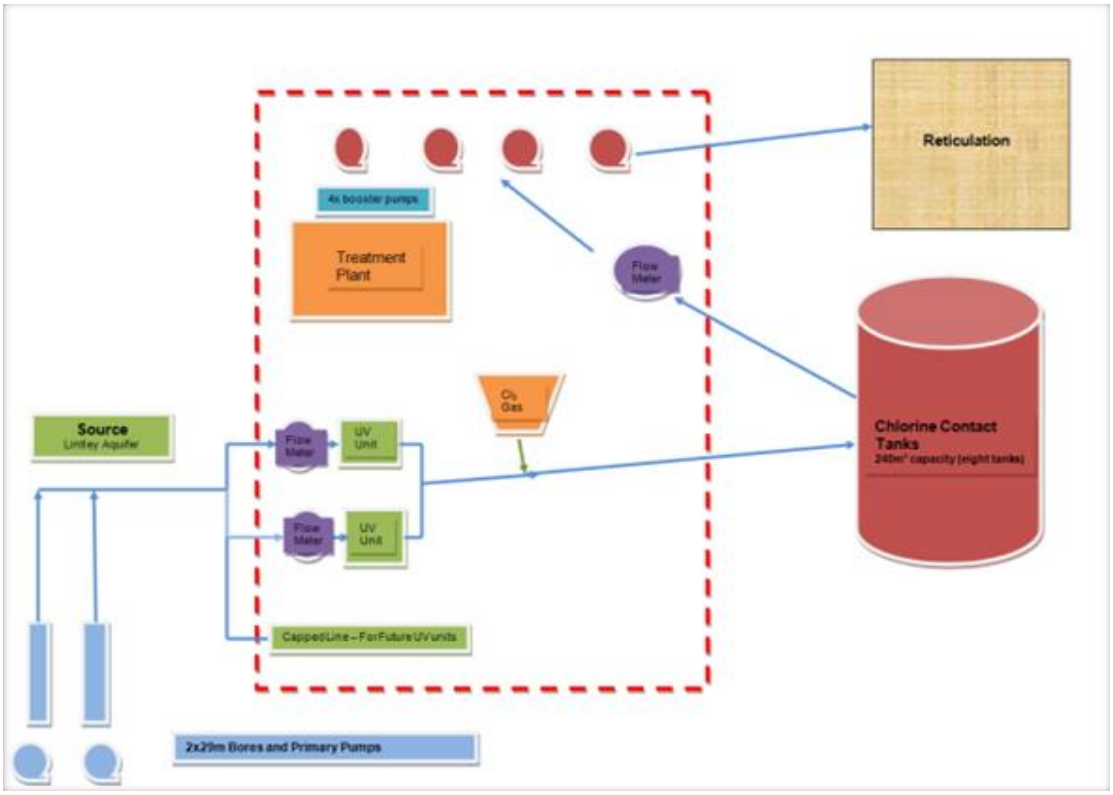
- Sub-mains pressure project carried out, including the installation of toby valves (at the boundary of each property) and service connections to each property.

2010 - New treatment plant built on Lintley Road consisting of two UV units (27L/s each), new chlorine equipment, one tonne chlorine tank, four secondary pumps with variable speed drives (7.5 kW), eight 30 cubic contact tanks, three flow meters, two new wells (Well west, Well east), well pumps currently set at 20L/s well pumps each on variable speed drives (maximum output 24L/s).

- Pressure reducing valve added on 63 mm pipeline at 96 Lintley Road.
- New reticulation 250 mm diameter uPVC main installed between the new treatment plant on Lintley Road and the end of the existing 200 mm diameter main at the 'Tee', 1.9 km west on Macale Road.
- Old falling main between break pressure tank on 888 Old Balfour Road and new valve has been retired.
- Old water treatment plant retired.
- Renewed Main Reservoir tank farm 20 tanks (450 m³).
- Renewed Balfour Reservoir tank farm 40 tanks (fifth tank on site is private).

2015 - Water main replaced over SH bridge

Process description



Groundwater is drawn from the gravels of the Oreti River catchment, passed through a treatment plant before being pumped through the scheme reticulation and main reservoir, the Lumsden township reservoir and the Balfour reservoir. Water is treated with UV, chlorine gas and sent to contact tanks before

being pumped into the reticulation. Treated water gravitates down to the Balfour Reservoir before discharging into farm storage tanks. A booster station at Longridge lifts water to the Longridge reservoir. The supply network consists of gravity mains, rising mains, and valves.

Council owns and maintains the service connections from the trunk main to the ballcock on the household storage tanks.

(a) Abstraction

Water Permit 205657 granted (25 February 2009) to take groundwater in the Oreti catchment at a maximum rate of 66l/s. Consent expires 25 February 2029.

PERIOD	MAXIMUM DAILY VOLUMES (M^3/DAY)	MAXIMUM ANNUAL RATE (M^3/DAY)
Commencement until 30 June 2019	4,200	1,050,000
1 July 2019 until 30 June 2028	5,350	1,337,000
1 July 2028 until expiry	5,760	1,435,000

(b) Intake headworks

Water is drawn from a confined aquifer of the Oreti River catchment through two borehead wells west of the main treatment plant on Lintley Road. Well depth is approximately 24 metres to the top of the well screen, with six metre long stainless steel wedge wire screens.

Design: treated rural water scheme. Restricted supply to farms and household storage tanks on the Lumsden-Balfour rural area, including Balfour township. Lumsden township is unrestricted but metered into the township.

Catchment: confined aquifer - may have a slight infiltration from upper unconfined aquifer.

(c) Water treatment

The treatment building is aligned in parallel on a duty/standby system. Suction and delivery pipework is 200 mm diameter stainless steel on the pumps.

There are two UV units (Wedeco spekton 150 reactors) and four (30 kw Lowara SV4607/2F300T) pumps.

Each pump is fitted with a Hydrovar variable frequency drive.

A surge relief valve is located on the delivery line which will operate in the event of a power failure.

Pump controls: pump control is by pressure in the rising main to the main reservoir. The pump station is monitored by Council's Kingfisher SCADA system.

Standby power: no standby power supply is incorporated.

(d) Storage

The Main Reservoir has a capacity of 450 m^3 equivalent to approximately seven hours at full demand. The tank farm consists of 20 concrete tanks.

The Balfour Reservoir is a 90 m^3 (four tanks) reservoir located on a rise on the Old Balfour Road, north-west of the town, feeds Balfour town and the rural supply network beyond Balfour. (Note - there is an extra tank at the reservoir site that is a consumer tank). The reservoir is gravity fed from the main reservoir and the secondary pumps at the WTP. An altitude valve at the Balfour reservoir controls the filling of the reservoir, a pressure transducer that transmits via UHF link radio to the Invercargill office.

The Longridge Reservoir is a 23 m^3 (one tank) reservoir located on Longridge Hill, feeds Longridge North and properties off Longridge Road.

Additional individual on-site storage of 48 hours is required off every connection.

(e) Booster station

The Longridge Booster Station contains two Grundfos CP3-100 pumps sending treated water to the Longridge Reservoir.

Pump controls: pump control is by a pressure switch and time delay. The pump station is monitored by Council's Kingfisher SCADA system.

Standby power: no standby power supply is incorporated.

(f) Reticulation

The rising mains are made of PVC. Gravity mains are made of polyethylene and PVC. No leak detection assessment has been carried out to date. A very basic hydraulic model has been produced for this scheme.

In Balfour, a 150 mm diameter uPVC main runs along Queen Street from the reservoir, and west along Kruger Street. The main reduces to 100 mm diameter uPVC south of the last fire hydrant in Queen Street, and also east along Kruger Street. Individual service connections are 20 mm HDPE. Testing results from hydrants in Balfour are sufficient to meet a W3 classification for Firefighting (7).

In the rural area, the majority of the reticulation mains linking reservoirs and in the top portion of branch lines are 200 mm and 150 mm diameter uPVC pipes. Extremities of branch lines are largely 100 mm diameter uPVC pipes, which reduce to 63 mm, 50 mm and 20 mm as the number of connections reduces. Individual service connections range in size from 15 mm to 25 mm diameter HDPE depending on the number of units being supplied and the available pressure (which depends on the location within the network).

Water meters

There are no zone or consumer water meters on this scheme but each consumer is restricted by the number of units they purchased.

Hydrants

There is one hydrant in the Balfour community but none in the outer rural network.

Asset condition and performance

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	30 m Well 1	1	1	A	2100
	30 m Well 2	1	1	A	2100
Treatment Plant	Transfer Pump 1	1	1	A	2039
	Transfer Pump 2	1	1	A	2039
	Transfer Pump 3	1	1	A	2039
	Transfer Pump 4	1	1	A	2039
	Chlorinator	1	1	A	2039
	UV unit controls	1	1	A	2029
	Surge Protection eq	1	1	A	2029
	Switchboard	1	1	A	2029
	Telemetry	1	1	A	2029
Storage	Main Reservoir	1	1	A	2038
	Balfour Reservoir	1	1	A	2038
	Longridge Res.	3	3	B	2038

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Booster Station (Longridge)	Booster Pump 1	2	2	C	2028
	Booster Pump 2	2	2	C	2020
	Pressure Surge eq	3	5	C	Unknown
	- Switchboard	3	2	C	2020
	- Telemetry	2	2	A	2027
Reticulation	Gravity mains	4	4	B	2058
	Rising mains	1	1	A	2058
	Valves	3	3	B	2038
	Hydrants	3	3	B	2069
	(Lumsden and Balfour Only)	3	3	B	2069
	Meters	3	3	B	2029

Appendix Table G: Lumsden/Lumsden-Balfour Condition and Performance

Note: The old Lumsden Water Treatment Plant has been abandoned, however in the case of a major event eg, earthquake, the plant could be re-activated.

Operation and maintenance

No issues.

Critical assets

Critical assets identified are:

- rising main from the treatment plant to the reservoirs/reticulation
- the chlorinator.
- the UV units
- the secondary pumps
- the well pumps and wells
- rising main to the Longridge reservoir
- falling main to the Lumsden township.

Key issues

There is currently a considerable amount of interest in extending the scheme to new users. It is therefore proposed to develop a short term and long term development strategy.
The short term strategy will focus on options available to allow a number of new farms to connect. The longer term option will also consider requirements to put Balfour township onto direct feed as well as potentially extending to Riversdale.

Capital expenditure plan - Lumsden

The issues discussed above have been addressed with the following projects:

Capital expenditure plan - Lumsden-Balfour (rural)

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Metering - District Metered Areas	WAT178	MS Project WAT178 in 17/18	LOS	19/20	83,025	District Funding
Consent Renewal Preparation	WAT177	MS Project 177 in 23/24	REN	23/24	22,540	District Funding
UV and Turbidity monitoring	WAT1683	Additional project in 18-28 LTP	REN	27/28	188,361	District Funding

Disposal plan

The old pump plant has been decommissioned, with electricity disconnected. The plant building and equipment are not insured. The asset is "maintained" for emergency situation only and is a short term solution at best.

Appendix H: Manapouri Water Supply

Description

The Manapouri community has an estimated 2013 usual resident population of 228 with a projected 2028 usual resident population of 354. The estimated peak population for Manapouri was 940 in 2006, projected to 332 in 2018. The scheme has 248 total equivalent connections.

History

The scheme was built in the 1969 by the New Zealand Electricity Department to service the workers village.

1975 - Water supply is chlorinated despite severe opposition from town residents.

1982 - SDC took over responsibility for the scheme.

1991 - Significant repairs are made to the rising main in the area of Frasers Beach.

1995 - Telemetry installed.

1999 - Montgomery Watson undertakes Hydraulic Analysis of reticulation.

2001 - Minor structural work and maintenance of the Water Tower is undertaken.

2002 - Depolox chlorine monitoring installed.

- Water Permit granted to extract 865 m^3/day from Lake Manapouri for 20 years.

2004 - S10K chlorine dosing installed.

2007 - New Secondary Pump 2 (Goulds GIS 80x65-160 5.5 kW).

2008 - Scheme extension along Hillside Rd, 50 mm line.

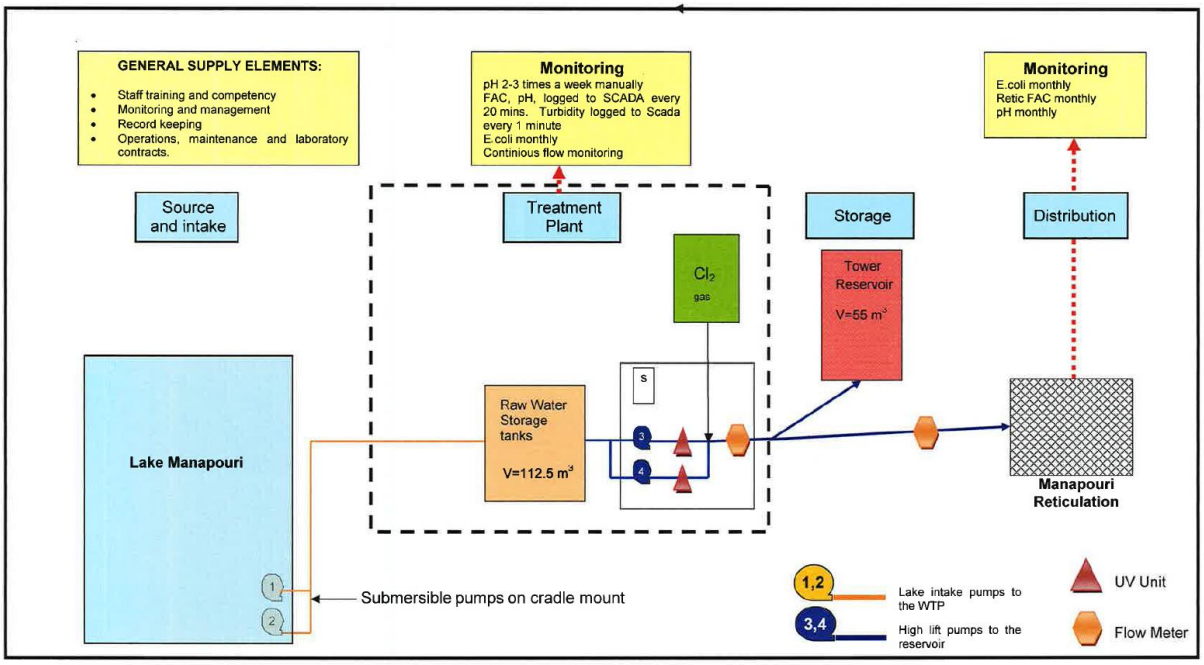
- Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

2012 - Treatment plant upgrade undertaken to meet Drinking-water Standard requirements. Installation of UV disinfection along with pump and pipework upgrades.

2017 - Options for improvements considered

2021 - Further treatment options being scoped

Process Description



Lake water pumped from Lake Manapouri to the treatment plant where water is treated with chlorine gas. Treated water is lifted to the Tower Reservoir before pressurising the reticulation. The supply network consists of gravity mains, rising mains, and valves.
Council owns and maintains the service connections from the trunk main to the toby at the boundary.

(a) Abstraction

Water Permit 201796 granted to take no more than 865 m^3/day from Lake Manapouri. Consent expires 4 August 2023.

(b) Intake headworks

Two pumps are fixed to a cradle on the bed of Lake Manapouri. At normal lake level they lie in approximately 6-7 m of water. A sealed electrical supply extends from the lakeside to the pumps. Low lake levels expose the electricity supply cables at the water edge. Separate 50 mm diameter polyethylene rising mains extend from each pump to the lake shore where they join into a single 100 mm diameter asbestos cement rising main which extends 44 m (vertical) to the treatment plant.
Flexible steel helicore pipe connections are fitted in-line near the pumps and near the shore connection into the 100 mm diameter rising main.

Duties are alternated and pumps are stopped and started automatically at pre-set contact tank water levels.

Design: treated urban supply on mains pressure.

Catchment: unconfined catchment.

Pump controls: controlled by a direct connection to level sensors in the contact tanks.

Standby power: no standby power supply is incorporated.

(c) Water Treatment

The treatment plant is located under the tower reservoir and consists of disinfection equipment and contact tanks. Chlorine gas is injected to disinfect the raw water prior to entering the contact tanks. Correct doses are consistently achieved by set point chlorination controlled by a Depolox-4 unit.
Two pumps: An original 5.5 kW Brown Brothers pump and the new Goulds pump lift treated water to the tower reservoir.

Pump controls: the pumps are controlled by an ultra sonic level controller in the tower reservoir with a direct connection to the switchboard. The treatment plant is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(d) Storage

Five concrete contact tanks provide 112.5 m^3 of contact storage. The tower reservoir has a capacity of 55 m^3. It is constructed of steel and elevated approximately 18 m above ground. For a current population of 306 usual residents at 250 L/p/day gives storage time of 17.2 hours, see comment below for fire storage.

(e) Reticulation

The rising main is made up of asbestos cement and polyethylene. Gravity mains are made up of PVC, polyethylene, and asbestos cement. The pipes should have been installed with rubber-ring joints. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme. Good pipe location and size information is available on Council's GIS. Some general observations from a review of this information are as follows:

Firefighting capacity is poor in Manapouri. Few of the hydrants in Manapouri satisfy the minimum flow requirements of 25 L/s. Those that do comply are located on Waiau Street near Pearl Harbour and at the intersection of View Street. Three quarters of the hydrants are capable of flows less than 80% of the required 25 L/s flow for Class E Firefighting Requirements.

The Tower Reservoir is capable of providing water for approximately 25 minutes of concurrent Class E and average daily flows (if starting at 80% full). The minimum requirement is one hour standby flow for Type E fire zones.

If the contact tanks are considered part of the available storage then approximately one hour and 25 minutes of concurrent Class E at average daily flows (if starting at 80% full) can be provided. To provide for continuity of electricity supply to the high-lift pumps, which supply water to the town from the contact tanks, a standby generator would be required.

(f) Water meters and hydrants

There are no zone or consumer water meters and 36 hydrants on this scheme.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Pump Cradle	3	3	B	2028
	Primary Pump 1	3	3	B	2026
	Primary Pump 2	3	3	B	2023
Treatment Plant	Chlorinator	1	1	C	2018
	Contact Tanks	5	5	C	2018
	Secondary Pump 1	1	1	C	2023
	Secondary Pump 2	1	1	A	2027
	Switchboard	2	2	C	2025
	Telemetry		1	A	2031
	UV Units	1	1	A	2037

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
	Flow Meter	1	1	A	2037
Storage	Tower Reservoir	2	2	C	2060
Reticulation	Gravity mains	3	3	B	2028
	Rising mains	4	4	B	2028
	Valves	3	3	B	2018
	Hydrants	3	3	B	2060
	Meters	3	3	B	2030

Appendix Table H: Manapouri Condition and Performance

Operation and maintenance

No known issues.

Critical assets

Critical assets identified are:

- rising main from the intake to the reservoir
- the chlorinator.

Key issues

- lack of firefighting capacity at a number of locations
- the reservoir will also require replacement within the planning period
- the ageing reticulation is coming to the end of design life in 2028
- raw water quality can vary with high turbidity events causing risk of non-compliance with Drinking Water Standards. It is proposed to investigate options for improvements in the upcoming LTP period.

Capital expenditure plan

The following renewal projects have been identified to address condition and performance issues:

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Extend Water Treatment Plant for pH correction system	WAT241	result of scheme tour 2014 MS Project WAT241	LOS	18/19	160,371	District Funding
Replace pipeline contact tanks to manifold and intake upgrade	WAT259	result fo scheme tour 2014	REN	19/20	138,375	District Funding
Metering - District Metered Areas	WAT262	MS Project WAT262	LOS	19/20	24,088	District Funding
Electrical mains replacement to intake in shielded cable	WAT1505	Additional project in 18-28 LTP	REN	19/20	117,875	District Funding
Lateral to Possum Lodge replace with 50mm to assist pressure	WAT1527	Additional project 18-28 LTP	REN	19/20	66,625	District Funding
WTP upgrade re turbidity	WAT1531	Additional project in 18-28 LTP	LOS	19/20	512,500	District Funding
Extend Water Treatment Plant for pH correction system	WAT241	result of scheme tour 2014 MS Project WAT241	LOS	20/21	157,286	District Funding
WTP upgrade re turbidity	WAT1531	Additional project in 18-28 LTP	LOS	20/21	524,288	District Funding
Consent Renewal Preparation	WAT261	MS Project - WAT261	REN	21/22	21,475	District Funding
Switchboards, pumps and monitoring	WAT1687	Additional project in 18-28 LTP	REN	24/25	182,793	District Funding

There is currently no disposal plan in place for assets.

Appendix I: Matuku Rural Water Supply

Description

The Matuku (restricted) Rural Water Supply has eight connections to the scheme with a total of 156 units of water allocated (1 unit equals 1,818L/day). There are also eight trough connections with a total of 161 units allocated. The scheme is not for potable use and therefore not currently registered with the MOH.

The scheme is governed by the Matuku Rural Water Supply Committee under the guidance of technical staff at the SDC.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise.

1982 - SDC took over responsibility for the scheme.

1998 - Water Permit granted to extract 219.6 m^3/day from the Aparima River for 20 years.

1998 - A new intake structure was constructed to replace the old well following ongoing poor yield issues.

2003 - Dewatering pump installed in an inclined pipe to better manage turbid water.

2007 - Radio replaced.

- Additional highlift pump installed (Lowara SV805 2.2 kW).

2008 - River pump replaced.

- Spare river pump purchased (Lowara 8GS07 0.75 kW).

2014 - Investigations into water loss undertaken.

2017 - Safety improvements at intake undertaken.

2017 - Application for re-consenting of intake prepared.

2018 – New consent granted

Process description

River water is drawn from the Aparima River and pumped to a storage reservoir and farm storage tanks. The supply network consists of gravity mains, rising mains, and valves.
Council owns and maintains the service connections from the trunk main to the ballcock on the farm storage tanks.

(a) Abstraction

Water Permit 97373 granted to take no more than 219.6 m^3/day from the Aparima River at a maximum rate of 9.15 m^3/hr. Consent expires 26 August 2018 with a new one granted for a further 20 years.

(b) Intake headworks

Water is drawn from the Aparima River by a dewatering pump located in an inclined PVC pipe. The pump is manually adjusted on a rope to ensure the inlet is under water. The intake is affected by river quality and quantity issues. The river pump discharges to a clearwater tank.

A Discharge Permit 97374 to release silt from the intake pipe and filter backwash on to land. Consent expires 26 August 2018.

Design: restricted supply to farm storage tanks.

Catchment: unconfined catchment.

Pump controls: the river pump is controlled by a direct link to float switches in the clear water tank.

Standby Power: no standby power supply is incorporated.

(c) Water treatment

This is a non-potable untreated supply.

(d) Pump stations

There are two booster pumps conveying water to the reservoir:

Pump controls: The booster pumps operate on a duty-standby arrangement. They are controlled by an ultrasonic level control (ultrasonic hawk unit) powered by a direct cable link. The pump station is monitored by Council's Datran SCADA system via VHF radio.

Standby power: No standby power supply is incorporated.

(e) Storage

The main reservoir has a capacity of 45 m^3. It is 3.8 hours storage at current demand (156 units).

(f) Reticulation

The rising main is PVC. The gravity mains are polyethylene and PVC. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(g) Water meters and hydrants

There are no zone or consumer water meters and 1 hydrant on this scheme.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Inclined pipe	2	2	C	2031
	River pump	3	3	B	2020
	River Pump (spare)	3	3	B	N/A
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Pump stations	Clear water tank	1	1	C	Unknown
	Pump 1	2	2	C	Unknown
	Pump 2	2	2	A	2032
	Switchboard	4	3	C	2025
	Telemetry	2	2	A	2025
Storage	Main Reservoir	4	3	D	2031
Reticulation	Gravity mains	3	3	B	2051
	Rising mains	3	3	B	2051
	Valves	3	3	B	2031
	Hydrants	N/A	3	B	2051

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
	Meters	3	3	B	2025

Appendix Table I: Matuku Rural Water Supply Condition and Performance

Operation and maintenance

No known issues.

Critical assets

Critical assets identified are the rising main from the intake to the reservoir and the river pump.

Key issues

- poor performance of the river pump.
- the telemetry unit (RTU) requires upgrading to Kingfisher/Citect, the SCADA system.
- the scheme may be required to meet the DWS including the development of a PHRMP and associated infrastructure upgrades. For planning purposes it has been assumed that this scheme would be categorised as Rural Agricultural. To date there is no confirmation around required timescales, however this date had been extended beyond.
- renewal of water permit in 2018.

Capital expenditure plan

The following LOS and Renewal projects have been programmed to address the above issues:

Options for point of entry treatment to dwellings on the scheme will be considered.

Matuku

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Install flowmeter and new intake pump	RW272	MS Project RW272 in 17/18	REN	18/19	20,000	Loan & Reserves

Appendix J: Mossburn Water Supply

Description

The Mossburn community has an estimated 2013 usual resident population of 201 with a projected 2018 usual resident population of 222. The scheme has 120 connections.

The scheme registered with the MOH but is currently upgraded.

History

The township water supply was established in 1964 with a supply bore at the north end of Cumberland Street and a small diameter pipework system. Labour for scheme construction was provided by the residents of Mossburn as a cost saving measure. The original bore is now partially collapsed.

1982 - SDC took over responsibility for the scheme.

1986 - Water supply upgrade which include large diameter main with firefighting capacity, new well in Cumberland Street and additional reservoir storage.

1991 - Water Permit granted to extract 440 m^3/day from groundwater in the Oreti catchment for 10 years.

1995 - Telemetry installed.

1997 - Local well re-developed.

2001 - New well constructed and pump (Grundfos SP25-7 5.5 kW) installed to accommodate for the expansion of Silver Fern Farms Limited (formerly PPCS).

2005 - New switchboard installed at intake.

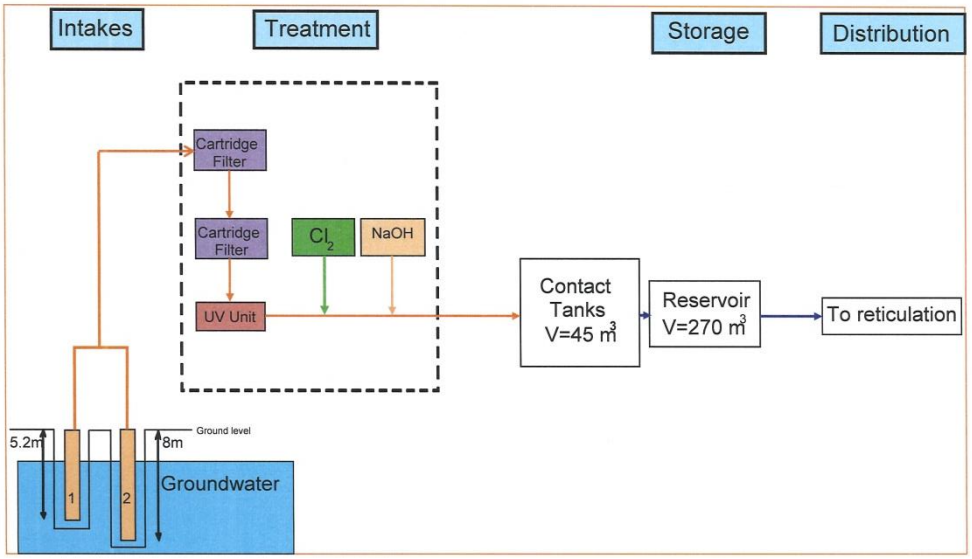
2006 - Water meter installed at intake.

- Water Permit 200181 granted.
- Cornwell Street main renewed due to poor condition.

2014 - New treatment plant installed in 2014.

2016 - Silver Fern Farms works closes down.

Process description



Groundwater is drawn from the gravels of the Oreti River catchment by two wells. Water is aerated and treated with chlorine gas before being pumped to the main reservoir. Treated water gravitates to network reticulation. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the toby at the boundary.

(a) Abstraction

Water Permit 200181 granted to take a total of 600 m^3/day from groundwater in the Oreti catchment. Consent expires 3 November 2026.

(b) Intake headworks

Raw water is sourced from two wells near the golf course. The "local" well was constructed in 1986 approximately 300 m from the true right bank of the Oreti River and 5.2 m deep.

An 8 m deep well was installed October 2001 to supplement the supply and is located 100 m north of the "local" well. Over the past few years there have been numerous low well events.

Primary P1 is located in the remote well and is of slightly less capacity than the Primary P2. The pump is a multi-stage submersible pump in good condition, however, this pump is approximately 15 years old and due for replacement in 2005.

Primary P2 is located in the local well and is of slightly greater capacity than the Primary P1. The pump is a multi-stage submersible pump in good condition.

Design: treated urban supply on mains pressure.

Catchment: unconfined catchment.

Pump controls: The primary pumps are controlled by an ultrasonic level control (ultrasonic hawk unit) at the reservoir by a direct cable link. The pump station is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water treatment

In 2014 a new treatment plant was constructed to meet requirements of the Drinking Water Standards. This is now a multi stage plant incorporating filtration pH correction with caustic soda, chlorination and UV disinfection before water is pumped up to the existing contact tanks from where water is supplied to the reticulation network by gravity.

(d) Storage

Total storage of 308 m^3 is available comprising of contact tank 44 m^3 (2 x 5,000 gallon) and main reservoir storage at 264 m^3 (12 x 5,000 gallon). The main reservoir has approximately 12 hours at full demand.

(e) Reticulation

The rising main is PVC. Gravity mains are polyethylene and PVC. The majority of the reticulation network was installed in the early 1960s. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme. Hydrants tested by the New Zealand Fire Service comply with the "New Zealand Fire Service Code of Practice for Firefighting Water Supplies" requirement.

(f) Water Meters and Hydrants

There is a zone meter on the rising main from the intake as well as 14 consumer water meters.

There are 26 hydrants on this scheme.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	3.3 m Well (old)	5	5	A	Out of Service
	5.2 m Well (Local)	2	4	B	2040
	8 m Well (Remote)	2	4	B	2061
	Primary P1 (Remote)	3	3	B	2025
	Primary P2 (Local)	3	3	B	2025
	Switchboard	1	1	A	2030
	Telemetry	1	1	A	2025
Treatment Plant	Filtration	1	1	A	2025
	pH Correction	1	1	A	Unknown
	Chlorination	1	1	A	Unknown
	UV Disinfection	1	1	A	2021
Storage	Main Reservoir	3	3	B	2021
	Flow Meter	1	1	A	2037
Reticulation	Gravity mains	3	3	B	2084
	Rising mains	3	3	B	2084
	Valves	3	3	B	2044
	Hydrants	3	3	B	2084
	Meters	1	1	B	2084

Appendix Table J: Mossburn Condition and Performance

Operation and maintenance

There are issues with the telecom communication line occasionally failing between the intake and the reservoir - this can cause the pumps to fail to start when the reservoir calls for water.

There are occasional periods of low water levels in the wells but it is unclear whether this is a groundwater issue or a well issue.

There have been issues in the past with the capacity of the well and the inability to keep up with demand in summer. It is thought that this is due to groundwater levels but flow paths are uncertain. The wells are thought to have slotted (steel) casing screens which may be corroding and restricting entry of water to the wells.

Critical assets

Critical assets identified are:

- rising main from the intake to the treatment plant.
- the chlorinator.
- UV Disinfection
- rising main to contact tanks.

Key issues

- both wells are not performing during dry summers and are due for redevelopment.
- the reservoir and contact tanks meet the end of their design life in 2021.
- Bedford Road continues to present problems for properties connected to the 25 mm rider main. It is proposed to extend the existing eight service connections to the 100 mm main and decommission the rider main.

Capital expenditure plan

The following projects have been programmed to address the above issues.

Acquisition - demand

There are no projects programmed to meet increasing demand in this 10 year period.

Monowai Sewerage Scheme

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Contact tanks and clorine monitoring	WAT1691	Additional project 18-28 LTP	REN	23/24	184,310	District Funding
Consent Renewal Preparation	WAT288	MS Project - WAT288	REN	23/24	22,540	District Funding

Appendix K: Mount York Rural Water Supply

Description

The Mount York (restricted) Rural Water Supply has 15 connections to the scheme with a total of 175.5 units of water allocated (1 unit equals 1,818L/day).

The scheme is not for potable use and therefore not currently registered with the MOH.

The scheme is governed by the Te Anau Rural Water Supply Committee under the guidance of technical staff at the SDC.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise.

1982 - SDC took over responsibility for the scheme.

1989 - Water Permit granted to extract 1056 m^3/day from the Mararoa River for 10 years (combined consent for Mt York and Takitimu).

1995 - Telemetry installed.

1999 - Takitimu scheme removed from combined intake.

2002 - New Booster Station constructed to service the Freestone Hill area.

2006 - Water Permit 99164 granted.

2008 - New vertical multistage pump (Pump 1) installed at intake (Lowara SV33-07 15 kW).

- Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).
- New vertical multistage pump (Pump 2) installed at intake (Lowara SV33-07 15 kW).

Process description

River water is drawn from the Mararoa River and pumped to storage reservoirs and farm storage tanks. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the farm storage tanks.

(a) Abstraction

Water Permit 99164 granted to take 1,056 m^3/day (in association with Takitimu RWS) from groundwater in the Waiau catchment. Consent expires 7 November 2026.

(b) Intake headworks

Water is drawn from the Mararoa River approximately 3,000 m downstream of Hillside-Manapouri Road. Water is pumped by centrifugal pumps to a 182 m^3 reservoir. Pressure surge equipment protects the pumps comprising of a manually drained pressure vessel.

Design: untreated rural water scheme. Restricted supply to farm storage tanks.

Catchment: unconfined catchment.

Pump controls: pump control is by a multi-level controller (float-less switch) at the reservoir and transmitted to the intake via UHF link (SALCOM).

The intake is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water Treatment

This is a non-potable untreated supply.

(d) Storage

The main reservoir has a capacity of 182 m^3. The time equivalent at full demand is 13.6 hrs at current demand (175.5 units).

The Mt York reservoir has a capacity of 22 m^3. The time equivalent at full demand is unknown.

The Freestone reservoir has a capacity of 91 m^3. The time equivalent at full demand is unknown.

(e) Booster stations

1. (Mt York/Lester Stephens)

There is one pump discharging to the network.

Pump controls: pump control is by a multi-level controller (float-less switch) at the reservoir and transmitted to the intake via UHF link (SALCOM). Mr Stephens runs the pump manually when required. Very low use site.

Standby power: no standby power supply is incorporated.

2. (Freestone)

There is one pump discharging to the network. There was an agreement in place to provide electricity to the Freestone farm for an electric fence as part of the agreement to locate the station on the farm. In recent years the farm also takes power for a new woolshed. This is causing an increased burden on the supply.

Pump controls: pump control is by a pressure switch with a delay. The pump station is not monitored by Council's SCADA system.

Standby power: no standby power supply is incorporated.

(f) Reticulation

The rising main is PVC. Gravity mains are PVC and polyethylene. The pipes should have been installed with rubber-ring joints. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(g) Water meters and hydrants

There are no zone or consumer water meters or hydrants on this scheme.

Asset condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	3.5 m Well	3	2	C	2031
	Transfer Pump 1	1	1	A	2033
	Transfer Pump 2	1	1	A	2033
	Surge Protection	4	5	C	2005
	Switchboard	1	1	C	2020
	Telemetry	1	3	A	2018

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Storage	Main Reservoir	5	2	C	2008
Booster Station 1	Booster Pump 1	4	3	C	2010(**)
	Switchboard	5	4	C	2028
Booster Storage 1	Mt York reservoir	3	2	C	2018
Booster Station 2	Booster Pump 2	1	1	B	2027
	Switchboard	2	2	C	2027
Booster Storage 2	Freestone reservoir	3	2	C	2018
Reticulation	Gravity mains	3	3	B	2051
	Rising mains	3	3	B	2051
	Valves	3	3	B	2021
	Hydrants	N/A	N/A	N/A	N/A
	Meters	3	3	B	2051

Appendix Table K: Mount York RWS Condition and Performance

Operation and maintenance

No issues.

Critical assets

Critical assets identified are:

- rising main from the intake to the main reservoir.
- rising main from the intake to the Mt York reservoir.
- rising main from the intake to the Freestone reservoir.
- Freestone booster pump.

Key issues

It is suspected that the supply is being used as a source of drinking water.

Capital expenditure plan

The following projects have been programmed to address the above issues:

Te Anau Rural Water Supply
Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Plant and Equipment (Mt York)	RW1609	Additional project in 18-28 LTP	REN	20/21	19,036	Reserves
Consent Renewal Preparation (Mt York)	RW316	MS project RW316	REN	23/24	22,540	Reserves

Appendix L: Ohai-Nightcaps-Wairio Water Supply

Description

The Ohai-Nightcaps community has an estimated 2013 usual resident population of 609 with a projected 2018 usual resident population of 606. The scheme has 374 connections.

History

The scheme was built in 1952 for the Ohai community. Originally an untreated scheme the water was pumped from the Morley Stream in the north-east of Ohai to header tanks on the hill to the south.

1972 - Full treatment plant constructed after high risk of contamination identified (the water fermented). Treatment facility included coagulation, clarification, pH correction, followed by filtration and chlorination.

1972 - Supply extended to Nightcaps.

1982 - SDC took over responsibility for the scheme.

1987 - Supply extended to Wairio and the former Wairio School (now Te Kohanga Reo O Ohai) beyond.

2000 - Mount Linton Station joins scheme as a large consumer.

2001 - Ageing dosing pumps are replaced.

- Primary Pump 2 (1963) replaced (Southern Cross 80x50-315) and intake modified to the original dry well to setting/suction tank arrangement. Primary Pump 3 removed from service.

2002 - Water Permit granted to extract 800 m^3/day from the Morley Stream for 20 years.

2003 - Discharge Permit granted to discharge 2,000 m^3/year of backwash water from the sand filters at the treatment plant for 20 years.

2006 - Mixing tower overhauled.

2007 - Primary Pump 1 replaced (Goulds GIS 80x50-315 45 kW).

2008 - Leak detection work carried out due to severe water shortages especially in the Sinclair Avenue area.

- PHRMP approved by Drinking Water Assessor.

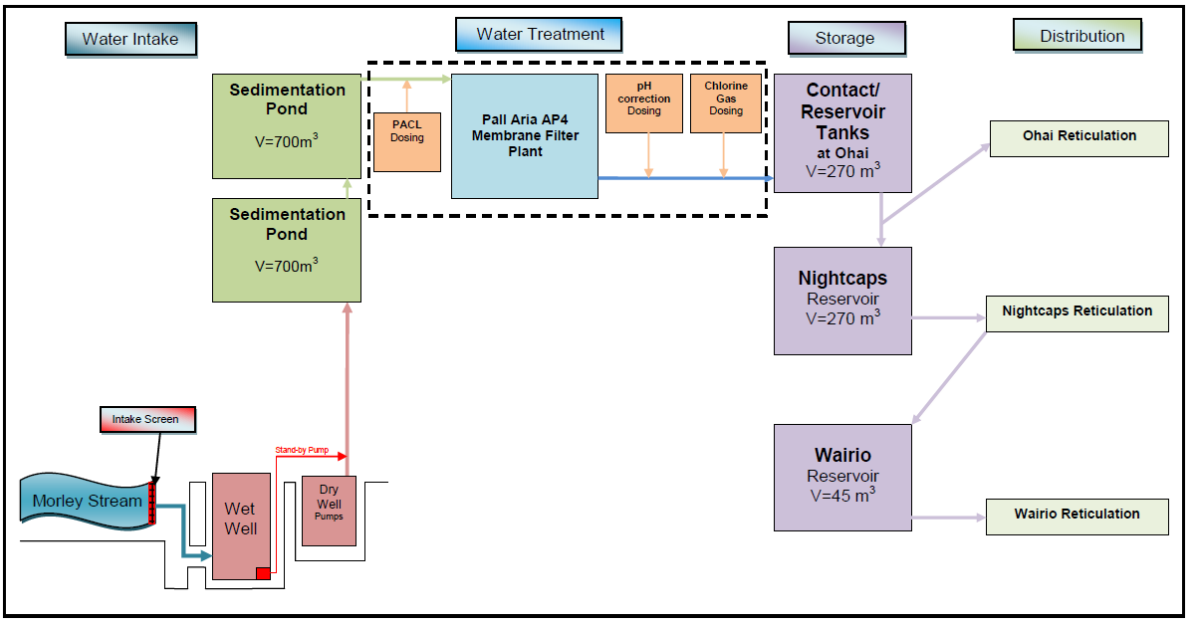
2009 - MOH Subsidy funding for the following work carried out between 2009 and 2011.

- Replacement falling main to Nightcaps.
- Upgrade of Nightcaps storage tanks from 272 m^3 to 407 m^3.
- New treatment plant capable of treating up to 1,200 m^3/day.

2012 - In-take upgrade completed.

2017 - Consent for increased water take granted.

Process description



River water is drawn from the Morley Stream and pumped to the treatment plant and the reservoir. Treated water gravitates to the reticulation network. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the toby tap at the boundary.

(a) Abstraction

Water Permit 20474 granted to take no more than 800 m^3/day from the Morley Stream. Consent expires 28 November 2022.

(b) Intake headworks

Water is pumped from the intake to the treatment facilities, on the hill to the south, through a 650 m long, 150 mm diameter concrete lined steel rising main. The intake is affected by river quality and quantity issues. At times extra pumping equipment is required to pump river water into the wet well. The intake was upgraded in 2012.

(c) Water treatment

The treatment facilities are located on designated, elevated land to the south of the water intake. The rising main from the intake discharges into a mixing tower where alum and polyelectrolyte are mixed into the water. Water then cascades into the lower reservoir for coagulation and finishing settlement of floc. The alum dosed water is subsequently treated via a micro-filtration plant which was commissioned in late 2012. Consent expires 28 November 2022.

(d) Storage

The main reservoir has a capacity of 227 m^3. The time equivalent at full demand is unknown.
The Nightcaps reservoir has a capacity of 407 m^3. The time equivalent at full demand is unknown. The Wairio reservoir has a capacity of 45 m^3. The time equivalent at full demand is unknown. There are two fire storage (22.5 m^3 each) reservoir tanks in Wairio (one at each end of the town) which are fed off the third Wairio reservoir.

(e) Reticulation

From the intake to treatment plant the rising main is made of concrete lined steel. The Nightcaps booster rising main is made of PVC. Gravity mains are made up of asbestos cement, PVC, polyethylene, copper, and steel. No hydraulic model has been produced for this scheme.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Inlet structure	3	5	C	2040
	Primary Pump 1	1	1	A	2032
	Primary Pump 2	1	2	C	2026
	Switchboard	1	1	A	2030
	Telemetry	1	1	A	2025
Treatment Plant	Microfiltration Plant	1	1	A	2022
	*Chem. mixing tower	1	1	A	2025
	*Clarifier	4	4	C	2029
	*Alum dosing pumps	1	1	A	2026
	Telemetry	1	1	A	2026
Storage 1	Main Reservoir	4	4	C	2011
Booster station	Booster Pump	N/A	N/A	N/A	-
	Switchboard	1	1	C	2023
Storage 2	Nightcaps Reservoir	3	2	C	2031
Storage 3	Wairio Reservoir	4	3	C	2046
Storage 4	Wairio firefighting	5	4	C	2046
Reticulation	Gravity mains	4	4	B	2018
	Rising mains	4	4	B	2018
	Valves	4	4	B	2018
	Hydrants	4	4	B	2046
	Meters	4	4	B	2023

Appendix Table L: Ohai-Nightcaps-Wairio Condition and Performance

Operation and maintenance

Site security has been an increasing issue for the Ohai Treatment Plant with increasing costs for repairs caused by vandalism.

There is an emerging trend for higher maintenance costs associated with valves and hydrants.

Critical assets

Critical assets identified are:

- rising main from the intake to the treatment plant.
- falling mains from treatment plant to Ohai and Nightcaps.
- new membrane treatment plant.
- chlorinator.
- Nightcaps booster pump.

Key issues

- the reticulation begins to meet the end of the design life in 2022. Strategically it has been agreed to rely on an increase of planne /unplanned maintenance rather than undertake a significant renewals programme.
- the Wairio fire tanks are in poor condition and need replaced (the WSC has requested that prior to the Wairio tanks being replaced the condition be reviewed and the results discussed with the Committee).

Capital expenditure plan

The following projects have been programmed to address the above issues:

Ohai/Nightcaps/Wairio Water

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Tank replacement	WAT696	replacement of tanks at Ohai for safety purposes	REN	18/19	90,000	District Funding
Ohai - Consent Renewal Preparation	WAT342	MS Project - WAT342 (LOS Statutory)	REN	20/21	20,972	District Funding
Nightcaps - Water main renewal Sinclair Ave	WAT1504	Additional project in 18 - 28 LTP	REN	22/23	109,951	District Funding
Ohai - Switchboard and monitoring	WAT1694	Additional porect 18-28 LTP	REN	26/27	191,055	District Funding

Appendix M: Orawia Water Supply

Description

The scheme has eight connections to the scheme with a total of 24 units of water allocated (1 unit equals 1,818L/day).

The scheme is registered with the MOH but is currently ungraded.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise.

1982 - SDC took over responsibility for the scheme.

1998 - Water Permit granted to extract 45.5 m^3/day from the Waiau catchment for 20 years.

2014 - New package water treatment plant installed.

2015 - Intake upgrades completed

2017 - New water take consent prepared.

Process description

Spring water is collected and gravitates to a treatment plant before discharging into household storage tanks. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the storage tanks.

(a) Abstraction

Water Permit 97372 granted to take at a maximum rate of 45.5 m^3/hr.

Consent expired 30 October 2018 with a new consent issued expiring in 2029.

(b) Intake Headworks

Water is collected from the Orawia Spring approximately 2,000 m north-west of the Orawia township. The intake is affected by surface water quality and quantity issues. An improvement was undertaken for the 2015 year.

Design: treated urban supply. Restricted supply to household storage tanks.

Catchment: Unconfined catchment.

Pump controls: there are no pumps and no SCADA.

Standby power: no standby power supply is required.

(c) Water treatment

Package water treatment plant based around filtration and disinfection was installed in 2014

(d) Storage

The main reservoir has a capacity of 46 m^3. The time equivalent at full demand is approximately one day at the current demand (24 units).

(e) Reticulation

The gravity mains are made up of polyethylene and PVC. The pipes should have been installed with rubber-ring joints. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(f) Water meters

There are no zone or consumer water meters and three hydrants on this scheme.

Asset condition and performance

The current condition and performance grading of the water supply system is shown in the table below.

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Inlet structure	2	2	A	2036
Treatment Plant	Package Plant	1	1	A	2025
Storage	Main Reservoir	1	1	A	2046
Reticulation	Gravity mains	3	3	B	Unknown
	Rising mains	3	3	B	Unknown
	Valves	3	3	B	Unknown
	Hydrants*	-	-	-	N/A
	Meters	1	1	A	2036

Appendix Table M: Orawia Condition and Performance

* Hydrant requirements for this scheme are no longer required.

* Filtration and chlorination and UV is combined at "package plant".

Operation and maintenance

New treatment plant operating well.

Critical assets

Critical assets identified are:

- filters
- chlorination.

Key issues

Intake was upgraded in 2015.

Capital expenditure plan

No projects are planned.

Appendix N: Otautau Water Supply

Description

The Otautau community has an estimated 2013 usual resident population of 798 with a projected 2018 usual resident population of 892. The scheme has 420 connections.

History

The Otautau water supply was established in 1963/1964.

1975 - New well constructed to reduce risk of upstream contamination (low groundwater levels and suspected contamination from farm effluent - no longer in operation).

1982 - SDC took over responsibility for the scheme.

1995 - Telemetry installed.

1997 - Secondary pumps renewed.

1997 - Treatment plant switchboard replaced and upgraded to include soft start to secondary pumps.

2001 - Chlorination installed.

2004 - Water Permit granted to extract 1,056 m^3/day from groundwater in the Aparima catchment for 20 years.

2005 - Pipe samples tested by Opus (Elton Street).

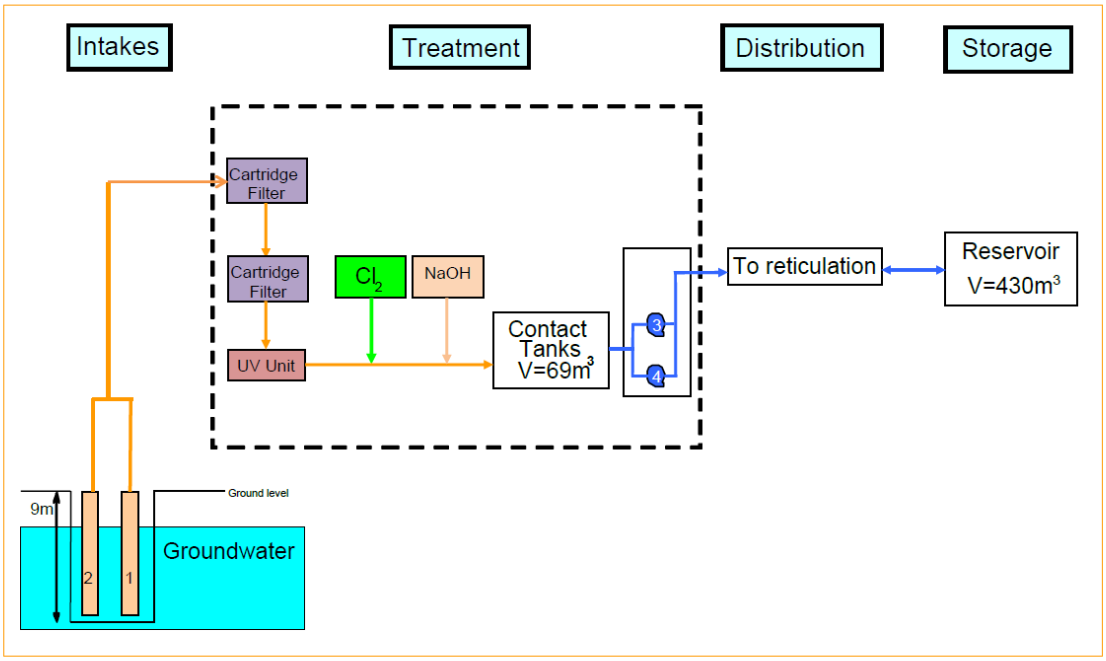
2009 - Slaughterhouse road main replacement.

2011 - Replacement of 150 mm AC pipe on Main Street.

2014 - Treatment plant upgraded with filtration pH correction and UV disinfection equipment installed.

2019 – New bores constructed

Process description



Groundwater is drawn from the gravels of the Aparima River catchment and passes through a treatment

plant before being pumped to the main reservoir. Treated water gravitates to the reticulation network. The supply network consists of gravity mains, rising mains, fire hydrants and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the storage tanks.

(a) Abstraction

Water Permit 99185 granted to take 1,056 m^3/day from groundwater in the Aparima catchment. Consent expires 19 July 2024.

(b) Intake headworks

The intake and treatment plant are located on Liemen Street approximately 150 m from the true right bank of the Aparima River. The well is constructed of 760 mm slotted steel to a depth of nine metres and contains two submersible pumps (duty/standby) who deliver raw water to the contact tanks at the treatment plant.

Design: treated urban supply on mains pressure.

Catchment: unconfined catchment.

Pump controls: primary pumps are controlled by probes in the contact tanks by a direct cable link.

Standby power: no standby power supply is incorporated.

(c) Water Treatment

The water is chlorinated as it enters the contact tanks following a simple aeration device. The aeration treatment serves to increase the pH of the raw water typically from 6.1 up to 7.0 before entering the reticulation system. The purpose of the pH correction is to decrease the slightly corrosive effect of the water on metal and cement pipework and fittings. Water from the contact tanks is supplied through the reticulation network to the reservoir by two secondary pumps (duty/standby).

Pump controls: the secondary pumps are controlled by an ultrasonic level control (ultrasonic hawk unit) at the reservoir and transmitted to the treatment plant via UHF link (SALCOM). The treatment plant is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(d) Storage

The main reservoir has a capacity of 360 m^3 equivalent to approximately 16 hours at full demand. The precast concrete reservoir is located 1.7 km south-west of the centre of Otautau on Knutsford Road.

(e) Reticulation

The rising main and gravity mains are asbestos cement and polyethylene. The majority of the reticulation network was installed in 1963/64. The gravity mains are primarily 150 mm diameter asbestos cement trunk mains and 100 mm diameter sub-mains. Minor, smaller diameter, laterals extend from the 100 mm diameter laterals in Kendal Street to the west up Slaughterhouse Road and to some other peripheral properties along the western boundary of the urban area.

(f) Water meters

There is a meter on the rising main leaving the plant and 25 consumer water meters. There are 96 hydrants on this scheme.

Condition and performance

The pipe sample tested by Opus in 2005 was in very poor condition. The operator also reports lines in Slaughterhouse Road, Gray Street, Lieman Street and George Street as being in poor condition.

Some cracks were recently identified in the front wall of the reservoir.

The current condition and performance grading of the water supply system is shown in the table below.

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Old Well	2	2	A	Unknown
	9 m Well	3	4	C	2034
	Primary Pump 1	1	2	A	2020
	Primary Pump 2	1	2	A	2022
	New Primary pump	1	1	C	2028
Treatment Plant	Aerator REMOVED 2015	2	2	C	2026
	Chlorinator	3	3	C	2018
	Contact tanks	2	2	C	2023
	Secondary Pump 1	2	2	C	2023
	Secondary Pump 2	2	2	C	2023
	Switchboard	1	1	A	2025
	Telemetry	1	5		
Storage	Main Reservoir	2	4	C	Unknown
Reticulation	Gravity mains	4	3	B	2022
	Rising mains	5	3	B	2022
	Valves	3	3	B	2018
	Hydrants	3	3	C	2022
	Meters	3	3	C	2022

Appendix Table N: Otautau Condition and Performance

Note: There is now UV and filtration and PH correction at treatment plant.

Operation and maintenance

Increasing amount being spent maintaining Talbot valves suggesting these are at the end of their life. Renewal strategy required. Raw water quality is degrading over time, consider programming raw water monitoring.

Critical assets

Critical assets identified are:

- rising main from the intake to the reservoir.
- the aerator.
- the chlorinator.

Key issues

- although both primary pumps have met the ends of their design lives the decision has been made in conjunction with the Community Board to keep the pumps in service until they fail. This is on the basis that there are two operating pumps with a spare pump ready to install.
- the issue for Otautau is the aerator is at the end of the design life and needs replaced.

- confirm condition of reservoir.
- reticulation renewals will be required pending likely condition assessment work. Allow for lateral/valve replacements.
- the contact tanks meet the end of the design life in 2012.
- the telemetry unit (RTU) requires upgrading to Kingfisher/Citect, the SCADA system.
- the scheme is required to meet the DWS including the development of a PHRMP and associated infrastructure upgrades. For planning purposes it has been assumed that this scheme would be categorised as minor with compliance due by 1 July 2014.
- the renewal of the water permit is due in 2024.

Capital expenditure plan

The following projects have been programmed to address the above issues:

Otautau

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation	WAT435	MS Project WAT435	REN	22/23	21,990	District Funding

Appendix O: Princhester Rural Water Supply

Description

The Princhester (restricted) Rural Water Supply has three connections to the scheme with a total of 19.9 units of water allocated (1 unit equals 1,818L/day).

The scheme is not for potable use and therefore not currently registered with the MOH.

The scheme is governed by the Te Anau Rural Water Supply Committee under the guidance of technical staff at the SDC.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise. There have been difficulties in the past with probes due to the low conductivity of the water.

1982 - SDC took over responsibility for the scheme.

1995 - Telemetry installed.

1998 - Water Permit granted to extract 50 m^3/day from the Lagoon Creek for 20 years.

2002 - New well installed to overcome water quality issues.

2006 - New intake pump (Lowara 6G S30 3 kW).

2008 - Section of rising main from booster replaced (approximately 1.3 km).

- Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

2018 – Consent granted for 25 year period

Process description

River water is drawn from Lagoon Creek and pumped to storage reservoirs and farm storage tanks. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the farm storage tanks.

(a) Abstraction

Water Permit 98094 granted to take 50 m^3/day from Lagoon Creek at a maximum rate of 0.002 m^3/s. Consent expired 22 January 2019 with a new consent granted for a further 25 year period expiting September 2043.

(b) Intake headworks

Water is drawn from an intake well situated on the east bank of Lagoon Creek approximately 3,500 m upstream of State Highway 94. Water is pumped by a centrifugal pump to the main reservoir. Pressure surge equipment protects the pumps comprising of a manually drained pressure vessel. Well levels have not changed since the well was installed. There is a secondary intake from a spring that can feed directly into the booster reservoir during some months of the year.

Design: untreated rural water scheme. Restricted supply to farm storage tanks.

Catchment: unconfined catchment.

Pump controls: pump control is by solar powered ultrasonic level controller (ultrasonic hawk unit) at the main reservoir and transmitted to the intake via UHF link (SALCOM). The intake is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water Treatment

This is a non-potable untreated supply.

(d) Storage

The main reservoir has a capacity of 68 m^3 equivalent to approximately 13 hours at full demand. The Booster reservoir has a capacity of 46 m^3 equivalent to approximately 9.5 hours at full demand.

(e) Booster stations

There is one pump in discharging to the network.

Pump controls: pump control is by a pressure switch with a delay. The pump station is not monitored by Council's SCADA system.

Standby power: no standby power supply is incorporated.

(f) Reticulation

The rising main and gravity main is made up of PVC. The pipes should have been installed with rubber-ring joints. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(g) Water meters, hydrants and valves

There are no zone or consumer water meters or hydrants on this scheme. There are an unknown number of valves.

Asset condition and performance

The current condition and performance grading of the water supply system is shown in the table below.

Asset Type	Asset Component	Condition	Performance	Confidence	Predicted End of Life (IPS)
Intake	5 m Well	4	2	C	2040
	Primary Pump 1	1	1	A	2032
	Switchboard	2	2	C	2018
	Telemetry	2	5	A	2018
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Storage 1	Main Reservoir	2	2	C	2040
Booster station	Booster Pump 1	3	3	C	2018
	Switchboard	4	4	C	2018
Storage 2	Booster Reservoir	2	4	C	2040
Reticulation	Gravity mains	4	3	B	2020
	Rising mains	4	3	B	2020
	Valves	3	3	B	2040
	Hydrants	N/A	N/A	N/A	-
	Meters	3	3	C	2040

Operation and maintenance

There are increasing issues relating to private property leaks. Scheme sometimes suffers from a lack of supply during the winter months.

Critical assets

Critical assets identified are:

- the well pump.
- the rising main from the intake to the main reservoir.
- the rising main from the main reservoir to the booster reservoir.

Key issues

- electrical equipment at the intake and the booster are at the end of their design lives.
- resource consent renewal will be applied for in 2018.

Capital expenditure plan

The issues discussed above have been addressed with the following projects:

Te Anau Rural Water Supply
Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation (Princhester)	RW439	MS Project in 17/18	REN	18/19	20,000	Rates & Reserves

Appendix P: Ramparts Rural Water Supply

Description

The Ramparts (restricted) Rural Water Supply has 56 connections to the scheme with a total of 166.7 units of water allocated (1 unit equals 1,818L/day).

The scheme is not for potable use and therefore not currently registered with the MOH.

The scheme is governed by the Te Anau Rural Water Supply Committee under the guidance of technical staff at the SDC.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise.

1982 - SDC took over responsibility for the scheme.

1995 - Telemetry installed.

2000 - Water Permit granted to extract 720 m^3/day from Kakapo Swamp for 20 years.

2004 - New Booster Pump 1 installed (Grundfos CP8-80K 3 kW).

2006 - New Booster Pump 2 installed (Lowara SV808 4 kW).

2007 - New motor to Primary Pump 1.

2008 - New Primary Pump 1 (Lowara 2630/15 18.5 kW).

- New Primary Pump 2.
- Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

2019 – New consent application submitted to Environment Southland – currently awaiting a decision and draft conditions.

Process description

River water is drawn from Kakapo Swamp and pumped to storage reservoirs and farm storage tanks. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the farm storage tanks.

(a) Abstraction

Water Permit 99018 granted to take 720 m^3/day from the Kakapo Swamp at a maximum rate of 30 m^3/hr. Consent expired 3 May 2020. A new application has been lodged with Environment Southland

(b) Intake headworks

Water is drawn from intake wells situated at the north end of the Kakapo Swamp. Water is pumped by submersible bore pumps to the main reservoir. Pressure surge equipment protects the pumps comprising of a manually drained pressure vessel. The intake is affected by river quality and quantity issues.

Design: untreated rural water scheme. Restricted supply to farm storage tanks.

Catchment: unconfined catchment.

Pump controls: pump control is by solar powered ultrasonic level controller (ultrasonic hawk unit) at the main reservoir and transmitted to the intake via UHF link (SALCOM). The intake is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water Treatment

This is a non-potable untreated supply.

(d) Storage 1

- the main reservoir has a capacity of 182 m^3 equivalent to approximately 13 hours at full demand.
- the Kepler reservoir has a capacity of 136 m^3 equivalent to approximately 230 hours at full demand.
- the Booster reservoir has a capacity of 68 m^3 equivalent to approximately 230 hours at full demand.

(e) Booster station

There are two boosters pump discharging to the network.

Pump controls: pump control is by a pressure switch with a delay. The pump station is not monitored by Council's SCADA system.

Standby power: no standby power supply is incorporated.

(f) Reticulation

The rising main is made of PVC. The gravity mains are made up of PVC and polyethylene. The pipes should have been installed with rubber-ring joints. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(g) Water meters and hydrants

There are no zone or consumer water meters or hydrants on this scheme.

Asset condition and performance

The current condition and performance grading of the water supply system is shown in the table below.

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	5.3 m Well	2	2	C	2034
	Primary Pump 1	1	1	A	2033
	Primary Pump 2	1	1	A	2033
	Switchboard	4	3	C	2018
	Telemetry	2	5	A	2018
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Storage 1	Main Reservoir	2	2	C	2034
Storage 2	Kepler Reservoir	2	2	C	2034
Booster stations	Booster Pump 1	1	1	A	2029
	Booster Pump 2	1	1	A	2027
	Switchboard	1	1	C	2018
Storage 3	Booster Reservoir	2	2	C	2034
Reticulation	Gravity mains	3	3	B	2054
	Rising mains	3	3	B	2054
	Valves	3	3	B	2024
	Hydrants	N/A	N/A	N/A	-
	Meters	3	3	C	2034

Appendix Table P: Ramparts RWS Condition and Performance

Operation and maintenance

At times there have been issues with low well levels indicating the slots in the well may be corroding.

Critical assets

Critical assets identified are:

- rising main from the intake to the main reservoir.
- rising main from the main reservoir to the booster reservoir.
- rising main from the main reservoir to the Kepler reservoir.

Key issues

- reticulation renewals are programmed to address areas in poor condition.
- The renewal of the water permit being processed by ES.

Capital expenditure plan

The following projects have been programmed to address the above issues:

Te Anau Rural Water Supply

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation (Ramparts)	RW482	MS Project RW482 in 18/19	REN	18/19	20,000	Reserves
Plant and equipment (Ramparts)	RW1613	Additional project in 18-28 LTP	REN	23/24	11,160	Reserves

Appendix Q: Riverton Water Supply

Description

The Riverton community has an estimated 2013 usual resident population of 1,506, with a projected 2018 usual resident population of 1,655. The scheme has 1,117 total equivalent connections.

History

Riverton's public water supply was established in 1975.

A summary of main dates and actions is:

1975 - Water supply established.

1976 - Treatment building constructed.

1982 - SDC took over responsibility for the scheme.

1987 - Water Permit granted to extract 73.6 m^3/hr from the Aparima River for 10 years.

1994 - Intake pumps replaced.

- Discharge Permit granted to discharge 91 m^3/day of backwash water to Jacobs River Estuary for 10 years.

2000 - Depolox chlorine monitoring installed.

2002 - Raw intake pumps and infrastructure upgraded.

2003 - AMP revised.

2004 - Flood damage to the intake cut the water supply to the town for several days. Repairs were covered by insurance.

- New Secondary Pump 2 installed (Southern Cross 80 x 50-250 37 kW).
- Discharge Permit expired.

2005 - Xypex repairs carried out to the clarifier.

- Dirty water incident disrupted the WTP but chlorine residual was maintained in the reticulation.

2006 - New Secondary Pump 1 installed (Goulds GIS 80 x 50-250 37 kW).

2007 - PHRMP approved by Drinking Water Assessor.

- New consent granted to upgrade intake (construct infiltration gallery) and take water.

2008 - AC watermain across bridge renewed (C07-40).

- PHRMP approved by the MOH.
- Upgrades to intake carried out with MOH subsidy.
- Rising main from intake to treatment plant renewed carried out with MOH subsidy.

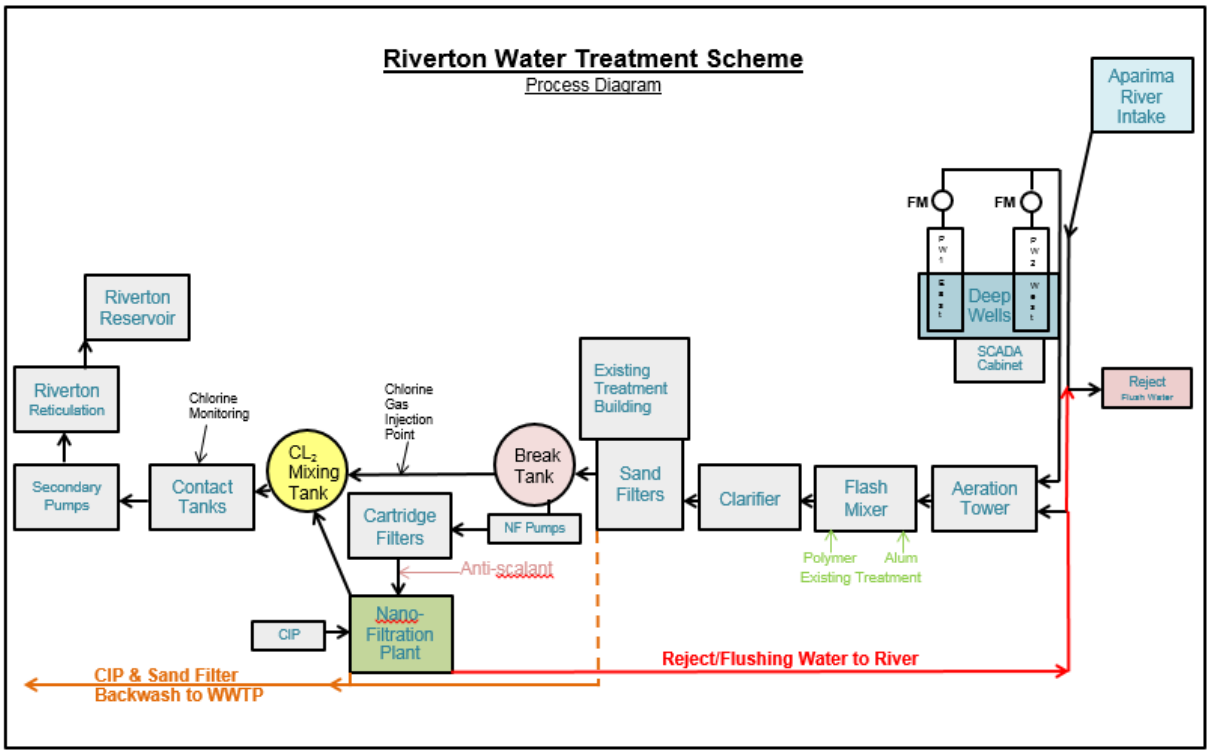
2011 - Investigations to identify new source for the water supply completed.

2012 - New supply wells drilled at site of test location (currently awaiting consent).

2014 - Stage 1 upgrade of treatment plant completed.

2017 - Stage 2 commissioning undertaken

Process description



Water is pumped from twin bores at 36 Centre Road, Gummies Bush and pumped to a Paterson Candy PCI treatment plant, clarifier and sand filters before being pumped through the reticulation to the main reservoir.

The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the toby on the boundary.

(a) Abstraction

Water Permit: Auth-20158384 issued 4 April 2016; Expires 4 April 2051.

Extraction not greater than 36 l/s, 3135 m3/day, 655,175 m3/year

(b) Intake headworks

There are two (2) wells 300mm diameter steel casing with 6 meter lengths of 2mm Johnston wedge wire screen in bottom of each well.

The wells are 15 meters apart and operate in duty/stand by set-up with each pump generally changing duty automatically between starts, but either well can be selected to run.

The wells are 118 meters deep, Pump Well 1 is the eastern well, and pump 2 is the western well.

Pump well 2 ground level is 1 meter lower than pump well 1 ground level. The static water in the wells is approximately 3-4 meters below the well flanges.

The wells are situated as a high knob of land to avoid the artesian head that would otherwise occur.

They are 150mm "mag flow" water meter, 150mm testable check valve and hand valve on each well. There is a VSD variable Speed Drive on each pump.

Currently the pumps at a rate varying from 20-25 l/s but could pump to 30 l/s if required. The wells would have capacity to pump 40 l/s subject to a resource consent approval. There is a monitoring well approximately 150 meters to the north of pump well 1 and pump well 2 where the aquifer water level is monitored as per the consent.

The rising main from the well site to the Water Treatment Plant is 200 mm diameter "O" PVC- Series 2 pipe PN 9.

The rising main is directionally drilled under the Aparima River in (2 meter depth under the bed of the river) HDPE pipe with an isolation valve on the North side if the bridge, along with a flushing valve.

The well site has a switch board, variable speed drives on each pump, SCADA and radio link back to the water treatment site.

Catchment: Well catchment is confined. Water quality (water tested by GNS) - the water is approximately 150 years old, The well water has no e-coli bacteria, tested twice weekly for 4 months from 26 Sept 2017, Oct, Nov, Dec 2017, Jan 2018. Water has medium-high, Total Iron Fe 0.45-0.55 mg/l water has high calcium content. Raw water hardness level 180-205

Stand by power: This no stand by power and the well head or the water treatment plant site. Each site has plugs and switches to enable a mobile generator to be installed at the site. Currently (Jan 2018) the maintenance contractor has three stand by generators that can be used around the district.

(c) Water treatment

Raw water from the wells enters the two (2) aeration towers to oxidise the iron that is in solution in the water, then passes through a "Degas" tank and the original flash mixer and clarifier.

The water is then drawn the two (2) rapid sand filters to remove the iron that has precipitated out. The clarifier also helps with the final degas of the water.

Currently no chemical is added to the water in the pretreatment stage. The pH of the raw water is approximately 8.0pH. The turbidity of the raw water ex the sand filters is <0.12

The water then flows through to the break tank where the flow is divided. Approximately 80% pumps through the Nano filtration plant and 20% of the flow bypasses the Nano filtration plant. This reduces the hardness of the water to below a hardness level of 100, which is considered "soft water" under the DWSNZ.

Chlorine is dosed into the flow just prior to the mixing tank and the FAC level is monitored on the exit pipe from the mixing tank.

The chlorine level is also monitored on line as the water leaves the plant.

The nano-filtration plant reduces the pH of the water. The water leaving the plant generally has a pH in the 7.2 to 7.6 range.

Discharge Permit AUTH 20158546 to release backwash water and accelerator sludge into the Jacobs River Estuary at a maximum rate of 699.84 m3/day is in force until 4 April, 2051.

A single story concrete block pump station situated beside the treatment plant contains electrical control equipment and two secondary pumps (operating in parallel). The two secondary pumps are used to pump water from the treatment plant into the reticulation network with excess continuing to the reservoir. The pumps are controlled by telemetry from the reservoir.

The pump station also contains the backwash pump.

Pump controls: secondary pumps are controlled by an ultrasonic level control (ultrasonic hawk unit) at the reservoir and transmitted to the treatment plant via radio link. The treatment plant is monitored by Council's SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(d) Storage

The main reservoir has a capacity of 1,020 m^3. The time equivalent at full demand is unknown but should be approximately two days at current demand (1,527 people at plant design flow of 340 L/p/day).

(e) Reticulation

Both rising mains are made of asbestos cement. Gravity mains are made up of asbestos cement, polyethylene, and PVC. The pipes should have been installed with rubber-ring joints. No leak detection assessment has been carried out to date.

No hydraulic model has been produced for this scheme. Excluding connections the reticulation network consists mainly of 100 mm and 150 mm diameter pipes.

Rider mains are not common. The reticulation pipes generally form a good ring main coverage of the town. Isolation valves and four double type air valves have been installed. During the 1970s all valves had the old hemp packing to the glands replaced with Teflon.

(f) Water meters

There are water meters on lines leaving the intake, plant, and reservoir and 28 consumer water meters.

There are 207 hydrants on this scheme. All hydrants are the screw down type (mostly Blakeborough), with 80% being 'squat' design and the remainder medium depth hydrants.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below.

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Well 1 (118 m)	1	1	A	2068
	Well 2 (117 m)	1	1	A	2068
	Primary Pump 1	1	1	C	2022
	Primary Pump 2	4	4	C	2032
	Flow meter 1	1	1	A	2033
	Flow meter 2	1	1	A	2027
	Compressor	3	3	C	Unknown
	VSD's (x 2)	1	5	A	2033
	Switchboard	1	1	C	2027
	Telemetry	1	2	A	2025
Treatment Plant	Aeration Tower	1	1	A	2068
	Poly dosing pumps	2	2	C	2026
	SCM				
	Sediment Tanks/Clarifier	3	3	C	2024
	Rapid Sand Filters	2	3	C	2027
	Settling Ponds	3	3	B	Unknown
	Chlorinator	1	2	A	2032
	pH dosing pumps	2	2	C	2025
	Contact Tanks	3	2	C	2027
	Nanofiltration Plant	1	1	A	2033
	Secondary Pump 1	1	2	C	2019
	Secondary Pump 2	1	2	A	2025
	Backwash Pump	1	2	A	2025

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
	Spare Chl Pump 1	Unknown	Unknown	Unknown	Unknown
	Chl sample pump	2	3	C	2025
	Air blower	1	2	C	2025
	Switchboard (T'ment)	2	2	A	2025
	Switchboard (2no)	2	2	A	2025
	Telemetry	1	1	A	2032
Storage	Main Reservoir	3	3	B	2034
Reticulation	Gravity mains	3	3	B	2035
	Rising mains	4	3	B	2035
	Valves	3	3	B	2025
	Hydrants	3	3	C	2035
	Meters	3	2	B	2035

Appendix Table Q: Riverton Condition and Performance

Note: There are two parallel system operating for intake sites and water treatment. 2016 WTP elements will be noted when "as-built" details are entered to I.P.S.

Some AC sampling has been carried out with samples graded in moderate to poor condition. The rising main from the intake was sampled in 2003 and graded as poor. This has now been replaced.

The current performance of the treatment plant was because the current quality of raw water is very poor. At the time of writing, the intake was being upgraded. Pending the quality of water from the new intake treatment upgrades are likely to be required.
Treatment improvements will be identified through the PHRMP and upgrades have been programmed.

Operation and maintenance

The shaft sleeves on the transfer pumps wear faster than expected due to the amount of sediment in the raw water.

There is increasing maintenance costs associated with certain laterals - programme replacement.

Critical assets

Critical assets identified are:

- rising main from the intake to the treatment plant
- clarifier
- sand filters
- chlorinator
- Nano filtration plant
- rising main from the treatment plant to the reservoir

Key issues

The water quality and security has been addressed with a new source at 36 Gummies Road Centre Bush and extensive development of the water treatment plant in High Street Riverton, with the introduction of a membrane filtration system. Sludge produced in the water making process is now consented for disposal to the Aparima River.

Should there be future demand[3] it is estimated that upgrades will be required to the clarifier, filters, secondary pumps, contact tanks and increase in the main size to Rocks area. Given low growth rates this work is not considered necessary in the upcoming period.

Capital expenditure plan

The following projects have been programmed to address the above issues:

Riverton/Aparima

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Scheme Improvements	26362	Treatment Plant Upgrade, Rising Main & intake improvements	LOS	18/19	206,247	Mix & Loan
200mm Magflow at water out at Water Treatment Plant	WAT1510	Additional project in 18-28 LTP	LOS	18/19	15,000	District Funding
Replace water main above Bowling club and main at John St	WAT1534	Replace water main above Bowling club previously washed out due to slip (80m) and main at 59 John St for hydrant service	REN	18/19	20,000	District Funding
Metering - District Metered Areas	WAT564	Additional project in 18-28 LTP MS Project WAT564 in 19/20	LOS	19/20	73,800	District Funding
Replace water main above Bowling club and main at John St	WAT1534	Replace water main above Bowling club previously washed out due to slip (80m) and main at 59 John St for hydrant service	REN	19/20	85,224	District Funding
Additional UV disinfection	WAT545	Additional project in 18-28 LTP UV disinection at Riverton WTP for up to 50% of flow that we are currently caliming secure statue for. Project added following Havelock North stage 2 report release.	LOS	19/20	512,500	District Funding

[3] There currently is no growth anticipated in Riverton over the next 10 years.

Appendix R: Takitimu Rural Water Supply

Description

The Takitimu (restricted) Rural Water Supply has 26 connections to the scheme with a total of 135.4 units of water allocated (1 unit equals 1,818L/day).

The scheme is not for potable use and therefore not currently registered with the MOH.

The scheme is governed by the Te Anau Rural Water Supply Committee under the guidance of technical staff at the SDC.

History

The scheme was built in the 1970s by Lands and Survey (now Landcorp) as part of the government farming enterprise.

1982 - SDC took over responsibility for the scheme.

1989 - Water Permit granted to extract 1,056 m^3/day from the Mararoa River for 10 years (combined consent for Mt York and Takitimu).

1995 - Telemetry installed.

1998 - Water Permit granted to extract 120 m^3/day from the Waiau River for 20 years.

1999 - New intake constructed after flooding destroyed the rising main from the Mt York intake.

2003 - New Booster Pump 1 installed (Grundfos CR5-8 1.1 kW).

2005 - New Booster Pump 2 installed (Grundfos CR5-8 1.1 kW).

2006 - 110 m of rising main from intake replaced due to poor condition.

- Coats 80 mm PVC line replaced due to poor condition.

2007 - McConnell 32 mm PE line replaced due to poor condition.

2008 - Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

2016 - Rising Main replaced

Process description

River water is drawn from the Mararoa River and pumped to storage reservoirs and farm storage tanks. The supply network consists of gravity mains, rising mains, and valves.

Council owns and maintains the service connections from the trunk main to the ballcock on the farm storage tanks.

(a) Abstraction

Water Permit 99164 granted to take 1,056 m^3/day (in association with Mt York RWS) from groundwater in the Waiau catchment. Consent expires 7 November 2026.

(b) Intake headworks

Water is drawn by one pump from an inclined well situated on the west bank of the Mararoa River approximately 3,000 m downstream of the Hillside-Manapouri Road. The intake is affected by river quality and quantity issues. The switchboard for the pump is pole mounted and within the reach of flood waters.

Design: untreated rural water scheme. Restricted supply to farm storage tanks.

Catchment: unconfined catchment.

Pump controls: pump control is by solar powered ultrasonic level controller (ultrasonic hawk unit) at the main reservoir and transmitted to the intake via UHF link (SALCOM). The intake is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water treatment

This is a non-potable untreated supply.

(d) Storage

The main reservoir has a capacity of 150 m^3 equivalent to approximately 13 hours at full demand. The Booster reservoir has a capacity of 25 m^3.

The time equivalent at full demand is unknown. The track up to this reservoir is treacherous during winter and frequently impassable.

(e) Booster station

There are two pumps in parallel discharging to network reticulation.

Pump Controls: Pump control is by a pressure switch with a delay. The pump station is not monitored by Council's Datran SCADA system.

Standby Power: No standby power supply is incorporated.

(f) Reticulation

The rising main is made of an unknown material. Gravity mains are made up of polyethylene, PVC, and AC. The pipes should have been installed with rubber-ring joints. Isolation valves and four double type air valves have been installed.

During the 1970s all valves had the old hemp packing to the glands replaced with Teflon. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

(g) Water meters and hydrants

There are no zone or consumer water meters or hydrants on this scheme.

Asset condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	7 m Well	3	3	B	2044
	Primary Pump 1	3	3	B	2024
	Switchboard	3	3	B	2020
	Telemetry	1	4	A	2018
Treatment Plant	N/A	N/A	N/A	N/A	N/A
Storage 1	Main Reservoir	4	3	C	2031
Booster stations	Booster Pump 1	1	1	A	2028
	Booster Pump 2	1	1	A	2030
	Switchboard	1	1	C	2028

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Storage 2	Booster Reservoir	3	2	C	2031
Reticulation	Gravity mains	3	3	B	2051
	Rising mains	4	4	B	2051
	Valves	3	3	B	2021
	Hydrants	N/A	N/A	N/A	-
	Meters	3	3	C	2035

Appendix Table R: Takitimu RWS Condition and Performance

Rising main is in poor condition and subject to premature failure due to incorrectly installed PN12 to cope with 160 m head.

Operation and maintenance

There have been increasing repairs to rising main over recent years. There are ongoing difficulties accessing intake during the winter months due to poor condition of track.

Critical assets

Critical assets identified are:

- the well pump.
- the rising main from the intake to the main reservoir.
- the rising main from the main reservoir to the second reservoir.

Key issues

Areas of reticulation are in need of replacement.

Capital expenditure plan

The following projects have been programmed to address the above issues:

Te Anau Rural Water Supply
Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation (Takitimu)	RW591	MS Project RW591 in 23/24	REN	23/24	22,540	Reserves
Switchboards and pumps (Takitimu)	RW1616	Additional project for 18-28 LTP	REN	25/26	161,885	Reserves

Appendix S: Te Anau Water Supply

Description

The Te Anau community has an estimated 2013 usual resident population of 2,628 with a projected 2018 usual resident population of 2,938. The scheme has 2002 total equivalent connections.

History

The scheme was built in 1966.

Te Anau currently has two water supply sources. The primary source is from three shallow bores adjacent to Lake Te Anau to the north-west of town near the cricket oval. Two of these bores were installed in 1966 as part of Te Anau's first community water supply scheme. The third bore was installed in 1995 to help meet increasing demands.

In 1976 the Upukerora bore (second source) was commissioned and until October 1993, when the bore filtration failed, it was Te Anau's principal water supply source. When the Upukerora River is in flood significant turbidity/discolouration is evident in the Upukerora supply. The supply has been extended over time to meet requirements of a number of subdivisions within the township.

2000 - Town service lane upgrade.

- Low pressure supply to Lakefront rural lifestyle blocks.

2001 - First stage of rising main upgrade project.

2002 - Watermain extension to Lawson Burrow Crescent (Luxmore Stage IX).

2003 - Watermain extension to Hawea Place (end of Tom Plato Drive) (Fiordland Estates Stage I).

- Patience Bay and Murchison Avenue extensions (Patience Bay Stage 2).
- Watermain extension to Lawson Burrow and Earl Place (Luxmore Stage X) 2004. Water permit granted to extract 2,100 m^3/day from groundwater for back-up supply from the Waiau catchment for 20 years.
- Water permit granted to extract 6,500 m^3/day from groundwater from the Waiau catchment for 20 years.
- Watermain extension to McIvor Place (Luxmore Stage XI).
- Matai Street watermain upgrade and extension along Sandy Brown Road. Booster station constructed at Sandy Brown Road.

2005 - Well No. 4 constructed.

2006 - Major upgrade to Lakeside WTP (C06-18) including modification to the contact tank manifold, new pumps and pipework, and new switchboard and telemetry.
A switchboard and telemetry was installed at the reservoir. A back-up generator was installed.

- Rising main upgrade along Milford Road, installed approximately 2.2 km of 300 mm mPVC and associated valves, hydrants, and polyethylene water service laterals (C06-05).

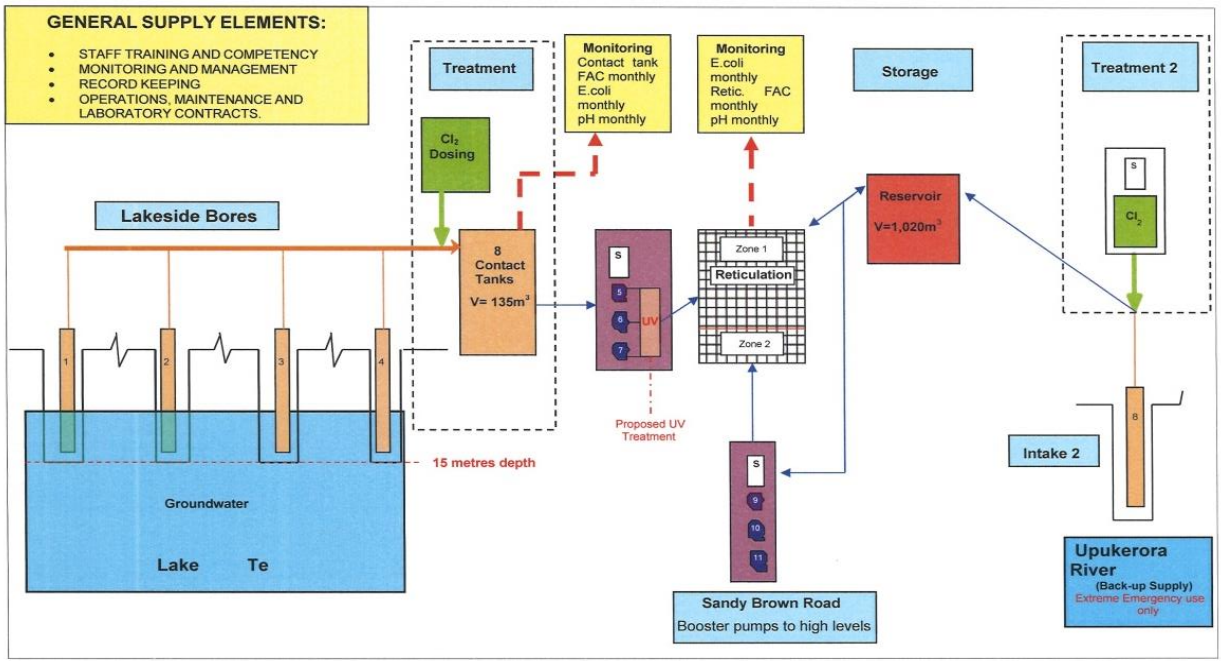
2008 - Te Anau Basin Repeater was constructed to improve the effective output signal strength of the radio (previously exceeded the New Zealand Standards).

2013 - Treatment plant upgraded to meet new Drinking water standards.

2017 - Mackinnon Loop mains replacement undertaken

2018-21 – Further renewals on Qunitin drive and Lakefront Drive undertaken

Process description



Groundwater is drawn from the gravels of the Waiau catchment and passes through a treatment plant before being pumped through the reticulation to the main reservoir.
A back-up intake treats water and pumps straight to the reservoir. Treated water gravitates back to the reticulation network. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the toby at the boundary. There is a low pressure restricted supply along Milford Road. In this case Council owns all the pipework and fittings up to the restrictor unit.

(a) Abstraction

Water Permits 20355 and 20356 granted to take no more than 6,500 m^3/day and 2,100 m^3/day respectively from groundwater in Waiau catchment. Consent expires 5 July 2024.

(b) Intake 1 Lakewise (WT081)

Four wells draw water through sands and gravels from the Waiau catchment adjacent to Lake Te Anau. The bores are shallow (12-15 m deep) and are located approximately 100 m apart 30-50 m back from the normal lake edge. There is one pump in each well with a combined pump extraction capacity of approximately.

367 m^3/hr. The duty primary pump (which is alternated) starts when at a pre-set contact tank water. The other primary pumps are progressively activated as lower water levels are reached. Water from the lakeside source is pumped to a series of eight 22.7 m^3 contact tanks (181.6 m^3 in total).

Note: Old bore casing remains in place approximately 6 m from the new Well 2 casing the old well headworks serves as an access point for maintenance and raw water sampling.

Design: treated urban supply on mains pressure.

Catchment: unconfined catchment.

Pump controls: primary pumps are controlled by ultrasonic level control (ultrasonic hawk unit) transmitters located in the contact tanks and directly linked to the lakeside treatment plant.

Standby Power: Standby power is provided from the generator at the lakeside treatment plant.

(c) Lakeside Water Treatment Plant (WT081)

Treatment is provided by the injection of chlorine through a manifold immediately prior to the contact tanks. Contact time at the lakeside source is provided by 8 x 22.7 m^3 concrete tanks. Some degree of treatment is provided by the gravel/sand media surrounding the wells. However, the level of this treatment is not known. Continuous chlorine monitoring was installed in 2001 and is linked to the SCADA telemetry system.

The contact tanks are connected to high lift pumps (housed in a concrete block pump building) which deliver water into the reticulation system.

Water from the lakeside high lift pumps is delivered directly into the town reticulation with the excess continuing to the reservoir.

In 2006 following pressure demand problems and increasing electricity costs associated with the 90 kW motor, a redesign of the pumping equipment was carried out. Three new Goulds GIS 100X65-200Z 37 kW pumps were installed. They are plumbed to operate individually or in series when needed at peak times. The existing four pumps were decommissioned and removed from site.

Pump controls: the secondary pumps are controlled by an ultrasonic level controller at the reservoir and transmitted to the Upukerora pump station via UHF link (SALCOM) and then to the treatment plant via VHF radio. The station monitored by Council's Datran SCADA system via VHF radio.

Standby power: A 275kVA Caterpillar GEH275 Diesel generator was installed in 2006 to provide emergency power supply for the WTP.

(d) Pump stations

A booster station with 30 m^3 storage was constructed in 2004 as part of a service extension in Sandy Brown Road. This pump station provides the required pressure and flow to the upper terrace area while buffering any fluctuations from the town supply.

Pump controls: pump control is by a pressure switch with a delay. The pump station is monitored by Council's Datran SCADA using Kingfisher RTU equipment system via VHF radio.

Standby Power: No standby power supply is incorporated, however, there is a generator plug on the switchboard.

(e) Storage (WT082)

The main reservoir has a capacity of 1,020 m^3. The time equivalent at full demand is unknown. The reservoir is a covered circular 15 m diameter concrete tank located to the east of Te Anau on a terrace approximately 28 m above the Upukerora source. The full water level of the (6 m high) reservoir is approximately 47 m above the lakeside high lift pumps and approximately 38 m above the current township (on the lower terraces). There is a magflow meter on the outlet. There is also an isolation valve present on the reservoir outlet pipe which could be connected to a pressure sensor within the reticulation. It has been located there in mind of the valve automatically closing in the event of a major burst.

(f) Reticulation

The rising main is PVC. Gravity mains are PVC, asbestos cement, and polyethylene. The pipes should have been installed with rubber-ring joints. Leak detection assessments have been carried out in the past although the data has not been compiled for this plan. Very good pipe location and size information is available on Council's GIS.

Council has a hydraulic model (H20NET) of the reticulation network that enables various flow and demand regimes to be emulated and the effects on supply pressures and flows to be evaluated at various parts of the network. The model requires further development.

The reticulation system consists of two ring-main systems with a series of sub-main branches. A delivery pipe extends from the lakefront high lift pumps to the reticulation system at the northwest end of Bligh Street and

from the intersection of Milford Road and Howden Street to the reservoir. This delivery pipe is a combination of 300 mm and 200 mm diameter PVC and 300 mm diameter mPVC.

Piped reticulation networks supply all Te Anau properties on the lower terraces. Most commercial and out of town consumers are metered or are on restricted flow supplies. The extension along Sandy Brown Road from Milford Road to new booster station, increases from 150 mm to 200 mm to service the upper terrace area.

(g) Water meters

There are magflow meters on the lines leaving the treatment plant and on the outlet to the reservoir. There are 78 consumer water meters. All meters on this water supply are read quarterly by Council's service contractors, who also repair any leaks or defects.

(h) Hydrants

There are 261 hydrants on this scheme. Hydrants are the screw down type.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Primary Intake	12 m Well No. 1	2	2	C	2025
	Primary Pump 1	2	2	C	2023
	12 m Well No. 2	2	2	C	2025
	Primary Pump 2	2	2	C	2020
	12-15 m Well No. 3	1	1	C	2025
	Primary Pump 3	2	2	C	2022
	15 m Well No. 4	1	1	C	2065
	Primary Pump 4	1	1	C	2030
Treatment Plant	Secondary Pump 1	1	1	A	2031
	Secondary Pump 2	1	1	A	2031
	Secondary Pump 3	1	1	A	2031
	Chlorinator	1	1	C	2023
	Analyser	1	1	A	2020
	Turbidity meter	1	1	A	2021
	Magflow meter	1	1	A	2031
	Contact Tanks	4	2	C	2018
	Switchboard	2	2	C	2019
	Telemetry	2	1	A	2025
	Generator	1	1	A	2056
	UV Units	1	1	A	2017
Booster stations	Pump 1	1	2	C	2029
	Pump 2	1	2	C	2029
	Jockey pump	1	2	C	2029
	Settling Tank	1	2	C	Unknown
	Switchboard	1	2	C	2029

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
	Telemetry	1	1	A	2019
Back-up Intake	12 m Well No. 1	5	5	C	2062
	Back-up Pump 1	5	5	B	2026
Back-up Treatment	Chlorinator	5	5	C	2027
	Switchboard	5	5	C	2027
	Telemetry	5	5	A	2025
Storage	Main Reservoir	2	2	C	2025
	Magflow meter	1	1	A	2031
	Switchboard	1	1	A	2036
	Telemetry	1	1	A	2026
Reticulation	Gravity mains	3	3	B	2026
	Rising mains	3	3	B	2026
	Valves	3	3	B	2016
	Hydrants	3	3	C	2026
	Meters	3	3	C	2026

Appendix Table S: Te Anau Condition and Performance

Operation and maintenance

Increasing maintenance spent on repairing laterals. Programme funds to replace.

Critical assets

Critical assets identified are:

- the Lakeside chlorinator
- the rising main from the treatment plant to the main reservoir
- the back-up chlorinator
- the back-up rising main

Key issues

Long term future growth expected outside duration of current AMP.

Capital expenditure plan

The following projects have been programmed to address the above issues:

Te Anau

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Metering - District Metered Areas	WAT675	MS Project WAT675 in 17/18	LOS	18/19	101,500	District Funding
Sandy Brown second water tank and VSD on third pump	WAT1512	Second water tank at Sandy Brown Pup Station and VSD on third pump incl SCADA and logic work. Additional project in 18-28 LTP.	LOS	20/21	52,429	District Funding
Lateral replacement ahead of time and Switchboards/monitoring	WAT1524	Te Anau laterals required ahead of time Pomplona, Quintin, Homer, Henry, Duncan & Burnby Drive.	REN	21/22	1,068,265	District Funding
Consent Renewal Preparation	WAT671	Additonal project in 18-28 LTP MS Project WAT671 in 22/23	REN	22/23	21,990	District Funding

Appendix T: Tuatapere Water Supply

Description

The Tuatapere community has an estimated 2013 usual resident population of 561 with a projected 2018 usual resident population of 557. The scheme has 302 total equivalent connections.

History

The current reticulated water supply was installed in the early 1970s and until recent times has remained unchanged.

1982 - SDC took over responsibility for the scheme.

1995 - Telemetry installed.

1996 - Contract let to upgrade the water supply using Waiau Working Party funds.

1999 - Water permit granted to extract 960 m^3/day from groundwater in the Waiau catchment for 20 years.

2000 - Commissioning of the new treatment plant upgrade is complete.

2001 - pH correction is added to the treatment process.

2005 - Secondary Pump 2 renewed.

2007 - Difficulties maintaining pressure in town during winter due to numerous leaks.

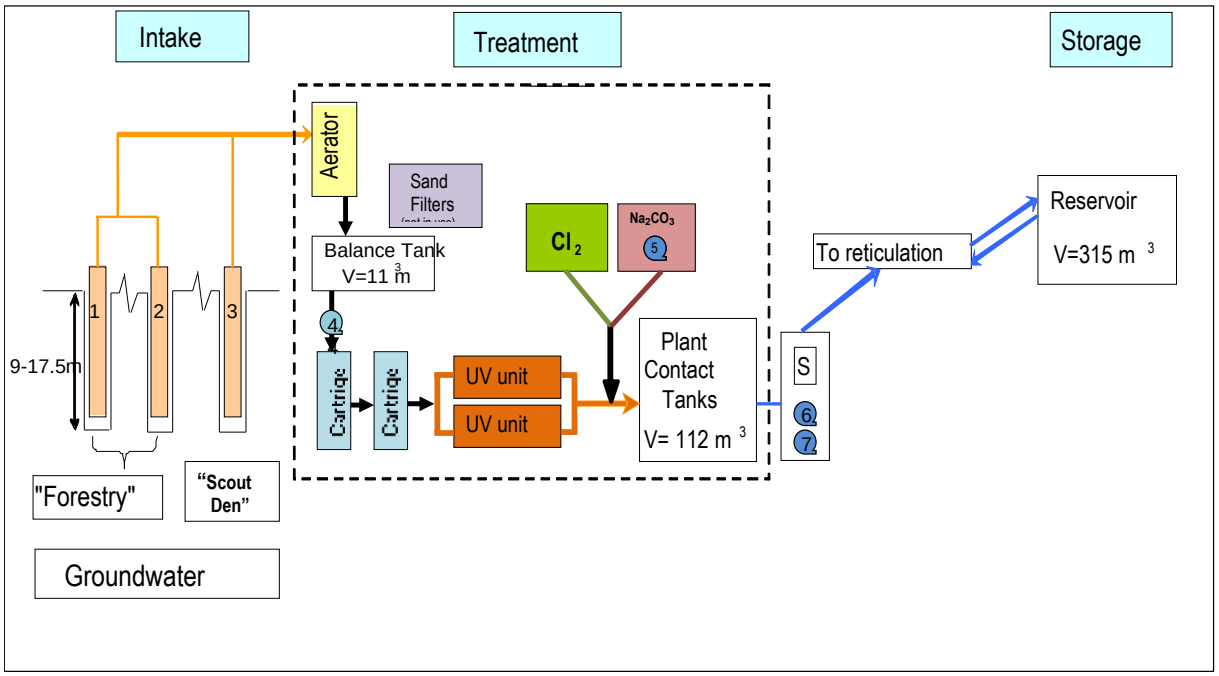
2008 - Risk of flood to the WTP increases as Waiau River begins encroaching on the true right bank adjacent to the plant.

- PHRMP approved by the MOH.

2013 - Treatment upgrade completed.

2019 - New consent granted

Process description



Groundwater is drawn from the gravels of the Waiau catchment and passes through a treatment plant before being pumped through the reticulation to the main reservoir.
Treated water gravitates to the reticulation network. The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the farm storage tanks.

(a) Abstraction

Water Permit 98317 granted to take no more than 960 m^3/day from two bores as back-up town supply from groundwater in the Waiau catchment at a maximum rate of 40 m^3/hr. Consent expired 13 August 2019 with a new consent granted in 2019 for a further 25 year period..

(b) Intake headworks

Since the water supply upgrade of 1997 the town has had two supply wells. The original Bush Well is located in road reserve at Erskine Road to a depth of six to eight metres. There are two submersible pumps discharging in the asbestos cement rising main. This well has had problems with corroded slots leading to low well levels. The well is currently out of service to protect the pumps.

The secondary (Forestry Well) and primary source is a newer well established in 1998, located in the Forestry Road Reserve approximately 25 m from Half Mile Road. One pump draws water from an aquifer 5 m deep. The rising main is PVC pipe and links to the existing rising main from Well No. 1.

For most of the year the Well No. 1 supplies water to the treatment plant, but during summer both wells are utilised in tandem to mitigate the effects of a low yield.

As part of the 1997 water supply upgrade the original Waiau River intake has been decommissioned.

Design: treated urban supply on mains pressure.

Catchment: unconfined catchment.

Pump controls: pump control is by a direct link to level sensor electrodes mounted within the balance tank at the treatment plant. The intake is monitored direct link to the treatment plant.

Standby power: no standby power supply is incorporated.

(c) Water Treatment

The water treatment plant is located in the Tuatapere Domain on the banks of the Waiau River. The plant has been inundated with floodwaters several times in the past. The plant is now at risk of collapse as the river undermines the adjacent bank.

Raw water from the intake enters a stainless steel cascade type aerator with a design flow rate of 40 m^3/hr. From the aerator water falls into an 11,000 L balance tank providing flow buffering ahead of the filter pump.

pH correction has been added to the treatment process to address the mildly aggressive raw groundwater. Water exiting the filters is low in pH around 6. In order to achieve a final pH in the reticulation a 5% lime slurry is added to the water. The system comprises of a make-up tank complete with mechanical stirrer. The lime slurry is injected into pipe feeding the contact tanks. The dose rate is preset in the electronic controller located in the treatment building.

Water is drawn from the contact tanks and pumped to the town reticulation and reservoir by two secondary pumps (duty/standby). Both pumps can be run together if required.

Pump controls: the filter pump is controlled by a pressure switch with a delay. The lime slurry pump is controlled by electronic controller with set-points adjusted via SCADA. The secondary pumps are controlled by a direct link (leased telecom circuit) to an ultrasonic level controller in the reservoir. The treatment plant is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(d) Storage

The main reservoir has a capacity of 318 m^3 equivalent to approximately 15 hours at full demand.

(e) Reticulation

The rising main is asbestos cement. The gravity main is asbestos cement, polyethylene and PVC. The pipes should have been installed with rubber-ring joints. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

Excluding connections the reticulation network consists generally of 100 mm and 150 mm diameter pipes. Rider mains are not common. The reticulation pipes are generally asbestos cement the particular type is generally unknown. The level of mains failures is low, typically one per year. Consumer laterals utilise "Talbot" connectors. These are failing more regularly due to age and corrosion effects.

(f) Water Meters

There is a water meter on the line leaving the plant and 15 commercial, industrial and institutional users metered. Of the metered supplies, the most significant consumers are Lindsay and Dixon, Waiau Hotel and DT King Transport.

(g) Hydrants

There are 59 hydrants which are the screw down type. The town is well serviced by hydrants, with most of the hydrants complying with fire service flow and pressure requirement except for a small number at the western end of Half Mile Road.

Condition and performance

The corrosive water causes problems with many metal fittings in the reticulation especially the Talbot valves, and tapping bands. Premature replacement is likely to be required. It may be economic to replace the lateral while the toby and tapping band is being replaced.

There is a 50 mm main in Bridge Street with five repairs.

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake 2 (Forestry)	12 m Well	5	5	A	2007
	Primary Pump 3	3	3	B	2020
	Switchboard	2	2	C	2007
	Telemetry	2	5	A	2010
Treatment Plant	Balance Tank	2	2	C	2045
	Dosing pumps	2	2	C	2016
	RS Filters	2	4	C	2034
	Cartridge Filters	2	2	C	2034
	Chlorinator	2	3	C	2021
	Contact Tanks	1	1	A	2070
	Secondary Pump 1	1	2	C	2023
	Secondary Pump 2	1	2	C	2025
	Switchboard	2	2	C	2025
	Telemetry	2	5	C	2025

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
	Spare sec. pump	4	4	A	2005
	Spare sec. pump	4	4	A	2008
Storage	Main Reservoir	1	1	A	2090
Reticulation	Gravity mains	3	3	B	2030
	Rising mains	4	4	B	2030
	Valves	3	3	B	2020
	Hydrants	3	3	C	2030
	Meters	3	3	C	2030

Appendix Table T: Tuatapere Condition and Performance

Note: Intake (Bush) has been abandoned 2014. There are two x forestry bores and scout den and UV's and Aeration Tower.

Operation and maintenance

There have been issues in the past with frost causing bursts on private property with an unoccupied dwelling.

There are increasing costs associated with the premature failure of Talbot valves at the lateral connection tapping on the main.

Critical assets

Critical assets identified are:

- the aerator
- the sand filters
- the cartridge filters
- the chlorinator
- the lime dosing pump
- the rising main from the treatment plant to the reservoir.

Key issues

- contact tanks were in poor condition and were renewed in 2013
- the reservoir tanks have been replaced and fenced
- the telemetry unit (RTU) requires upgrading to Kingfisher/Citect, the SCADA system.

Capital expenditure plan

The following projects have been programmed to address the above issues:

Tuatapere

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Consent Renewal Preparation	WAT736	MS PRoject WAT736 in 18/19	REN	18/19	20,000	District Funding
Powdercoat, sandblast and boardwalk	WAT1532	Additional project in 18-28 LTP	O&M	20/21	73,400	District Funding

Appendix U: Winton Water Supply

Description

The Winton community has an estimated 2013 usual resident population of 2,436 with a projected 2018 usual resident population of 2,430. The scheme has 1,241 total equivalent connections.

History

Winton's public water supply was established in 1956 including an intake located on Gerrard Road near the Oreti River and the water tower. A number of key activities have been undertaken since construction with those from 2000 documented below.

2000 - New primary pump installed.

2001 - Seismic assessment carried out on the water tower.

2004 - Sections of Park, Mackenzie and Hilary Streets renewed in PVC.

2006 - New primary pump installed (Goulds 8JNHC 22 kW) due to fault. Other pump repaired and kept as spare in Winton Depot.

- Sections of AC mains renewed with pipe bursting and directional drilling techniques: Grange, Home, Mary, Eglinton, Albert, Mackenzie, and John Streets.

2007 - Air core investigations were carried out and unsuccessful test bores were constructed at the Maternity Hospital site and Ivy Russell Park.

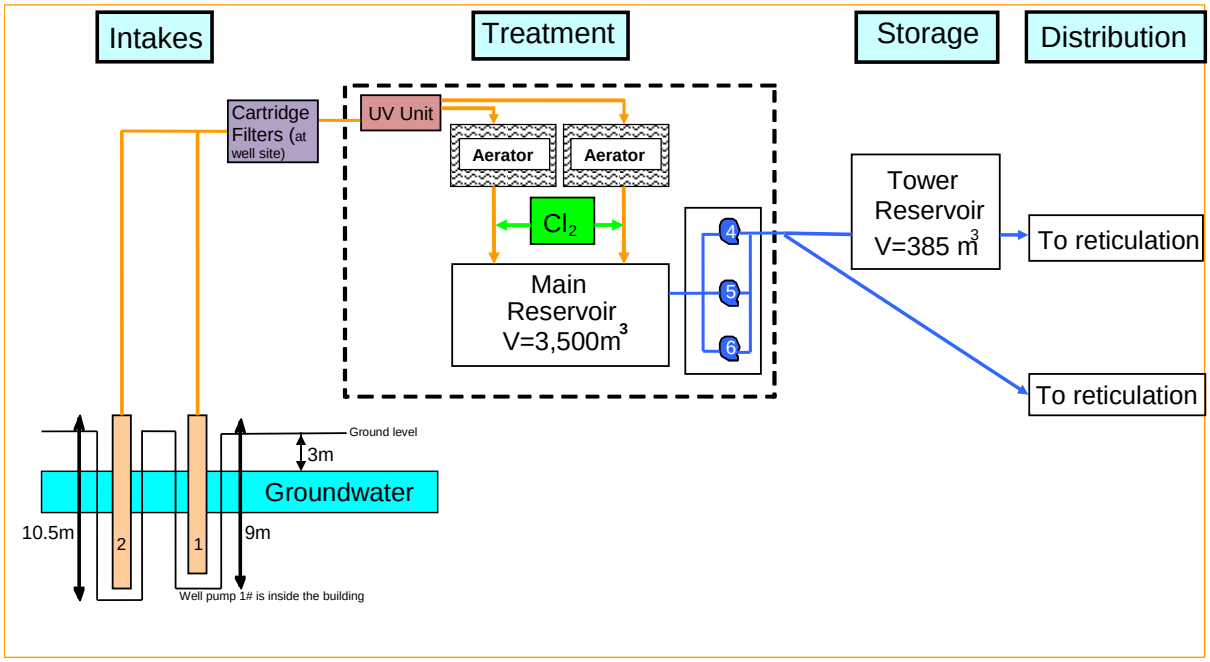
2008 - All secondary pumps overhauled.

2014 - Construction of a second intake well completed

2014 - Treatment upgrade completed

2015-19 - Mains renewal programme undertaken

Process description



Groundwater is drawn from the unconfined gravels of the Oreti catchment and pumped to a treatment plant and main reservoir. Treated water is pumped to a water tower before it gravitates to the reticulation network.

The supply network consists of gravity mains, rising mains, and valves. Council owns and maintains the service connections from the trunk main to the ballcock on the farm storage tanks.

(a) Abstraction

Water Permit 94248 granted to take 3,000 m^3/day from groundwater in the Lower Oreti groundwater zone. Consent expires 30 September 2008.

(b) Intake headworks

The contributing aquifer consists of clean sandy gravels, up to 4 m thick, associated with the Oreti River. The well is located between a drainage ditch 70 m to the east and Substation Road 250 m to the west. The rising main from the well to the reservoir is a 200-225 mm diameter asbestos cement pipe constructed in 1975.

The well is located inside a concrete block shed containing the electrical control gear, surge protection equipment, pipework and valves. There is insufficient room within the well for a second submersible pump and pump removal is achieved by lifting the pump out through the shed roof.

The ground water level is typically 2-3 m below ground and normal draw-down is two to three metres. A single submersible pump is located inside the 750 mm diameter well. The submersible pump delivers water into the reservoir 2.6 km to the south-east. Five piezometer holes have been installed around the well to monitor ground water levels.

Design: treated urban supply on mains pressure.

Catchment: unconfined catchment.

Pump controls: the primary pump is controlled by an ultrasonic level control (ultrasonic hawk unit) at the reservoir and transmitted to the intake plant via UHF link (SALCOM). The intake transmits to the treatment plant which is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(c) Water treatment

Gas chlorination equipment is housed in the pump station building next to the main reservoir dosed by Depolox. Gas levels are regularly checked and the equipment is reliable. The pH is corrected by forced draught aeration prior to the reservoir.

The aerator is located on top of the reservoir. It is necessary to correct the pH for aesthetics, to reduce corrosiveness and to improve the efficiency of chlorination.

The treatment building (1975) also contains three tower delivery pumps (in parallel), surge protection equipment, and one redundant pump (since relocating aerators to top of the reservoir). The tower secondary pumps are used to pump water from the reservoir into the reticulation network and when the inflow from the pump station is greater than the demand outflow from the reticulation network the tower reservoir fills.

Pump controls: the secondary pumps are controlled by an ultrasonic level control (ultrasonic hawk unit) at the tower and transmitted to the treatment plant via UHF link (SALCOM). The treatment plant is monitored by Council's Datran SCADA system via VHF radio.

Standby power: no standby power supply is incorporated.

(d) Storage

Storage and chlorination contact time is provided by a reservoir to the east of the town centre and additional storage is provided by a water tower (header tank) in the town centre.

The 3,500 m^3 main reservoir is a covered single circular reinforced concrete tank, consisting of pre-stressed concrete bands, which contain precast wall panels. It is on ground and located at the southern end of Florence Road about 200 m east of Great North Road. It shares a fenced compound with the pump station.

The water tower is the original reservoir and is a reinforced concrete cantilever structure with a capacity of 365 m^3. A 10 m diameter, 5.5 m high concrete reservoir tank rests on top of the supporting hollow concrete column, which is approximately 7 m in diameter and 29 m tall.

(e) Reticulation

The rising main is approximately 3,030 m and constructed of asbestos cement. Gravity mains are made up of asbestos cement, PVC, polyethylene, concrete spun reinforced, steel concrete lined. No leak detection assessment has been carried out to date. No hydraulic model has been produced for this scheme.

Excluding connections the reticulation network consists generally of 100 mm diameter with some 150 mm diameter pipes. Rider mains are not common. The reticulation pipes generally form good ring main coverage of Winton.

There are approximately 1,154 connections, approximately 90% of which are Low Density Polyethylene (LDPE) and the remainder (mainly in the town centre) copper. All connections were copper prior to 1968. In the period 1968 to 1985 most of the copper connections were replaced with LDPE pipes, generally as roads were reconstructed and sealed. Isolation valves and four double type air valves have been installed. During the 1970s all valves had the old hemp packing to the glands replaced with Teflon.

(g) Water meters

There is a water meter on the line from the intake. There are 15 commercial, industrial and institutional users metered, with 85% of meters installed between 1992 and 1997. The most significant industrial users are Craigpine Timber Limited and Central Southland College.

(h) Hydrants

All 165 hydrants are the screw down type (mostly Blakeborough), with 80% being 'squat' design and the remainder medium depth hydrants.

Condition and performance

The current condition and performance grading of the water supply system is shown in the table below:

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Intake	Gerrard Road Well	5	5	A	Decommissioned
	9 m Wells x 2	2	2	C	2034
	Primary Pump 1& 2	1	1	A	2031
		5	5	A	2025
	Spare Primary pump	1	2	C	2024
	Surge Protection eq	2	2	A	2025
	Switchboard	2	3	C	2025
	Telemetry				

ASSET TYPE	ASSET COMPONENT	CONDITION	PERFORMANCE	CONFIDENCE	PREDICTED END OF LIFE (IPS)
Treatment Plant	Chlorinator	1	2	C	2026
	Aerator (forced draft)	4	5	C	2025
					2028
	Secondary Pump 1	1	2	A	2028
	Secondary Pump 2	1	2	A	2028
	Secondary Pump 3	1	2	A	2015
	Spare Chl Pump	2	2	C	2025
	Switchboard	2	2	C	2025
	Telemetry	1	2	A	
Storage	Main Reservoir	2	2	C	2038
	Tower reservoir	4	4	D	2015
Reticulation	Gravity mains	5	5	B	2100
	Rising mains	4	4	B	2100
	Valves	3	3	B	2100
	Hydrants	3	3	C	2100
	Meters	3	3	C	2050

Appendix Table U: Winton Condition and Performance

Note: Tower reservoir has been used "over-life" due to the fragile nature in some areas of supply reticulation as head pressure supply is more constant than variable speed pump supply.

The condition of the reticulation in Winton is improving with the most fragile AC (Fibrolite) now replaced. An ongoing replacement programme has been scheduled in order to optimise maintenance and renewals costs.

The condition of the reticulation in Winton is improving with the most fragile AC (Fibrolite) now replaced. An ongoing replacement programme has been scheduled in order to optimise maintenance and renewals costs.

Operation and maintenance

The worst areas of fragile AC have now been replaced but maintenance trends identify that other areas within the reticulation are now requiring increased numbers of repairs. Further replacements have been programmed.

The tower is average in IPS but is still functional and operational. The demolition of this asset is estimated at $400,000 and will be required possibly by 2035. 10 yearly structural inspection and reports will be required.

Critical assets

Critical assets identified are:

- the rising main from the intake to the treatment plant.
- the rising main from the main reservoir to the tower reservoir.

Key issues

- resource consent expires 2039.
- the scheme is required to meet the DWS including the development of a PHRMP and associated infrastructure upgrades. For planning purposes it has been assumed that this scheme would be categorised as minor with compliance due by 1 July 2011.
- develop a strategy to cater for future demand without compromising the existing infrastructure.
- the issues for Winton are the ongoing replacement of the 15 km AC gravity main meets the end of their design life in 2015 Replacement of all mains will be complete by 2018.

Capital expenditure plan

The following projects have been programmed to address the above issues:

Winton

Water Supply

Project Name	Project Code	Description	Type*	Year	$Amount	Funding Source
Metering - District Metered Areas	WAT790	MS Project WAT790 in 18/19	LOS	20/21	32,506	District Funding
Turbidity and pH monitoring	WAT1717	Additional project in 18-28 LTP	REN	26/27	23,225	District Funding