Drinking Water

Activity Management Plan 2021-31

August 2021

Ashburton DISTRICT COUNCIL

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Contents

List of tables

List of figures

Introduction

Council operates 12 water supply schemes across the district. These schemes service approximately 71% of the usually resident population of the district (Census 2013).

This plan summarises the Council's long-term strategic and management approach to the operation and maintenance of the community-based drinking water schemes.

1. Key issues for Drinking Water

The biggest single challenge for ADC's drinking water supplies in the near future is achieving compliance with the current Drinking-Water Standards for New Zealand (DWSNZ) and the Health Act 1956 and then maintaining that compliance through future changes to regulations and policy. Across the board we will need to transform our operational practices and process controls to bring water safety risk management to the levels expected, and for some schemes this will mean capital upgrades are required.

This is all occurring in the shadow of significant changes to the governance, regulation, funding, management and delivery of water supplies that could be with us in only a few years.

1.1. Ensuring water safety

Ensuring the safety of the water we supply is the most important job for a water supplier.

Water safety can be thought of as two related activities: compliance and risk management. The Health Act 1956 provides the overarching legislative framework and spells out the duties of water suppliers.

The duty to comply with drinking-water standards is only one of these duties, which also include the duty to ensure adequate supply of water, the duty to monitor drinking water, the duty to prepare and implement water safety plans and the duty to take reasonable steps to supply wholesome drinking water.

1.1.1. Drinking-water standards

The DWSNZ regulate the quality of the water supplied to customers, and govern how that quality is confirmed and reported. This is not the whole story of ensuring water safety.

Most of ADC's water supplies underwent upgrades in the 2003-2013 in order to meet the DWSNZ. Many of these are in need of further upgrades, which can be grouped into a few classes:

- Methven Springfield and Montalto never received their DWSNZ upgrades due to changing regulatory conditions for rural-agricultural schemes;
- Methven and Mt Somers received upgrades but these are not sufficient to guarantee protozoal treatment compliance in very wet weather events;
- Hakatere is likely to need additional treatment to meet a more stringent treatment requirement.

As new standards come in in the coming years, and the multi-barrier approach is more strongly-embedded, is it likely that additional layers of treatment may be needed for the schemes which currently receive minimal treatment, mainly the deep groundwater-sourced schemes.

The rural-agricultural schemes (Methven Springfield and Montalto) present a particular challenge, as they have relatively high demand and few customers.

1.1.2. Water Safety Plans

The duty to prepare and implement Water Safety Plans (WSPs) recognises that complying with the DWSNZ is a necessary but not sufficient condition for ensuring water safety. There is more to do.

WSPs are a critically important aspect of an overall water safety system. They document, among other things: the processes and procedures that are in use by operators and managers, an assessment of possible risks and failure modes, responses to incidents or causes for concern, monitoring systems, the approach to record-keeping and documentation, and auditing procedures. They also include a clear improvement plan for the future of the water supply, and a commitment from management and governance to implement the WSP.

The status of WSPs has been enhanced by recent changes to the Health Act. In particular, there is a new requirement, added by the Health (Drinking Water) Amendment Act 2019, to "take all reasonable steps to […] comply with the timetable set out in the supplier's water safety plan".

We are in the process of redeveloping four water safety plans (Methven, Mt Somers, Fairton and Mayfield) under the new 2019 Framework, and there are likely to be others, including Ashburton, prepared in the 2021 calendar year. Crucially, any undertakings under these plans will need to be given effect to through Annual Plan processes if not already scheduled in a Long Term Plan.

1.1.3. Other duties

The remaining duties include duties to monitor drinking water to ensure it meets the DWSNZ and does not pose a risk to public health, to take reasonable steps to supply wholesome drinking water and to ensure an adequate supply of water.

To meet the latter duty, we have reviewed our water supplies and identified areas of risk. In Chertsey, for example, high demand on narrow lines can cause low pressure. In Hinds, repeated leak repairs cause multiple interruptions to be experienced. In Rakaia, the bore is a single point of failure: should the bore pump fail, or maintenance be required on the bore or headworks, providing water for an extended period by tanker is impractical, so we are proposing a second bore to provide redundancy.

Wholesome drinking water is water which not only meets the standards but also meets the guideline values for aesthetic factors. Water which is not wholesome may be regarded as having an unusual or unpleasant taste, smell or odour. An example of where this may be a concern is in dead ends, where low water turnover can lead to strong chlorine smells. As an example, we are proposing to renew a water line in Upper Hakatere with one which is of sufficient size to be flushed easily, and to add a flushing point for this purpose.

1.2. Future management and governance structure

The government is undertaking a detailed, top-to-bottom review and reform programme for the three waters services, to determine how to improve the management of drinking water, wastewater, and to a lesser degree stormwater. This is in response to a number of significant recent events (cost overruns on two large wastewater schemes, contamination and illness outbreaks, and concerns from the Auditor General and Productivity Commission about investment and regulation of three waters infrastructure). In particular, attention was drawn to a "dispersal of responsibilities in the sector"[1]. This work is being led by the Department of Internal Affairs.

As of July 2020, the Government's "starting intention is public multi-regional models for water service delivery to realise the benefits of scale for communities and reflect neighbouring catchments

[1] Government review of three waters services (Cabinet Paper), https://www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-review-Cabinet-Paper_Redactions-applied/$file/Three-waters-review-Cabinet-Paper_Redactions-applied.pdf

and communities of interest". This is intended to create fewer larger entities, owned by local authorities.

The fine details of the final arrangements are still to be determined. This will be developed by the local government sector in conjunction with central government. There is a timetable of approximately 3 years, running through to July 2023, comprising three main phases:

- Councils sign up to a memorandum of understanding (MoU) agreeing to work together in good faith to consider multi-region groupings. This phase does not commit ADC to anything, and Council has agreed to this.
- Councils opt-in to multi-region groupings and begin the planning. At this point there is a binding commitment made to joining the larger entities.
- The new entities form and establish themselves, beginning operation somewhere in late 2022.

Each phase is likely to be accompanied by a tranche of funding. This funding is partly a response to a need for greater investment and partly a recognition that Covid-19 has had an effect on funding.

While we understand the general shape of the reforms, the specifics are uncertain. The effects are likely to be felt in the areas of governance and funding, and consequently in prioritisation, if funds and projects are considered regionally or cross-regionally.

ADC has not committed to joining any new entity, so our current planning and the timing of projects is based on status quo continuing.

1.3. Aging infrastructure

The reticulation networks for Ashburton, Methven and Rakaia are all at, or approaching, the end of their expected lives. Because each of these was installed as a system the pipes within each network are all of similar age and will need replacing at a similar time.

To manage the impact of the replacement costs, the renewal work will need to be spread over a number of years. The risk of spreading this renewal work is that the later assets may fail before they are replaced and need emergency replacement, or at least there may be an increased maintenance cost to repair assets until they can be fully renewed. The risk of premature failure can be mitigated through careful planning and consideration of asset condition information.

A large programme of facility upgrades between 2003 and 2013 has meant that most of the water supply facilities have not needed significant renewals expenditure. However we are now beginning to see components reaching end of life and needing replacement, and this LTP will include a number of scheduled renewals and an allowance for those renewals which cannot reasonably be programmed.

1.4. System capacity and demand

On the whole and when storage is taken into consideration, the district's water supplies have adequate capacity, even accounting for forecast growth, and no facility capacity upgrades are indicated at present. There some exceptions:

- On the Methven, Rakaia, Hinds, Hakatere, and Mt Somers supplies, peak flows in summer can exceed the nominal capacity of the treatment plants. This is not a problem at present, because the peaks last 1-3 hours and the schemes have storage designed to buffer these peaks. But, this is an indicator that there is less headroom on these than on other schemes.

Investigations are planned and have taken place to determine the size, duration and frequency of these peak flows and to investigate causes (e.g. leaks, high demand). Loss and leakage reduction is always considered as a first approach before large capital expenditure.

- While Ashburton has adequate capacity at present, the fact that the supply has no storage and higher capacity and resilience requirements for firefighting means that it is important to plan for increased capacity in the future. The main goal is to ensure peak instantaneous flow demand can still be met. Water loss detection work has helped to identify some leaks in areas of the town.

Schemes with high presumed water loss at the moment include: Ashburton (MNF of 38 L/prop/hr), Rakaia (MNF of 24 L/prop/hr), Hinds (MNF of 66 L/prop/hr), and Dromore (MNF of160 L/prop/hr). A good result would be under 10 L/prop/hr, and ideally below 5 L/prop/hr. Minimum night flow may not be entirely representative for small, rural schemes where the absolute numbers are small and a small amount of leakage can have a large impact on a scheme's minimum night flow.

Notwithstanding the spare capacity available at most of the schemes, Council has a requirement to manage demand to reduce or maintain per-property consumption. This has positive outcomes for the environment and also for eliminating the costs of supplying water which goes to waste. This is enshrined in two of the performance measures.

This LTP proposes to continue the rollout of smart water meters on all properties across the district to help with leak detection, demand management and water use education. However, it is important to note that universal water charging is not proposed for this LTP, but may be considered again for the 2024-34 LTP once meters have been installed.

1.5. Fluoridation

Currently only Methven's water is fluoridated. The Health (Fluoridation of Drinking Water) Amendment Bill, which would have given DHBs the power to decide whether to mandate fluoridation within their areas, or to direct that fluoride not be added, remains to be enacted and it is unclear if this bill will be progressed or whether there will be direction from another source, such as new DWSNZ.

Given these uncertainties, we have assumed status quo for the purposes of long term planning. If the bill passes or there is other direction provided, the issue will obviously be revisited.

2. Activity description - Drinking Water

2.1. What we do

Council operates 12 water supply schemes across the district. These schemes service approximately 71% of the usually resident population of the district (Census 2013).

Table 1: Council water supplies

Scheme	Registered Population	Km of reticulation	Source				Treatment					
			Secure groundwater	**Infiltration gallery**	**Groundwater**	**Surface water**	**Filtration**	**Iron & manganese removal**	**UV sterilisation**	**pH correction**	**Chlorination**	**Fluoridation**
Ashburton	19,000	212								✓	✓	
Methven	1,700	42		✓			✓		✓		✓	✓
Rakaia	1,100	15	✓								✓	
Hinds	340	7									✓	
Mt Somers	260	14		✓			✓		✓		✓	
Chertsey	230	9									✓	
Fairton	210	3	✓								✓	
Methven Springfield	180	86		✓					✓		✓	
Mayfield	160	4									✓	
Hakatere	110	1			✓			✓	✓		✓	
Montalto	100	80				✓			✓		✓	
Dromore	90	24									✓	
Totals	**23,480**	**497**										

Operations and maintenance is covered by a contract with Ashburton Contracting Limited. This contract was tendered in 2020 and is discussed further later.

Refer also 13.1 Appendix A – Current Valuation by Scheme

2.2. Why we do it

Council operates water schemes to promote the health and safety of the community through the provision of an efficient, safe and reliable water supply.

The Health Act 1956 requires Councils to improve, promote, and protect public health within their Districts.

3. Goal for Drinking Water

ADC seeks to provide communities with access to safe, reliable and potable water at an affordable cost. We aim to meet statutory obligations and customer expectations while anticipating and reacting to the changing needs of the District.

3.1. Our principles

These are the guiding principles for how we will function and deliver activities and services to the community.

- Plan and provide fit for purpose services.
- Work with the community and engage in meaningful conversations.
- Lead the community with clear and rational decision-making.
- Represent the district on regional / national issues and partner with others when needed.

3.2. Our contribution to our community outcomes

Drinking Water contributes to the following Community Outcomes as shown below.

	Residents are included and have a voice	A district of great spaces and places	A prosperous economy based on innovation and opportunity	A balanced and sustainable environment
Drinking Water		✓	✓	✓

4. Levels of service and performance measures for Drinking Water

4.1. What are we trying to achieve

Council manages performance to monitor levels of service and improve service delivery. Performance measures for drinking water are reported through the 6-Monthly Performance Report, Annual Report and reports to Council.

The mandatory performance measures initially adopted for the 2015-25 LTP were retained for the 2018-28 LTP and again for the 2021-31 LTP. These focus on:

- Ensuring water is compliant with the DWSNZ
- Minimising both customer water demand and water loss
- Reducing the number of customer complaints and maintain good response times to incidents

- A further performance measure has been included looking at resident satisfaction with the quality of Council supplied drinking water.

The performance measures are outlined in the following table:

4.1.1. What we plan to do and our levels of service

What we're aiming for: To promote the health and safety of the community through the provision of an efficient, safe and reliable water supply.

WHAT WE'RE WORKING TOWARDS (Levels of service)	HOW WE'LL MEASURE PROGRESS (Performance measures)		HOW WE'RE PERFORMING NOW (2019/20 results)	WHAT WE'RE AIMING FOR 2021/22	2022/23	2023/24	2024/25 – 2031/31
We provide quality drinking water to connected properties	All Council drinking water schemes achieve bacteria compliance* *The extent to which Council's drinking water supplies comply with part 4 of the DWSNZ – bacteria compliance criteria.*		91.7% (11/12)	100%	100%	100%	100%
	All Council drinking water schemes achieve protozoal compliance* *The extent to which Council's drinking water supplies comply with part 5 of the DWSNZ – protozoal compliance criteria.*		16.7% (2/12)	100%	100%	100%	100%
Council contractors respond to drinking water failures and requests with median response times	Median response time (in hours) to urgent and non-urgent callouts* *Where Contractors attend a call-out on Council's behalf to a fault or unplanned interruption to a Council networked reticulation system, the median response times are measured, from the time Council receives the notification to the time that service personnel reach the site, and to the time that Council received notification of resolution of the problem:*	Urgent call-out attendance	0.33 hrs (20 minutes)	1 hour	1 hour	1 hour	1 hour
		Urgent call-out resolution	2.40 hrs	4 hours	4 hours	4 hours	4 hours
		Non-urgent call-out attendance	0.23 days (5.47 hrs)	1 day	1 day	1 day	1 day
		Non-urgent call-out resolution	0.95 days (22.8 hrs)	5 days	5 days	5 days	5 days
We provide efficient and sustainable drinking water services	Reduction in real water loss from the reticulated systems* *The percentage of real water loss from Council's networked reticulation system is estimated using Minimum Night Flow (MNF) analysis, following an approach similar to Appendix A of the Water NZ Water Loss Guidelines and section 2b of the Water Loss Guidance from the National Performance Framework.*		52%	35%	34%	34%	33%
	Reduction in average consumption/resident/day* *The average consumption of drinking water per day per resident with Ashburton District.*		714 L	≤735L/ resident/ day	≤720L/ resident/ day	≤706L/ resident/ day	≤692L – 642L/ resident/ day

* Mandatory performance measure set by the Department of Internal Affairs

WHAT WE'RE WORKING TOWARDS (Levels of service)	HOW WE'LL MEASURE PROGRESS (Performance measures)		HOW WE'RE PERFORMING NOW (2019/20 results)	WHAT WE'RE AIMING FOR 2021/22	2022/23	2023/24	2024/25 – 2030/31
The majority of residents are satisfied with our drinking water services	Customer satisfaction with drinking water services* *The total number of complaints received by Council expressed per 1,000 connections about:*	A) Clarity B) Taste C) Odour D) Pressure or flow E) Continuity of supply F) Council's response to any of these issues	7.85 complaints/ 1000 connections	≤10 complaints/ 1000 connections	≤10 complaints/ 1000 connections	≤10 complaints/ 1000 connections	≤10 complaints/ 1000 connections
	Residents are satisfied with Council's drinking water supplies		83%	80%	80%	80%	80%

* Mandatory performance measure set by the Department of Internal Affairs

4.2. How will we know if we are achieving it

4.2.1. Reporting of performance measures

Council manages performance to monitor levels of service and improve service delivery. Reporting performance information is a key element of performance management. Interpreting results and communicating them to Council, management and the community provides a picture of service performance across Council. Performance measures for drinking water are reported through the Triannual Performance Report, Annual Report and reports to the Infrastructure Services Committee.

4.2.2. Historical performance

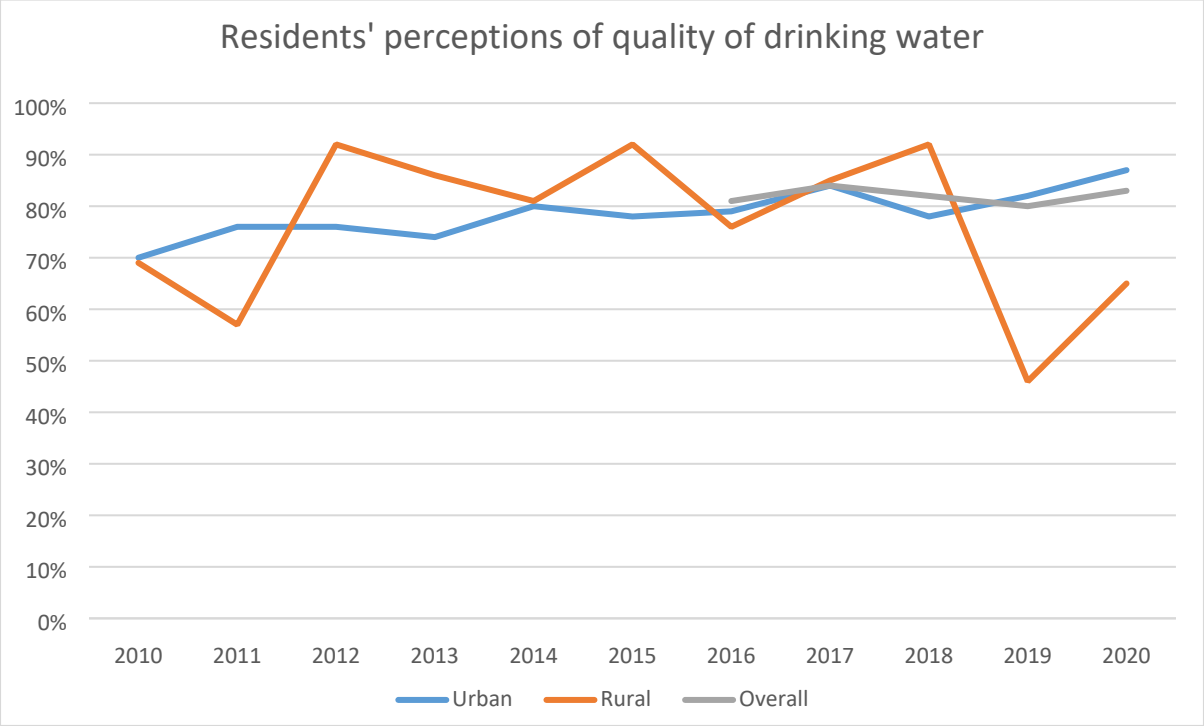
Council's annual residents' survey previously measured satisfaction with drinking water, split into two user groups: urban and rural. Changes made to the annual survey from 2016 onward have meant the new trends cannot be compared. Future AMPs will utilise the new trend data.

Residents were asked how satisfied they were with:

- the quality of the water supply they were connected to; and
- the reliability of their water supply

The results are shown below:

Figure 1: Resident satisfaction with water supply quality



Urban scheme **quality** satisfaction has averaged 82% in the last 5 years, and has been approaching below the target of 85%, reaching 87% in the 2019-20 year. Rural scheme satisfaction averaged 73%, just above the target of 75%. In the rural area this is quite volatile due to relatively small numbers of respondents. These schemes are also affected more by boil water notices and rain events, which may strongly affect perception.

5. Management of the Drinking Water activity

5.1. General

5.1.1. Operation and maintenance

The Council intends to continue to own, control and manage all of the public systems, but the work of actually operating and maintaining them is contracted out. However, should Council sign up to the larger three waters reform process this may result in the assets and their management transferring to another entity.

The operation and maintenance of drinking water assets is contracted out to Ashburton Contracting Ltd (ACL). ACL is required to operate and maintain the assets to achieve specified outcomes and ensure they provide the required levels of service.

The contract is performance based with a focus on forward programming, preventative maintenance and reporting, however, there are certain minimum standards. Contract works must be carried out to an acceptable standard, at the least cost, with minimum disruption to the community and the environment.

In accordance with Section 17A of the LGA 2002 a review of the cost-effectiveness of current arrangements was completed. One of the difficulties identified during the review was that a negotiated contract with one party made it difficult to demonstrate cost-effectiveness. The current contract, which commenced in July 2020, was competitively tendered and was won by ACL.

5.1.2. System control and monitoring

Council operates a SCADA (Supervisory Control and Data Acquisition) system, providing surveillance of the treatment plants and reservoirs in the water system and providing alarms when equipment fails or when operating parameters are exceeded. The SCADA system also records operational data. 18 water supply sites are presently monitored. There are also a small number of data loggers in use for pressure and flow monitoring, which are used where sites do not have access to mains power.

The overall SCADA system has evolved from its original purpose as an operational and alarming tool to a business information, asset management and compliance system, critical to maintaining the existing levels of service. SCADA provides the ability for Council to ascertain faults and instigate repairs without affecting the service to the consumer and plays a significant role in maintaining the efficiency and reliability of the utility schemes.

Given this increased criticality, investment has been made already and more is needed in this LTP period to improve capability, resilience and trustworthiness.

The approach is in four parts:

- Preparation of a telemetry AMP, a document which outlines the purpose of the system, identifies stakeholders, risks and issues, and sets out a future direction and long term strategy. This will also include standard procedures and start the process of designing a good QA system.

- Progressive renewal of older remote telemetry units (RTUs) and data loggers with newer units with improved capability. The oldest RTUs which did not support data logging have been replaced already, but a further 18 sites are approaching 20 years old, are no longer supported by the manufacturer and are in need of renewal.
  On the data logger side, we have selected a modern replacement logger range which is cellular, can be externally-powered and has larger memory and more advanced capabilities. Expanding the use of modern loggers will allow maintenance on remote sites to be reduced and can minimise site visits.
- Upgrading the communication equipment to provide higher data rates and communications redundancy. A new radio network has been established with new digital radios. For the most critical signals an out-of-band alarm system could be used; for example an alarm for water treatment failure, sent by SMS using a different cellular provider.
- Development and implementation of a QC process for telemetry and signals, the cornerstone of this being an end to end testing programme. This does not replace a good QA system but will allow earlier proactive rather than reactive fault identification.

5.1.3. Water loss

Unaccounted-for water is water which has still been treated and supplied but is lost either in the networks or through unauthorised consumption, and it has a cost in chemicals, electricity and wear and tear on treatment facility and reticulation assets. Minimising water loss involves identifying and quantifying the problem, locating where water is escaping the network, and fixing the leaks.

Water loss is currently measured by council using minimum night flow (MNF) analysis. This provides an indication of which schemes have the greatest water loss and helps target future work programmes.

On some schemes we have installed meters on every connection, which allows for a more fine-grained approach to be taken. A water balance can be carried out, comparing the total amount supplied from the treatment plant with the total amount that passes through the meters, which results in an estimate of water loss to leaks in the reticulation. The smart meters being installed can also spot private property leaks and allow an estimate of private leakage.

This LTP proposes to continue to address water loss through two main approaches:

- Continue funding and carrying out leak detection as a cyclic programme, to identify and locate public and private leaks; and
- Carry out a trial in Methven by installing smart meters in the township to assess both private and public water loss. If shown to be significant, we will consult through the 2024-34 Long-Term Plan on installing smart water meters in Ashburton and Rakaia.

5.1.4. Firefighting

The Ashburton domestic water supply has been designed as a fire fighting supply as described in the New Zealand Fire Service Fire-fighting Water Supplies Code of Practice. Methven and Rakaia would meet the code of practice to a point, but reticulation upgrades may be required to fully comply.

Fire hydrants are installed in a number of other townships primarily as flushing points only. The volume of stored water, pumping capacity and reticulation capacity in these schemes is generally inadequate to provide for the necessary residual fire flows and stored water requirements as set out in the New Zealand Fire Service Fire-fighting Water Supplies Code of Practice.

If any of the rural and township schemes are to provide adequate fire flows in the future, pumping and reticulation upgrades will be necessary.

5.1.5. Forecasting assumptions

The broad underlying assumptions that form the basis for the water supply AMP development are presented below.

Table 2: Water supply forecasting assumptions

	Management area	Assumption	Comment
1	Major project & capital works	Procurement will be provided that delivers the defined Level of Service within budget, at a similar cost to that presently incurred.	Construction project costs have been estimated using the following uncertainties: Tendered +/-5% Designed +/-10% Estimate +/- 30%
2	Demand management	Leak detection and other approaches will be used to improve current per-property water consumption rates.	Efficiencies in scheme use may not be achieved; e.g. sufficient reduction in water loss may not be possible or cost-effective.
3	Asset lives and depreciation	Assets will not wear out more quickly than forecast and require replacement earlier than planned.	If assets require replacement more quickly than forecast, renewal projects may need to be brought forward.
4	Population forecasts	The level of population growth will be as forecasted.	-
5	Assets aging	No attempt has yet been made to predict increases in maintenance costs that might occur.	-
6	Method of service delivery	A new contract having been issued, O&M will not change until 2025. Management, funding and governance will not change significantly.	While there is the prospect of significant change in the next 3 years, ADC has not committed to anything and thus status quo has been assumed.
7	Renewal forecasts	This is based on the current knowledge of asset condition and performance, and levels of service identified in this AMP.	Analysis of asset renewal requirements will increasingly be undertaken using predictive modelling. Some increases and decreases in expenditure may result.
8	Land use change	There will be no sudden changes in network demand caused by sudden changes in land use.	-
9	Schemes	No additional schemes will be created and none will be removed or shut down.	There is a possibility that Methven and Methven Springfield may share a treatment plant in future but this is not confirmed. Some smaller schemes may request Council support of takeover, but there are no firm plans. Lower Hakatere will have been joined with Upper Hakatere by the time this plan commences.

5.1.6. Renewal strategy

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

The purpose of the renewal strategy is to ensure that:

- Replacement of assets is carried out at the most appropriate time
- The most effective benefit is received from any asset renewals
- Renewals contribute to compliance with water supply levels of service

The major drivers for the Council's water main renewal strategy are presented below:

Table 3: Major drivers for water main renewal strategy

Driver	Effects	Comment
Water main failure	Level of service compliance	Risk of water main failures. Consequences could range from excessive water loss or pressure problems to loss of supply.
Risk aversion for critical assets	High consequence if failure occurs	For some assets the consequences of failure are greater than others. Examples include the railway and State Highway crossings in Rakaia, Ashburton and Tinwald, and the trunk main at Methven.
Construction occurring in roading network (renewals, sealing, other pipeline upgrade etc)	Digging up new formed or sealed roads	Loss of community confidence in Council.
Cost effective means of providing the service	Increased costs	Water main replacement projects are required to take account of whole-of-life factors like network valving (to reduce the impact of shutdowns), provision of ridermains (to reduce service road crossings) and future development or renewals.

Ashburton and Rakaia have a large quantity of pipe approaching end of life in the next 30 years, and Methven's water reticulation comprises a proportion of small diameter steel pipe from the early 1920s. A programme to prioritise and replace these has been underway for a number of years and is expected to continue throughout the LTP period, assuming expenditure matches depreciation. In particular in Rakaia very limited condition and deterioration information is available to allow the distribution of the expected times of first failure to be found, and in turn to inform the size and duration of any renewal programme. This will need to be addressed in the first few years of the plan to allow detailed planning to take place.

Managing a large renewal peak like this will require careful prioritisation to minimise risk of failures, to minimise written-off value in serviceable pipes and to spread expenditure appropriately across the programme.

Water take consents are due for renewal between 2030 and 2041. While the future consenting environment is unknown, it is reasonable to assume that Council will need to demonstrate appropriate demand management and steps towards reductions in water losses. If the programmed expenditure is insufficient to show a significant rate of reduction in water losses, then it may be necessary to increase the rate of renewal.

6. Changes made in the Drinking Water activity

6.1. Capital work

In a major project, all of the below-ground boreheads in Ashburton were converted to above-ground structures in new fenced compounds. This project was to improve the security and safety of these bores and included retrofitting sanitary seals to some of the older bores which did not have them.

Other works at the treatment plans have focused on instrumentation, such as a project underway to convert all sites to automatically-controlled chlorine dosing. Ultraviolet transmittance (UVT) meters have also been installed at the Ashburton plants to help understand the range of water that future UV disinfection equipment might be expected to deal with.

On the reticulation side, the majority of work has been focused into the Ashburton CBD where renewals have been brought forward a few years to be completed prior to major roading and streetscape works in the area. This has meant that other projects have been delayed, but the effect on the network has been minor.

Pipeline extensions were constructed around the edges of Ashburton in response to community requests. In these areas a number of private bores dried up and the ratepayers asked Council to extend the water supply service. The pipelines were constructed after consultation with the affected communities, and the costs were either met by the connecting property owners or will be met by the property owners when they connect in the future.

These extensions included Beach Road East, Johnson Street, Murdochs Road, Wilkins Road.

New subdivisions have been vested, bringing new reticulation assets, including Oaklea and Cawton Grove in Tinwald, Braebrook in Ashburton, and additional stages of Lake Hood.

6.2. Drinking Water Standards compliance investigations

The Mt Somers and Methven water supplies have, at times of high rainfall, had difficulty demonstrating protozoal treatment compliance consistently. There are two components to this:

- High turbidity causes non-compliance with the cartridge filter requirements, which only allow turbidity to be above 1.0NTU for a maximum of 3 minutes at a time.
- Low UV transmittance causes low UV dose, which causes non-compliance with the UV disinfection requirements.

These two components are related but not the same; turbidity and UV transmittance are only loosely correlated.

In addition, the Methven Springfield and Montalto schemes are yet to receive upgrades that would see them achieve protozoa compliance. This was initially delayed pending the release of DWSNZ guidance regarding rural agricultural supplies, and subsequently the rules have changed again for these schemes. There remains a great deal of uncertainty.

Investigations are ongoing to further understand these problems, and solutions. Council has been working with Beca and to date a detailed options analysis has been carried out on these schemes, including an assessment of options for alternative water sources. It has been decided that Methven will be the first priority, and it is likely that the Methven Springfield scheme can be supplied from a common treatment facility.

7. Key projects for Drinking Water

Membrane Treatment Plant Upgrades - $12.4M, Y1-3

This project proposes the installation of upgraded water treatment equipment at three locations: Methven (to serve the Methven and Methven Springfield schemes), Mount Somers and Montalto.

This is needed to ensure compliance with the protozoa treatment aspects of the DWSNZ.

In Methven and Mt Somers, upgraded treatment systems were installed in 2010-2013 with the intention of meeting the protozoa treatment requirements of the DSWNZ. These comprised 1µm cartridge filters and UV disinfection equipment. Since installation these systems have provided good treatment for most of the time. However, during periods of especially poor water quality such as heavy rainfall they cannot meet DWSNZ requirements for turbidity or UV dose.

When we cannot guarantee that the water is being treated in accordance with the DWSNZ we are required to issue a boil water notice to continue supplying the water. This happens typically a handful of times a year, and last on average for average 5 days, and up to 10. Boil water notices are inconvenient for residents and can be very costly for businesses, especially in the hospitality sector. A boil water notice also carries residual risk, as some people may not receive notifications or may not comply with the directions.

Montalto and Methven Springfield were originally intended to have treatment upgrades in 2016, but these were delayed partly because of the expected release of guidelines specifically for rural-agricultural water supplies and partly because of the early difficulties demonstrating compliance in Methven and Mt Somers. Subsequently these schemes were included in the same investigation project as Methven and Mt Somers.

The conclusion of the Beca investigation is that all four of these schemes cannot be adequately serviced by a cartridge filter and UV combination at all times, based on a programme of turbidity and UV transmittance measurements undertaken. Therefore the best solution, assuming no change to the model of having separate schemes, is either a membrane treatment system or coagulation, clarification and filtration setup. The final solution has yet to be definitively selected, and will depend on the details of the site and the final costs. Both are expected to have a similar cost and for the purposes of discussion we refer to the upgrade generically as a “membrane”.

What has been included within our 10 year plan is as follows:

- Year 1: Investigations and design of new treatment systems for Methven, Methven-Springfield and Mt Somers.
- Year 2: Construct new treatment system for Methven and Mt Somers.
  Carry out investigations and design for the Montalto treatment plant.
- Year 3: Construct new treatment system for Methven-Springfield and Montalto.

However, due to the significant cost this would impart on the Montalto and Methven-Springfield scheme users, we are currently investigation the option of one treatment plant covering all four schemes. This would significantly reduce the cost if it is feasible. The above funding in the budget is therefore a placeholder and represents the ‘worst case’ scenario.

UV Treatment Upgrades - $3.4M, Y1-4

This project makes provision for installing UV disinfection on all the deep groundwater supplies (Ashburton, Chertsey, Dromore, Fairton, Hinds, Mayfield, Rakaia).

This provides a second barrier to bacterial and protozoal contamination of the source water and is likely to be an important measure in the future. ‘Secure’ groundwater status is increasingly challenging to obtain and maintain as the requirements get stricter, so a second factor provides assurance that compliance can be maintained.

Water Meter Installation - Methven trial - $1.0M, Y1

Water meters will be installed in Year 1 in the Methven township. Analysis of water loss data will be undertaken in Year 2 to identify whether there is a significant amount of water lost from the system – as per our estimates, and what proportion of leaks are on private versus public property.

We will then consult with the community through the 2024-34 Long-Term Plan to install water meters in Ashburton and Rakaia if the Methven trial shows it would be worthwhile.

This project is part of a package of work items intended to reduce our reported water loss figure. Currently we report a water loss figure of 52%, weighted across the district, ranging from 4% in Mayfield to 53% in Ashburton. This estimate is based on minimum night flow, because without widespread water meters it is impossible to provide a robust estimate of actual unaccounted-for water. The basic proposal is to install smart meters with the ability to be read with drive-by equipment; this system can be optionally adapted to use fixed concentrators and report automatically to the cloud. This option can be explored and retrofit at any time in the future. Water metering will be accompanied by a continuation of a leak detection programme, and the reinstatement of zone meters, for a multi-pronged approach.

Additional Bores - $1.0M, Y2 & 6

This is two projects to drill new bores in Ashburton and Rakaia.

The proposed bore in Ashburton in Y6 is a placeholder to provide additional capacity at either Argyle Park or Bridge Street where consents make allowance for a third, undrilled, bore. The purposes is less about total volume of water, because this is limited by our current resource consent, but more about instantaneous demand, especially in a specific area. For example, if there is a large amount of development around the Argyle Park area and the existing bores are unable to maintain supply at peak times. In any case it is very likely that this will not be needed if water loss is reduced significantly, in which case the project will simply be deferred again.

The proposed bore in Rakaia, by contrast, is to provide redundancy for the single existing bore. Should the bore, pump or headworks experience problems, it is very difficult, and expensive, to provide an alternative supply by tankering water from Ashburton and involves emergency water conservation. This has been identified as a significant risk in our water safety planning.

There are two remaining old bores on site, one of which could practically be brought back into service in an emergency, but this is shallow and does not have a secure borehead. Even if the borehead were raised and a grout seal added its depth would mean it would require treatment. This would therefore not be a suitable source under the DWSNZ from a protozoa perspective and a boil water notice would need to be in effect if it were to be used. Even then, a boil water notice does not remove the outstanding risk, just mitigates it. As such it is unlikely that this would be an acceptable solution in a future WSP.

In addition, having this unsecure bore so close to our water supply bore is a risk to the main bore, threatening its secure groundwater status, so all of the old bore are intended to be decommissioned and filled in the 2020-21 year. In lieu of decommissioning, a grout seal and new borehead could be installed, but as noted above this would still require a boil water notice. A new deep bore is the better option.

Second Reservoir - Methven - $0.5M, Y5

Methven currently has 700m³ of available water storage in an old concrete reservoir. This reservoir has been assessed as not seismically sound, and is therefore at risk of failure in an earthquake situation.

Methven's peak demand is 1800m³/day and typical demand is 1200m³/day. It is desirable to have between 12 and 24 hours of peak day storage, which leads to a desired volume of 900-1800m³.

The first phase, in 2020-21, will add 500m³ of storage. The total storage will be 1200m³, but only 500m³ is seismically resilient.

To mitigate the risk associated with the older concrete reservoir, adding a second 500m³ is proposed. This will bring the total storage to 1700m³, of which 1000m³ will be seismically resilient. This will meet our storage targets.

In the long term the old concrete reservoir will be replaced with a similar sized reservoir to remove the seismic risk, but this is not proposed for 20-30 years to maximise the life of the existing structure.

The timing of this project balances affordability, constructability and risk. The first three years of the programme are relatively full with high-priority water safety projects, which will place heavy demands on both funding and contract management resources. There is a small but non-zero risk that in the intervening time something befalls the old reservoir. If desired, this project may be retimed at an annual plan process.

8. Proposed programme

The following sections describe the proposed projects for the next 10 years. The projects in the first 3 years are proposed and very likely to happen; projects in years 4 to 10 are less certain, and may be altered or reprogrammed for different years in subsequent Long Term Plans.

While there is the distinct possibility of additional tranches of funding being forthcoming from Government, this plan has been prepared on the assumption that ratepayers will be directly funding all of the proposed work. It is expected that any additional funding will be used to bring forward planned work.

8.1. Ashburton (Incl. Tinwald, Lake Hood and District-wide)

This LTP programme continues the ongoing rolling programme of watermain renewals.

This programme also includes some demolitions to finally retire some old buildings and structures, and decommissioning of old unused bores to protect groundwater from possible contamination.

Projects proposed to cater for development include the North-east Ashburton water servicing and there is also provision for an additional bore should one be required to balance demand in a particular area of the town.

One major water safety project is proposed, which is the installation of UV disinfection units. This provides a second barrier to bacterial and protozoal contamination of the source water and is likely to be an important measure in the future. 'Secure' groundwater status is increasingly challenging to obtain and maintain, as the requirements get stricter and stricter, so a second factor provides assurance that compliance can be maintained. This is proposed for all the groundwater-sourced supplies.

8.2. Methven

Methven requires an upgrade to its water treatment to comply with the DWSNZ at all times. While options have been discussed for some time, the most reliable and complete solution is an upgraded treatment plant. There is a possibility that the Methven and Methven Springfield schemes could be combined for a cost of around $2M extra, compared with $3.6M extra to build a separate treatment plant for Methven Springfield. This programme shows the two separately to indicate the worst-case option.

This programme also includes a second new reservoir to complement the first that is scheduled for the 2019-20 year and a renewal of the last section of the old raw water trunkmain. The sizing of this will depend on whether the Methven and Methven Springfield schemes are combined.

There are some small water safety improvements, in particular automated pressure and chlorine monitoring for the reticulation, which will provide greater assurance that the networks are operating safely at all times, and can highlight problems at an early stage.

There are also routine renewals, continuing the ongoing programme there.

8.3. Rakaia

Rakaia's programme features some pipeline renewals, representing the beginning of the renewals programme, the bulk of which will be in the following decades.

As with all of the groundwater-sourced supplies we have proposed adding UV disinfection equipment for water safety.

In Rakaia we also propose drilling a second bore to provide for redundancy in case one bore is out of commission for any reason. Recent experience with an unexpected pump failure highlighted the difficulty of providing a water supply for an extended period. This redundancy also makes pump or borehead maintenance much more practical.

8.4. Fairton

In Fairton the main proposed project, as with all of the groundwater-sourced supplies, is adding UV disinfection equipment for water safety.

We also plan to install a chlorine tank level sensor to provide an early warning of problems with the chlorine supply.

8.5. Hakatere

Hakatere has a number of projects in this LTP.

As part of the agreement to join the Lower Hakatere hut settlement to the Hakatere scheme, an undertaking was given by ADC that renewal of their reticulated network, which is in unknown condition but believed to be relatively poor, would be programmed. We proposed to carry this out in Year 3, which has the benefit of allowing the property owners sufficient time to upgrade on-property plumbing so that the reticulation pressure can be raised closer to ADC's typical range.

Hakatere is also likely to require additional treatment to meet the protozoal standards, as investigations of the catchment thus far have indicated a possibility of a 4-log treatment requirement. The UV unit itself is only able to provide 3 log credits. This log credit requirement has yet to be formally assigned. We are proposing adding a cartridge filter setup and associated run-to-waste system to provide the additional log credits.

Furthermore, this scheme is without a standby generator (one was installed but later removed due to local concerns over cost). In this scheme electrical power is required to run the pressure pumps; without power, water supply is immediately lost. To prevent the risk of backflow, as well as the wider public health impact of loss of water supply, we propose re-installing a standby generator. Cost is weighted less strongly compared to public health in the current water safety environment, and the combining of the household schemes for funding purposes means the impact of these projects is distributed more widely.

We also propose renewing a section of pipe at the end of Hakatere Drive. This pipe is small diameter and as a result is not able to be flushed effectively in response to occasional water quality complaints. Dead ends in Hakatere, as in other schemes, can experience low turnover and need to be flushed from time to time.

8.6. Hinds

Hinds has begun to experience a relatively high rate of pipe bursts and failures in the last 3-5 years, so there are a number of reticulation renewals programmed for this LTP cycle, spread over the 10 year period. If the rate of failure accelerates, the programme will be reconsidered and revised accordingly.

As with all of the groundwater-sourced supplies we have proposed adding UV disinfection equipment for water safety.

8.7. Mayfield

Mayfield's plan includes a few minor upgrades to improve process control and water safety. These include sensors and alarms for chlorine tanks, locks for reservoir lids and, as with all of the groundwater-sourced supplies, we have proposed adding UV disinfection equipment for water safety.

8.8. Chertsey

Chertsey has a few water safety and security improvements proposed, including fencing and lockable reservoir lids. And as with all of the groundwater-sourced supplies we have proposed adding UV disinfection equipment for water safety.

There are also some pipeline renewals proposed. These renewals serve to replace old, poor-quality pipe, and to ameliorate areas which have consistently low pressure during times of high demand.

Finally, the old pressure vessel and pressure switch system is scheduled for replacement with a more efficient modern version based on variable speed drives, to bring it in line with the rest of the district's supplies.

8.9. Methven Springfield

The largest project affecting the Methven Springfield scheme is the protozoa treatment upgrade. This may be carried out in conjunction with the Methven upgrade, or may be a stand-alone project.

In addition, the PRV renewal programme will continue, and some minor upgrades to chlorine dosing and control are planned.

8.10. Montalto

The Montalto scheme also requires an upgrade to meet the protozoa treatment standards, which will be the largest project on the scheme.

Aside from the core treatment upgrade, a backup generator is proposed, which will run all of the plant systems (and could be sized to run any future membrane treatment equipment). We also propose to upgrade the chlorine dosing and control systems.

The intakes also need some repairs, as do the reservoirs at Chapmans Road.

8.11. Mt Somers

Mt Somers is the fourth scheme which requires a major upgrade to its treatment systems to meet the drinking water standards for protozoa. This is programmed for year 2.

This scheme also needs a backup water source formalised, to address a significant risk to the security of the supply. Previously we have used a private bore near the infiltration gallery as a supplementary source, but this needs upgrading if it is to become a routinely-used part of the water supply.

Finally, some minor plant upgrades are proposed. We proposed to renew the turbidity meters which are old and reaching an age where parts are failing and not easy to replace. We also propose locked and alarmed reservoir lids for additional water safety.

8.12. Dromore

As with all of the groundwater-sourced supplies we have proposed adding UV disinfection equipment for water safety.

Also for water safety, we propose locked and alarmed reservoir lids for additional water safety, a chlorine tank level sensor and alarm, and to decommission the old, unused bore on the site.

Dromore also has watermain renewals proposed, renewing essentially the entire reticulation over 10 years. This scheme has a high rate of water loss to presumed leakage and a large number of CRMs received. This pipe is known to be poor-quality.

8.13. Renewals and Depreciation

Generally speaking, we aim to target renewal expenditure in line with depreciation, unless an increased rate of expenditure might be indicated by an increased rate of failures or repairs.

At this stage of their lives, most of the major plant and equipment at the water treatment plants is not reaching the end of its useful life, although this is likely to change towards the end of the LTP period. As a result renewal spending is slanted towards reticulation renewals. As we approach the end of the 2020s the plant upgrades which were completed between 2003 and 2013 will be approaching 25 years old and so the next few LTPs will refocus renewal spending towards renewal of the major plant items.

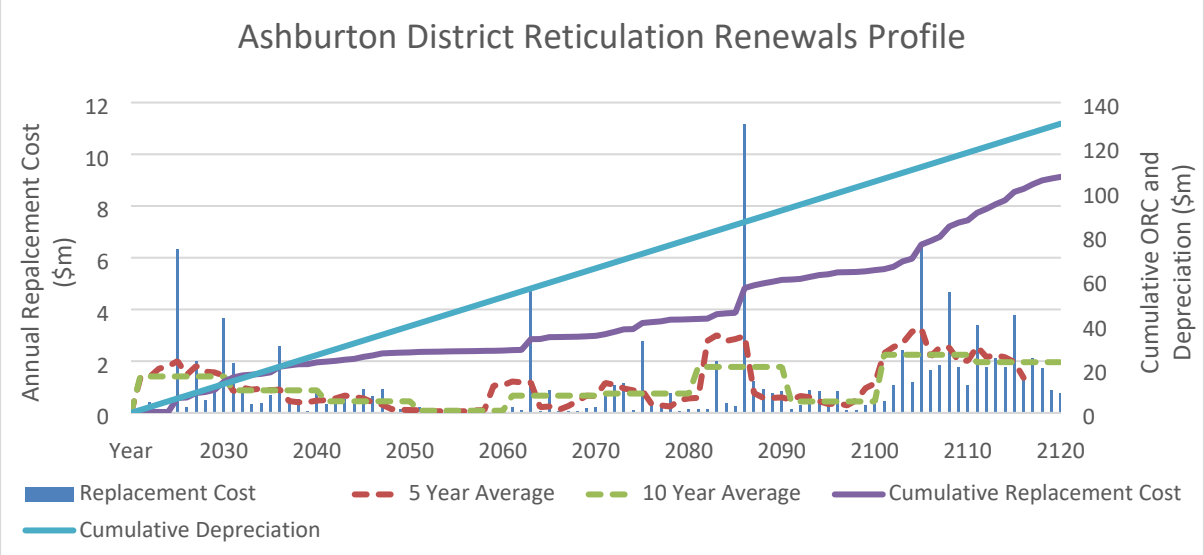
In the district at the moment there are some rural schemes that are beginning to experience higher rates of repairs, notably Hinds and Dromore, and areas where levels of service are beginning to fall below customer expectations (e.g. Chertsey). Therefore there are some larger expenditure years to allow for replacement of this reticulation.

8.14. Renewal Profiles

Renewal profiles show the expenditure required based purely on projected useful life. In practice this expenditure will be spread across a number of years to provide a more constant level of work.

8.14.1. Reticulation renewal profile

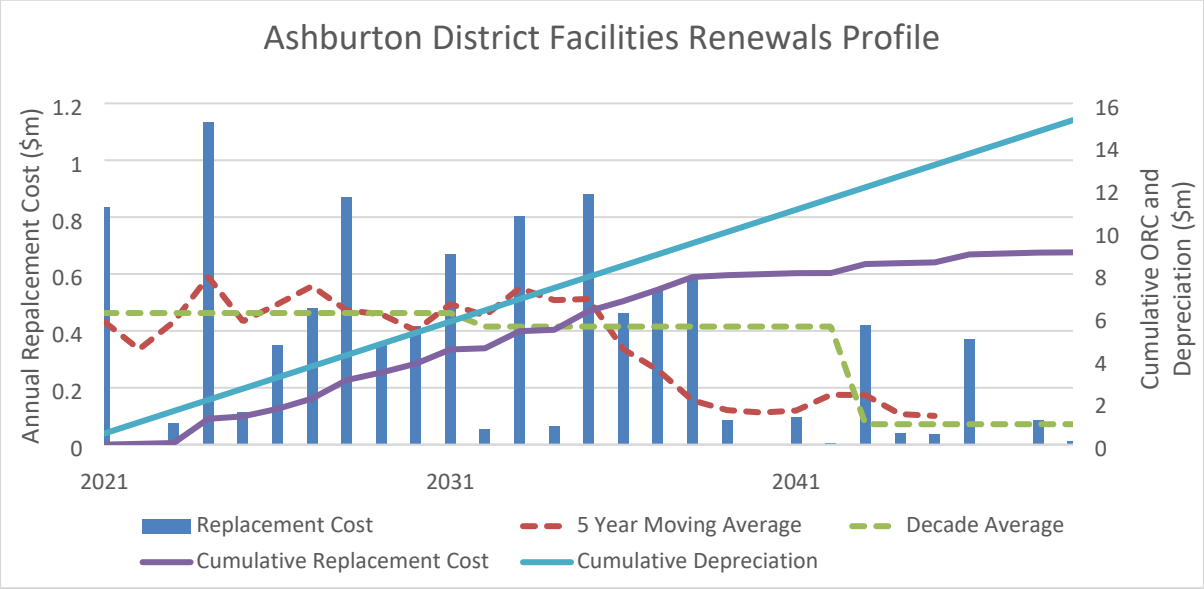
Figure 2: 100 year water reticulation renewal profile



This profile indicates that expenditure requirements approximately match depreciation funding, when spread over 30 years; there is no significant gap or build-up of delayed renewal work. The divergence towards the end of the profile reflects a number of assets which will be renewed early in the LTP and so their next renewal is not shown on the profile. In practice, the renewals for these assets are likely to appear in the early 2100s.

8.14.2. Facilities renewal profile

Figure 3: 30 year water facilities ORC profile



The divergence from depreciation towards the end of this profile reflects a number of assets with lives between 10 and 20 years which will be renewed early in the LTP and so their next renewal is not shown on the profile. In practice, the renewals for these assets are likely to appear towards the end and the cumulative replacement cost will increase accordingly.

Due to the limited componentisation of the facility assets, individual asset replacement years are not available; rather, the assets are allocated to broad categories (e.g. Mechanical and Electrical, Pumps). As a result, it is hard to predict with certainty when individual assets will require replacement.

To account for the above, and to ensure that significant new plant is correctly recorded as facility renewal items rather than being lost under maintenance, an allowance is included for unplanned facility asset renewals. Under the new operations and maintenance contract, more detailed information, at a more granular scale is being gathered which should help us better understand A facility asset condition and performance assessment programme will be developed to refine estimates of expected asset life.

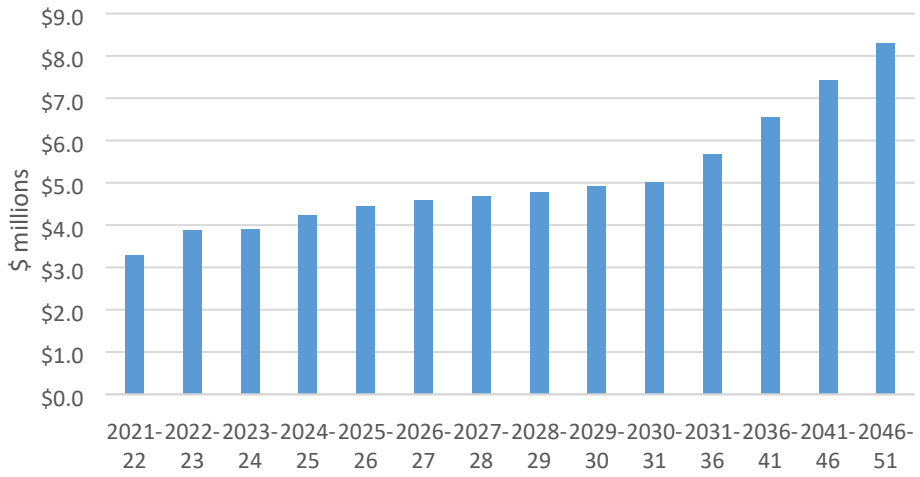
9. Costs for Drinking Water

9.1. Operations and maintenance expenditure

The total estimated operations and maintenance costs for drinking water activities is summarised below. These have been arrived at by applying forecast cost indexation (BERL 2020) to current expenditure, bearing in mind the assumption that there will be no significant change to the method of service delivery and thus no change in the projected cost. This may change if components of the current O&M contract are instead taken in-house.

Please note that the graph below excludes interest, depreciation and overhead charges and is inflated.

Figure 4: Operations and maintenance expenditure (inflated)



The primary operational and maintenance issues associated with the drinking water schemes are:

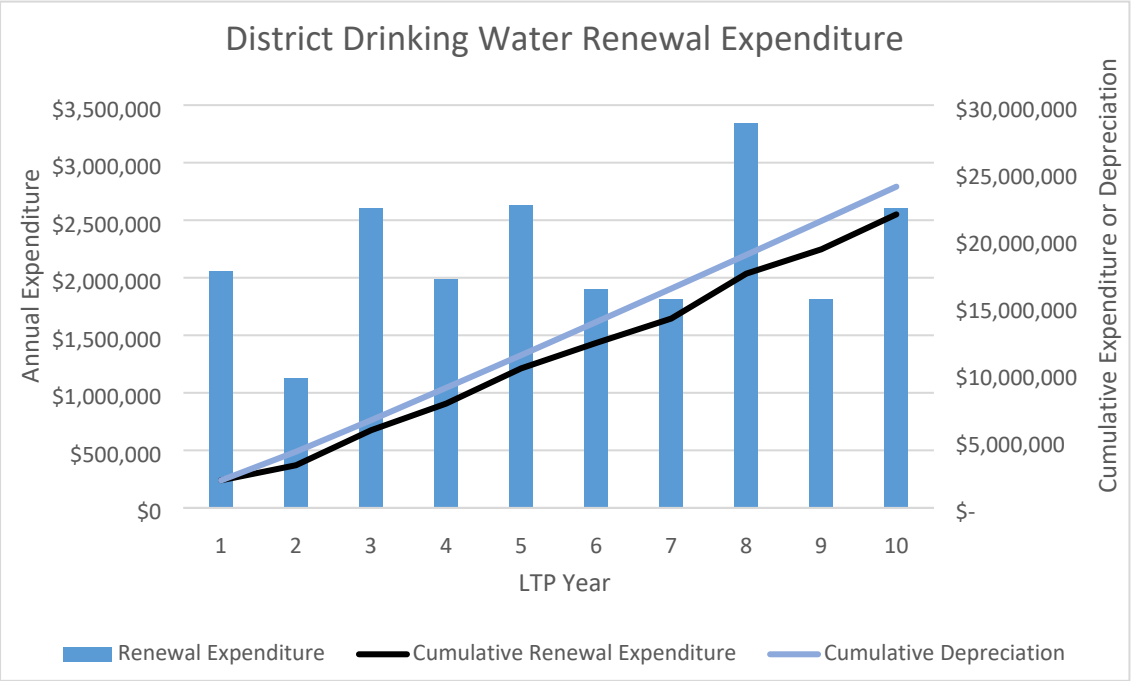
- Increased inspection and monitoring requirements driven by concerns raised from the Havelock North Inquiry.
- A need to ensure that preventative maintenance is being carried out regularly and robustly. This is an area of focus.
- A need to revisit the quantity, quality and medium of asset information being captured by the contractor and reported back to council during the course of operating the network.

Any new operations and maintenance contract will have provision to be integrated with the asset management and information system. This will include electronic data feeds for work orders, related back to unique assets.

9.2. Renewal programme funding

The funding of the renewal programme, for the whole district, is presented below. The expenditure is less than the rate of depreciation, and reflects the fact that a number of the schemes are relatively young and do not need extensive renewal.

Figure 5: District renewal programme expenditure vs depreciation (inflated)



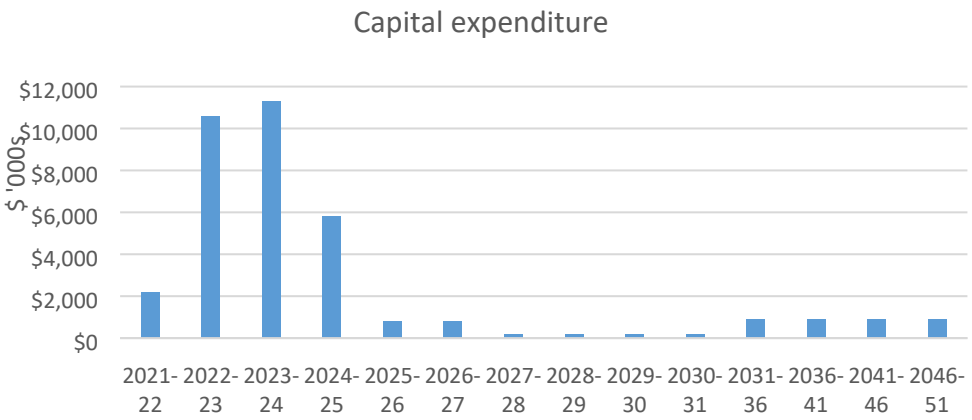
There is an allowance of $150,000 for unspecified facility renewals. This reflects the fact that we do not need wholesale facility replacements at this time, but that individual components are showing their age and needing replacement and some components, e.g. submersible pumps and their controls, can be costly to replace.

A large proportion of the expenditure towards the latter half of the 10-year period is in preparation for the planned second Ashburton urban bridge construction in or after 2025. A number of renewals are planned for the streets near the proposed bridge, including upsizing of the nearby pipes, to allow for the construction of a second pipeline across the bridge to provide additional resilience and capacity into Tinwald and Lake Hood.

9.3. New capital programme funding

New capital programme is funded typically through loan borrowing over 25 yrs. The funding timing of significant project can impact on Council's wider borrowing limits, so projects may need to be distributed over a number of years, or be prioritised against the wider spending needs of the district.

The graph below shows the capital funding requirements for the activity over the 2021-31 period.



The large expenditure in 2022-23 is the expansion of the water reticulation to the North-East Ashburton area. This is contingent on the results of consultation with the affected community, and thus may be deferred temporarily or indefinitely. As with the North-West Ashburton extension, the capital cost is likely to be met primarily or wholly by the ratepayers in that area, rather than the district at large.

Capital works programme

The following table details the annual budget for new capital works until 2028. New capital work refers to the development of new infrastructure, which increases the levels of service and/or the capacity of the asset service.

	Year 1 2021/22 $000	Year 2 2022/23 $000	Year 3 2023/24 $000	Year 4-10 2024/25-2030/31 $000
TOTAL NEW CAPITAL WORKS	**2,043**	**8,324**	**9,019**	**3,224**
Capitalised overheads	141	149	153	1,202
Ashburton water supply				
Peri-urban water servicing	137			3,517
UV disinfection		282	1,447	1,485
Additional bore				690
Chertsey water supply				
Chlorine tank level sensor alarms	5			
Compound fencing and security	20			
Lockable and alarmed reservoir hatches		10		
UV disinfection				49
Fairton water supply				
Chlorine tank level sensor alarm	5			
UV disinfection		52		
Hakatere water supply				
Chlorine tank level sensor alarm	5			
Generator	30			

	Year 1 2021/22 $000	Year 2 2022/23 $000	Year 3 2023/24 $000	Year 4-10 2024/25-2030/31 $000
Filter and run-to-waste system, turbidity analyser	65			
Compound fencing and security	20			
Hinds water supply				
Chlorine tank level sensor alarm	5			
Lockable and alarmed reservoir hatches		10		
UV disinfection			211	
Mayfield water supply				
Chlorine tank level sensor alarm	5			
Lockable and alarmed reservoir hatches		10		
UV disinfection				49
Methven water supply				
Membrane treatment plan	200	4,398		
Reticulation pressure monitoring		31		
Reticulation chlorine monitoring				108
Reservoir upgrade				612
Water meter installation	1,000			
Methven-Springfield water supply				
Membrane treatment plant	200		3,572	
Water meter installation		24	12	
Chlorine analyser and dosing control		31		
Chlorine tank level sensor alarms		5		
Montalto water supply				
Generator	30			
Chlorine analyser and dosing control	30			
Chlorine tank level sensor alarms	5			
Membrane treatment plant		367	3,762	
Mt Somers water supply				
Lockable and alarmed reservoir hatches		10		
Membrane treatment plant	258	2,666		
Additional source investigation				98
Rakaia water supply				
Second bore installation	23	440		
UV disinfection			15	309

Capital renewals programme

The following table details the annual budget for capital renewals until 2028. Capital renewals refers to the programmed upgrade or replacement of existing assets. In some cases this may result in an increase in the levels of service and / or in the capacity of the asset to service increased demand.

	Year 1 2021/22 $000	Year 2 2022/23 $000	Year 3 2023/24 $000	Year 4-10 2024/25-2030/31 $000
TOTAL CAPITAL RENEWALS	**2,055**	**1,124**	**2,611**	**16,204**
Capitalised overheads	215	226	232	1822
Ashburton water supply				
Telemetry unit renewal	75			
Water meter replacements	50	51	53	255
Water facilities asset renewals	150	155	159	1,236
Watermain renewals	675	686	802	7,011
Lime dosing equipment			137	
Chertsey water supply				
Pressure system replacement				38
Watermain renewals				685
Water meter renewals				13
Dromore water supply				
Watermain renewals			34	2,717
Water meter renewals				3
Hakatere water supply				
Watermain renewals		15	327	
Softener media renewal				19
Water meter renewals				6
Mayfield water supply				
Water meter renewals				6
Methven water supply				
Watermain renewals	695	75	138	877
Water meter replacements				38
Methven-Springfield water supply				
Rolling PRV renewal programme	75	77	79	338
Water meter renewals				3

	Year 1 2021/22 $000	Year 2 2022/23 $000	Year 3 2023/24 $000	Year 4-10 2024/25-2030/31 $000
Montalto water supply				
Reservoir renewals		41		
Intake repairs			423	
Mt Somers				
Turbidity meter renewal	35			
Trunkmain renewal				294
Water meter renewals				3
Rakaia water supply				
Watermain renewals		15	289	1,156
Water meter renewals				19

9.4. General approach to funding

Council's approach to funding its activities is detailed in its Revenue and Financing Policy.

Properties connected to a 'household' community potable water scheme are charged a group-targeted fixed rate. Water schemes in this group are: Ashburton (including Tinwald and Lake Hood), Methven, Rakaia, Chertsey, Fairton, Hinds, Hakatere, Mayfield, Mount Somers and Dromore.

The group-targeted fixed rate recovers the collective operating expenditure and capital expenditure for all schemes in the group.

The Methven-Springfield and Montalto rural potable water schemes are combined drinking water and stockwater schemes and are charged a water rate based on units of water and hectares respectively.

Non-residential or extra-ordinary water connections are charged the fixed rate, entitling them to 1m³ per day. Usage in excess of this amount is metered and was charged on a per cubic metre basis, billed quarterly. An exception is rural residential connections, defined as residential connections in the Residential D and Rural A zones, which receive an allowance of 1200L/day and are billed annually, rather than quarterly.

9.5. Funding requirements

For Drinking Water

	Annual Plan 2020/21 $000	Year 1 2021/22 $000	Year 2 2022/23 $000	Year 3 2023/24 $000	Year 4 2024/25 $000	Year 5 2025/26 $000	Year 6 2026/27 $000	Year 7 2027/28 $000	Year 8 2028/29 $000	Year 9 2029/30 $000	Year 10 2030/31 $000
Operating Funding											
Sources of operating funding											
General rate, UAGC*, rates penalties	0	0	0	0	0	0	0	0	0	0	0
Targeted rates	4,859	5,173	5,918	6,167	6,725	7,023	7,452	7,590	7,696	7,936	8,010
Subsidies and grants for operating purposes	0	0	0	0	0	0	0	0	0	0	0
Fees and charges	27	26	27	28	28	29	30	31	32	32	33
Internal charges and overheads recovered	47	0	0	0	0	0	0	0	0	0	0
Local authorities fuel tax, fines, infringement fees and other receipts	55	0	0	0	0	0	0	0	0	0	0
Total sources of operating funding	4,988	5,199	5,945	6,195	6,754	7,053	7,482	7,621	7,727	7,968	8,043
Applications of operating funding											
Payments to staff and suppliers	2,122	2,341	2,825	2,596	2,646	2,727	2,803	2,882	2,948	3,034	3,118
Finance costs	350	231	283	449	658	772	787	781	760	773	750
Internal charges and overheads	719	729	772	797	811	835	873	889	915	953	978
Other operating funding applications	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	3,192	3,301	3,880	3,842	4,115	4,335	4,462	4,552	4,623	4,759	4,845
Surplus/(deficit) of operating funding	1,796	1,898	2,065	2,352	2,639	2,718	3,020	3,069	3,104	3,209	3,198

* Uniform Annual General Charges

	Annual Plan 2020/21 $000	Year 1 2021/22 $000	Year 2 2022/23 $000	Year 3 2023/24 $000	Year 4 2024/25 $000	Year 5 2025/26 $000	Year 6 2026/27 $000	Year 7 2027/28 $000	Year 8 2028/29 $000	Year 9 2029/30 $000	Year 10 2030/31 $000
Capital Funding											
Sources of capital funding											
Subsidies and grants for capital expenditure	-	-	-	-	-	-	-	-	-	-	-
Development and financial contributions	150	173	178	182	187	192	196	202	207	213	218
Increase/(decrease) in debt	1,350	2,301	7,393	9,267	5,012	583	- 336	- 1,094	394	- 1,239	- 399
Gross proceeds from sale of assets	-	-	-	-	-	-	-	-	-	-	-
Lump sum contributions	-	-	-	-	-	-	-	-	-	-	-
Other dedicated capital funding	-	-	-	-	-	-	-	-	-	-	-
Total sources of capital funding	1,500	2,473	7,571	9,450	5,199	775	(139)	(893)	601	(1,027)	(180)
Application of capital funding											
Capital expenditure											
- to meet additional demand	67	185	528	429	3,521	70	0	0	0	0	0
- to improve the level of service	1,799	2,004	8,006	8,745	2,281	734	795	171	176	182	188
- to replace existing assets	1,172	2,055	1,124	2,611	1,989	2,638	1,906	1,829	3,375	1,832	2,634
Increase/(decrease) in reserves	259	127	(23)	17	47	51	178	176	154	168	196
Increase/(decrease) in investments	0	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding	3,297	4,371	9,636	11,802	7,837	3,493	2,880	2,176	3,705	2,182	3,017
Surplus/(deficit) of capital funding	(1,798)	(1,898)	(2,065)	(2,352)	(2,639)	(2,718)	(3,019)	(3,069)	(3,104)	(3,208)	(3,198)
Funding Balance	**0**	**0**	**0**	**0**	**(0)**	**(0)**	**0**	**(0)**	**0**	**0**	**0**

Expenditure by water supply

	Annual Plan 2020/21 $000	Year 1 2021/22 $000	Year 2 2022/23 $000	Year 3 2023/24 $000	Year 4 2024/25 $000	Year 5 2025/26 $000	Year 6 2026/27 $000	Year 7 2027/28 $000	Year 8 2028/29 $000	Year 9 2029/30 $000	Year 10 2030/31 $000
Ashburton	3,024	2,995	3,529	3,305	3,391	3,580	3,693	3,803	3,860	3,981	4,052
Methven	581	658	755	985	997	1,018	1,051	1,037	1,044	1,067	1,079
Rakaia	269	263	272	301	315	345	364	371	379	393	368
Fairton	72	79	82	91	92	94	100	102	104	106	107
Hakatere	70	102	110	112	123	124	126	124	126	129	128
Hinds	123	135	149	154	180	183	194	198	214	234	236
Mayfield	127	98	101	104	105	113	115	112	115	118	115
Chertsey	68	86	90	93	95	104	106	116	117	123	124
Methven/Springfield	226	230	290	308	488	499	512	523	535	546	555
Montalto	199	307	321	347	594	597	607	616	626	633	643
Mt Somers	130	142	164	323	321	329	343	347	351	344	345
Dromore	103	106	104	112	115	141	144	163	167	198	198
Barrhill	2	1	1	1	1	1	1	1	1	0	0
Lyndhurst	6	4	3	3	3	2	2	2	2	1	1
Total operating expenditure	4,998	5,206	5,971	6,239	6,819	7,132	7,358	7,514	7,641	7,872	7,951
less depreciation	1,806	1,904	2,091	2,397	2,704	2,797	2,896	2,961	3,018	3,112	3,106
Total applications of operating funding	3,192	3,301	3,880	3,842	4,115	4,335	4,462	4,552	4,623	4,759	4,845

Capital by water supply

	Annual Plan 2020/21 $000	Year 1 2021/22 $000	Year 2 2022/23 $000	Year 3 2023/24 $000	Year 4 2024/25 $000	Year 5 2025/26 $000	Year 6 2026/27 $000	Year 7 2027/28 $000	Year 8 2028/29 $000	Year 9 2029/30 $000	Year 10 2030/31 $000
Ashburton	1,707	2,293	1,499	2,813	6,362	1,982	2,125	1,544	2,110	1,419	1,936
Methven	1,391	1,125	4,704	280	399	736	317	329	312	265	336
Rakaia	3	28	461	310	335	389	7	25	370	383	27
Fairton	-	5	52	-	6	114	-	-	-	-	3
Hakatere	-	120	15	327	-	-	-	-	-	-	26
Hinds	-	305	19	382	9	195	16	356	456	317	13
Mayfield	105	5	10	-	49	-	-	-	-	-	6
Chertsey	143	25	10	-	87	-	206	-	97	-	396
Methven/Springfield	79	275	137	3,664	81	84	86	88	-	-	3
Montalto	-	65	408	4,185	-	-	-	-	-	-	-
Mt Somers	-	293	2,668	-	112	279	-	-	-	-	3
Dromore	13	5	57	34	670	25	488	40	780	35	681
Barrhill	-	-	-	-	-	-	-	-	-	-	-
Lyndhurst	-	-	-	-	-	-	-	-	-	-	-
Total capital expenditure	3,440	4,545	10,040	11,995	8,110	3,804	3,245	2,382	4,124	2,418	3,428
less vested assets	402	301	381	210	320	362	543	382	574	404	606
Council funded capital expenditure	3,038	4,244	9,659	11,785	7,791	3,442	2,702	2,000	3,551	2,014	2,822

9.6. Development Contributions

9.6.1. Water supply contributions

The Development and Financial Contributions Policy can be found on the Council's website or at the Council offices. The policy outlines the approach to be used by Ashburton District Council to implement development or financial contributions to fund growth related investment in network infrastructure and community facilities.

Schemes with additional demand capacity available for development growth and for which council has, or plans to, incur capital expenditure specifically to cater for growth will attract development contributions from developments which are able to connect to the scheme. A development contribution for water supply will normally be levied at the time of building consent.

9.6.2. Benefit analysis

The benefit in having a community water supply is considered a group benefit, therefore development contributions will be levied only where connection to a water supply is possible. There is considered to be no factors in a community well-being analysis which would alter the benefit analysis.

9.6.3. Development contribution methodology

The amount of development contribution levied for water supply varies from scheme to scheme depending on:

- The current level of excess capacity within each scheme.
- The residents per household figure for each scheme.
- The level of past and planned future capital expenditure for each scheme which is related to provision of demand capacity for growth.

The detailed calculations used to determine the rate of development contributions for each of the water supplies are included in the Development Contributions Policy.

10. Key legislation / industry standards and relationship with other planning / policy documents for Drinking Water

10.1. Legislative and other drivers

Commentary related to the key legislation and regulations affecting the water supply activity is provided below.

10.1.1. Civil Defence Emergency Management Act 2002

Sets an expectation that Council's services will function at the fullest possible extent during and after an emergency, even though this may be at a reduced level. In addition, Council has established planning and operational relationships with regional CDEM groups to deliver emergency management within our boundaries.

Water supply is regarded as a lifeline utility and is given special consideration within Council emergency management procedures. Every effort will be given to maintain services through, or restore services immediately after, an event.

10.1.2. Health Act 1956

Places an obligation on Council to improve, promote and protect public health within the District. The provision of safe and reliable water supply services which meet applicable legislation and standards promotes public health. Council has an obligation under the Health Act to prepare Water Safety Plans (WSPs) for each scheme.

10.1.3. Health and Safety at Work Act 2015

Requires Council to ensure the health and safety of workers while at work by providing: a working environment that is without risks to health and safety; safe plant and structures; safe systems of work; and information, training and supervision that is necessary.

Council must ensure the safety of the public and all workers (including contractors) when undertaking the activity. This requirement extends to the design and supply of new plant and structures.

10.1.4. Local Government Act 2002

Provides for democratic and effective local government that recognises the diversity of New Zealand communities. It states the purpose of local government, provides a framework and powers for local authorities to decide which activities they undertake and the manner in which they will undertake them, promotes the accountability of local authorities to their communities; and provides for local authorities to play a broad role in meeting the current and future needs of their communities for good-quality local infrastructure, local public services, and performance of regulatory functions.

10.1.5. Resource Management Act 1991

Provides an environmentally conscious framework for Local and Regional Authorities to administer powers with regard to development and the management of natural resources. The RMA 1991 focuses on the effects of activities rather than on the activities themselves. The water supply activity has 19 resource consents for water abstraction.

10.1.6. **National Environmental Standard for Sources of Human Drinking Water**

The NES requires regional authorities to ensure that effects of activities on drinking water sources are considered in decisions on resource consents and regional plans. As a water supplier, Council is reliant on the NES being applied consistently and appropriately in the region.

10.1.7. Canterbury Water Management Strategy (2010)

The Canterbury Water Management Strategy (CWMS) is a non-statutory document with a collaborative approach to managing water within the Canterbury Region.

10.1.8. Canterbury Land and Water Regional Plan

The purpose of the Canterbury Land and Water Regional Plan (LWRP) is to identify the resource management outcomes or goals for managing land and water resources in Canterbury to achieve the purpose of the RMA. It identifies the policies and rules needed to achieve the objectives.

10.2. Related documents

10.2.1. Infrastructure Strategy

The infrastructure strategy provides a look forward for 30 financial years at current and upcoming key infrastructure issues for the core activities (water, wastewater, stormwater and transportation) and stockwater, and the significant projects and expenditure required to address them.

The AMP provides the context and support for the infrastructure strategy.

10.2.2. Long-Term Plan

The Long-Term Plan explains what Council proposes over the next ten years with an infrastructure strategy and financial strategy looking at a thirty year horizon.

10.2.3. Water Safety Plans

Water Safety Plans (WSPs) encourage the application of risk-management principles to water treatment and distribution, to minimise controllable risks of contamination. WSPs identify the situations that may lead to contamination and the actions necessary to protect the public.

Each WSP includes a list of capital, operational and management improvements to be implemented.

10.2.4. Ashburton District Plan

The Ashburton District Plan sets a framework for development and the management of resources in the District. It establishes objectives and policies for managing the environmental effects of development, it defines the various zones (residential, rural, business, open space, etc), and the rules for what activities are permitted to occur in each zone.

Future expansions of the serviced area will be aligned with the growth directions signalled in the District Plan.

11. Risk management for Drinking Water

11.1. Council risk register

The Council developed a district wide risk register in 2013 and this is maintained regularly. This includes a high level consideration of the risk around "water supply interrupted or failure to comply with drinking water standards".

The impact of this risk was assessed from a Health and Safety, Operational, Political, Financial, and Environmental perspective.

Water supply failure is classed as a high risk, and further controls required are summarised below.

Table 4: Additional controls from the water supply service risk register

Risk	Priority	Controls
Schemes upgraded to meet national drinking water standards	High	Plans have been developed. Further planning is ongoing, but budgets reflect required upgrades for the remaining schemes.
Increase use of inline equipment to monitor key water quality parameters	Medium	This has been expanded in the last LTP cycle and will be further developed as an ongoing process of improvement
Maintain currency of water safety plans including updating to new framework	Medium	Revised WSPs against the new framework are being developed for four schemes, including Methven. Following this, the remaining schemes will need to be worked on over the next few years.
Complete wellhead upgrades and groundwater security assessments	High	The last upgrades should be carried out in the 2020-21 year. There may be a need for further catchment risk assessments as a part of WSP development.
Increased water monitoring	High	Additional parameters have been added to the schedule, including disinfection by-products.

Water conservation education	Low	This is an ongoing project.
Continue rollout of smart metering to reduce water consumption	Medium	Proposed for years 1-3 of the 2021-31 LTP. Small schemes have had meters rolled out, most recently Mt Somers
Climate Change Policy/Action Plan	Low	This work is ongoing, being led by a different department.

11.2. Water supply risk register

A risk management framework based on ISO AS/NZS 30001 was developed in 2011 and used to establish a water supply risk register. The risk register identifies risk management strategies to minimise the risks associated with the provision of drinking water. The risks are categorised as extreme, high, medium or low.

This water supply specific risk register was reviewed in 2017 and indicates there is one extreme and six high risks. The extreme and high risks have existing controls (mitigation) that have been or are being developed that reduces all the risks to moderate as presented below.

The risk profile will be extended in the future to encompass all assets in a Risk Management Plan.

Table 5: Water supply risk register - extreme and high risks

Risk severity	Risk category	Potential impact	Controls
Extreme	Infrastructure	Lack of adequate backflow prevention causes contamination	Existing: Backflow prevention part of new water supply by-law. Future: Backflow policy to be implemented and actively managed.
High	Infrastructure	Insufficient storage or capacity for firefighting purposes (where applicable)	Existing: Assess fire-fighting capacity requirements, cost and identify schemes' ability to fund needs. Identify potential non-asset solutions Future: Continue with focus on reducing scheme leakage.
High	Infrastructure	Treatment plant failure results in untreated water to consumers and non-compliance with DWSNZ	Existing: Remote monitoring in place at all facilities with alarm notification of process failure. Plants shutdown if treatment interrupted or outside spec. Ensure water fully treated before entering reservoirs. Future: Programme regular end-to-end testing of alarms and critical process control points.
High	Scheme specific	Failure of old Everite (a type of AC) watermains result in	Existing: A significant proportion has been renewed already or is programmed for

Risk severity	Risk category	Potential impact	Controls
		unprogrammed renewals (Ashburton)	renewal Future: Assess condition of remaining old pipes and prioritise for replacement.
High	Infrastructure	Failure of treatment plant component causes non-compliance with drinking water standards and consumer illness	Existing: Frequent and regular monitoring as part of new requirements of NZDWS 2005 (Rev. 2008). Increased attention to process control and response to event where plant are out of spec. Future: Programme regular end to end testing of alarms and critical process control points.
High	Events	Loss of water supply resulting in emergency measures to supply water	Existing: Ongoing monitoring of seasonal and long-term trend data. Future: Investigate scheme vulnerability and identify options for minimising effects of droughts.
High	Product	Contamination of water supply resulting from repair or incorrect commissioning of new works	Existing: Audit contract procedures (documented and onsite practise). Ensure adequate. Future: Develop and follow formal commissioning procedures for new facilities.

11.3. Public health risk

The Council and Water Supply risk registers identify public health risks as significant. The Water Safety Plans prepared for each scheme and approved by Community and Public Health address the specific risks presented by the individual water supplies, as well as general operational and management improvements.

The measures and improvements identified in the WSPs are carried forward to the capital and renewal programmes where appropriate or included in the operational or asset management improvements.

11.4. Climate change risk

As with the rest of the Canterbury region, the Ashburton area will likely be affected by climate change. The District has experienced extremes of drought and flood in the past and these may occur with greater frequency and severity.

The Climate Change Effects and Impacts Assessment report (Ministry for the Environment, 2008) details projections for climate trends in the Canterbury Region. Possible climate change outcomes that may impact on drinking water schemes in Ashburton include:

- Increase in mean annual temperature

- More frequent extreme rainfall events as a result of increased moisture holding capacity of warm air
- Reduced annual mean precipitation and increased drought conditions
- Sea level rise

The projected reductions of annual precipitation and increased drought conditions might lead to reductions in the availability of water both from groundwater and from lower river flows. This may also be reflected in increasing regulatory restrictions on water abstraction.

11.5. Resilience

Council has contributed to the resilience of the water supplies (source, treatment and reticulation) by:

- Providing standby generators at key sites, or provision for portable generators where a permanent generator is not installed.
- Increasing routine maintenance requirements and standards.
- Adopting appropriate design and construction standards (including approved materials). These standards have also been reviewed during 2017.

12. Stakeholders and consultation for Drinking Water

Council has a wide range of stakeholders. Key stakeholders are:

- ACL as contractor for the daily provision of the service.
- Residents connected to the respective water supply schemes.
- Iwi who have an interest in the management of water resources.
- Ministry for the Environment
- Environment Canterbury who are responsible for setting and enforcing consent limits and managing resource allocation in the region.
- Ministry of Health and the Community and Public Health division of the Canterbury District Health Board(CDHB) who are charged with the protection of public health and with ensuring that water suppliers are meeting their duties under the Health Act and related legislation.
- Audit NZ who ensure that Council is providing services in a fair and appropriate way, and are effectively managing our own performance and that of service providers.

13. Improvement programme for Drinking Water

13.1. Asset management

Council undertook a structured assessment of the appropriate level of asset management practice for the water supply assets in October 2010, following the guidance provided in Section 2.2.4 of the International Infrastructure Management Manual (IIMM) 2006. The appropriate level identified through this assessment for the water supply activity was Core Plus.

Council will develop a long term improvement programme to achieve the Asset Management level of Core Plus.

13.1.1. Asset Management Information System Implementation

In the 2019-20 financial year we completed the first phase of our transition to a best-of-breed asset management data system. We are using Infor Public Sector (formerly Hansen).

Following this first implementation phase, the system is now being used for asset registers and asset valuations, and the old spreadsheets have been retired. This means the data are stored in a much more robust and structured way. It also means that asset valuations can be carried out much more quickly and reliably, with a much-reduced chance of human error.

The asset information is also synced with the new GIS system to provide a single source of truth for asset information. Importantly, this eliminates double-handling of data and speeds up data updates.

Future development will include bringing together more lifecycle information about the assets, such as intervention costs (e.g. repairs and servicing), inspection records, condition assessments, and general documentation, drawings and photographs. In the longer-term, it is hoped that this will lead to more advanced asset management and refined renewals forecasting being possible.

13.1.2. ISO 55000 Asset Management 2014

This international standard was released in January 2014 and outlines the requirements for an asset management system for achieving a balance between cost, risk and performance in asset management to help guide asset related decision making and activities.

Council has yet to review whether their current Council's asset management practices will be changed to seek conformance with ISO 55000. However, improvement areas have been identified in this AMP which will assist in the move towards aligning with the requirements of ISO 55000 should this step be taken in future.

13.1.3. Asset management data quality

The quantity and quality of the asset data held was reviewed in August 2011 by Opus International Consultants Ltd. The following tables show the data quality ratings and the rating scale and definitions.

These grades have been periodically reviewed since that time and no changes are warranted at this point.

In preparation for the AMIS implementation a major programme of data cleansing has been carried out, which has dramatically improved the quality and quantity of drinking water asset data. This involved going back to original plans and aerial imagery. To go further, and to lift the data quality

from a B to an A grade would require site investigation, including excavating to locate and inspect infrastructure, which would be a significant and unjustifiable expenditure.

However, changes in requirements for as-built drawings and improvements in managing projects has increased the confidence level for data for new assets level A.

Asset Group	Asset	Quantity	Replacement cost	Life expectancy	ODRC
Utilities assets	Water	B	B	B-C	B
	Wastewater	B	B	B-C	B
	Stormwater	B	B	B-C	B
	Stockwater	B	B	B-C	B

Grade	Label	Description	Accuracy
A	Accurate	Data based on reliable documents	±5%
B	Minor inaccuracies	Data based on some supporting documentation	±15%
C	Significant data estimated	Data based on local knowledge	±30%
D	All data estimated	Data based on best guess of experienced person	±40%

13.2. Training

As noted in earlier sections, there is increased scrutiny of water suppliers and more demanding requirements from the government and the sector. A key component is identifying and managing risks to water supplies arising from inadequate training of staff. We have identified this as an area needing improvement in our own WSPs, noting that:

> "It is imperative that the personnel who are managing and operating the Montalto Water Supply are fully trained to do so. Inadequate training, and their consequences for public health are the introduction of microbiological and chemical contaminants into the supply, or the inadequate inactivation or removal or such contaminants."

There is discussion within the industry to introduce mandatory certification of operators and water supply owners, details of which are yet to be determined. It would be prudent to get ahead of this initiative and ensure that staff are trained appropriately.

The first stage is a detailed assessment of training needs, including preparing job descriptions, identifying skills gaps and training needs, creating a training development program, and developing and budgeting for training identified.

This will be further reinforced through the re-write of the Utilities Operations and Maintenance contract, where emphasis will be placed on a requirement for contractor staff to have appropriate industry recognised qualification(s).

13.3. Improvement actions

Ashburton District Council is committed to on-going improvement in the quality of its water supply management practices. This is reflected in the implementation of asset management systems and associated data collection and maintenance requirements.

The Improvement Plan is integral to that approach, quantifying current business practice and measuring progress toward an identified future position. The improvement plan is focused on the key areas of:

- **Information Management**: Implementation completed. The next stage is to build on the AMIS and extend its use to increase the range of data captured.
- **Scheme Knowledge**: Expand our monitoring of asset condition and performance, in particular for assets identified as critical
- **AM Policy**: To provide the principles by which Council intends to apply asset management to achieve Councils objectives
- **AM Improvement Programme**: To achieve the Asset Management level of Core Plus
- **Criticality Assessment:** Now complete. This may be reviewed periodically.
- **Renewal Strategy**: To ensure that replacement of assets is carried out at the most appropriate time and the most effective benefit is received
- **Contractor Procurement and Management**: This applies in part to operations and maintenance work and also to minor project work, where we have had some difficulty developing good service provider relationships. Major capital projects are generally well-managed.
  It is important to get work completed competently and in a timely fashion, and without introducing errors that may go unnoticed or cause unexpected problems later. We will revisit our procurement strategy to make sure we work with the most suitably competent contractors. This will be realised by ensuring that the expectations of Council are met by the capability of the contractor and that performance is considered along with price.
- **Scheme knowledge, specifications, standards and procedures**: A large amount of knowledge about the schemes and their operations and management is not well-documented or readily-available; often this knowledge is held by individuals, or simply not passed on when changes are made to schemes. This includes standard operating procedures, particularly management procedures, which may be understood by staff and operators but not formally written down.
  This is a significant risk if individuals move on from organisations taking knowledge with them, or if new staff are employed and are unable to quickly get up to speed. It also makes it difficult to engage service providers because necessary background information is not available.

We are addressing this with a portfolio of activities including building a library of standard operating procedures (SOPs), confirming and enumerating operational setpoints, and producing other formal technical documentation. A new electronic document and record management system (EDRMS) will also improve archiving and discovery of documents and correspondence.

Additional resources will be required to enable the achievement of the above improvement programme.

14. Appendices

14.1. Appendix A – Current valuation by scheme

Scheme	Asset Group	ORC 30 June 2020	Annual Depreciation
Ashburton	Plant Equipment	$ 8,044,179.65	$ 274,299.46
	Water Hydrant	$ 3,437,024.57	$ 45,834.04
	Water Main	$ 49,734,567.73	$ 610,696.84
	Water Meter	$ 5,214,141.38	$ 102,759.50
	Water Miscellaneous	$ 144,536.45	$ 5,157.06
	Water Service Line	$ 1,182,038.85	$ 11,816.33
	Water Valve	$ 3,667,052.15	$ 37,190.89
	Sub total	**$ 71,423,540.78**	**$ 1,087,754.12**
Chertsey	Plant Equipment	$ 266,731.96	$ 8,168.05
	Water Hydrant	$ 5,627.64	$ 75.04
	Water Main	$ 1,094,573.20	$ 10,945.75
	Water Meter	$ 43,777.50	$ 1,171.50
	Water Miscellaneous	$ 9,900.00	$ 198.00
	Water Service Line	$ 8,886.35	$ 88.77
	Water Valve	$ 26,516.37	$ 265.14
	Sub total	**$ 1,456,013.02**	**$ 20,912.25**
Dromore	Plant Equipment	$ 230,708.84	$ 7,859.17
	Water Main	$ 2,425,409.03	$ 24,254.10
	Water Meter	$ 12,002.32	$ 393.16
	Water Miscellaneous	$ 20,560.00	$ 411.20
	Water Service Line	$ 3,347.16	$ 33.48
	Water Valve	$ 23,195.90	$ 231.96
	Sub total	**$ 2,715,223.25**	**$ 33,183.07**
Fairton	Plant Equipment	$ 530,591.48	$ 15,823.57
	Water Hydrant	$ 5,539.34	$ 73.86
	Water Main	$ 425,187.99	$ 4,251.88
	Water Meter	$ 43,623.75	$ 803.10
	Water Miscellaneous	$ 10,280.00	$ 205.60
	Water Service Line	$ 10,114.28	$ 100.98
	Water Valve	$ 20,001.81	$ 200.00
	Sub total	**$ 1,045,338.65**	**$ 21,458.99**
Hakatere	Plant Equipment	$ 512,716.27	$ 19,019.72
	Water Main	$ 169,632.40	$ 1,696.35
	Water Meter	$ 21,252.00	$ 212.52
	Water Miscellaneous	$ 10,280.00	$ 205.60
	Water Service Line	$ 699.30	$ 7.00
	Water Valve	$ 16,639.59	$ 166.38
	Sub total	**$ 731,219.56**	**$ 21,307.57**
Hinds	Plant Equipment	$ 491,659.16	$ 16,016.46
	Water Hydrant	$ 28,382.50	$ 378.46
	Water Main	$ 1,203,837.17	$ 12,038.42
	Water Meter	$ 102,461.86	$ 2,330.56
	Water Miscellaneous	$ 30,460.00	$ 913.80
	Water Service Line	$ 23,994.41	$ 239.60
	Water Valve	$ 47,461.44	$ 474.58
	Sub total	**$ 1,928,256.54**	**$ 32,391.88**
Mayfield	Plant Equipment	$ 577,455.86	$ 19,844.82
	Water Hydrant	$ 19,431.84	$ 259.10
	Water Main	$ 668,787.26	$ 6,687.87
	Water Meter	$ 114,013.00	$ 4,401.13
	Water Miscellaneous	$ 10,280.00	$ 205.60
	Water Service Line	$ 10,798.01	$ 108.08
	Water Valve	$ 22,702.99	$ 227.01
	Sub total	**$ 1,423,468.96**	**$ 31,733.61**
Methven	Plant Equipment	$ 2,130,069.36	$ 60,897.76
	Water Hydrant	$ 480,253.89	$ 6,168.01
	Water Main	$ 8,714,007.15	$ 100,986.54
	Water Meter	$ 653,190.77	$ 16,663.30
	Water Miscellaneous	$ 25,890.00	$ 723.40
	Water Service Line	$ 112,033.33	$ 1,120.36
	Water Valve	$ 502,440.99	$ 5,024.26
	Sub total	**$ 12,617,885.49**	**$ 191,583.63**
Methven Springfield	Plant Equipment	$ 265,039.99	$ 10,716.54
	Water Hydrant	$ 16,618.02	$ 221.58
	Water Main	$ 9,980,044.14	$ 99,947.56

	Water Meter	$ 37,364.95	$ 373.69
	Water Miscellaneous	$ 4,950.00	$ 99.00
	Water Service Line	$ 10,761.77	$ 107.52
	Water Valve	$ 271,679.17	$ 2,716.81
	Sub total	**$ 10,586,458.04**	**$ 114,182.70**
Montalto	Plant Equipment	$ 313,591.56	$ 10,880.32
	Water Hydrant	$ 42,859.58	$ 571.40
	Water Main	$ 8,714,467.47	$ 88,822.44
	Water Meter	$ 12,847.24	$ 513.90
	Water Miscellaneous	$ 5,330.00	$ 106.60
	Water Service Line	$ 423.62	$ 4.24
	Water Valve	$ 152,925.78	$ 1,529.18
	Sub total	**$ 9,242,445.25**	**$ 102,428.08**
Mt Somers	Plant Equipment	$ 717,932.29	$ 28,750.81
	Water Hydrant	$ 35,738.47	$ 476.51
	Water Main	$ 2,065,145.11	$ 20,769.91
	Water Meter	$ 179,627.61	$ 7,054.69
	Water Miscellaneous	$ 15,610.00	$ 418.80
	Water Service Line	$ 15,518.91	$ 155.10
	Water Valve	$ 87,410.63	$ 874.04
	Sub total	**$ 3,116,983.02**	**$ 58,499.86**
Rakaia	Plant Equipment	$ 1,545,222.21	$ 52,355.96
	Water Hydrant	$ 286,970.79	$ 3,826.37
	Water Main	$ 3,157,945.23	$ 49,056.35
	Water Meter	$ 364,234.21	$ 7,136.00
	Water Miscellaneous	$ 15,610.00	$ 312.20
	Water Service Line	$ 87,621.70	$ 874.45
	Water Valve	$ 138,827.56	$ 1,388.26
	Sub total	**$ 5,596,431.70**	**$ 114,949.59**

14.1. Appendix B – Asset breakdowns

14.1.1. District

A renewal programme dating back decades has seen the stock of very old water pipes in the district, mainly in Ashburton and Methven, largely replaced. The oldest pipes are due for renewal in the near future.

The upcoming renewal programme now turns to renewing LDPE and Alkathene pipe installed in rural water schemes (e.g. Dromore and Chertsey) in the 1960s, as well as renewing AC pipe installed in the 1960s and 1970s which is reaching the end of its nominal life.

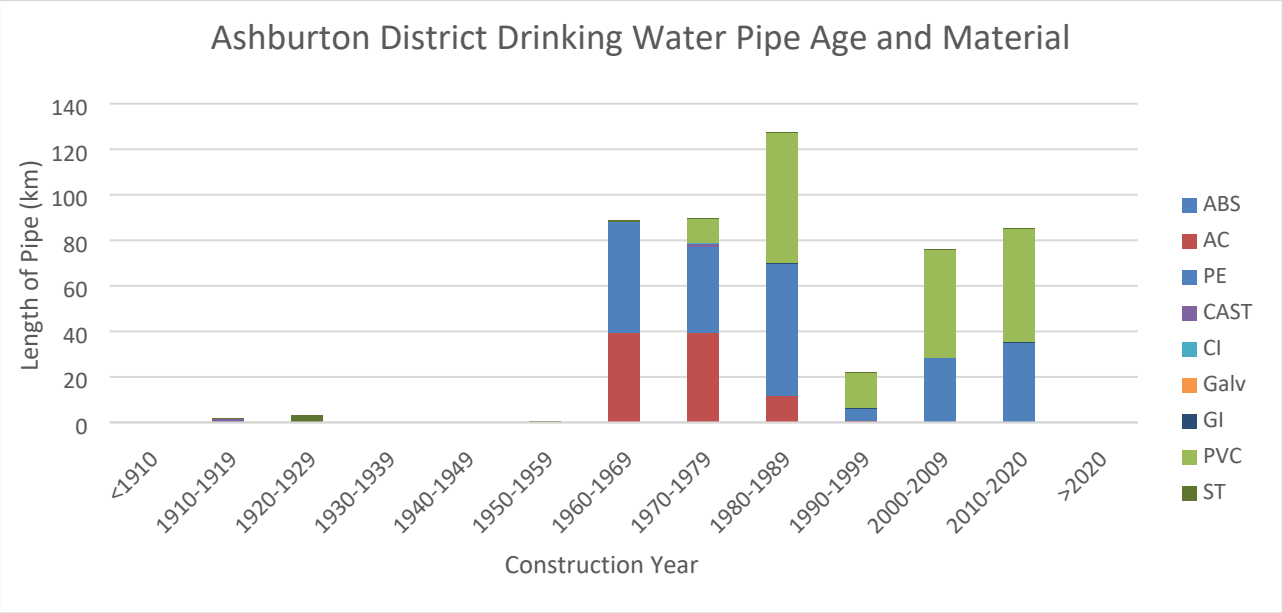


Figure 6 - Ashburton District Drinking Water Pipe Age and Material