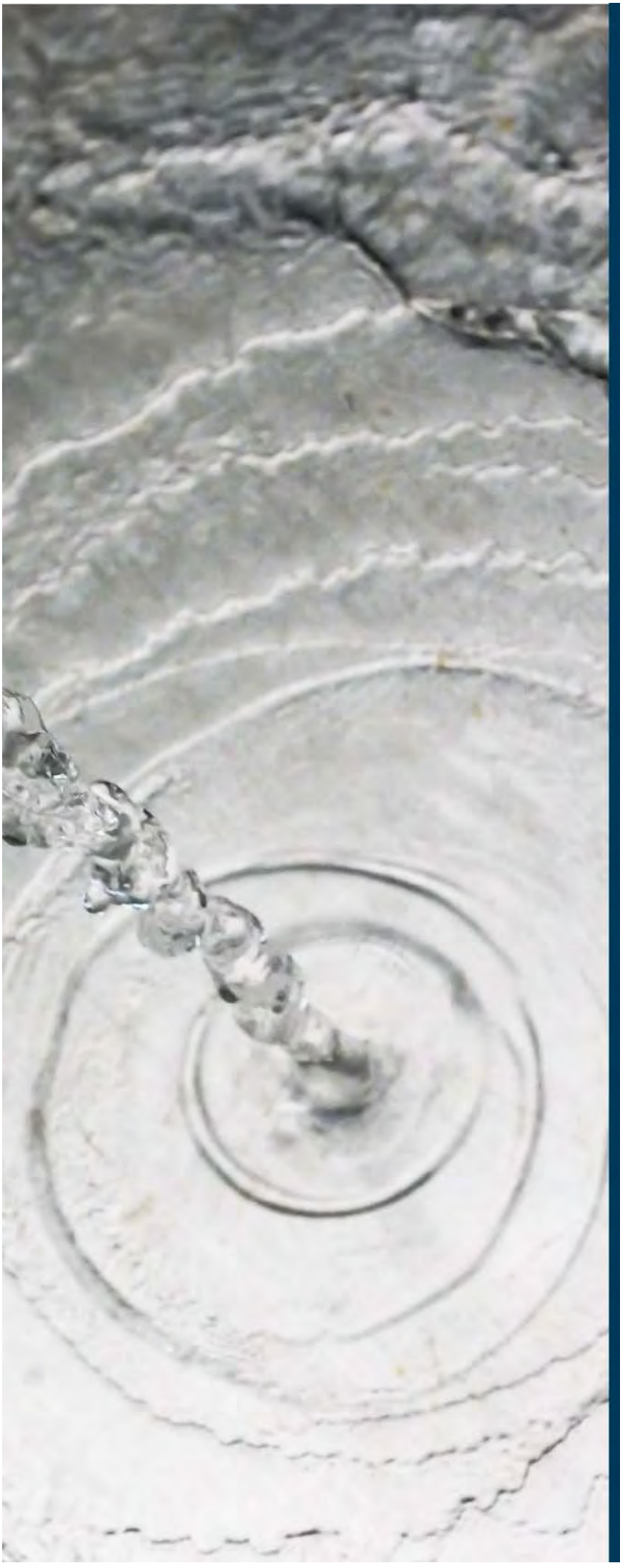

# 5 Waters

## Activity Management Plan

VOLUME 1. 2018

Selwyn DISTRICT COUNCIL

## QUALITY ASSURANCE & PLAN STATUS

| 1. Plan Version | | | |
|---|---|---|---|
| **Date** | **Version Number** | | **Checked by** |
| February 2009 | Version 1.1 2009 – 19 Adopted AMP | | Anne Greenup, Strategic Asset Manager |
| April 2012 | Version 2.0 Not final for LTP Consultation | | Anne Greenup, Strategic Asset Manager |
| June 2012 | Version 2.1 2012 – 22 Adopted AMP | | Anne Greenup, Strategic Asset Manager |
| 2 April 2015 | Version 3.0 Draft for LTP Consultation | | Murray Washington, Asset Manager |
| 22 June 2015 | Version 3.1 2015-25 Adopted AMP | | Murray Washington, Asset Manager |
| March 2018 | Version 4.0 2018-28 Draft for LTP Consultation | | |
| **2. Overall Responsibility for the Co-ordination of all Matters in this Plan** | | | |
| **Date** | **Name** | | **Designation** |
| 24 March 2015 | Murray England | | Asset Manager – Water Services |
| **3. Prepared By** | | | |
| **Date** | **Name** | | **Designation** |
| 24 March 2015 | Murray England/Alicia Paulsen | | Asset Manager – Water Services / Water Services Support Planner |
| **4. Version 3: Input From** | | | |
| **Date** | **Name** | **Designation** | **Input** |
| January 2018 | Grant Holland | Waugh | Legislation/Growth |
| February 2018 | Mark Gordon | AECOM | Risk/ AcMP Compliance |
| January 2018 | Charlotte Mills | OPUS | Wastewater Modelling |
| February 2018 | Shane Bishop | MWH | Ellesmere/ESSS Master Plans |
| February 2018 | Dan Johnson | OPUS | Water Master Plans/ Water Modelling |
| **5. Council Adoption** | | | |
| **Date** | **Record of Decision** | | |
| June 2018 | Council Minutes | | |
| **6. Public Consultation** | | | |
| **Date** | **Form Of** | | |
| April – May 2018 | Selwyn District Council website | | |
| **7. Plan Update and Review** | | | |
| **Date** | **Record Of** | | |
| | | | |
| | | | |
| **8. Peer Review Record** | | | |
| **Date** | **Reviewer** | **Designation** | **Input** |
| | | | |

# 5 Waters Services Activity Summary

## Activities covered

| | |
|---|---|
| Community water supplies | 30 schemes (public health). |
| Land drainage | 10 schemes (making land farmable/ |
| Stormwater urban | 21 schemes (urban stormwater management). |
| Water races rural and urban | 3 schemes (stock water, amenity, habitat) |
| Community wastewater schemes | 14 schemes + ESSS and Ellesmere WWTP (public health). |

## Overview

The availability of clean safe to drink water and the safe disposal of wastewater are fundamental to the health and welfare of the Selwyn community. The 5 Waters service provides clean safe to drink water for households and removal of wastewater and rain water in a way that protects the health of the population and natural environment. The 5 Waters service also provides river water for livestock and drains certain land so that it is usable. These services are provided through 78 separately rated water based schemes within the District. The 5 Waters assets are valued at $602 million with water supplies valued at $149 million, wastewater schemes $242 million, stormwater $57 million, land drainage $43 million and water races $111 million.

Drinking water is provided by the Council to over 82% of the population of the District. By comparison, wastewater services are provided to approximately 63% of the District. The largest consented wastewater treatment and disposal area is the Pines Wastewater Treatment Plant, servicing Rolleston, West Melton, Lincoln, Prebbleton and Springston (the Eastern Selwyn Wastewater Scheme).

It has always been clear that the water services are interlinked, if not directly, then via natural pathways. This reflects the unique geographical 'mountains to sea' layout of the Selwyn District. There is a strong connection between these services and it is essential that they are looked after. The Council's approach is to manage the 5 Waters activities in an integrated way.

## Why is the Council involved?

The Council is in the best position to respond to the expectations of the communities it serves and to translate these needs into levels of service, which have funding options accompanying them, for public scrutiny and comment. The Local Government Act 2002 clearly sets out how the Council must consult with residents over significant decisions and this ensures the community has a major decision making role. The 5 Waters assets are listed as 'Strategic' in this 2018/2028 Long Term Plan for the very reason that failure of these services has a devastating and far-reaching effect on the District. The Council is well positioned to take a major leadership role in planning and managing the assets and networks that deliver these essential services.

By managing all of the 5 Waters activities, the Council can plan ahead in a coordinated way and take advantage of the opportunities to introduce new initiatives e.g. the potential in the future to use treated wastewater to irrigate reserves, if this is feasible and acceptable to the public. When prioritising across the 5 Waters activities, opportunities to combine projects will become apparent. This coordination brings better results than a fragmented approach, which could occur if the activities were separately managed, especially by more than one provider.

There is also the need to comply with a raft of legislative and statutory processes, which the Council recognises in its strategic plan, policies, education programmes, and commitment to sustainable practices.

The security of the District's water supply is paramount as our communities require reliable, clean, safe water to serve their day-to-day needs. These water-related activities also protect and sustain the health of the environment, particularly the sensitive Te Waihora (Lake Ellesmere) catchment, by responsibly dealing with wastewater and the draining and disposing of groundwater and excess stormwater run-off.

The wastewater infrastructure is expected to continue to increase rapidly with the predicted growth in the eastern portion of the district. Stormwater assets have been, and will continue to be, rapidly developed to meet the increased standards reflected in the Regional Council's Land and Water Regional Plan rules.

## Activity goal

Selwyn District Council's goal for the 5 Waters activities is:
*'To provide water services that meet all relevant standards and are at a service level the public can afford and have confidence in, now and into the future'.*

## Council contribution to community outcomes

This activity contributes to the following community outcomes:

- A clean environment;
- A district with a rural identity;
- A healthy community;
- A safe place in which to live, work and play;
- An educated community;
- A prosperous community; and
- A community which values its culture and heritage

**The 5 Waters Activity Contribution to Community Outcomes**

| Key Community Outcome | Community Outcomes | How 5Waters Services Contributes |
|---|---|---|
| A clean environment | Air, land, water and general environment to be kept in a healthy condition. | **Manage** the 5 Waters activities in a way that minimises their potential adverse impact on the environment. |
| A district with a rural identity | A living environment where the rural identity of Selwyn is maintained | **Provide** water races and land drainage systems that are part of the rural landscape and contribute to the rural theme of Selwyn/ 5Waters services (community and private) are vital for the well-being of rural communities. |
| A healthy community | We have appropriate health, social and community services & they are accessible to all residents of the district. | **Provide** water, wastewater and drainage services necessary to support community and public health services. There is potential to provide for recreational opportunities in conjunction with stormwater management strategies. |
| | We have access to drinking water that helps protect their health. | **Provide** safe drinking water for all water schemes within the Selwyn district. |
| A safe place in which to live, work and play | We are safe at home and in the community. | **Provide** safe drinking water and effective wastewater removal and disposal as well as removal of stormwater and excess groundwater (via land drainage). |
| | We maintain a coordinated and effective response to, and recover from, emergency and disaster events. | **Respond** to emergency events by providing safe drinking water and effective wastewater removal and disposal as well as removal of stormwater and excess groundwater (via land drainage). |
| An educated community | Our district provides a range of quality, lifelong education and training opportunities. | **Provide** water, wastewater and drainage services necessary to support education facilities. |
| A prosperous community | Selwyn has a strong economy which fits within and complements the environmental, social and cultural environment of the district. | **Provide** business with water, wastewater and drainage services, sometimes to a higher standard or with a higher level of reliability than regular domestic services. Effective water races and land drainage systems are essential for productive use of land. |
| A community which values its culture and heritage | Our district provides a range of arts and cultural experiences and facilities. Local history and heritage is preserved, shared and promoted | **Provide** water, wastewater and drainage services for cultural activities. All 5Waters activities can impact on the cultural and heritage values and need to be managed to minimise adverse effects. |

## Negative effects on the wellbeing of the community

Carrying out activities associated with water and land has the potential to be damaging. The Council recognises these possible negative effects and takes the following measures to address them.

| Well-being | Possible / negative effect | The Council's response is to |
|---|---|---|
| **Social** | Drinking water or poor sanitation may cause serious illness. | Regularly monitor and measure water and groundwater E.coli levels to ensure that safe levels are achieved and maintained. |
| | Floodwaters may also carry contaminants hazardous to health. | Remove and dispose of wastewater effectively and safely without overflows causing flooding or contamination. Manage stormwater to minimise flooding. |
| | Poorly designed, operated or located infrastructure may cause noise, odour, visual or other impacts which have adverse effects on quality of life. | Design and locate new infrastructure and use buffer zones and planting in a way that reduces the effects of potentially disruptive assets. The adoption of technology to minimise adverse impacts as far as practicable. |
| | Failure to secure assets which subsequently cause physical harm or loss of life. | Regular health, safety and environmental audits of assets, implementation of national standards and appropriate 'design' standards. |
| **Economic** | Charges have to be levied to cover the cost of providing services that meet the Council's goals and its statutory obligations while remaining sustainable long term. | Responsibly provide efficient and effective levels of service that the community can afford. Provide a range of services with associated costs so people can make informed choices. |
| | Failure to levy charges at the appropriate time may result in an excessive burden for future generations. | Consider 'whole of life' costs and apportion capital costs equitably over time. Ensure that charges are realistic and do not result in accumulated costs later. |
| | Ineffective land drainage may damage crops or result in loss of productivity. | Manage system to minimise flooding. |
| **Economic** | Failure to make adequate service provision together with unreliable services may limit growth and impact on economic prosperity. | Plan ahead for economic growth and population expansion. Carry out renewals and new works in a timely manner and fund capital works for growth through development contributions. |
| **Environmental** | The activity has the potential to lower air quality, water quality and quantity and the health of soil and biodiversity. | Avoid, remedy and mitigate adverse effects and strictly adhere to Resource Consent conditions by monitoring before and after works and installations. Take corrective action if problems arise. |
| | The activity is very high in its use of energy (approximately half the Council's usage). | Choose assets and networks which are energy efficient and explore alternative sources of energy. The Council uses, in places, solar panels for energy and can run generators powered by diesel instead of electricity if required. |
| | | Encourage open stormwater systems with accompanying riparian vegetation and tree planting (as opposed to pipes) to reduce the carbon footprint and to treat stormwater before it enters streams and waterways. |
| | | Keep up to date with the latest technology and ideas. |
| | Water races take water from rivers and there is considerable seepage to ground from the races. | Water races are closed when they are no longer needed for farming purposes or for amenity. It is recognised that the water which seeps into the ground is not 'lost' but replenishes groundwater. Shallow wells can benefit from this top-up. |
| **Cultural** | The activity's services have the potential to cause damage to heritage sites, artefacts, other structures, landscape features and waterways. | Assess the impact on cultural well-being as a normal part of the decision-making process. Site and locate structures and services sensitively in the landscape and manage them responsibly. |
| | The pollution of groundwater and surface water is an important cultural issue. | Consult with Tangata Whenua and with the Historic Places Trust early on to avoid disturbances and destruction of important items and features. |

## Major projects

The projects identified in this 2018/28 LTP all assist in meeting the communities' desired level of service. They are predominantly to serve growth, but in the case of water quality and demand management work, they seek to improve the service level. Other major projects are also underway which relate to the provision of services.

**The major growth projects are:**

- Water source improvements to provide increased capacity for Darfield, Kirwee, Leeston, Lincoln, Prebbleton and Rolleston including the development of new wells, reservoirs and pump stations. The costs of these improvements are: Darfield $2.1 million with work to be undertaken between 2018 and 2024, Kirwee 0.83 million dollars 2019/2020, Leeston 2.2 million dollars with work to be undertaken between 2018-2028, Lincoln $5.9 million with work to be undertaken between 2018-2028 and Prebbleton $2.6 million with work undertaken between 2019-2020, Rolleston $10.5 million with work to be undertaken between 2018 and 2028.
- Developing additional infrastructure at the Pines Wastewater Treatment Plant. The treatment plant currently services Rolleston, Lincoln, Prebbleton, Springston and West Melton townships. The treatment plant was designed to be a modular system, with additions staged progressively to increase the plant's treatment capacity to cope with population growth. In 2018/19 extension to the solar drying hall and associated works is proposed at a cost of $3.1 million dollars. Pines IV – plant expansion for additional capacity will occur 2020/21 at a cost of $5.4 million dollars Costs will be funded largely from development contributions.
- An upgrade of the Ellesmere Wastewater treatment plant (in Leeston) is also planned to provide the scheme (serving Leeston, Southbridge and Doyleston) with more capacity to cope with future growth. The upgrade is planned to be completed by 2024 at an estimated cost of $7.5 million dollars.

**The major levels of service projects are:**

- The upgrade of water supply treatment plants across the district to meet or exceed drinking water standards as a budgeted cost of $6 million dollars with work undertaken between 2018-2021.
- District-wide flood protection and treatment works will be designed and constructed between 2018-2028 in line with the developed stormwater management plans. This work has a budget of $2.1 million dollars.
- At the Pines Waste Water Treatment Plant a septage receiving facility will be constructed to accept waste collected from the districts septic tanks. This $1 million dollar project is programmed for 2019/2020.
- In Leeston the new flood diversion channel has commenced construction with the final stage of work taking place between 2018 and 2020. This work has a budget of $1 million dollars.
- Closure of the Kowhai water race tunnel. The tunnel carries water from the lower Kowhai River intake to Malvern water races. The replacement / renewal of the tunnel is uneconomic. Over the last couple of years Council has operated the scheme using only the upper intake to trial future permanent closure of the tunnel. This trial was successful.
- Council will review the future of other significant water race assets as they reach the end of their predicted useful life

**Other major projects and decisions include:**

- Progress the development and implementation of stormwater catchment management plans for all townships.
- Investigate and implement opportunities to improve water supply scheme efficiency and resilience through scheme interconnections.
- Work with Central Plains Water and other third parties to develop shared water services / infrastructure where such ventures provide benefit to and are supported by Council.
- Progress ratepayer initiated water race closures to public consultation once approved by the Water Race Committee for closure. The committee will consider ratepayer initiated closures once 80% written support from directly affected property owners is obtained. All closures are subject to Council approval. Council initiated race closure will also occur over this LTP period.
- Work towards the closure of the Upper Ellesmere Water Race network.
- Work with Environment Canterbury and key stakeholders to realise opportunities to use consented stock water for environmental enhancement including targeted stream augmentation and habitat enhancement.
- Review rating and governance structure of all land drainage schemes in consultation with the land drainage committees.
- Review the environmental risks relating to the operation of the districts wastewater network.
- Chlorination of water supplies on a benefit / risk basis.

## Water and sanitary assessment

In 2006 Council adopted its first Water and Sanitary Services assessment. Review of Water and Sanitary Services Assessment occurred in 2017/18 and is reported in the 2018-2028 5 waters Activity Management Plan. The assessment will be reviewed again before the end of the 2018-2028 LTP period.

The assessment covers water, wastewater and stormwater (including land drainage services). There have been significant improvements since 2006, particularly in:

**Wastewater**

- The Council is migrating onsite serviced properties within township reticulated areas to the network. Council has also been assessing the requirements for installing reticulated networks within township which currently rely on onsite wastewater disposal.
- The Eastern Selwyn Sewage Scheme and Ellesmere Sewage Scheme have been and are programed for further upgrading to service the connected growing communities.
- The standard of wastewater quality at the point of disposal continues to be a focus for Council.

**Water Supply**

- Water Safety Plans are in place for all schemes, with improvements in water quality underway or provided.
- Council water supplies were monitored in 2016/17 with 99.2% of samples taken from the reticulation and 99.8% from the treatment plants complying with the national standards for bacterial (E.coli) criteria.

**Stormwater (and land drainage)**

- Stormwater systems are being installed at the time of subdivision and the quantity at discharge is improving as confirmed by measurement.

## Demand and Asset Management

The 5 Waters activities physical assets consist of:

- Below ground services including pipes, wells, pump stations and wastewater treatment equipment; and
- Above ground facilities including pumps, reservoirs, intakes, open channels and land disposal areas.

Asset Management practices have been measured against appropriate international practice guidelines. The Council is aiming to achieve an intermediate level of asset management practice within the period of this LTP.

Where relevant, we have assessed the impact of changing demand for the 5 Waters activities. This is more relevant in water and wastewater, and to a lesser extent stormwater, land drainage activities and water race activities.

**Demand Management**

Based on current community growth trends, demand for water, wastewater and stormwater services has the potential to exceed consented and capacity allowances in some schemes. This analysis is based on the Council's population information, a detailed review of historical records and forward predictions of use, after factoring in potential climate changes and energy costs as well as engineering staff / contractor knowledge.

Achieving reasonable usage, particularly in the areas of water (human drinking water and stock water) together with wastewater treatment and disposal is a key factor in this LTP. In particular, the need to ensure that water is used wisely, sits above all other issues in the operations and maintenance sphere. The strong relationships between water use and wastewater disposal, stormwater, water race and land drainage systems have been provided for in integrated projects.

Through the Greater Christchurch Urban Development Strategy (UDS), the Land Use Recovery Plan (LURP) process and more recently the NPS on Urban Development, it was identified that our main townships of Lincoln, Prebbleton, Rolleston and West Melton will experience considerable growth. These townships, in particular, are subject to detailed demand planning and will require either new consents/wells or where allowance has already been made, additional new infrastructure to deliver/dispose of the water stream. The section on significant projects identified the expected level of works to be undertaken. Over time, existing parts of townships are expected to upgrade their stormwater services to meet consenting limits and requirements

Projects which assist in passive (e.g. education), and active demand management are identified. The outcome sought is to meet environmentally driven consent constraints while providing an appropriate level of service.

Council are actively implementing a Water Demand Management Strategy which has included the installation of water meters and implementation of volumetric water charging.

**Infrastructure Sustainability**

The 5 Waters activities are mutually interdependent and the Council will provide the extent and quality of service demanded by the community and legislation, now and in the future, in an integrated way. This involves prudently managing the acquisition, maintenance, operation, renewal and disposal of water assets in ways that optimise the value of services delivered to the community.

Infrastructure sustainability is a core part of the Councils vision for successful asset management. This will be achieved through ensuring that:

- Growth and demand is monitored to ensure a timely provision of infrastructure;
- Vested assets are fit for immediate and long term community needs;
- Assets are maintained and renewed to meet the needs of current and future generations; and
- Natural resources are managed responsibly and sustainably.

Council is aware of the potential impact climatic cycles and trends has on its five waters and is actively monitoring and planning for this.

## Key Assumptions

The key assumptions and uncertainties underpinning this plan are as follows:

1. The Selwyn District population will continue to grow at a high rate, similar to that experienced over the past ten years. Growth will be focused in Rolleston and the Eastern Selwyn area, with moderate rates elsewhere. Some more remote communities will only experience limited growth. Total population will grow to nearly 77,000 in 2028 and 105,000 in 2048.
   The numbers of persons per house will vary between townships, with a decrease over time.
2. Central Plains Irrigation Scheme. The impact on Council's activities, particularly water races and the requirement for new bridges/culverts will be included in AcMPs.
3. Central Plains Irrigation Scheme. Following on from the successful completion of Stage 1 of the Central Plains Water Ltd Scheme supplying surface water to 23,000 Ha in the Te Pirata Area; Infrastructure is being constructed to irrigate 20,000 Ha in the Darfield area (Stage 2), and 4300 Ha in the Sheffield/Springfield area.
4. It assumed that there will be no major adverse events during the period covered by the Selwyn Long Term Plan, for example, earthquake, pandemic or flood. While events may occur at any time, Council's planning will focus on operational resilience and Emergency Management.
5. The Community Outcomes which link to Levels of Service will not change, apart from minor clarification. Funding to deliver the LoS will therefore occur in accordance with the communities stated priorities.
6. Renewal Funding & Programme, 5Waters: A minimum 30 year renewal plan is followed, with funding via targeted scheme funding, general rates, and external sources as relevant to the asset. No depreciation funding occurring for any assets on the basis that actual identified renewal needs form the basis of ongoing funding needs.
7. It is assumed that the conditions of Resource Consents held by the Council (requirements and costs) will remain similar to current levels, and that the Council will obtain the necessary Resource Consents for planned projects and ongoing needs in the future.
8. Investment in maintaining and developing the required level of quality data to efficiently operate and predict issues.
9. Will be estimated on the basis this work is facilitated by external consultants.
   Construction Projects costs estimated using the following:
   a. Estimate +/- 25%
   b. Where designed +/-10%
   c. Post tender +/-5%
10. There will be no new technologies deployed that will significantly change the demand for or of provision of services.
11. It is assumed that the planning horizon for growth (30-45 years) and asset lifecycles (30 years plus) are sufficient to inform the ten year forecasts included in the LTP.
12. Procurement will be provided that delivers the defined LoS within budget, at a similar cost to that presently incurred in accordance with the Asset Procurement Strategy.
13. It is assumed that there will be no significant changes to current modes of service delivery for each service area or variations in terms of contract prices (above inflation and inventory adjustments) for current operations and maintenance contracts.
    Council will continue to consider collaboration opportunities and assess changes to service delivery on a case by case basis.
14. That reviews of service delivery modes (LGA 2002 s17) will not initiate significant changes to service delivery modes
15. The condition and remaining typical life have been accurately assessed, permitting appropriate renewal forward programmes to be developed and routinely updated.
16. Asset lives have been adopted from the best information available at the time of assessment. Asset lives will not be modified due to the 2010 and 2011 earthquakes unless an assessment indicates otherwise.
17. Staff will target resources based on the level of criticality and risk (highest to lowest where criticality has been assessed).
18. Our communities will not qualify for central government funding to improve sewer or water scheme works e.g. water quality upgrades.
19. It is assumed that any changes to the operation of Council's 5 Waters systems required by the implementation of the National Policy Statement on Freshwater Management can be addressed within existing budgets.

20. Demand management techniques will be applied and implemented as appropriate to networks, schemes and service areas both in the Council and user management areas.
21. Stormwater Management Plans will be completed and consented in all townships. That budgets will be sufficient for implementing the required actions
22. That there will be no requirement imposed to floriate SDC Managed Water Supplies.
23. That any additional actions arising from the Havelock North Water Enquiry can be accommodated with current management practices and budgets.
24. Community expectations for stormwater services across district township will increase over time, but there will be no urgent demand for extensive new networks and / or flood protection works within the first three years of the LTP
25. Council will adopt a risk management approach for the assessment and use of chlorine treatment in its water supplies.
26. That groundwater nitrate levels will remain below the Maximum Acceptable Values (MAV) over the next ten years.
27. Secure ground water status will be lost over the next ten years on bores located in semi aquifers and bored less than 30m deep in confined aquifers.

## Service targets for 5 waters activities

| Objective | Current service | Planned service 2018-28 | Indicative service 2021-2028 | Performance measure | Current performance | 2018/19 | 2019/20 | 2020/21 | 2021-28 |
|---|---|---|---|---|---|---|---|---|---|
| **Land Drainage** | | | | | | | | | |
| Nuisance effects from water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the land drainage network provided. | | | Proportion of residents rating the land drainage system good or very good. | 45% | ≥40% | ≥40% | ≥40% | ≥40% |
| | The land drainage network is managed to give a good quality service. | | | The number of complaints received about the performance of the Land Drainage system, expressed per 1000 rated properties. | 3.37 | Less than 10 | Less than 8 | Less than 6 | Less than 5 |
| Water services are provided in a cost effective manner. | **Operating Costs**<br>The land drainage network is provided at a reasonable cost. | | | Total average operating cost per serviced property for Land Drainage. | $74 | ≤$100 | ≤$100 | ≤$110 | ≤$120 |
| **Stormwater** | | | | | | | | | |
| Adverse effects of water services on the environment are minimised. | **Discharge Compliance**<br>The stormwater network is managed in accordance with resource consents conditions. | | | Compliance with resource consents for discharge from the stormwater system measured by the number of:<br>a) abatement notices;<br>b) infringement notices<br>c) enforcement orders; and<br>d) convictions.<br>Received from Environment Canterbury.<br>(Mandatory Performance Measure) | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil |
| Nuisance effects of water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the stormwater network provided. | | | Proportion of residents rating the stormwater system good or very good. | 51% | ≥45% | ≥45% | ≥45% | ≥45% |
| | The stormwater network is managed to give a good quality service. | | | The number of complaints received about the performance of the stormwater system, expressed per 1000 rated properties.<br>(Mandatory Performance Measure) | 4.87 | Less than 10 | Less than 8 | Less than 6 | Less than 6 |
| | **Response Times**<br>Flooding events are attended promptly by contractors and/or staff. | | | The median response time to attend a flooding event measured from the time that personnel receives notification to the time that service personnel reach the site.<br>(Mandatory Performance Measure) | Nil | Less than 1 hour for urgent flooding events. | Less than 1 hour for urgent flooding events. | Less than 1 hour for urgent flooding events. | Less than 1 hour for urgent flooding events. |

| Objective | Current service | Planned service 2018-28 | Indicative service 2021-2028 | Performance measure | Current performance | 2018/19 | 2019/20 | 2020/21 | 2021-28 |
|---|---|---|---|---|---|---|---|---|---|
| | **System Adequacy**<br>The stormwater system is maintained adequately and minimises flooding. | | | The number of flooding events that occur as a result of overflow from the stormwater system that enters a habitable floor.<br>(Mandatory Performance Measure) | Nil | Nil in less than 50 year storm events. | Nil in less than 50 year storm events. | Nil in less than 50 year storm events. | Nil in less than 50 year storm events. |
| | | | | For each flooding event, the number of habitable floors affected, expressed per 1,000 properties connected to the stormwater system.<br>(Mandatory Performance Measure) | Nil | Nil per 1,000 connected properties in less than 50 year storm events | Nil per 1,000 connected properties in less than 50 year storm events | Nil per 1,000 connected properties in less than 50 year storm events | Nil per 1,000 connected properties in less than 50 year storm events |
| | **Operating Costs**<br>The stormwater network is provided at a reasonable cost. | | | Total average operating cost per serviced property for Stormwater. | $73 | ≤$85 | ≤$85 | ≤$85 | ≤$85 |
| **Wastewater** | | | | | | | | | |
| Adverse effects of water services on the environment are minimised. | **Discharge Compliance**<br>The wastewater network is managed in accordance with resource consent conditions. | | | Compliance with resource consents for discharge from the wastewater system measured by the number of:<br>a) abatement notices;<br>b) infringement notices<br>c) enforcement orders; and<br>d) convictions.<br>Received from Environment Canterbury.<br>(Mandatory Performance Measure) | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil |
| Nuisance effects of water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the wastewater system provided. | | | Proportion of residents rating the wastewater system good or very good. | 78% | ≥65% | ≥65% | ≥65% | ≥70% |
| | The wastewater network is managed to give a good quality service. | | | The total number of complaints received about sewage odour, blockages, system faults and response to issues with the sewerage system, expressed per 1000 rated properties.<br>(Mandatory Performance Measure) | 3.22 | Less than 10. | Less than 8. | Less than 6. | Less than 6. |

| Objective | Current service | Planned service 2018-28 | Indicative service 2021-2028 | Performance measure | Current performance | 2018/19 | 2019/20 | 2020/21 | 2021-28 |
|---|---|---|---|---|---|---|---|---|---|
| Problems with water services are addressed in a timely manner and prioritised according to risk and need. | **Fault Response Times**<br>Wastewater system faults or problems are attended to promptly by contractors and/or staff. | | | Where personnel attend wastewater overflows resulting from a blockage or other fault in the wastewater system. The median response time measures the:<br>a) attendance time: from the time that the personnel receives notification to the time that service personnel reach the site;<br>b) resolution time: from the time that the personnel receives notification to the time that service personnel confirm resolution of the blockage or other fault. (Mandatory Performance Measure) | a) 30 minutes<br>b) 2 hours 36 minutes. | a) Less than 1 hour<br>b) Less than 24 hours | a) Less than 1 hour<br>b) Less than 24 hours | a) Less than 1 hour<br>b) Less than 24 hours | a) Less than 1 hour<br>b) Less than 24 hours |
| Service capacity is provided to accommodate growing communities, where this growth is sustainable. | **Serviced Area**<br>The wastewater network is provided to growing communities, where this growth is sustainable. | | | The proportion of residential properties serviced by wastewater services within the district expressed as a percentage of total residential properties. | 63% | ≥60% | ≥60% | ≥60% | ≥65% |
| The community is provided with water services to a standard that protects their health and property. | **System Adequacy**<br>The wastewater network is managed to give a good quality service. | | | The number of wet and dry weather wastewater overflows from the wastewater system, expressed per 1000 rated properties. (Mandatory Performance Measure) | 1.1 | Less than 1.5 overflow. | Less than 1.4 overflow. | Less than 1.3 overflow. | Less than 1.2 overflow. |
| Water services are provided in a cost effective manner. | **Operating Costs**<br>Wastewater services are provided at a reasonable cost. | | | Total average operating cost per serviced property for wastewater. | $349 | ≤$360 | ≤$360 | ≤$360 | ≤$360 |
| **Water supply** | | | | | | | | | |
| Adverse effects of water services on the environment are minimised. | **Water Take Compliance**<br>The water supply network is managed in accordance with resource conditions. | | | Compliance with resource consents for surface water takes for water supplies measured by the number of:<br>a) abatement notices;<br>b) infringement notices<br>c) enforcement orders; and<br>d) convictions.<br>Received from Environment Canterbury. | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil |

| Objective | Current service | Planned service 2018-28 | Indicative service 2021-2028 | Performance measure | Current performance | 2018/19 | 2019/20 | 2020/21 | 2021-28 |
|---|---|---|---|---|---|---|---|---|---|
| Nuisance effects of water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the water supply provided. | | | Proportion of residents rating the water supplies good or very good. | 74% | ≥65% | ≥65% | ≥65% | ≥70% |
| | The water supply network is managed to give a good quality service. | | | The total number of complaints received about drinking water clarity, continuity of supply, odour, taste, pressure or flow and the response to any of these issues, expressed per 1000 rated properties.<br>(Mandatory Performance Measure) | 11.14 | Less than 15. | Less than 15. | Less than 15. | Less than 15. |
| Problems with water services are addressed in a timely manner and prioritised according to risk and need. | **Fault Response Times**<br>Water system faults or problems are attended to promptly by contractors and/or staff. | | | Where personnel attend a non-urgent call-out in response to a fault or unplanned interruption in the reticulation system. The median response times measures the:<br>a) attendance time: from the time that personnel receive notification to the time that service personnel reach the site;<br>b) resolution time: from the time that personnel receive notification to the time that service personnel confirm resolution of the fault or interruption.<br>(Mandatory Performance Measure) | a) 1 hour<br>b) 23 hours 24 minutes | a) Less than 24 hours<br>b) Less than 120 hours | a) Less than 24 hours<br>b) Less than 120 hours | a) Less than 24 hours<br>b) Less than 120 hours | a) Less than 24 hours<br>b) Less than 120 hours |
| | | | | Where personnel attend an urgent call-out in response to a fault or unplanned interruption in the reticulation system. The median response times measures the:<br>a) attendance time: from the time that personnel receive notification to the time that service personnel reach the site;<br>b) resolution time: from the time that personnel receive notification to the time that service personnel confirm resolution of the fault or interruption.<br>(Mandatory Performance Measure) | a) 32 minutes<br>b) 2 hours 17 minutes | a) Less than 4 hours<br>b) Less than 48 hours | a) Less than 4 hours<br>b) Less than 48 hours | a) Less than 4 hours<br>b) Less than 48 hours | a) Less than 4 hours<br>b) Less than 48 hours |

| Objective | Current service | Planned service 2018-28 | Indicative service 2021-2028 | Performance measure | Current performance | 2018/19 | 2019/20 | 2020/21 | 2021-28 |
|---|---|---|---|---|---|---|---|---|---|
| Service capacity is provided to accommodate growing communities, where this growth is sustainable. | **Serviced Area**<br>The water supply network is provided to growing communities, where this growth is sustainable. | | | The proportion of residential properties serviced by water supplies within the district expressed as a percentage of total residential properties. | 82% | ≥80% | ≥80% | ≥80% | ≥85% |
| | **Maintenance of the Reticulation Network**<br>The water supply network is managed to minimise the leakage or loss from the system. | | | The percentage of real water loss from the water reticulation system in urban schemes. A water balance calculation methodology is used.<br>(Mandatory Performance Measure) | 16.4% | 24% | 22% | 20% | 20% |
| | **Fire Fighting**<br>There is adequate firefighting supply in the approved areas. | | | The proportion of an urban fire district area within 135m of one fire hydrant and 270m of two fire hydrants. | 70% | Greater than 60% of the district | Greater than 60% of the district | Greater than 60% of the district | Greater than 60% of the district |
| | **Demand Management**<br>There is enough water supplied to meet customer needs. | | | The average consumption of drinking water per day per resident.<br>(Mandatory Performance Measure) | 0.43$m^3$ per day | Less than 0.6$m^3$ per person per day within urban schemes | Less than 0.5$m^3$ per person per day within urban schemes | Less than 0.5$m^3$ per person per day within urban schemes | Less than 0.5$m^3$ per person per day within urban schemes |
| | **Safety of Drinking Water**<br>Water is safe to drink and complies with the Drinking Water Standards of New Zealand. | | | The extent to which the drinking water supplies comply with the drinking water standards for bacteria compliance.<br>(Mandatory Performance Measure) | Treatment 99.8%<br><br>Reticulation 99.2% | ≥99% of monitoring samples comply, at both the treatment plant and within the reticulation, across the district | ≥99.5% of monitoring samples comply, at both the treatment plant and within the reticulation, across the district | ≥99.5% of monitoring samples comply, at both the treatment plant and within the reticulation, across the district | ≥99.9% of monitoring samples comply, at both the treatment plant and within the reticulation, across the district |
| | | | | The extent to which the drinking water supplies comply with the drinking water standards for protozoal compliance.<br>(Mandatory Performance Measure) | 50% | ≥70% of the treatment plant sites are compliant across the district | ≥80% of the treatment plant sites are compliant across the district | ≥90% of the treatment plant sites are compliant across the district | ≥90% of the treatment plant sites are compliant across the district |

| Objective | Current service | Planned service 2018-28 | Indicative service 2021-2028 | Performance measure | Current performance | 2018/19 | 2019/20 | 2020/21 | 2021-28 |
|---|---|---|---|---|---|---|---|---|---|
| Water services are provided in a cost effective manner. | **Operating Costs**<br>The water supply is provided at a reasonable cost. | | | Total average operating cost per serviced property for water supply. | $310 | ≤$330 | ≤$330 | ≤$330 | ≤$330 |
| **Water races** | | | | | | | | | |
| Nuisance effects of water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the water race network provided. | | | Proportion of residents rating the water race system good or very good. | 44% | ≥35% | ≥35% | ≥35% | ≥35% |
| | The water race network is managed to give a good quality service. | | | The total number of complaints received about continuity of supply, expressed per 1000 rated properties. | 29.66 | Less than 50. | Less than 50. | Less than 50. | Less than 50. |
| Problems with water services are addressed in a timely manner and prioritised according to risk and need. | **Fault Response Times**<br>Water race system faults or problems are attended to promptly by contractors and/or staff. | | | Where personnel attends an urgent blockage or other fault in the water race system. The median response times measures the:<br>a) Attendance time: from the time that personnel receives notification to the time that service personnel reach the site;<br>b) Resolution time: the time that personnel receives notification to the time that service personnel confirm the resolution of the blockage or other fault. | a) 2 hours 4 minutes<br>b) 3 hours 20 minutes | a) Less than 4 hours<br>b) Less than 48 hours | a) Less than 4 hours<br>b) Less than 48 hours | a) Less than 4 hours<br>b) Less than 48 hours | a) Less than 4 hours<br>b) Less than 48 hours |
| Water services are provided in a cost effective manner. | **Operating Costs**<br>The water race network is provided at a reasonable cost. | | | Total average operating cost per serviced property for water races. | $139 | ≤$200 | ≤$200 | ≤$200 | ≤$200 |
| Adverse effects of water services on the environment are minimised. | **Water Take Compliance**<br>The water race network is managed in accordance with resource consent conditions. | | | Compliance with resource consents for surface water takes for water supplies measured by the number of:<br>a) abatement notices;<br>b) infringement notices<br>c) enforcement orders; and<br>d) convictions.<br>Received from Environment Canterbury. | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil |

# TABLE OF CONTENTS

# 1.0 INTRODUCTION

The Selwyn District Council (or Council) provides five water services to its ratepayers, these are Water Supply, Wastewater, Stormwater, Land Drainage and Water Races.

Council supplies clean safe water to drink for households and removes wastewater and rain water in a way that protects the health of the population and natural environment. Council also provides river water for livestock and drains land so that it is usable.

This section sets out the purpose of the Activity Management Plan (AcMP), indicates the intended level of service, summarises the districts assets and recognises the key challenges the district will face over the next ten years.

## 1.1 Purpose of the plan

The purpose of this AcMP is to outline and summarise the Council's long-term asset management approach for the provision and intergenerational management of water, wastewater, stormwater, water race and land drainage services - "the 5Waters" throughout the District. This may also be considered the overall objective of Asset Management.

This AcMP is intended to be read in conjunction with the Long Term Plan (LTP) and fulfils requirements of the Local Government Act 2002 (and amendments), - Schedule 10.

The purpose of the plan is to outline:

- The services provided now and in the future;
- The linkages between agreed community outcomes and levels of service;
- Acquisition, operation, maintenance, renewal and disposal of assets;
- Assessment and mitigation of risk;
- Funding of services; and
- Proactive knowledge improvement.

## 1.2 Structure and Format

The AcMP document structure is summarised below in Table 1-1. This volume of the AcMP should be read in conjunction with Volume 2,3,4,5 and 6 - Water Supplies, Wastewater, Stormwater, Water Races and Land Drainage.

**Table 1-1 AcMP Structure**

| Section | Description |
|---|---|
| Introduction | Sets out the purpose of the Activity Management Plan, indicates the key stakeholders and shows the plans framework. |
| Strategy, Goals, Objectives and Procedures | Identifies Council Strategies; National Policies, Regional Policies and Plans; Council Policies, Legislation; Bylaws; and Standards and Guidelines. |
| Activity Areas | Covers the ownership of 5Waters assets and the description of assets managed in this plan. |
| Management and Organisation structure | Sets out the organisational structure of the assets department, the consultation procedures that are adhered to and relationships with key stakeholders of the Council. |
| Levels of Service | Defines the level of service for the 5Waters Activities and the performance measures by which the service levels are assessed. |
| Growth and Demand | Provides details of growth forecasts which affect the management and use of all 5Waters assets. |
| Lifecycle Management | Outlines what is planned to manage and operate the assets at the agreed levels of service while optimising lifecycle costs. |
| Infrastructure Sustainability | Details the management of sustainability within the 5Waters Activity and the impact of climate cycles and trends on the district. |
| Risk Management | Details the risk management process utilised for assessing and managing risk as well as highlighting critical assets within the 5Waters activities. |
| Asset Management Process and Practices | Outlines the information available and the systems used to make decisions on how the assets will be managed. |
| Financial Summary | Identifies the financial requirements resulting from all of the information provided in the sections prior. |
| Improvement Plan | Details the improvements to asset management and the activity management plans which are planned over the next three years. |

## 1.3 Summary of Assets

The sustainable use of a safe water supply and the disposal of wastewater are fundamental to the health of all people and to the protection of the natural environment. The Council provides drinking water to all urban areas and some rural areas and wastewater disposal to most urban areas. These services provide an effective way to protect public health and to protect the natural environment.

In fulfilling Council's responsibilities to ensure that occupied buildings are sanitary, the Local Government Act – LGA and the Health Act require the Council to continue to provide the reticulated water supply and wastewater services that it owns and maintain its capacity (refer section 130 of LGA).

The open channel land drainage schemes provide the lowland areas of the district with an effective and efficient method of lowering groundwater levels. This water is ultimately discharged to Te Waihora / Lake Ellesmere and the Pacific Ocean. As a secondary use, stormwater also flows into and through the land drainage systems.

Appropriate land drainage ensures the rural community has land suitable to farm and live on. In the same way, these schemes provide some townships with a practical way of keeping houses, roads and businesses free of flood waters, by taking away stormwater.

The open channel water race schemes take river and stream water, distributing it by gravity through open channel for uses such as stock, irrigation, shelter belts, race side flora and fauna, and amenity values within urban townships. This service provides the rural communities with a water source where no other feasible one exists, and an amenity and environmental service which is unique.

The inventory of the 5Waters assets owned by Selwyn District Council are shown by the replacement column in Table 1-2 below. The notable exclusions are land which is valued via the Corporate Asset Plan.

**Table 1-2 Summary of 5Waters Services**

| Services | Schemes | Operating Costs (Total of 2018-2028) | Replacement Value as at 30 June 2017 |
|---|---|---|---|
| Water | 28 | $88,344,306.99 | $149,154,315.74 |
| Wastewater | 15 | $84,133,162.89 | $242,076,193.79 |
| Stormwater | 22 | $12,654,046.64 | $56,675,488.95 |
| Land Drainage | 9 | $3,048,550.00 | $43,168,585.49 |
| Water Races | 3 | $30,597,307.02 | $110,874,533.77 |
| Total | 77 | $218,777,373.54 | $601,949,117.74 |

A summary of the 5Waters expenditure on operating the 77 schemes is shown below in Figure 1-1. The 5Waters activity comprises of 18.7% of the Councils total operating costs projected for the 2018-2028 period.

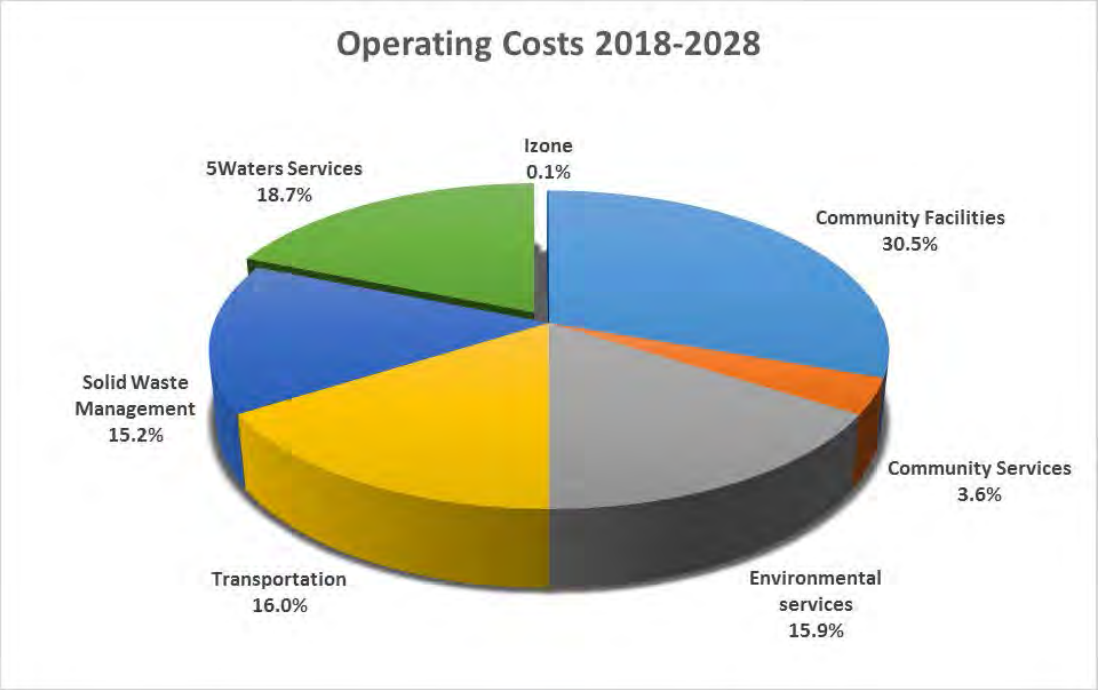


**Figure 1-1 Projected Operating Costs for 2018-2028**

A summary of the 5Waters expenditure on capital projects across the schemes is shown in Figure 1-2. The 5Waters activity comprises of 24.9% of the Councils total capital spend projected for the 2018-2028 period.

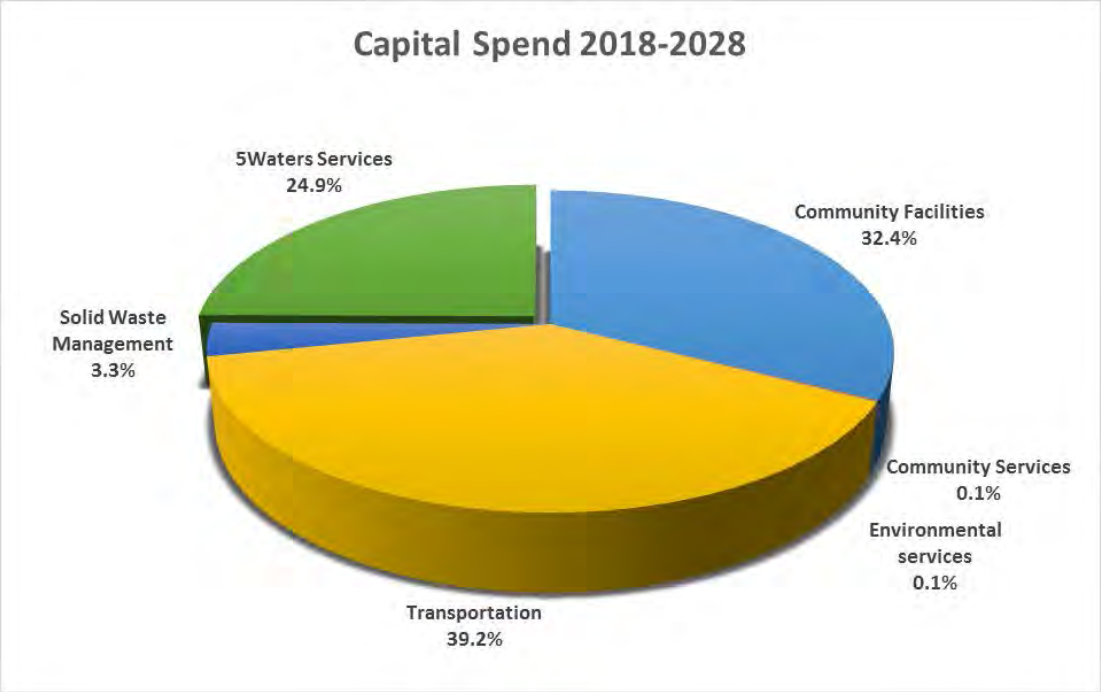


**Figure 1-2 Projected Capital Spend for 2018-2028**

A summary of the value of the 5Waters assets is shown below in Figure 1-3. The 5Waters activity comprises of 45.2% of the Councils total asset value as at 30 June 2017.

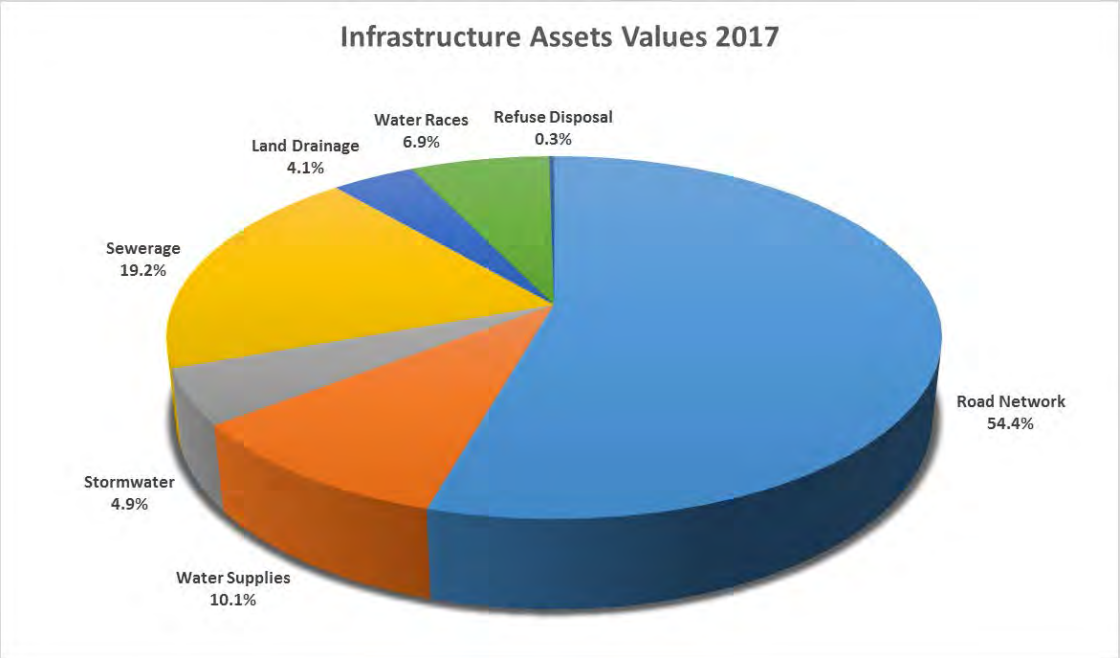


**Figure 1-3 Infrastructure Asset Value as at 30 June 2017**

A summary of the expenditure on projects and capital projects is shown below in

Figure 1-4. Projects are driven by both growth and Levels of Service demands. Capital projects are predominately driven by growth whereas projects are generally driven by level of service, this split is also shown in Figure 1-4.

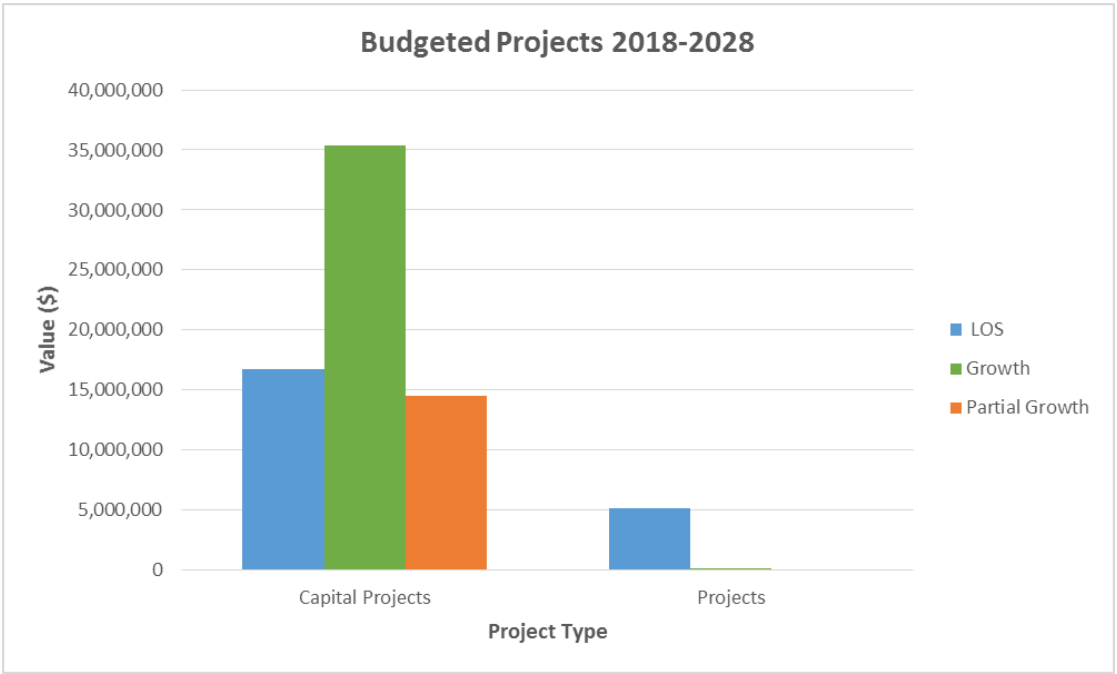


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**Figure 1-4 Project Works 2018-2028**

## 1.4 5Waters Level of Service

There are nine objectives across the 5Waters. The community made it clear in 2006 that their top four levels of service were to:

- **Protect** their health and property;
- Be **cost-**effective;
- Meet reasonable **needs**; and
- Be **fairly priced.**

In managing Selwyn's 5Waters, we aspire to provide these services at the level which is sustainable in the long-term with a high level of customer satisfaction. This balance creates tension between the needs of today and the future generations.

We continue to focus resources to deliver a high level of service. To achieve this, we need the right balance of qualified staff and consultants, funding and time to complete projects.

*The Levels of Service are in tension – that is the 5Waters services you use and consume are from a strategic 60-year view do not yet align with the right work being done at the right time to minimise cost, damage to the environment and meet our customers wants and needs. This is an evolving programme, with significant steps being taken over the last 3 years.*

*Over the next 3 years future work is identified to tie the strategic direction into delivery of the 5Waters business.*

## 1.5 Key Challenges

There are a number of key challenges for asset management within the Selwyn District, these are outlined in Table 1-3 below. The first three are challenges which are across all the 5Water services, these are followed by challenges which face each of the 5Water services.

**Table 1-3 Key Challenges for Asset Management**

| Key Challenges | What we plan to do |
|---|---|
| Setting efficient rating levels | Improve asset renewal data quality to an appropriate level;<br>Improve the quality of operations and maintenance projections; and<br>Ensure operational costs are clear before committing to capital works, renewals or modifications. |
| Changing regulatory requirements | Monitor changes in Iwi and regulatory requirements. |
| Growth | Undertake master planning and demand management. |

| | |
|---|---|
| *Water*<br>Ensuring Water is Safe to Drink | Identify source risk areas and mitigate through Water Safety Plans. |
| *Wastewater*<br>Septage Disposal<br>Alternative Treatment Options | Remediate Septage disposal sites (these are no longer active);<br>Investigate different treatment options for Darfield and Upper Selwyn Huts |
| *Water Races*<br>Long Term Viability of Schemes<br>Unique ecology in the race network | Identify customers needs alongside and CPW objectives and timing<br>Assess and value unique race areas. |
| *Stormwater*<br>Urban based improvements | Deliver integrated catchment plans, coordinated resourcing of stormwater system consenting, design and operation. |
| *Land Drainage*<br>Changes in land ownership<br>Intensification of land use and water quality<br>Cost of scheme operation | Better management of schemes via education and partnerships (iwi and Regional Council)<br>Move away from targeted rates to 'one rate'. |

## 1.6 Current Asset Management Performance

The Councils Asset Management Policy sets the appropriate level of asset management practice for delivery of Council's 5Waters, Community Facilities and Transportation services. The 5Waters activity has adopted an 'intermediate' level of asset management practice.

An Asset Management Maturity Assessment and an AcMP Review was undertaken by AECOM in 2017, a summary of the results of this are shown in Figure 1-5.

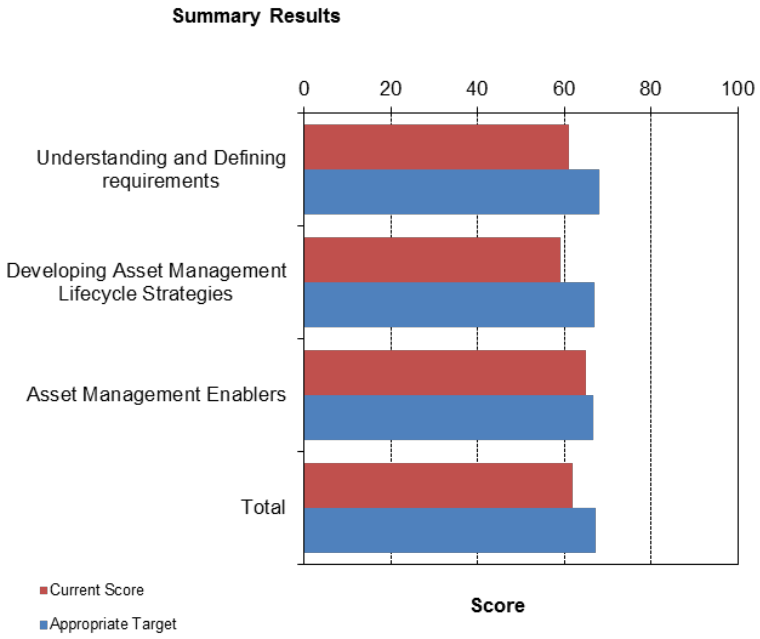



**Figure 1-5 Asset Management Maturity 2017**

Figure 1-5 shows that overall the 5Waters activity has achieved an intermediate level of asset management maturity.

An overall comment, describes the results of the 2017 report. A summary of this is provided below:

> *This is an extremely comprehensive Activity Management Plan comprising approximately 1700 pages across all 6 volumes. The reason for including a large quantity of information in the Activity Management Plan is appreciated and will support the retention of institutional knowledge about the 5 Waters and effective succession planning. Staff of Selwyn District Council are to be commended for the effort that has clearly gone into this AMP.*

# 2.0 STRATEGIES, OBJECTIVES AND LEGISLATION

The Council's operation and delivery of all activities is constrained and shaped by legislation, statutory plans, processes, and other documents. This section describes the combination of directives in place and their impact on the 5Waters in Selwyn.

In particular this section identifies details:

- Legislation;
- National Policies, Regional Policies and Plans;
- Councils Policies, Bylaws and Standards and Guidelines; and
- Councils Strategies and Plans.

## 2.1 Role of Strategies and Plans

Central Government provide a high level of direction and regulation into the water infrastructure sector through Strategies, Plans, Policy Statements and Legislation. Regionally there is a suite of Plans and Strategies, many of which link with the Greater Christchurch Urban Development Strategy (UDS) partnership.

Selwyn District Council has developed a broad range of documents including strategies to define the broad scope and direction of its activities. Once adopted by Council, no process or action should be inconsistent with it.

## 2.2 Government and Industry Direction

In providing the services to the community, Council needs to be cognisant of Central Government and Industry direction for infrastructure assets and public service provision. This is done through attending conferences and seminars, studying reports released by Central Government agencies and membership of industry organisations. The key themes that are signalled are outlined in Table 2-1.

**Table 2-1 Key Themes**

| Theme | Source |
|---|---|
| **Information**<br><br>How local authorities identify the right information that provides the evidence on what they need to understand about their assets, and how they collect, capture, and share that information?<br><br>How well local authorities are managing and planning to provide services now and into the future? | Office of the Auditor General<br><br>(multi-year themed work programme 2016/17) |

| | |
|---|---|
| How good is the knowledge on asset condition and how is it used to determine the nature and frequency of maintenance and renewals?<br><br>How is asset information used to make decisions and enable sustainable service delivery? | |
| **Water**<br><br>Our proposed theme for 2017/18 is Water. We are interested in water because it is of significant and growing interest to Parliament and citizens here and internationally, in terms of both water quality and quantity. It is a broad topic that spans central and local government, the environment, the economy, and society.<br><br>It therefore provides a focused and useful introduction to our proposed 2018/19 theme of Sustainable development. We are currently considering the scope of work under our proposed sustainable development theme[1]. | Office of the Auditor General<br><br>(multi-year themed work programme 2017/18) |
| **Havelock North**<br><br>Following the widespread outbreak of gastroenteritis in Havelock North in August 2016, with more than 5,000 people falling ill, the Government announced that an Inquiry into the Havelock North water supply contamination incident would be held.<br><br>Drinking water supplies are regulated under the Health Act 1956 and the source of drinking water is regulated under the Resource Management Act and National Environmental Standards for sources of drinking water. The National Environmental Standards are given effect to by the Regional Council.<br><br>Government's report of Havelock North Drinking Water Inquiry: Stage 2 was made publicly available on 6 December 2017. The report recommended a number of urgent and early actions to prevent recurrences of an outbreak of waterborne disease in water supplies throughout New Zealand. The recommendations are currently being considered by Government.<br><br>On the 20 December 2017, the Director-General of health Chai Chuah issued a statement for the purpose of protecting public health and informing the public. It was advised that all drinking-water suppliers and drinking-water assessors that:<br><br>• Protection of drinking-water sources is of paramount importance and a founding principle of drinking-water safety; | Department of Internal Affairs – Better Local Government |

[1] Source – OAG 2016/17 Annual Plan

| | |
|---|---|
| • Every drinking-water supplier must contribute to the protection of drinking-water sources;<br>• The risk to the public is increased if drinking-water is untreated;<br>• To provide adequate protection to public health, suppliers providing drinking-water to untreated networked supplies should consider implementing appropriate and effective treatment without delay; and<br>• They should reconsider their reliance on secure bore water status as a means of providing safe drinking water.<br><br>In light of this advice, Council staff have reviewed the timing of projects in the 2018-28 LTP. The main impact was bringing forward UV treatment on secure bores to the first two years of the LTP. Previously these sites were considered a lower risk and were therefore budgeted in the later years of the LTP. | |
| **Improving New Zealand's Water, Wastewater & Stormwater Sector**<br><br>A position paper prepared by LGNZ identifies three areas for improvement within the Water Service area:<br>– Increasing need to renew and replace assets;<br>– Service providers are being asked to meet higher standards of quality; and<br>– There is not enough information on performance. | Local Government NZ |
| **Metadata Standards**<br><br>To ensure the correct asset data is collected and in the correct manner, LINZ and MBIE gained funding from Treasury to work with local councils and central government agencies to develop national metadata standards for the 3-waters (potable, waste and storm) network, and for residential and light commercial buildings.<br><br>Draft standards have been developed for capturing, describing and storing data for potable water, and residential housing and light commercial buildings.<br><br>The roll out of these data standards is expected to start mid 2017. | LINZ & MBIE |
| **Earthquake damage & pipe renewals**<br><br>The 2011 Canterbury earthquake has led to a major project which could impact on cost of replacing water pipes.<br><br>A joint venture between Water New Zealand, the Institute of Public Works Engineering Australasia (IPWEA) and the Quake Centre based at Canterbury | Water NZ |

| | |
|---|---|
| University, is aimed at providing tools to enable better and more nationally consistent decisions on where and how to renew and replace water piping.<br><br>This venture may result in significant savings through improved decision-making.<br><br>The first stage aims to bring together guidance documents and tools to enable Council staff to make evidence based decisions relating to the management and renewal of their drinking, storm and wastewater pipe networks. The programme covers inspection, maintenance and renewal strategies | |

## 2.3 Legislation

### Key Legislation – Implications of Asset Management

Legislation is established by Central Government and must be complied with at Local Government Level. Significant legislation and regulations affecting the 5Waters activities are provided in Table 2-2.

Different legislation has differing levels of impact on the 5Waters activity; this is indicated under Impact Range (Broad ***, Moderate **, Limited *).

**Table 2-2: Legislation Impact on the 5Waters Activity**

| Legislation & Regulation | Scope | Activity Impact |
|---|---|---|
| **Biosecurity Act 1993** | **Water races & Land Drainage** | |
| **Building Act 2004 (and amendments)** | **All** | * |
| **Civil Defence Emergency Management Act 2002** | **All** | *** |
| **Climate Change (Emissions Trading and Renewable Preference) Act 2008** | **All** | * |
| **Climate Change Response Act 2002 (and amendments)** | **All** | ** |
| **Ellesmere Land Drainage Act 1905** | **Land Drainage** | ** |
| **Energy Efficiency and Conservation Act 2000** | **All** | * |
| Environmental Protection Authority Act 2011 | **All** | * |
| Epidemic Preparedness Act 2006 (and amendments) | **All** | * |
| **Fencing Act 1978** | | |
| **Fire Service Act 1975** | **Community Water** | ** |
| **Government Roading Powers Act 1989** | | |
| **Greater Christchurch Regeneration Act 2016** | **All** | *** |
| Hazardous Substances and New Organisms Act 1996 | **Water races & Land Drainage** | ** |

| | | |
|---|---|---|
| **Health Act 1956** | **Community Water** | *** |
| **Health and Safety at Work Act 2015** | **All** | *** |
| **Historic Places Act 1993 (and amendments)** | **All** | * |
| **Land Drainage Act 1908** | **Land Drainage** | * |
| **Land Transport Management Act 2003** | | |
| **Land Transport Act 1989** | | |
| **Local Government Act 2002 (and amendments)** | **All** | *** |
| **Local Government Act 1974 (and amendments)** | **All** | ** |
| **Local Government Rating Act 2002 (and amendments)** | **All** | ** |
| **Local Government Rating Act 1979** | **All** | * |
| **Local Government (Financial Reporting) Regulations 2011. Renamed to Local Government (Financial Reporting and Prudence) Regulations 2014** | **All** | ** |
| **Local Government (Financial Reporting) Amendment Regulations 2013** | | |
| **Marine and Coastal (Takutai Moana) Act 2011** | **Water races & Land Drainage** | * |
| **National Water Conservation (Rakaia River) Order 1998** | **All** | ** |
| **Ngai Tahu Claims Settlement Act 1998** | **All** | * |
| **Public Works Act 1981 (and amendments)** | **All** | * |
| **Reserves Act 1977 (and amendments)** | **All** | |
| **Resource Management Act 1991 (and amendments)** | **All** | *** |
| **Telecommunications Act 1987** | | |
| **Transit New Zealand Act 1989.** | | |
| **Utilities Access Act 2010** | **All** | *** |
| **Water Conservation (Te Waihora / Lake Ellesmere) Order 2011** | **Water races & Land Drainage** | ** |
| **Water Conservation (Rakaia River) Order 1988** | **All** | ** |
| **WorkSafe New Zealand Act 2013** | **All** | ** |

## Canterbury Earthquake Recovery Act 2011 - CERA

The CER Act was provided in response to the earthquake events of 4 September 2010 and 22 February 2011. A recovery plan was developed and implemented in response to these and subsequent events over the greater Christchurch area – Selwyn and Waimakariri Districts and Christchurch City Council.

The CERA (Act) provides the Minister for Canterbury Earthquake Recovery and CERA CEO with powers to override all other Acts. This is generally expected to be achieved through Orders in Council.

The CERA (Act) had effect from 18 April 2011, with its existence proposed for five years. It was repealed by the Greater Christchurch Regeneration Act in 2016.

### Greater Christchurch Regeneration Act 2016

The expiry of the Canterbury Earthquake Recovery Act 2011 (CER Act) on 18 April 2016 prompted the development of the Greater Christchurch Regeneration Act 2016 which came into force during April 2016.

The primary focus of the CER Act was on recovery – where "Recovery" was defined as including restoration and enhancement.

The Greater Christchurch Regeneration Act establishes a new entity called Regenerate Christchurch. Jointly controlled by Christchurch CC and the Crown, one of its objectives is to lead regeneration in the Christchurch district for the next five years. 'Regeneration' is defined broadly as:

- Rebuilding; and
- Improving the environmental, economic, social, and cultural well-being, and the resilience, of communities through urban renewal and development, and restoration and enhancement.

The new framework transfers more decision-making powers to local authorities and provides for greater public input.

### Civil Defence Emergency Management Act 2002

Under the CDEM Act 2002 there is an expectation that Council's services will function at the best possible level and extent during and after an emergency, including no change from normal operation. Council has established planning and operational relationships with regional CDEM groups to deliver emergency management within Selwyn district boundaries.

Water supply and wastewater are regarded as critical services requiring attention during adverse events and are given special consideration within Council emergency management procedures. Every effort will be given to restore services immediately after an event to at least provide adequate water for sanitation and health needs. Supply quantity and quality may be limited.

### Health Act 1956 and Health Amendment Act 2007

Places an obligation on Council to improve, promote and protect public health within the District. The provision of water services conserves public health and helps to protect land and waterways from contamination.

The Health Act requires Council to provide the Medical Officer of Health with reports on the level, rate and mitigation measures of diseases, and quality of water.

The Health Act 1956 was amended by the Health (Drinking Water) Amendment Act (HAA 2007) in October 2007 and aims to protect public health by improving the quality of drinking-water provided to

communities. The main duties in the Act only apply to supplies above a certain size. Drinking-water suppliers must comply with Sections 69S to 69ZC of the Act by the dates listed in the table.

As a consequence of this Act, Council were required to take all practicable steps to comply with the Drinking-Water Standards for New Zealand 2005 (Amended 2008) implementing this through water safety plans (WSP). These plans are complete and have been approved by the Drinking Water Assessor.

A Water Supply may be categorised as a Rural Agricultural Water Supply and assessed against Section 12 of the DWSNZ. However, the criteria for Section 12 of the DWSNZ is still to be prepared and there is uncertainty as to what that part of the DWSNZ will ultimately require.

**Water Safety Plans**

The Health (Drinking Water) Amendment Act 2007 requires drinking water suppliers to prepare and implement a Water Safety Plan (WSP) for any water supply serving more than 500 people [s69Z]. WSPs were previously known as Public Health Risk Management Plans (PHRMP). These must be reviewed and re-submitted for approval by a Drinking Water Assessor every five years.

The Act places a duty on drinking water suppliers to take all practicable steps to comply with drinking water standards. A drinking water supplier complies with this requirement by implementation of an approved WSP [s69 (1) and (2)]. Chapter 10 of the Drinking Water Standards for New Zealand (DWSNZ) includes alternative compliance criteria for drinking water supplies serving fewer than 500 people. Such supplies may adopt a WSP based compliance approach. A number of Council's water supplies fall into this category.

Council confirmed in 2010 that WSPs were to be completed and implemented for all Council drinking water supplies. These are reviewed every five years. Table 2-3 presents the status of the WSPs (as at January 2018). WSPs have a risk management focus, an aspect which is discussed further in Section 9.4.

WSPs have public health consequence as their focus and include a programme of improvement works, including both capital projects and operation and maintenance items. The Ministry of Health's Assessors periodically review implementation of the improvement plans and report Non-Conformances and Recommendations. Having prepared and commenced implementation of WSPs in advance of the statutory timeframes Council is well placed to achieve compliance providing that a strong focus on implementation is maintained.

**Table 2-3 Water Safety Plan Summary**

| Code | Scheme | Population | Status | Approved Date | Revision Due |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| ART002 | Arthurs Pass | 350 | Approved | Jun-15 | May-20 |
| CAS003 | Castle Hill | 299 | Approved | Jun-15 | May-20 |
| CLA005 | Claremont | 170 | Approved | Jun-15 | May-20 |
| DAR001 | Darfield | 3,283 | Approved | Jul-14 | Jun-19 |
| DUN008 | Dunsandel & Sherwood Estate | 480 | Approved | May-15 | Apr-20 |
| EDE002 | Edendale, Genesis Drive | 180 | Approved | Apr-15 | Mar-20 |
| SEL001 | Hororata Acheron, Acheron | 240 | Approved | Jul-15 | Jun-20 |
| SEL001 | Hororata Acheron, Hororata | 920 | Approved | May-15 | Apr-20 |
| JOH001 | Johnson Rd, West Melton | 160 | Approved | Jun-15 | May-20 |
| JOW001 | Jowers Road | 51 | Approved | Feb-17 | Jan-22 |
| KIR001 | Kirwee | 1,100 | Approved | May-15 | Apr-20 |
| LAK007 | Lake Coleridge | 148 | Approved | Jun-15 | May-20 |
| LEE001 | Leeston | 2,350 | Approved | May-15 | Apr-20 |
| LIN002 | Lincoln | 4,500 | Approved | May-15 | Apr-20 |
| MAL001 | Malvern Hills, Dalethorpe | 183 | Approved | May-15 | Apr-20 |
| MAL001 | Malvern Hills, Hartleys Rd | 1,409 | Approved | Jun-15 | May-20 |
| PRE001 | Prebbleton | 3,346 | Approved | May-15 | Apr-20 |
| RAK003 | Rakaia Huts | 313 | Approved | Mar-15 | Feb-20 |
| RAV001 | Raven Drive | 37 | Approved | Jun-15 | May-20 |
| ROL001 | Rolleston | 12,292 | Approved | Apr-15 | Mar-20 |
| SHE004 | Sheffield/Waddington | 585 | Approved | May-15 | Apr-20 |
| SOU001 | Southbridge | 992 | Approved | May-15 | Apr-20 |
| SPR002 | Springfield | 520 | Approved | May-15 | Apr-20 |
| SPR003 | Springston | 510 | Approved | May-15 | Apr-20 |
| TAI009 | Tai Tapu | 606 | Approved | Jun-15 | May-20 |
| TAU011 | Taumutu | 30 | Approved | Jun-15 | May-20 |
| TEP014 | Te Pirita | 37 | Approved | May-15 | Apr-20 |
| UPP005 | Upper Selwyn Huts | Unknown | Approved | Jun-15 | May-20 |
| WES010 | West Melton | 1,800 | Approved | Jul-14 | Jun-19 |

## Health and Safety at Work Act 2015

The Health and Safety at Work Act 2015 (HSWA)was enacted on 4 April 2016 and is part of "Working Safer: a blueprint for health and safety at work" and reforms New Zealand's health and safety system following the recommendations of the Independent Taskforce on Workplace Health and Safety. Working Safer is aimed at reducing New Zealand's workplace injury and death toll by 25 per cent by 2020.

The HSWA:

- **Reinforces** proportionality – what a business needs to do depends on its level of risk and what it can control;
- **Shifts** from hazard spotting to managing critical risks – actions that reduce workplace harm rather than trivial hazards;
- **Introduces** the "reasonably practicable" concept – focusing attention on what's reasonable for a business to do;
- **Changes** the focus from the physical workplace to the conduct of work – what the business actually does and so what it can control; and
- **Supports** more effective worker engagement and participation – promoting flexibility to suit business size and need.

A guiding principle of the HSWA is that workers and other persons should be given the highest level of protection against harm to their health, safety, and welfare from work risks as is reasonably practicable. The HSWA shifts the focus from monitoring and recording health and safety incidents to proactively identifying and managing risks so everyone is safe and healthy.

The HSWA identifies four duty holders:

| | |
|---|---|
| Persons conducting a business or undertaking (PCBUs) – these may be individuals or organisations | Have the primary responsibility for the health and safety of their workers and any other workers they influence or direct. They are also responsible for the health and safety of people at risk from the work of their business |
| Officers | (Company directors, partners, board members, chief executives) must do due diligence to make sure the business understands and is meeting its health and safety responsibilities |
| Workers | Must take reasonable care for their own health and safety and that their actions don't adversely affect the health and safety of others. They must also follow any reasonable health and safety instruction given to them by the business and cooperate with any reasonable business policy or procedure relating to health and safety in the workplace. |
| Other persons at workplaces | Who come into the workplace, such as visitors or customers, also have some health and safety duties to ensure that their actions don't adversely affect the health and safety of others |

A range of regulations will be developed as part of this HSWA. The HSWA requires identifying the risks associated with hazards and associated mitigation to reduce those risks.

### Historic Places Act 1993

Describes an archaeological site as "Any place in New Zealand that:

- Was associated with human activity that occurred before 1900;
- Is the site of the wreck of any vessel where that wreck occurred before 1900; and

- Is or may be able through investigation by archaeological methods to provide evidence relating to the history of New Zealand".

It is unlawful to modify, damage or destroy any archaeological site – recorded or not – without an authority from the New Zealand Historic Place Trust.

### Local Government Act 2002

Defines the purpose of local authorities as enabling local decision-making by and on behalf of the community, and allows local authorities the power of general competence. This Act specifically requires Councils to continue to provide water and wastewater services if they do so already.

The Local Government Amendment Act 2012 made significant changes to the Local Government Act 2002 in relation to:

- Purpose of local government;
- Reorganisation options;
- Role and power of Mayors; and
- Community outcome reporting.

The 2012 amendments endeavoured to:

- Change what development contributions can be used for;
- Allow for objections to development contributions charges;
- Encourage more collaboration and shared services between local authorities;
- Make consultation requirements more flexible;
- Provide for a new significance and engagement policy;
- Enable more efficient and focused consultation on long-term plans and annual plans;
- Remove unnecessary duplication between annual plans and long-term plans;
- Introduce new requirements for infrastructure strategies and asset management planning;
- Enable elected members to use technology to participate in council meetings, rather than attending in person;
- Require councils to disclose information about their rating bases in long-term plans, annual plans and annual reports; and
- Require disclosure of risk management arrangements for physical assets in annual reports.

This included provisions that enable the Local Government Commission to:

- Establish local boards (similar to those in Auckland) as part of new unitary authorities, and in existing unitary authorities; and

- Create council-controlled organisations and joint committees as part of a reorganisation scheme.

In addition to the general requirements of the Local Government Act there are some specific clauses that apply to water services, these are specified in Table 2-4.

**Table 2-4: Water Services LGA 2002 Clauses**

| Section | Details | Applies to |
|---|---|---|
| S 125 | Places a requirement to assess water and other sanitary services from time to time | Water and Sanitary Services Assessment |
| S 130 | Imposes an obligation to maintain water services and places limitations on the transfer or selling of assets | Divestment of services |
| S 136 | Empowers Councils to enter into Contracts relating to provision of water services for periods not exceeding 35 years whilst maintaining control over the pricing of the service, retain legal responsibility for the service and being responsible for the development of policy related to the water services | Utilities Contract |
| S 137 | Empowers Councils to enter joint local government arrangements and joint arrangements with other entities for the provision of water services, with the same constraints as S136 | Utilities and Professional Services provision and procurement |
| Pt 1 -2<br>Pt 3 - 23 | Council provides groups of activities for financial, performance and negative effects reporting purposes. The Water and Waste unit will provide Group summaries for water (urban & rural), sewerage and stormwater | Water and Waste Services |

### Local Government Act 1974

A significant part of the Local Government Act 1974 has been repealed, with specific sections still in force. Part 21, Section 319 of this act essentially empowers the Council to maintain its roads to the standard it sees fit. Part 26 Sewerage and Stormwater, sections 440-469 applies to land drainage and rivers by territorial authorities. Part 29 Land drainage and rivers clearance, sections 501F -517ZM applies to sewerage and stormwater drainage by territorial authorities. Part XXIII Water Supply, sections 375-397 applied to water supplies, but have been repealed.

### Local Government Rating Act 2002

Provides Council with flexible powers to set, assess, and collect rates to fund Council activities while ensuring that rates are set in accordance with decisions that are made in a transparent and consultative manner and providing for processes and information to enable ratepayers to identify and understand their liability for rates.

### Resource Management Act 1991

Governs all water takes and discharges. Water takes and discharges to waterways and land occur through the extraction of water from waterways and land. Resource consents obtained for water takes and discharge activities require parameters such as volume and quality to be monitored as well as taking steps to mitigate any adverse effects that may occur through the activity.

There have been numerous amendments to the Resource Management Act over the years:

- 2009 –
    - streamlined and simplified the RMA
    - improved how councils process resource consents
    - set up a system that allows nationally significant consent applications to be dealt with more quickly
- 2013 –
    - improve the resource consent regime
    - set a time limit for consent processing
    - provided easier referral to the Environment Court
    - increased requirements for councils to base their planning decisions on a robust and thorough evaluation of the benefits and costs

Resource management reform is one of Government's key priorities. RMA reform is focused on taking away much of the uncertainty, time and cost from the RMA and creating a system that enables growth while ensuring important environmental standards are maintained.

At the time of writing this Plan the Resource Legislation Amendment Bill 2015 was before a Select Committee.

The four most significant changes to the Bill are:

- Requiring councils to follow national planning templates that will improve the consistency and reduce the complexity of plans. This will substantially reduce the volume of planning documents across the country because most provisions will be standardised;
- Faster and more flexible planning processes. The Bill provides three different tracks by which a council can produce a plan: the existing track that now has tighter timelines, a new collaborative track, and a streamlined rack;
- Reduced requirements for consents. The Bill eliminates the need for thousands of minor consents by giving councils discretion to not require them, by introducing a new 10-day fast-track for simple consents and by removing requirements for consents where they are already required under other Acts; and

- Stronger national direction around requiring provision for growth like housing, and provision for national regulations to address issues like dairy stock in rivers and other regulations to limit extent of RMA application.

The Bill addresses areas of legislative duplication in the areas of:

- Hazardous substance management - Removing the explicit function of regional councils and territorial authorities to manage hazardous substances under the RMA, as this is already covered by the Hazardous Substances and New Organisms Act 1996;
- The notified concession process under the Conservation Act - Aligning the notified concession process under the Conservation Act 1987 with notified resource consents under the RMA at key steps;
- Recreation reserve exchanges under the Reserves Act - Creating an optional joint process of public notification, hearings and decisions for proposals that involve private plan changes and/or resource consents under the RMA and recreation reserve exchanges under the Reserves Act 1977; and
- Financial and development contributions under the Local Government Act - There is currently considerable variation and overlap between how different councils charge financial and development contributions. The Bill will remove the ability for a council to charge a financial contribution under the RMA. This will make it clear that the costs of servicing new growth should be met through development contributions under the Local Government Act 2002. Consent conditions will still be able to include contributions to offset environmental effects.

### Utilities Access Act 2010

The Act establishes a framework for the National Code of Practice to govern how corridor managers and utility operators coordinate their activities within transport corridors.

The purpose of the Code is to:

- Maximise the benefit to the Public while ensuring that all Utility Operators are treated fairly;
- Ensures that disruptions to Roads, Motorways, and railways caused by Work by Utility Operators are kept to a minimum, while maintaining safety; and
- Provides a nationally consistent approach to managing access to Transport Corridors.

During 2012 Council engineers investigated the Utilities Access Act 2010 and associated National Code of Practice for Utility Operators' Access to Transport Corridors to consider and document:

- Implications of the Code
- The context of the Selwyn district:

- Overview
- Roles
- Systems
- Business processes
- Implementation

This project identified actions necessary to implement the Code.

The Code is a mandatory requirement for all road and rail controlling authorities and utility network operators under the Utilities Access Act 2010, and came into effect on the 1st January 2012. The Code was reviewed during 2016.

The initial KPI data identified several issues including a lack of consistency, along with the fact that not all reporting entities had sent in their returns, meaning that any comparisons were incomplete. The situation was exacerbated by the fact that only 1 year's results are available, with any real value to come from analysis of changing trends over time. Refining of the data collection requirements will be a major focus moving forward, resulting in a more comprehensive reporting and analysis to be provided following the receipt of 2016-17 KPI data.

### Standards, Codes of Practice and Guidelines

National environmental standards, design standards (AS/NZS ISO), Codes of Practice and Guidelines provide technical direction. National Standards must be complied with under the direction of relevant legislation.

### National Environmental Standards

National environmental standards are regulations issued under the Resource Management Act 1991 (RMA). They prescribe technical standards, methods and other requirements for environmental matters. Region and local councils must enforce these standards (or they can enforce stricter standards where the standard provides for this). In this way, national environmental standards ensure consistent minimum standards are maintained throughout all New Zealand's regions and districts.

The National Environmental Standard for Sources of Human Drinking Water came into effect on 20 June 2008 and is intended to reduce the risk of contaminating drinking water sources such as rivers and groundwater. It does this by requiring regional councils to consider the effects of activities on drinking water sources in their decision making. Specifically, the NES require Councils to:

- Decline discharge or water permits that are likely to result in community drinking water becoming unsafe for human consumption following existing treatment;
- Be satisfied that permitted activities in regional plans will not result in community drinking water supplies being unsafe for human consumption following existing treatment;

- Place conditions on relevant resource consents requiring notification of drinking water suppliers if significant unintended events occur (e.g. spills) that may adversely affect sources of human drinking water; and
- Work with Regional Council (Canterbury) to place conditions on applicable new consents for the protection of its public supply sources.

### National Environmental Standard for Sources of Human Drinking Water (2008)

The National Environmental Standard for Sources of Human Drinking Water is intended to reduce the risk of contaminating drinking water sources such as rivers and groundwater. It does this by requiring regional councils to consider the effects of activities on drinking water sources in their decision making - resource consents and regional plans. Specifically, councils will be required to:

- Decline discharge or water permits that are likely to result in community drinking water becoming unsafe for human consumption following existing treatment;
- Be satisfied that permitted activities in regional plans will not result in community drinking water supplies being unsafe for human consumption following existing treatment;
- Place conditions on relevant resource consents requiring notification of drinking water suppliers if significant unintended events occur (e.g. spills) that may adversely affect sources of human drinking water; and
- Council works with Regional Councils to place conditions on applicable new consents for the protection of its public supply sources.

### AS/NZ Standards

Where possible, relevant AS/NZS standards are used as the basis for determining standards of design and construction. The Code for Subdivision and Development AS/NZS: 4404 is the principal document defining design requirements. New works within the urban areas are constructed in general accordance with NZS4404 Land Development and Subdivision Infrastructure which sets minimum standards for reticulation construction, including the provision of firefighting water.

A summary of key Asset Management standards and manuals are tabled below in Table 2-5.

**Table 2-5: Asset Management Standards & Manuals**

| Asset Management Standards |
|---|
| NAMS International Infrastructure Management Manual 2006 |
| NAMS International Infrastructure Management Manual 2011 |
| ISO 55000 International Standards for Asset Management 2014 |
| PAS 55-1:2008 Asset Management (British Standards) |
| NAMS Developing Levels of Service and Performance Measures Guidelines 2007 |

| |
|---|
| NAMS Optimised Decision Making Guidelines 2004 |
| NAMS Infrastructure Asset Valuation and Depreciation Guidelines 2006 |
| NZWWA New Zealand Pipe Inspection Manual 2006 |
| NZWWA The New Zealand Infrastructural Asset Grading Guidelines 1999 |

In 2014 the International Organisation for Standardisation (ISO) published the ISO 55000 series of asset management standards. The ISO 55001:2014 Standard sets out the requirements for an integrated, effective management system for asset management. The ISO 55001 Standard builds on the PAS 55 Standard for Asset Management published in 2004 by the British Standards Institution (BSI). The PAS 55 Standard achieved widespread international acceptance and use which led to the development of the ISO Asset Management Standard. PAS 55 has now been withdrawn by the BSI in favour of ISO 55001. With the ISO 55001 Standard now emerging as the international benchmark against which asset management maturity is measured, organisations are increasingly assessing the adequacy of their asset management practices relative to the requirements of the Standard.

In 2017 Council reviewed whether asset management practices conform to ISO 55001. From this assessment Council (as scored from the 5 Waters Activity Management Plan) scored an average of 1.62 across all ISO 55001 requirements. This places Selwyn District Council approximately midway between “aware” and “developing” in terms of their asset management practices. The review indicated key areas that Council could work towards to improve practice. The Council will undertake these over the next three years which will assist in the move towards aligning with the requirements of ISO 55001 if this is the direction Council decide to take in the future.

## 2.4 National Strategies and Plans

National policy statements are issued by the government to provide direction to regional and local government about matters of national significance which contribute to meeting the purposes of the Resource Management Act 1991.

### National Infrastructure Plan

The National Infrastructure Plan 2015 (NIP 2015) is the third National Infrastructure Plan to be released by the Government.

The NIP 2015 confirms the Government’s long term vision for infrastructure and is designed to reduce uncertainty for businesses by outlining the Government's intentions for infrastructure development over a 20 year timeframe. It provides a framework for infrastructure development rather than a detailed list of projects and it includes a series of actions.

The NIP provides a Vision for New Zealand’s Infrastructure that:

*"By 2045 New Zealand's infrastructure is resilient and coordinated and contributes to a strong economy and high living standards."*

The NIP 2015 is the first Infrastructure Plan that details a comprehensive suite of actions that will be undertaken to deliver on the new approach. The actions are focussed on what central government, local government and infrastructure peak bodies will do, reflecting the collaborative effort required to change how infrastructure is planned, developed and managed in New Zealand. Significant policy work and consultation will be required to develop the detail. The following list of actions are taken from the NIP 2015.

The Action Plan for **Asset Management** means:

- Local government will have a long-term view of their investment requirements to make more informed decisions. The Local Government Amendment Act 2014 is a step towards this, requiring an infrastructure strategy for at least a 30-year period.
- Infrastructure providers will develop a more sophisticated approach to understanding the condition of those assets, the timing of renewals, and how they are performing in comparison to similar networks. This be will progressed through the establishment of shared metadata standards across roading, the three waters, and government built assets.
- Infrastructure providers will be able to understand how their networks interact with other infrastructure networks as well as the implications for land use planning and the end user of infrastructure services.
- Individual sectors will progress specific programmes to improve their asset management maturity including the establishment of a programme to enhance the capability, productivity and leadership in asset management throughout the public sector in New Zealand by IPWEA New Zealand and the NIU.

The Action Plan for the **3 Waters** means:

The sector will be recognised for its mature asset management practices across all providers, underpinned by reliable and accurate data on the state and performance of the network to support better decision-making. A key focus is optimising the existing three waters network. This will be achieved through:

- Developing national metadata standards for water infrastructure to ensure a consistent base to build evidence, undertake forecasting, deepen capability (LINZ, NIU, local authorities, and sector bodies).
- Establishing centres of excellence responsible for collating the data obtained through the shared metadata standards, providing the necessary analytics and supporting local decision-making (NIU, sector bodies, and local authorities).

- EquiP LP, Local Government New Zealand's centre of excellence, is developing a Governance Development programme and an Organisational Performance programme to assist councils in raising the standard of governance, performance and asset management (LGNZ).
- The LGNZ 3 Waters project to lift the performance of our potable water, wastewater and stormwater services and infrastructure. The project established a National Information Framework survey in 2014 and the issues paper released in October 2014 explores the issues facing New Zealand's three waters sector. LGNZ will be releasing a position paper in 2015 to outline what a well performing three waters sector should look like and propose options for a sector led approach to improving performance in the future.

Infrastructure providers collaborate more effectively within and across regions, taking a long-term view and ensuring adequate investment in high-growth communities. This will be achieved through:

- Investigating options to support long-term integrated regional infrastructure plans, potentially with legislative recognition incorporating central, regional and local government objectives (NIU).
- Recognising the importance of aligning infrastructure delivery with planning.
- Investigating how to manage water, wastewater and stormwater services across the sub region.

## National Policy Statement for Freshwater Management

The National Policy Statement for Freshwater Management 2014 (NPS-FM 2014) sets out the objectives and policies for freshwater management under the Resource Management Act 1991. The NPS-FM 2014 came into effect on 1 August 2014. The NPS-FM is one of the initiatives developed as part of the Government's programme of water reform. The NPS-FM:

- Requires regional councils to set freshwater objectives for fresh water, and provides a process for setting them;
- Requires councils to account for freshwater takes and contaminants, which will provide information for setting and managing to freshwater objectives and limits;
- Provides for Councils to set the limits and methods which will affect how water is used, and this may require water resources users to adjust their practices; and
- Requires regional councils to involve iwi and hapū in the management of fresh water, and to work with them to identify tāngata whenua values and interests, and reflect these in the management of, and decision-making about, fresh water.

These initiatives flow through respective Regional Councils Policy Statements & Regional Plans as follows:

**Canterbury Land and Water Regional Plan**

***Policy 4.16A*** of the CLWRP requires the Council to account for and assume responsibility for the quality and quantity of all stormwater discharged from its reticulated stormwater systems by 2025. This includes management of discharges into the Council stormwater systems from high risk activities or sites.

*"Any reticulated stormwater system for any urban area is managed in accordance with a stormwater management plan that addresses the following matters:*

*(a) the management of all discharges of stormwater into the stormwater system; and*

*(b) for any reticulated stormwater system established after 11 August 2012, including any extension to any existing reticulated stormwater system, the discharge of stormwater being subject to a land-based or designed treatment system, or wetland treatment prior to any discharge to a lake or river; and*

*(c) how any discharge of stormwater, treated or untreated, into water or onto land where it may enter water meets or will meet, the water quality outcomes and standards and limits for that waterbody set out in Table 1, Schedules 5 and 8 and Sections 6 to 15,(whichever applies); and*

*(d) The management of the discharge of stormwater from sites involving the use, storage or disposal of hazardous substances, and*

*(e) Where the discharge is from an existing local authority network, demonstration of a commitment to progressively improve the quality of the discharge to meet condition (c) as soon as practicable but no later than 2025."*

### National Environmental Standard for Sources of Human Drinking Water (2008)

The National Environmental Standard for Sources of Human Drinking Water is intended to reduce the risk of contaminating drinking water sources such as rivers and groundwater. It does this by requiring regional councils to consider the effects of activities on drinking water sources in their decision making - resource consents and regional plans. Specifically, councils will be required to:

- Decline discharge or water permits that are likely to result in community drinking water becoming unsafe for human consumption following existing treatment;
- Be satisfied that permitted activities in regional plans will not result in community drinking water supplies being unsafe for human consumption following existing treatment;
- Place conditions on relevant resource consents requiring notification of drinking water suppliers if significant unintended events occur (e.g. spills) that may adversely affect sources of human drinking water; and
- Council works with Environment Canterbury (Ecan) to place conditions on applicable new consents for the protection of its public supply sources.

## National Policy Statement for Urban Development Capacity

The National Policy Statement on Urban Development Capacity 2016 (NPS-UDC) sets out the objectives and policies for providing development capacity under the Resource Management Act 1991.

The NPS-UDC came into effect on 1 December 2016 and has been described by the government as "the core issue of increasing land supply".

The NPS-UDC directs local authorities to provide sufficient development capacity in their resource management plans for housing and business growth to meet demand.

Development capacity refers to the amount of development allowed by zoning and regulations in plans that is supported by infrastructure. This development can be "outwards" (on greenfield sites) and/or "upwards" (by intensifying existing urban environments).

Sufficient development capacity is necessary for urban land and development markets to function efficiently in order to meet community needs. In well-functioning markets, the supply of land, housing and business space matches demand at efficient (more affordable) prices.

The NPS-UDC contains objectives and policies that local authorities must give effect to in their resource management decisions that provide direction on:

1. The outcomes that urban planning decisions should achieve;
2. The evidence underpinning those decisions;
3. Responsive planning approaches; and
4. Coordination between local authorities and providers of infrastructure.

Within these four, the NPS-UDC targets the more challenging requirements for urban areas experiencing the most significant growth.

The NPS provisions also apply in tiers from general to more specific circumstances, as follows:

- The objectives apply to all local authorities when making planning decisions that affect 'urban environment';
- Urban environments that are expected to experience growth;
- Medium and high growth rates; and
- High growth areas.

Local authorities that have a high-growth urban area within their jurisdiction are expected to meet all of the requirements of policies in this national policy statement, while local authorities with medium-growth urban areas in their jurisdiction, and all other local authorities, have lesser requirements, as per Table 2-6 below.

**Table 2-6 National Policy Statement Policy Requirements**

| | All local authorities | Local authorities with a medium growth area | Local authorities with a HIGH growth area |
|---|---|---|---|
| Objectives that apply | All | All | All |
| Policies that apply | PA1-PA4 | PA1-PA4 | PA1-PA4 |
| | | PB1-PB7<br>PC1-PC4<br>PD1-PD2 | PB1-PB7<br>PC1-PC4<br>PD1-PD2 |
| | | | PC5-PC14<br>PD3-PD4 |

The NPSUDC is a recent initiative from Central Government that requires high growth councils to undertake several mandatory assessments to assist in determining housing capacity over a 30 year period. This includes monitoring market indicators, preparing a Housing and Business Capacity Assessment to determine demand, supply and feasibility and to implement these findings through responsive planning initiatives. The availability of serviced land is a key determinant to whether one site may be more feasible than another site to develop from a market perspective.

The Capacity Assessments document whether Council infrastructure, including water, wastewater and stormwater utilities, are available and identify where it is programmed as a measure of when it may be feasible to develop in the short (3 years), medium (10 years) and long (30 year) periods. In the case of Selwyn District the vast majority of the available land that makes up the short to medium term supply is serviced by available infrastructure.

Any shortfalls in supply identified by the Capacity Assessments will need to be provided for under a Settlement Pattern Review, which will identify where additional land may be required to accommodate future growth. This will require an infrastructure assessment to determine if and when it may be able to be serviced before it can be deemed to be plan enabled supply.

Council has developed water and wastewater masterplans that cover the growth townships.

## Productivity Commission

The New Zealand Productivity Commission (NZPC) is an independent Crown entity that provides advice to the Government on improving productivity in New Zealand. The NZPC conduct inquiries and productivity research to expand knowledge about productivity and identify areas for improvement.

### i. Local Government Regulation

During May 2012 and inquiry was commissioned to contribute to the Government's 'Better Local Government' initiative to improve the legislative framework for New Zealand's councils.

The Commission was asked to:

- Develop principles to guide decisions on which regulatory functions are best undertaken by local or central government;
- Identify opportunities to improve the regulatory performance of local government; and
- Recommend options for regularly assessing the regulatory performance of the local government sector.

Amongst the Commission's recommendations for improving regulation are:

- A tool for helping to decide what regulations, and which parts of implementing regulation, are best performed by Government or councils;
- Use of standardised formats and increased transparency to better demonstrate how key council regulatory decisions have been made;
- More focus by government departments, when preparing new regulation intended to be implemented by councils, on the costs and benefits of the proposed regulation, where those costs and benefits will fall, whether or not councils have the capability and capacity required to effectively implement the new regulation, and the likely costs of building that capability and capacity where it does not exist;
- The development of a 'Partners in Regulation' protocol to better guide Government/council engagement;
- The development of new or enhanced joint Government/council forums for overseeing improvements; and
- Greater use of risk-based approaches to monitoring and enforcement of regulation by councils, together with enabling greater use of infringement notices to support regulations in place of more costly formal prosecutions.

**ii. Urban Planning**

During 2015 the Productivity Commission was tasked to look at ways of improving New Zealand's urban planning system. This is a follow up on the Commission's findings that New Zealand's urban planning laws and processes were unnecessarily complicated, slow to respond to change and did not meet the needs of cities.

The Commission has been asked to identify the most appropriate system for allocating land use in cities to achieve positive social, economic, environmental and cultural outcomes. This includes the processes that are currently undertaken through the Resource Management Act, the Local Government Act and the Land Transport Management Act. The inquiry will look beyond the existing planning system and consider whether a fundamentally different approach to urban planning is needed.

The draft report found the following deficiencies:

- The current planning system is slow to adapt and is risk averse;

- Processes for updating land use rules are slow and uncertain;
- There is too much unnecessary, poorly-targeted regulation;
- Resistance to change from local residents and barriers to funding new infrastructure also inhibit a city's ability to grow and respond to change;
- Ambiguous and broad language in current planning laws has led to overly restrictive rules in urban areas, 'scope creep', and an under-emphasis on the natural environment;
- The relevant primary legislation does not give prominence to urban issues, and it is difficult to set clear priorities for the natural environment; and
- The lack of central government guidance has led to decisions that suit local interests, but which have negative wider impacts such as rising land and housing prices.

The draft report recommends:

- A more restrained approach to land use regulation;
- Infrastructure that is delivered at the right time and at the right place;
- Infrastructure pricing and funding that more accurately reflects actual costs, use and impacts;
- A clearer distinction between the built and natural environment and unambiguously state the important priorities, especially at the national level;
- Stronger professional capabilities at both the local and central government level is required, along with an organisational culture that is fit for purpose to meet the new demands of a future planning system; and
- A different relationship between both levels of government will be required, one that is based on mutual understanding, collegiality and effective interactions, as both are mutually dependent on each other for their success.

The final report is due for release during 2017.

It is important for Council to stay abreast of any local government related inquiries conducted by the Productivity Commission as Central Government may use the NZPC's reports and findings as a catalyst to initiate proposed change.

### The NZ Energy Strategy and the NZ Energy Efficiency & Conservation Strategy

The NZ Energy Strategy, and the NZ Energy Efficiency and Conservation Strategy are statutory documents and are and referenced in the GPS.

Released in 2011, the revised *New Zealand Energy Strategy provides the government's direction for energy and the role energy will play in New Zealand's economy. It replaces the 2007 New Zealand Energy Strategy. It covers the supply, delivery and use of energy. It offers direction for the energy industry; for energy-related aspects of transport, housing, research and development; and infrastructure. The last*

*section is the New Zealand Energy Efficiency and Conservation Strategy, which provides direction more specifically for energy efficiency, renewable energy and energy conservation[2].*

*The New Zealand Energy Efficiency and Conservation Strategy (NZEECS) was written in 2007, and was a key part of the government's response to meeting its energy, climate change, sustainability and economic transformation goals. It has been written as a companion document to, and will give effect to a number of the objectives set out in, the New Zealand Energy Strategy (NZES)[3].*

*The New Zealand Energy Strategy 2011–2021 and the New Zealand Energy Efficiency and Conservation Strategy 2011–2016 will add a focus on energy efficiency to these goals. New Zealand's per capita energy use for transport is high compared to many other OECD countries. Improving transport energy efficiency offers major opportunities to improve the productivity of the overall economy.*

*To do this these strategies will focus on improving vehicle fuel efficiency, and increasing the uptake of low-carbon fuels and technologies. They will highlight the potential to reduce energy use in urban areas through walking and cycling and greater use of public transport. The strategies will place an expectation on local authorities to ensure integrated travel options through their transport and planning roles. Local authorities will also be expected to improve the efficiency of local transport networks and layouts so that people and freight can move about with greater ease and energy efficiency[4].*

### Water Conservation Te Waihora/Lake Ellesmere Order 2011

Hearings to vary the Water Conservation (Lake Ellesmere) Order 1990 were undertaken in June 2011. The variation requests some worthy amendments, particularly recognition of cultural and spiritual values of Te Waihora. The 5Waters Plan (2009-2019) already recognised the high significance of Te Waihora/ Lake Ellesmere, and broadly agreed with the variations. However, Council submitted evidence on the basis that the existing activities of wastewater, land drainage stormwater and water races would not be stopped as a result of the variation. The decision issued on this matter clearly states that discharges are not covered. This will allow Selwyn District Council to at least apply for new consents in time.

## 2.5 Regional and Greater Christchurch Strategies and Plans

Canterbury Region and Greater Christchurch area strategies and plans are discussed in the following sections. Canterbury Regional documents relate to the entire region and are typically developed under Ecan direction; the group of documents developed for the Greater Christchurch area prior to, or under the Greater Christchurch Urban Development Strategy (UDS) partnership also follow.

[2] *Source: New Zealand Energy Strategy*

[3] *Source: EECA.govt.nz*

[4] *Source: GPS 2011*

## Canterbury Land and Water Regional Plan

The Land & Water Regional Plan is a new planning framework for Canterbury and aims to provide clear direction on how land and water are to be managed and help deliver community aspirations for water quality in both urban and rural areas.

The Canterbury Land and Water Regional Plan (LWRP) identifies the resource management objectives for managing land and water resources in Canterbury to achieve the purpose of the Resource Management Act 1991. It identifies the policies and rules needed to achieve the objectives, and provides direction in terms of the processing of resource consent applications.

This LWRP is made up of 16 sections and a map volume:

- The first describes Canterbury's land and water resources, interrelated issues that need to be managed, the key partnerships, relationships and processes already underway, including the Canterbury Water Management Strategy (CWMS).
- The second section describes how the Plan works and contains the definitions used in the Plan.
- The subsequent three sections cover the region-wide objectives, policies, and rules.
- Sections 6 to 15 inclusive contain sub-region catchment specific policies and rules, and
- Section 16 contains the schedules.
- The maps referred to in the rules are in a separate map volume.

## Canterbury Regional Council's Regional Policy Statement

The requirements of the Resource Management Act 1991 are being implemented by the Canterbury Regional Council through the Resource Consent procedure and the Proposed Natural Resources Regional Plan.

The Canterbury Regional Policy Statement 2013 (Revised December 2013) gives an overview of the significant resource management issues facing the region, including issues of resource management significance to Ngāi Tahu. The purpose of the CRPS is to set out objectives, policies and methods to resolve those resource management issues and to achieve the integrated management of the natural and physical resources of Canterbury. There are specific policies related to infrastructure and recovery and rebuilding of Greater Christchurch, this is covered under Section 0.

## Iwi Plans

Mahaanui Iwi Management Plan is a significant document. Any impact on the current or proposed 5Waters Strategy must account for this. The most significant for the Te Waihora catchment is the Ngai Tahu and Canterbury Regional Council Interim Co-Governance arrangement. It must be noted that:

- Selwyn District Council and its Te Waihora communities have an integral role in this matter as it affects land drainage, water races, stormwater and wastewater;

- Iwi are clearly showing that they see more benefit in a relationship with territorial authorities than the Crown; and
- There is a direct linkage with the Canterbury Water Management Strategy.

The Te Waihora/Lake Ellesmere restoration and rejuvenation of the mauri and ecosystem health has been confirmed with the signing of Whakaora Te Waihora - a long-term relationship agreement and shared commitment between Environment Canterbury, Ngāi Tahu and Te Waihora Management Board.

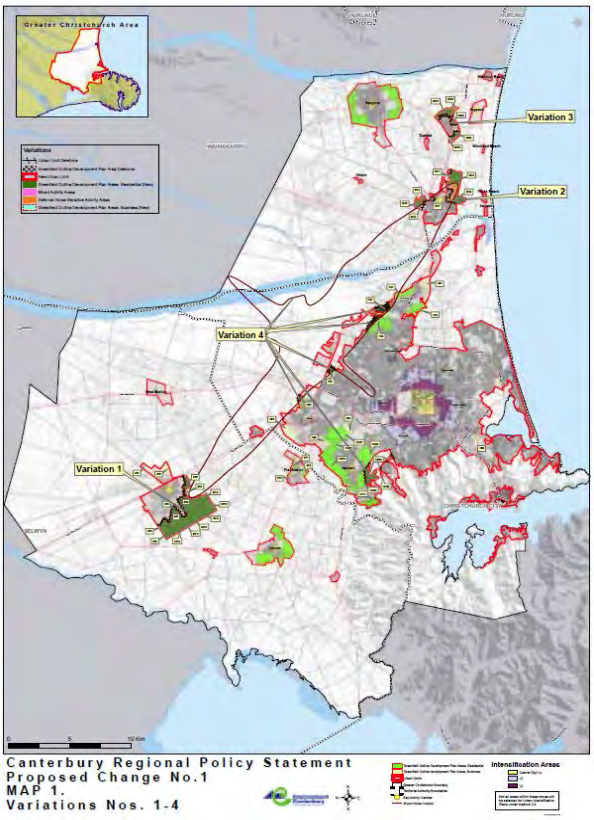
The interim co-governance agreement puts in place a framework within which Ngāi Tahu and Environment Canterbury will work towards the realisation of outcomes aimed at the restoration and rejuvenation of the values of the lake and catchment.

By February 2012 Iwi and ECan have agreed to build on this interim agreement by developing an enduring co-governance structure (by February 2012).

The interim arrangement is informal and non-statutory and has functions which include the following:

- Development of a long-term co-governance agreement ;
- Provision for the governance group (the Te Waihora Management Board) together with Environment Canterbury Commissioners) to provide input into decision-making on matters relating to the lake and its management (for example statutory plans, review of regional and Selwyn-Waihora Zone Implementation Plans, the appointment of hearing commissioners);
- Oversight of the restoration programme (called Whakaora Te Waihora) which is part-funded by government;
- Provision for discussions with key stakeholders on the part they will play in the long term management of Te Waihora. The Selwyn District Council plays a pivotal role in the management of the physical resources of the lake and catchment and the parties will work closely with Selwyn District Council to ensure its special relationship is recognised and provided for appropriately in the new arrangements; and
- The signing of a co-governance agreement for the active management of Te Waihora is a specific goal contained in the Canterbury Water Management Strategy.

## Greater Christchurch Urban Development Strategy




The Greater Christchurch Urban Development Strategy (UDS) has a significant influence on Selwyn District Council's planning and actions. The UDS area includes the Springs and Selwyn Central Wards of the District.

*The Greater Christchurch Urban Development Strategy (the Strategy) is a bold and ambitious plan for managing urban development that protects water, enhances open spaces, improves transport links, creates more liveable centres and manages population growth in a sustainable way.*

*The Strategy vision is for a greater Christchurch for the residents of the area (living south of the Ashley River and north of the Selwyn River) and the Strategy partners, Environment Canterbury, the Christchurch City Council, Selwyn and Waimakariri District Councils and the New Zealand Transport Agency (formerly Transit New Zealand).*

**Figure 2-1: Canterbury Regional Policy Statement Proposed Change No.1**

*The Strategy provides the primary strategic direction for the Greater Christchurch area, including the location of future housing, development of social and retail activity centres, areas for new employment and integration with transport networks. It also establishes a basis for all organisations, not just the Strategy partners, and the community to work collaboratively to manage growth.*

*The Strategy was created through a three-year long consultation and development process initiated in 2004 due to rising concerns over the lack of collaborative planning and leadership to manage growth in the area in a sustainable way. Community consultation undertaken by the Strategy partners resulted in over 3,250 submissions on growth management options for the area.*

### Regional Policy Statement Proposed Change 1 (Urban Development Strategy)

Proposed Change 1 was developed to address land use and urban growth management in Greater Christchurch until 2041. It introduced a new Chapter 12A (Development of Greater Christchurch) to the Regional Policy Statement which sets out the land use distribution, household densities for various areas, and other key components for consolidated and integrated urban development. It also sets out which land is to remain rural for natural resource protection or for other reasons.

The Minister for Canterbury Earthquake Recovery, Hon Gerry Brownlee, decided to revoke Proposed Change 1 to the Canterbury Regional Policy Statement. The decision was ancillary to the decision to insert the new Chapter 6 – Recovery and Rebuilding of Greater Christchurch into the Regional Policy Statement as a result of the approval of the Land Use Recovery Plan.

### Land Use Recovery Plan

The Land Use Recovery Plan takes effect on 6 December 2013. It is a statutory document, and directs the Christchurch City Council, Waimakariri and Selwyn District Councils and Canterbury Regional Council (Ecan) to make changes to district plans, the Canterbury Regional Policy Statement and other instruments. Some of these changes take effect immediately and others are to be developed by the relevant council within specified timeframes.

Action 18(i) to (vii) identifies seven greenfield priority areas for future residential development.

The Council has developed Outline Development Plans (ODPs) with associated text amendments through an extensive consultation process with landowners, affected parties and stakeholders.

The ODPs have been developed in accordance with best practice urban design and subdivision criteria and will facilitate the provision of up to 4,500 additional residential sections in the Selwyn District. This is discussed in Section 6.0: Growth and Demand.

### Climate Change Report (Environment Canterbury)

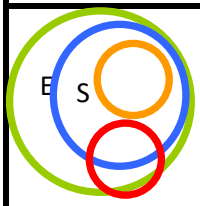
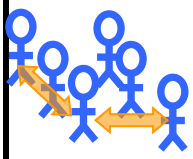
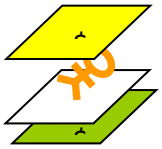
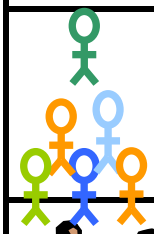
This report considers the effects of climate change for the region on the environment, society and the economy. Predicted effects that are relevant to this activity include: changes to indigenous biodiversity and ecosystems; distribution shift of pest species (plants and animals); more extreme weather events; competition for scarce water resources; environmental deterioration effect on primary production with consequent implication for the district economy.

## 2.6 Selwyn District Council Strategies, Plans, Policies and Bylaws

### Sustainability Principles

In February 2008 Council adopted Seven Sustainability Principles to guide planning and management of infrastructure. These are outlined in Figure 2-2.

**Figure 2-2: Selwyn District Council Seven Sustainability Principles**

| | |
|---|---|
|  | **Principle 1: Make decisions based on the four aspects of well-being**<br>Integrate environmental, economic, social and cultural considerations within Council decision making. Consider both the short-term and long-term effects of the decision |
|   | **Principle 2: Observe the Precautionary Principle to provide contingency and enable adaptability of our community**<br>Err on the side of caution in the face of scientific uncertainty and a risk of serious or irreversible environmental damage |
|  | **Principle 3: Seek "intra-generational" and "inter-generational" equity**<br>Improve quality of life and create opportunity for all of the current generation, without compromising the quality of life and opportunity of future generations |
|  | **Principle 4: Internalise environmental and social costs**<br>Develop and adopt a system that recognises the true costs and benefits of protecting and restoring environmental/ecological, human, social and cultural resources affected as a result of the services that Council provides |
|  | **Principle 5: Foster community welfare**<br>Support and encourage the region to prosper socially and culturally. Our assets are not just our built assets but our people, their skills and the connections between them |
|  | **Principle 6: Act to halt the decline of our indigenous biodiversity and maintain and restore remaining ecosystems**<br>Conserve, and sustainably use and manage, the district's biodiversity, recognising the various services that ecosystems provide to humans as well as the environment's intrinsic value |
|  | **Principle 7: Consider, and promote the sustainability of our neighbouring communities and work with governing bodies for sustainable outcomes**<br>Recognise that we are part of a whole globe system whether we can physically see the impacts of our actions or not. |

## 5Waters Strategy

Council uses strategies to define the broad scope and direction of its activities. Once adopted by Council, no process or action may be inconsistent with these strategies. In 2009 Council adopted its 5Waters Strategy. The strategy is supported by a set of sustainability principles and Selwyn specific interpretations of the four wellbeing's (environmental, social, economic, cultural).

In combination, the stated principles and strategy goals reflect councils adopted method of giving effect to sustainable development (refer 'purpose of Local Government Act 2002').

The 5Waters Strategy identifies the depth and span of goals and actions in 'we will do….' format. It describes the desired position of this council activity in 60 years. The 5Waters Strategy is one of a number of strategies in place, including 'Selwyn 2031', adopted in 2014.

This Strategy will be reviewed before the next LTP, considering the amount of growth the district has undergone over the past few years it is timely that it was reviewed.

Figure 2-3 below covers global to local 5Waters issues which are encompassed by the 5Waters Strategy. In taking this position a clear link between global influences e.g. World Health Organisation Standards on drinking water quality is shown with individual scheme compliance requirement.

**Figure 2-3: 5Waters Strategy Layers**

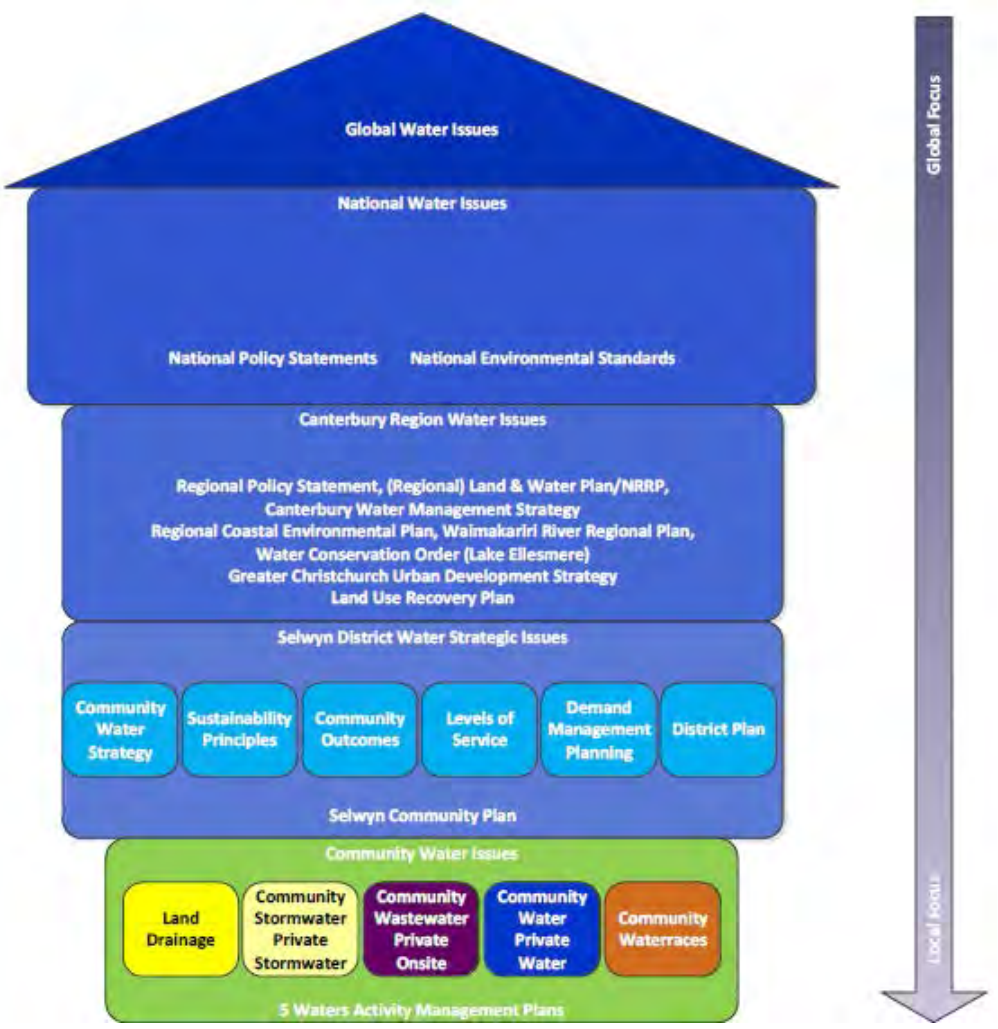



Table 2-7 identifies the planning framework in which the 60 year 5Waters Strategy sits. The strategy drives work in the 10 year Long Term Plan (LTP) work programme. This 10 year plan process is described

in this 5Waters AcMP. Any infrastructure constructed within this LTP is done so in accordance with the strategies 60 year vision.

**Table 2-7: 5Waters Planning Windows**

| Document | Planning Horizon | | | | | | |
|---|---|---|---|---|---|---|---|
| Annual Plan Process | **1 year** | Short term funding for on-going delivery of strategy | | | | | |
| Long Term Plan Update + 30yr Infrastructure Strategy | | **3 years** | Review of long term funding predictions | | | | |
| Community Outcomes | | | **6 years** | Higher level goals | | | |
| Local Government Review 'Stronger Communities' | | | **6 years** | Focus on Council rationalisation development and reform | | | |
| Long Term Plan | | | **10 years** | Shows funding predictions | | | |
| Activity Management Plan | | | | **10-20 years** | Shows wider activity matters | | |
| Regional Water Strategy | | | | | **20 years** | Selwyn – Waihora zone | |
| 30yr Infrastructure Strategy | | | | | **30 Years** | Shows wider activity matters | |
| Resource Consents | | | | | **35 Years** | Show activity to occur | |
| 5Waters Strategy | | | | | | 60 years | Selwyn long term sustainability |

## District Wide Strategy (Future for Selwyn)

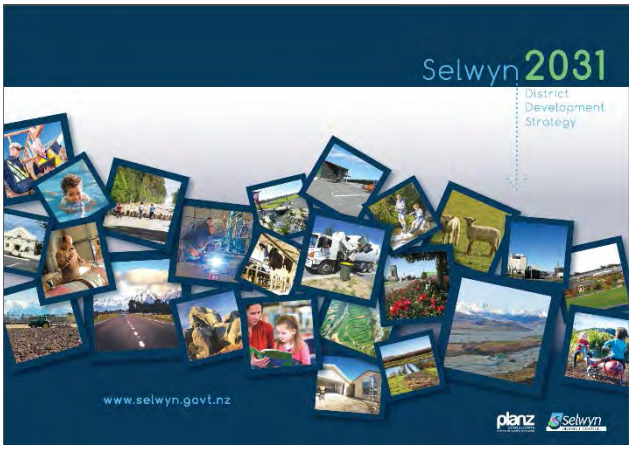
In 2014 Selwyn District Council adopted 'Selwyn 2031" the District Development Strategy. This strategy has been in preparation since 2011.

The Vision of Selwyn 2031, is:

*"To grow and consolidate Selwyn District as one of the most liveable, attractive and prosperous places in New Zealand for residents, businesses and visitors."*

*To achieve this vision, Selwyn 2031 identifies the following five high-level Directions to guide Council's future decision-making:*

- A More Sustainable Urban Growth Pattern;
- A Prosperous Community;
- A Great Place to Live;
- A Strong and Resilient Community;
- Sustainably Managing our Rural and Natural Resources




## Procurement Strategy

Developed in 2010 to meet the requirements of NZTA's Procurement Manual, this Strategy details the approach to procurement across the Transportation, 5Waters, Community Services and Waste Management.

Procurement of services for the Transportation Activity is required to comply with the Strategy. The Executive Summary follows.

*Selwyn District Council has developed a comprehensive regime for asset management planning and service delivery. This framework reflects community desires and national drivers and includes Council's:*

- Mission Statement
- Statement of Values
- Community Outcomes
- Sustainability Principles
- Activity Goals

*Council seeks to procure goods and services to support the asset delivery function in a manner that is consistent with this framework and Council's overall business approach.*

*Council has identified the need to plan effectively and deliver quality in a sustainable manner; lowest cost options are not necessarily the best. A robust strategic and asset management planning regime is a priority to ensuring an effective work programmes are developed. A whole-of-life approach relies on asset management planning including lifecycle management planning and modelling.*

*Suppliers are expected to understand the drivers of Council's planned approach and the commitment made to deliver the agreed Levels of Service.*

*The objectives for this Strategy are:*

1. *Supporting the achievement of Council's Community Outcomes and the Selwyn Community Plan Programme through efficient procurement processes*
2. *Integration with Council's organisational goals as contained in the Mission Statement, Statement of Values and Sustainability principles*
3. *Delivery of services to the community that represent value for money*
4. *Encouraging appropriate levels of competition across suppliers*
5. *Ensuring procurement is fair and transparent with effective accountability measures*

*In general, Selwyn District Council will utilise the guidance provided by the NZTA Procurement Manual Procurement Procedure 1 - Infrastructure for Physical Works and Procurement Procedure 2 Planning and Advice for Professional Services. However a departure to this is where Council has varied the limit for closed contests (selected tender) to $250,000.*

*Within this approach Council will consider the most appropriate bundling of work for maintenance and construction (renewal and improvement) in terms of Council's objectives and the market's ability and capacity.*

*While retaining scope for small local suppliers and the benefits to the local economy they can provide, Council also has a responsibility to recognise the efficiencies and benefits derived from larger and longer term maintenance and construction contracts. Competitive tendering where price and quality are evaluated will be used to select suppliers or supplier panels. In some cases direct appointment may be the most effective approach and this will be considered in terms of specialisation, market competitiveness and the overall cost and efficiency to Council.*

*The appropriateness of the approaches used will be assessed regularly and this strategy will be reviewed every three years in line with NZTA requirements. This will primarily relate to the Transport Activity and components funded through the National Land Transport Programme, managed by the NZ Transport Agency.*

### Asset Management Policy

*'An AM system is the set of inter-acting elements of an organisation to establish AM policies and objectives, and processes to achieve those objectives (ISO 55000)*

The AM Policy should provide clear direction as to the appropriate focus and level of AM practice expected. This level should reflect the strategic business objectives as well as meeting legal requirements, community needs and available resources. The appropriate AM level will also depend on the costs and risks associated with the activity.

This Asset Management Policy sets the appropriate level of asset management practice for Council's Water Activity as 'Intermediate' practice:

*'Intermediate' asset management practice is undertaken at a level between 'Core' and 'Advanced' practice. The focus is to build on the basic technical asset management planning of 'Core' practice by introducing improved maintenance management and more advanced asset management techniques (as appropriate). Further use is made of risk management, asset lifecycle management, and service standard optimisation techniques.*

The policy was updated in May 2017 and will be reviewed and updated before the 2021-2031 LTP.

### Selwyn Long Term Plan

The Local Government Act 2002 requires local authorities in New Zealand to prepare a LTP that sets out Council's intentions over a ten-year period. The Act is very clear on how Councils should prepare their plans and what should be included in the final document. Consultation with the community is a very important part of this process. This is to ensure the people who effectively pay for the services delivered in the plan have the opportunity to feedback on what they want to see and how much they are prepared to pay. 5Waters is considered to be a significant/core activity.

The LTP sets out the direction for Selwyn District Council over the following ten years. The LTP is reviewed by Council every three years.

The LTP provides information on all Council activities, how these will be delivered, how much they will cost and how they will be paid for. The first year of the LTP is also the Annual Plan for the first year of the ten year LTP period and as a result there is no separate Annual Plan process for that year.

### Annual Plan

In accordance with the Local Government Act 2002 local authorities in New Zealand must prepare and adopt and Annual Plan for each financial year. The Annual Plan must support the long-term plan in providing integrated decision-making and co-ordination of the resources of the local authority; and contribute to the accountability of the local authority to the community. The Annual Plan process provides an opportunity to adjust the direction of Council and the community for the twelve months following. It also provides an opportunity for Council to highlight the key issues it faces and update the community on achievements and plans for the following year.

### 30 Year Infrastructure Strategy

Changes to the Local Government Act 2002 during 2014 requires that a local authority must prepare and adopt, as part of its LTP, an Infrastructure Strategy for a period of at least 30 consecutive financial years.

The task of building, operating and maintaining infrastructure assets in an affordable manner is becoming increasingly difficult in view of:

- Demographic changes;
- Environmental impacts;

- New technologies;
- Continually changing legislative environment (Central & Regional Government);
- Infrastructure resilience; and
- Aging of infrastructure.

Council considered these impacts and developed a strategy to guide decision-making for the next 30 years.

### Delivery of Services Review

Section 17A of the Local Government Amendment Act 2014 requires that a local authority must review the cost-effectiveness of current arrangements for meeting the needs of communities within its district or region for good-quality local infrastructure, local public services, and performance of regulatory functions. While not separately audited or consulted on, the review is integral to demonstrating efficient, effective services that represent value for money.

Section 17A has a number of triggers that apply to the application of the Section:

- Significant change in service levels
- Within two years of the completion of a relevant contract (before renewal of contract)
- At Councils discretion with a maximum time between reviews of six years
- The first review is required within three years (clause 1A of new Schedule 1AA)

Exceptions for review are:

- Circumstances where the services cannot be reasonably altered within the two years
- The local authority is satisfied that the potential benefits of undertaking the review do not justify the costs of undertaking the review

The review:

1. Must consider options for
    a. Governance
    b. Funding
    c. Delivery
2. Options for the responsibility for governance, funding and delivery is exercised by
    a. The local authority
    b. A Council controlled organisation of the local authority
    c. A Council controlled organisation where the local authority is one of several shareholders
    d. Another local authority
    e. Another person or agency

Council undertook this review in April 2016.

### Selwyn District Plan

Section 73 of the Resource Management Act 1991 requires the Selwyn District Council to have at all times a District Plan for its District.

The District Plan sets out in a systematic way the manner in which the Council intends to deal with its functions under the Act. In doing this, the District Plan specifies objectives, policies and methods, in relation to resource management issues in the District, to achieve the integrated and sustainable management of the District's resources.

The District Plan must reflect and provide for the principle resource management issues pertaining to the District. The District Plan identifies and discusses the issues that have been identified by the Council and sets out the objectives and policies of the District Plan in regard to those issues. The District Plan also specifies the environmental results anticipated to be achieved by the implementation of the objectives and policies.

To achieve the objectives and policies of the Plan, rules are included which prohibit, regulate or allow activities.

The Council has adopted the principle of zoning. This technique recognises that different areas of the District will have different resources, character and levels of amenity and that the community will seek different environmental results for these areas. The zones provide opportunities for future development in keeping with the character and amenity sought for these different areas. Any particular activity must comply with the rules applicable to the zone in which it is situated, as well as general district rules covering a range of matters such as subdivision, heritage values and transportation.

The Selwyn District Plan was made partially operative on 10 June 2008 and there have been multiple plan changes and variations made.

### Selwyn District Council Engineering Design Standards for Subdivisions and Development

The role of Engineering Design Standards for Subdivision and Development has been strengthened through the plan changes discussed above. The guidance provided now includes:

- Engineering Code of Practice (2011);
- Subdivision Design Guide (SDC, 2009) – A design guide for residential subdivision in the urban living zones;
- Medium Density Housing Design Guide (SDC, 2009) – A design guide for medium density housing;
- Good Solutions Guide Subdividing Large Rural Style Lots (Davis Ogilvie, 2009);
- Commercial Design Guide (SDC, 2011) – A design guide for commercial development; and

- Subdivision Design Guide & Urban Design Action Plan.

The guidance while aimed at developers can also be used as a basis for Council's own project works. Prior to the introduction of the plan changes and the development of the engineering standards, service and technical design details were contained in the levels of service portion of the AMP. Collation and analysis of the suite of Engineering Design Standards to ensure consistency across the range of former, current and proposed levels of service and standards is identified as an Improvement Plan item.

## Master Plans and Structure Plans

**Rolleston Town Centre Master Plan**

In 2013, Council undertook consultation of the development of Rolleston in terms of a readily growing population centre and as the 'hub of the district'. The consultation specifically included the Rolleston Town Centre and Foster Park (also in Rolleston).

*Rolleston has a lot of potential. The town is growing quickly but there are a number of issues and challenges:*

- *Rolleston doesn't have a main street or a town centre. This means that people tend to drive from one location to another. With no town centre it's also harder to create central public spaces which people will use.*
- *Rolleston Primary School, I-zone and the Council offices are key areas but are not well connected to the shopping area.*
- *The new Aquatic Centre, Foster Recreation Park, Clearview Primary and the new high school to the south of the town centre will become increasingly busy locations and there is the opportunity to create a well connected recreation and education hub.*
- *Existing community facilities (Rolleston Library and the Rolleston Community Centre) and sports grounds are at capacity*[5].

[5] Source: Public Consultation on Draft Masterplan, September 2013


The plan was adopted on April 2014. Key projects are integrated into this AcMP.

Based on this feedback the vision for the centre is:

*By 2031 Rolleston Town Centre will be a thriving destination at the heart of Rolleston where people will come to work, shop and play.*

The centre will:

- Be locally distinctive;
- Be family and child-friendly;
- Include quality built form;
- Progress sustainability;
- Value open space; and
- Be economically competitive.

Based on this vision the Masterplan introduces key 'projects' as follows:

1. Development of a two-sided retail 'high street' along Tennyson Street;
2. Reinforcing Tennyson Street as the key 'spine' route through the town centre from SH1 to the Foster Recreation Park;
3. Introducing a 'fine grain' built form by creating new streets to improve legibility and connectivity and a range of building sizes and forms;
4. Introducing a new multi-purpose library/ community/ technology centre and town square at the heart of the centre as a key attraction and landmark development; and

5. Integration of the Reserve into the town centre as a high amenity park adjacent to the 'high street' and town square.

**Lincoln Structure Plan**

The Lincoln Structure Plan determines when, where and how the town of Lincoln will grow over the next three decades as its population climbs from about 3,200 to 11,900 in 2041.

The Structure Plan indicates where the new streets, paths, pipes and drains will go; where the new houses, school and community buildings and where the new parks, reserves and land uses will be.

It brings together a wide range of information from:

- Council files, maps and plans;
- Research by our consultants;
- Discussions, meetings and workshops with landowners, developers and residents; and
- Submissions from all of the above.

The Structure Plan was adopted on 28th May 2008. The Council proposes to implement the Structure Plan by notifying Plan Change 7 to the District Plan. Additionally in 2015, Council has engaged the services of Abley Consultants to produce a Lincoln Town Centre Streetscape Report that looks at different design options for Gerald Street through Lincoln. This will input into how Gerald Street is to be upgraded in the next few years.

**Rolleston Structure Plan**

The Rolleston Structure Plan was adopted by Council on 23 September 2009 following two years of work and consultation with the community, consultants, landowners, developers and Council staff.

Rolleston will grow from an existing population of 7,000 to close to 50,000 by 2075. The Structure Plan addresses four key issues:

- Town Centre;
- Land Use;
- Movement; and
- Infrastructure.

**Prebbleton Structure Plan**

The Prebbleton Structure Plan was adopted by Selwyn District Council on the 24th February 2010. It provides a framework for guiding development over the next 30 years to achieve a high level of town planning and urban design.

The village is expected to grow by an additional 1,295 households by 2041. The Structure Plan details what community services and infrastructure is required and the character elements that need to be protected to ensure that the village amenity is retained.

The Structure Plan is consistent with the Greater Urban Development Strategy and Proposed Change 1 to the Regional Policy Statement, and will guide plan changes, resource consents and reviews of the District Plan.

The further development and implementation of these plans will require commitment and collaboration from planners and activity managers. This will occur over the course of successive LTPs. It is proposed that a project team be established for Structure Plan Implementation.

### Asset Management Plans

Asset Management has been described as applied common sense. Therefore, documenting applied common sense results in an AcMP. In essence there is limited funding and competing priorities. The AcMP helps staff/Council decide where and how to spend the limited funds to achieve the desired results. Changes to the Local Government Act 2002 further emphasised the need for asset management planning and the development of AcMPs.

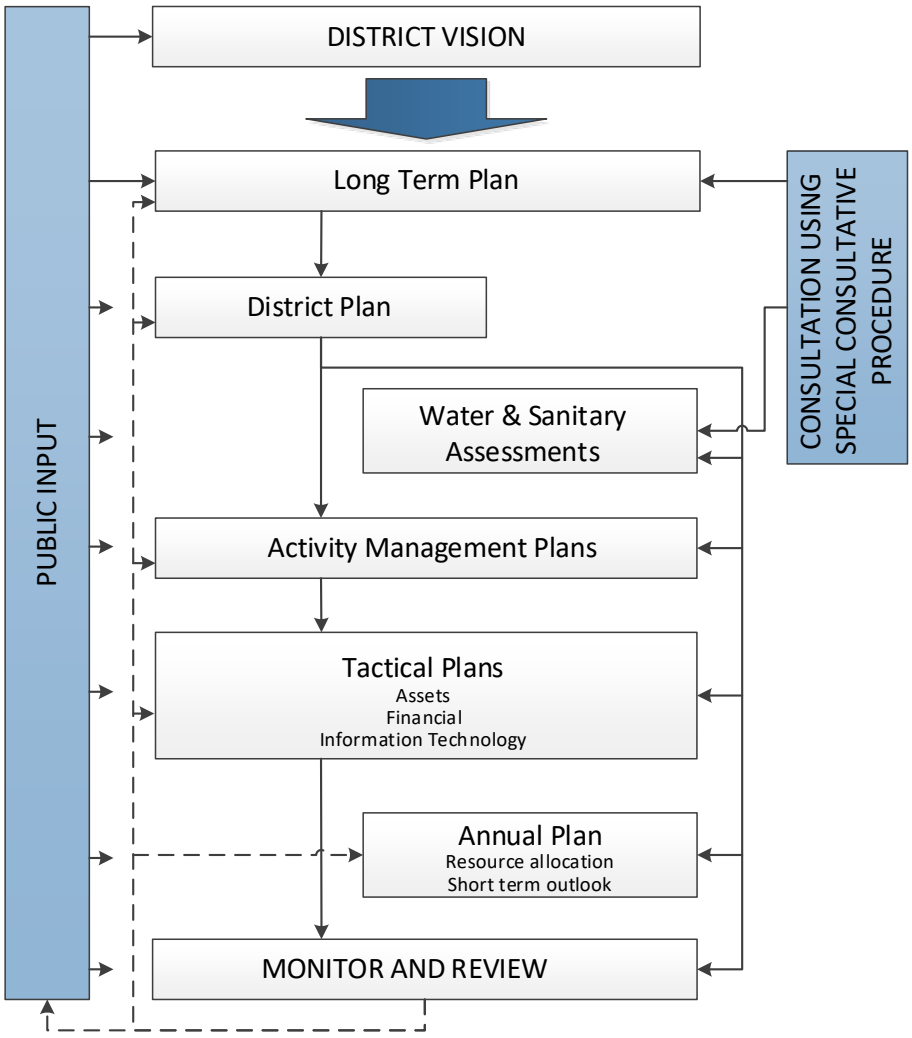
AcMPs are a key component of Council's planning process. They are prepared within the context and framework of the LTP, District Plan, Annual Plan and Funding Policy. Figure 2-4 depicts the links and information flows with the AcMP, other corporate plans and public consultation.

As part of the Local Government Act 2002 requirements (Schedule 10) the LTP must, for the ten years of the Plan, identify for each group of assets the costs for any additional asset capacity required and the maintenance, renewal, and replacement costs for the assets.

This statement of cost for the 10-year period includes the accounting for asset depreciation in accordance with The New Zealand Equivalents to International Financial Reporting Standards, and the recording of all significant assumptions in preparing the financials.

This AcMP will provide the basis for identifying service potential and any losses, and determining the long-term financial strategies for Council's water network assets. This AcMP is part of a suite of AcMPs and forms part of Council's LTP for the period 2018-2028.

**Figure 2-4: Corporate Links to AcMPs**




This AMP is intended to be read in conjunction with the LTP and fulfils requirements of the Local Government Act 2002 (and amendments) – Schedule 10, which states:

1) The purpose of local government is—
    a. to enable democratic local decision-making and action by, and on behalf of, communities; and
    b. to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses.
2) In this Act, good-quality, in relation to local infrastructure, local public services, and performance of regulatory functions, means infrastructure, services, and performance that are—
    a. efficient; and
    b. effective; and
    c. appropriate to present and anticipated future circumstances.

In order to demonstrate that the delivery of services are efficient, effective and appropriate; Selwyn District Council has developed a suite of Activity Management Plans (AMP or AcMP) for its Core Infrastructural Services as part of this LTP process. These AMPs provide comprehensive account of the efficiency, effectiveness and appropriateness of Council's Core Infrastructural Assets, asset management practices and knowledge.

## Council Policies

Over time Council has established a broad suite of policies. These state Council's position on specific issues and detail the management approach to be implemented by staff.

Policies differing levels of impact on the 5Waters activity; this is indicated under Impact Range (Broad ***, Moderate **, Limited *).

**Table 2-8: Policy Impact on the 5Waters Activity**

| Policy Group | Policy Name | Impacted Range |
|---|---|---|
| **Archives and Records A1** | Archiving Policy A101 | * |
| **Advertising A2** | Political Signs A202<br>Signs On Footpaths A203<br>Advertising On Bus Shelters A205<br>Bus Shelter Rental Policy A206<br>Footpath Rental Policy A207 | * |
| **Bridges B1** | Bridge Repairs/Enhancements B101 | * |
| **Building B2** | Earthquake Prone Dangerous And Insanitary Buildings B201 | * |
| **Cemeteries C1** | Assumption Of Ownership Of Private Cemeteries C102<br>Bishops Corner And Killinchy Cemeteries C103<br>Burial Depth C104<br>Record Of Burials C105<br>Interment Of Items With The Deceased C107 | * |
| **Community Awards / Funding C2** | Long Service Award For Volunteer Fire Brigades C201<br>Long Service Awards For St Johns Ambulance C202<br>Special Fund For Historical Publications C203<br>Cultural And Recreational Special Fund C204<br>Arts Funding - Creative New Zealand C205<br>Selwyn District Educational Fund C206<br>The Selwyn District Achievement Awards C207<br>Cultural Support Fund C208 | * |

| Policy Group | Policy Name | Impacted Range |
|---|---|---|
| **Consultation C3** | Consultation Policy C301 | * * |
| **Council Activities C4** | Advisory Committee Administration Grants C401<br>Anzac Day C40<br>Council Chambers - Other Than Council Use C403<br>Councillors‟ Requests C404<br>Councillors Support Equipment C407<br>Final Meeting Of Council Term C408<br>Meeting Date C410<br>Nuclear Weapons Free Zone C413<br>Ombudsman C414<br>Conference Attendance C415<br>Public Forums C416<br>Public Statements C417<br>Standing Orders C421<br>Sister City Visits C423 | * |
| **Council Property C5** | Asset Sales C501<br>Land Sales C502<br>Sale Of Vehicles C503<br>Vehicle Replacement C504<br>Vandalism C505 | * * |
| **Community Planning And Design C6** | Crime Prevention Through Environmental Design C602 | * * |
| **Dogs D1** | Dog Control D100<br>Disposal To Dogwatch D102<br>Fees - Applications For Hardship D103<br>Discount And Time Payment Of Dog Fees D104<br>Prosecutions For Outstanding Fees D105<br>Refund Of Registration Fees D106<br>Release Of Impounded Dogs D107<br>Remission Of Penalties On Registration Fees D108<br>Dog Microchipping Service D109 | * |
| **Engineering E1** | Civil Engineering Standards E101 | * * * |
| **Finance Policy F1 40** | Future Capital Contributions F103<br>Appointment And Remuneration Of SiIHL Directors F104 | * * |

| Policy Group | Policy Name | Impacted Range |
|---|---|---|
| **Gambling G1** | Gambling Venue Policy G101 | * |
| **Graffiti G2** | Graffiti Removal Policy G201 | * |
| **Housing H1** | Allocation Of Rental Accommodation H101<br>Market Rentals H103<br>Staff Rentals H104<br>Payment Of Rentals By Staff H105<br>Tenancy Bonds H106 | * |
| **Insurances I1** | Community Halls I101<br>Rural Fire Fighters Insurance I102 | * |
| **Land Bank L1** | Strategic Purchase Of Land For Designated Purposes L101 | ** |
| **Leasing L2** | Renewal Of Leases L202<br>Revocation Of Reserve Classifications L204<br>Security For Loan Advances L205<br>Termination Of Leases L206<br>Term Of Leases Or Licences L207<br>Leases And Licence Rental Reviews L208<br>Transfer Of Farming Leases Or Licences L209 | * |
| **Libraries L3 52** | Membership And Fees L302 | * |
| **Liquor Licencing L4** | Sale Of Liquor Licencing Policy L401 | * |
| **LTP - Statutorily Required Policies L5 (included in LTP)** | Development Contributions L501<br>Significance L502<br>Partnerships With The Private Sector L503<br>Rates Remission L506<br>Lump Sum L507<br>Revenue And Financing L508<br>Capacity Of Maori Involvement In The Council Processes L509<br>Liability Management L510<br>Investment L511 | *** |
| **Property Numbering & Naming Of Roads & Private Rights Of Ways N1** | Property Numbering N101<br>Road Naming N102 | * |
| **Plantations P1** | Sale Of Timber P101 | * |

| Policy Group | Policy Name | Impacted Range |
|---|---|---|
| **Public Facilities P2** | Public Hall And Recreation Centre Management Committees P201<br>Public Toilets P202<br>Public Toilets User Charge Policy P203 | * * |
| **Rating R1** | Debt Recovery R103<br>Remission Of Penalty If Rates Paid On 2nd Instalment R104<br>Interest On Separate Rate Accounts R107<br>Darfield Medical Centre R108<br>Non Rateability Of Halls And Reserves R109<br>Rates Remissions For Land With Recognised And Protected Natural, Historical Or Cultural Values R112<br>Water And Sewerage Loans R116<br>Royalty For Gravel Extractions R117<br>Rating For Utilities R118<br>Land Information Memorandum Additional Information R119<br>Environment Canterbury Rates Collection R120<br>Sewerage Rating Policy R122 | * * |
| **Remuneration R2** | Disclosure Of Income R204 | * |
| **Reserves On Council Land R3** | Camping On Reserves R301<br>Fencing Of Reserves R303<br>Naming Of Parks And Reserves R304 | * |

| Policy Group | Policy Name | Impacted Range |
|---|---|---|
| **Roads R4** | Standards And Guidelines For Construction And Maintenance Of Roads R401<br>Community Board To Be Advised Of Closures R402<br>Temporary Road Closures R403<br>Inland State Highway Route R404<br>Payment Of Roading Development Contributions R406<br>Completion Date For Roading Projects R409<br>Cost Of Cattle Stops R410<br>Parking Areas On Road Frontages At Schools R411<br>Directional Signs R412<br>Grading Of Roads R413<br>Ranking Of Seal Extensions R414<br>Provision Of Judder Bars R416<br>Mailbox Access R417<br>Stock Crossing Funding R419<br>Sealing Of Entranceways R421<br>Maintenance Of Boundary Roads R423<br>Road Stopping R424<br>Unsealed Road Contributions R425<br>Cellphone Antenna Mast/ Streetlight Pole Installation R426<br>Street Lighting - Discretionary R427<br>Street Lights In Rural Zones R428<br>Cost Of Lighting Of Dairy Cow Crossings R429<br>Road Name Signs Format R430<br>Seal Extension Policy R431 | * |
| **Resource Management R5** | Processing Of Late Submissions And Further Submissions R501<br>Resource Consent Applications By Councillors R503 | * |
| **Sewerage S1** | Township Sewage Treatment/ Effluent Disposal S101<br>Connecting Rural Properties To Rising Sewer Mains S102<br>Connecting City Ratepayers To Prebbleton Rising Main S103<br>Rear Lot Sewer Connections S104 | *** |
| **Solid Waste S2** | Waste Management Policy S201<br>Zero Waste Target S20 | * |
| **Subdivision S3** | Subdivision Of Properties S301<br>Subdivision Plans S304 | ** |

| Policy Group | Policy Name | Impacted Range |
|---|---|---|
| **Trees On Council Land T2** | Specimen Trees On Council Land T201<br>Allergy-Friendly Plant Selection For Council Administered Land T202<br>Removal Of Allergenic Plant Specimens From Council Administered Land T203 | * |
| **Townships T3 90** | Allocation Of Funds For Township Reserve Development T301 | * |
| **Water Races W1** | Irrigation From Water Races W101<br>Water Race Ponds W102<br>Race Cleaning And Maintenance W103<br>Water Race Tailings W104<br>Spraying Of Council Water Races W105<br>Relocation Of Water Races W106<br>Closures Of Water Races W107<br>New Races Or Associated Structures W108<br>Exemptions From Paying Water Race Rates W109<br>Carry Out Work On Private Property W110<br>Subdivisions W111<br>Soakholes W112<br>Registration Of Complaints W113<br>Household Water Supplies W114<br>Credits For Unplanned Disruption Of The Water Race Supply W115<br>Repair Of Water Race Sinkholes W116<br>Planned Works Outage Management W117<br>Purposes Of Water races W118 | * * * |

| Policy Group | Policy Name | Impacted Range |
|---|---|---|
| **Water Supplies W2** | Connections To Darfield Water Supply W201<br>Edendale Water Supply W202<br>Out Of Area Water Supplies W203<br>Point Of Use Water Treatment Devices W204<br>Rakaia Gorge Toilets W206<br>Sheffield/Waddington Water Supply W207<br>Subdivisional Water Connections W208<br>Water Metering Pricing Policy W209<br>Council's Role In Community Water Supplies W210<br>Fire Fighting Standard Community Waterworks W211<br>Private Operator Utilisation Of Council Community Water Supplies/Schemes W212<br>Backflow Protection At Point Of Supply W213 | *** |
| **Works Contributions W3** | Land Drainage Contributions W302<br>Booking Of Capacity In Infrastructural System W304<br>Section 40 Public Works Act 1981 - Amalgamation Policy W305 | ** |

It is Council policy that a review of the Policy Manual will be undertaken no later than 6 months following each triennial election, this occurred in 2014.

## Council Bylaws

Section 155 of the Local Government Act 2002 requires every local authority, before making a bylaw, to determine whether a bylaw is the most appropriate way of addressing the perceived problem. That act also requires all bylaws to be reviewed by 30 June 2008.

The process and timing of bylaw reviews are managed by the Council's Policy Section. When reviewing each bylaw consideration is given as to whether:

- A bylaw is the most appropriate way of addressing the particular problem or issue
- The bylaw is in the most appropriate form, and
- The bylaw has implications under the New Zealand Bill of Rights Act 1990

Table 2-9 lists the bylaws enacted by SDC and their impact on 5Waters:

Different bylaws has differing levels of impact on the 5Waters activity; this is indicated under Impact Range (Broad ***, Moderate **, Limited *).

**Table 2-9 Impact of BylawsTable 2-9**

| Bylaw Group | Bylaw Name | Impacted Range |
|---|---|---|
| Animal Related Bylaws | Dog Control Bylaw 2012<br>Stock Droving Bylaw 2008 | * |
| Cemetery Bylaw | Cemetery Bylaw 2011 | * |
| Fire Bylaw | Rural Fire Bylaw 2009 | ** |
| General Bylaw | General Bylaw 2009 | ** |
| Parks and Reserves Bylaw | Parks and Reserves Bylaw 2009 | * |
| Transportation Bylaws | Christchurch to Little River Railtrail: Prebbleton to Lincoln Bylaw 2007<br>Speed Limits Bylaw 2006 & register<br>Traffic and Parking Bylaw 2009 | * |
| Utility Bylaws | Water Race Bylaw 2008<br>Water Supply Bylaw 2008<br>Wastewater Drainage Bylaw 2009<br>Trade Waste Bylaw 2009 | *** |
| Waste Management (Refuse) Bylaw | Waste Management and Minimisation Bylaw 2012 | * |

## The Council's Mission Statement

The Council's Mission Statement is:

*"To achieve excellence in the management of resources and the provision of services for the People of Selwyn District"*

## The Council's Statement on Quality of Service

The emphasis on quality and service shall be, at all times, the focus of the Council activities.

*The Council will maintain and strive to improve the quality of services that are provided.*

*It will continue to provide services that meet the needs of its 'customers' and exceed their expectations in the process.*

*To achieve success, the Council will demonstrate innovation in providing solutions to meet those needs and expectations into the future while operating in a cost-effective and business-like manner.*

### The Council's Statement of Values

In fulfilling its statutory and community obligations, the Council will operate according to the following values. Asset management and service delivery, as core functions of the Council, are therefore consistent with the following Values:

***Leadership***

*The Council will guide, inform and seek community involvement in policy decisions in accordance with the principles of community governance.*

***Community Service***

*The Council will provide quality services in a prompt, helpful and friendly manner, minimising the cost through innovative management and best utilisation of resources.*

***Commercial***

*The Council's service charges will be based on the benefits of those services to the recipients after considering the equity, efficiency and transparency of those services.*

***Environment and Biodiversity***

*The Council will encourage and, where appropriate, carry out or enforce measures to sustain and enhance the district's biophysical environment, including its biological diversity.*

***Health and Safety***

*The Council will encourage and, where appropriate, carry out or enforce measures to sustain and enhance public health and safety.*

***Economic Development***

*The Council will encourage and, where appropriate, facilitate sustainable economic development.*

***Cultural Diversity***

*The Council will have due regard for the diversity of cultural perspectives within the District.*

***Treaty of Waitangi***

*The Council will have due regard for the principles of the Treaty of Waitangi.*

***Staff***

*As a good employer, The Council will continue to attract, retain and develop skilled staff.*

## 2.7 Issues

In interaction between Council activity management and the combination of national, regional and greater Christchurch documents requires on-going monitoring. Further changes in the priorities of

central government are expected along with a refocusing in the Greater Christchurch area as earthquake recovery progresses.

At a national level the Government is reviewing how to improve the management of drinking water, storm water and waste water (three waters) to better support New Zealand's prosperity, health, safety and environment. Three waters services are a core responsibility of local councils.

- The review is focusing on understanding the challenges associated with managing finances, infrastructure and compliance and monitoring systems.
- The review is aiming to identify how to make the most of the current regulatory settings, and support greater collaboration between local and central government.
- The review consists of two stages:
    - Stage One – exploring the issues and opportunities with three waters services by gathering and analysing information. This should be completed by the end of 2017.
    - Stage Two - looking at options for improving three waters services. This should commence in 2018.

The outcome of this review will be closely monitored by Council.

## 2.8 Improvement Planning

Throughout this section a number of specific actions to improve the way in which the Council identifies and manages legislation changes associated with the 5Waters activity. These actions are summarised below in Table 2-10.

**Table 2-10 AM Improvement Items - Legislation**

| Section Ref | Improvement Opportunities | Priority | Timing |
|---|---|---|---|
| 2.4 | Review legislation changes before next AcMP | Low | 2020/21 |
| 2.4.16 | Implement aspects identified to work towards compliance of ISO 55001 Asset Management Standards | Low | 2018/19 |
| 2.5.1 | Continue to monitor Environment Canterbury's plans and policies and make submissions where appropriate | Medium | Ongoing |
| 2.6.2 | Review and Update 5Waters Strategy | High | 2020/21 |
| 2.6.13 | Update Policy Manual if required | Medium | Every 3-5 Years |
| 2.6.5 | Review and Update of the Asset Management Policy | Medium | 2020/21 |
| 2.6.10 | Review the Engineering Code of Practice and other Standards | High | 2018/19 |

| | | | |
|---|---|---|---|
| 2.7 | Monitor Government Legislation | Medium | Ongoing |
| 2.7 | Monitor the outcomes of Three Water Review | High | 2018/19 |

## 3.0 ACTIVITY AREAS

This section of the Plan details the rationale for ownership of the 5Waters assets and the description of assets covered under it.


**Figure 3-1 Selwyn District Overview**

The Selwyn District Council is a local authority situated in the South Island of New Zealand. The Council was formed in 1989, as a result of an amalgamation.

The Council is a provider of "core" activities which are considered to be delivery of water (urban and rural), wastewater, stormwater, land drainage and water races services. These are 5 of the 11 Council activities.

The Council is located in the heart of the Canterbury Region's groundwater zone. How and where water for human, agricultural, cultural and recreational uses is managed is of considerable interest to Canterbury residents. Council has consistently regarded the provision of the 5Waters as vital to maintaining the community's health and well-being.

The Council provides services to residents via 81 5Waters Schemes. The 5Waters are summarised in Table 3-1 below.

**Table 3-1 Summary of the 5Waters Services[6]**

| Services | Schemes | Serviced Properties (no.) | Operating Costs (Total of 2015-25) | Replacement Value as at 30 June 2017 |
|---|---|---|---|---|
| Water | 28 | 15,259 | $34,269,866 | $149,154,316 |
| Wastewater | 15 | 11,165 | $34,392,377 | $242,076,194 |
| Stormwater | 22 | 13,757 | $7,383,601 | $56,675,489 |
| Land Drainage | 9 | 7,314 | $2,009,550 | $43,168,585 |
| Water Races | 3 | 14,609 | $22,312,674 | $110,874,534 |
| Total | 78 | 62,104 | $100,368,068 | $601,949,118 |

Council has access to a globally unique, high quality water source. Secure and uncontaminated freshwater for drinking is still delivered to the majority of accessible populated areas in the district. How Council ensures that this life-giving resource is preserved for future generations is of utmost importance.

Generally streams, rivers and springs are not part of this activity, as they are managed by the overarching authority – the Canterbury Regional Council. In fact, the Canterbury Regional Council has delegated authority to manage the water resource, with Council one of approximately 18,0000 parties requesting consent to take/use and discharge it.

## 3.1 Water

The following section describes the potable (drinking) water activity. Further detail on this activity is provided in Volume 2: Water Supplies.

### Water Supply Principles

There are six principles of water management, these were identified in the Havelock North Inquiry in 2017. These principles are ingrained in good practice worldwide and should imbue every aspect of the New Zealand approach to drinking water. These six principles are outlined in this section.

**Principle 1: A high standard of care must be embraced**

Unsafe drinking water can cause illness, injury or death on a large-scale. All those involved in supplying drinking water (from operators to politically elected representatives) must therefore embrace a high standard of care akin to that applied in the fields of medicine and aviation where the consequences of

[6] Septage pit sites are not included in this summary

a failure are similarly detrimental to public health and safety. Vigilance, diligence and competence are minimum requirements and complacency has no place.

**Principle 2: Protection of source water is of paramount importance**

Protection of the source of drinking water provides the first, and most significant, barrier against drinking water contamination and illness. It is of paramount importance that risks to sources of drinking water are understood, managed and addressed appropriately. However, as pathogenic microorganisms are found everywhere, complete protection is impossible and further barriers against contamination are vital.

**Principle 3: Maintain multiple barriers against contamination**

Any drinking water system must have, and continuously maintain, robust multiple barriers against contamination appropriate to the level of potential contamination. This is because no single barrier is effective against all sources of contamination and any barrier can fail at any time. Barriers with appropriate capabilities are needed at each of the following levels: source protection; effective treatment; secure distribution; effective monitoring; and effective responses to adverse signals. A "source to tap" approach is required.

**Principle 4: Change precedes contamination**

Contamination is almost always preceded by some kind of change and change must never be ignored. Sudden or extreme changes in water quality, flow or environmental conditions (for example, heavy rainfall, flooding, earthquakes) should arouse particular suspicion that drinking water might become contaminated. Change of any kind (for example, personnel, governance, equipment) should be monitored and responded to with due diligence.

**Principle 5: Suppliers must own the safety of drinking water**

Drinking water suppliers must maintain a personal sense of responsibility and dedication to providing consumers with safe water. Knowledgeable, experienced, committed and responsive personnel provide the best assurance of safe drinking water. The personnel, and drinking water supply system, must be able to respond quickly and effectively to adverse monitoring signals. This requires commitment from the highest level of the organisation and accountability by all those with responsibility for drinking water.

**Principle 6: Apply a preventive risk management approach**

A preventive risk management approach provides the best protection against waterborne illness. Once contamination is detected, contaminated water may already have been consumed and illness may already have occurred. Accordingly, the focus must always be on preventing contamination. This requires systematic assessment of risks throughout a drinking water supply from source to tap;

identification of ways these risks can be managed; and control measures implemented to ensure that management is occurring properly. Adequate monitoring of the performance of each barrier is essential. Each supplier's risk management approach should be recorded in a living WSP which is utilised on a day to day basis.

## Description of the Activity

Council manages 28 (30 including individual rural water supplies) water supplies, located between the main divide - Arthurs Pass and Pacific coast – Taumutu, this is shown in Figure 3-2. They supply water for public needs including household, gardens, and public reserves. The water supplies service 82% of residential properties within the district.

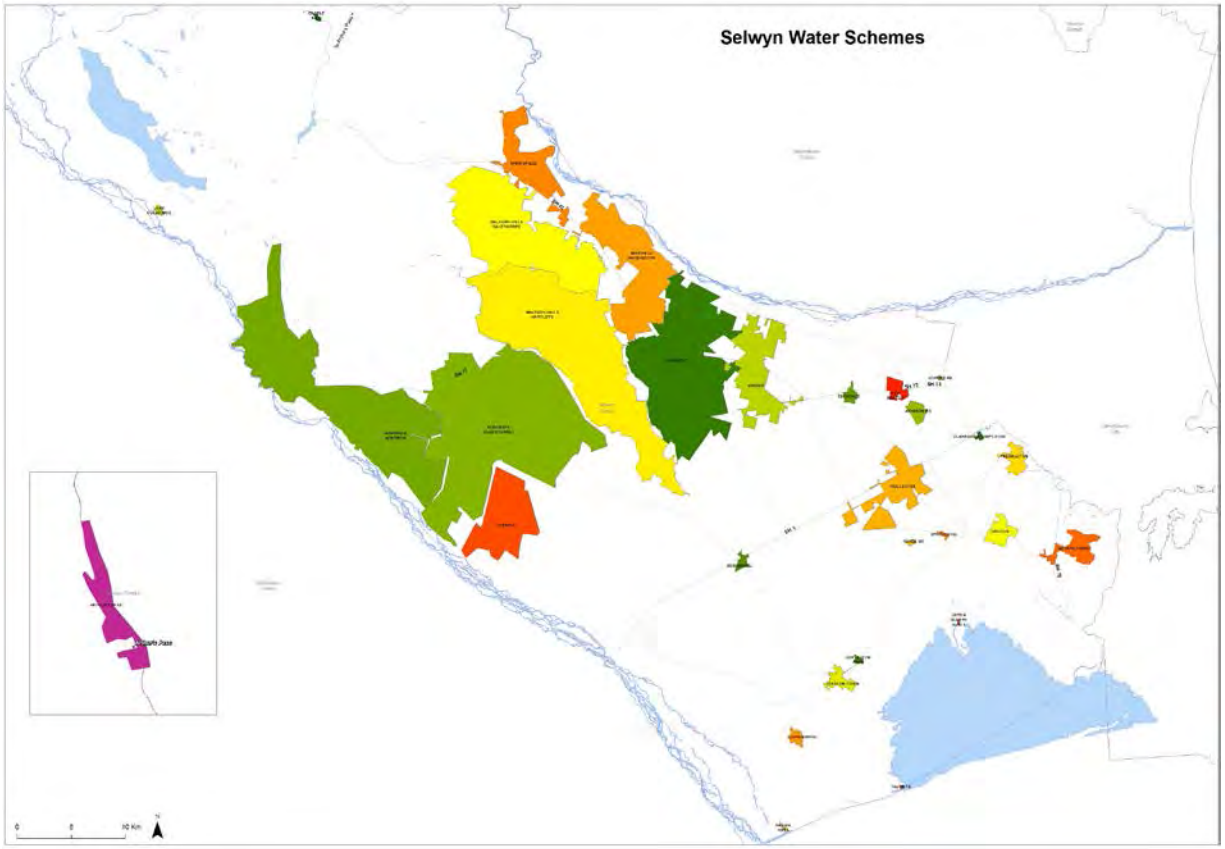



**Figure 3-2 Location of Selwyn Water Schemes**

The diverse geographic supply location brings with it the need to provide water that meets the particular communities needs. For example:

- Arthurs Pass is frost prone and has a high tourist and bach population. Water for outdoor needs is not required; whereas
- Rolleston has a dense urban population, with large recreation reserves and highly permeable soils. Water use is high in summer, driven by long periods of north-west wind conditions.

A summary of the 28 water supplies is provided below in Table 3-2.

**Table 3-2 Summary of Water Schemes**

| Scheme | Full Charges as at 1 Jan 2018 | Replacement Cost as at 2017 | Budgeted Maintenance Cost 2018/19 | Average Daily Demand (m3) |
|---|---|---|---|---|
| Arthur's Pass Water Supply | 120 | $680,780 | $53,125 | 113 |
| Castle Hill Water Supply | 124 | $2,347,904 | $62,290 | 281 |
| Claremont Water Supply | 54 | $670,259 | $28,820 | 163 |
| Darfield Water Supply | 978(+Restricted ) | $20,338,133.61 | $324,100 | 1810 |
| Doyleston Water Supply | 106 | $1,077,089 | $22,350 | 80 |
| Dunsandel Water Supply | 172 | $1,539,591 | $61,083 | 358 |
| Edendale Water Supply | 68 | $1,403,509 | $55,143 | 148 |
| Johnson Road Water Supply | 56 | $794,963 | $49,030 | 116 |
| Jowers Road Water Supply | 18 | $177,836 | $26,110 | - |
| Kirwee Water Supply | 343 | $5,430,070 | $94,080 | 620 |
| Lake Coleridge Water Supply | 56 | $675,897 | $46,310 | 41 |
| Leeston Water Supply | 900 | $4,312,391 | $106,900 | 1200 |
| Lincoln Water Supply | 1974 | $10,087,019 | $145,150 | 1870 |
| Malvern Hills Rural Water Supply | - | - | $328,700 | - |
| Prebbleton Water Supply | 1422 | $8,561,246 | $164,100 | 1846 |
| Rakaia Huts Water Supply | 113 | $471,130 | $29,755 | 55 |
| Raven Drive Water Supply | 12 | $337,211 | $20,100 | 13 |
| Rolleston Water Supply | 5451 | $37,548,865 | $632,000 | 7,300 |
| Hororata-Acheron Water Supply | - | $16,843,795 | $258,215 | - |
| Sheffield/Waddington Water Supply | 157 | $3,765,997 | $101,550 | 310 |
| Southbridge Water Supply | 347 | $1,806,704 | $79,500 | 527 |
| Springfield Water Supply | 168 | $3,610,7636 | $134,050 | 358 |
| Springston Water Supply | 189 | $1,110,609 | $49,025 | 196 |

| | | | | |
|---|---|---|---|---|
| Tai Tapu/Otahuna Water Supply | 188 | $2,553,077 | $70,900 | 395 |
| Taumutu Water Supply | 11 | $105,562 | $8,340 | - |
| Te Pirita Water Supply | 9 | $1,952,998 | $36,450 | 203 |
| Upper Selwyn Huts Water Supply | - | $68,311 | $18,000 | - |
| West Melton Water Supply | 650 | $6,937,905 | $197,200 | 1050 |

## Key Issues

The following key issues have been identified across the Councils water schemes. Issues within each individual scheme is provided in Volume 2 of the AcMP. And issues common to one or more of the schemes are cited below in Table 3-3.

**Table 3-3 District Wide Key Issues**

| Common Issues | Description |
|---|---|
| Water Management | The regional focus on wise use of water is being reflected in demand management based consent conditions. |
| Water quality upgrades and the associated capital burden on applicable communities | This is driven by WSPs and the underlying Drinking Water Standards 2005(2008). Along with the Havelock North Enquiry. |
| The need for more source water in growth areas, especially Eastern Community in urban areas. | Towns such as West Melton have grown from 60 to 653 connections over the last 5 years. |
| Operations and Maintenance costs of assets | Driven by increasing costs of contractors and compliance. |
| Long travel times | Are a significant issue for Council in the remote schemes |
| Continued focus on criticality and improving asset knowledge | Asset management requires complete data. Including a need to maintain condition assessments and calculate advanced renewal profiles. |

## Governance

Refer to Section 0 for further information on the role of the committees.

## Operations and Maintenance

Council has two full time water operations staff (an engineer and a contract supervisor), which run the water supplies within the district. These staff members are supported by two project engineers, Supervisory Control and Data Acquisition software (SCADA) engineer and two admin staff who work across the other 5Waters schemes.

Under contract *C1241 Water Services Network Management Contract* scheduled and reactive maintenance work is undertaken on these supplies. This contract was approved by Council on the 22th June 2016 for a period of 1 July 2016 to 30 June 2021. The new contract rates have made an impact on the budgets, particularly on smaller remote schemes where long travel time are a significant issue.

Telemetry is heavily relied upon to provide early warning of scheme faults

## Demand and Capacity

High growth in the eastern urban townships including Rolleston, Lincoln, West Melton, Leeston and Prebbleton is driving the need for more public drinking water from these townships sources – both at existing and new sites.

### 3.1.1.1 Current Demands

As schemes vary in size from 10 connections to over 5,500 connections, the individual water scheme needs also differ. However when looking at a per person demand (litres per person per day) is it clear that the smaller schemes use more water than the larger ones. This is shown by Figure 3-3 below for 1st January to 31st December 2014, note that the rural schemes have been excluded as this skews the graph. The rural schemes are Malvern Hills, Hororata Acheron and Te Pirita which used 3.84, 23.85 and 16.97 $m^3$ per connection per day respectively.

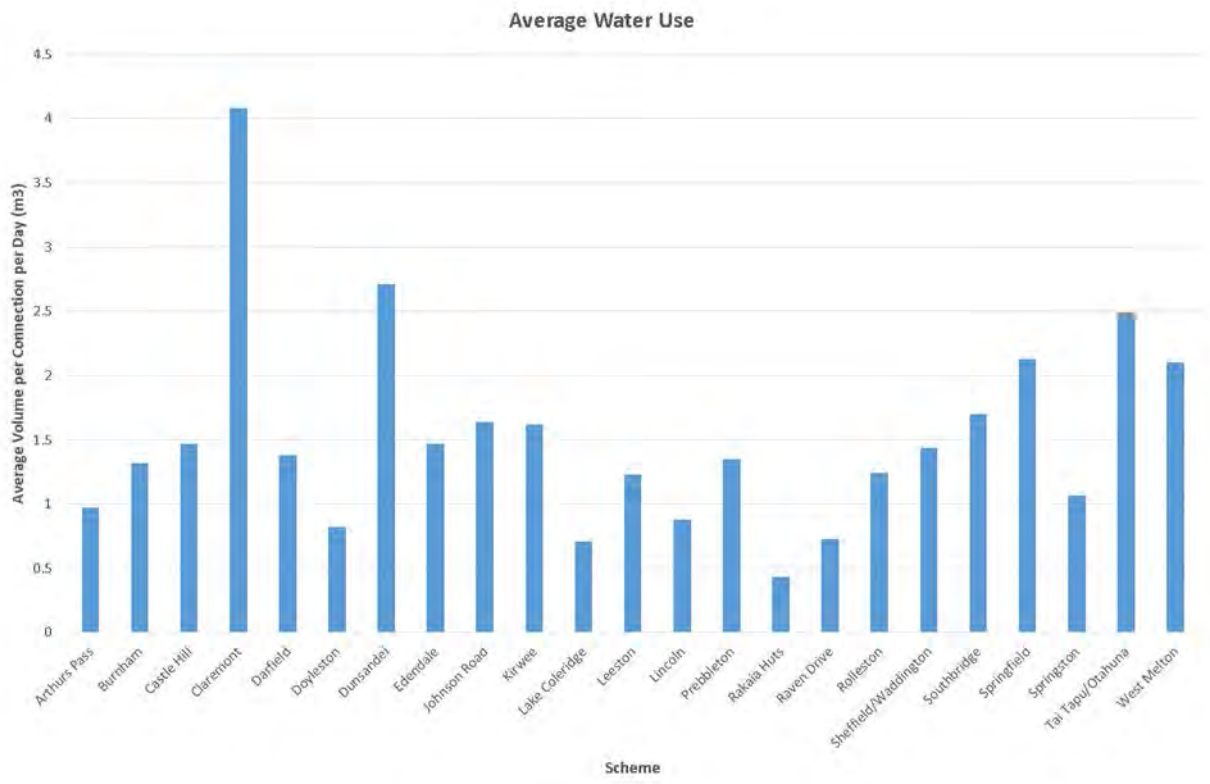



**Figure 3-3 Average Water Use per Scheme**

### 3.1.1.2 Future Demand

Future demand considerations must be take into consideration:

- Existing resource consents and their flow rate limitations;
- Existing pumping capacity;
- Existing peak flow and future flow requirements; and
- Increase or decrease in population/number of dwellings.

A suggested a key performance indicator and long term goal of less than 0.6 $m^3$ per person per day within urban schemes. While not formally adopted by Council this is considered a reasonable first step in working towards the wise use of water.

### Water Resource Consents Summary

This section identifies the type and scale of public water supplies in the district.

The majority (68%) of public water is sourced from the Waimakariri zone. This provides 85% of the daily consented water volume (volumes have been annualised where necessary). This is shown below in Figure 3-4 and Figure 3-5.

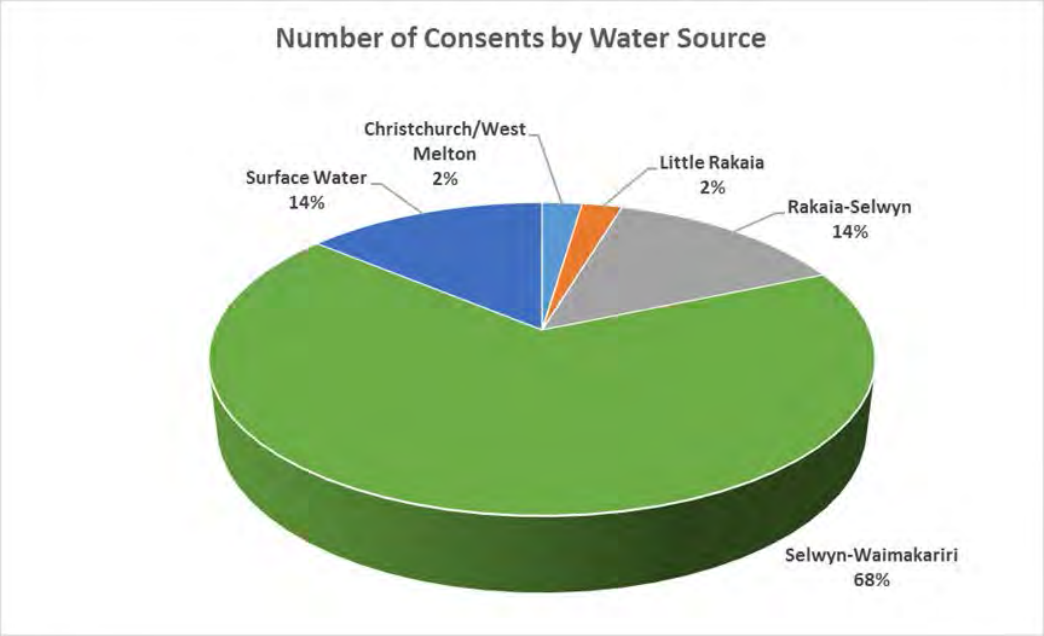



**Figure 3-4 Water Consents by Water Source**

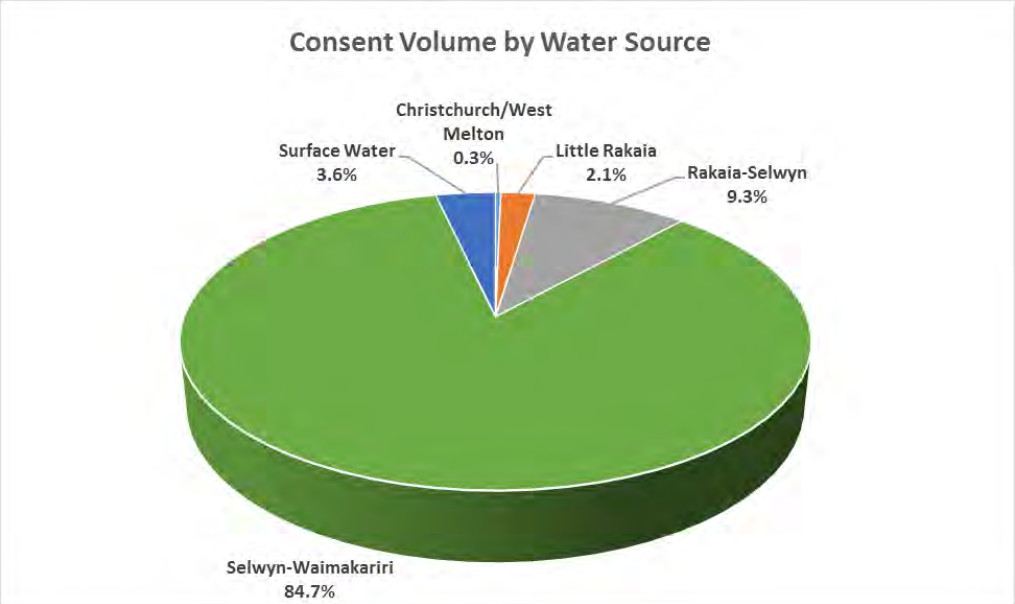



**Figure 3-5 Water Consent Volume by Water Source**

The majority of consented annual volume is for Rolleston, Prebbleton and Darfield (this does not include consents which only have a litres per second take). This shown in Figure 3-6 below.

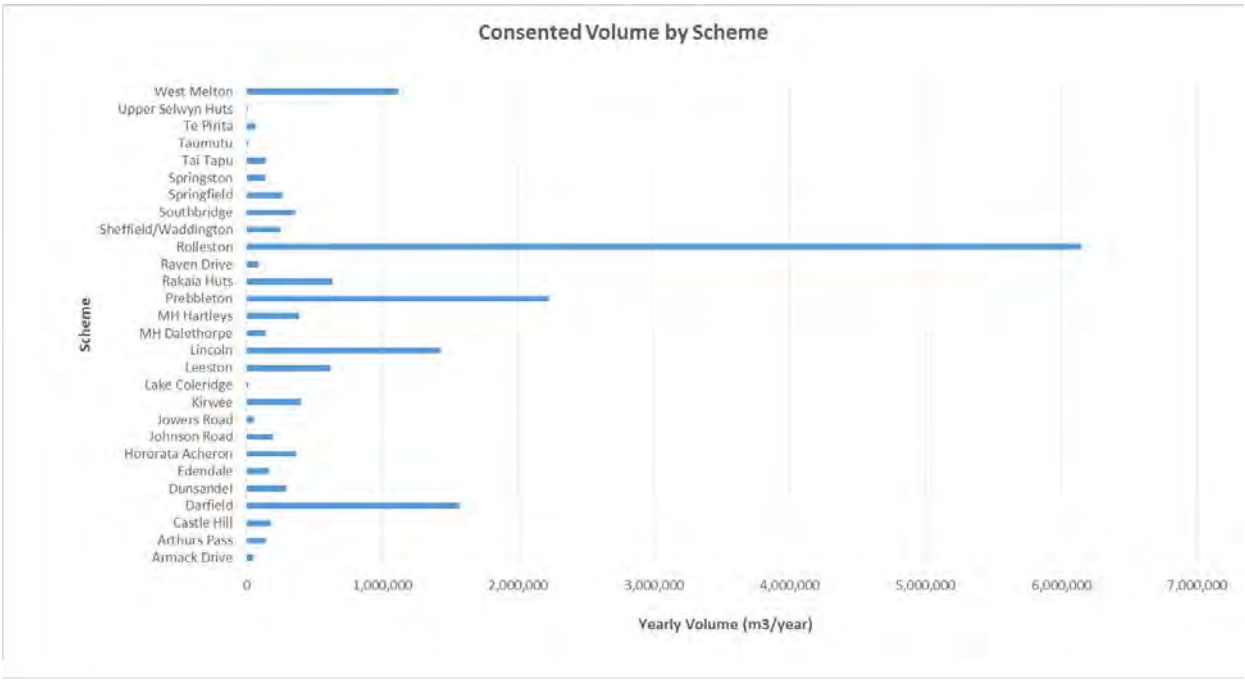



**Figure 3-6 Consented Daily Volume by Scheme**

## Water Quality

There are 9 river/gallery intakes and 38 deeper groundwater takes. These river/gallery sources provide unsecure water with bacteria and silt from time to time. Water Safety Plans (WSPs) aim to address these relatively poor water quality schemes.

The WSPs are scheduled for review every five years. The completion of WSPs does not necessarily mean there will be a change in water grades. Instead acceptance of risk through the WSP is an acknowledgement by the community and Council that they will carry some risks and deal with others through financial and Council resources. In effect the WSP prioritises work by the level of risk it poses to human health.

Source, treatment plant and reticulation water is regularly tested for the presence of bacteria. Results for the period 2012-2017 are provided in Figure 3-7, Figure 3-8 and Figure 3-9. These results are a reflection that the water supply communities generally have access to high quality water.

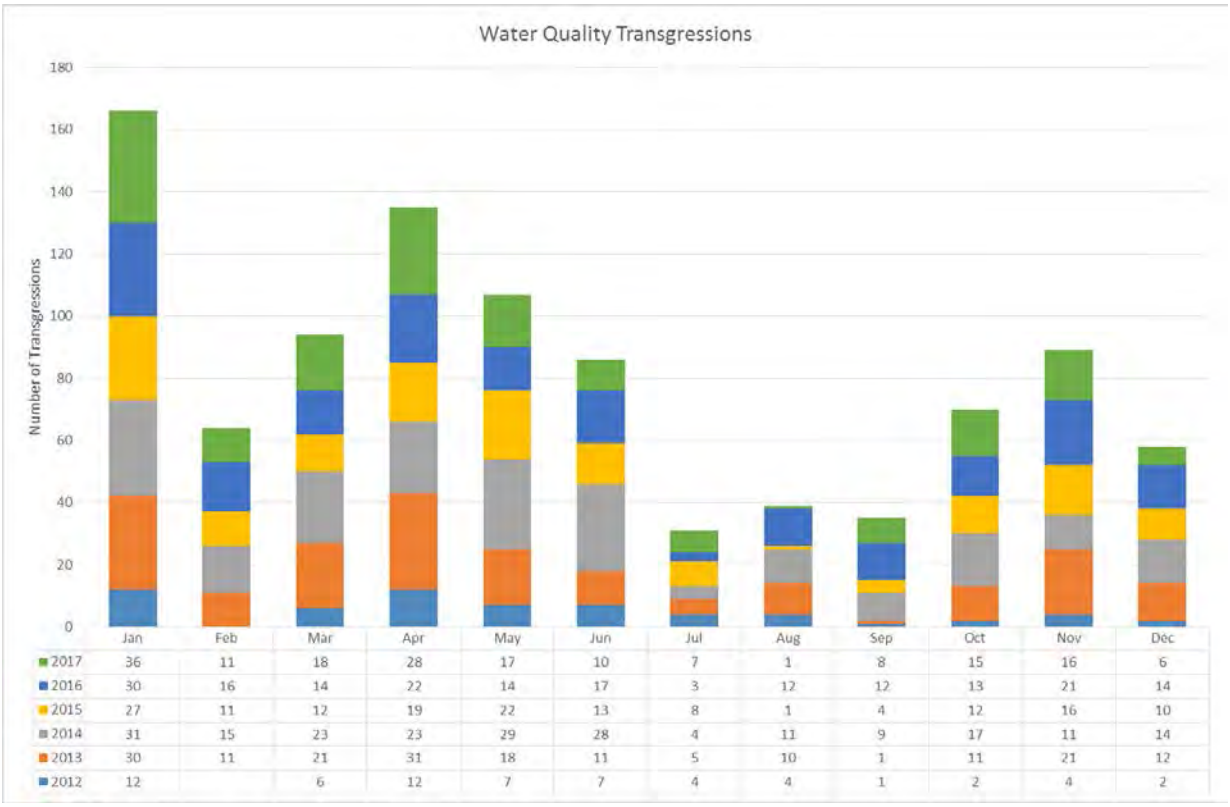



**Figure 3-7 Source Sampling and Bacteria Transgressions**

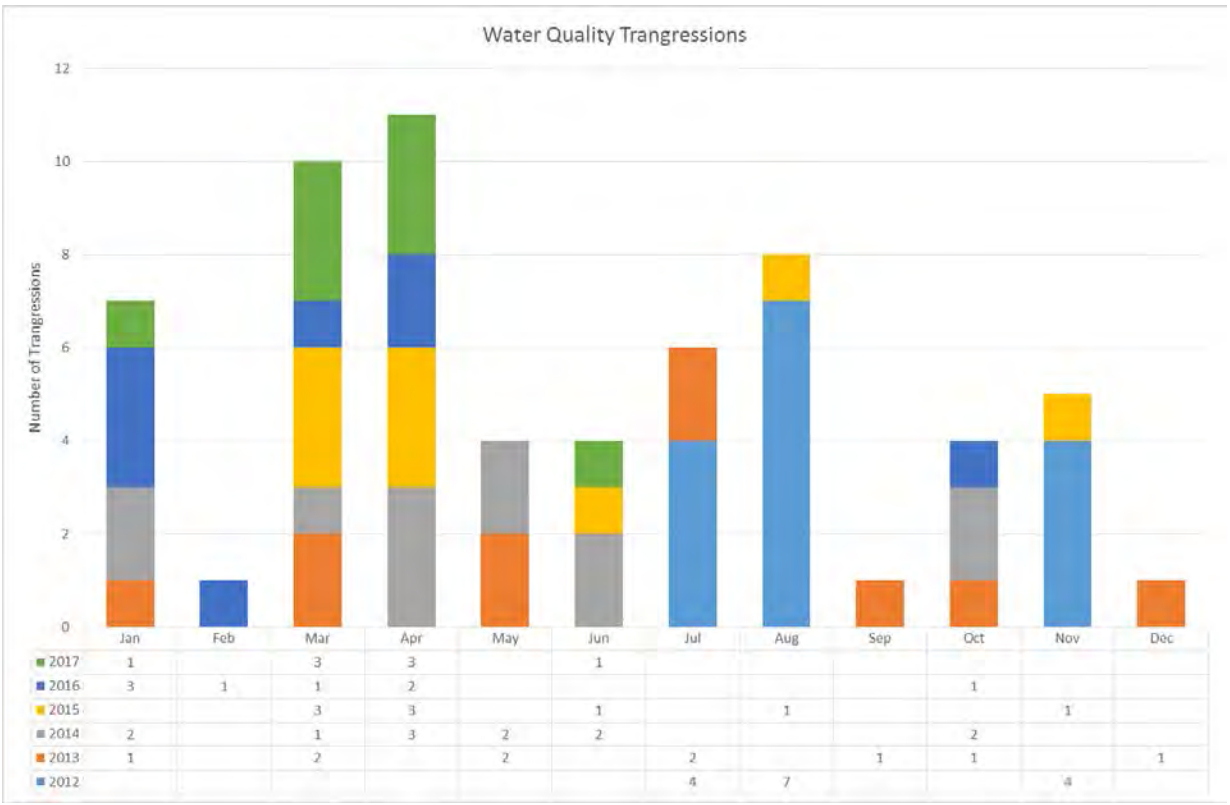



**Figure 3-8 Treatment Plant Sampling and Transgressions**

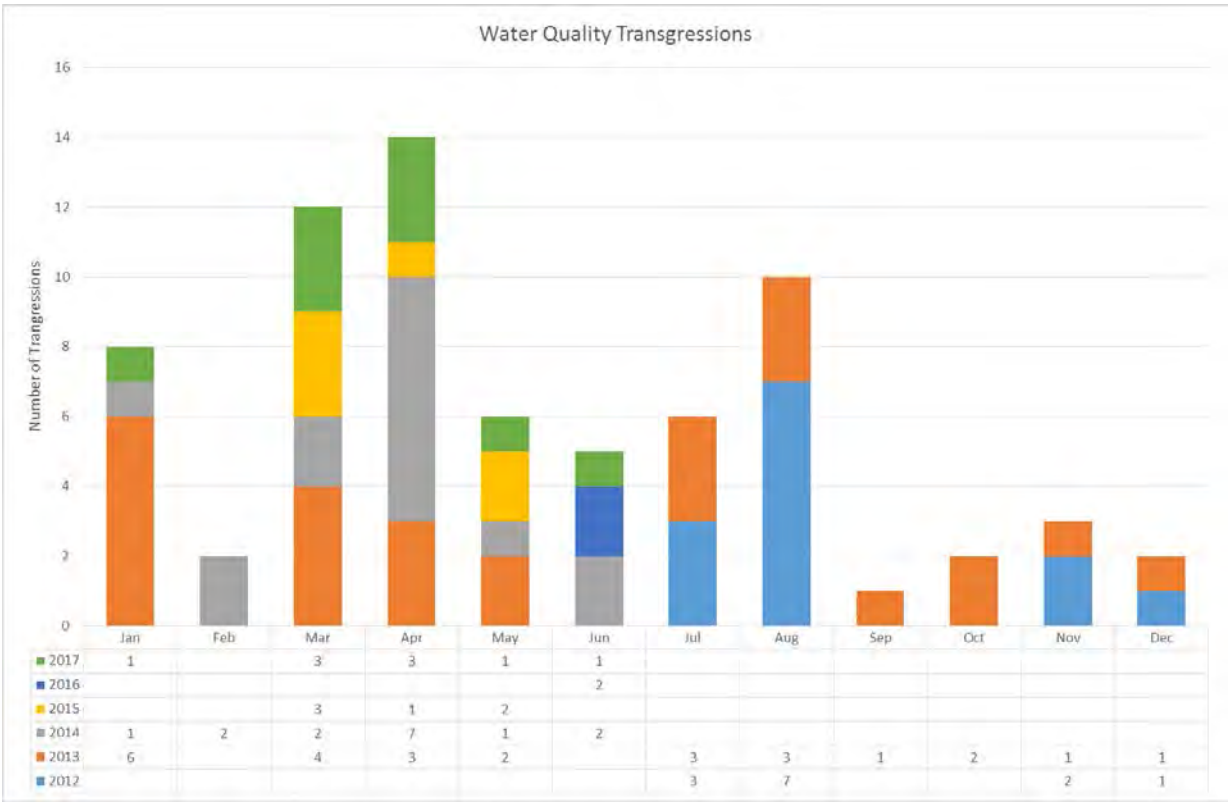



**Figure 3-9 Reticulation (Zone) Sampling and Transgressions**

Turbidity is also sampled for the water schemes. SCADA details the turbidity results for all schemes for the sample periods 2012/13 to 2016/17. Turbidity has a 'guidance value for aesthetic determinants' set at 2.5NTU.

## Bore Pumps

The water supplies located on the Selwyn plains area rely on pumped systems to take deep groundwater either direct into the network and/or to surface reservoirs. Pumping capacity is limited by the rate (litres per second) specific to schemes water take and use consent.

Council has a focus on making the most efficient match of pumps and pumping systems to the communities needs. Variable speed drive systems are used extensively to:

- Reduce the pump start up energy load on the mainline network; and
- Minimise the energy used to meet customers water needs.

In more alpine areas, such as Arthurs Pass, gravity conveyance of water from the steep surrounding catchments is used to provide water to customers.

## Water Treatment

23 of 28 schemes are located in the plains area, where deep generally secure groundwater can be obtained. As a result disinfection or neutralisation of organisms in source water is not required.

In the shallow unsecure water schemes, Council uses filtration, ultra violet light (UV) and chlorination treatment systems to reduce the likelihood of source water organisms entering the community water network.

Details of treatment are provided in Volume 2 at a scheme level however, a summary is provided below. This summary identifies which sources have permanent barriers installed to make water safe to drink i.e. in their normal operation. During transgression events, chlorination may be used in addition to existing treatment where applicable. Refer table Table 3-4 below for a summary of treatment systems for each water supply.

## Water Quality and Chlorination

Selwyn District Council is committed to providing our communities with safe drinking water.

The Council currently uses a variety of water treatment methods for its 30 water supplies and all supplies have Water Safety Plans which are approved by the Canterbury District Health Board. Treatment methods used in various supplies include secure ground water (to meet current New Zealand Drinking Water Standards), Ultraviolet (UV) disinfection, selective abstraction and filtration, while chlorination is currently used on five supplies: Acheron, Castle Hill, Dalethorpe, Hororata and Springfield[7].

Below are some answers to common questions about chlorination.

***Why would SDC want to add chlorine to our water?***

*We want to make sure that everyone in the Selwyn District has safe drinking water. The Health Act makes SDC responsible for providing a safe and wholesome drinking water supply and to do everything practicable to meet the NZ Drinking Water Standards.*

*On the 20 December 2017 The Director-General of Health issued a formal statement reminding water suppliers of their statutory responsibilities set out in the Health Act 1956.*

*The formal statement recommends reconsidering reliance on 'secure bores' and warns that the public risk is increased if drinking-water is untreated. Councils and DHBs have been advised to seek information from public health units on the need to disinfect any drinking-water supply that is currently not being treated. The Ministry strongly advises water should be treated, with chlorination the safest treatment option.*

***We already have UV treatment so why do we need chlorine too?***

*UV (ultra violet light) treats the water where it enters our supply network. It is very effective as long as the water is not turbid (discoloured). UV treatment does not treat the water once it is in our reservoirs and pipes.*

*There is always the potential for contaminants to get into the water reticulation system, for example through cracks in the reservoir, broken pipes – tree roots growing through pipes are a potentual problem, as are unlawful connections from households where people do their own plumbing.*

***How much chlorine will you use?***

*As little as possible to keep your water safe. Typically we will use a dose of 1.0 - 0.5mg of chlorine for every litre of water. This will give a residual dose of 0.3mg per litre in what comes through your taps.*

[7] For more information on the ways that we treat water, visit: http://www.selwyn.govt.nz/my-property/5waters-services/water-supplies/water-quality-in-selwyn-district

***I've heard that chlorine is unsafe – is that true?***

*Chlorine has been used safely all over the world for around 120 years. It keeps millions of people all round the world – including most of New Zealand – safe from waterborne illness.*

*The amount of chlorine dosed into the water supply will be carefully managed to ensure levels of chlorine in the water people drink are absolutely minimised.*

*In a small number of people chlorine can be an irritant for an existing condition such as asthma or eczema. If you feel your skin getting dry or itchy use moisturiser after having a shower or bath. If you notice increased skin irritation, asthma symptoms or other symptoms – seek medical advice from your GP.*

*The use of filters will mitigate any risks for those on dialysis. This can be arranged by the Canterbury District Health Board.*

***I don't like the Taste chlorinated water. Is there anything I can do?***

*If you are concerned about the taste, you can either:*

- *Fill a jug of water and leave it on the bench or in your fridge overnight. The chlorine will dissipate naturally over a few hours. or*
- *Install an under-bench filter. Chlorine and any associated by-products can removed by using a granulated, activated carbon (GAC) filter. These are available from hardware supplies stores and water filter companies.*

***I don't want to shower or wash my clothes in chlorinated water – what can I do?***

*You can buy a carbon filter that attaches to your water supply where it enters your property. It will remove all the chlorine from the water to your home.*

***Pets***

*If you have fish in outside ponds you will need to either turn down in-coming water to an absolute trickle (this dilutes the chlorine level to a safe amount for your fish), or fill up drums of water and let them sit for at least 24 hours before using (the UV of the sun evaporates chlorine).*

*For fish tanks or bowls inside, fill up a container of water and let it sit for at least 24 hours and then only replace 1/3 of this water at a time with what is in the tank already. If you're still worried, you can buy de-chlorinating kits (sodium thiosulfate) at pet supplies stores.*

***What are the Drinking Water Standards?***

*The Drinking Water Standards for New Zealand are issued by the Ministry of Health(external link) under the Health Act and set out the requirements water suppliers need to meet to provide safe water to their communities. The standards specify:*

- *Maximum amounts of substances, organisms, contaminants and residues that may be present in drinking water.*
- *Criteria for demonstrating compliance with standards.*

*Remedial action to be taken in the event of non-compliance with standards.*

## Table 3-4: Public Water Supply Treatment Devices (normal operation)

| Scheme | Water Treatment / Barriers | | | | |
|---|---|---|---|---|---|
| | Turbidity Monitoring | Filtration | Ultra Violet Light | Chlorination | Secure GW |
| **Gallery/River/Lake** | | | | | |
| Arthur's Pass | ✓ | ✓ | ✓ | | |
| Castle Hill | ✓ | | | ✓ | |
| Lake Coleridge | ✓ | | ✓ | | |
| Malvern Hills Hartleys | ✓ | | ✓ | | |
| Malvern Hills Dalethorpe | ✓ | ✓ | ✓ | ✓ | |
| Selwyn Rural – Dry Acheron | | | | ✓ | |
| Selwyn Rural - Glentunnel | ✓ | | ✓ | ✓ | |
| Springfield | ✓ | ✓ | ✓ | ✓ | |
| Sheffield / Waddington | ✓ | | ✓ | | |
| **Deep Groundwater** | | | | | |
| Dunsandel | ✓ | | ✓ | | |
| Johnson Rd | ✓ | | ✓ | | |
| Kirwee | ✓ | | ✓ | | ✓ |
| Lincoln | ✓ | | | | ✓ |
| Prebbleton | ✓ | | | | ✓ |
| Rolleston | ✓ | | ✓ | | ✓ |
| West Melton | ✓ | ✓ | ✓ | | |
| Leeston | | | | | ✓ |
| Jowers Road | | | | | |
| Raven Drive | | | | | ✓ |
| Rakaia | | | | | ✓ |
| Claremont | | | | | ✓ |
| Darfield | ✓ | | | | ✓ |
| Edendale | ✓ | | ✓ | | ✓ (Provisional) |
| Springston | | | | | ✓ |
| Southbridge | | | | | |
| Tai Tapu | | | | | ✓ |
| Taumutu | | | | | |
| Te Pirita | | | | | ✓ |
| Upper Selwyn Huts | | | | | |

## Reservoirs

Council has above and below ground water storage. Above ground storage reservoirs are timber, concrete and plastic material and are reasonably durable. Below ground aquifer systems are considered to be a secure and appropriate type of storage, though with increasing catchment abstraction, monitoring of recharge and well levels is required.

The philosophy that below ground storage via the aquifer is appropriate comes with the:

- Risk that the aquifer yields not remain constant; and
- Requirement that adequate and resilient redundancy in surface pumping and electrical systems is available; and
- Above ground storage is provided in steel reinforced concrete and wire band timber tanks.

Above ground storage is employed to:

- Ensure sufficient water is available over peak demand periods. A normal peak demand period is 2-5 hour, over which time the reservoir water is rapidly drawn down. Councils target storage for new schemes is 8 hours at peak demand. Existing schemes are configured to utilise ground and surface storage, pipe capacity and reservoirs; and
- Allow for lower rates of water source take, and stop oversizing of mainline pipes and pumping systems ; and
- Provide fire flow requirements, where a set volume of water is reserved for fire flow needs.

A review of all Councils public water supply reservoirs was undertaken after the September 2010 Greendale earthquake. This review identified there was no severe damage which required urgent attention, but repairs were needed. These repairs have either been completed or are planned.

## Water Storage for Fire Fighting

New Zealand Fire Service Firefighting Waters Supplies Code of Practice "The Code" is a publicly available specification published by Standards New Zealand (SNZ PAS 4509:2008). It provides criteria around what constitutes a sufficient minimum supply of water pressure and volume for firefighting in structures in Urban Fire Districts. A Code such as this is non-mandatory but can be incorporated into relevant bylaws or district plans. Council have not incorporated it into the 2008 Water Supply Bylaws. The Code is not necessarily relevant to water supplies that are not designated as Urban Fire Districts. However,

Council may wish to use some aspects of the Code as a guide. The Code is not relevant to rural fire fighting but includes guidance on provision of alternative firefighting water sources that may be appropriate to rural firefighting needs.

An Urban Fire District is an area declared or constituted under section 26 of the Fire Service Act. The following Urban Fire Districts are situated within Selwyn District (Refer to Selwyn District Council Fire Plan 2013-2018 Appendix G).

| | | |
|---|---|---|
| Darfield | Dunsandel | Kirwee |
| Leeston & Doyleston | Lincoln | Prebbleton |
| Rolleston | Sheffield/Waddington | Southbridge |
| Springfield | Springston | Tai Tapu |

Council's Civil Defence/Emergency Manager updates the Rural Fire Plan annually. As part of the review, changes to the gazetted Urban Fire Districts are identified and recommended to the National Fire Authority. For example in Rolleston as urban development occurs, the gazetted area extends to accommodate the high density built environment. At the same time, the Rural Fire area is amended to reflect the extension to the urban area.

West Melton has been identified as a possible area for gazetting as an Urban Fire District. However, the town currently has a rural fire party station, and any change to an urban fire district would require evidence showing:

(a) Significant increase in property values;

(b) That other Fire Parties including the Urban stations at Rolleston and Kirwee could not adequately service the area within target response times e.g. 5-10minutes; and

(c) The National Fire Commander and Council supports the change and allocates appropriate resources.

The Code of Practice is directly applicable to those supplies listed in Group A. Group B schemes could be included and those in C-D should not be considered under the Code.

**Table 3-5 Applicable Groups for Firefighting Code of Practice**

| **Firefighting Water Supplies Code of Practice APPLIES** | |
|---|---|
| **Group A** | |
| Darfield (urban)<br>Dunsandel<br>Kirwee (urban)<br>Leeston (urban) | There are Urban Fire Districts associated with these water supplies. Most have local volunteer fire brigades. It would be appropriate for Council to provide a fire fighting water supply in general accordance with the Code. |

| | |
|---|---|
| Doyleston<br>Lincoln<br>Prebbleton<br>Rolleston<br>Sheffield/Waddington (urban)<br>Southbridge<br>Springfield (urban)<br>Springston<br>Tai Tapu (urban) | It should be possible to meet FW2 Code requirements for the Urban Fire District areas served by Council water supplies. It may be possible to provide a higher standard for business zones in the larger towns. Izone should be targeted for provision of a higher level of fire fighting water supply. |
| **Firefighting Water Supplies Code of Practice COULD BE APPLIED** | |
| **Group B** | |
| Arthur's Pass<br>Castle Hill<br>Lake Coleridge<br>Rakaia Huts<br>West Melton * | There are no Urban Fire Districts associated with these small towns. Arthur's Pass, Lake Coleridge and West Melton have Volunteer Rural Fire Forces (VRFF). These towns are served by mains pressure water supplies.<br><br>Where practicable, Council should seek to meet FW2 Code requirements for the Living Zone areas served by the community water supply. Hydrants should be provided within the prescribed distances of structures even if flows and volumes cannot be provided or sustained for the desired period.<br><br>*It is likely that West Melton will be gazetted as an Urban Fire District in future and this should be anticipated in any planning. |
| **Firefighting Water Supplies Code of Practice DOES NOT APPLY** | |
| **Group C1** | |
| Armack Drive<br>Branthwaite Drive<br>Edendale<br>Taumutu<br>Templeton (Claremont)<br>Upper Selwyn Huts | These small rural communities are typically rural-residential subdivisions served by very small mains pressure water supplies that will not be able to provide adequate flows for fire fighting.<br><br>The provision of hydrants, tanker filling points and identification of alternative water sources are options to facilitate fire fighting, even if only in a limited way. Private on-site storage, or community storage may be appropriate. |

| Firefighting Water Supplies Code of Practice DOES NOT APPLY | |
|---|---|
| **Group C2** | |
| Burnham<br>Jowers Road<br>Johnson Road<br>Raven Drive | These small rural communities are typically rural-residential subdivisions served by low pressure water schemes supplying tanks on each property.<br><br>The provision of hydrants, tanker filling points and identification of alternative water sources are options to facilitate fire fighting, even if only in a limited way. Private on-site storage, or community storage may be appropriate. |
| **Group C3** | |
| Whitecliffs )<br>Glentunnel ) MHRWS<br>Coalgate )<br>Hororata - Selwyn RWS | There are no Urban Fire Districts associated with these small towns but two (Hororata, Coalgate) have auxiliary volunteer rural fire brigades. These towns are supplied from rural water schemes supplying tanks on each property.<br><br>The provision of hydrants, tanker filling points and identification of alternative water sources are options to facilitate fire fighting, even if only in a limited way. Private on-site storage, or community storage may be appropriate. |
| **Group D** | |
| Darfield (rural)<br>Kirwee (rural)<br>Leeston (rural)<br>Malvern Hills RWS<br>(excl towns)<br>Selwyn RWS (excl. towns)<br>Sheffield/Waddington (rural)<br>Springfield (rural)<br>Tai Tapu (Otahuna)<br>Te Pirita RWS | These small communities and rural areas have rural water schemes providing low pressure water to tanks on each property. Some are an extension of the local town supply.<br><br>The provision of hydrants, tanker filling points and identification of alternative water sources are options to facilitate fire fighting, even if only in a limited way. Private on-site storage, or community storage may be appropriate. |

### 3.1.1.3 Group A Fire Code Suitability Assessment

The community structures requirements and volume of water available have been assessed. Group A water supplies achieve the requirements of the Code to varying degrees - Table 3-6. Improvements could be undertaken, but will require council and community support and a change in council policy.

**Table 3-6 Group A - Fire Code Suitability**

| Water Supply | Summary | Suggested Target | Comments |
|---|---|---|---|
| Darfield | Can meet FW3 | Living Zones – FW2<br>Business Zones - FW3 | Confirm that FW3 is adequate for business zones |
| Dunsandel | Can NOT meet FW2 | Living Zones – FW2<br>Business Zones – FW2 | Review with Fire Service as existing system may be considered adequate for this community |
| Kirwee | Can NOT meet FW2 | Living Zones – FW2<br>Business Zones – NA | Review with Fire Service as existing system may be considered adequate for this community |
| Leeston | Can meet FW2<br>Can nearly meet FW3 | Living Zones – FW2<br>Business Zones - FW3 | Reliant on aquifer storage but vulnerable to pump failure and power outages |
| Prebbleton | Can meet FW3 | Living Zones – FW2<br>Business Zones - FW3 (poss. FW4 in future?) | Resource consent breach to supply FW3. System at capacity. Consider fire fighting needs as part of upgrade planning. |
| Doyleston | Can meet FW2 | Living Zones – FW2<br>Business Zones – FW2 | Reliant on aquifer storage but vulnerable to pump failure and power outages |
| Lincoln | Can meet FW3 | Living Zones – FW2<br>Business Zones – FW4 | Reliant on aquifer storage but vulnerable to pump failure and power outages |
| Rolleston | Can meet FW6 | Living Zones – FW2<br>Business Zones – FW4<br>IZone – FW5+ ? | Reliant on aquifer storage but vulnerable to pump failure and power outages. FW5 can be met with loss of one bore source |
| Sheffield / Waddington | May meet FW2 | Living Zones – FW2<br>Business Zones – NA | Subject to network capacity |
| Southbridge | Can NOT meet FW2 | Living Zones – FW2<br>Business Zones – FW2 | System close to capacity. Consider fire fighting needs as part of upgrade planning. |
| Springfield | May meet FW2 | Living Zones – FW2<br>Business Zones – NA | Subject to network capacity |
| Springston | Can NOT meet FW2 | Living Zones – FW2<br>Business Zones – NA | System close to capacity. Consider fire fighting needs as part of upgrade planning. |

| | | | |
|---|---|---|---|
| | | | Review with Fire Service as existing system may be considered adequate for this community |
| Tai Tapu | Can NOT meet FW2 | Living Zones – FW2<br>Business Zones – NA | Review with Fire Service as existing system may be considered adequate for this community |

## Water Reticulation

A summary of the material and diameter for the pipes within the reticulation as well as more information about the types of assets for water can be found in Section 7.0, Lifecycle Management.

## Risk Assessment

A risk assessment has been undertaken for Water Supplies. The key output from the risk assessment is the identification of any extreme and high risks which need to be mitigated. In order to mitigate these risks they have been included and budgeted for in the projects within the LTP. The list of business wide risks is in Section 9.2 and scheme wide risks are listed in 5Waters Activity Management Plan: Volume 2. Table 3-7 below outlines the risk priority rating and Table 3-8 lists the scheme wide risks.

**Table 3-7 Risk Priority Rating**

| Risk Score | Level of Risk | Risk Response |
|---|---|---|
| > 50 | Extreme | Awareness of the event to be reported to Council.<br>Urgent action to eliminate / mitigate / manage the risk.<br>Document risk and action in the AMP. |
| 35-50 | Very High | Risk to be eliminated / mitigated / managed through normal business planning processes with responsibility assigned. |
| 14-35 | High | Manage risk using routine procedures. |
| 3.5-14 | Moderate | Monitor the risk. |
| < 3.5 | Low | Awareness of the event to be reported to Council.<br>Immediate action required to eliminate / mitigate / manage the risk.<br>Document risk and action in the AMP. |

**Table 3-8 Risks – Water Supplies**

| Risk | Action/Project | Year Identified | 2014 Risk Rating | 2017 Risk Rating | Residual Risk Rating |
|---|---|---|---|---|---|
| Inaccurate asset data causes inaccuracies in valuations and renewals programs | Carry out P&E inventory checks on assets | 2014 | 20 | 20 | 20 |
| Increasing number of easements | Document easements | 2014 | 12 | 12 | 12 |

| | | | | | |
|---|---|---|---|---|---|
| Lack of bore and reservoir turnover | Review bore and reservoir turn over | 2014 | 27 | 27 | 12 |
| backflow contamination | Staff project for inspections | 2017 | | 40 | 20 |
| SCADA upgrade | Network SCADA Upgrade | | | 20 | 10 |
| Water quality does not meet DWSNZ | Review treatment and upgrade as required | 2017 | | 40 | 7 |

## Funding Program

Section 11.0 provides the financial summary and details the funding and expenditure across the 5Waters activities. An overall summary of the funding program for the water supply activity is outlined within this section.

The 10 Year financial programme for the 5Waters is divided into the following categories:

a) Expenditure – Operations and Maintenance;

b) Projects – either specific or jointly funded;

c) Capital Projects - result in new assets; and

d) Renewals - replacement of assets on a like for like basis within a 20 year horizon.

Table 3-9 and Figure 3-10 outline the budget for the water supply activity for the next 10 years.

**Table 3-9 Water Supply Budget Summary**

| Values | Expenditure | Renewals | Projects | Capital Projects |
|---|---|---|---|---|
| Year 1 | $3,202,386 | $1,611,014 | $594,000 | $10,231,333 |
| Year 2 | $3,298,029 | $1,363,101 | $128,000 | $8,254,000 |
| Year 3 | $3,346,790 | $1,930,539 | $133,000 | $2,416,000 |
| Years 4 to 10 | $24,422,662 | $15,169,066 | $1,720,000 | $10,524,387 |
| **Total** | $34,269,866 | $20,073,721 | $2,575,000 | $31,425,720 |

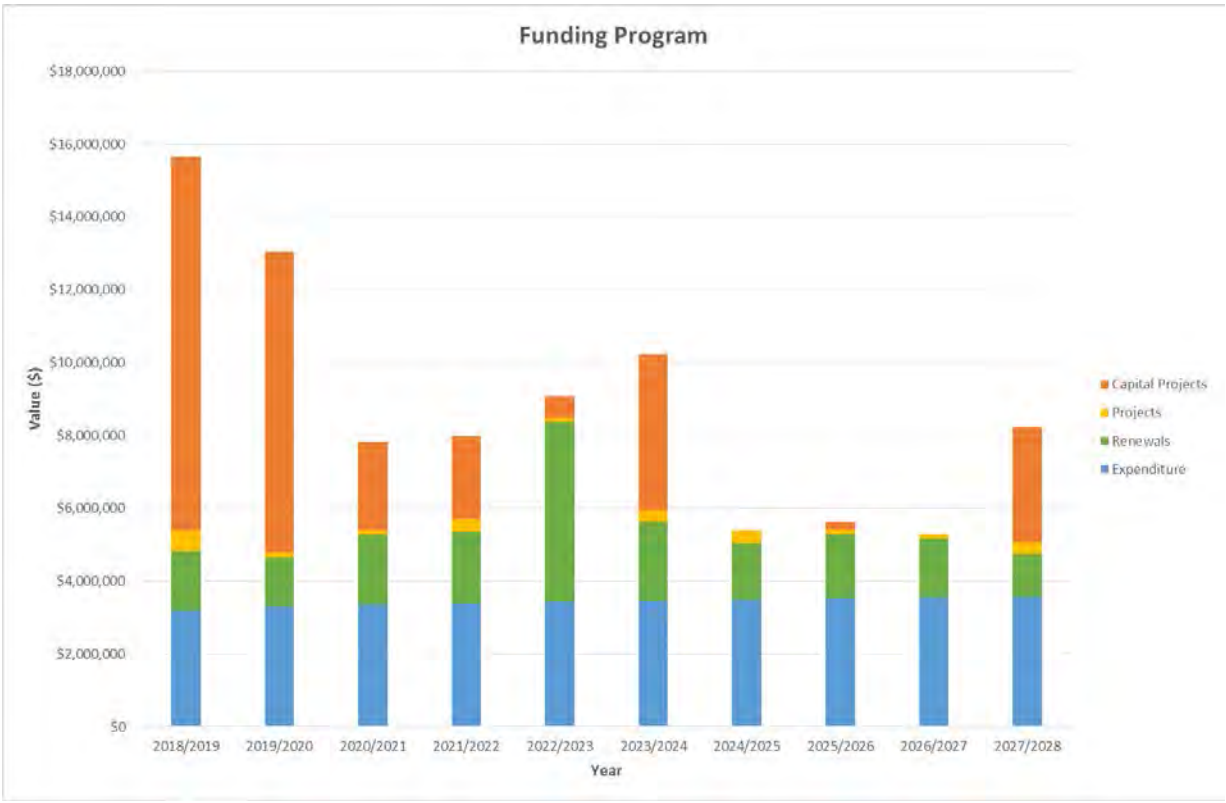



**Figure 3-10 Water Supply Financial Summary**

### 3.1.1.4 Shared Projects

There are a number of shared projects for water. Shared projects are projects across one activity which share the costs across all schemes as they all receive the benefit.

**Table 3-10 List of Shared Projects**

| Project Type | GL | Description | Year 1 ($) | Year 2 ($) | Year 3 ($) | Years 4 to 10 | Funding Split[8] |
|---|---|---|---|---|---|---|---|
| Projects | 38000108 | AMS | $10,000 | $10,000 | $10,000 | $70,000 | 100% LoS |
| Projects | 38000114 | AMP Valuation | $2,000 | $4,000 | $4,000 | $26,000 | 100% LoS |
| Projects | 38000955 | Education | $1,000 | $1,000 | $1,000 | $7,000 | 100% LoS |
| Projects | 40000142 | AMS | $30,000 | $30,000 | $30,000 | $210,000 | 100% LoS |
| Projects | 40000146 | AMP Valuation | $4,000 | $8,000 | $8,000 | $52,000 | 100% LoS |
| Projects | 40000161 | Backflow inspections | $5,000 | | | | 100% LoS |
| Projects | 40000162 | DWSNZ - Security | $200,000 | | | $600,000 | 100% LoS |
| Projects | 40000163 | Treatment design | $200,000 | | | | 100% LoS |
| Projects | 40000901 | Planning and Policy | $60,000 | $60,000 | $60,000 | $420,000 | 100% LoS |
| Projects | 40000905 | Education | $10,000 | $10,000 | $10,000 | $70,000 | 100% LoS |
| Projects | 400090033 | Document easements | | | | $10,000 | 100% LoS |
| Capital Projects | 400090034 | Review bore and reservoir turn over | $10,000 | | | | 100% LoS |
| Capital Projects | 400090035 | Install surge diverters | $40,000 | | | | 100% LoS |
| Capital Projects | 400090036 | Backflow | $20,000 | | | | 100% LoS |

[8] LoS refers to Level of Service

G refers to Growth

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Capital Projects | 400090037 | SCADA upgrade | $56,000 | $92,500 | $31,000 | | 100% LoS |
| Capital Projects | 400090038 | Treatment/chlorine | $200,000 | $500,000 | $300,000 | | 100% LoS |

The list of scheme specific projects can be found in Volume 2: Water Supplies.

## 3.2 Wastewater

This section describes the wastewater activity. Further detail on the schemes is provided in Volume 3: Wastewater.

### Description of the Activity

The Council is responsible for 14 reticulated wastewater systems that service 63% of properties within the district, shown in Figure 3-11. Reticulated community wastewater schemes have been provided where:

- Unsanitary conditions were created through high groundwater conditions and/or urban growth; and
- Sale of Crown operations to Council required that a reticulated scheme be provided for, e.g. Arthurs Pass and Lake Coleridge.

The wastewater schemes have a replacement value of approximately $242M (excluding land value). Overall there are 42 pump stations and 8 wastewater treatment and disposal plants. The total length of the reticulation is 473km, varying in diameter from DN50 to DN600.

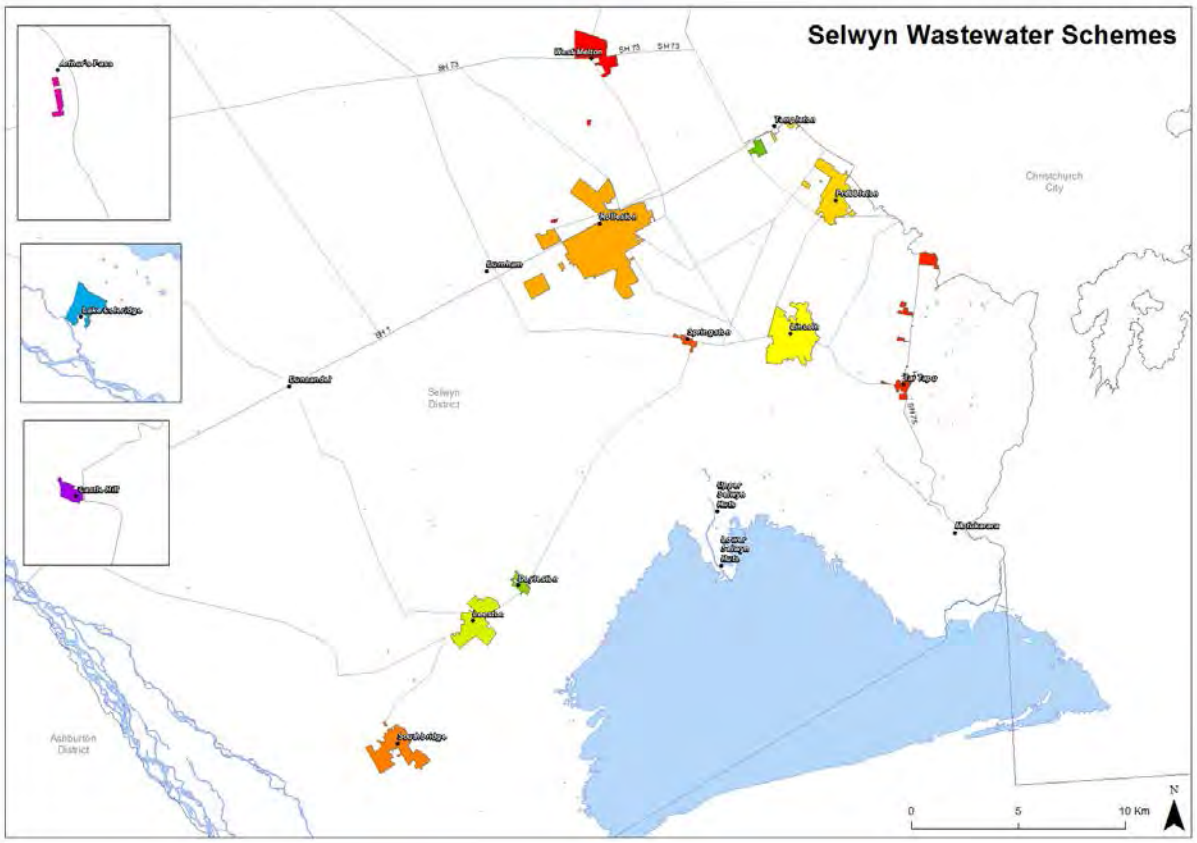



**Figure 3-11 Location of Wastewater Systems**

Council also used to operate 2 septage pits – Ardlui Road and Bleakhouse Road. These take septic tank (household and small business) wastewater. Council is investigating wastewater management options

for Darfield and Kirwee, which currently rely on individual onsite treatment and disposal systems. These schemes are discussed in Volume 3: Wastewater at a scheme level. Wastewater effluent discharge quality must be within Councils Wastewater Bylaw 2008 criteria. Outside these standards, the discharger is covered by Tradewaste Bylaw criteria.

A summary of the wastewater schemes is provided below in Table 3-11.

**Table 3-11 Summary of Wastewater Schemes**

| Scheme | Full Charges as at 1 Jan 2018 | Replacement Cost as at 2017 | Budgeted Maintenance Cost 2018/19 |
|---|---|---|---|
| Arthur's Pass Wastewater Scheme | 9 | $424,165 | $41,720 |
| Castle Hill Wastewater Scheme | 121 | $3,556,643 | $17,054 |
| Claremont Wastewater Scheme | 52 | $4,070,690 | $56,944 |
| Doyleston Wastewater Scheme | 114 | $1,920,789 | $39,021 |
| Eastern Selwyn Sewer Scheme | - | $57,538,085 | $1,812,970 |
| Ellesmere Sewer Scheme | - | - | $164,814 |
| Lake Coleridge Wastewater Scheme | 48 | $1,531,569 | $61,635 |
| Leeston Wastewater Scheme | 874 | $17,350,918 | $120,475 |
| Lincoln Wastewater Scheme | 1930 | $43,335,546 | $185,100 |
| Prebbleton Wastewater Scheme | 1348 | $18,045,934 | $147,000 |
| Rolleston Wastewater Scheme | 5,191 | $68,198,063 | $270,600 |
| Septage Disposal Facilities | - | - | - |
| Southbridge Wastewater Scheme | 329 | $7,153,360 | $55,630 |
| Springston Wastewater Scheme | 177 | $3,142,640 | $22,330 |
| Tai Tapu Wastewater Scheme | 182 | $4,923,688 | $59,365 |
| Upper Selwyn Huts Wastewater Scheme | - | $1,122,644 | $22,000 |
| West Melton Wastewater Scheme | 598 | $9,761,455 | $48,000 |

## Key Issues

The following key issues have been identified across the Councils wastewater schemes. Issues within each individual scheme is provided in Volume 3 of the AcMP. And issues common to one or more of the schemes are below in Table 3-12.

**Table 3-12 District Wide Key Issues**

| Common Issues | Description |
|---|---|
| High Infiltration and Inflow rates | Leeston, Lincoln, Springston, Upper Selwyn Huts |
| Te Waihora Water Conservation Order (2011) strengthened protection of cultural values and the Land and Water Plan requirements | Upper Selwyn Huts treatment and disposal system is installed on the lake edge with consent due to expire. |
| Renewals | Costs for asset replacement is high ground water areas have increased<br>Upper Selwyn Huts reticulation are Grade 5 (very poor) condition |
| Capital Works - ESSS | Financing Pines Extension |
| Darfield-Kirwee | High growth is predicted for Darfield. A wastewater system is programmed for year13 of the LTP. |
| Septage Sites – Ardlui and Bleakhouse | Sites now closed and require remediation. |
| Long travel times | Are a significant issue for Council in the remote schemes |

## Operations and Maintenance

Council has two full time wastewater operations staff (an engineer and a contract supervisor), who runs the wastewater schemes within the district. This staff member is supported by two projects engineers, a SCADA engineer and two admin staff who work across the other 5Waters schemes.

Under contract *C1241 Water Services Network Management Contract* scheduled and reactive maintenance work is undertaken on these supplies. This contract was approved by Council on the 22th June 2016 for a period of 1 July 2016 to 30 June 2021. The new contract rates have made an impact on the budgets, particularly on smaller remote schemes where long travel time are a significant issue.

Telemetry is heavily relied upon to provide early warning of scheme faults.

## Demand and Capacity

High growth in the eastern urban townships including Rolleston, Lincoln, West Melton and Prebbleton is driving the need for upgrades and expansion of the existing treatment plants

## Treatment Plants Summary

An overview of the eight wastewater treatment plants is provided below in Table 3-13 below with a brief outline of the treatment plants further below. Specific scheme details are provided in Volume 3: Wastewater.

**Table 3-13 Selwyn Sewer Treatment Plants**

| Wastewater Scheme | Currently connected to |
|---|---|
| Arthurs Pass | **Community Treatment Plant** |
| Castle Hill | **Community Treatment Plant** |
| Claremont | **Community Treatment Plant** |
| Doyleston | **Leeston** - pumped to Leeston, treated and disposed of via "Ellesmere" WWTP |
| Lake Coleridge | **Community Treatment Plant** |
| Leeston | **Ellesmere Community Treatment Plant**<br>Multi staged maturation ponds followed by border-dyked irrigation. High ground water discharge to drains via ground filtration basins.<br>Consents expires 2029 |
| Lincoln | **Eastern Selwyn Sewer Scheme –** pumped to Rolleston, treated and disposed of via "Pines" WWTP |
| Prebbleton | **Eastern Selwyn Sewer Scheme –** pumped to Rolleston, treated and disposed of via "Pines" WWTP |
| Rolleston | **Eastern Selwyn Sewer Scheme –** pumped to Rolleston, treated and disposed of via "Pines" WWTP |
| Southbridge | **Leeston** - pumped to Leeston, treated and disposed of via "Ellesmere" WWTP |
| Springston | **Eastern Selwyn Sewer Scheme –** pumped to Rolleston, treated and disposed of via "Pines" WWTP |
| Tai Tapu | **CCC**- pumped to Christchurch City, disposal at Bromley/Ocean Outfall |
| Upper Selwyn Huts | **Community Treatment Plant** |
| West Melton | **Eastern Selwyn Sewer Scheme –** pumped to Rolleston, treated and disposed of via "Pines" WWTP |

### 3.2.1.1 Eastern Selwyn Sewer Scheme

The Eastern Selwyn Sewer Scheme serves the townships of Rolleston, Lincoln, Prebbleton, Springston and West Melton.

Providing adequate wastewater treatment and disposal services has been the main restriction in enabling development in the growth areas. Rapid growth was predicted to continue in some of these Eastern Selwyn townships. Therefore, the Pines I WWTP was designed, with construction starting in 2012, as a modular plant so that additional treatment works can be added in stages to service future

demand with an ultimate capacity (permitted by resource consent) of 22,000 PE, with disposal to an 80 ha irrigation area.

Further addition are planned between 2018 and 2020. In 2018/19 extension to the solar drying hall and associated works is proposed at a cost of $3.1 million dollars. Pines IV – plant expansion for additional capacity will occur 2020/21 at a cost of $5.4 million dollars and they will be funded largely from development contributions.

#### 3.2.1.2 Templeton Claremont

The Templeton Claremont scheme was installed in 2005, for the 56 lot subdivision created on the Selwyn-Christchurch City boundary. Access to the adjacent City Council network was only available on the basis that Selwyn District "transfer" wastewater connections from another scheme, e.g. reduce Prebbleton wastewater allocation by 56 equivalent connections. This was not possible, with the result that a consented package plant treatment and land irrigation scheme were installed.

#### 3.2.1.3 Ellesmere Treatment Plant

The Ellesmere Treatment Plant serves Leeston, Doyleston and Southbridge.

Council operates a consented oxidation pond, wetland treatment and land disposal based wastewater treatment plant at Leeston. This plant also takes wastewater effluent from neighbouring townships of Doyleston and Southbridge. The consenting process for disposal for these communities took over 10 years and consideration of three different disposal area proposals (and associated consent applications) due to the ground water mounding concerns of the rural community.

The Leeston plant was upgraded in 2003, with over $4M spent to improve the wastewater treatment and disposal. It was consented to treat 3,600 people equivalents ("PE"), recognising that it and the connected townships are subject to very high groundwater levels. An upgrade of the Ellesmere Wastewater treatment plant is planned to provide the scheme with more capacity to cope with future growth. The upgrade is planned to be completed by 2024 at an estimated cost of $7.5 million dollars.

##### Tai Tapu Wastewater Scheme

Tai Tapu was provided with a CCC bulk conveyance disposal connection in 1996/1997. Wastewater is pumped to Christchurch City in an untreated form with limitations on flows. A maximum of 279 connections can be made.

#### 3.2.1.4 Upper Selwyn Huts Wastewater Scheme

The Upper Selwyn Huts area provides for approximately 39 normally resident people, and during peak periods around 282 people.

The Upper Selwyn Huts wastewater treatment and disposal system is located adjacent to the Selwyn River. During normal operation wastewater is treated in an oxidation pond and discharges to a grassed border dyke area.

The consent for discharge to land expires in 2020. In recent years the Council has been in discussion with community members and other agencies, to consider options for extending the licences beyond 2020. The Council has established a committee to work with the Upper Selwyn Huts community, to develop a plan for the future residential occupancy of the settlement. This process will also involve Environment Canterbury, the Department of Conservation (which holds the lease for the nearby Lower Selwyn Huts settlement), Te Taumutu Rūnanga and Ngai Tahu, to ensure consistency with those agencies' responsibilities in relation to Te Waihora/Lake Ellesmere. The Council will also seek an extension to the existing wastewater consent to align it with the Department of Conservation licenses for Lower Selwyn Huts, which expire in 2024. Any decisions on longer-term wastewater system options will be subject to consultation through a future annual plan or long-term plan process. In the meantime, the Council is reviewing the licence fee and it is likely that there will be a substantial increase to reflect the cost of the recent upgrade to the water system.

#### 3.2.1.5 Arthurs Pass, Lake Coleridge and Castle Hill Village

These scheme are located within Alpine areas and are relatively isolated.

Static growth is predicted in these schemes. Discharge to sensitive environments – Arthurs Pass (National Park), Castle Hill (reserve) and Lake Coleridge (Rakaia River via tail race) is subject to scrutiny from ECan and the Department of Conservation.

#### 3.2.1.6 Septage Pits

Council used to operate two septage pits, which take septic tank effluent. Further details are provided in Volume 3: Wastewater.

### Wastewater Reticulation

A summary of the material and diameter for the pipes within the reticulation as well as more information about the types of assets for wastewater can be found in Section 7.0, Lifecycle Management.

### Risk Assessment

A risk assessment has been undertaken for Watewater schemes. The key output from the risk assessment is the identification of any extreme and high risks which need to be mitigated. In order to mitigate these risks they have been included and budgeted for in the projects within the LTP. The list of business wide risks is in Section 9.2 and scheme wide risks are listed in 5Waters Activity Management Plan: Volume 3. Table 3-14 below outlines the risk priority rating and Table 3-15 lists the scheme wide risks.

**Table 3-14 Risk Priority Rating**

| Risk Score | Level of Risk | Risk Response |
|---|---|---|
| > 50 | Extreme | Awareness of the event to be reported to Council.<br>Urgent action to eliminate / mitigate / manage the risk.<br>Document risk and action in the AMP. |
| 35-50 | Very High | Risk to be eliminated / mitigated / managed through normal business planning processes with responsibility assigned. |
| 14-35 | High | Manage risk using routine procedures. |
| 3.5-14 | Moderate | Monitor the risk. |
| < 3.5 | Low | Awareness of the event to be reported to Council.<br>Immediate action required to eliminate / mitigate / manage the risk.<br>Document risk and action in the AMP. |

**Table 3-15 Risks - Wastewater**

| Risk | Action/Project | Year Identified | 2014 Risk Rating | 2017 Risk Rating | Residual Risk Rating |
|---|---|---|---|---|---|
| Increasing number of easements | Document easements | 2014 | 27 | 27 | 6 |
| Cross connections | Backflow protection and overflow review | 2017 | | 40 | 20 |
| SCADA upgrade | Network SCADA Upgrade | 2017 | | 20 | 10 |

## Funding Program

Section 11.0 provides the financial summary and details the funding and expenditure across the 5Waters activities. An overall summary of the funding program for the wastewater activity is outlined within this section.

The 10 Year financial programme for the 5Waters is divided into the following categories:

a) Expenditure – Operations and Maintenance;

b) Projects – either specific or jointly funded;

c) Capital Projects - result in new assets; and

d) Renewals - replacement of assets on a like for like basis within a 20 year horizon.

Table 3-16 and Figure 3-12 outline the budget for the wastewater activity for the next 10 years.

**Table 3-16 Wastewater Budget Summary**

| Values | Expenditure | Renewals | Projects | Capital Projects |
|---|---|---|---|---|
| Year 1 | $3,194,658 | $1,229,161 | $187,000 | $5,051,737 |
| Year 2 | $3,257,779 | $428,915 | $281,000 | $3,776,011 |
| Year 3 | $3,320,041 | $1,104,360 | $111,000 | $5,957,553 |
| Years 4 to 10 | $24,619,899 | $15,124,809 | $818,000 | $15,671,240 |
| **Total** | $34,392,377 | $17,887,245 | $1,397,000 | $30,456,541 |

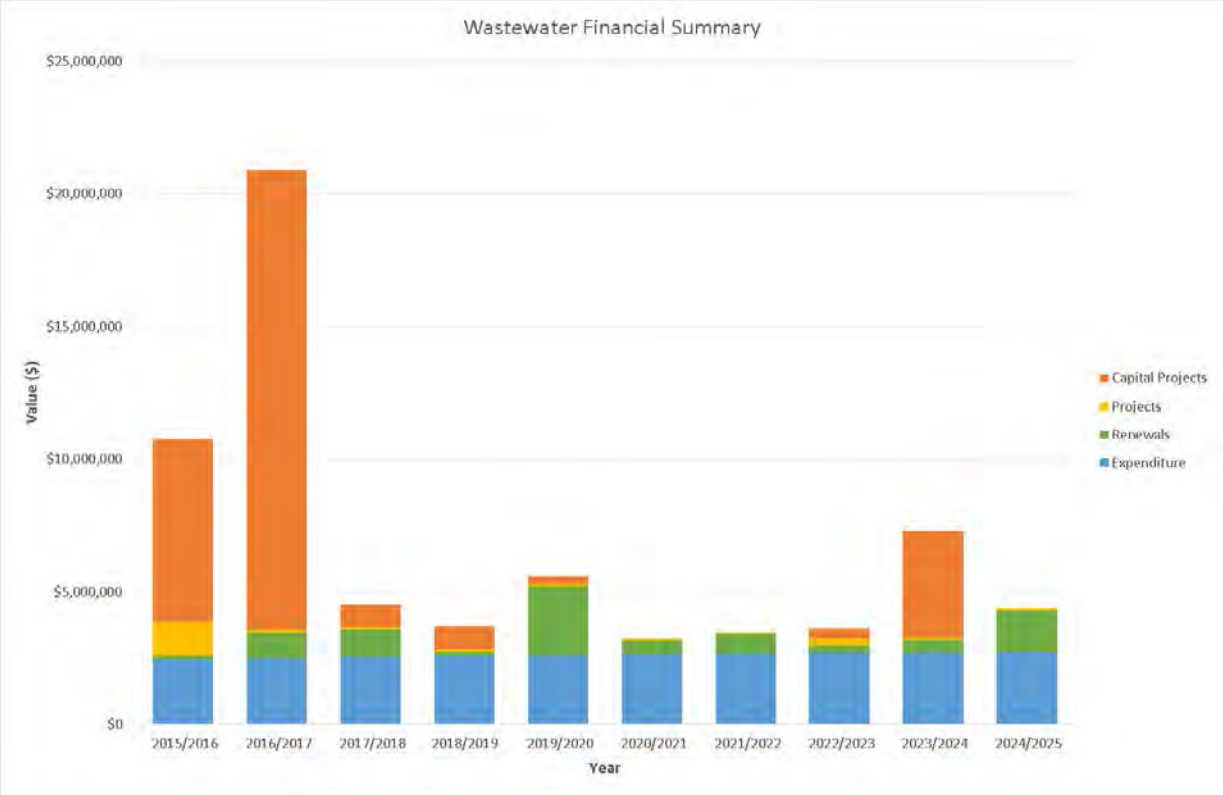



**Figure 3-12 Wastewater Financial Summary**

### 3.2.1.7 Shared Projects

There are a number of shared projects for wastewater. Shared projects are projects across one activity which share the costs across all schemes as they all receive the benefit.

**Table 3-17 List of Shared Projects**

| Project Name | GL | Description | Year 1 ($) | Year 2 ($) | Year 3 ($) | Years 4 to 10 | Funding Split[9] |
|---|---|---|---|---|---|---|---|
| Projects | 4600096 | AMS | $30,000 | $30,000 | $30,000 | $210,000 | 100% LoS |
| Projects | 46000100 | AMP Valuation | $4,000 | $8,000 | $8,000 | $52,000 | 100% LoS |
| Projects | 46000981 | Planning and Policy | $60,000 | $60,000 | $60,000 | $420,000 | 100% LoS |
| Projects | 46000986 | Education | $3,000 | $3,000 | $3,000 | $21,000 | 100% LoS |
| Capital Projects | 460090034 | Air valves odour control | $200,000 | $100,000 | $50,000 | | 100% LoS |
| Projects | 4600900251 | Document easements | | | | $5,000 | 100% LoS |
| Capital Projects | 460090007 | Flush tank backflow | $200,000 | | | | 100% LoS |
| Capital Projects | 460090008 | SCADA upgrade | $56,000 | $92,500 | $31,000 | | 100% LoS |

The list of scheme specific projects can be found in 5Waters Activity Management Plan: Wastewater.

[9] LoS refers to Level of Service

G refers to Growth

## 3.3 Stormwater

The following section describes the stormwater activity. Further detail on the schemes is provided in Volume 3: Stormwater.

### Description of the Activity

Council manages 21 stormwater management areas within the Selwyn District. These areas are all urban in nature and have infrastructure in place to collect, convey and dispose of surface water. Many areas also manage stormwater in terms of water quality and quantity. This helps manage surface water in these urban areas that can lead to risks to public health and safety, damage to property and contribute to dangerous road conditions. The stormwater management areas are located between the main divide (Arthurs Pass) and Pacific coast (Rakaia Huts) and do not include rural areas, refer Figure 3-13 below for the location of the stormwater management areas. The diverse geographic location of the stormwater management areas brings with it the need to provide a range of location specific stormwater management techniques that meet particular community's needs. For example, rainfall, ground water depths and soils types vary across the district and affect stormwater management.

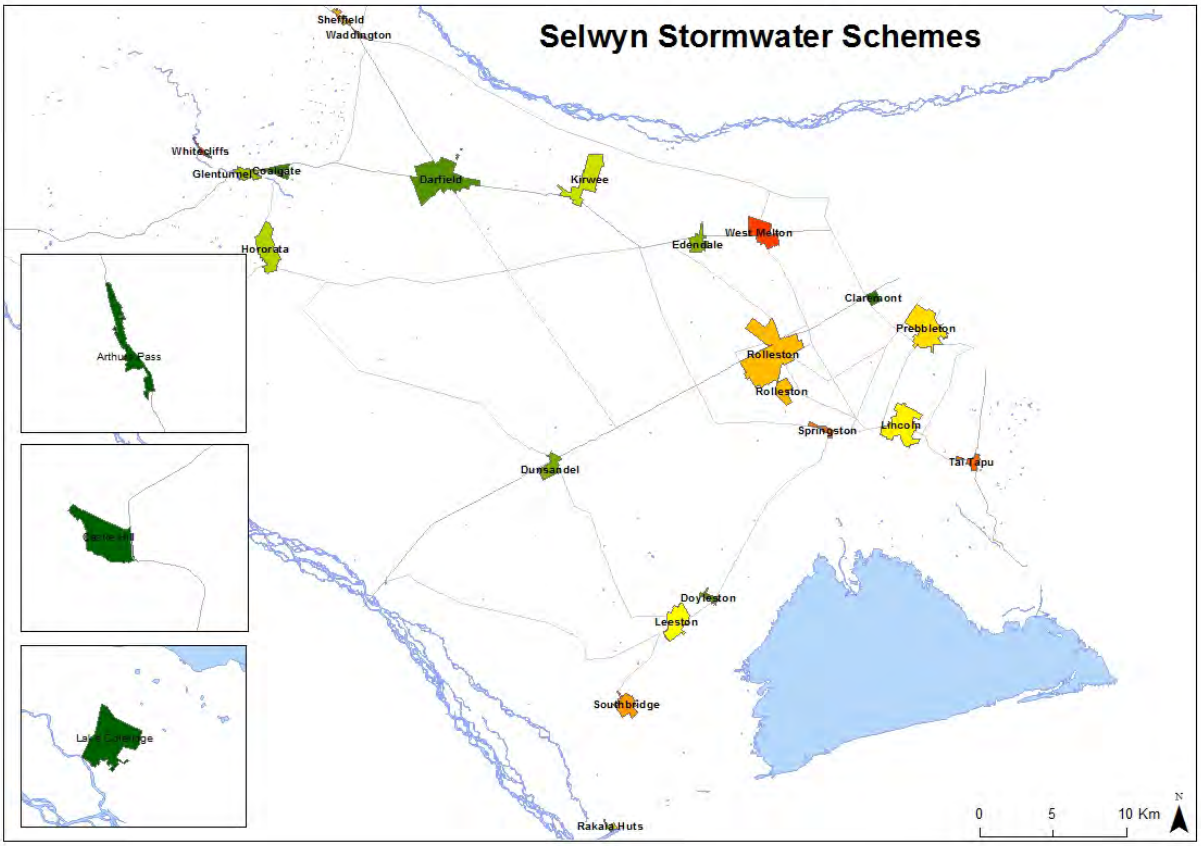



**Figure 3-13 Location of Stormwater Schemes**

Figure 3-14 below shows rainfall varying between 600mm (Lincoln) in the Lower Plains to 4330mm (Arthurs Pass) along the main divide. Rainfall affects the sizing of future devices and the planning for future upgrades.

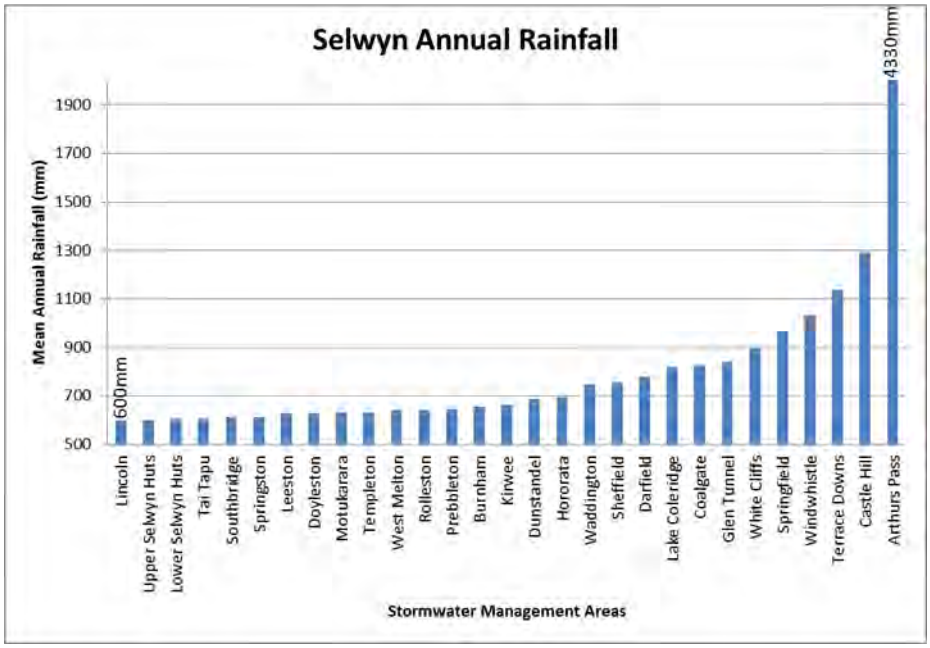



**Figure 3-14 Selwyn Annual Rainfall**

Figure 3-15 shows the depth of ground water varying between near surface (Lincoln) and over 80m deep (Darfield). Groundwater levels affects the selection of stormwater management devices e.g. high ground water sites (Lincoln) are best suited to ponds and wetlands to manage stormwater while areas with low (deeper than 6m) ground water (Rolleston) are best disposed to ground depending on soil types/infiltration rates.

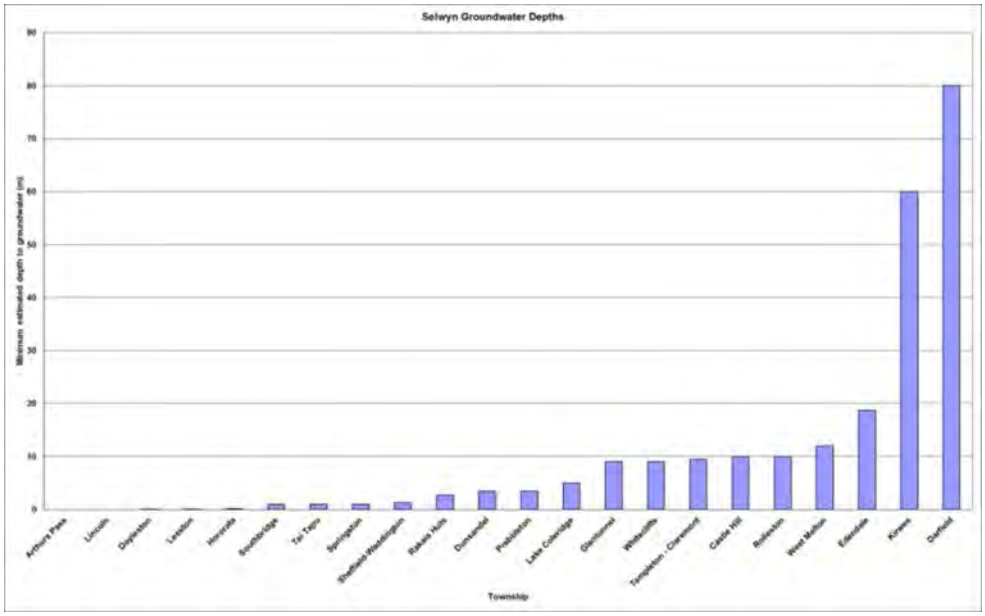



**Figure 3-15: Selwyn Maximum Ground Water Depth**

A summary of the 22 stormwater schemes is provided below in Table 3-18.

**Table 3-18 Summary of Stormwater Schemes**

| Scheme | Full Charges as at 1 July 2017 | Replacement Cost as at 2017 | Budgeted Maintenance Cost 2018/19 |
|---|---|---|---|
| Arthurs Pass Stormwater Scheme | 136 | $321,277 | $15,100 |
| Castle Hill Stormwater Scheme | 187 | $699,248 | $18,500 |
| Claremont Stormwater Scheme | 58 | $109,117 | $315 |
| Darfield Stormwater Scheme | 1061 | $573,654 | $16,220 |
| Doyleston Stormwater Scheme | 118 | $647,141 | $8,345 |
| Dunsandel Stormwater Scheme | 177 | $201,936 | $2,550 |
| Glentunnel Stormwater Scheme | 76 | $152,691 | $7,850 |
| Hororata Stormwater Scheme | 71 | $301,661 | $7,205 |
| Kirwee Stormwater Scheme | 356 | $181,953 | $4,210 |
| Lake Coleridge Stormwater Scheme | 69 | $108,483.2 | $7,130 |
| Leeston Stormwater Scheme | 889 | $6,288,618 | $59,226 |
| Lincoln Stormwater Scheme | 2015 | $28,002,257 | $219,400 |
| Prebbleton Stormwater Scheme | 1457 | $6,389,215 | $84,850 |
| Rakaia Huts Stormwater Scheme | 114 | $268,749 | $1,195 |
| Rolleston Stormwater Scheme | 5289 | $4,640,713 | $134,500 |
| Southbridge Stormwater Scheme | 365 | $957,167 | $16,770 |
| Springfield Stormwater Scheme | 136 | $40,471 | $1,215 |
| Springston Stormwater Scheme | 195 | $894,139 | $11,730 |
| Tai Tapu Stormwater Scheme | 183 | $2,051,896 | $24,912 |
| West Melton Stormwater Scheme | 647 | $3,752,410 | $41,800 |
| Whitecliffs Stormwater Scheme | 90 | $80,238 | $10,488 |

## Key Issues

The following key issues have been identified across the Councils stormwater schemes. Issues within each individual scheme is provided in Volume 4 of this AcMP. And issues common to one or more of the schemes are below in Table 3-19.

**Table 3-19 District Wide Key Issues**

| Common Issues | Description |
|---|---|
| Schemes are becoming management Intensive | Due to system development/growth, environmental requirements and public expectations. |
| Long travel times | Are a significant issue for Council in the remote schemes. |
| Provision of water quality monitoring, treatment upgrades and the associated capital burden on applicable communities. | This is driven by the Land and Water Plan/Discharge Consents. |
| Increasing number of capacity upgrades | Capacity upgrades which result from increasing expectations from ratepayers signal that a higher LoS is provided. |
| Data accuracy | Continuous improvement of stormwater asset data records in terms of completeness and accuracy required. |

## Operations and Maintenance

Council has two full time engineers, who focus on the operation and maintenance of stormwater, land drainage and water race schemes within the district. These staff members are supported by a projects engineer, SCADA engineer and two admin staff who work across the other 5Waters schemes.

Under contract *C1241 Water Services Network Management Contract* scheduled and reactive maintenance work is undertaken on these supplies. This contract was approved by Council on the 22th June 2016 for a period of 1 July 2016 to 30 June 2021. The new contract rates have made an impact on the budgets, particularly on smaller remote schemes where long travel time are a significant issue.

Telemetry is relied upon to provide early flood warnings for Tai Tapu, Leeston and Doyleston.

## Demand and Capacity

High growth in the urban areas of Rolleston, Lincoln and Prebbleton is driving the need for the extension of the stormwater management areas and associated infrastructure.

Demand on the stormwater network is based on the conveyance of prescribed design rainfall events.

It is impractical to provide a primary stormwater system with the capacity to fully accommodate the runoff from all possible storms. The historic design standard for most of the primary Council stormwater system was to convey runoff resulting from a storm with a 2 - 5 year return period storm.

Rainfall totals for the 10 year 1 hour event is shown below for comparative purposes and illustrates the varying rainfall depths for this particular rainfall event over the district.

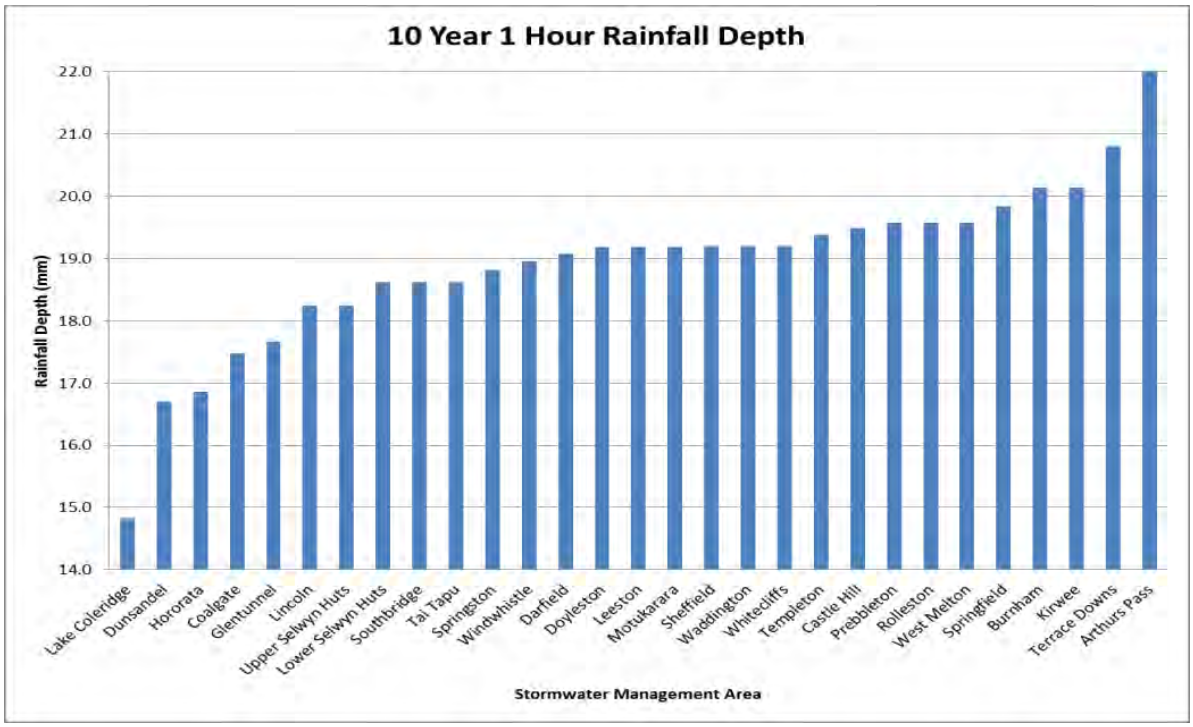



**Figure 3-16: Selwyn 10 year 1 hour rainfall depth**

Modern subdivisions and stormwater renewals/upgrades are now designed for the 10 year return period. Current standards in Selwyn are designed for, primary a 1 in 10 year event and secondary for a 1 in 50 year event. It is inevitable that the parts of the piped system will be overloaded to varying degrees whenever rainfall with a return period in excess of the design storm occurs.

## Water Quality

In terms of stormwater discharge there are two types of receiving environment and measured effects. These are:

- Discharge to ground (potentially affecting drinking water); and
- Discharge to surface water (potentially affecting aquatic life).

Council undertakes stormwater sampling to meet consent conditions. A summary of information collected from Rolleston (discharge to ground) and Lincoln (discharge to surface water) is provided below.

### 3.3.1.1 Discharge to Ground

Water quality samples are taken as part of the global stormwater consents for Selwyn townships. The receiving environment is sampled upstream and downstream of the discharge point. The results from July 2017 for the townships of Arthurs Pass and Hororata are presented below in Table 3-20.

**Table 3-20: Stormwater Characterisation**

| Determinant | Units | Arthurs Pass | Hororata |
|---|---|---|---|
| Total Suspended Solids | $g/m^3$ | <3 | 645 |
| Nitrate – Nitrogen | $g/m^3$ | 0.02 | 0.33 |
| Amomonia Nitrogen | $g/m^3$ | <001 | 0.07 |
| Total Phosphorus | $g/m^3$ | <0.005 | 1.31 |
| Dissolved Reactive Phosphorus | $g/m^3$ | <0.005 | 0.113 |
| Total Nitrogen | $g/m^3$ | <0.05 | 5.08 |
| Dissolved Copper | $g/m^3$ | <0.0005 | 0.0014 |
| Dissolved Lead | $g/m^3$ | <0.0005 | <0.0005 |
| Dissolved Zinc | $g/m^3$ | <0.002 | <0.002 |
| pH | | 7.21 | 6.90 |
| Conductivity at 25 degress | uS/cm | 46 | 78 |
| Temperature | Deg C | 6.8 | 6.8 |
| Dissolve Oxygen | g $O2/m^3$ | 10.7 | 10.6 |

### 3.3.1.2 Discharge to Surface Water

Water quality samples were taken from the L2 River immediately downstream of the Lincoln stormwater management area. The results are presented below and compared to the Australian water quality guidelines for fresh and marine (ANZECC) guidelines. Regular sampling is undertaken to meet consent conditions.

**Table 3-21: Stormwater Characterisation**

| | Total Suspended Solids $g/m^3$ | Dissolved Copper $g/m^3$ | Dissolved Lead $g/m^3$ | Dissolved Zinc $g/m^3$ |
|---|---|---|---|---|
| 6 March 2015 | 4 | <0.0005 | <0.0001 | 0.0011 |
| 10 June 2014 | 19 | 0.0013 | <0.0001 | 0.0092 |
| 8 April 2014 | 47 | 0.0016 | <0.0001 | 0.0085 |
| 6 January 2014 (dry) | 13 | 0.0005 | <0.0001 | 0.0011 |
| 4 September 2013 | 30 | 0.0012 | <0.0001 | 0.0054 |

| | | | | |
|---|---|---|---|---|
| 6 May 2013 | 420 | 0.0019 | <0.0001 | 0.0029 |
| 18 March 2013 | 51 | 0.003 | 0.00023 | 0.0049 |
| Water Quality standard for 95% protection level | na | 0.0014 | 0.0034 | 0.008 |

The results were taken as part of the Lincoln Stormwater Monitoring Programme at site 6 below the Lincoln township.

The results in Table 3-21 above show low dissolved metal concentration in the L2 River in both low and high flow conditions. The metal levels are below the 95% protection level (spring fed plains rivers NRRP WQL4 Table WQL17) in all but one high flow sample where copper levels were elevated. One high flow event in May 2013 resulted in high TSS results downstream of the township. This was associated with construction in adjacent subdivisions.

### Stormwater Management

Stormwater management relates to the 'day to day' management of the quantity and quality of stormwater discharge. The management of stormwater needs to address quantity effects to control erosion and flooding, and quality effects as runoff is one of the principal mechanisms for transfer of road/traffic generated contaminants to the environment.

Integrated stormwater management plans are required for all townships under the Land and Water Regional Plan by June 2018. The plans form part of the discharge consents required. Table 3-22 below shows the townships for which this has been completed.

**Table 3-22 Management Plans**

| Consent Granted | Consent Lodged |
|---|---|
| Rolleston (CRC132527) | Tai Tapu (CRC167468) |
| Lincoln (CRC151652) | Prebbleton (CRC167469) |
| Claremont (CRC050844.1) | Southbridge (CRC167470) |
| Castle Hill (CRC064128.1) | Hororata (CRC167471) |
| West Melton (CRC167467) | |
| Kirwee (CRC167466) | |
| Darfield (CRC167465) | |
| Rakaia Huts (CRC175956) | |

## Stormwater Assets

Council has a wide variety of stormwater assets within the district. A brief description of these assets is discussed here:

a) Oil Interceptor – Is a proprietary device which uses baffles to trap and contain hydrocarbons (oils and fuels).

b) Humeceptor - Is a hydrodynamic separator which helps to reduce mass sediment load from the discharge, some removal of hydrocarbons is also achieved.

c) Swale (Rock lined) – Is a longitudinal open channel which is lined with rocks. The swale both conveys and treats stormwater.

d) Swale (Grassed) – Is a longitudinal open channel which is lined with grass. The swale both conveys and treats stormwater.

e) Swale (Wetland) – Is a longitudinal open channel which is lined with wetland plant species. The swale both conveys and treats stormwater and is particular useful in areas with high groundwater tables.

f) Soakage trench – Carries out the same function as soakholes but is orientated in a horizontal direction rather than vertically. They are particularly useful in areas with reduced infiltration rates or higher ground water tables.

g) Reticulated network – Includes pipes, manholes, sumps. The primary purpose of the reticulated network is to collect and convey stormwater. Historically these systems were designed for the 2 year storm event. Today's engineering standards require the piped network to be designed for a 10 year event with overland flow provision for up to the 50 year event.

h) Corrugated Flume – is a corrugated half pipe used to convey stormwater in areas which are prone to erosion.

i) Infiltration basin – is a stormwater management device which is used to store, treat and dispose of stormwater to the ground via soakage.

j) Wetland - is a stormwater management device which is used to attenuate, treat and dispose of stormwater. Discharge from a wetland is to surface water (open drains or streams). Wetlands have high biodiversity value and are best suited in areas where the ground water table is high.

k) Soakholes – Are used to dispose of stormwater to ground in areas where the ground water table is low and soil permeability is high.

l) Open drains – are channels used to convey stormwater. They are cost effective means to convey large volumes of water.

m) Flood diversion channel – is a large scale open drain designed to convey flood flows.

n) Soakage Pit – these are historic gravel abstraction pits which are used to store and dispose of flood waters.

Details of the stormwater management devices utilised in each scheme are provided in Volume 4: Stormwater, at the scheme level.

### Stormwater Reticulation

A summary of the material and diameter for the pipes within the reticulation as well as more information about the types of stormwater assets can be found in Section 7.0, Lifecycle Management.

### Risk Assessment

A risk assessment has been undertaken for Stormwater schemes. The key output from the risk assessment is the identification of any extreme and high risks which need to be mitigated. In order to mitigate these risks they have been included and budgeted for in the projects within the LTP. The list of business wide risks is in Section 9.2 and scheme wide risks are listed in 5Waters Activity Management Plan: Volume 4. Table 3-23 below outlines the risk priority rating and

Table 3-24 lists the scheme wide risks.

**Table 3-23 Risk Priority Rating**

| Risk Score | Level of Risk | Risk Response |
|---|---|---|
| > 50 | Extreme | Awareness of the event to be reported to Council.<br>Urgent action to eliminate / mitigate / manage the risk.<br>Document risk and action in the AMP. |
| 35-50 | Very High | Risk to be eliminated / mitigated / managed through normal business planning processes with responsibility assigned. |
| 14-35 | High | Manage risk using routine procedures. |
| 3.5-14 | Moderate | Monitor the risk. |
| < 3.5 | Low | Awareness of the event to be reported to Council.<br>Immediate action required to eliminate / mitigate / manage the risk.<br>Document risk and action in the AMP. |

**Table 3-24 Risks - Stormwater**

| Risk | Action/Project | Year Identified | 2014 Risk Rating | 2017 Risk Rating | Residual Risk Rating |
|---|---|---|---|---|---|
| Increasing number of easements | Document easements | 2014 | 27 | 27 | 6 |

| | | | | | |
|---|---|---|---|---|---|
| Public health and safety risks, such as drowning | Review Health and safety risks | 2014 | 3.5 | 3.5 | 3.5 |
| Sediment from subdivisions | Sediment Control Rules | 2014 | 27 | 27 | 12 |
| Unable to predict heavy rainfall events | Develop a flood warning system | 2014 | 6 | 6 | 6 |
| Environmental contamination, urban stormwater containing heavy metal contaminants reaching downgradient water supplies, cultural impacts | Renewal of consents | 2014 | 45 | 45 | 10 |
| Flood identification | Scope out flood protection works | 2017 | | 20 | 2.1 |
| Stormwater management | Stormwater upgrades with consents | 2017 | | 6 | 2.1 |

## Funding Program

Section 11.0 provides the financial summary and details the funding and expenditure across the 5Waters activities. An overall summary of the funding program for the Stormwater activity is outlined within this section.

The 10 Year financial programme for the 5Waters is divided into the following categories:

a) Expenditure – Operations and Maintenance;

b) Projects – either specific or jointly funded;

c) Capital Projects - result in new assets; and

d) Renewals - replacement of assets on a like for like basis within a 20 year horizon.

Table 3-25 and Figure 3-17 outline the budget for the stormwater activity for the next 10 years.

**Table 3-25 Stormwater Budget Summary**

| Year | Expenditure | Renewals | Projects | Capital Projects |
|---|---|---|---|---|
| Year 1 | $698,811 | | $118,000 | $1,155,000 |
| Year 2 | $683,587 | $115,037 | $65,000 | $1,051,000 |

| | | | | |
|---|---|---|---|---|
| Year 3 | $732,712 | $75,756 | $30,000 | $ 700,000 |
| Years 4 to 10 | $5,268,492 | $360,653 | $222,000 | $1,378,000 |
| **Total** | $7,383,601 | $551,445 | $435,000 | $ 4,284,000 |

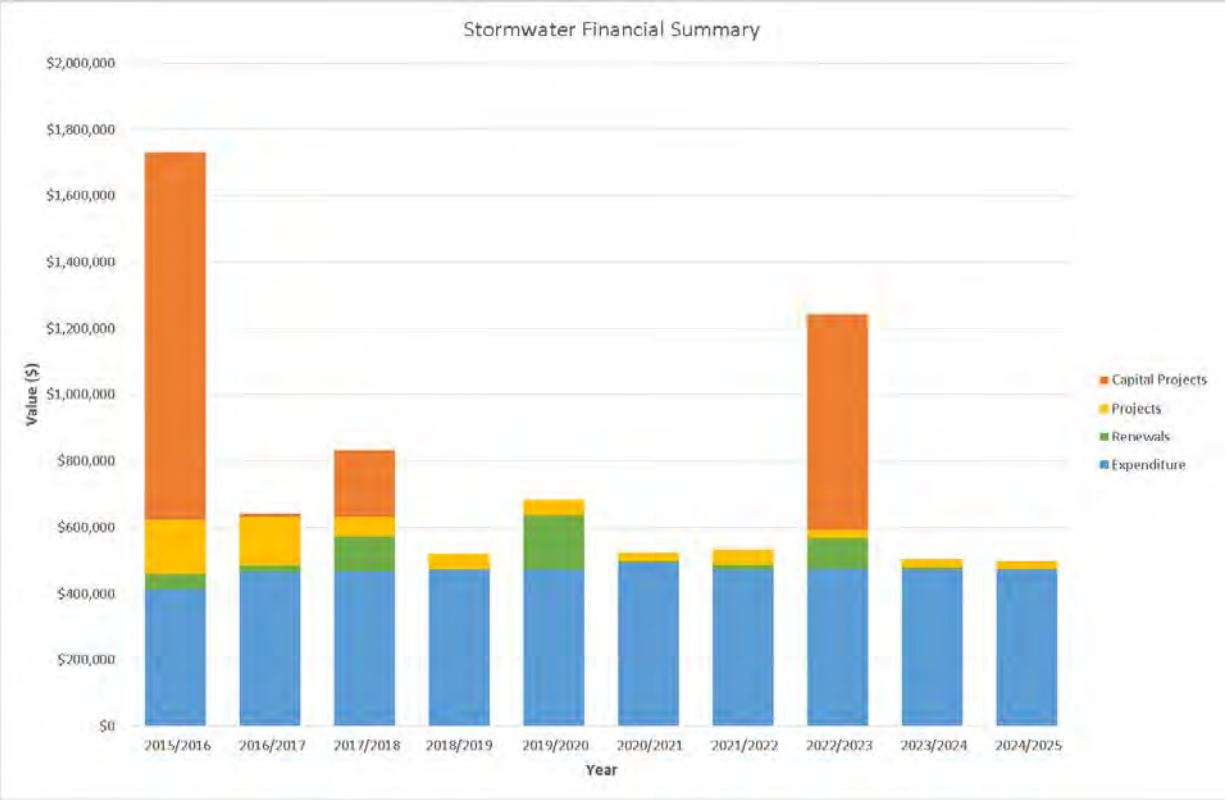



**Figure 3-17 Stormwater Financial Summary**

### 3.3.1.3 Shared Projects

There are a number of shared projects for stormwater. Shared projects are projects across one activity which share the costs across all schemes as they all receive the benefit.

**Table 3-26 List of Shared Projects**

| Project Type | | Description | Year 1 ($) | Year 2 ($) | Year 3 ($) | Years 4 to 10 | Funding Split[10] |
|---|---|---|---|---|---|---|---|
| Projects | 4400067 | Prepare Stormwater Catchment M | $50,000 | $10,000 | $5,000 | | 100% LoS |
| Projects | 4400068 | AMS | $10,000 | $10,000 | $ 10,000 | $70,000 | 100% LoS |
| Projects | 4400074 | AMP Valuation | $ 2,000 | $ 4,000 | $4,000 | $26,000 | 100% LoS |
| Projects | 4400081 | Planning and Policy | $10,000 | $10,000 | $ 10,000 | $70,000 | 100% LoS |
| Projects | 4400085 | Education | $ 1,000 | $ 1,000 | $1,000 | $7,000 | 100% LoS |
| Projects | 4400088 | Document easements | | | | $5,000 | 100% LoS |
| Projects | 4400089 | Flood protection scope | $ 5,000 | | | | 100% LoS |
| Capital Projects | 440090001 | Flood protection and Treatment | $200,000 | $400,000 | $400,000 | $1,000,000 | 100% LoS |

The list of scheme specific projects can be found in 5Waters Activity Management Plan: Stormwater.

[10] LoS refers to Level of Service

G refers to Growth

## 3.4 Land Drainage

The following section describes the Land Drainage activity. Further detail on the schemes is provided in Volume 5: Land Drainage.

### Description of the Activity

Council manages 9 drainage schemes covering 20,732 hectares within the Selwyn District as shown below in Figure 3-18. These schemes are in place to drain groundwater (primary function) from the land and stormwater (secondary function). One scheme is for specifically the purpose of flood protection, Bealey River stopbanks/flood water diversion, and one scheme is for erosion protection maintenance on a section of waterway on the Hororata River. The remaining nine schemes are primarily land drainage.

Council operates nine schemes, being:

i. Arthurs Pass Drainage District
ii. Hororata River Drainage District
iii. Osbornes Drainage District
iv. Ellesmere Drainage District
v. Greenpark Drainage District
vi. Leeston Drainage District (including Leeston Township and Leeston Rural)
vii. LII Drainage District
viii. Taumutu Drainage District including Taumutu Culverts and Taumutu Drains (sub set of the above)
ix. Wairiri Valley

**Figure 3-18 Location of Land Drainage Schemes**

There is a high concentration of schemes around Te Waihora, reflecting ancient geophysical and geological events including the position of the Waimakariri River.

#### 3.4.1.1 Primary Purpose - Removal of Groundwater

The primary purpose of the land drainage network is to reduce groundwater levels, including natural spring water, and in doing so make land available for arable farming and dwelling. With the exception of the Osbornes area, these drains convey water by gravity flow, to Te Waihora / Lake Ellesmere. Use of productive land in the Osbornes drainage scheme is reliant on electrically driven pumps which lift water into Te Waihora / Lake Ellesmere.

Osbornes Drainage was developed from 1967 onwards and has been considered to be a model example of the economic and social benefits resulting from land drainage being provided in rural land.

#### 3.4.1.2 Secondary Purpose – Stormwater Conveyance

The secondary benefit of the land drainage network is to minimise the effects of flooding due to stormwater runoff. This secondary benefit is a result of their construction but not the purpose for which they were built.

From the 1850's onwards settlers found the majority of the District's lowland areas covered in flax swamps and light tussocks in the higher areas. Drains were installed to bring the land into production, some by the Ellesmere Road Board, but most by settlers themselves. By the 1920's the drained country had become highly productive.

Prior to 2004, stormwater from townships was generally discharged directly to the drains, particularly Doyleston, Leeston, Lincoln, Southbridge, Springston, Prebbleton and Tai Tapu. Since 2004, new development land has been required to install stormwater systems that reduce or delay peak discharges, and manage the water quality by stormwater treatment. Council has also progressively taken over the development stormwater consents from new developments and has employed qualified staff to manage these 35 year consents.

A summary of the land drainage schemes is provided below in Table 3-27.

**Table 3-27 Summary of Land Drainage Schemes**

| Scheme | Scheme Area | Replacement Cost as at 2017 | Budgeted Maintenance Cost 2018/19 |
|---|---|---|---|
| Arthur's Pass Drainage Area | 15.44 ha | $42,749 | $15,000 (3 yearly) |
| Ellesmere Drainage District | 1,265.59 ha | $3,355,545 | $26,300 |
| Greenpark Drainage District | 2,243.87 ha | $1,935,702 | $4,790 |
| Hororata River Drainage Area | 761.91 ha | - | $5,150 |
| Leeston Urban and Rural Drainage District | 10,607.13 ha | $21,680,045 | $70,300 |
| LII Drainage District | 4,755.06 ha | $7,882,568 | $77,500 |
| Osborne Drainage District | 1,791.77 ha | $2,518,743 | $34,660 |
| Taumutu Drainage District | 653.60 ha | $1,459,992 | $6,970 |

| | | | |
|---|---|---|---|
| Taumutu Culverts | - | $104,919 | $5,600 |
| Wairiri Valley Drainage Area | 377.46 ha | $4,188,322 | $4,600 |

## Key Issues

The following key issues have been identified across the Councils Land drainage schemes. Issues within each individual scheme is provided in Volume 5 of the AcMP. And issues common to one or more of the schemes is shown below in Table 3-28.

**Table 3-28 District Wide Key Issues**

| Common Issues | Description |
|---|---|
| Provision of water quality monitoring and management | This is driven by the Land and Water Plan/Discharge Consents. |
| Capacity upgrades | Resulting from increasing expectations from ratepayers that a higher LoS will be provided. |
| Data accuracy | Continuous improvement of stormwater asset data records in terms of completeness and accuracy is required. |
| Management intensive | Due to environmental requirements and public expectations. |
| Scheme Condition | Require capital works upgrades, monitoring and reporting, and a higher level of resources input to operate the scheme in future. |
| Drain Monitoring | Regularly monitor to ensure appropriate standards are maintained to deliver the design flow. Critical drains are to be inspected at least once every year. Minor drains are to be inspected at least once every five years. |

## Governance

Council delegates some aspects of management of the Land Drainage network to the Land Drainage Advisory committee and 9 Land Drainage Committee's comprising of local residents with an interest in the Land Drainage network. Council Service Delivery Staff work alongside the Committee's to prioritise and facilitate maintenance activities which are undertaken by a number of local contractors around April/May each year. Refer to Section 0 for further information on the role of this committee.

## Operation and Maintenance

Council has two full time engineers, who focus on the operation and maintenance of stormwater, land drainage and water race schemes within the district. These staff members are supported by a SCADA engineer and two admin staff who work across the other 5Waters schemes.

Drain inspections are carried out by either the Drainage Committees or Council Staff. These inspections are in many cases carried out in conjunction with the formulation of the yearly cleaning programme. Selwyn District Council requires Drainage Committees and individual property owners to advise when maintenance is required outside of normal maintenance cycles, and such reporting is essential to updating the monitoring program.

Inspection and monitoring will be directed at identifying the following problems:

- Encroachment of weeds and other obstructions which may impair waterway performance;
- Bank erosion that may also threaten the waterway performance, resulting in loss of pasture and sedimentation of the drains;
- Accumulation of silt which may result in poor hydraulic performance; and
- Excessive bed degrading that may destabilise drain beds and banks.

## Land Drainage Management

The Council is responsible for the operation and maintenance of the main drains (classified drains) with all other drains being the responsibility of the owner on whose property they are located. It is understood that there are approximately 3m of private drains for every 1m of classified drains.

Drains are generally cleaned of weed, vegetation and sediment with an excavator on a 1-5 year basis. On road sides, drain cleanings are left on the berm, or where necessary taken away by truck to clean fill sites.

The drainage systems require regular maintenance, for continued productive use of the associated arable land, dwellings and infrastructure. Council is required to continue maintenance of this significant activity. Council's forecasts increased costs to maintain the network, and is also expecting land development in urban areas to continue as predicted. There is no practical alternative and inevitably the water which is discharged may contain nutrients or other potential contaminants.

Weed cutting occurs by boat in the LII Drainage scheme

The method for cleaning has been historically based focused on ensuring hydraulic efficiency. It is now recognised that drains may be important habitats, and have multiple uses and values. Many landowners recognise the values of managed waterways and want to manage the environment responsibly.

Land drainage activity is expected to change which will be driven by management of the:

- Legislation, such as the RMA and Environment Canterbury NRRP and Land and Water plan; and
- Trade implications including the potential for imposition of non-tariff trade barriers by competing countries that are already operating under stricter environmental regulatory controls than New Zealand.

### Demand - Capacity

Demand on the land drainage schemes can be potentially affected by management of the lake, increased groundwater levels, and urban development.

#### 3.4.1.3 Management of Te Waihora/Lake Ellesmere

Lake levels directly affect the lower reaches of the land drainage network. Low lake levels aid drainage while high lake levels restrict drainage by causing back-water effects resulting in the flooding of low lying land. The management of the lake is controlled under the Water Conservation Order and Environment Canterbury consent CRC042860.1 (CRC110972).

The land drainage schemes most prone to inundation due to high lake levels include:

- Ellesmere Drainage District;
- Greenpark Drainage District;
- L2 Drainage District;
- Leeston Drainage District; and
- Osbornes Drainage District.

#### 3.4.1.4 Groundwater levels

Groundwater levels vary seasonally as a result of rainfall and snow melt. In addition to these natural influences ground water abstraction for irrigation is having a significant impact on ground water levels.

There is a belief amongst the community that the proposed Central Plains Irrigation scheme has the potential to elevate groundwater levels which could potentially add stress to the land drainage network. Central Plains Water are required, under their consents, to monitor the Council network.

#### 3.4.1.5 Urban Development

The expansion of urban development will increase the reliance on the land drainage schemes to maintain a lowered groundwater level and increase the importance of the systems secondary purpose – stormwater conveyance.

### Water Quality

In terms of Land drainage discharge there are two types of receiving environments. These are:

- Discharge to Lake Ellesmere / Te Waihora, and
- Discharge to river / waterway.

Selwyn District Council is building up a database of water quality information. Results and sampling locations for the majority of the sites is provided below.

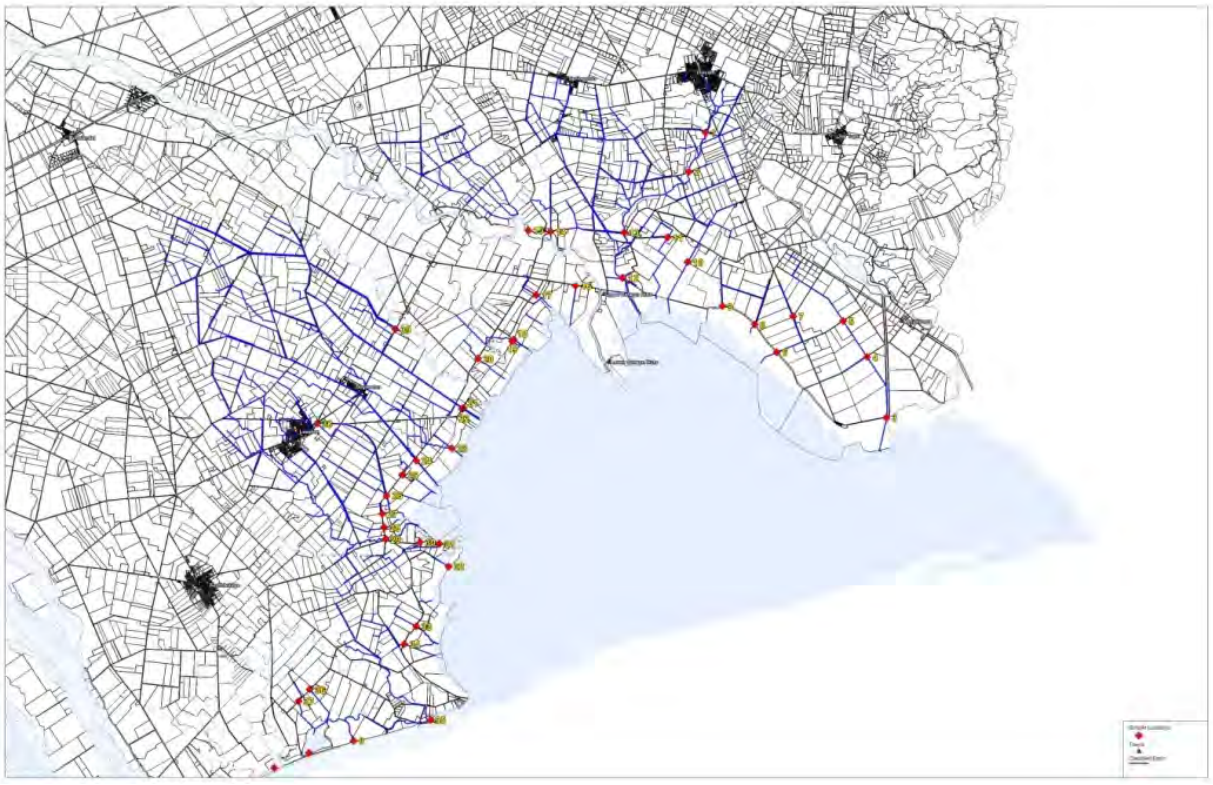


**Figure 3-19: Location of Land Drainage Water Quality Sample Locations**

As an indication of water quality the table below shows a summary of Environment Canterbury's records for 6 of the land drainage discharges into the Te Waihora/Lake Ellesmere. All values are averages.

**Table 3-29: Water Quality Results (Average Values)**

| Site Location | DO (mg/L) | Temp (°C) | pH | Cond (uS/m @ 25°C) | TN (mg/L) | TP (mg/L) | TSS (mg/L) |
|---|---|---|---|---|---|---|---|
| LII Stm @ Pannetts Rd bridge Site No:SQ30878 | 9.4 | 12.6 | 7.5 | 24 | 3.6 | 0.049 | 4.8 |
| Irwell R at Lake Rd Site No:SQ30963 | 8.2 | 11.9 | 7.4 | 33 | 1.5 | 0.121 | 5.5 |
| Hanmer Rd Drain at Lake Rd Site No:SQ30975 | 11.4 | 11.3 | 7.9 | 36 | 3.0 | 0.082 | 7.4 |
| Boggy Creek at Lake Rd Site No:SQ30976 | 10.7 | 12.3 | 7.8 | 34 | 5.9 | 0.075 | 8.8 |
| Doyleston Drain at Lake Rd Site No:SQ30977 | 10.6 | 11.9 | 7.6 | 34 | 3.8 | 0.085 | 5.4 |
| Harts Creek at Lower Lake Rd Site No:SQ30992 | 9.6 | 11.5 | 7.5 | 22 | 4.9 | 0.037 | 6.8 |

## Pump Stations

There is one land drainage pump station in the Osbornes Drain Land Drainage Scheme. The pumping hours vary substantially through the year. A new switchboard was installed in 2013 enabling the pump station to be connected to SCADA. Text alerts are received by the land drainage committee which is comprised of landowners in the area. Several of these committee members monitor the increases in drain water levels that could indicate pump failure/power outages etc.

## Land Drainage Reticulation

A summary of the material and diameter for the pipes within the reticulation as well as more information about the types of assets for land drainage can be found in Section 7.0, Lifecycle Management.

## Risk Assessment

A risk assessment has been undertaken for Land Drainage schemes. The key output from the risk assessment is the identification of any extreme and high risks which need to be mitigated. In order to mitigate these risks they have been included and budgeted for in the projects within the LTP. The list of business wide risks is in Section 9.2 and scheme wide risks are listed in 5Waters Activity Management Plan: Volume 5. Table 3-30 below outlines the risk priority rating and Table 3-31 lists the scheme wide risks.

**Table 3-30 Risk Priority Rating**

| Risk Score | Level of Risk | Risk Response |
|---|---|---|
| > 50 | Extreme | Awareness of the event to be reported to Council.<br>Urgent action to eliminate / mitigate / manage the risk.<br>Document risk and action in the AMP. |
| 35-50 | Very High | Risk to be eliminated / mitigated / managed through normal business planning processes with responsibility assigned. |
| 14-35 | High | Manage risk using routine procedures. |
| 3.5-14 | Moderate | Monitor the risk. |
| < 3.5 | Low | Awareness of the event to be reported to Council.<br>Immediate action required to eliminate / mitigate / manage the risk.<br>Document risk and action in the AMP. |

**Table 3-31 Risks – Land Drainage**

| Risk | Action/Project | Year Identified | 2014 Risk Rating | 2017 Risk Rating | Residual Risk Rating |
|---|---|---|---|---|---|
| Committees issue work on behalf of council | Develop procurement policy for Land Drainage committees | 2014 | 12 | 4 | 4 |

| | | | | | |
|---|---|---|---|---|---|
| Committees run land drainage scheme - interest may wane, appropriateness | Review land drainage governance structure | 2014 | 12 | 4 | 4 |
| CPW may impact ground water levels and function of drains | Investigate CPW impact on groundwater levels | 2014 | 10 | 10 | 10 |
| Environmental impact of poor drain maintenance practices | Develop a drain cleaning protocol | 2014 | 27 | 12 | 12 |
| Inaccurate asset data | Improve asset data quality | 2014 | 12 | 4 | 4 |
| Increased cost monitoring and compliance of consents | Global consent for land drainage activities | 2014 | 27 | 27 | 27 |
| No process for converting private to classified drains | Write a protocol around adding and subtracting classified drains | 2014 | 9 | 4 | 4 |
| Non optimised drain cleaning practices result in poor and expensive operations, loss of key committee members may also result in loss of knowledge | Maintenance schedules required for all scheme | 2014 | 27 | 9 | 9 |
| Discharge exceeds WQ guidelines without Council being aware, potential compliance issues with Ecan | Water quality monitoring | 2014 | 27 | 12 | 12 |
| Inadequate legal protection / enforcement powers | Develop bylaw | 2017 | | 4 | 2 |

## Funding Program

Section 11.0 provides the financial summary and details the funding and expenditure across the 5Waters activities. An overall summary of the funding program for the Land Drainage activity is outlined within this section.

The 10 Year financial programme for the 5Waters is divided into the following categories:

a) Expenditure – Operations and Maintenance;

b) Projects – either specific or jointly funded;

c) Capital Projects - result in new assets; and

d) Renewals - replacement of assets on a like for like basis within a 20 year horizon.

Table 3-32 and Figure 3-20 outline the budget for the water race activity for the next 10 years.

**Table 3-32 Land Drainage Budget Summary**

| Values | Expenditure | Renewals | Projects | Capital Projects |
|---|---|---|---|---|
| Year 1 | $235,895 | $175,000 | $69,300 | $25,000 |
| Year 2 | $212,395 | $175,000 | $54,300 | $20,000 |
| Year 3 | $201,895 | | $29,300 | |
| Years 4 to 10 | $1,359,365 | $110,000 | $281,100 | $100,000 |
| **Total** | $2,009,550 | $460,000 | $434,000 | $145,000 |

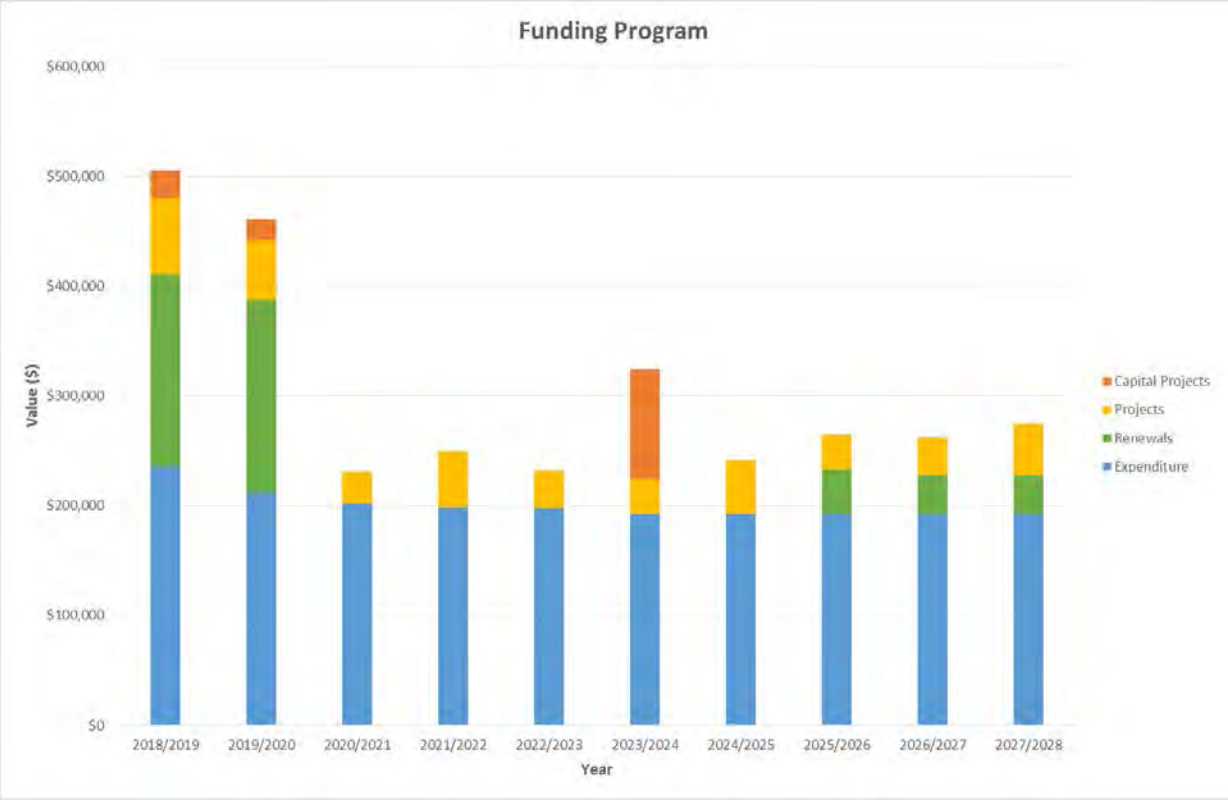



**Figure 3-20 Land Drainage Financial Summary**

### 3.4.1.6 Shared Projects

There are a number of shared projects for Land Drainage. Shared projects are projects across one activity which share the costs across all schemes as they all receive the benefit.

**Table 3-33 Key Projects**

| Project Name | GL | Description | Year 1 ($) | Year 2 ($) | Year 3 ($) | Years 4 to 10 | Funding Split[11] |
|---|---|---|---|---|---|---|---|
| Projects | 4500034 | Establish Water Quality Monito | $20,000 | $20,000 | $20,000 | $140,000 | 100% LoS |
| Projects | 4500068 | AMS | $2,000 | $2,000 | $2,000 | $14,000 | 100% LoS |
| Projects | 4500069 | AMP Valuation | $1,000 | $2,000 | $2,000 | $13,000 | 100% LoS |
| Projects | 4500074 | Improve asset data quality | | $3,000 | | $6,000 | 100% LoS |
| Projects | 4500075 | Global consent for land draina | $20,000 | | | | 100% LoS |
| Projects | 4500076 | Write a protocol around adding | $2,000 | | | | 100% LoS |
| Projects | 4500077 | Maintenance schedules | $2,000 | | | | 100% LoS |
| Projects | 4500078 | Planning and Policy | $3,000 | $3,000 | $3,000 | $21,000 | 100% LoS |
| Projects | 4500082 | Education | $300 | $300 | $300 | $2,100 | 100% LoS |
| Projects | 4500083 | Procurement policy | $3,000 | $2,000 | | | 100% LoS |

The list of scheme specific projects can be found in 5Waters Activity Management Plan: Land Drainage.

[11] LoS refers to Level of Service

G refers to Growth

## 3.5 Water Races

The following section describes the Water Races activity. Further detail on the schemes is provided in Volume 6: Water Races.

### Description of the Activity

Council has been operating the water race system for approximately 130 years. Over the past 5 years, substantial changes have been identified which are expected to change the need for and use of the schemes. These include Central Plains Irrigation scheme and strategic pressure via the Canterbury Water Management Strategy process.

There are presently three water race schemes within the district: Ellesmere, Malvern and Paparua; these generally service the plains areas of the old County Councils (pre 1989 amalgamation). The Selwyn scheme with its intake on the Selwyn River was closed in 2009. Figure 3-21 indicates the extent of the main water races and the locations of the intakes.

**Figure 3-21 Location of Water Race Schemes**

A summary of the 3 water race schemes is provided below in Table 3-34.

**Table 3-34 Summary of Water Race Schemes**

| Scheme | Scheme Area | Replacement Cost as at 2017 | Budgeted Maintenance Cost 2017/18 | Annual Average |
|---|---|---|---|---|
| Ellesmere Water Race Scheme | 50,158 ha | $18,447,270 | $566,910 | 62.6 million $m^3$ |
| Malvern Water Race Scheme | 61,684 ha | $71,036,363 | $813,800 | 36.2 million $m^3$ |
| Paparua Water Race Scheme | 35,837 ha | $21,380,906 | $887,600 | 41.3 million $m^3$ |

### Key Issues

Table 3-35 outlines key issues common to one or more of the Councils water race schemes. Issues within each individual scheme is provided in Volume 6 of the AcMP.

**Table 3-35 District Wide Key Issues**

| Common Issues | Description |
|---|---|
| New Resource Consents | The major implication of these consent conditions accepted by Council are: |

| | |
|---|---|
| | (a) Fish screen installation at all intakes;<br>(b) Assessment of water race flora and fauna, with protection if appropriate ;<br>(c) Rationalisation of the race network to ensure efficiency of its primary use – stockwater;<br>(d) Assessment and reporting of alternative supply options; and<br>(e) Reduced flows during periods of low river flows.<br>There is a significant cost to install and maintain these fish screens as they tend to be located in the river flood zones and can be subject to a high level of vandalism. |
| Tradeoff between uses | Tension between increasing efficiency, use and maintaining environmental instream and amenity needs. |
| Costs of Implementing fish screens | Meeting the costs of installing fish screens while a number of rated users are requesting the removal of the water race channels. Currently users pay for it with an alternative rating structure proposed. |
| Water Quality | Monitoring and improving water quality in the water race. This includes didymo, and aims to reduce the impact of downstream (Te Waihora) contamination. |

## Governance

The Selwyn District Council Water Race Subcommittee engage and direct the management of the three water race schemes. The committee has 12 members of various representation. Refer to Section 0 for further information on the role of this committee.

## Operations and Maintenance

Council has two full time engineers, who focus on the operation and maintenance of stormwater, land drainage and water race schemes within the district. These staff members are supported by a projects engineer, SCADA engineer and two admin staff who work across the other 5Waters schemes.

Under contract *C1241 Water Services Network Management Contract* scheduled and reactive maintenance work is undertaken on these supplies. This contract was approved by Council on the 22th June 2016 for a period of 1 July 2016 to 30 June 2021. The new contract rates have made an impact on the budgets, particularly on smaller remote schemes where long travel time are a significant issue.

Telemetry is relied upon to provide data regarding intake flows at each of the headworks.

## Water Race Management

The efficient movement of water in the race system requires an effective programme for control of aquatic/race bank weeds and silt removal. Aquatic weeds and silt build up contribute to inefficient water use by restricting water movement in races thereby increasing water losses through evaporation, seepage, by clogging flumes and siphons. However, stronger attention needs to be given to vegetation management, which includes balancing beneficial aspects of race vegetation (i.e. minimise bank erosion, enhancing amenity and providing habitat for fish /invertebrate and wildlife) with potential negative effects discussed above.

To ensure Water Races are maintained to an appropriate level the Council will continue to:

- Use race cleaning equipment and methods to minimise the effects of race cleaning on fisheries and aquatic habitats;
- Use contractors that have staff with proven skills and experience or can demonstrate that they have the skills and suitable machinery for race cleaning to ensure minimum effect on waterways;
- Develop and improve race cleaning methods /approaches in consultation with stakeholders;
- Detail on the Councils Geographic Information System (GIS) those parts of the race network, which are known to have significant ecological/fisheries values; and
- Refine protocols and procedures for race cleaning.

Some vegetation growth (e.g. perennial grasses) is desirable on race banks above the waterline to minimise the establishment of land weeds, preventing race bank wind and water erosion. Council carries out significant quantities of spraying to remove noxious weeds adjacent to Council races.

The Council will continue to:

- Investigate opportunities for enhancing race planting of appropriate species;
- Promote awareness of race planting to private property owners; and
- Continue consultation with stakeholders on race weed spraying activities.

Council will continue to develop a Weed Spraying Contract to improve environmental performance of weed spraying activities that includes “Best Practice” weed spraying protocols.

## Water Race Intakes

Stock water intakes require part of the river to be directed toward intake structures to provide sufficient head for water abstraction. This is achieved by pushing up stones in the river bed as per consent for those activities which drafts water towards the intake gates.

## Water Race Reticulation

A summary of the material and diameter for the pipes within the reticulation as well as more information about the types of assets for water races can be found in Section 7.0, Lifecycle Management.

## Risk Assessment

A risk assessment has been undertaken for Water Race schemes. The key output from the risk assessment is the identification of any extreme and high risks which need to be mitigated. In order to mitigate these risks they have been included and budgeted for in the projects within the LTP. The list of business wide risks is in Section 9.2 and scheme wide risks are listed in 5Waters Activity Management Plan: Volume 6. Table 3-36 below outlines the risk priority rating and Table 3-37 lists the scheme wide risks.

**Table 3-36 Risk Priority Rating**

| Risk Score | Level of Risk | Risk Response |
|---|---|---|
| > 50 | Extreme | Awareness of the event to be reported to Council.<br>Urgent action to eliminate / mitigate / manage the risk.<br>Document risk and action in the AMP. |
| 35-50 | Very High | Risk to be eliminated / mitigated / managed through normal business planning processes with responsibility assigned. |
| 14-35 | High | Manage risk using routine procedures. |
| 3.5-14 | Moderate | Monitor the risk. |
| < 3.5 | Low | Awareness of the event to be reported to Council.<br>Immediate action required to eliminate / mitigate / manage the risk.<br>Document risk and action in the AMP. |

**Table 3-37 Risks – Water Races**

| Risk | Action/Project | Year Identified | 2014 Risk Rating | 2017 Risk Rating | Residual Risk Rating |
|---|---|---|---|---|---|
| Consent non-compliance | Consent compliance report and review of processes | 2014 | 27 | 27 | 12 |
| Increasing impacts for closure, impacts water/cost viability. No protocol for closure | Develop a protocol for closure | 2014 | 12 | 12 | 2 |
| Loss of knowledge (Sicon…) | Maintenance Manual Update | 2014 | 12 | 12 | 4 |
| Poor asset data | Collect asset data | 2014 | 12 | 12 | 4 |
| H&S Risks | Manage risks | 2017 | | 40 | 10 |

## Funding Program

Section 11.0 provides the financial summary and details the funding and expenditure across the 5Waters activities. An overall summary of the funding program for the Water race activity is outlined within this section.

The 10 Year financial programme for the 5Waters is divided into the following categories:

a) Expenditure – Operations and Maintenance;

b) Projects – either specific or jointly funded;

c) Capital Projects - result in new assets; and

d) Renewals - replacement of assets on a like for like basis within a 20 year horizon.

Figure 3-22 and Table 3-38 outline the budget for the water race activity for the next 10 years.

**Table 3-38 Water Race Budget Summary**

| Values | Expenditure | Renewals | Projects | Capital Projects |
|---|---|---|---|---|
| Year 1 | $2,288,310 | $429,931 | $159,000 | $303,000 |
| Year 2 | $2,263,596 | $2,301,531 | $58,000 | |
| Year 3 | $2,235,096 | | $38,000 | |
| Years 4 to 10 | $15,525,672 | $4,731,170 | $264,000 | |
| **Total** | $22,312,674 | $7,462,633 | $519,000 | $303,000 |

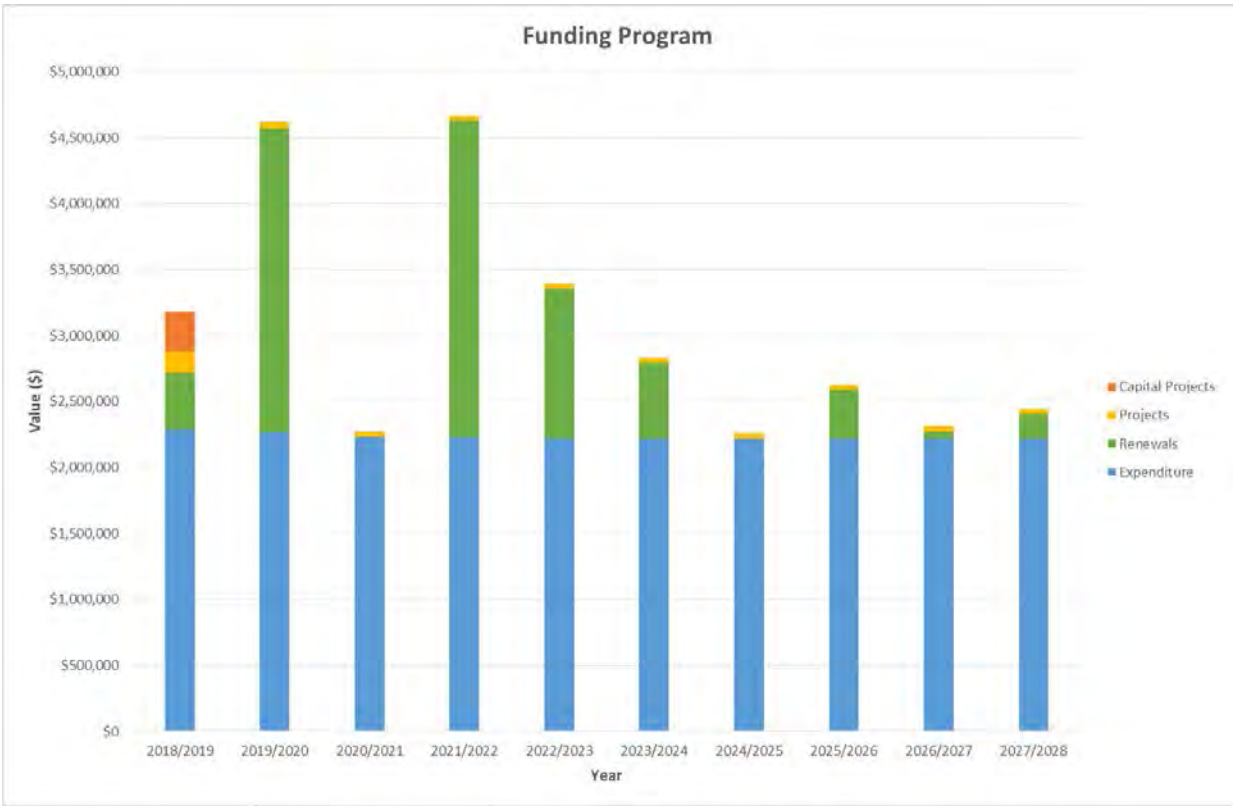



**Figure 3-22 Water Race Financial Summary**

#### 3.5.1.1 Shared Projects

There are a number of shared projects for Water Races. Shared projects are projects across one activity which share the costs across all schemes as they all receive the benefit.

**Table 3-39 Key Projects**

| Project Type | GL | Description | Year 1 ($) | Year 2 ($) | Year 3 ($) | Years 4 to 10 | Funding Split[12] |
|---|---|---|---|---|---|---|---|
| Projects | 3900077 | AMS | $10,000 | $10,000 | $10,000 | $70,000 | 100% LoS |
| Projects | 3900079 | AMP Valuation | $2,000 | $4,000 | $4,000 | $26,000 | 100% LoS |
| Projects | 3900083 | Develop a protocol for closure | $3,000 | | | | 100% LoS |
| Projects | 3900084 | Maintenance Manual Update | $3,000 | | | $9,000 | 100% LoS |
| Projects | 3900085 | Collect asset data | | $3,000 | | $6,000 | 100% LoS |
| Projects | 3900086 | Identify health and safety risk | | | $3,000 | $6,000 | 100% LoS |
| Projects | 3900087 | Planning and Policy | $20,000 | $20,000 | $20,000 | $140,000 | 100% LoS |
| Projects | 3900091 | Education | $1,000 | $1,000 | $1,000 | $7,000 | 100% LoS |
| Capital Projects | 39009009 | P2 H&S | $300,000 | | | | 100% LoS |

The list of scheme specific projects can be found in 5Waters Activity Management Plan: Water Races.

[12] LoS refers to Level of Service

G refers to Growth

## 3.6 Improvement Planning

There are no improvement items listed for this section of the AcMP.

# 4.0 MANAGEMENT AND ORGANISATIONAL STRUCTURE

This section sets out the organisational structure of the assets department, the consultation procedures that are adhered to and relationships with key stakeholders of the Council.

## 4.1 Organisational Structure

Figure 4-1 details the organisational structure for the Asset management team at Council and outlines responsibility and linkages for the delivery of services for the 5Waters activities.

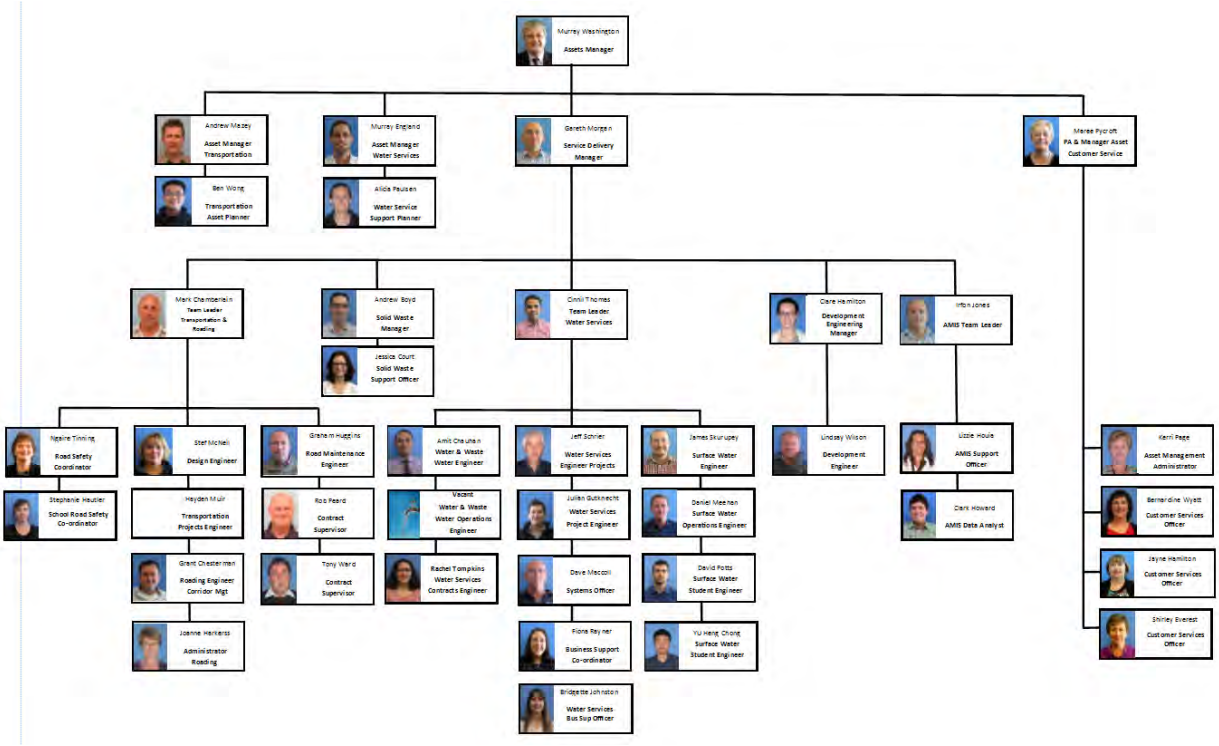



**Figure 4-1 Organisational Chart**

The current organisational structure separates the asset management team from the service delivery team. The key responsibilities of these two teams' roles is outlined below in Table 4-1.

**Table 4-1 Key Responsibilities of Roles**

| Role | Key Responsibility |
|---|---|
| Asset Manager | Sets strategic direction<br>Determines and prepares policy<br>Decides level of service<br>Prepares AM Plans |
| Service Delivery | Manages maintenance and development works<br>Collects AM information<br>Is responsible for contractor performance |

| | |
|---|---|
| | Ensures consent and drinking water standards compliance |
| Operator/Contractor | Maintains and operates assets |

Responsibility for the asset management function in Selwyn District is via the Asset Management team whose responsibility includes:

- The achievement of appropriate Asset Management practices which meet corporate Asset Management development standards and reporting of these in the AcMPs;
- Adequate budgeting and long-term forecasting;
- Identifying and managing asset and service related risk;
- Reporting of Level of Service, Key performance indicators and Risks at Corporate level; and
- Community and Committee Liaison.

Water services, the service delivery team was established to perform a range of functions that are essential to the achievement of Levels of Service on a daily basis. Water services are involved in day-to-day management of all 5Waters schemes and are responsible for providing the Council with appropriate technical and supervisory engineering services to enable the utilities to meet the required level of service. This includes but is not limited to:

- Management of the maintenance and operations Contracts;
- The associated liaison with the public;
- Ensuring assets are maintained and in compliance with consents and drinking water standards;
- Monitoring and reporting inline with consents and drinking water standards;
- Asset data collection, management and analysis;
- Condition monitoring;
- LIMS/PIM etc;
- Operational Management;
- Project and Contract Management (supervision, administration);
- Provision and monitoring of SCADA;
- Provision and updating of Asset Management System (AMS) and GIS; and
- Processing Consent Applications and requests for information.

Although boundaries are defined between service delivery and asset management, overlap does exist. This overlap will be managed by Council staff and roles will continue to be defined during this LTP period.

External consultants are also utilised by Council to help provide the 5Waters services. An example of where they are utilised in the key operating areas is shown below in Table 4-2.

**Table 4-2 Operating Areas and Service Providers**

| Operating Area | Role | Provider |
|---|---|---|
| Valuation | Asset Management | Council and Consultants |
| Criticality and Condition Modelling | Asset Management | Council and Consultants |
| Budget and Forecasting | Asset Management | Council |
| Level of Service | Asset Management | Council |
| Activity Management Plans | Asset Management | Council and Consultants |
| Bylaw development | Asset Management | Council |
| Operations and Maintenance | Service Delivery | Operator/Contractor |
| Management of Operations and Maintenance Contract | Service Delivery | Council |
| Minor Project Design | Service Delivery | Council |
| Major Project Design | Service Delivery | Tendered |
| SCADA management and Operations | Service Delivery | Council |
| Water testing | Service Delivery | Operator/Contractor |

## 4.2 Human Resource Management

### Staff Numbers

Currently the Assets department has approximately 36 full time equivalent employees and 15 are associated with the management of the 5Waters Activity.

Significant increases in population and associated infrastructure are expected to occur over the next 10 years in the Selwyn District. Because of this, assessment of staffing requirements will be required on an annual basis to ascertain the appropriate requirements for the increased workload. Assessment needs to consider the level of staffing coverage required to implement all of the Asset unit's functions including internal management, information systems management, project management, design, supervision, construction, operations and maintenance.

### Staff Skills

In addition to staffing numbers, assessment of staffing levels needs to consider the skill requirements to meet the demands of the infrastructure that Council does and will own and operate.

Increases in the complexity in water and wastewater treatment plants will occur as drinking water and environmental standards increase. The complexity of these plants and their associated resource consent compliance will require skilled and trained engineers for their operation, maintenance and supervision.

### Training

Training of staff is presently on an ad-hoc basis with no structured long term development plans for the individual staff members in the asset management field. The link between asset life, and the ability to deliver levels of service with the skills of the people who plan, design, install, operate and maintain the assets is inevitable. It is crucial that the skill gaps of staff, contractors and service providers are identified and there are structured training programmes to close these gaps. The impact of the training provided should also be evaluated.

### Succession Planning

Succession planning is considered necessary to reduce the risk associated with staff leaving the organisation leaving resource gaps and 'taking' knowledge with them.

Succession planning allows institutional knowledge to be passed on, and assists in ensuring continuity within the organisational culture.

Succession planning techniques that Council have considered as appropriate are:

- Sourcing suitable replacement staff from within the organisation wherever possible;

- Developing personal career development plans for all relevant staff. This can include identifying weaknesses in training and experience and attempting to address those weaknesses by use of mentoring, relevant projects and continuing professional development programmes;
- Identifying likely staff retirements, promotions, resignations or position changes on an annual basis; and
- Identifying potential internal staff to fill positions becoming vacant, providing those staff with projects that extend them and give them relevant experience for filling the positions.

### External Resources

External consultant and contractor services are procured where Council expertise or resources are not available, either in the required time or to the required degree.

Procurement of consultants is via a professional services brief. Procurement of contractors is by contract conditions of engagement.

## 4.3 Procurement

Council has identified the need to plan effectively and deliver quality in a sustainable manner; lowest cost options are not necessarily the best. A robust strategic and asset management planning regime is a priority to ensure effective work programmes are developed. A whole-of-life approach relies on asset management planning including lifecycle management planning and modelling. Suppliers are expected to understand the drivers of Council's planned approach and the commitment made to deliver the agreed Levels of Service. The objectives for the 2010 procurement Strategy are:

- Supporting the achievement of Council's Community Outcomes and the Selwyn Community Plan Programme through efficient procurement processes;
- Integration with Council's organisational goals as contained in the Mission Statement, Statement of Values and Sustainability principles;
- Delivery of services to the community that represent value for money;
- Encouraging appropriate levels of competition across suppliers; and
- Ensuring procurement is fair and transparent with effective accountability measures.

While retaining scope for small local suppliers and the benefits to the local economy they can provide, Council also has a responsibility to recognise the efficiencies and benefits derived from larger and longer term maintenance and construction contracts. Competitive tendering where price and quality are evaluated will be used to select suppliers or supplier panels. In some cases direct appointment may be the most effective approach and this will be considered in terms of specialisation, market competitiveness and the overall cost and efficiency to Council.

## Changes to Procurement

The 5Waters currently operates under a contract held by Sicon Ltd. This contract is due to expire 30 June 2021.

Council has identified the need to plan effectively and deliver quality in a sustainable manner; lowest cost options are not necessarily the best. An integrated approach across the 5Waters to professional services, construction, maintenance and renewal activities is favoured to ensure that the optimal solution is sought. A robust strategic and asset management planning regime is a priority to ensuring an effective work programme is developed. A whole-of-life approach relies on asset management planning including lifecycle management planning and modelling.

Suppliers are expected to understand the drivers of Council's planned approach and the commitment made to deliver the agreed Levels of Service.

The key components of value for money are regarded as:

- Robust planning to identify an effective work plan;
- Appropriate and efficient supplier selection procedures; and
- Successful delivery of works and services (the right outcome on time and within budget).

## Proposed Delivery Models and Supplier Selection Methods

For the 5Waters Activities, Selwyn District Council will utilise the guidance provided by the NZTA Procurement Manual Procurement Procedure 1 - Infrastructure for Physical Works and Procurement Procedure 2 Planning and Advice for Professional Services. Council has varied the limit for closed contests (selected tender) to $250,000 for all activities.

Further analysis by service delivery and the asset management team on procurement options was carried out between July-June 2012.

In procuring the next Contract it was considered that the following options are relevant:

- Renegotiate/extend current Contract with the incumbent Contractor;
- Negotiate a new Contract with the incumbent Contractor;
- Competitive Tender;
- Public tender;
- Selected tender or Registration of Interest (ROI); and
- Provide services through an in-house works unit.

## Procurement Options

An assessment of procurement options has been undertaken against the following categories:

- Ease and Cost of Process;
- Addressing Gaps (Technical, Legal, Field Issues, Contract Management);
- Assurance of Value for Money;
- Business Continuity/Risk of Knowledge Loss; and
- Procurement Approach Ranking.

#### 4.3.1.1 Ease and Cost of Process

Renegotiating/extending the existing Contract with the incumbent Contractor is the easiest option and the lowest procurement cost option available. Negotiating a new Contract with the incumbent will require development of a new Contract and will result in added costs. A tender process will result in development of a new Contract, evaluating the Contract options and going through the whole tender process. This will be a high cost option available and will impact significantly on staff time and resources. Establishing an in-house works unit will also be a high cost option and will be a complicated process.

#### 4.3.1.2 Addressing Gaps (Technical, Legal, Field Issues, Contract Management)

Renegotiating/extending the existing Contract will not result in addressing any of the gaps identified as the status quo will be maintained. Establishing an in-house works unit will address legal and Contract management issues, but will not necessarily resolve technical gaps and field issues as the need to formalise processes and specifications will be less. All the remaining options will address all of the technical, legal gaps, field and identified Contract management issues through development of a new Contract.

#### 4.3.1.3 Assurance of Value for Money

Negotiating a new Contract with the incumbent will give the least assurance of value for money as it is not based on open and competitive pricing. However, scheduled rates can be obtained to provide a cost framework ensuring negotiated rates are aligned with current trends. Establishing an in-house works unit is not likely to provide any assurance of value for money. A public tender will be more likely to ensure value for money, but there are risks associated with this.

#### 4.3.1.4 Business Continuity/Risk of Knowledge Loss

A public tender may result in a new Contractor. This will result in immediate termination of the relationship of trust that exists between the Council and the existing Contractor. The local knowledge will be lost with new staff having to familiarise themselves with the district and distribution and collection systems. The focus on service to customers that was instilled in most of the current Contractor's staff while they were still working as in-house Council staff will be lost. A selected tender or ROI will provide some assurance of reputable Contractors, but the local knowledge and focus on service to customers will be lost.

#### 4.3.1.5 Procurement Approach Ranking

From the above it is evident that renegotiating/extending the existing Contract with the incumbent is the least favoured option. It is the easiest and lowest procurement cost option, but it will not address any of the technical and legal gaps, and field and Contract management issues. It will not ensure value for money, but will retain local knowledge and maintain the existing relationship of trust.

Establishing an in-house works unit will address legal and identified Contract management issues, but will not necessarily address technical gaps and field issues. It will be a complicated and costly process and is not likely to provide assurance of value for money. As a result it is ranked as the second least preferred option.

Public or selected tender are ranked equal as it will ensure value for money and will address technical and legal gaps, and field and identified Contract management issues. These options will be the highest procurement cost option as it will impact significantly on staff time and resources.

Negotiating a new Contract with the incumbent is the highest ranked option as it will address all of the technical and legal gaps, and field and identified Contract management issues. It will have some procurement cost implication and will require research of current operation and maintenance scheduled rates to provide a framework to ensure competitive pricing. But most importantly it will retain local knowledge and maintain the current relationship.

## 4.4 Consultation Procedures and Processes

### Community Outcomes for the Long Term Plan

The Council has carried out significant consultation with the residents of the District to establish the Community Outcomes for the LTP, these were reviewed in 2011 following the changes to the Local Government Act in 2010. For the 2018 LTP the Community Outcomes retain the essence of those included in previous plans, with a greater focus on the outcomes where Council's role is prominent ('Council Outcomes').

### Statutes that Include Consultation

Statutes that require Council to undertake consultation for the 5Waters include:

- Local Government Act
- Resource Management Act
- Land Transport Management Act
- Reserves Act
- Ngai Tahu Settlement Claims Act
- Health Act

## Significance Policy

Under the LGA 2002, each Council is required to have a Policy of Significance. The requirements for the policy can be seen as being a means for ensuring that in making decisions that Council is:

- Clear about why it is addressing a matter;
- Has considered and evaluated the options and alternatives; and
- Has information on the community views about the matter and the options for addressing it. Particularly, it has an understanding of the views and preferences of those persons likely to be affected by, or have an interest in the matter.

A significant activity is one that has a high degree of significance in terms of its impact on either:

- The well-being of the people and environment of Selwyn District; and/or
- Persons likely to be affected by or with an interest in that activity; and/or
- Capacity of the Selwyn District Council to provide for the well-being of the district.

The 5Waters schemes are considered by the Selwyn District Council as "Significant Activities" therefore some decisions require consultation.

## Consultation Policy

In December 2014 the Significance and Engagement Policy superseded the Council' Public Consultation Policy. This policy states the approach to consultation.

The Council's Public Consultation Policy (C301) states that the Council will:

- Clarify its expectations through public consultation;
- Allow sufficient time for effective response to its proposals;
- Report on public proposals and follow up when necessary; and
- Maintain the consultative process.

The approach taken to consultation has been reconsidered in terms of LGA20-02 s76AA, inline with Council's Significance and Engagement Policy. This Policy was adopted in December 2014 and has information on:

- The Council's approach to determining the significance of proposals and decisions in relation to issues, assets or other matters;
- Any criteria or procedures that are to be used by the Council in assessing the extent to which issues, proposals, decisions or other matters are significant;
- How the Council will respond to community preferences about engagement on decisions relating to specific issues, assets or other matters, including when use of the special consultative procedure is desirable; and

- How the Council will engage with communities on other matters.

### The Special Consultative Procedure

There are a number of instances where the Council will undertake consultation at a District wide or comprehensive level. This generally occurs when there is a requirement to use the Special Consultative Procedure as prescribed in the LGA2002 section 83. This occurs in the following situations:

- Adopting or amending the Activity Management Plan. The plan is reviewed every three years with the Annual Plan giving effect to that Plan in the intervening years. The Council must consult on community outcomes at least every six years;
- Adopting the Annual Budget;
- Adopting, amending or reviewing a Bylaw;
- Proposing a change in the way a significant activity is undertaken;
- Significant decisions not already provided for in the Activity Management Plan; and
- Termination of a service.

The Council will decide that some decisions are significant and will therefore require a more rigorous assessment of options and a more robust consultative process. Those decisions are treated as amendments to the Community Plan and can be dealt with either separately or as part of the Annual Plan process.

The level of consultation required will be determined inline with the Policy on Significance and Policy on Engagement and Consultation.

### Public Consultation Process for Levels of Service and Performance

A public focus group process was undertaken in 2008 to develop an understanding of problems, concerns and the relative importance of each level of service in each community. This process was not repeated for this subsequent LTPs as it was considered sufficiently robust and the findings remained current to carry forward into subsequent LTPs.

These LoS extend over the 10 years (short term). However after strategic consultation (a qualitative assessment), many of the lower weighted LoS were given much higher importance. Initially, workshops were held with representatives of the communities to obtain insight and input into the issues around water services in the District. Subsequently a telephone survey was conducted to obtain wider feedback on the issues identified in the workshops and in particular to better understand consumer's priorities. These have been reflected through 5Waters activity objectives which are listed below in order of priority:

1. The community is provided with water services to a standard that protects their health and property;

2. Water services are provided in a cost effective manner;
3. Customers are provided with and fairly charged for water services that meet their reasonable needs;
4. Service capacity is provided to accommodate growing communities, where this growth is sustainable;
5. Problems with water services are addressed in a timely manner and prioritised according to risk and need;
6. Nuisance effects of water services are minimised;
7. Adverse effects of water services on the environment are minimised;
8. Greenhouse gas emissions from the provision of water services are minimised; and
9. Adverse effects of water services on cultural and heritage values are minimised.

## Community Consultation

The Selwyn District Council has undertaken a range of consultation processes over the past few years specifically targeted at gathering information on the extent of infrastructure that Council will be required to install, its future vision or how the services are management. The extent of the historical and proposed consultation is detailed below in Table 4-3 below.

**Table 4-3 5Waters Activity Consultation Processes (Historical and Proposed)**

| Consultation Processes | Key Stakeholders Involved | Date | Reasons for Consultation | Extent of Consultation |
|---|---|---|---|---|
| Current | | | | |
| **Residents Survey** | **Community** | **Annual basis since 1999** | **Ratepayers satisfaction with services provided by Council** | 2,107 residents surveyed by telephone |
| **Water Race Vision** | **Water Race committee** | **Ongoing** | **Identify the matters potentially affecting the strategic direction of the Water race scheme** | Council, Public |
| **Land Drainage Discharges** | **Iwi, ECan and rated users** | **2011-current** | **Identifying practical solutions to improve water quality** | Ecan, Iwi |
| **Darfield Wastewater** | **Township Committee** | **2015 Onwards** | **To advise the Council on the strategic approach to** | Project working party |

| | | | | |
|---|---|---|---|---|
| | | | **wastewater management** | |
| **Proposed** | | | | |
| 2021-2031 LTP process | Community | 2021 Onwards | Legislative requirement criteria of LGA 2002 | In accordance with the LGA 2002 consultation requirements |

## Maori Contribution to Council's Decision Making Process

The Local Government Act requires the Council to establish processes that provide opportunities for Maori to contribute to the Council's decision-making. To facilitate this, Council has included, over a number of years, local Iwi representation on:

- Project teams associated with community projects eg. Osbournes Drain;
- District Plan Committee; and
- In periodic meetings between runanga and staff on particular issues.

Council Policy C302 also addresses consultation with Tangata Whenua on the District Plan

Council will further consider the contribution of Maori through the guidance provided in Mahaanui - Iwi Management Plan (2013).

The Policy on Consultation and Engagement also provides details on consultation with Ngai Tahu.

## Consultation Process for Key Stakeholders and Larger Users

The Key stakeholders and larger users are consulted in a variety of ways, subject to the purpose of the consultation.

Generally face to face meetings are held, with a clear purpose and deliverables. For example, staff met with Central Plains Water in formal meetings to discuss the provision of water and the future of the water races. The sharing of information is generally through email based processes.

The Canterbury Water Strategy was established throughout Canterbury following several years of collaborative work by the Mayoral Forum, the Steering Group, Environment Canterbury and the region's 10 territorial authorities. The Zone Committees established under the Canterbury Water Management Strategy are also key consultation points.

Project Working Parties are also established from time to time to progress matters, which Key Stakeholders are invited to or members of. For example, a working party was set up in 2015 for the Darfield Wastewater project. Key stakeholders have positions on or provide feedback on these processes.

Council has established Memorandums of Understanding with several key stakeholders. These provide a framework for working through issues and highlighting 'common ground'. To date these include New Zealand Transport Agency, Ngai Tahu and Waihora Ellesmere Trust.

## 4.5 Service Life of Facilities and Network

The service life of a network or facility can be influenced by factors outside the actual expected lives of the individual assets within the 5Waters services. The influences associated with the 5Waters are:

- The role of Council in providing a continuous service indefinitely; this only differs with regard to Water race systems where closure will be considered in the future;
- Resource consents: Major consents are usually 20 to 35 years but the infrastructure that are associated with these consents i.e. wastewater treatment plant may have a life of 50 to 75 years; and
- Receiving environment (social/culture).

The risks associated with the service life of the network are considered at many stages and further discussed in 8.0 Infrastructure Sustainability.

## 4.6 Key Stakeholders

The key stakeholders and the outcomes that they require from the 5Waters Activities are detailed in Table 4-4. Different issues will require different levels of consultation from a broad approach to specific and generally dictated by the extent of impacts.

**Table 4-4: Key Stakeholders**

| | Key Stakeholders | Range | Desired Stakeholder Outcome(s) |
|---|---|---|---|
| External | Selwyn District Council customers and resident population | Broad | Reliable service that meets levels of service, strategic and sustainable drivers. |
| | Canterbury Regional Council | Moderate | Sustainable management of resources implementing Regional Strategies. For example: Land and Water Plan, National Regional Resources Plan, Canterbury Water Management Strategy. |
| | Greater Christchurch Urban Partners (Waimakariri DC, Christchurch CC and ECan) | Moderate | Partnership in urban growth over 35 year period. |
| | Local Government New Zealand and Central Government | Limited | Ensure that Local Government Act is complied with .(via Auditor-General) |

| | | | |
|---|---|---|---|
| | Christchurch City | Limited | Disposal of wastewater<br>Operation of water races in Christchurch area |
| | Department of Conservation | Limited | Enhance conservation value of natural waterways. (i.e. rivers/streams) |
| | IPENZ, NZWWA, Ingenium | Limited | Council supports the organisation and continuing professional development. |
| | Local Iwi/Ngai Tahu | Moderate | Enhance water quality and Te Waihora for Mahinga kai, cultural/spiritual values. |
| | Local Businesses/Industries | Moderate | 5Waters services to suit commercial needs and expansion, at affordable cost. |
| | Wider Community | Limited | Enhance landscape and aesthetic values of farmland and plains. |
| | Ministry of Health | Limited | Water quality is suitable, consistently assured, does not spread diseases. |
| Internal | Selwyn District Council | Broad | Maximise the four aspects of well being through provision of the 5Waters Activity. |
| | Elected Officials | Broad | Owner of assets, responsible for sustainable service levels under the LGA 2002. |
| | Council committees | Limited | |
| | Executive | Broad | Compliance with regulations, service reliability, quality, economy and risk management. |
| | Asset Managers | Limited | "Executive" plus policy, planning and implementation of infrastructure and service management activities e.g. operations, demand management, maintenance, construction. Safety. Effective corporate support for decision-making, service management, procurement, finance, communications, I.T., staff and other resources. |
| | Contract managers (Service Delivery) | Moderate | Responsible for implementation of infrastructure and service management activities. Day to day maintenance and operation. |
| | Planners | Limited | AcMP support for Long-term Community Plans. Infrastructure support for current/future district activities . |

| | | | |
|---|---|---|---|
| | Finance | Moderate | Proper accounting for assets and for services consumed by asset management activities. |
| | Customer Services | Limited | Systems which minimise and resolve complaints/enquiries about service. |
| | Information Services | Limited | Clarity of technical and budget requirements for systems and support. |

### Relationships with Specific Key Stakeholders

#### 4.6.1.1 Tangata Whenua - Kaitaikitanga, tikanga

For Maori, linking the past, present and the future is an important concept of life. There is much value in learning from the past in planning for the future. Kaitiakitanga – safe guarding our future (guardianship) and Tikanga (protocols) are two powerful concepts embodied in Maori culture. These values are reflected in the 5Waters Strategy Principles.

Council works with Tangata Whenua and will continue to enhance the relationships with the local Iwi through their representative agency – Mahaunui Kurataiao. With respect to the 5Waters this relationship will continue to be developed by the Asset Manager through discussions on issues. For example the Lincoln Integrated Stormwater Management Plan is one matter where strong productive dialogue has occurred between parties.

Council will seek to understand and exercise the principles of Kaitiakitanga so those who follow can enjoy what we enjoy today, and seek to establish the right Tikanga that will enable us to deliver water services in an integrated and sustainable way.

#### 4.6.1.2 Canterbury Regional Council - Environment Canterbury (ECan)

Environment Canterbury is delegated responsibility for management of the water resources within the District and achieves this through Regional Plans. These plans provide a framework for the sustainable environmental management of Canterbury's physical and natural resources.

Council must liaise with Environment Canterbury to obtain advice and comply with consents in relation to the 5Waters Activity. Table 4-5 identifies the types of water consents held by Council.

**Table 4-5: Consent Types**

| Consent Types | Water Supply | Wastewater | Stormwater | Land Drainage | Water Races |
|---|---|---|---|---|---|
| Coastal Permit | | | X | | |
| Discharge to Air (of contaminants) | | X | | | |
| Discharge to Water | | X | X | X | X |
| Discharge to Land | | X | X | X | X |
| Land Use | X | X | X | X | X |
| Water Permit – Divert Water | X | | X | X | |
| Water Permit - Groundwater | X | X | | | |
| Water Permit – Surface Water | X | | | | X |

These consents are vital for the delivery of sustainable services to our 5Waters communities. Without the consents, Councils assets would essentially be unusable.

#### 4.6.1.3 Water NZ

Water NZ, previously known as the NZ Water and Wastes Association, provides a forum for the exchange of ideas between those involved in the New Zealand water industry. Water NZ also manages projects such as the development of national codes of practice. In recent times, Water NZ has taken on an advocacy role to Central Government on water issues. Particularly, rationalisation of legislation and improved governance.

#### 4.6.1.4 IPENZ, INGENIUM, LGNZ

Institute of Professional Engineers New Zealand (IPENZ), Local Government New Zealand (LGNZ) and INGENIUM provide peer support and exchange of information to foster appropriate practice and share/manage issues that arise. They are involved in standards development, and advocate at a Central Government level.

#### Community and Public Health – Canterbury District Health Board

Community and Public Health (CPH) are tasked with monitoring, advising on and improving the public health of communities on behalf of the Ministry of Health. The Medical Officer of Health and staff are predominantly concerned with the quality of drinking water the Council supplies to its consumers and the disposal of wastewater effluent where this could compromise community health. To these ends CPH:

- Annually audits compliance water supplies with Water Safety Plans;
- Is part of working parties on wastewater e.g. Darfield-Kirwee; and
- A regulator of Council water supplies under the Health (Drinking Water) Amendment Act 2007.

### Large or Significant Users

Within the 5Waters activities there are a number of large or significant users that need to be considered as they represent a higher risk for revenue, and in some cases criticality. Examples of these or significant users are: Water – Council reserves, Rolleston Izone; and Wastewater – Rolleston Correctional institutions and Westland Dairy (Izone).

### Greater Christchurch Urban Development Strategy Partners

Selwyn District Council has a close relationship with the Christchurch City Council (CCC) and Waimakariri District Council (WDC), under the Greater Christchurch Urban Development Strategy (UDS). Council has a number of obligations under the UDS that relate to the 5Waters Activity (IN 706).

At an operational level some of the Council's sewer networks pump into the CCC wastewater scheme. The Council and CCC have an agreement for Council to administer and operate the water races within the Christchurch area. Water race water is supplied to the Wigram Wards of CCC.

### Other Organisations

Council has a consultative relationship with other organisations including:

- Fish and Game, North Canterbury;
- Central Plains Water Trust;
- Te Waihora Trust/Ellesmere Trust;
- Irrigation New Zealand; and
- Zone Committees.

### Township, Community and Scheme Committees

Each township and rural community has a local advisory committee which is elected every three years at a specially convened public meeting. The purpose of the committee is to consult with its community and relay local concerns and preferences to the Council or Ward Board. There is one exception currently- Edendale which does not have a formally elected committee

Scheme committees are also elected on a three yearly basis and have delegated responsibilities for a number of the water race and land drainage schemes. The committees have terms of reference – the Community Committee Agreement, which provide direction on their governance role. While committees play a role in the management of the 5Waters Activity, ultimate responsibility and hence risk, lies with Council as the owner of the asset.

Historically there were two rural water supply committees. These committees - Malvern Hills and Hororata Acheron Water Supply now meet informally once a year to discuss concerns regarding the strategic and operational management of the scheme. Previously these committees were actively engaged in the strategic management of these schemes through a quarterly meeting.

## Water Race Subcommittee

The Selwyn District Council Water race subcommittee has 12 members with the following representation:

1. Two user representatives from each of the Malvern, Paparua and Ellesmere Schemes
2. Single representatives from the following:
   - Paparua Water Race Irrigation User Group
   - Selwyn Central and Malvern Area Boards
   - Christchurch City Council (Waimari and Wigram Wards)
   - Selwyn District Council - water portfolio holder

The Selwyn District Council Water Race Subcommittee was established for purposes including:

- Providing direct user representation into the management and operation of the respective water race systems in accordance with Council Bylaws;
- Review of Council's Water Race Bylaws and Policy and recommendation of amendments from time to time;
- Recommending the level of the funds to be raised from respective schemes to meet operational and capital needs;
- On advice from Council's engineering staff recommending the water race 10 year plan;
- Recommending priority of Water Race works where necessary; and
- Approving consent/re-consenting of the schemes.

## Land Drainage Scheme Committees

The land drainage network is owned by Council. To support this Council takes both direct and hands-off action for service delivery. Its direct roles include formulation and implementation of management systems, policies and rules governing operation of the drainage schemes. Council's asset management and service delivery staff are involved in the schemes day to day management at present. Targeted rates are levied to support the direct and indirect works.

The District Land Drainage Committee has an annual meeting each year. This committee includes members from the other land drainage advisory committees. The Land Drainage Advisory Committees responsibilities are detailed in the "Terms of Reference" for the Drainage Committees, which was updated in 2017.

## 4.7 Other Committees

From time to time Council established committees or Project Working Parties for specific tasks. In 2015 a Working Party was established for the Darfield wastewater project, working parties provide strategic advice only.

## 4.8 Access to Council's infrastructure

Access to Council's infrastructure is primarily controlled by the LGA 2002 (section 181). Council may enter private land to inspect, alter, renew, repair or clean any work provided that the infrastructure was constructed with the land owner's permission.

### Permissions and Easements

Historically details of the land entry permissions given are often difficult to locate and can give rise to disagreements between Council and the property owner. It is considered that all existing and future agreements are stored on the individual's property file and flagged electronically.

Easements are currently required in urban locations where infrastructure is required to be located within private property or reserves. This is considered necessary to ensure that Council or Council's representative has unrestricted access to the infrastructure without the problems associated with the use of section 181 of the LGA 2002.

At present there is no easily accessible record showing Council easements across private property or file on written agreements for rural water supplies or water races.

Significant lengths of water races were gazetted in the 1880's and early 1900's; permitting access for the operation and maintenance of these races. Details of these gazette notices are required to be shown on GIS for future use.

Easements are normally not required for classified drains, with access for cleaning, inspection and maintenance be provided by the Land Drainage Act 1908 and amendments.

### Property Designations

The Selwyn District Council District Plan contains a schedule of designated sites. Facilities not noted in this schedule are there by right and either meet the rules of the District Plan or Plan/Rules that were in force at the time of installation. Sites that accommodate major new assets are considered for designation as they are acquired.

### Proposed Additional Access Processes

Creating a list (paper and GIS based) and overall plan showing all Council easements required and those already obtained over private property should be undertaken (IN 105). This will be a valuable tool in the event of property development or subdivision to identify at an early stage whether Council services are involved or encroached upon by the proposed future development or subdivision.

### Use of Suitably Qualified Persons

An important measure of the quality of Council's asset management is the ability, experience and qualifications of the individuals and companies involved in its preparation. The Council employs a wide range of technical staff appropriately qualified to carry out the asset management function. Formal qualifications range from NZ Certificate to Chartered Engineer.

## 4.9 Improvement Planning

Throughout this section a number of specific actions to improve the way in which the Council identifies, manages and organises the 5Waters activity. These actions are summarised below in Table 4-6.

**Table 4-6 AM Improvement Items – Management and Organisational Structure**

| Section Ref | Improvement Opportunities | Priority | Timing |
|---|---|---|---|
| 4.1 | Continue to define the boundary between Asset Management and Service Delivery | High | Ongoing |
| 4.4 | Continue to involve Stakeholders in decisions where necessary. | Medium | Ongoing |

# 5.0 LEVELS OF SERVICE

The Levels of Service for the 5Waters Activities are defined in this section and the performance measures by which the service levels will be assessed. The levels of service are aimed at supporting the community outcomes and meeting the strategic goals. This section also holds information on the customer surveys undertaken and the legislative requirements adhered to in arriving at the service levels.

Figure 5-1 below outlines the linkages between the current legislation, community objectives, 5Waters objectives and key performance indicators.

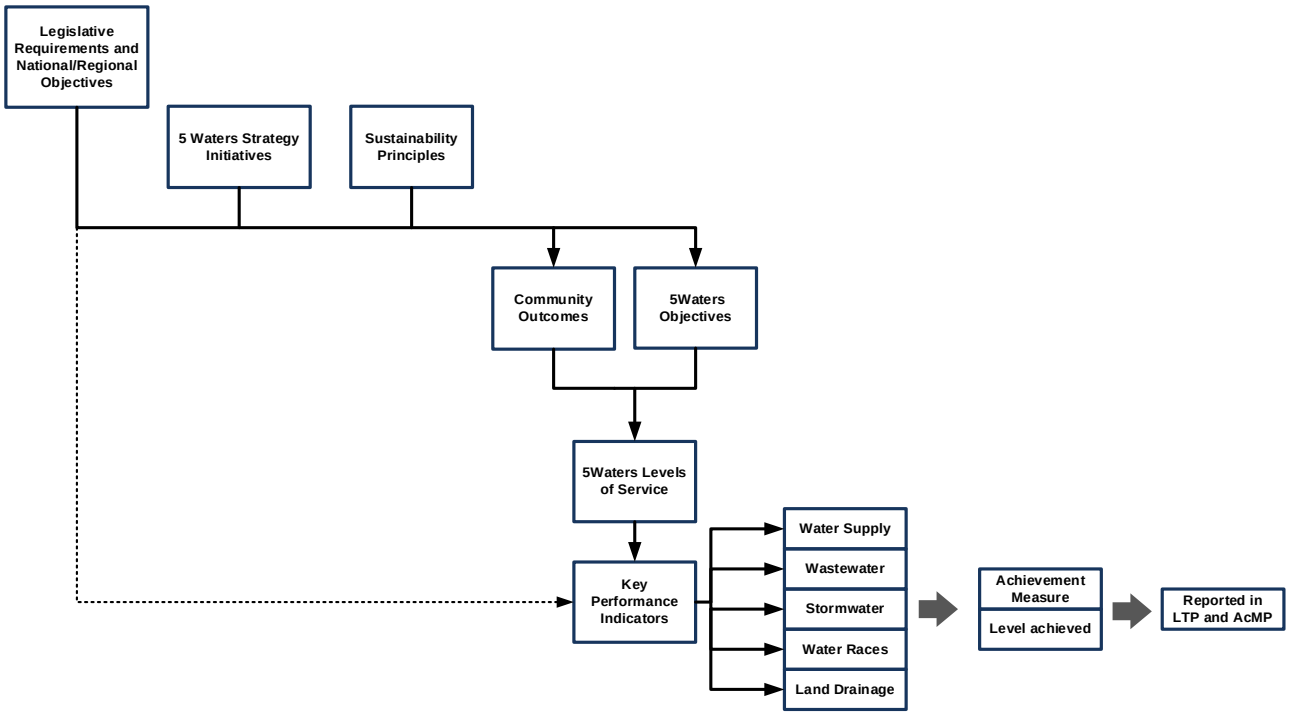



**Figure 5-1 Influences in Key Performance Indicators**

## 5.1 Objectives

Objectives and levels of service are developed to reflect the expectations of the community and regulators. Targets are established which indicate the standard that should be met. Objectives are relevant to all of the 5Waters, while Levels of Service statements are more specific.

The objectives of water services are cited below. The generic wording of these objectives is intentional so they are applicable across the 5Waters. This ensures that they can be used to evaluate and prioritise the benefits of any proposed projects or improvement measures, across the 5Waters Activity. This is a key step towards integrated management of the five water services.

**Table 5-1: 5Waters Objectives**

| 5Waters Objectives | |
|---|---|
| 1 | The community is provided with water services to a standard that protects their health and property |
| 2 | Customers are provided with and fairly charged for water services that meet their reasonable needs |
| 3 | Nuisance effects of water services are minimised |
| 4 | Water services are provided in a cost effective manner |
| 5 | Problems with water services are addressed in a timely manner and prioritised according to risk and need |
| 6 | Service capacity is provided to accommodate growing communities, where this growth is sustainable |
| 7 | Adverse effects of water services on cultural and heritage values are minimised |
| 8 | Adverse effects of water services on the environment are minimised. |
| 9 | Greenhouse gas emissions from the provision of water services are minimised. |

Level of service statements are more specific than the objectives and may apply to one or more of the 5Waters activities. These statements are written in a manner that can be understood by non-technical readers, but are often linked with more technical definition.

Levels of service must be measurable. The performance measures that have been attributed to each level of service have been specified to ensure:

i. They can be benchmarked to other utilities wherever possible; and

ii. They are mutually independent of each other.

## 5.2 Community Outcomes

Community outcomes are the outcomes that a local authority aims to achieve in meeting the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions. They represent the Council's overall vision for the District, and they guide the Council as it makes its plans and delivers its services.

The community outcomes were initially developed in 2006 based on a range of information sources and consultation processes. They were further developed in 2009 as part of the preparation of the Selwyn Community Plan 2009/19 and further refined as part of the preparation of the 2012/22 and 2015/25 LTPs, see Table 5-2 below.

**Table 5-2 Community Outcomes**

| Well-being | Key Community Outcomes | Community Outcomes |
|---|---|---|
| Environment | A clean environment | Air, land, water and general environment to be kept in a healthy condition. |

| | | |
|---|---|---|
| | A rural district | A living environment where the rural theme of Selwyn is maintained. |
| Social | A healthy community | Selwyn people have access to appropriate health, social and community services. |
| | | We have access to drinking water that helps protect their health. |
| | A safe place in which to live, work and play | We are safe at home and in the community. |
| | | We know & help our Neighbours. |
| | | We maintain a coordinated and effective response to, and recover from, emergency and disaster events. |
| | | Pedestrians, cyclists and motor vehicle users can safely move around Selwyn district. |
| | An educated community | Our district provides a range of quality, lifelong education and training opportunities. |
| Economic | A prosperous community | Selwyn has a strong economy which fits within and complements the environmental, social and cultural environment of the district. |
| | An accessible district | Effective and accessible transport system. |
| Culture | A community which values its culture and heritage | Our district provides a range of arts and cultural experiences and facilities. |

Key Community Outcomes as identified in Table 5-2 and how they relate to the 5Waters Activity are detailed below in Table 5-3.

**Table 5-3 Community Outcomes and 5Water Services**

| Community Outcomes | 5Water Services |
|---|---|
| Air, land, water and general environment to be kept in a healthy condition. | Managing the 5Waters activities in a way that minimises their potential adverse impact on the environment. |
| A living environment where the rural theme of Selwyn is maintained. | Providing water races and land drainage systems that are part of the rural landscape and contribute to the rural theme of Selwyn/ 5Waters services (community and private) are vital for the well-being of rural communities. |
| Selwyn people have access to appropriate health, social and community services. | Providing water, wastewater and drainage services necessary to support community and public health services. There is potential to provide for recreational opportunities in conjunction with stormwater management strategies. |
| We have access to drinking water that helps protect their health. | Providing safe drinking water for all water schemes within the Selwyn district. |

| | |
|---|---|
| We are safe at home and in the community. | Providing safe drinking water and effective wastewater removal and disposal as well as removal of stormwater and excess groundwater (via land drainage). |
| We maintain a coordinated and effective response to, and recover from, emergency and disaster events. | Responding to emergency events by providing safe drinking water and effective wastewater removal and disposal as well as removal of stormwater and excess groundwater (via land drainage). |
| Our district provides a range of quality, lifelong education and training opportunities. | Providing water, wastewater and drainage services necessary to support training facilities. |
| Selwyn has a strong economy which fits within and complements the environmental, social and cultural environment of the district. | Providing business with water, wastewater and drainage services, sometimes to a higher standard or with a higher level of reliability than regular domestic services. Effective water races and land drainage systems are essential for productive use of land. |
| Our district provides a range of arts and cultural experiences and facilities. | Providing water, wastewater and drainage services for cultural activities. All 5Waters activities can impact on the cultural and heritage values and need to be managed to minimise adverse effects. |

The achievement of community outcomes can be assisted through the delivery of levels of service. The levels of service have been reviewed to ensure that they adequately cover those adopted previously and align with the community outcomes.

## 5.3 5Waters Level of Service

Community outcomes are achieved by providing a level of service to the community. Levels of service provided by the Council are also driven by:

- Customer expectations of the quality of service;
- The price customers are willing to pay for the service;
- Legislative requirements;
- Strategic objectives of the Council;
- Availability of resources; and
- Financial constraints.

This section outlines the current level of service and performance measures identified for each.

### Current Level of Service

The levels of service for 5Waters activities are shown below in Table 5-4. The level of service is linked to the 5Waters objectives. The levels of service were developed internally by Council staff, however it is

recognised that residents and community groups should have input into determining these. Therefore, this has been listed as an improvement item to be completed before the 2018 LTP.

**Table 5-4 5Waters Level of Service**

| 5Waters | 5Waters Objectives | Level of Service |
|---|---|---|
| Land Drainage | Nuisance effects from water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the land drainage network provided. |
| | | The land drainage network is managed to give a good quality service. |
| | Water services are provided in a cost effective manner. | **Operating Costs**<br>The land drainage network is provided at a reasonable cost. |
| Stormwater | Adverse effects of water services on the environment are minimised. | **Discharge Compliance**<br>The stormwater network is managed in accordance with resource consents conditions. |
| | Nuisance effects of water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the stormwater network provided. |
| | | The stormwater network is managed to give a good quality service. |
| | Problems with water services are addressed in a timely manner and prioritised according to risk and need. | **Response Times**<br>Flooding events are attended promptly by contractors and/or staff. |
| | The community is provided with water services to a standard that protects their health and property. | **System Adequacy**<br>The stormwater system is maintained adequately and minimises flooding. |
| | Water services are provided in a cost effective manner. | **Operating Costs**<br>The stormwater network is provided at a reasonable cost. |
| Wastewater | Adverse effects of water services on the environment are minimised. | **Discharge Compliance**<br>The wastewater network is managed in accordance with resource consent conditions. |
| | Nuisance effects of water services are minimised. | **Customer Satisfaction** |

| | | |
|---|---|---|
| | | Residents are satisfied with the wastewater system provided. |
| | | The wastewater network is managed to give a good quality service. |
| | Problems with water services are addressed in a timely manner and prioritised according to risk and need. | **Fault Response Times**<br>Wastewater system faults or problems are attended to promptly by contractors and/or staff. |
| | Service capacity is provided to accommodate growing communities, where this growth is sustainable. | **Serviced Area**<br>The wastewater network is provided to growing communities, where this growth is sustainable. |
| | The community is provided with water services to a standard that protects their health and property. | **System Adequacy**<br>The wastewater network is managed to give a good quality service. |
| | Water services are provided in a cost effective manner. | **Operating Costs**<br>Wastewater services are provided at a reasonable cost. |
| Water Supply | Adverse effects of water services on the environment are minimised. | **Water Take Compliance**<br>The water supply network is managed in accordance with resource conditions. |
| | Nuisance effects of water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the water supply provided. |
| | | The water supply network is managed to give a good quality service. |
| | Problems with water services are addressed in a timely manner and prioritised according to risk and need. | **Fault Response Times**<br>Water system faults or problems are attended to promptly by contractors and/or staff. |
| | Service capacity is provided to accommodate growing communities, where this growth is sustainable. | **Serviced Area**<br>The water supply network is provided to growing communities, where this growth is sustainable. |

| | | |
|---|---|---|
| | | **Maintenance of the Reticulation Network**<br>The water supply network is managed to minimise the leakage or loss from the system. |
| | | **Fire Fighting**<br>There is adequate fire fighting supply in the approved areas. |
| | | **Demand Management**<br>There is enough water supplied to meet customer needs. |
| | | **Safety of Drinking Water**<br>Water is safe to drink and complies with the Drinking Water Standards of New Zealand. |
| | Water services are provided in a cost effective manner. | **Operating Costs**<br>The water supply is provided at a reasonable cost. |
| Water Races | Nuisance effects of water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the water race network provided. |
| | | The water race network is managed to give a good quality service. |
| | Problems with water services are addressed in a timely manner and prioritised according to risk and need. | **Fault Response Times**<br>Water race system faults or problems are attended to promptly by contractors and/or staff. |
| | Water services are provided in a cost effective manner. | **Operating Costs**<br>The water race network is provided at a reasonable cost. |
| | Adverse effects of water services on the environment are minimised. | **Water Take Compliance**<br>The water race network is managed in accordance with resource consent conditions. |

### Risks associated with Level of Service

Consideration has been given to any risks associated with not meeting the levels of performance measures. The 5Waters level of service relate to critical services and the performance targets adopted show a continuance of existing levels of service.

The following risks have been identified and considered:

i. Levels of service targets are not met. Unless budgets are reduced, the risk is low as targets are strongly linked to population growth and also funded from development contributions.

ii. Changes to community expectations. The risk is medium. The level of service has improved over the past ten years but as residents move from Christchurch City to Selwyn townships they expect the same level of service to be provided. This is not always feasible especially in towns such as West Melton, where the infrastructure upgrades have not kept up with population growth.

### Key Performance Indicators

The key performance indicators for 2018-2028 have been derived from the mandatory non-financial performance measures and existing measures. The non-financial measures only focus on stormwater, wastewater and water supply therefore some of these measures have also been applied to the other two waters, land drainage and water races, for consistency. A customer satisfaction measure across the 5Waters has also been added.

#### 5.3.1.1 Legislative Requirements

The legislation applicable to the management of assets covered in this activity management plan is outlined in Section 2.0. It is noted in this section that significant changes to the LGA were made in 2014, refer to Section 0. Within these the Secretary for Local Government was required to make rules specifying non-financial measures for local authorities to use when reporting to their communities. The Department of Internal Affairs states that:

> *The aim was to help the public to contribute to discussions on future levels of service for their communities and to participate more easily in their local authority's decision-making processes.*
>
> *The performance measures will do this through providing better information about the levels of service for five groups of activities carried out by local authorities – stormwater drainage, wastewater and the disposal of wastewater, flood protection and control works, water supply, and the provision of footpaths and roads. Local authorities will be required to use a standard set of performance measures for these five activities when reporting to their communities.*

These mandatory performance measures are cited below.

**Performance Measure 1 – safety of drinking water**

The extent to which Council's water supply complies with:

a) Part 4 of the drinking water standards (bacteria compliance criteria)

b) Part 5 of the drinking water standards (protozoa compliance criteria)

**Performance Measure 2 – maintenance of the reticulation network**

The percentage of real water loss from Council's networked reticulation system (including a description of the methodology used to calculate this)

**Performance Measure 3 – fault response times**

Where Council attends to a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times measured:

a) Attendance for urgent call outs: from the time that Council receives notification to the time that service personnel reach the site, and

b) Resolution of urgent call outs: from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption

c) Attendance for non urgent call outs: from the time that Council receives notification to the time that service personnel reach the site, and

d) Resolution of non urgent call outs: from the time that Council receives notification to the time that service personnel confirm resolution of the fault or interruption

**Performance Measure 4 – customer satisfaction**

The total number of complaints received by Council about any of the following:

a) Drinking water clarity

b) Drinking water taste

c) Drinking water odour

d) Drinking water pressure

e) Continuity of supply

f) Council's response to any of these issues

**Performance Measure 5 – demand management**

The average consumption of drinking water per day per resident within the district.

The rules came into force on 30 July 2014 and Council was required to incorporate these performance measures in the 2015-2025 LTP onwards.

#### 5.3.1.2 2018-2028 Key Performance Indicators

The key performance indicators assess the level of service achieved within the 5Waters activities, these are listed below in Table 5-5 -

Table 5-9 below. Targets for the next ten years have been set and where these targets are changing over time shows the improvements to the level of service that the Council is aiming to achieve. The levels of service and performance targets are generic across the 5Waters schemes, however it is recognised that there are different level of service in urban areas in comparison to rural areas.

### Table 5-5 Land Drainage Performance Measures for 2018-2028

| Land Drainage | | | | | | |
|---|---|---|---|---|---|---|
| **5Waters Objectives** | **Level of Service** | **Key Performance Indicators** | **Target Year 1** | **Target Year 2** | **Target Year 3** | **Target Year 4 to 10** |
| Nuisance effects from water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the land drainage network provided. | Proportion of the residents rating the land drainage system good or very good. | ≥40% | ≥40% | ≥40% | ≥40% |
| | The land drainage network is managed to give a good quality service. | The number of complaints received about the performance of the Land Drainage system, expressed per 1000 rated properties. | Less than 10 | Less than 8 | Less than 6 | Less than 5 |
| Water services are provided in a cost effective manner. | **Operating Costs**<br>The land drainage network is provided at a reasonable cost. | Total average operating cost per serviced property for Land Drainage. | ≤$100 | ≤$100 | ≤$100 | ≤$100 |

### Table 5-6 Stormwater Performance Measures for 2018-2028

| Stormwater | | | | | | |
|---|---|---|---|---|---|---|
| **5Waters Objectives** | **Level of Service** | **Key Performance Indicators** | **Target Year 1** | **Target Year 2** | **Target Year 3** | **Target Year 4 to 10** |
| Adverse effects of water services on the | **Discharge Compliance** | Compliance with resource consents for discharge from the stormwater system measured by the number of: | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| environment are minimised. | The stormwater network is managed in accordance with resource consents conditions. | a) abatement notices;<br>b) infringement notices<br>c) enforcement orders; and<br>d) convictions.<br>Received from Environment Canterbury. | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil |
| Nuisance effects of water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the stormwater network provided. | Proportion of residents rating the stormwater system good or very good. | ≥45% | ≥45% | ≥45% | ≥45% |
| | The stormwater network is managed to give a good quality service. | The number of complaints received about the performance of the stormwater system, expressed per 1000 rated properties. | Less than 10 | Less than 8 | Less than 6 | Less than 6 |
| Problems with water services are addressed in a timely manner and prioritised according to risk and need. | **Response Times**<br>Flooding events are attended promptly by contractors and/or staff. | The median response time to attend a flooding event measured from the time that personnel receives notification to the time that service personnel reach the site. | Less than 1 hour for urgent flooding events | Less than 1 hour for urgent flooding events | Less than 1 hour for urgent flooding events | Less than 1 hour for urgent flooding events |
| The community is provided with water services to a standard that protects their health and property. | **System Adequacy**<br>The stormwater system is maintained adequately and minimises flooding. | The number of flooding events that occur as a result of overflow from the stormwater system that enters a habitable floor. | Nil in less than 50 year storm events | Nil in less than 50 year storm events | Nil in less than 50 year storm events | Nil in less than 50 year storm events |
| | | For each flooding event, the number of habitable floors affected, expressed per 1000 properties connected to the stormwater system. | Nil per 1000 connected properties in less than 50 | Nil per 1000 connected properties in less than 50 | Nil per 1000 connected properties in less than 50 | Nil per 1000 connected properties in less than 50 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | year storm events | year storm events | year storm events | year storm events |
| Water services are provided in a cost effective manner. | **Operating Costs**<br>The stormwater network is provided at a reasonable cost. | Total average operating cost per serviced property for Stormwater. | ≤$85 | ≤$85 | ≤$85 | ≤$85 |

### Table 5-7 Wastewater Performance Measures for 2018-2028

| Wastewater | | | | | | |
|---|---|---|---|---|---|---|
| **5Waters Objectives** | **Level of Service** | **Key Performance Indicators** | **Target Year 1** | **Target Year 2** | **Target Year 3** | **Target Year 4 to 10** |
| Adverse effects of water services on the environment are minimised. | **Discharge Compliance**<br>The wastewater network is managed in accordance with resource consent conditions. | Compliance with resource consents for discharge from the wastewater system measured by the number of:<br>a) abatement notices;<br>b) infringement notices<br>c) enforcement orders; and<br>d) convictions.<br>Received from Environment Canterbury. | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil |
| Nuisance effects of water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the wastewater system provided. | Proportion of residents rating the wastewater system good and very good. | ≥65% | ≥65% | ≥65% | ≥70% |

| | | | | | | |
|---|---|---|---|---|---|---|
| | The wastewater network is managed to give a good quality service. | The total number of complaints received about wastewater odour, blockages and system faults, expressed per 1000 rated properties. | Less than 10 | Less than 8 | Less than 6 | Less than 6 |
| Problems with water services are addressed in a timely manner and prioritised according to risk and need. | **Fault Response Times**<br>Wastewater system faults or problems are attended to promptly by contractors and/or staff. | Where personnel attend wastewater overflows resulting from a blockage or other fault in the wastewater system. The median response time measures the:<br>a) attendance time: from the time that the personnel receives notification to the time that service personnel reach the site;<br>b) resolution time: from the time that the personnel receives notification to the time that service personnel confirm resolution of the blockage or other fault. | a) Less than 1 hour<br>b) Less than 24 hours | a) Less than 1 hour<br>b) Less than 24 hours | a) Less than 1 hour<br>b) Less than 24 hours | a) Less than 1 hour<br>b) Less than 24 hours |
| Service capacity is provided to accommodate growing communities, where this growth is sustainable. | **Serviced Area**<br>The wastewater network is provided to growing communities, where this growth is sustainable. | The proportion of residential properties serviced by wastewater services within the district expressed as a percentage of total residential properties. | ≥60% | ≥60% | ≥60% | ≥65% |
| The community is provided with water services to a standard that protects their health and property. | **System Adequacy**<br>The wastewater network is managed to give a good quality service. | The number of dry weather wastewater overflows from the wastewater system, expressed per 1000 rated properties. | Less than 1.5 overflow | Less than 1.4 overflow | Less than 1.3 overflow | Less than 1.2 overflow |

| | | | | | | |
|---|---|---|---|---|---|---|
| Water services are provided in a cost effective manner. | **Operating Costs**<br>Wastewater services are provided at a reasonable cost. | Total average operating cost per serviced property for wastewater. | ≤$360 | ≤$360 | ≤$360 | ≤$360 |

### Table 5-8 Water Supply Performance Measures for 2018-2028

| Water Supply | | | | | | |
|---|---|---|---|---|---|---|
| **5Waters Objectives** | **Level of Service** | **Key Performance Indicators** | **Target Year 1** | **Target Year 2** | **Target Year 3** | **Target Year 4 to 10** |
| Adverse effects of water services on the environment are minimised. | **Water Take Compliance**<br>The water supply network is managed in accordance with resource conditions. | Compliance with resource consents for surface water takes for water supplies measured by the number of:<br>a) abatement notices;<br>b) infringement notices<br>c) enforcement orders; and<br>d) convictions.<br>Received from Environment Canterbury. | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil |
| Nuisance effects of water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the water supply provided. | Proportion of residents rating the water supplies good or very good. | ≥65% | ≥65% | ≥65% | ≥70% |
| | The water supply network is managed to give a good quality service. | The total number of complaints received about drinking water clarity, continuity of supply, odour, taste, pressure and flow, expressed per 1000 rated properties. | Less than 15 | Less than 15 | Less than 15 | Less than 15 |
| Problems with water services are | **Fault Response Times** | Where personnel attend a non-urgent call-out in response to a fault or | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| addressed in a timely manner and prioritised according to risk and need. | Water system faults or problems are attended to promptly by contractors and/or staff. | unplanned interruption in the reticulation system. The median response times measures the:<br>a) attendance time: from the time that personnel receive notification to the time that service personnel reach the site;<br>b) resolution time: from the time that personnel receive notification to the time that service personnel confirm resolution of the fault or interruption. | a) Less than 24 hours<br>b) Less than 120 hours | a) Less than 24 hours<br>b) Less than 120 hours | a) Less than 24 hours<br>b) Less than 120 hours | a) Less than 24 hours<br>b) Less than 120 hours |
| | | Where personnel attend an urgent call-out in response to a fault or unplanned interruption in the reticulation system. The median response times measures the:<br>a) attendance time: from the time that personnel receive notification to the time that service personnel reach the site;<br>b) resolution time: from the time that personnel receive notification to the time that service personnel confirm resolution of the fault or interruption. | a) Less than 4 hours<br>b) Less than 48 hours | a) Less than 4 hours<br>b) Less than 48 hours | a) Less than 4 hours<br>b) Less than 48 hours | a) Less than 4 hours<br>b) Less than 48 hours |
| Service capacity is provided to accommodate growing communities, | **Serviced Area**<br>The water supply network is provided to growing communities, where this growth is sustainable. | The proportion of residential properties serviced by water supplies within the district expressed as a percentage of total residential properties. | ≥75% | ≥75% | ≥75% | ≥80% |

| | | | | | | |
|---|---|---|---|---|---|---|
| where this growth is sustainable. | **Maintenance of the Reticulation Network**<br>The water supply network is managed to minimise the leakage or loss from the system. | The percentage of real water loss from the water reticulation system in urban schemes. | 24% | 22% | 20% | 20% |
| | **Fire Fighting**<br>There is adequate fire fighting supply in the approved areas. | The proportion of an urban fire district area within 135m of one fire hydrant and 270m of two fire hydrants. | Greater than 60% of the district | Greater than 60% of the district | Greater than 60% of the district | Greater than 60% of the district |
| | **Demand Management**<br>There is enough water supplied to meet customer needs. | The average consumption of drinking water per day per resident. | Less than 0.6$m^3$ per person per day within urban schemes | Less than 0.5$m^3$ per person per day within urban schemes | Less than 0.5$m^3$ per person per day within urban schemes | Less than 0.5$m^3$ per person per day within urban schemes |
| | **Safety of Drinking Water**<br>Water is safe to drink and complies with the Drinking Water Standards of New Zealand. | The extent to which the drinking water supplies comply with the drinking water standards for bacteria compliance. | 99% of monitoring samples comply, at both the treatment plant and within the reticulation, across the district | 99.5% of monitoring samples comply, at both the treatment plant and within the reticulation, across the district | 99.5% of monitoring samples comply, at both the treatment plant and within the reticulation, across the district | 99.9% of monitoring samples comply, at both the treatment plant and within the reticulation, across the district |
| | | The extent to which the drinking water supplies comply with the drinking water standards for protozoal compliance. | 70% of the treatment plant sites are | 80% of the treatment plant sites are | 90% of the treatment plant sites are | 90% of the treatment plant sites are |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | compliant across the district | compliant across the district | compliant across the district | compliant across the district |
| Water services are provided in a cost effective manner. | **Operating Costs**<br>The water supply is provided at a reasonable cost. | Total average operating cost per serviced property for water supply. | ≤$330 | ≤$330 | ≤$330 | ≤$330 |

### Table 5-9 Water Race Performance Measures for 2018-2028

| Water Races | | | | | | |
|---|---|---|---|---|---|---|
| **5Waters Objectives** | **Level of Service** | **Key Performance Indicators** | **Target Year 1** | **Target Year 2** | **Target Year 3** | **Target Year 4 to 10** |
| Nuisance effects of water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the water race network provided. | Proportion of residents rating the water race system good or very good. | ≥35% | ≥35% | ≥35% | ≥35% |
| | The water race network is managed to give a good quality service. | The total number of complaints received about continuity of supply, expressed per 1000 rated properties. | Less than 50 | Less than 50 | Less than 50 | Less than 50 |
| Problems with water services are addressed in a timely manner and prioritised according to risk and need. | **Fault Response Times**<br>Water race system faults or problems are attended to promptly by contractors and/or staff. | Where personnel attends an urgent blockage or other fault in the water race system. The median response times measures the:<br>a) Attendance time: from the time that personnel receives notification to the time that service personnel reach the site; | a) Less than 4 hours<br>b) Less than 48 hours | c) Less than 4 hours<br>d) Less than 48 hours | a) Less than 4 hours<br>b) Less than 48 hours | a) Less than 4 hours<br>b) Less than 48 hours |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | b) Resolution time: the time that personnel receives notification to the time that service personnel confirm the resolution of the blockage or other fault. | | | | |
| Water services are provided in a cost effective manner. | **Operating Costs**<br>The water race network is provided at a reasonable cost. | Total average operating cost per serviced property for water races. | ≤$200 | ≤$200 | ≤$200 | ≤$200 |
| Adverse effects of water services on the environment are minimised. | **Water Take Compliance**<br>The water race network is managed in accordance with resource consent conditions. | Compliance with resource consents for surface water takes for water supplies measured by the number of:<br>a) abatement notices;<br>b) infringement notices<br>c) enforcement orders; and<br>d) convictions.<br>Received from Environment Canterbury. | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil |

### 5.3.1.3 Past Performance

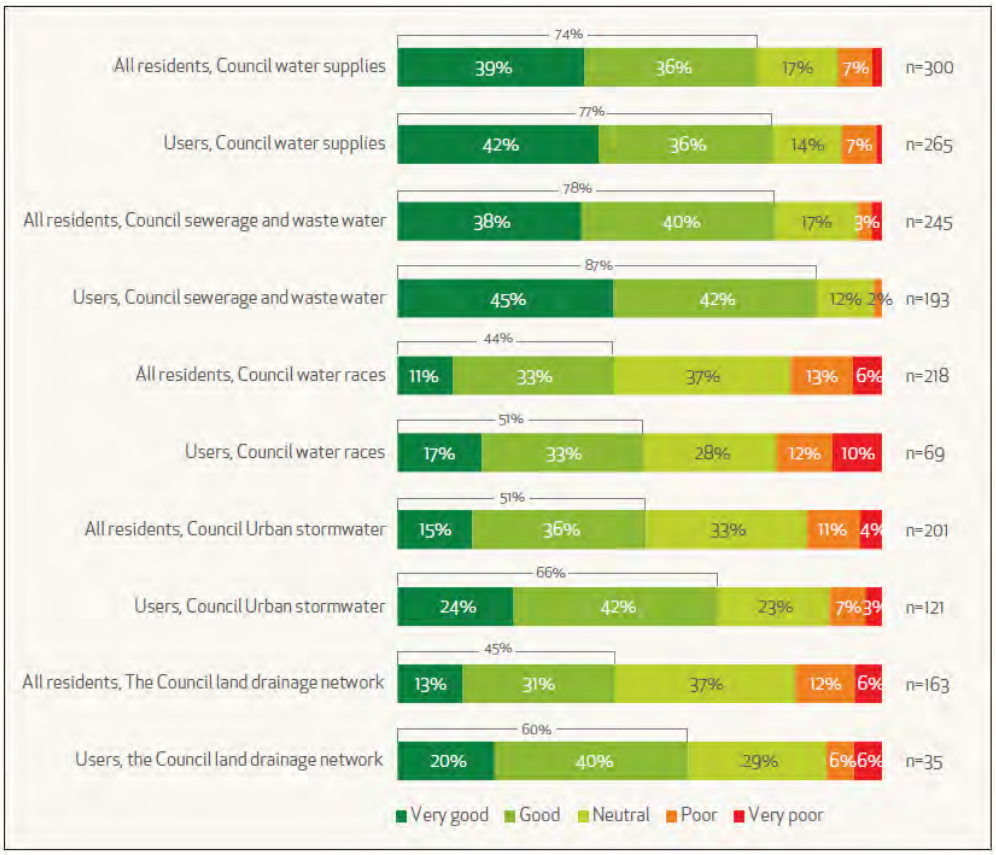
The Annual Reports show the level of achievement across the key performance indicators and therefore the level of service. This section outlines the past performance of Council for some of the key performance indicators. Due to the recent implementation of mandatory performance measures, past performance is not available for all measures.

**Residents survey**

Resident's satisfaction of the 5Waters Activities has been measured over a number of years as part of an annual satisfaction survey. The purpose of the resident's survey is to gather data on residents satisfaction for the services that Council is responsible for as well as provide insights into how the Council can best invest resources to improve service levels and resident satisfaction in the future.

Residents satisfaction is also reported in the key performance indicators across all 5Waters. Table 5-10 shows the perceptions of 5Waters services. 74% of respondents felt good or very good about their water service, wastewater received 78%, stormwater received 51%, land drainage network received 45% and only 44% of respondents were happy with their water races. Figure 5-2 shows the performance of the Council for the last 6 years.

**Table 5-10 Perceptions of Water Services[13]**




[13] Source: Residents' Survey, June 2017

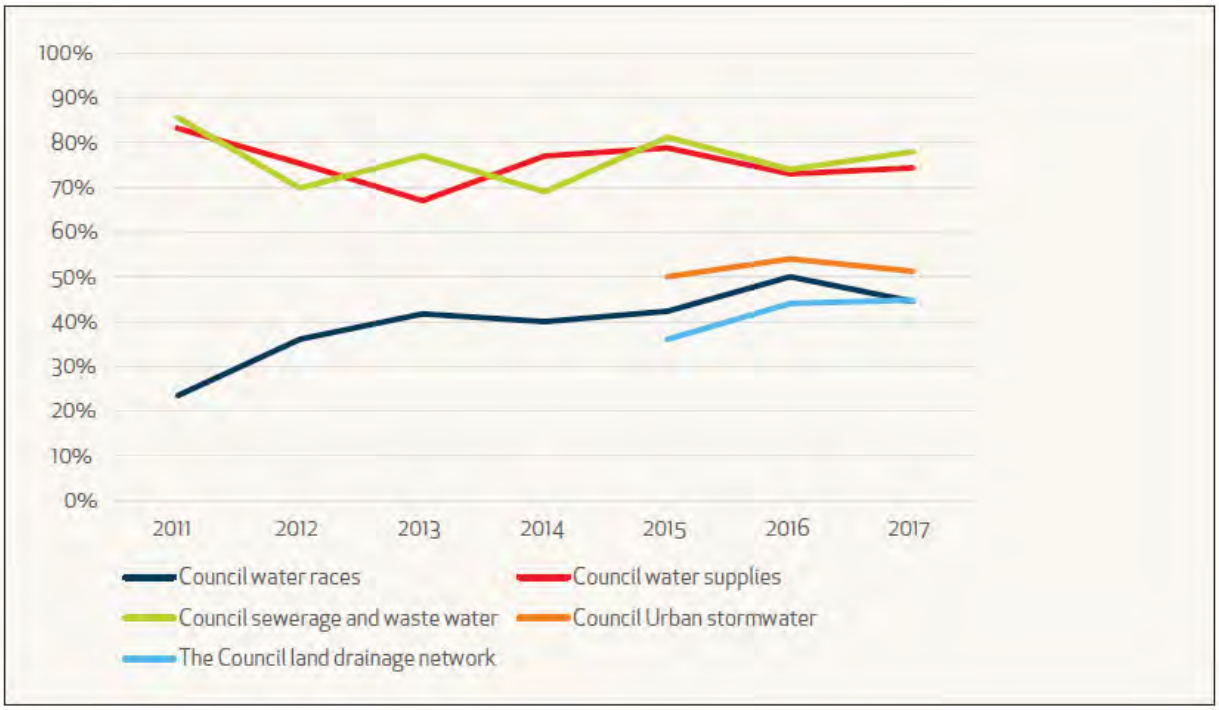



**Figure 5-2 Perceptions of Water Services, Over Time (Good and Very Good Responses) [14]**

### Drinking Water Compliance

For a number of years drinking water compliance has been measured and reported for the zone and treatment plant. The results and the targets for the past eight years are shown below in Figure 5-3.

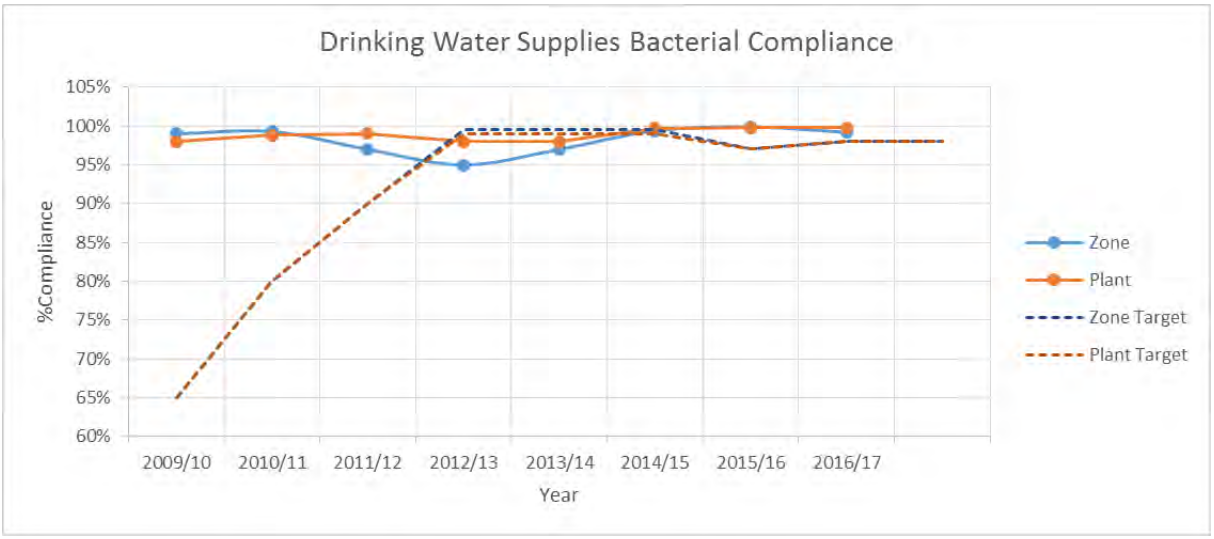



**Figure 5-3 Drinking Water Bacterial Compliance Past Performance**

[14] Source: Residents' Survey, June 2017

**Properties Serviced with the District**

For a number of years the proportion of residential properties serviced by water and wastewater services within the district has been measured. This measure shows the immense growth the district has undergone. The results and the targets for the past 8 years are shown below in Figure 5-4.

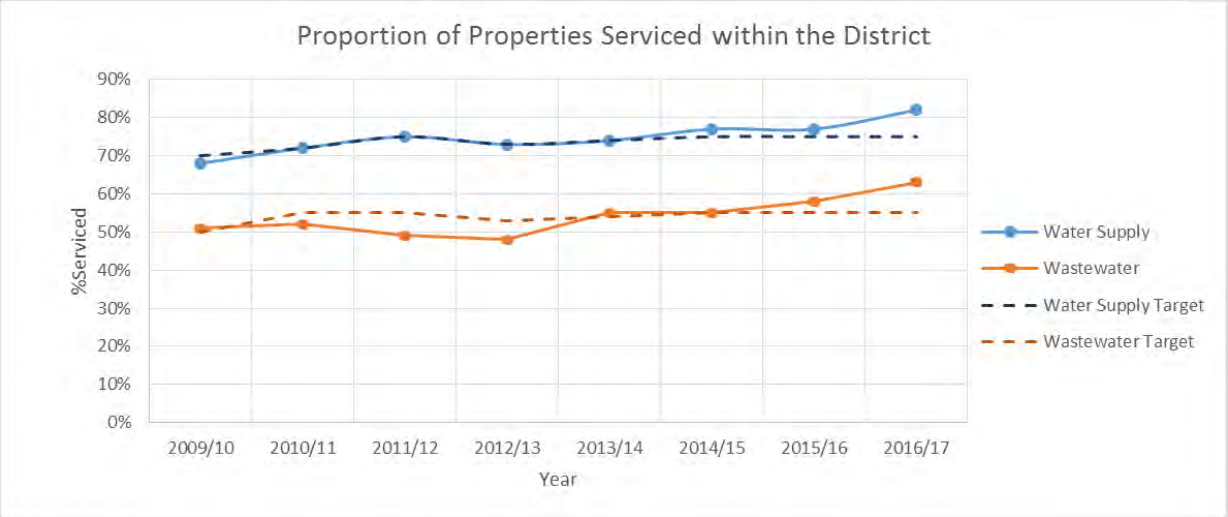



**Figure 5-4 Serviced Properties Past Performance**

**All other measures**

Table 5-11 below shows the achievement of the key performance indicators over the last two years (since the implementation of the mandatory measures). The data for these measures in captured in the AMS system. The capture and reporting of this data is continually being refined, therefore this is listed as an improvement item.

### Table 5-11 Key Performance Indicator Performance

| Land Drainage | | | | | | |
|---|---|---|---|---|---|---|
| **5Waters Objectives** | **Level of Service** | **Key Performance Indicators** | **Achievement** | **Target 2016/17** | **Achievement** | **Target 2015/16** |
| Nuisance effects from water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the land drainage network provided. | Proportion of the residents rating the land drainage system good or very good. | Achieved<br>45% | ≥40% | Achieved<br>44% | ≥40% |
| | The land drainage network is managed to give a good quality service. | The number of complaints received about the performance of the Land Drainage system, expressed per 1000 rated properties. | Achieved<br>3.37 | Less than 10 | Achieved<br>1.71 | Less than 10 |
| Water services are provided in a cost effective manner. | **Operating Costs**<br>The land drainage network is provided at a reasonable cost. | Total average operating cost per serviced property for Land Drainage. | Achieved<br>$74 | ≤$95 | Achieved<br>$79 | ≤$95 |
| **Stormwater** | | | | | | |
| **5Waters Objectives** | **Level of Service** | **Key Performance Indicators** | **Achievement** | **Target 2016/17** | **Achievement** | **Target 2015/16** |
| Adverse effects of water services on the environment are minimised. | **Discharge Compliance**<br>The stormwater network is managed in accordance with resource consents conditions. | Compliance with resource consents for discharge from the stormwater system measured by the number of:<br>e) abatement notices;<br>f) infringement notices<br>g) enforcement orders; and<br>h) convictions. | a) Achieved<br>b) Achieved<br>c) Achieved | a) Nil<br>b) Nil<br>c) Nil | a) Achieved<br>b) Achieved<br>c) Achieved | a) Nil<br>b) Nil<br>c) Nil |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Received from Environment Canterbury. | d) Achieved | d) Nil | d) Achieved | d) Nil |
| Nuisance effects of water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the stormwater network provided. | Proportion of residents rating the stormwater system good or very good. | Achieved<br>51% | ≥40% | Achieved<br>54% | ≥40% |
| | The stormwater network is managed to give a good quality service. | The number of complaints received about the performance of the stormwater system, expressed per 1000 rated properties. | Achieved<br>4.87 | Less than 10 | Achieved<br>6.19 | Less than 10 |
| Problems with water services are addressed in a timely manner and prioritised according to risk and need. | **Response Times**<br>Flooding events are attended promptly by contractors and/or staff. | The median response time to attend a flooding event measured from the time that personnel receives notification to the time that service personnel reach the site. | Achieved<br>Nil | Less than 1 hour for urgent flooding events | Achieved<br>Nil | Less than 1 hour for urgent flooding events |
| The community is provided with water services to a standard that protects their health and property. | **System Adequacy**<br>The stormwater system is maintained adequately and minimises flooding. | The number of flooding events that occur as a result of overflow from the stormwater system that enters a habitable floor. | Achieved<br>Nil | Nil in less than 50 year storm events | Achieved<br>Nil | Nil in less than 50 year storm events |
| | | For each flooding event, the number of habitable floors affected, expressed per 1000 properties connected to the stormwater system. | Achieved<br>Nil | Nil per 1000 connected properties in less than 50 year storm events | Achieved<br>Nil | Nil per 1000 connected properties in less than 50 year storm events |

| | | | | | | |
|---|---|---|---|---|---|---|
| Water services are provided in a cost effective manner. | **Operating Costs**<br>The stormwater network is provided at a reasonable cost. | Total average operating cost per serviced property for Stormwater. | Achieved<br>$73 | ≤$80 | Achieved<br>$78 | ≤$85 |
| **Wastewater** | | | | | | |
| **5Waters Objectives** | **Level of Service** | **Key Performance Indicators** | **Achievement** | **Target 2016/17** | **Achievement** | **Target 2015/16** |
| Adverse effects of water services on the environment are minimised. | **Discharge Compliance**<br>The wastewater network is managed in accordance with resource consent conditions. | Compliance with resource consents for discharge from the wastewater system measured by the number of:<br>e) abatement notices;<br>f) infringement notices<br>g) enforcement orders; and<br>h) convictions.<br>Received from Environment Canterbury. | a) Achieved<br>b) Achieved<br>c) Achieved<br>d) Achieved | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Achieved<br>b) Achieved<br>c) Achieved<br>d) Achieved | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil |
| Nuisance effects of water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the wastewater system provided. | Proportion of residents rating the wastewater system good and very good. | Achieved<br>78% | ≥60% | Achieved<br>60% | ≥60% |
| | The wastewater network is managed to give a good quality service. | The total number of complaints received about wastewater odour, blockages and system faults, expressed per 1000 rated properties. | Achieved<br>3.22 | Less than 15 | Achieved<br>3.33 | Less than 15 |
| Problems with water services are addressed in a timely manner and | **Fault Response Times**<br>Wastewater system faults or problems are attended to | Where personnel attend wastewater overflows resulting from a blockage or | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| prioritised according to risk and need. | promptly by contractors and/or staff. | other fault in the wastewater system. The median response time measures the:<br>c) attendance time: from the time that the personnel receives notification to the time that service personnel reach the site;<br>d) resolution time: from the time that the personnel receives notification to the time that service personnel confirm resolution of the blockage or other fault. | a) Achieved 30 minutes<br>b) Achieved 2 hours 36 minutes | a) Less than 1 hour<br>b) Less than 24 hours | a) Achieved 0 hours<br>b) Achieved 2 hours | a) Less than 1 hour<br>b) Less than 24 hours |
| Service capacity is provided to accommodate growing communities, where this growth is sustainable. | **Serviced Area**<br>The wastewater network is provided to growing communities, where this growth is sustainable. | The proportion of residential properties serviced by wastewater services within the district expressed as a percentage of total residential properties. | Achieved<br>63% | ≥55% | Achieved<br>58% | ≥55% |
| The community is provided with water services to a standard that protects their health and property. | **System Adequacy**<br>The wastewater network is managed to give a good quality service. | The number of dry weather wastewater overflows from the wastewater system, expressed per 1000 rated properties. | Not Achieved<br>1.1 | Less than 1 overflow | Not Achieved<br>1.3 | Less than 1 overflow |
| Water services are provided in a cost effective manner. | **Operating Costs**<br>Wastewater services are provided at a reasonable cost. | Total average operating cost per serviced property for wastewater. | Achieved<br>$349 | ≤$380 | Achieved<br>$346 | ≤$400 |

| Water Supply | | | | | | |
|---|---|---|---|---|---|---|
| **5Waters Objectives** | **Level of Service** | **Key Performance Indicators** | **Achievement** | **Target 2016/17** | **Achievement** | **Target 2015/16** |
| Adverse effects of water services on the environment are minimised. | **Water Take Compliance**<br>The water supply network is managed in accordance with resource conditions. | Compliance with resource consents for surface water takes for water supplies measured by the number of:<br>e) abatement notices;<br>f) infringement notices<br>g) enforcement orders; and<br>h) convictions.<br>Received from Environment Canterbury. | a) Achieved<br>b) Achieved<br>c) Achieved<br>d) Achieved | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Achieved<br>b) Achieved<br>c) Achieved<br>d) Achieved | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil |
| Nuisance effects of water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the water supply provided. | Proportion of residents rating the water supplies good or very good. | Achieved<br>74% | ≥65% | Achieved<br>73% | ≥60% |
| | The water supply network is managed to give a good quality service. | The total number of complaints received about drinking water clarity, continuity of supply, odour, taste, pressure and flow, expressed per 1000 rated properties. | Achieved<br>11.4 | Less than 15 | Achieved<br>5.47 | Less than 15 |
| Problems with water services are addressed in a timely manner and prioritised according to risk and need. | **Fault Response Times**<br>Water system faults or problems are attended to promptly by contractors and/or staff. | Where personnel attend a non-urgent call-out in response to a fault or unplanned interruption in the reticulation system. The median response times measures the:<br>a) attendance time: from the time that personnel receive notification to the time that service personnel reach the site; | a) Achieved 1 hour | a) Less than 24 hours | a) Achieved 40 minutes | a) Less than 24 hours |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | b) resolution time: from the time that personnel receive notification to the time that service personnel confirm resolution of the fault or interruption. | b) Achieved 23 hours 17 minutes | b) Less than 120 hours | b) Achieved 25 hours | b) Less than 120 hours |
| | | Where personnel attend an urgent call-out in response to a fault or unplanned interruption in the reticulation system. The median response times measures the:<br>c) attendance time: from the time that personnel receive notification to the time that service personnel reach the site;<br>d) resolution time: from the time that personnel receive notification to the time that service personnel confirm resolution of the fault or interruption. | a) Achieved 32 minutes<br>b) Achieved 2 hours 17 minutes | a) Less than 4 hours<br>b) Less than 48 hours | a) Achieved 34 minutes<br>b) Achieved 24 hours | a) Less than 4 hours<br>b) Less than 48 hours |
| Service capacity is provided to accommodate growing communities, where this growth is sustainable. | **Serviced Area**<br>The water supply network is provided to growing communities, where this growth is sustainable. | The proportion of residential properties serviced by water supplies within the district expressed as a percentage of total residential properties. | Achieved<br>82% | ≥75% | Achieved<br>77% | ≥75% |
| | **Maintenance of the Reticulation Network**<br>The water supply network is managed to minimise the leakage or loss from the system. | The percentage of real water loss from the water reticulation system in urban schemes. | 16.4% | Value to be Reported | 19.4% | Value to be Reported |

| | | | | | | |
|---|---|---|---|---|---|---|
| | **Fire Fighting**<br>There is adequate fire fighting supply in the approved areas. | The proportion of an urban fire district area within 135m of one fire hydrant and 270m of two fire hydrants. | Achieved<br>70% | Greater than 60% of the district | Achieved<br>64% | Greater than 60% of the district |
| | **Demand Management**<br>There is enough water supplied to meet customer needs. | The average consumption of drinking water per day per resident. | Achieved<br>0.43$m^3$ per person per day | Less than 1..3$m^3$ per person per day within urban schemes | Achieved<br>0.5$m^3$ per person per day | Less than 1.3$m^3$ per person per day within urban schemes |
| | **Safety of Drinking Water**<br>Water is safe to drink and complies with the Drinking Water Standards of New Zealand. | The extent to which the drinking water supplies comply with the drinking water standards for bacteria compliance. | Achieved<br>Treatment: 99.8%<br>Reticulation: 99.2% | 98% of monitoring samples comply, at both the treatment plant and within the reticulation, across the district | Achieved<br>Treatment: 99.8%<br>Reticulation: 99.9% | 97% of monitoring samples comply, at both the treatment plant and within the reticulation, across the district |
| | | The extent to which the drinking water supplies comply with the drinking water standards for protozoal compliance. | Achieved<br>50% | 55% of the treatment plant sites are compliant across the district | Achieved<br>52% | 40% of the treatment plant sites are compliant across the district |
| Water services are provided in a cost effective manner. | **Operating Costs**<br>The water supply is provided at a reasonable cost. | Total average operating cost per serviced property for water supply. | Achieved<br>$310 | ≤$340 | Achieved<br>$324 | ≤$360 |

| Water Races | | | | | | |
|---|---|---|---|---|---|---|
| **5Waters Objectives** | **Level of Service** | **Key Performance Indicators** | **Achievement** | **Target 2016/17** | **Achievement** | **Target 2015/16** |
| Nuisance effects of water services are minimised. | **Customer Satisfaction**<br>Residents are satisfied with the water race network provided. | Proportion of residents rating the water race system good or very good. | Achieved<br>44% | ≥30% | Achieved<br>50% | ≥30% |
| | The water race network is managed to give a good quality service. | The total number of complaints received about continuity of supply, expressed per 1000 rated properties. | Achieved<br>29.66 | Less than 150 | Achieved<br>30 | Less than 200 |
| Problems with water services are addressed in a timely manner and prioritised according to risk and need. | **Fault Response Times**<br>Water race system faults or problems are attended to promptly by contractors and/or staff. | Where personnel attends an urgent blockage or other fault in the water race system. The median response times measures the:<br>c) Attendance time: from the time that personnel receives notification to the time that service personnel reach the site;<br>d) Resolution time: the time that personnel receives notification to the time that service personnel confirm the resolution of the blockage or other fault. | a) Achieved 2 hours 4 minutes<br>b) Achieved 3 hours 20 minutes | a) Less than 4 hours<br>b) Less than 48 hours | a) Achieved 2 hours 23 minutes<br>b) Achieved 3 hours 53 minutes | a) Less than 4 hours<br>b) Less than 48 hours |
| Water services are provided in a cost effective manner. | **Operating Costs**<br>The water race network is provided at a reasonable cost. | Total average operating cost per serviced property for water races. | ≤$139 | ≤$190 | Achieved<br>$161 | ≤$180 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Adverse effects of water services on the environment are minimised. | **Water Take Compliance**<br>The water race network is managed in accordance with resource consent conditions. | Compliance with resource consents for surface water takes for water supplies measured by the number of:<br>e) abatement notices;<br>f) infringement notices<br>g) enforcement orders; and<br>h) convictions.<br>Received from Environment Canterbury. | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil | a) Achieved<br>b) Achieved<br>c) Achieved<br>d) Achieved | a) Nil<br>b) Nil<br>c) Nil<br>d) Nil |

### Service Level Improvement Plan

Service level improvements occur when projects are undertaken that enhance the existing network or provide a new service. Projects identified in this plan will be prioritised according to urgency and importance.

As part of the long term process all known asset requirements are identified and assessed for inclusion in the plan. The budget is allocated to the most appropriate year from the best available information. The capital works program is approved by the Councillors and the executive team and then goes through a submissions process before finally being adopted. Projects that have been approved for funding from previous years are reviewed as part of this process and may be dropped if priorities or funding levels change.

Some capital works projects are 100% service level improvements since they provide a new service or are solely to increase in an existing level of service. Others, especially where there is a growth element involved, can be a mixture of renewals, growth and service level improvement.

### Adoption of Levels of Service

The adoption of the LoS by Council is via Councils LTP program where any primary LoS changes are considered (no significant primary changes have occurred).

## 5.4 Improvement Planning

Throughout this section a number of specific actions to improve the way in which the Council identifies and manages its level of service associated with the 5Waters activity. These actions are summarised below in Table 5-12.

**Table 5-12 AM Improvement Items – Levels of Service**

| Section Ref | Improvement Opportunities | Priority | Timing |
|---|---|---|---|
| 5.3.4 | Continue to refine key performance measure targets | Medium | Every 3 years |
| 5.3.4.3 | Continue to improve capture of key performance indicator information within our AMS system | Medium | Ongoing |

## 6.0 GROWTH AND DEMAND

This section provides details of growth forecasts and demand drivers, which affect the management, and utilisation of 5Waters assets. Selwyn District Council adopted its Growth Model for planning use in December 2013. It includes 2013 census data and allowances for post-earthquake settlement patterns and the impact of the LURP.

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

- Local population trends;
- Accuracy of predicted future populations;
- Local economic trends;
- Land use change;
- Changing technologies;
- Changing legislative requirements;
- Changing regional and district planning requirements;
- Water resource issues; and
- Climate and climate change.

Increasing demand for services over time generates a requirement for an increase in the scope of services, and for the development of additional infrastructure. Expenditure programmes need to be planned to fund the capital works and associated on-going operational expenditure. Alternately, it may be possible to manage demand within the existing system capacity or through the use of non-asset solutions.

Where a reduced demand is forecast it may be appropriate to renew assets with a lesser capacity, operation expenses may decrease or an asset may become surplus to requirements. This situation is not predicted for any communities in Selwyn District within the next thirty years.

Statistics New Zealand's 2013 census summary of the district follows[15].

[15] http://www.stats.govt.nz/Census/2013-census/profile-and-summary-reports/qstats-place-posters.aspx#canterbury

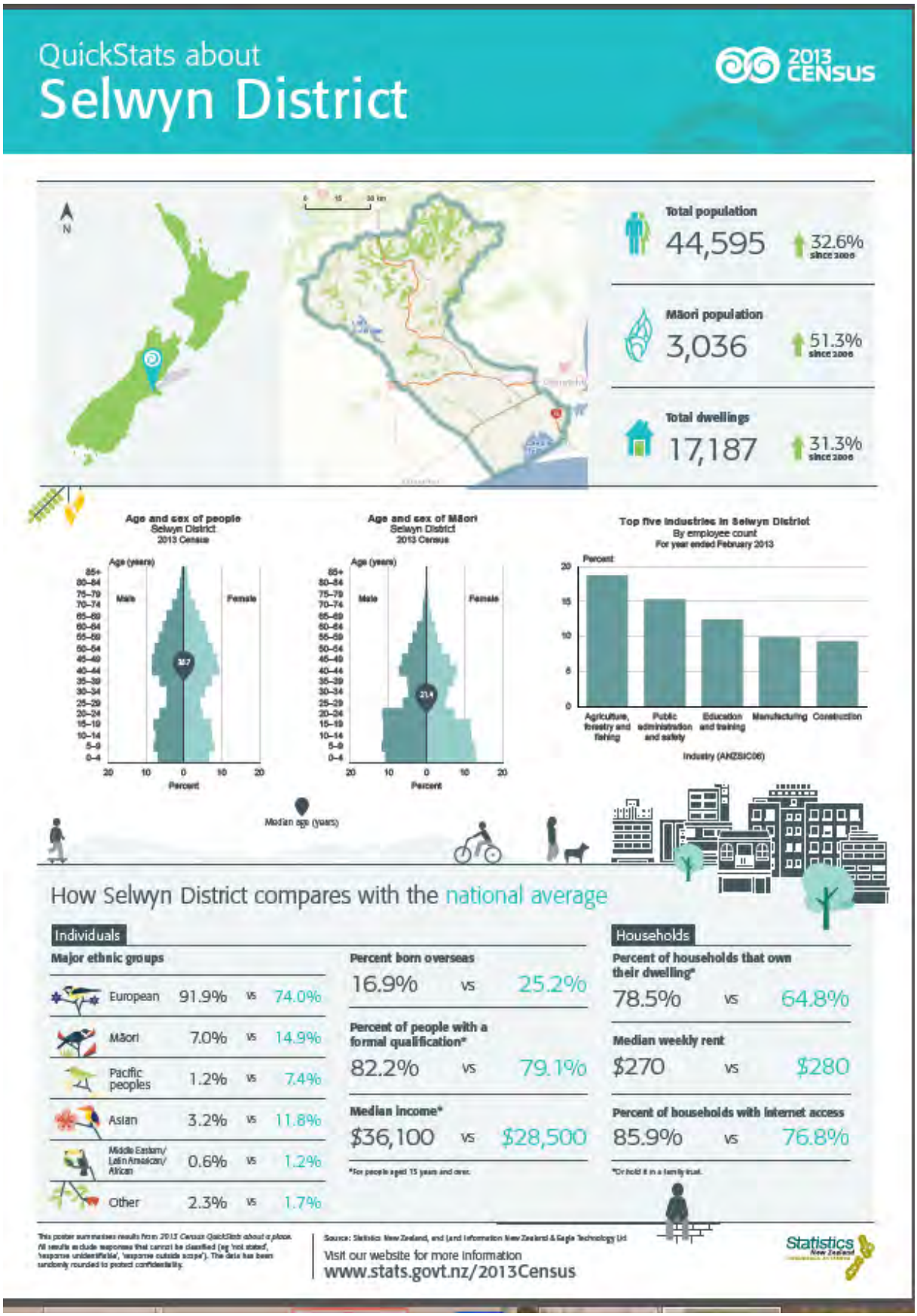



**Figure 6-1 Statistics New Zealand Summary**

## 6.1 Population Projections (District and Community)

The population of the Selwyn District has grown rapidly over the past thirty years, from 20,520 in 1986 to approximately 56,200 in 2016, an overall increase of 174%. The rate of growth has also increased each decade. This is a substantially greater rate of growth than experienced by either the Canterbury Region (+37%) or total New Zealand (+42%).

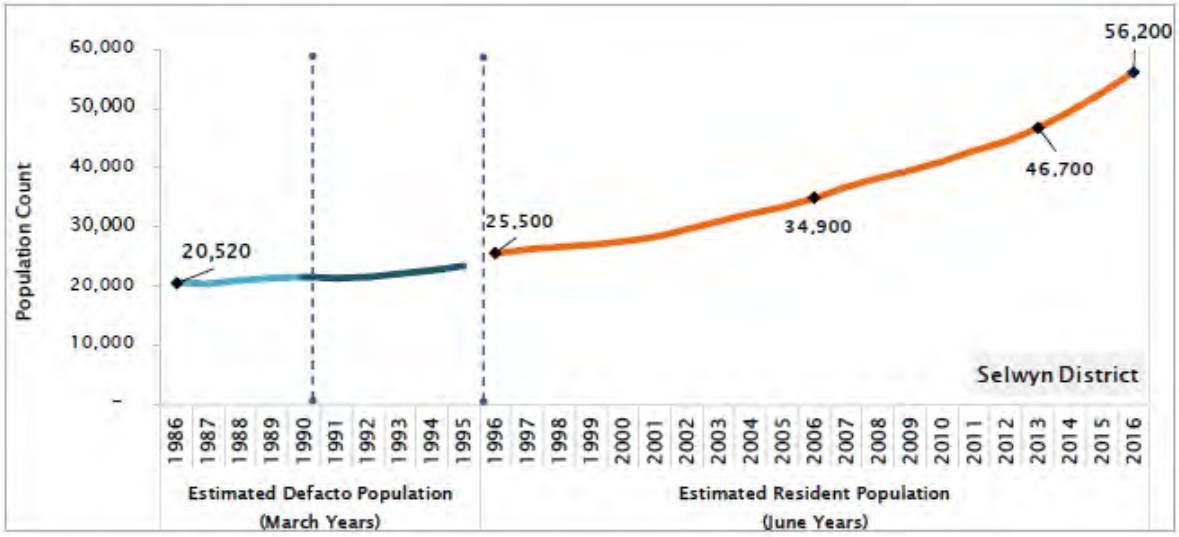



**Figure 6-2: Population Size and Growth, 1986-2016, Selwyn District16**

*Notably Selwyn's growth was occurring prior to the 2010-2011 Christchurch earthquakes, although it has since escalated. Between 1996 and 2010 the population grew by an average 4.3% per year, whilst between 2010 and 2016 it grew by 6.2% per year, the growth rate increasing each year between 2012 and 2016.*

The population of the Selwyn District has grown significantly over the past few decades, disproportionately due to high net internal migration gains, whilst simultaneously experiencing low/negative international migration. Meanwhile natural increase has remained comparatively low (See Figure 6-2).

The district has also seen strong growth from high levels of natural increase, driven partly by that internal migration. These trends have resulted in the population of Selwyn being relatively youthful, New Zealand's third-youngest TA in 2013. However the district's population is also ageing at a faster rate than both the Canterbury Region and total New Zealand, due to greater numerical growth at older ages. This latter situation does not appear to be caused by significant migration gain at older ages (for Selwyn), but rather, ageing-in-place, that is, greater percentage growth in numbers at older ages than

[16] Source: Natalie Jackson Demographics (2017) Selwyn – Review of Demographics (Part A)

for both Canterbury and total New Zealand, seemingly because they remain in the district, or leavers are replaced via arrivals, as they age. Migration has steadily been from Christchurch City into Selwyn. Inter-census periods 2001-06 and 2008-13 both show 71% of migration into Selwyn district was from Christchurch city. Figure 6-3 indicates peaks at the 'parents and children' cohorts, this is supported by the need for new schools in Rolleston and Lincoln.

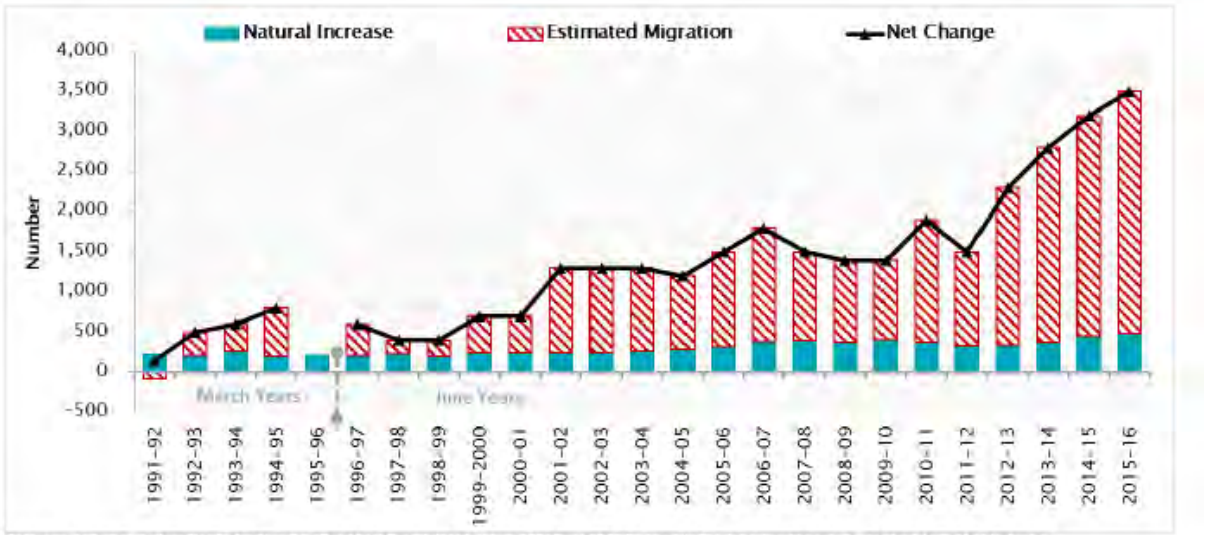



**Figure 6-3: Observed Components of Change (1991-2016), Selwyn District17**

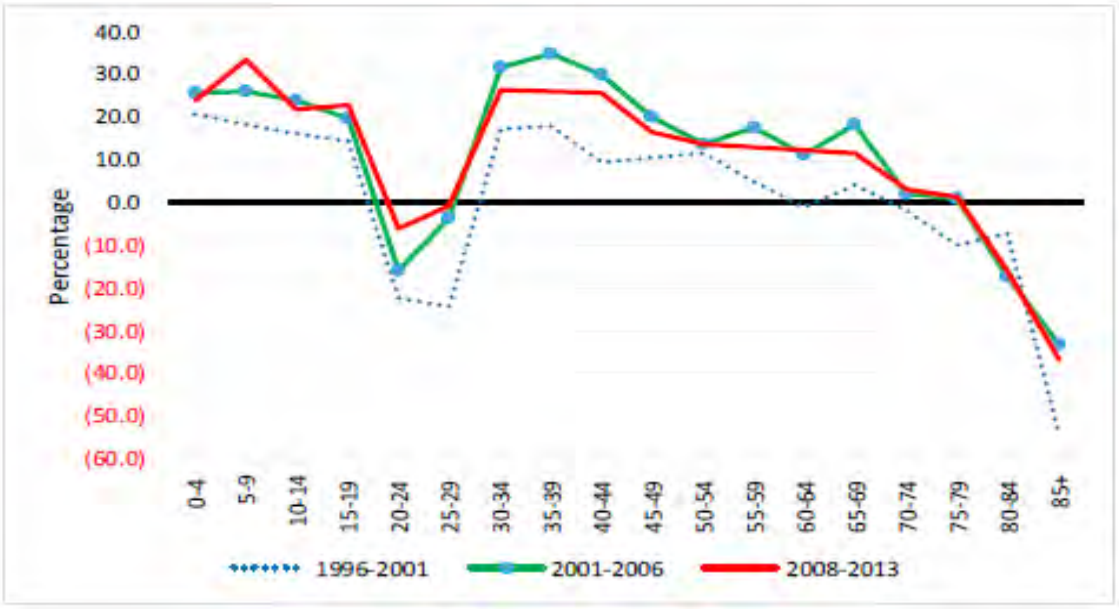



**Figure 6-4: Net migration as a percentage of each age group, 1996-2001, 2001-2006, 2008-2013, Selwyn District[18]**

[17] Source: Natalie Jackson Demographics (2017) Selwyn – Review of Demographics (Part A)

[18] Source: Natalie Jackson Demographics (2017) Selwyn – Review of Demographics (Part A)

Despite its appearance of a relatively youthful population, population aging is already evident in the district. Figure 7.4 shows a high proportion of residents in the 20 to 39 brackets, reducing through the older age groups in 1996. Twenty years later, the 40 to 54 brackets and 5 to 24 year olds are the most prevalent. The reduction in 25 to 39 year olds is significant.

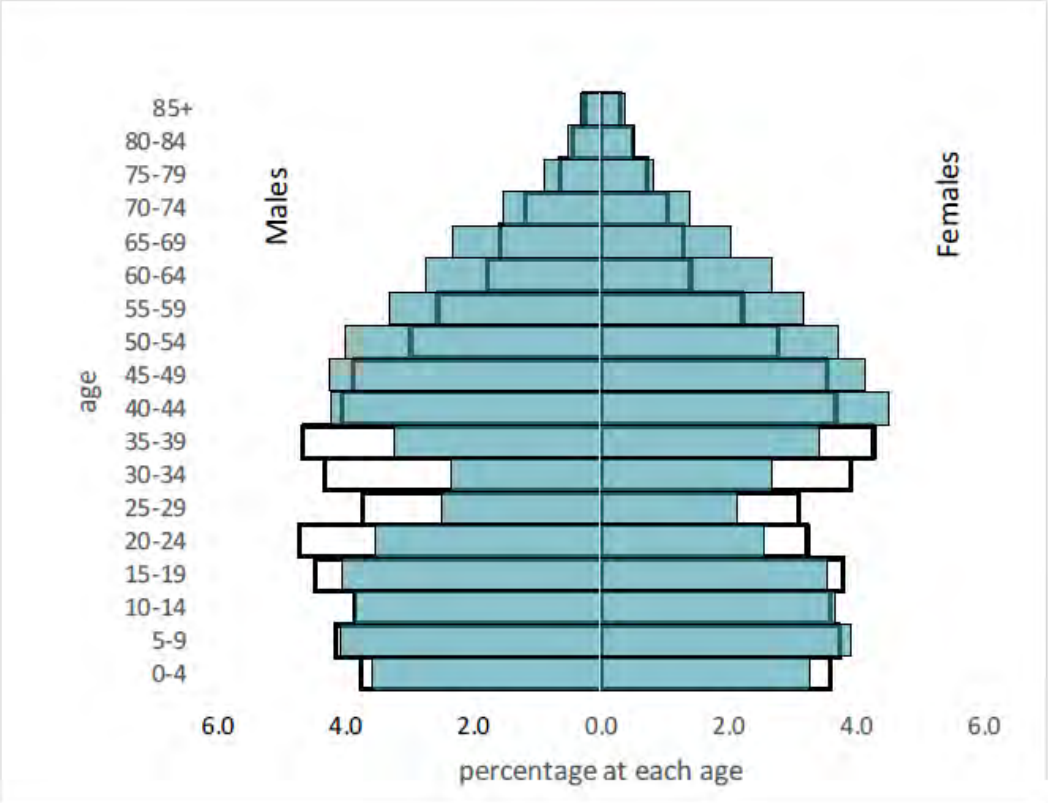



**Figure 6-5: Age-Sex Structure, 1996 (unshaded bars) and 2013 (shaded bars), Selwyn District[19]**

There are a high proportion of commuters, especially to Christchurch City. This trend is expected to continue as transportation links between Christchurch and Rolleston improve.

## Council Model for Selwyn District Growth

Prior to the 2013 census SDC worked with Business and Economic Research Limited (BERL) to develop growth scenarios for the purposes of activity management and long term planning. Following the census, Council has developed and refined a medial projection.

In 2017 Council engaged Natalie Jackson Demographics to review the projections model and advise on its use for long term planning in the future. This rigorous review confirmed the suitability of the model and highlighted challenges with the underpinning assumptions and source data for migration. While

[19] Source: Natalie Jackson Demographics (2017) Selwyn – Review of Demographics (Part A)

a cohort-migration projection would be more robust, the overall and township projections for both population and household numbers were sufficient.

One key finding of the review was the impact of numbers of inhabitants per household. This currently differs across the district, and will continue to reduce as the population ages.

Applying the review and resetting township populations in 2017 using rates and services data, the model has been improved for long term planning purposes.

The application of the growth projection is illustrated in Figure 6-6 below.

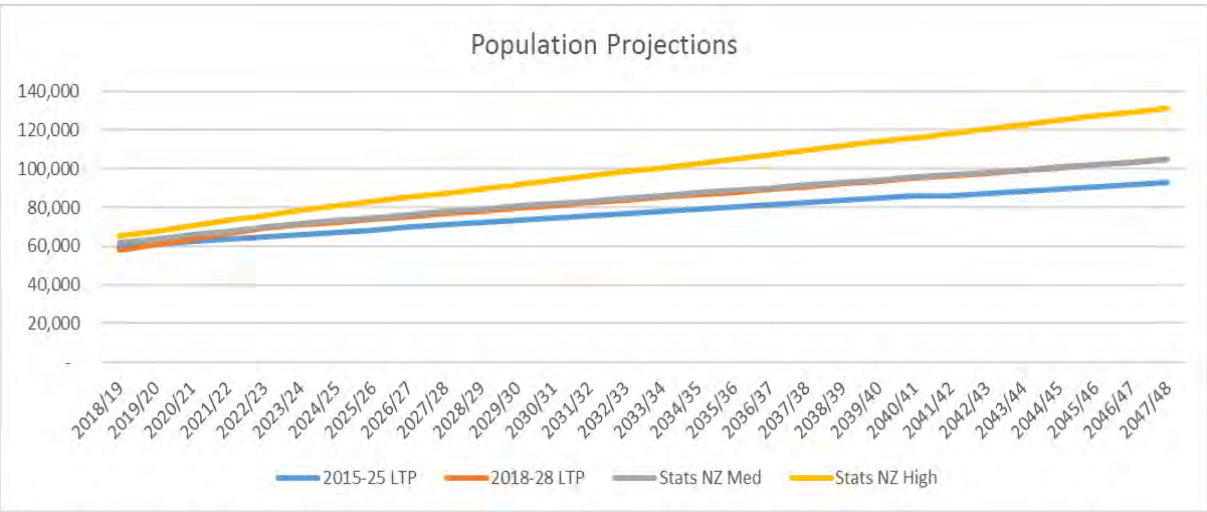



**Figure 6-6: District Population Projections 2018 to 204820**

These projections indicate very little difference between the SDC model and the statistics NZ medium variant. The SDC model is calibrated annually and has been shown to be close to the figures projected.

Considering the potential growth scenarios, the variants suggest two considerations.

1. Growth is less than expected, the low variant indicates a 2043 population some 10,000 resident less than the SDC model and Statistics NZ medium variant.
2. Growth is greater than projected, the high variant indicates a 2043 population of 15,000 more residents.

These scenarios should be considered in the decision-making around provisions of infrastructure.

Statistics New Zealand's models show a reduction in migration which is reflected in area unit movements. This is indicated in figure 7.6 below. The Selwyn District Model does not project a drop in population growth associated with the reduction in immigration. The impact on communities across this district is shown in the figure at an area unit level. While the numbers vary from the actual township populations the trends are useful.

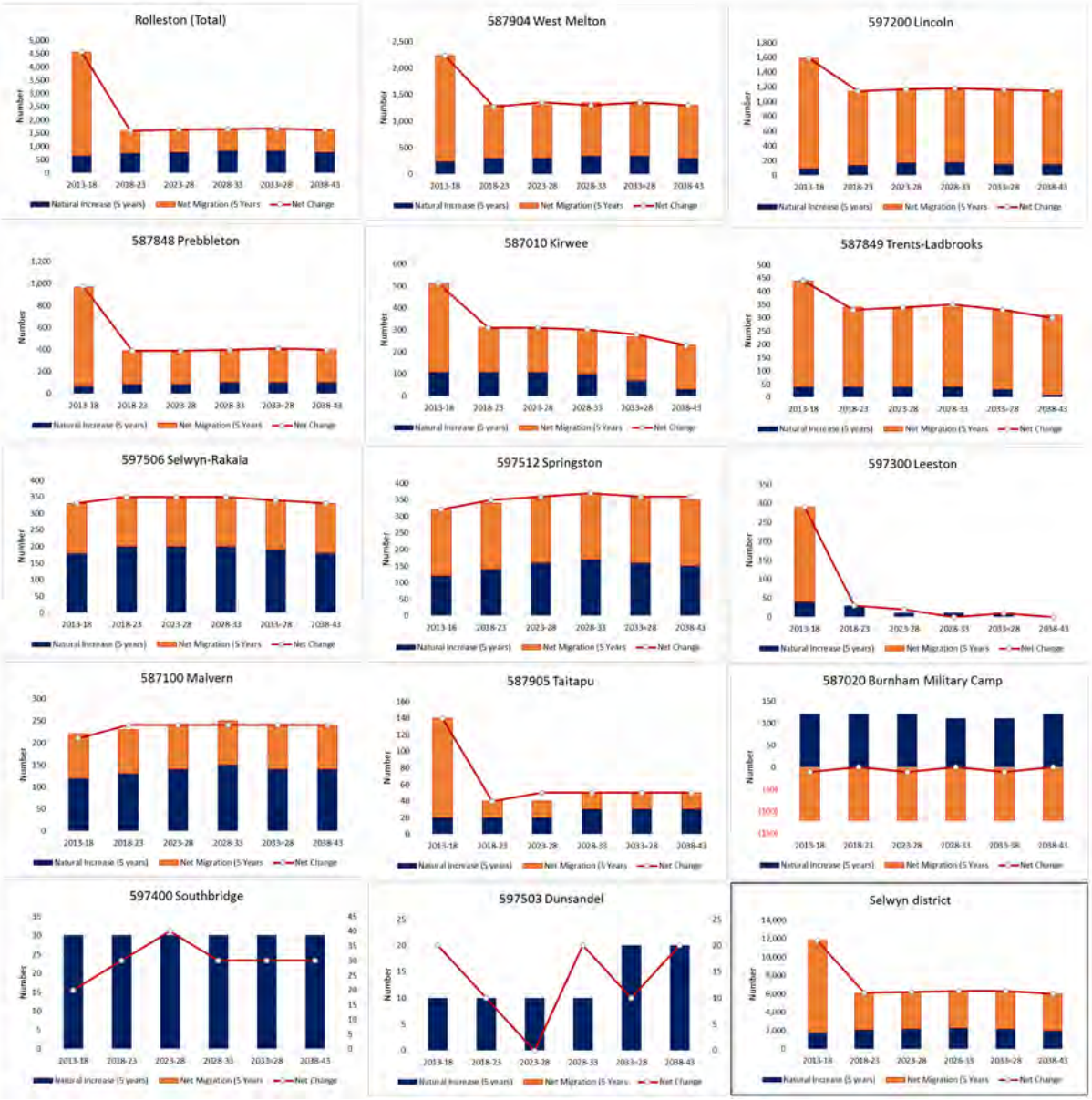



**Figure 6-7: Projected Components of Change (Net Migration and Natural Increase) for Selected Area Units of the Selwyn District, and Total Selwyn District, 2013-204321**

[21] Source: Natalie Jackson Demographics (2017)– Review of Demographics (Part B) - Townships

The Statistics NZ data shows that age-sex structures do vary across the district, with Rolleston expected to continue to have a more youthful population; while aging is more pronounced in other communities. Lincoln is heavily influenced by the student population, while Burnham currently is a base for young male soldiers. Changes to the operation of the military camp will affect the composition of Burnham and other communities in terms of where soldiers reside in future. This is a factor in the 2017 review of the SDC growth model.

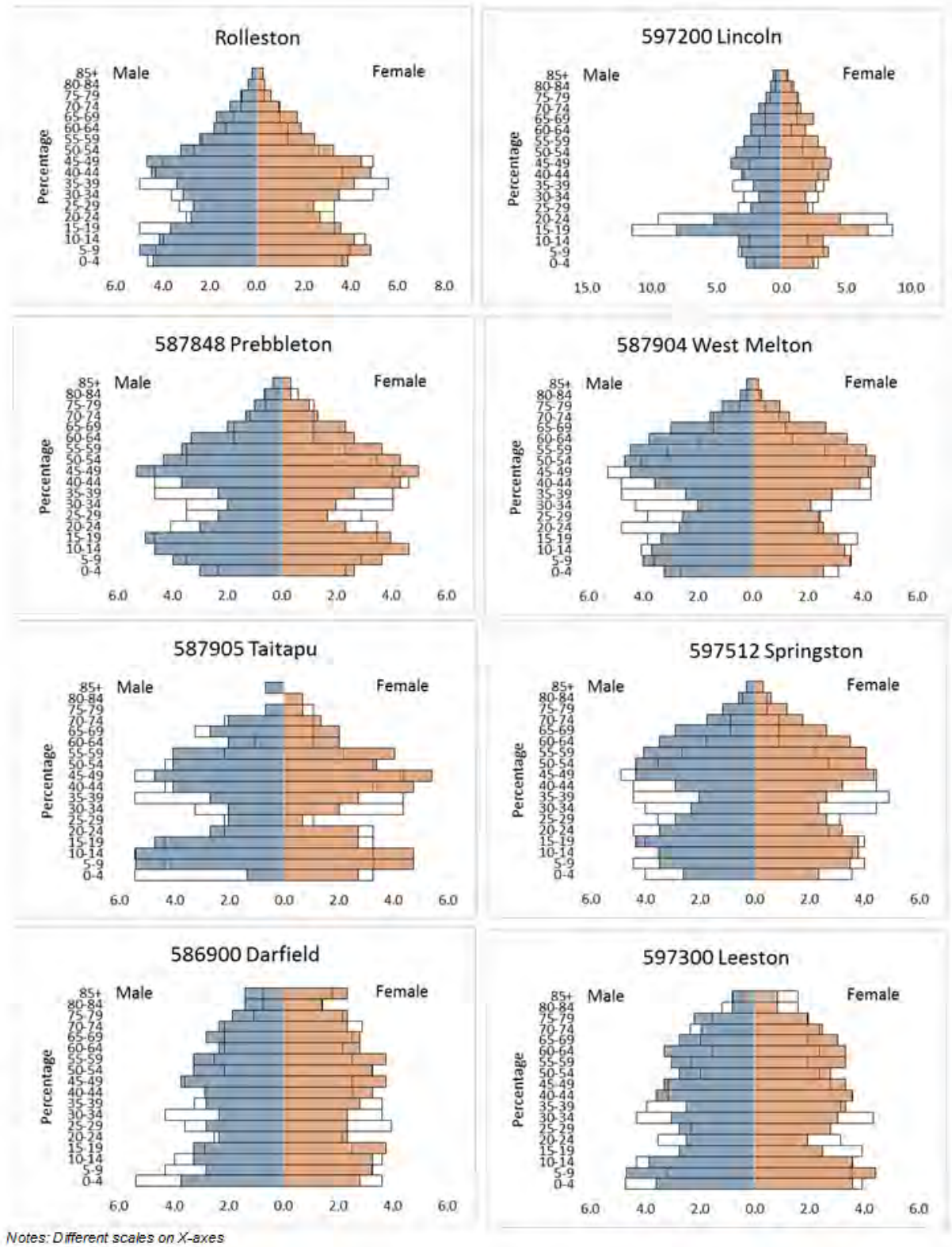



**Figure 6-8: Age-Sex Structures 1996 (unshaded bars) and 2016 (shaded bars) for Selected Area Units of the Selwyn District**[22]

[22] Source: Natalie Jackson Demographics (2017)– Review of Demographics (Part B) - Townships

The growth projections for population and households includes the following key assumptions:

- Model includes 2013 census 'start' numbers revised to align with 2017 Council data;
- Of the increase in residents, 85% will be in the urban area; and of those, 80% will be in the LURP area (55% in Rolleston, 34.5% in Lincoln, 8% in Prebbleton, 2% in West Melton and 0.25% in Springston and Tai Tapu);
- The number of persons per household will drop by 0.1 households in 2027, and a further 0.1 persons per household in 2038;
- Rolleston's population is younger than average and has larger household sizes, 2.8 person per household will drop to 2.7 households in 2027, and further to 2.6 persons per household in 2038;
- Leeston's population is somewhat older and have smaller household sizes, 2.6 person per household will drop to 2.5 households in 2027, and further to 2.4 persons per household in 2038;
- Darfield's population are older and have smaller household sizes, 2.5 person per household will drop to 2.4 households in 2027, and further to 2.3 persons per household in 2038; and
- The balance of the district's population is expected to comprise 2.7 person per household will drop to 2.6 households in 2027, and further to 2.5 persons per household in 2038.

Table 6-1 below outlines the growth projections.

**Table 6-1 Growth Projections**

| Location | Proportion of LURP growth | Persons/hh 2017 | Persons/hh 2027 | Persons/hh 2018 |
|---|---|---|---|---|
| Rolleston | 55.00% | 2.8 | 2.7 | 2.6 |
| Lincoln | 34.50% | 2.7 | 2.6 | 2.5 |
| Prebbleton | 8.00% | 2.7 | 2.6 | 2.5 |
| West Melton | 2.00% | 2.7 | 2.6 | 2.5 |
| Tai Tapu | 0.25% | 2.7 | 2.6 | 2.5 |
| Springston | 0.25% | 2.7 | 2.6 | 2.5 |
| Darfield | - | 2.5 | 2.4 | 2.3 |
| Leeston | - | 2.6 | 2.5 | 2.4 |
| Others | - | 2.7 | 2.6 | 2.5 |

The number of persons per household represents a change from the previous model where the number of persons per household was uniform at 2.8. This change reflects 2013 census data and the normal pattern of aging populations. This has an overall impact of some 3,000 additional households at 2043.

The growth of populations across the district is illustrated in the following graphs and infographics.

These are sourced from Natalie Jackson Demographics (2017) or produced by Waugh Infrastructure Management Ltd for this document. As the infographic illustrates the relative size and rate of growth for the townships, the township 'spread' is not representative.

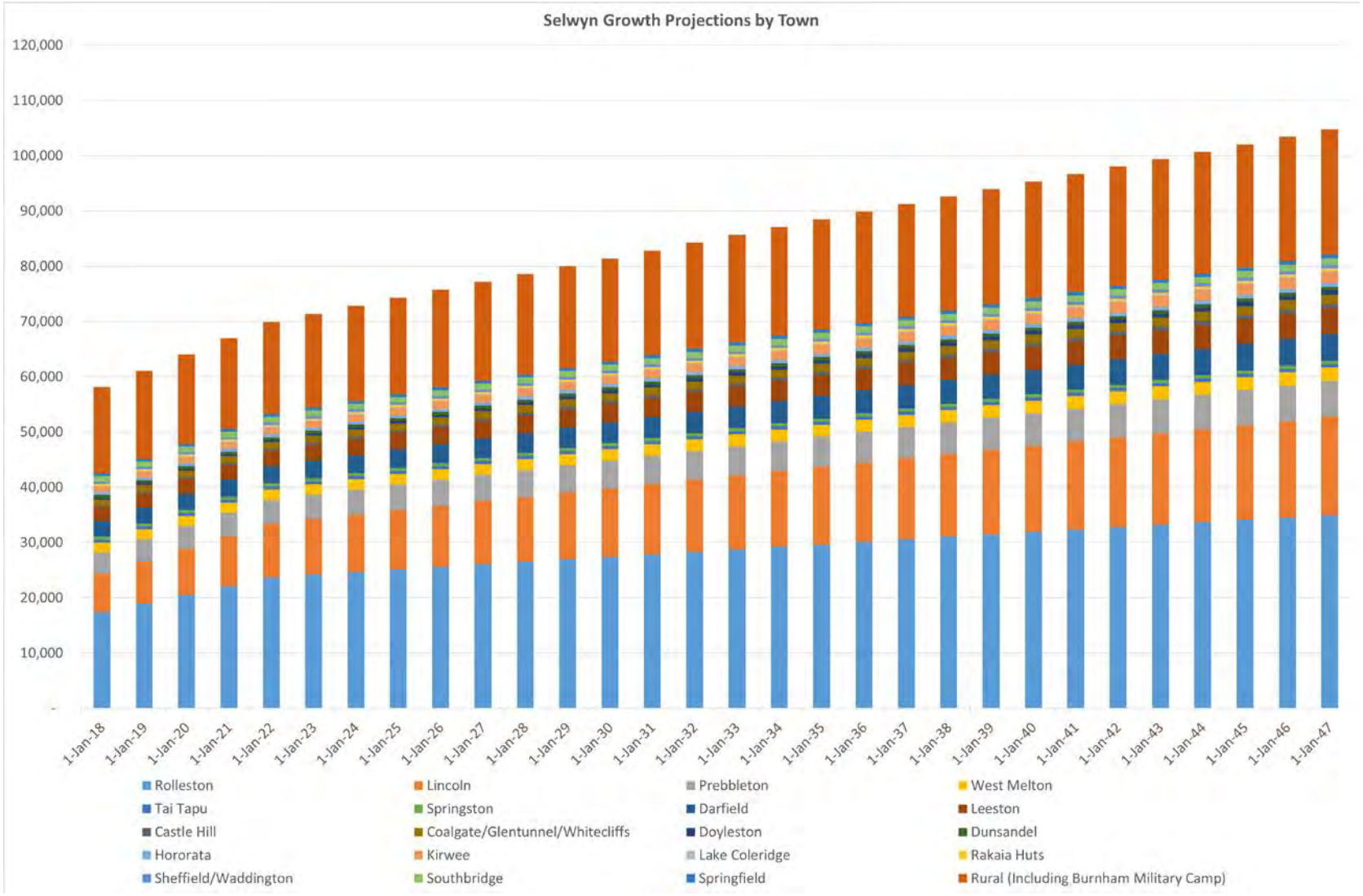



**Figure 6-9: District Population and Households 2018 to 2048**

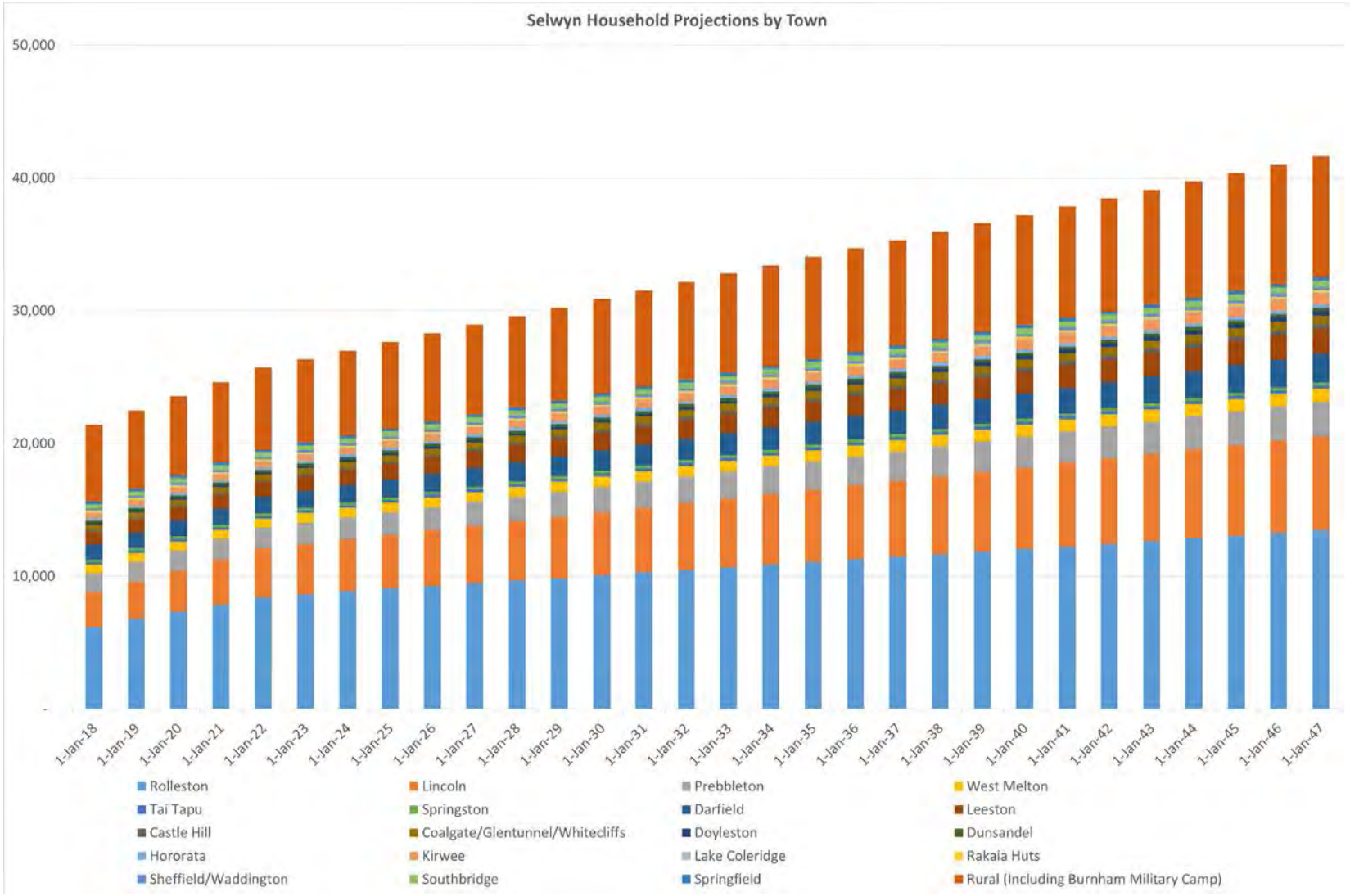



**Figure 6-10: Selwyn Population Growth Projections**


**Figure 6-11: Selwyn Populations Growth Projections**


**Figure 6-12: Selwyn Populations Growth Projections**


**Figure 6-13: Selwyn Populations Growth Projections**

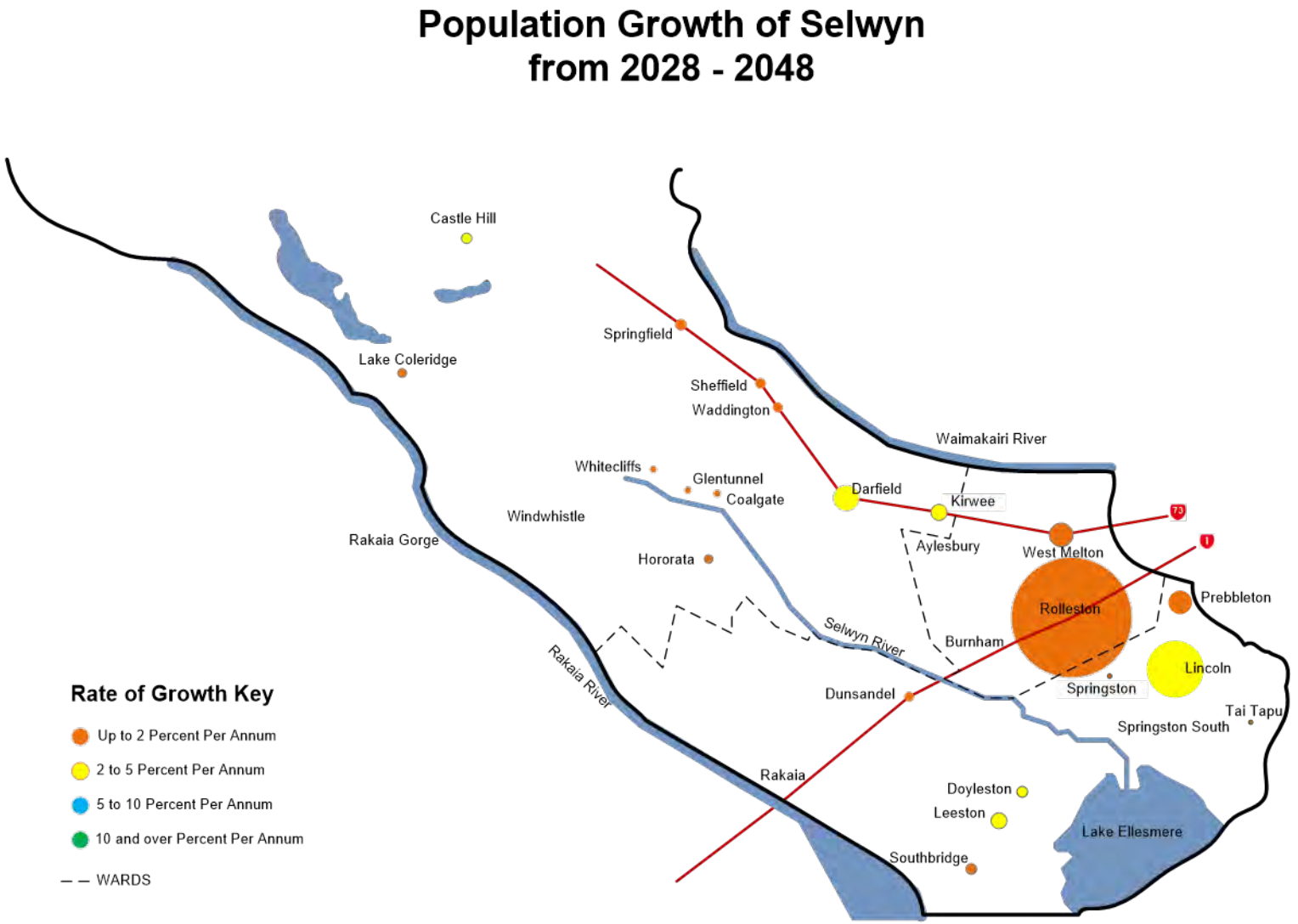
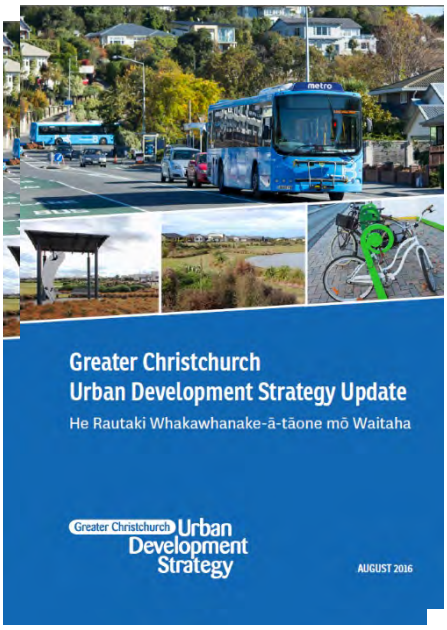



**Figure 6-14: Selwyn Populations Growth Projections**

## 6.2 Greater Christchurch Urban Development Strategy (UDS) - Background and effects

The Greater Christchurch Urban Development Strategy (UDS) has a significant influence on Selwyn District Council's planning and actions. The UDS area includes the Springs and Selwyn Central Wards of the District.




*The Greater Christchurch Urban Development Strategy (the Strategy) is a bold and ambitious plan for managing urban development that protects water, enhances open spaces, improves transport links, creates more liveable centres and manages population growth in a sustainable way.*

*The Strategy vision is for a greater Christchurch for the residents of the area (living south of the Ashley River and north of the Selwyn River) and the Strategy partners, Environment Canterbury, the Christchurch City Council, Selwyn and Waimakariri District Councils and the New Zealand Transport Agency (formerly Transit New Zealand).*

*The Strategy provides the primary strategic direction for the Greater Christchurch area, including the location of future housing, development of social and retail activity centres, areas for new employment and integration with transport networks. It also establishes a basis for all organisations, not just the Strategy partners, and the community to work collaboratively to manage growth.*

*The Strategy was created through a three-year long consultation and development process initiated in 2004 due to rising concerns over the lack of collaborative planning and leadership to manage growth in the area in a sustainable way. Community consultation undertaken by the Strategy partners resulted in over 3,250 submissions on growth management options for the area*

In 2016 the strategy was revised to align with post-earthquake priorities and legislation. The key changes were the establishment of new guiding principles and strategic goals. This led to new implementation methods and the support of the "Resilient Greater Christchurch Plan". The actions have been updated, with SDC having a role as UDS partner.

Greater Christchurch Urban Development Strategy

## Strategic goals

**Healthy communities**

- The distinct identities and sense of place of the towns, suburbs and city areas are recognised and enhanced.
- Ngāi Tahu is able to reinforce and re-establish connections with ancestral land, waterways and other taonga, and enhance the Ngāi Tahu sense of identity and belonging in the region.
- People and communities have equitable access to a range of integrated community infrastructure, facilities and services, including education, health, sport, recreation and core council services.
- Individuals, whānau and communities are empowered to participate and engage with strategy partners.
- The increasing diversity of the population and communities is recognised, and reflected in strategies, plans, programmes and projects.
- With good urban design, neighbourhoods and their centres include communal spaces, are liveable, walkable, safe and attractive, and have good connectivity and accessibility.
- Buildings and homes incorporate sustainable building principles and innovative design so that they are warm, safe and accessible.
- Housing offers a more diverse range of types and sizes. Affordable housing provides for the needs of different people and groups.
- Ngāi Tahu whānau are able to develop papakāinga/kāinga nohoanga, and use Māori reserve land to provide for their economic, social and cultural wellbeing.

**Enhanced natural environments**

- Groundwater quality and quantity are maintained or improved.
- Indigenous biodiversity, ecosystems and mahinga kai values are protected and enhanced.
- The many values of the coastline, estuaries, wetlands and waterways are recognised and restored, and their ecosystem services are recognised.
- Resource efficiency is supported by energy and water conservation, waste minimisation and local food production.
- Air quality is improved and maintained.

**Prosperous economies**

- Land, water and other valued resources are able to be used sustainably and within agreed limits.
- Adequate land for commercial and industrial uses is available in appropriate locations. The rebuilding and regeneration needs of businesses are well addressed.
- Economic development embraces innovation and technology, and is supported by effective and efficient transport and infrastructure.
- A collaborative and connected business environment supports workforce education and retention.

**Integrated and managed urban development**

- Clear boundaries for urban development are defined and maintained. The urban area is consolidated by redeveloping and intensifying existing urban areas.
- New urban development is well integrated with existing urban areas. Sufficient land is available to meet needs for regeneration and future land use.
- We understand and plan for risk from natural and other hazards, including flooding, seismic activity, sea level rise and climate change.
- A network of vibrant and diverse key activity and neighbourhood centres supports the Christchurch central city, incorporates mixed-use and transport-orientated development, supports increased density and diversity of housing, and provides access to community facilities.
- An efficient, reliable, safe and resilient transport system for people and businesses reduces dependency on private motor vehicles, promotes active and public transport, and improves accessibility for all people.
- Key public transport corridors and routes are identified and protected. The transport network can readily adapt to new technology and modes.
- Infrastructure, including transport, is resilient, timely and affordable, and comprehensively integrated with land use planning.
- Strategic regional and sub-regional infrastructure, including Lyttelton Port and Christchurch International Airport, service and utility hubs, and existing and future corridors, is protected.

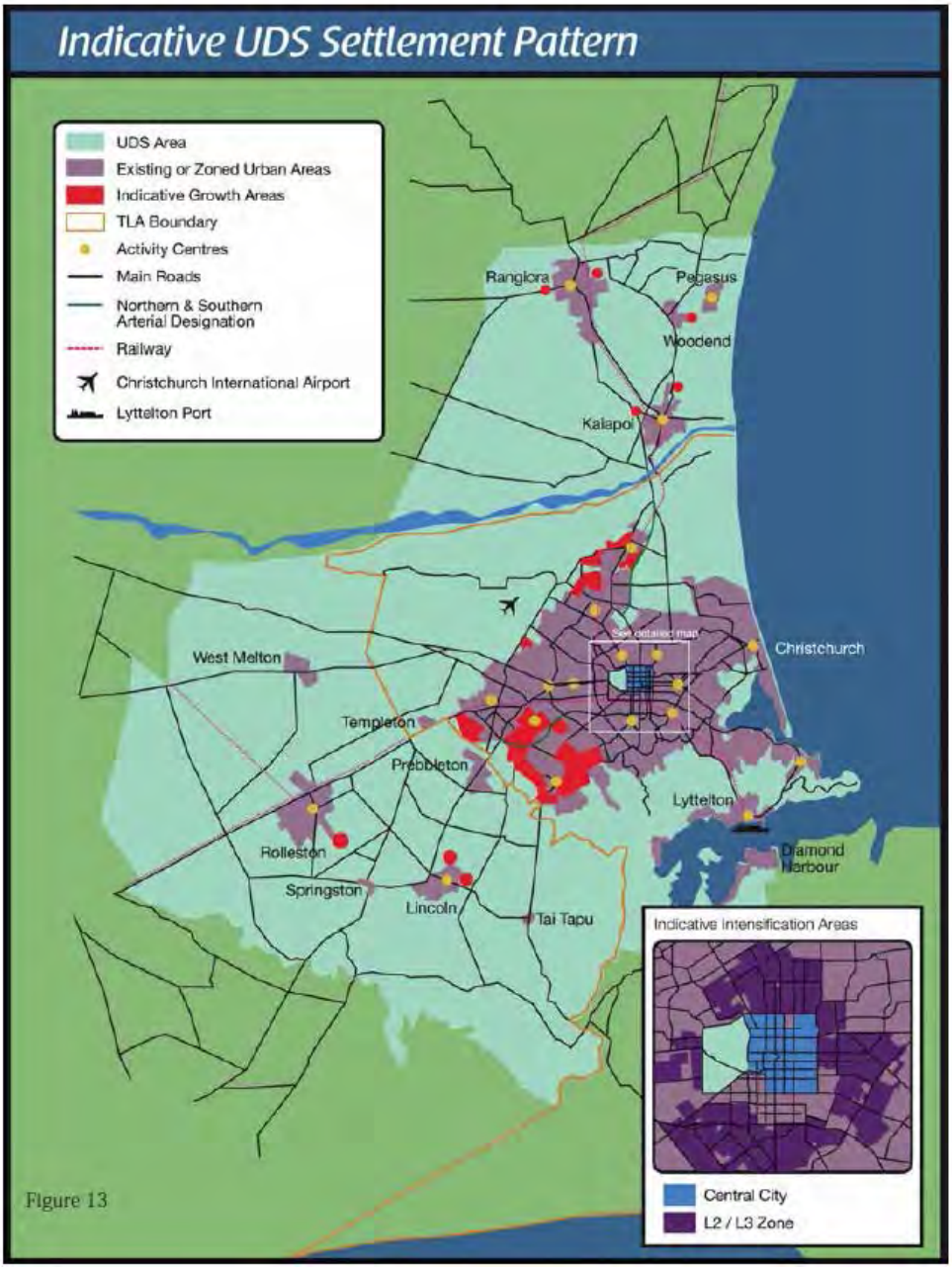
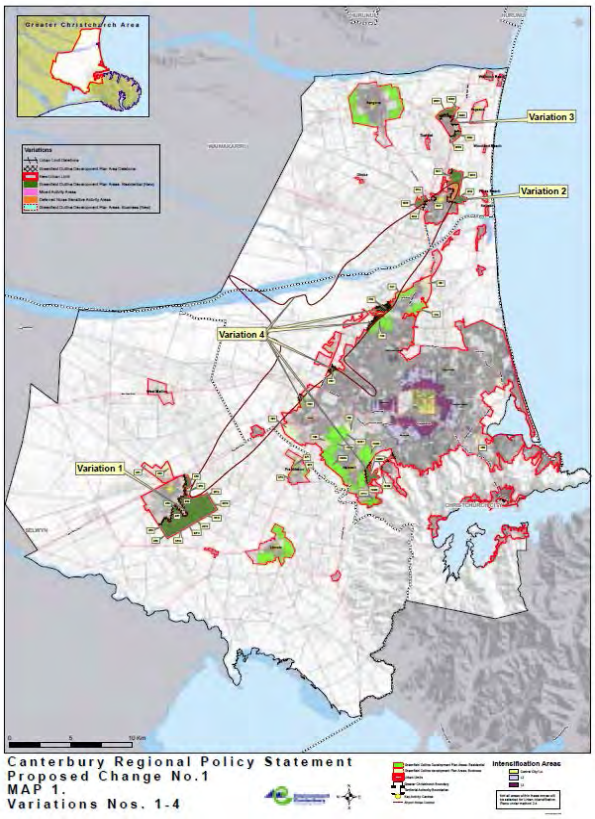



**Figure 6-15 Indicative UDS Settlement Pattern**

## 6.3 Regional Policy Statement Proposed Change 1 (Urban Development Strategy)

Proposed Change 1 was developed to address land use and urban growth management in Greater Christchurch until 2041. It introduced a new Chapter 12A (Development of Greater Christchurch) to the Regional Policy Statement which sets out the land use distribution, household densities for various areas, and other key components for consolidated and integrated urban development. It also sets out which land is to remain rural for natural resource protection or for other reasons.




The Minister for Canterbury Earthquake Recovery, Hon Gerry Brownlee, decided to revoke Proposed Change 1 to the Canterbury Regional Policy Statement. The decision was ancillary to the decision to insert the new Chapter 6 – Recovery and Rebuilding of Greater Christchurch into the Regional Policy Statement as a result of the approval of the Land Use Recovery Plan.

**Figure 6-16: Canterbury Regional Policy Statement Proposed Change No.1**

## 6.4 Land Use Recovery Plan (LURP)

The Land Use Recovery Plan took effect in December 2013. It is a statutory document, and directs the Christchurch City Council, Waimakariri and Selwyn District Councils and Canterbury Regional Council (Environment Canterbury) to make changes to district plans, the Canterbury Regional Policy Statement and other instruments. Some of these changes take effect immediately and others are to be developed by the relevant council within specified timeframes.

In particular, the Land Use Recovery Plan addresses:

- The location and mix of residential and business activities;
- Priority areas for residential and business land development;
- Ways to provide for a range of housing types, including social and affordable housing;
- Ways to support recovery and rebuilding of central city, suburban and town centres; and
- Ways to support delivery of infrastructure and transport networks to serve the priority areas.

Action 18(i) to (vii) identifies seven greenfield priority areas for future residential development.

The Council has developed Outline Development Plans (ODPs) with associated text amendments through an extensive consultation process with landowners, affected parties and stakeholders.

The ODPs have been developed in accordance with best practice urban design and subdivision criteria and will facilitate the provision of up to 4,500 additional residential sections in the Selwyn District.

Accordingly, the Land Use Recovery Plan has considerable influence on the scale and pattern of growth in Selwyn District in the immediate timeframe.

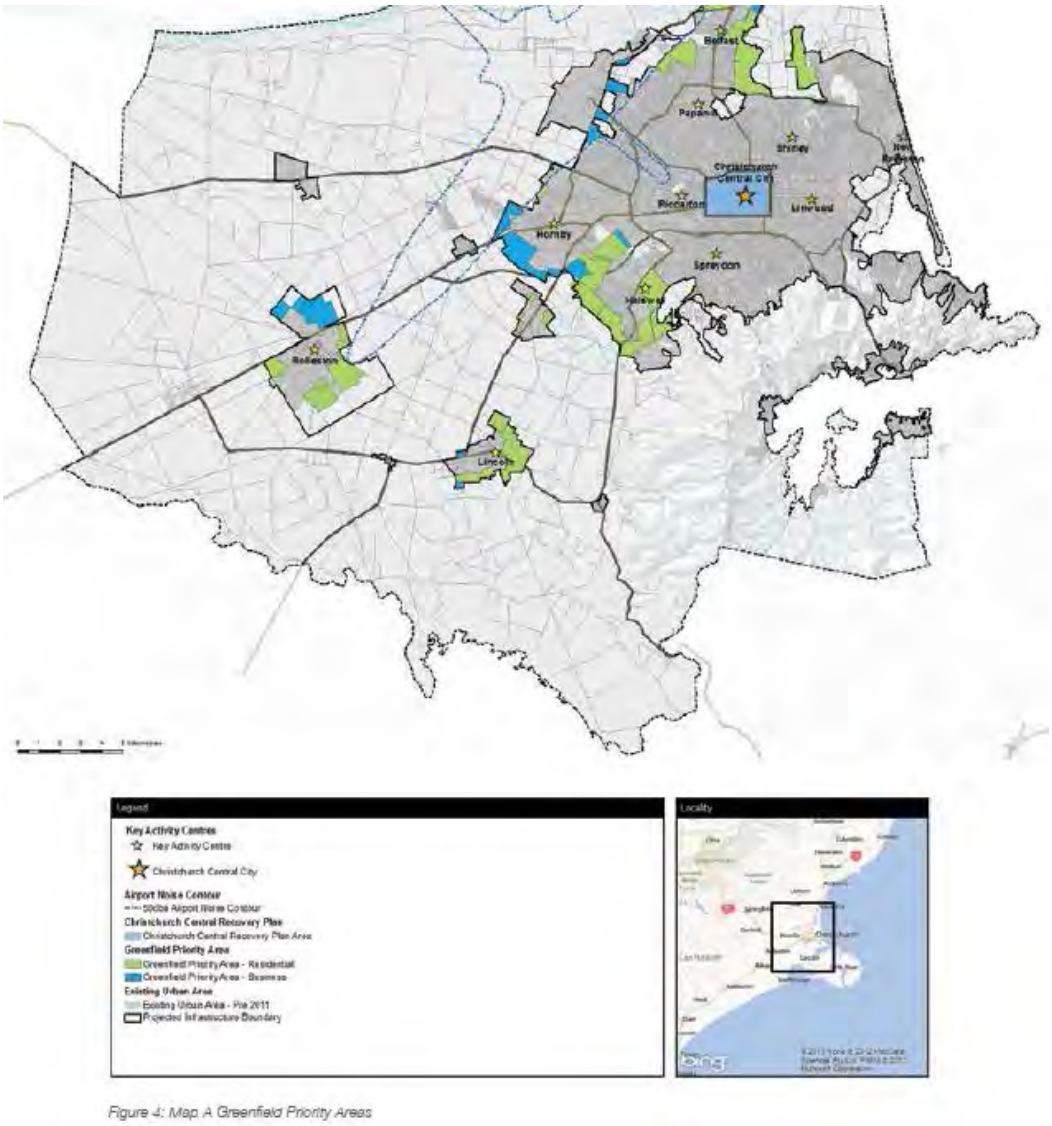



Figure 4: Map A Greenfield Priority Areas

**Figure 6-17: UDS Greenfields Priority Areas**

There are specific actions required by SDC to support the implementation of the LURP.

*Action 6: Selwyn District Plan*

*Selwyn District Council is directed, pursuant to section 24(1)(c) of the CER Act, to change or vary the objectives, policies and methods of its district plan to the extent necessary to identify appropriate sites, including brownfield sites, within the existing urban area for intensified residential and mixed-use development and enable comprehensive development of these sites.*

*Action 13: Selwyn District Plan*

*Selwyn District Council is directed, pursuant to section 24(1)(c) of the CER Act, to change or vary the objectives, policies and methods of its district plan to the extent necessary to enable a range of community facilities within key activity centres.*

*Action 17: Immediate amendments to the Selwyn District Plan*

*Selwyn District Council is directed, pursuant to section 24(1)(a) and (b) of the CER Act, to amend its district plan to include the zoning and outline development plan provisions set out in Appendix 4 (Amendment 1 and 4) for the following greenfield priority areas:*

*i. Living Z and Living 1A – Prebbleton*

*ii. Living Z – Rolleston*

*iii. Living Z – Lincoln*

*Action 18: Selwyn District Plan*

*Selwyn District Council is directed, pursuant to section 24(1)(c) of the CER Act, to amend its district plan to the extent necessary to include zoning and outline development plans in accordance with chapter 6 of the Regional Policy Statement for the following greenfield priority areas shown on map A, Appendix 1:*

*i. ODP Area 4 – Rolleston*

*ii. ODP Area 9 – Helpet Park*

*iii. ODP Area 10 – East Maddisons/Goulds Road*

*iv. ODP Area 11 – Branthwaite Drive*

*v. ODP Area 12 – Dunns Crossing Road (existing Living zone)*

*vi. ODP Area 13 – Springston Rolleston/Dynes Road (existing Living zone)*

*vii. ODP Area 3 – Prebbleton*

*viii. Implementation of SDC rural residential development strategy.*

*Action 27: Selwyn District Plan*

*Selwyn District Council is directed, pursuant to section 24(1)(c) of the CER Act, to change or vary the objectives, policies and methods of its district plan to the extent necessary to provide for:*

*Rebuilding of existing business areas*

*i. comprehensive developments in existing urban business areas, including brownfield sites*

*Rebuilding of centres*

*ii. zoning that defines the extent of each key activity centre*

*iii. implementation of the Rolleston Town Centre Masterplan*

*Greenfield priority areas for business*

*iv. greenfield priority areas for business at Lincoln and Rolleston shown on map A, appendix 1*

*v. rezoning of other greenfield priority areas for business shown on map A, appendix 1*

*vi. thresholds for commercial activities in greenfield priority areas where these are considered necessary to avoid reverse sensitivity effects or effects on the viability of key activity centres.*

*Action 29: Selwyn District Council Town Centre Development*

*Selwyn District Council to find ways to overcome barriers to implementing the Rolleston Town Centre Masterplan, including the need to modify or cancel existing resource consents relating to land within the Rolleston Town Centre study area. A request by Selwyn District Council may be made to the Minister for Canterbury Earthquake Recovery to use interventions under the CER Act to overcome barriers to addressing recovery and rebuilding issues that cannot be resolved through usual processes.*

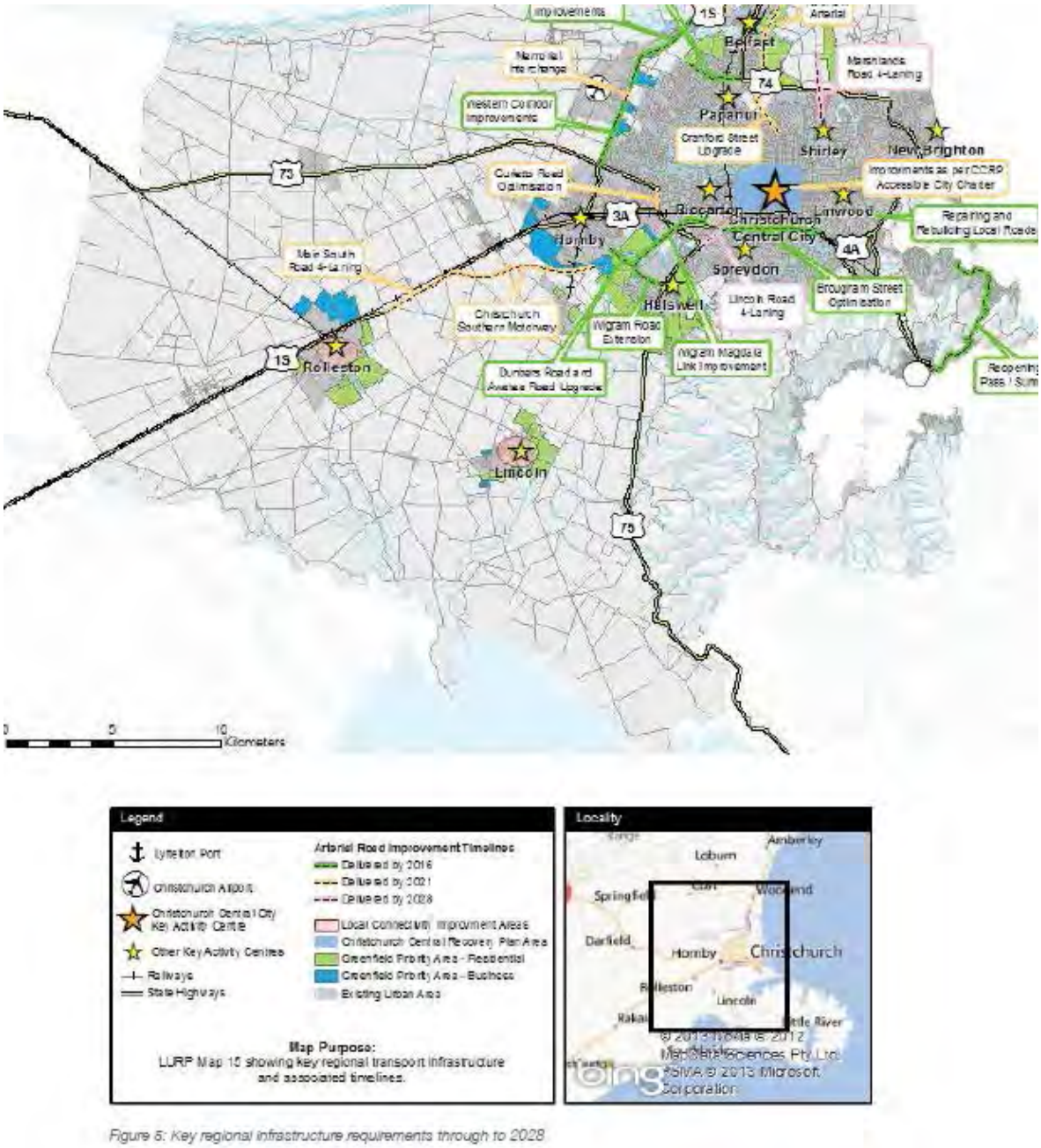



Figure 6: Key regional infrastructure requirements through to 2028

**Figure 6-18: UDS Key Regional Infrastructure requirements**

*Action 35: Selwyn District Council's prioritised infrastructure programmes*

*Selwyn District Council, pursuant to section 26(4) of the CER Act, must amend Local Government Act instruments to the extent necessary to provide for prioritised infrastructure programmes that identify capacity requirements and optimise available resources and funding to support the development of greenfield priority*

*residential and business areas, key activity centres, neighbourhood centres, and intensification and brownfield areas.*

## 6.5 Selwyn Housing Accord/Special Housing Areas

The Housing Accord and Special Housing Areas Act was introduced in 2013. The purpose of the legislation is to enhance housing affordability by facilitating an increase in land and housing supply in certain regions or districts, that have been identified as having housing supply and affordability issues. Selwyn District was added to Schedule listing such areas 2015.

Once a Housing Accord is entered into, the next step is for special housing areas to be identified through an order in council. Application for complying development areas could be made and assessed against the Housing Accord's criteria.

The process:

1. Minister identifies district with significant housing affordability and Land supply issues
2. Order in Council adds district to Schedule 1 of the Act
3. Minister negotiates housing accord with council
4. Council proposes special housing areas
5. Minister assesses council's proposal
6. Order in Council declares special housing area
7. More permissive and fast-tracked consent processes can be used

Selwyn District Council signed a Housing Accord with Government in December of 2015.

Potential capacity has been supplemented by way of the Land Use Recovery Plan (LURP), which has created six more growth areas which have a theoretical capacity of 4500 dwellings. The Selwyn District Plan anticipates the development of all these areas in accordance with Outline Development Plans. There has been very limited development to date in these areas due to fragmented land ownership, high land values and high numbers of 'lifestyle' properties with some owners unwilling to aggregate or sell their land.

While in the fullness of time some of this land may be expected to be developed, it is unlikely in the foreseeable future. As such, in the next few years there is likely to be a land supply shortage in Rolleston. This could reduce the affordability of remaining sections in growth areas.

This Accord seeks to contribute to improved affordability by increasing the supply of land in Selwyn, with a focus on Rolleston in particular. It will also ensure that a proportion of new housing supply created is affordable.

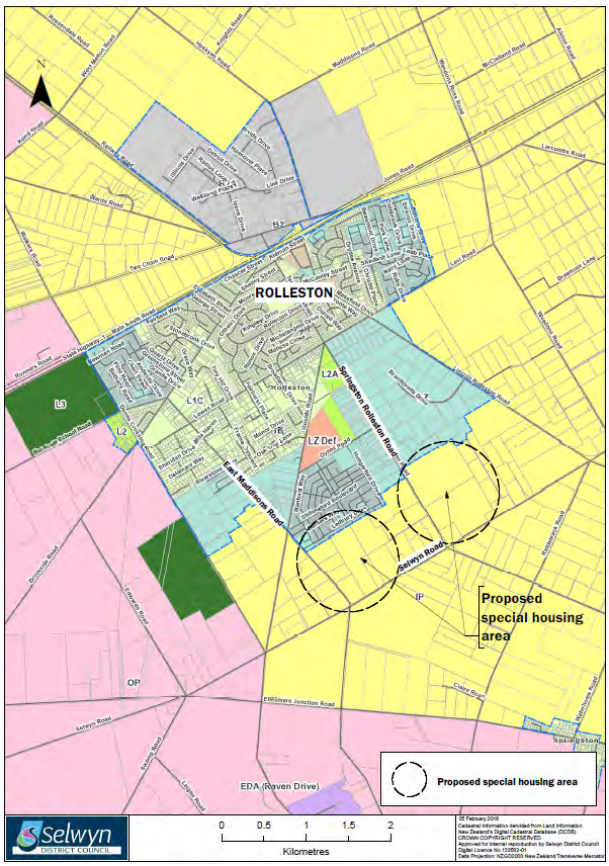



**Figure 6-19: Rolleston Special Housing Areas**

## 6.6 District Plan Review

The Resource Management Act 1991 (RMA) requires all operative provisions of a plan to be reviewed every 10 years.

The current Selwyn District Plan was notified in two volumes (Rural Volume in 2000 and Township Volume in 2001) and remains in this two-volume format. While the Plan has yet to be made fully operative, there are large parts of the Plan that have not changed since 2004 when decisions on submissions were released. It is therefore timely to undertake a holistic appraisal of how to improve the Plan, with the aim of the review to produce a 'second generation' District Plan.

At a broad level, it is recognised that the existing District Plan has become unwieldy, with a total of 1500 pages and an excessive number of zones and appendices, including zones within appendices. A number of

plan changes have also lead to various approaches to different issues within the Plan, most notably being the way in which urban growth is managed within and outside the Greater Christchurch area. In addition, the resource consent team have identified a range of issues in administering specific parts of the Plan that could be improved through a District Plan Review.

The Council agreed to undertake a full review of the District Plan as a matter of priority at a Council meeting held on 27 May 2015. The District Plan review is expected to take three to four years, but this will be longer if there are complex submissions to work through.

Alignment of the District Plan Review and LTP processes has been pursued where possible. For 2018, the LTP will use 'Community Outcomes,' while the 2021 LTP may align more closely with the objectives in the District Plan to reflect the aspirations of the community for the district.

## 6.7 Influences on Growth and Demand (District and Community)

### Major Influences

There are a number of issues that influence demand forecasting and the associated development improvements. These issues include:

- Local population trends;
- Accuracy of predicted future populations;
- Local economic trends and the diversity of industries;
- Changing technology;
- Changing legislation requirements; and
- Changing community service requirements.

Particular trends that have a significant impact on the 5Waters Activity include:

a) Growth of the satellite townships closer to Christchurch, such as Rolleston, Lincoln and Prebbleton. The growth predictions and patterns of these townships are encompassed in the Greater Christchurch Urban Development Strategy (UDS), which promotes the sustainable growth of this part of the greater Christchurch area to 2041.

b) Proposed Plan Change 7 provides for the strategic residential growth around townships within the Greater Christchurch Area, including Rolleston, Lincoln, Prebbleton and West Melton. It is a key method for giving effect to Proposed Change 1 (PC1) to the Regional Policy Statement in

Selwyn. The broad objective and policy framework put in place by the Plan Change will manage business and well as residential growth, however the zoning of specific blocks of land primarily relates to new residential development areas around each of the existing townships. Outline Development Plans (ODPs) have been developed for inclusion into the District Plan as part of the plan change process. These seek from the outset to achieve good urban design and sustainable outcomes by establishing how each block will spatially develop across all infrastructural assets, and how these developments will link to existing and other new areas. One of the key elements required to be shown on the ODPs are roading, walking and cycling routes and networks. Plan Change 7 is rezoning over 600ha of Greenfields land and has a requirement to achieve a minimum net density of 10 households per hectare under PC1. It is expected that nearly 12,000 new households will result by 2041 under current growth predictions.

c) Central Plains Irrigation Scheme – The ongoing development of this integrated water supply scheme to irrigate the central plains area of the District has the aim of increasing agricultural production.

## Economic Trends

The main industry groups in the district are agriculture, tourism and education and research.

### Agriculture

Farming has and is expected to continue to have, a significant impact on the District's economy, with a number of district towns being service centres for the rural community. One of Council's objectives is to ensure that this industry will not be adversely affected by changes in Council policy and planning requirements.

Farming in the District has responded to climatic and trade uncertainties in recent years by diversifying and, in some cases, subdividing and selling land for residential development. As a result dairying, deer farming and residential development have increased while sheep farming has declined. Viticulture and olive growing are also expanding in response to the more Mediterranean climatic conditions of recent years (hot summers, mild winters).

### Synlait

In 2008, Synlait opened a new dairy factory outside Dunsandel. The Synlait Milk facility processes more than 550 million litres of milk each year. It is capable of processing 3.2 million litres of raw milk per day, from which up to 340 metric tonnes of milk powder can be produced along with other high-value functional ingredients.

**Fonterra**

In 2012 Fonterra opened a new milk processing plant, located on SH 73 just west of Darfield.

Darfield produces regular and instant whole milk powder. At full steam, it processes 7.2 million litres of milk per day, adding up to an annual production of 220,000 tonnes. The facility employs more than 230 staff and involves a fleet of 37 tankers.

**Westland Milk Products**

Westland Milk Products is New Zealand's second biggest dairy co-operative, and has a production facility in Rolleston.

In 2015 the West Coast's dairy co-operative ramped up its Canterbury presence by building a $40 million plant to make long life milk at Rolleston. The plant's development relates to the company's first venture into retail-ready liquid milk at the Izone industrial park. The long life product known as UHT milk for its ultra high temperature processing usually has a shelf life of six to nine months and is usually used in hot climates. Commercial production from the plant is capable of packing more than 50 million litres of UHT milk and cream a year. The product is sold into China's UHT market, where returns are high and growth prospects are strong.

Westland Milk Products has recently signed a joint venture agreement with leading paediatric milk formula company Ausnutria to create a new stand-alone infant formula blending and canning company to be called Pure Nutrition Limited. This will involve a blending and canning plant at Rolleston. The plant's initial capacity is expected to be around 20 million cans of milk formula per year (approx. 15,000 tonnes depending on product mix). Construction is expected to be completed by late 2017. Approximately 30 new jobs will be created.

**Tourism**

Tourism is a significant industry supported and encouraged by the Council. Tourist numbers have continued to grow nationally and within the Canterbury region. The growing trend to independent travellers has become more common in recent years.

A number of the small settlements such as Arthurs Pass, Rakaia, Castle Hill, and Lake Coleridge are popular places for holiday homes and recreational facilities. Arthurs Pass, Darfield and Springfield in particular support summer and winter-sports in the Craigieburn Basin, Arthurs Pass National Park, Lake Coleridge, the Rakaia Basin and Mt Hutt. These settlements also service long-distance traffic and provide tourist facilities on main tourist routes.

The Council plans to improve tourist facilities in these areas to encourage tourism. Route 72, the Inland Scenic Route provides an inter-district connection between tourism and recreational facilities in Selwyn and those

in the adjoining Ashburton and Waimakariri Districts and beyond to the Mackenzie Basin / Mt Cook and Hanmer Springs / Kaikoura. It offers an increasingly attractive, and some times more direct, alternative to the utilitarian State Highway 1. These tourist facilities are supplemented by the major golf course and other recreational and visitor facilities at Terrace Downs.

**Higher Education and Research**

Lincoln University is located on the outskirts of Lincoln Township. Education and Research Institutes located around Lincoln provide significant employment, in the District and Lincoln is widely regarded as a centre of excellence in agricultural and related research industry.

The crown research institutes located at Lincoln include AgRearch, Landcare Research, plant & food research.

The Council in joint venture with Lincoln University, Canesis (formerly the Wool Research Organisation of New Zealand (WRONZ), and the Crown Research Institutes aim to promote and develop the current research/ education base in Lincoln. This will be called the 'Lincoln Hub'.

*The overarching goal of the Lincoln Hub is to accelerate the rate of economic development of the land-based sectors while improving their environmental performance. In doing so, the Hub will become a globally-significant centre for education, research, technology transfer and adoption, and practice change. By supporting industry innovation, the Hub will help build the capability needed for the primary sectors to achieve their potential. To achieve this, the Hub will be fully integrated into the strategies of the primary industries, and stimulate innovation and entrepreneurial endeavour by the private sector. It will also draw on and connect with other successful Hubs from across New Zealand and the world[23].*

**Izone**

In 2000 the Council looked to attract new commercial and industry ventures to the district. This prompted the development of the Rolleston Industrial Park (IZONE), which has been established to promote and provide for this type of activity and growth. In recent years development has expanded beyond Izone, with a wider Rolleston Industrial Zone becoming established. Izone is now one of the larger industrial parks in New Zealand.

Covering 188 hectares, Izone has land developed, zoned and ready to bring services and infrastructure into development. The fully master-planned, greenfield site is currently home to more than 70 companies involved mostly in manufacturing, warehousing and logistics, and servicing Canterbury's significant agricultural sector.

The development's ownership by Selwyn District Council ensures affordable land prices, low annual rates and favourable district plan rules. These include: no development levies, no maximum site cover, and no restrictions on the generation of traffic movements.

[23] Source: http://www.lincoln.ac.nz/Lincoln-Home/Research/Lincoln-Hub/

As it stands Izone Industrial Park has the potential to grow to over 459 hectares.


**Figure 6-20: Izone Industrial Park**

### Other Industries

Other industries that provide a varied source of employment in the district include:

- Commercial and Industrial (e.g. The Warehouse's distribution centre)
- Golf Courses e.g. Terrace Downs
- Department of Corrections facilities
- Hospitals
- Forestry, e.g. Selwyn Plantation Board
- Dairying
- Lake Coleridge Hydro Scheme
- NZ Defence Force (Burnham Military Camp)
- Various Small to Medium industry e.g. Meadow Mushrooms

Some of these industries have a lesser effect on the district's overall economy, but are important for providing a variety of employment opportunities within Selwyn.

**Employment**

The rapid growth in Selwyn District is underpinned by strong employment opportunities. Originally these have been in the agricultural sector, Lincoln University and research centres, as well as commuting to Christchurch City. Through the Izone development and other initiatives have meant there are considerable opportunities within the district. Izone is the only industrial hub in New Zealand to have a dedicated staff recruitment website. Enterprise Recruitment is Izone's talent gateway. This free service allows Izone companies to advertise job vacancies and provides those looking to move to Selwyn with appropriate information about life in the district. Eventually Enterprise Recruitment will advertise jobs throughout the district and become the talent gateway to Selwyn.

The 2013 census shows employment in agriculture and forestry employ the largest number of workers, followed by manufacturing and construction.

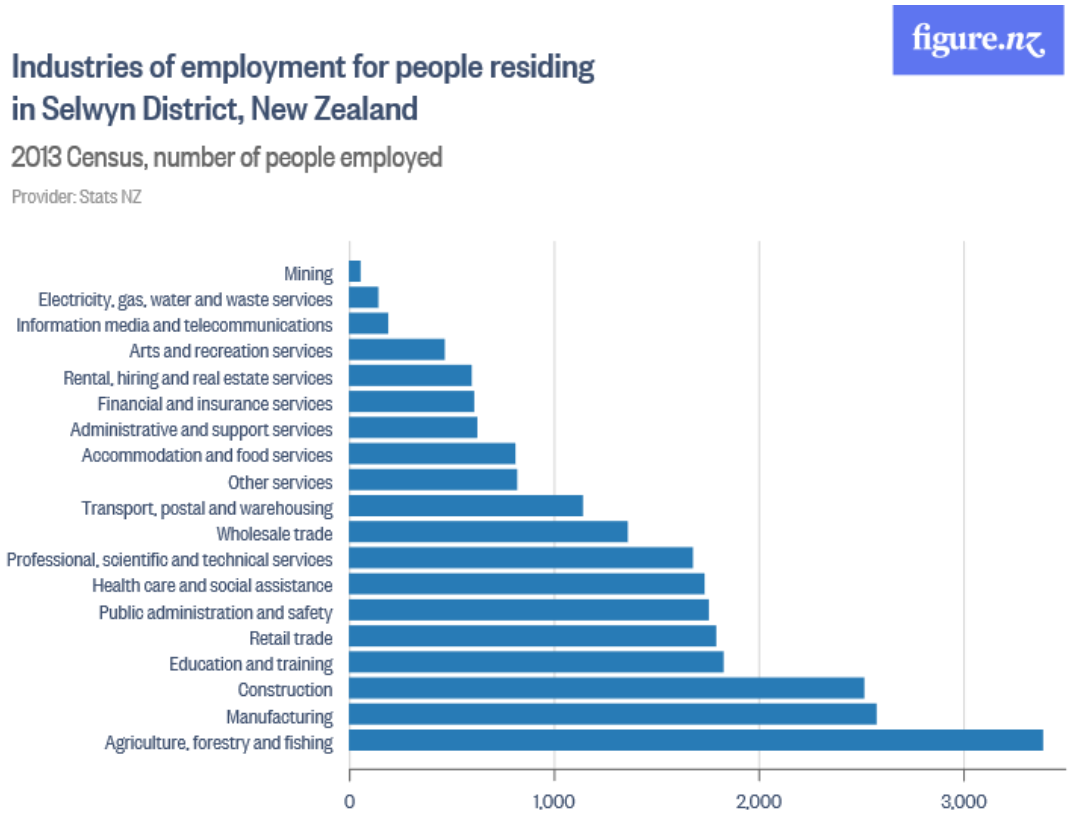



**Figure 6-21: Selwyn District Sources of employment (2013 Census)[24]**

[24] https://figure.nz

**Work**

The most common occupational group in Selwyn District is 'managers', and 'professionals' is the most common occupational group in New Zealand.

The unemployment rate in Selwyn District (total population aged 15 years and over) is 2.9% for people aged 15 years and over, compared with 7.1% for all of New Zealand.

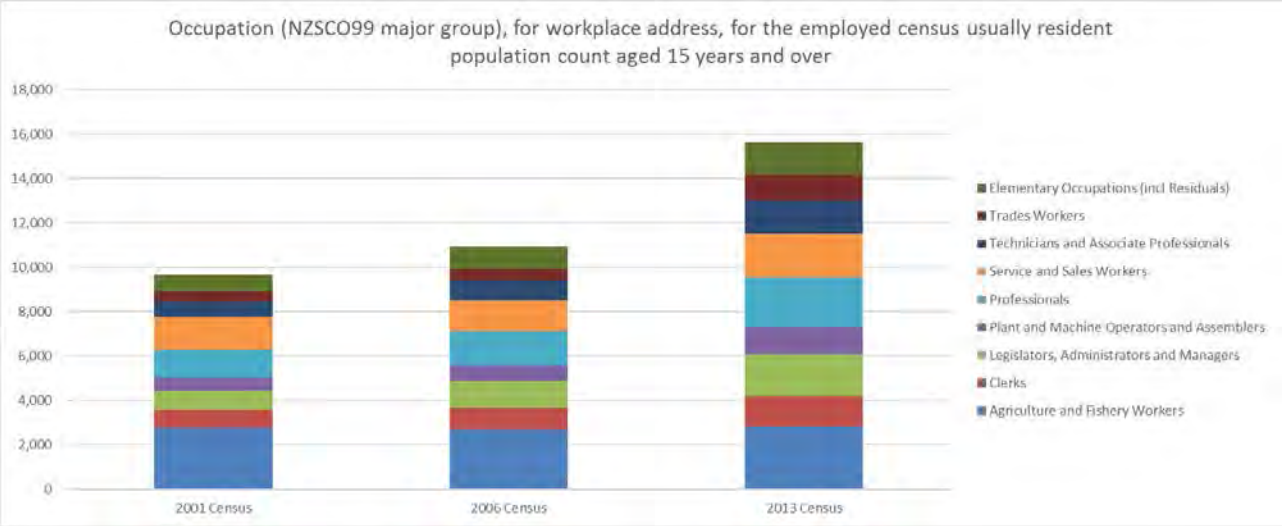



**Figure 6-22: Selwyn District Occupation Groups[25]**


**Figure 6-23: Occupation for employed people aged 15 years and over (Selwyn District and New Zealand, 2013 Census)**

[25] Data sourced from Statistics NZ

**Income**

For people aged 15 years and over, the median income (half earn more, and half earn less, than this amount), in Selwyn District is $36,100. This compares with a median of $28,500 for all of New Zealand.

31.8% of people aged 15 years and over in Selwyn District have an annual income of $20,000 or less, compared with 38.2% of people for New Zealand as a whole.

In Selwyn District, 34.3% of people aged 15 years and over have an annual income of more than $50,000, compared with 26.7% of people in New Zealand.

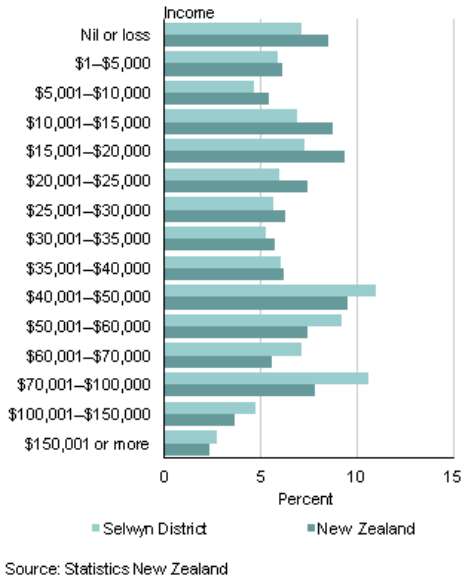



**Figure 6-24: Total personal income for people aged 15 years and over (Selwyn District and New Zealand 2013 Census)**

**Business demographics**

Business demographic data for the year ended February 2013 showed that:

There were 5,524 business locations (geographic units) in Selwyn District compared with 507,908 for all of New Zealand. This is an increase of 9.3% from the year ended February 2006 for Selwyn District.

There were 14,800 paid employees in Selwyn District compared with 1,941,040 for all New Zealand. This is an increase of 28.2% from the year ended February 2006 for Selwyn District.

**Table 6-2 Top Five Industries in Selwyn[26]**

| For year ended February 2013<br>By Employee Count | | | | |
|---|---|---|---|---|
| Industry (ANZSIC06)(1) | Selwyn District | | New Zealand | |
| | Employee count | Percent of total employee count | Employee count | Percent of total employee count |
| Agriculture, forestry and fishing | 2,770 | 18.7 | 111,520 | 5.7 |
| Public administration and safety | 2,260 | 15.3 | 110,900 | 5.7 |
| Education and training | 1,840 | 12.4 | 167,240 | 8.6 |
| Manufacturing | 1,450 | 9.8 | 211,710 | 10.9 |
| Construction | 1,380 | 9.3 | 124,870 | 6.4 |
| 1. Australian and New Zealand Standard Industrial Classification 2006 (ANZSIC06 V1.0). | | | | |
| Note: Some regions, territorial authorities, and local boards may have more than one industry with the same employee count but the table has been restricted to five industries. | | | | |

### Impact on Infrastructure Planning

The on-going and rapid growth is reliant on core infrastructure. This includes transportation for the movement of freight and people, utilities and waste management to meet the basic needs of industry and the community; and the provision of community facilities that attract and retain people. Rapid growth is a challenge that requires a timely response to ensure the provision of infrastructure is not lagging behind the demand, creating dissatisfaction within the community.

With low levels of employment and a high number of commuters it is important that the district remains attractive and a community of choice. This is partly determined by the services provided by Council, and along with 'essential services' there is key role for community facilities in attracting and retaining residents.

## 6.8 Development Contributions

Development contributions are contributions required from developers to help offset the effects of growth they have induced on the network. They are levied under the Local Government Act 2002.

[26] **Source:** Statistics New Zealand

Financial contributions are amounts or works required of developers to avoid, remedy or mitigate the adverse effects of their developments on the environment, built or natural. They are levied under the Resource Management Act 1991

The relationship between capacity, growth, levels of service, and the delivered-capacity of new works is shown diagrammatically below in Figure 6-25

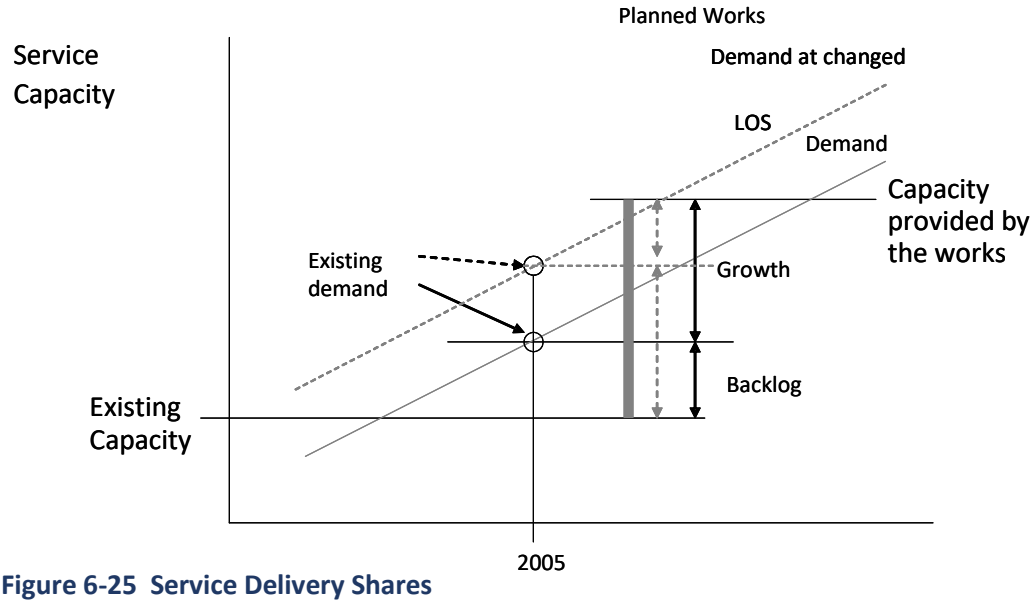



**Figure 6-25 Service Delivery Shares**

Works that include a growth component can be considered for a development contribution – based on the cost of providing additional capacity for growth. Providing additional capacity for an enhanced level of service as well, shown here as the higher of the two sloping lines, may still attract a growth component but it will be of a lesser proportion.

The Selwyn District Council Development Contributions Policy was adopted by the Council on 14 June 2017. This follows approval on 24 June 2015 and an update on 22 June 2016.

The Policy details the Purpose of Development Contributions as follows:

*The purpose of development contributions is to enable territorial authorities to recover from those persons undertaking development a fair, equitable, and proportionate portion of the total cost of capital expenditure necessary to service growth over the long term. Council in preparing this policy has complied with the purpose of the Local Government Act 2002.*

In general, a development contribution may be required in relation to a development when:

- The effect of that development requires the Council to construct new or additional assets or assets of increased capacity for any network infrastructure, reserves or community infrastructure; and
- As a consequence, the Council incurs capital expenditure to provide appropriately for network infrastructure, reserves and community infrastructure.

The effect of development in terms of the impact on assets includes the cumulative effect that a development may have in combination with another development. A Development Contributions Policy also enables the Council to require a development contribution that is used to pay, in full or in part, for capital expenditure already incurred by the Council in anticipation of development.

The Council will not require a development contribution for network infrastructure, reserves or community infrastructure in the following cases:

- Where it has, under section 108(2)(a) of the Resource Management Act, imposed a condition on a resource consent requiring that a financial contribution be made in relation to the same development for the same purpose; or
- Where the developer will fund or otherwise provide for the same reserve, network infrastructure, or community facilities; or
- Where it has received or will receive funding from a third party for the same purpose.

The balance of the Policy details the calculation and administration of development contributions respective to: Water and Sewerage, Stormwater, Transportation and Reserves.

## 6.9 Demand Management

Demand management has a slightly different meaning for each of the 5Water activities provided, but overall it can be taken to mean 'demand for the provision of a service, whether that is the supply of water (including potable and stockwater), or the removal of wastewater (including stormwater and land drainage)'. Increasing demand for a service typically requires additional capital investment and the use of additional resources. If increased demands cannot be accommodated, then a decline in level of service will be experienced (e.g. low water pressure, sewer overflows)

The use of demand management strategies has the benefit of:

- Deferral of capital investment;
- Maintaining levels of service;
- Complying with consenting authorities requirements;
- Reducing operational and maintenance costs;
- Conserving valued resources; and
- Minimising adverse impacts.

Environment Canterbury, as the consenting authority, are requiring water demand management practices to be implemented as part of the requirements of consents and regional plans.

Demand management initiatives will be taken where existing water use is inefficient, or where resource constraints limit the availability of water. The impact of such initiatives will vary depending on the specific measures implemented. Although it is expected that demand management initiatives will see a decreasing per/household demand trend, it is considered prudent to assume that current usage patterns will continue until measurable reductions are evident. The planning impacts of this approach are small, with deferral of capital works the likely outcome.

### Demand Impacts on Assets

Population growth is generating increased demand for services within the 5Waters activities. For example, increasing water demand is resulting in limited or insufficient water to meet peak demand particularly in dry or hot summer periods. In addressing security of supply and increasing demand, there is the choice of building additional capacity and creating new infrastructure, or alternatively taking action to both manage and reduce demand through a range or combination of demand management strategies. Timely provision of sustainable infrastructure and the impacts of climate change on Councils assets is discussed in Section 8.0, Infrastructure Sustainability.

There is a tendency to only consider sources of supply when dealing with increasing demand. However, increasing demand also puts a strain on the reticulation network infrastructure that may have insufficient capacity to convey and store, for example the amount of water needed to satisfy demand. This justifies the pursuit of demand management strategies. A demand management strategy reflecting the current situation is now required if difficulties in meeting demand and additional infrastructure expenditure are to be avoided or deferred.

### Demand Management Plan

Demand management can be applied across all of the 5Waters activities however, in the past Council has implemented demand management strategies predominately for water supplies. A Water Conservation and Demand Management Plan was developed in 2016, this is further discussed below in Section 0.

An overarching demand management strategy has yet to be developed for the 5Waters activities, this is listed as an improvement item for 2020/21.

#### 6.9.1.1 Water Demand Management

In 2016 a Water Conservation and Demand Management Plan was developed. This plan reflects a growing awareness of the need for sustainable and efficient use of natural water resources. As a provider of Water Services, Council has an obligation to the community to provide safe and wholesome water for drinking and sanitation. The objective of the plan is to:

- Provide an overview of Selwyn District Council's current water demand management practices;
- To provide a strategy for water demand management;

- Efficiently manage the demand for water by users;
- Identify where there are opportunities to improve our understanding of how much water we supply to our customers and when; and
- Provide improvements to water management initiatives.

The plan outlines business as usual water conservation and demand management actions, these are:

1. Measurement and understanding of current average and peak water usage
2. Deliver education and information to the community to implement water conservation
3. Implement water restrictions where required
4. Maintain growth projections and carry out master planning
5. Implementation of mechanisms such as the Water Supply Bylaw 2008 and the Proposed District Plan to encourage and promote efficient use of water
6. Management of asset lifecycle to minimise water losses
7. Conducting regular review of the water balance and benchmarking against other municipal suppliers

Further to these additional actions were identified to enable future improvements in water demand management, these are outlined in Table 6-3 below.

**Table 6-3 Improvement Actions**

| No. | Action | Priority | Intent |
|---|---|---|---|
| 1 | District wide water metering and demand analysis | High | Ensures customers place a value on clean fresh water by incentivising low water use, and efficiency of water use. Provides a fair and equable rating system for low and high water users. |
| 2 | Water education programme on low water demand gardening | High | Provides guidance to existing and new residences, on the unique dry environment in the Selwyn District. This enables appropriate plantings and garden watering practices. |
| 3 | Targeted Water Audits | Medium | Reduce daily and peak demand by working with high water users to reduce demand. |
| 4 | Review drought management plan | Medium | Review management of water supplies with staff and contractors following periods of dry weather to confirm what worked well and what can be improved. |
| 5 | Rainwater harvesting feasibility | Medium | Investigate the benefits and issues with rain water harvesting. |
| 6 | Wastewater re-use and recycling | Low | Review the option to re-use treated wastewater for irrigation use on Council reserves and gardens. |

Action 1, water metering, has nearly been completed. By the end of the 2017/18 financial year water metering will be place across all properties in the district. Water metering enables consumers to place an appropriate value on clean safe water. Table 6-4 below outlines where water metering exists within the district.

**Table 6-4 Scheme Metering as at January 2018**

| Scheme | Metering Status | Scheme | Metering Status |
|---|---|---|---|
| **Arthur's Pass** | Not yet metered | **Leeston** | Not yet metered |
| **Castle Hill** | Not yet metered | **Lincoln** | Metered |
| **Claremont** | Metered | **Malvern Hills** | Restricted supply |
| **Darfield** | All metered | **Prebbleton** | Metered |
| **Darfield Rural A** | Restricted supply | **Rakaia Huts** | Not yet metered |
| **Darfield Rural B** | Restricted supply | **Raven Drive** | Metered |
| **Doyleston** | Metered | **Rolleston** | Metered |
| **Dunsandel** | Metered | **Sheffield/Waddington** | Not yet metered |
| **Edendale** | Metered | **Southbridge** | Not yet metered |
| **Hororata Acheron** | Restricted supply | **Springfield** | Metered |
| **Johnson Road** | Metered | **Springfield - Annat Extension** | Restricted supply |
| **Jowers Road** | Not yet metered | **Springston** | Metered |
| **Kirwee** | Metered | **Tai Tapu** | Not yet metered |
| **Kirwee - Courtenay Bealey Exte** | Restricted supply | **Tai Tapu Otahuna Valley** | Restricted supply |
| **Kirwee - Courtenay Extension** | Restricted supply | **Te Pirita** | Metered |
| **Lake Coleridge** | Metered | **West Melton** | Metered |

The plan also outlines a peak demand management plan which provides guidance on using water restrictions to manage peak demand. The most effective way to reduce water consumption in times of

drought or water shortage is to introduce water restrictions. Water restrictions theoretically allow the water source to be sustained under a variety of usage and drought scenarios. Restrictions will apply to the Selwyn District area including residential, rural restricted areas and commercial/industrial water users.

Table 6-5 below details levels for restrictions for water supplies under Councils control. Water restrictions can be initiated by the Asset Manager or as delegated to staff.

**Table 6-5 Levels of Water Restrictions**

| Levels | Actions |
|---|---|
| *Level 1* | • *No watering of lawns is permitted between the hours of 6am to 9am and 4pm to 9pm only*<br>• *Garden watering is permitted*<br>• *There is a requirement to decrease demand especially during peak periods.* |
| *Level 2* | • *Watering of lawns is permitted between 9am-4pm and 9pm-6am on alternate days only.*<br>*(Note. If your street address number is even then water on even-numbered days, if your street address number is odd then water on odd-numbered days. For example if your property number is 2, 24b or 108 you can water your lawn as needed on the 8, 10, 12 December and so on during the permitted times. If watering during the daytime we recommend choosing a cooler day to reduce evaporation.)*<br>• *Garden watering is permitted.*<br>• *There is a requirement to decrease demand especially during peak periods* |
| *Level 3* | • *No watering of lawns is permitted.*<br>• *Hand garden watering is permitted, total ban on domestic sprinklers*<br>• *There is a requirement to decrease demand* |
| *Level 4* | • *Total ban on all external non-essential use of water*<br>• *Consumers may carry water using a bucket, watering can or similar to maintain plants as necessary* |

The key messages publicised with the water restrictions are:

- Water restrictions are now being introduced.
- Residents in several Selwyn towns are being urged to immediately reduce their water usage at peak times.
- Water consumption is already high and is increasing significantly, mainly from residential water use for garden and lawn watering.

- Water supplies in some locations are struggling to meet demand, in some cases resulting in significant pressure drops and depletion of reservoir storage.
- A range of factors is contributing to the high demand including extreme weather conditions, low river flows, and continuing growth in some residential areas.
- Council is working on improvements to increase capacity for a number of supplies

A water supply planning strategy has been developed for Selwyn water supplies following the implementation of district wide rating. The planning strategy was developed to underpin asset investment decisions, ensuring efficient and effective delivery of water supply services sufficient to meet reasonable community needs across the district. Supplies were broadly classified on the basis of factors including population served, growth, presence of schools and hospitals, presence of commercial activities, supply type. The supply classification reflects the consequence in event of a water supply failure. A range of operating conditions were also considered, as it is recognised that the desired water supply objectives will vary depending on the prevailing conditions. These include: normal operation, impaired operation – minor/major, and emergency operation. The scenario groupings are aligned with the likelihood (or frequency) of an event occurrence that may impact on the supply of water to consumers.

Water loss calculations are also annually undertaken as part of key performance indicators. Using a water balance method Council can identify where water supplied into a water supply distribution network is utilised, and is typically used to establish the level of water loss occurring in a water supply network. This analysis is helpful for managing demand and development of a water loss strategy is included in the improvement plan. This will provide an overall strategy and programme to manage water losses in the district in the long term to agreed acceptable levels.

Council proposes to build a reasonable use model for water consumption. This model will assess how much water is reasonable to use on each property connected to their water supply schemes. This model is further discussed in Section 0 in Infrastructure Sustainability.

A water supply strategy will be developed which provides a clear direction and summarises information from five key documents:

i. Climate Cycles and Trends
ii. Levels of Service
iii. Demand Management
iv. Reasonable Use
v. Water Loss

This document will also feed into the revised 5Waters Strategy.

#### 6.9.1.2 Wastewater Demand Management

Wastewater demand management involves implementing strategies to reduce effluent flows and promoting more efficient network operations. These strategies involve altering or repairing the asset to achieve the target.

The Council's future demand management approach will be a continuation of the effluent flow reduction strategies. The hydraulic models that have been developed further strengthen this approach. This will enable the infiltration reduction to be quantified and improved upon.

#### 6.9.1.3 Stormwater Demand Management

Demand management for the stormwater utility is limited to promoting on site stormwater management and limiting the extent of development that contributes stormwater runoff to community systems. This is achieved through District Plan Rules, and potentially through Codes of Practice (Urban).

#### 6.9.1.4 Land Drainage Demand Management

The primary control mechanism available to Council in respect to the drainage systems is to control the areas in which development can occur, and the densities to which it can occur. These controls are implemented through Council's District Plan.

Public education programmes are to be developed to remind the public of the monetary and environmental consequences of inappropriate use of the drainage system.

#### 6.9.1.5 Water Races Demand Management

Limited surface water in rivers and streams during summer drought places added stress on other water uses/values such as fishing, recreation, ecological and cultural values. Extraction of water for Council water race system has potential to place additional pressures on river systems.

A detailed Demand Management Strategy for water races has been developed and is incorporated in the Water Race Management Plan. This considers various strategies for optimising demand, conservation, reducing risk of insufficient capacity, quantifying and reducing water lost through infiltration and overflows.

These strategies are based on the water balance and the ability to obtain the most effectiveness from these strategies .i.e. infiltration accounts for 89% of water used therefore the majority of effort should be directed into this area.

### Asset Programs to meet demand

The program for the provision of infrastructure to meet demand is set out in Section 11.0, Financial Summary.

This section outlines the funding program for 5Waters activities for the next ten years. The program is split into four types of expenditure where:

i. Expenditure consists of operation and maintenance costs;

ii. Renewals are replacement of assets which are nearing or exceeded their useful life;

iii. Projects are investigations, decisions and planning activities which exclude capital works; and

iv. Capital projects are activities involving physical works.

At a scheme level, these programs are detailed in Volume 2,3,4,5 and 6.

## 6.10 Water and Sanitary Assessment[27]

The Water and Sanitary Services Assessment is an assessment of all services (public and private) relating to:

- Water;
- Wastewater;
- Stormwater;
- Cemeteries; and
- Public Toilets.

The purpose of an assessment under section 125 of the Local Government Act 2002 is to assess, from a public health perspective, the adequacy of water and other sanitary services available to communities within a territorial authority' district. In particular the quality of services, current and estimated future demands, the extent to which drinking water provided by water supply services meets applicable regulatory standards; and the actual or potential consequences of stormwater and sewage discharges within the district.

The last review was undertaken in 2011. Since then the district has experienced significant growth resulting in water and wastewaster connections growing exponentially. Large parts of the 2011 review and the original 2006 assessment remain relevant. This review is based on these assessments and provides up to date information to reflect the changed circumstances.

This assessment is set out in two main parts. The first part covers the context and principles during the undertaking of this assessment. And the second, covers the assessment of each service area.

### Exclusions of the assessment

This assessment focuses on public health matters but it needs to be read in conjunction with other planning documents; including the Long Term Plan, Activity Management Plans and the Demand Management Plan. These documents have a specific purpose and detail each service area in depth. Consequently, this assessment provides a broad overview of each service rather than a detailed description.

[27] This section is an exert from the Water and Sanitary Services Assessment.

It is important to note that the Council does not have responsibility of all areas or aspects of service provision. For example Council is not responsible for the performance of private septic tanks or other private wastewater treatment facilities. However the performance of these facilities can have effects on the wider environment and community perceptions regarding sanitary services. Therefore, although Council is not specifically responsible it must consider whether there is a need for any specific action, such as education, to ensure that the community's health is protected. While the assessment does not describe the performance of the private service provision, it does describe the issues associated with private services and explains the Councils action in relation to matters that are beyond immediate control.

Solid waste management is also excluded from this assessment. The Council have adopted a Waste Minimisation and Management Plan (2011) which is kept under review and managed separately from sanitary services, there are specific legislative requirements for this under the Waste Minimisation Act, 2008.

### Impacts of Growth on Water and Sanitary Services

The growth projections indicate that the district will continue to grow. Decisions about the provision of infrastructure and sanitary services over the next 30 years need to take into account these growth patterns.

The likely changes mean:

- Continued growth within the townships provides challenges around timely installation of infrastructure and the ability of industry to meet these demands.
- The building of new houses also creates some short term pressure on water infrastructure (e.g. establishment of new lawns). This is exacerbated by larger sections in townships such as Prebbleton and West Melton.
- The population of Selwyn is relatively youthful, indicating large parents and children cohorts which is why there is a need for new infrastructure such as schools in Rolleston and Lincoln.
- The population is also ageing which means there will be a requirement for different dwellings (e.g. smaller houses and less of a requirement of irrigation of large garden areas).
- Growth in holiday destination towns (e.g. Castle Hill) creates intermittent peaks and visitor expectations (e.g. occupancy during holiday peaks).
- Increased tourist numbers with increasing expectations (e.g. seasonal peaks of visitors seeking experiences).
- Migration from Christchurch City to Selwyn has created changes in public perception and expectations (e.g. residents in rural towns expecting high levels of service).
- The aging demographic and increasing population will result in some increase in demand for burial space and cemetery services over time. There is however, a slight trend towards ashes interment versus plot burial, which will reduce pressure on future land requirement if this trend continues.

There is sufficient land available at the current cemeteries (with expansion into existing land at some sites) to meet demand over the next 10 years.

- There is significant increasing demand for public toilets, particularly as a result of tourism and visitor numbers increasing in the district. Other demand drivers include freedom camping, township growth (commercial precincts), sports parks and larger recreation parks. There has been significant investment in construction of new and the upgrade of existing facilities in recent years to address quality and capacity issues. Future works are planned to meet expected demand.

In addition to these trends key sanitary services such as water and wastewater treatment facilities are regulated through consents, some of which will require renewal or replacement over the next 30 years. In addition to this, due to the rapid growth an increasing number of consents are being applied for, particularly for water. The regulatory environment which we are now applying or re-applying for these consents has undergone significant changes in recent years. Higher standards now apply for the renewal of existing consents or proposal of new facilities.

Alongside this there has significant changes to the legislative environment. The introduction of national and regional polices such as the National Policy Statement on Fresh Water Management and the Land and Water Plan has increased consenting requirements and removed previously permitted activities. The outcome of the Havelock North Inquiry has increased water compliance reporting requirements. The Department of Internal Affairs is also currently undertaking a review of the 3 Water Services at a national level.

There is also a greater level of understanding since 2011 of the impacts of climate cycles and trends. Research undertake by the Royal Society of New Zealand (2016) has explored the implications of Climate Change for New Zealand and found that the Australasian region continues to show a long-term trend towards higher surface air and sea surface temperatures, more hot extremes and fewer cold extremes and changed rainfall patterns. At a district level research undertaken by Aqualinc (2016) suggests that by 2046:

- Average temperature will increase by 0.8 degrees
- Evapotranspiration rates will increase by about 3%
- Mean annual rainfall on the Canterbury Plains will stay relatively unchanged
- The number of windy days could increase by 1 to 2%
- Minor impact on groundwater and flows in lowland streams
- Sea levels could rise by a further 0.08-0.23m

These changes will have impacts on the 5Waters assets and management. All of the Councils asset management planning has been based on models and projections of climate changes. These assumptions are being reviewed as part of the ongoing review of asset management plans to ensure that infrastructure is capable of managing the potential events indicated in the latest research.

## Service Assessments

### Water Supply

Council manages 30 water supplies, located between the main divide (Arthurs Pass) and Pacific Coast (Taumutu), the details of these are described in the Water Supply Activity Management Plan. In short, the networks supply 82% of the district for public needs including households, gardens and public reserves. The water sources are a mixture of groundwater bores and surface water intakes which is regulated by consents from the Environment Canterbury. While these networks supply the majority of the district, other properties are services by private water sources including bores, surface water and roof water.

The availability of drinking water is important to supporting the health and well-being of communities. Water quality and quantity is both important. While the Council provides satisfactory water to the majority of the district, some areas are serviced by networks that do not provide an on demand service (i.e. they have tanks and are on a restricted supply) and some communities rely on a private supply (roof water tanks, surface water takes and bores).

The Councils supply network consists of abstraction from groundwater bores and surface water bodies. Surface water supplies can be susceptible to the ingress of contaminants from the catchment especially during period of heavy rainfall and flooding where run-off finds its way in. Land use activities also influence the quality of water within each catchment. The surface supplies in Selwyn can be subject to turbidity and variable flows. The majority of water in Selwyn is provided by groundwater bores. These bores are subject to potential risks through potential for contamination by associated land use activities and poor security around the well heads. However, there are also concerns regarding the variable quality of the groundwater itself. Over time in Selwyn we have seen an increasing number of transgressions in secure wells. This has led to the following assumption in the LTP:

*Secure ground water status will be lost over the next ten years on bores located in semi-confined aquifers and bores less than 30m deep in confined aquifers.*

The level of nitrates in water bores could also be an issue in Selwyn due to land use practices and the increase in conversion of farms to dairying. Although no Selwyn wells are currently at high risk from nitrates we monitor the wells in Dunsandel, Darfield and one Rolleston (Illinois Drive) monthly due to the requirements under the Drinking Water Standards (once its measured at over half the maximum acceptable value). Also, not all bores which belong to SDC are located on SDC land, this creates issues for ensuring the protection of the well head.

Houses reliant on roof water are subject to variations in rainfall and in some places this may not provide an adequate supply. Periods of low supply could impact on households health and well-being. Roof water has the potential for immediate contamination. For example roofing materials have the ability to attract dust

from atmosphere created from wood burners, fertilisers and roads. Wildlife such as birds increase the risk of contamination due to the spread of faeces and the collection of leaves in gutters can create bacteria.

Storage of water also has a significant potential to result in risks to public health. Where communities rely on privately owned tanks or patterns of use are sporadic this risk is higher. For tanks connected to rainwater systems, first flush systems are necessary to prevent debris being washed into tanks during a rainfall tank. Unfortunately, the purchase of these systems are not standard practice. Historically tanks were open, i.e. they were not sealed to prevent entry by animals, insects and birds. Also, maintenance of any storage system is critical but is often overlooked until a problem arises. There are a lot of tank type systems within Selwyn, as any resident connected to a restricted supply (rural schemes or larger residential sections) are required to have a tank. Reservoirs/tanks are also part of the Selwyn water supplies, these tanks are regularly maintained and all sit above ground to limit the ingress of contaminated material.

These households/communities within Selwyn have been identified to have higher risks:

- Private community supplies e.g. Lower Selwyn Huts
- Private Supplies e.g. Properties on private bores
- Institutions e.g. Marae, Lincoln University
- Community halls
- Community Pools
- Campgrounds
- Households using water race water for domestic use

It is noted that Community and Public Health (CPH) do not monitor or regulate private water supplies but if they are over a certain size they must be registered.

In the first year of the LTP there is a project to identify all the households that use water race water for domestic use. Although the water races were not designed for a domestic supply it is known that some users use it for domestic use.

There has been an increase in tourism in the Selwyn District. This is partly due to the Kaikoura earthquake and the popularity of freedom camping. Often there is over 200 people a night at campgrounds that weren't designed for that capacity. Therefore, we are now experiencing issues with having the capability to supply potable water. The water that is provided is separate to Councils water supplies and is not treated, signage indicates this is a non-potable supply**.**

**Wastewater**

The Council manages 14 reticulated wastewater systems, the details of these are described in the Wastewater Activity Management Plan. In short, the networks service 63% of the district and have been

provided where unsanitary conditions were created through high groundwater conditions, large settlements or the sale of Crown operations to Council that required a reticulated system be provided. The majority of the wastewater is pumped to the Pines Wastewater Treatment Plant in Rolleston or the Ellesmere Treatment Plant in Leeston, both plants are disposal to land. While these networks supply the majority of the districts households the rest of the district are serviced by septic tanks.

Treatment, disposal and collection of wastewater is important to supporting the health and well-being of communities. The absence or deficiency of suitable provision can result in communities coming into contact with raw or partially treated wastewater. The health risks of this are significant and could be life threatening. While the Council provides a service to the majority of the community, large areas and communities are also serviced by private systems.

The Councils network consists of infrastructure and discharges which are subject to resource consents held by Environment Canterbury. These consents include requirements for regular monitoring and reporting to ensure that the natural environment is protected.

Levels of technical knowledge and skills are required to ensure that private systems are properly installed, maintained and replaced. Failure of private systems may be difficult to detect as there are limited systems in place to ensure comprehensive monitoring and maintenance. This is exacerbated by changes in property ownership and therefore a lack of understanding about the wastewater system. There is therefore a risk that the system could fail and unintended discharges could result. Where these systems only serve one household, the risk is limited, however there is potential to be exposed to raw wastewater. Another issue arises where dwellings are only used for holiday occupancy. Therefore the pattern of wastewater discharge can vary considerably with periods of no use and periods of excessive loading.

Darfield and Kirwee are two of the largest un-sewered communities in New Zealand. Community and Public Health have previously identified a concern that discharge of minimally-treated wastewater to ground form this community may pose a public health risk. In 2014 a three phase investigation to assess the potential risk to public health of minimally treated water was carried out. The key issues that were raised were:

- Increased risk to public health associated with clustered/greater density development;
- Poor knowledge/irregular maintenance of onsite systems on private residential properties;
- Minimum property sizes should be enforced if onsite treatment is retained; and
- Commercial properties/business have a greater understanding of their systems and have them serviced more regularly than residential land owners.

The Council is working through this issue and signalled its intent that it would progress consideration of a reticulated scheme, in some form, in the 2017/18 Annual Plan. Any proposal to include a reticulated scheme

in Councils budgets would then be subjected to full consultation in the 2018-28 Long Term Plan, Infrastructure Strategy and the Activity Management Plans.

Council owns two septage disposal facilities which were commissioned during 1996 and decommissioned in 2017. These sites were developed to allow disposal of domestic septic tank sludge for the Darfield and Hororata areas. The Council is currently applying for a consent to remediate the sites. At present there is no septage disposal facilities in the district. The Council is planning to build a septage receiving site at the Pines Wastewater Treatment Plant (in Rolleston) within the next three years, this is budgeted in the 2018-2028 LTP.

Tourism growth in the Selwyn District over the years has included a significant growth in the popularity of freedom camping. This has resulted in increased use of the district's campgrounds (which are free camping sites with only basic toilet and refuse services provided). This has resulted in some wastewater issues at campgrounds because they weren't designed for that capacity. These campgrounds are mostly serviced by septic tanks and/or holding tanks. Water supplies are also generally via a well onsite and so are not tested.

Tourism growth has also seen an increase in the number of campervans to the district and the resulting disposal of self-contained effluent is creating an increasing demand for dump stations. This is currently addressed by the provision of four campervan effluent disposal stations on Council land, plus other private provision at some service stations. Council has identified the need for increased provision of effluent disposal stations to meet future expected demand. Additional funding has been programmed over the next 10 years for the provision of new stations, although siting is subject to further analysis and has not yet been confirmed.

**Stormwater**

The Council manages 21 stormwater management areas within the district. These areas are all urban in nature and have infrastructure in place to collect, convey and dispose of surface water. Many areas also manage stormwater in terms of water quality and quantity. The diverse geographic location of the stormwater management areas brings with it the need to provide a range of location specific stormwater management techniques that meet particular community's needs. For example, rainfall, ground water depths and soil types vary across the district and affect stormwater management.

Council helps manage surface water in these urban areas that can lead to risks in public health and safety, damage to property and contribute to dangerous road conditions. The Councils network consists of infrastructure and discharges which are subject to resource consents granted by Environment Canterbury. Changes under the Land and Water Reginal Planning rules mean the Council is required to lodge all stormwater network consent applications by 30 June 2018 and from 2025 Council is required to account for and are responsible for the quality and quantity of stormwater discharges from their network. Council

currently holds 7 of these consents with four additional consents being lodged at Environment Canterbury for processing.

Urban areas also receive run-off from upstream rural catchments which are typically used for farming activities involving the application of substances such as fertiliser and the management of animals. Therefore there is potential for upstream catchments to provide a source of contaminants, especially in heavy rain events. It is noted that wherever rainfall has contact with the ground it has the potential to become contaminated with material or substances that could pose a risk to public health if they become in contact with it. In contrast to urban areas, rural serviced communities are characterised by low density areas and permeable areas such as farmland. This provides a greater risk to health during flood events however the probability of them occurring and inundating the dwelling is low and often events are infrequent and of short duration.

In 2013 the Council experienced a significant stormwater event, in particular this affected the township of Leeston. Following this, a public meeting was held during which the community asked the Council to look at options to divert flood waters from the surrounding land around the township to manage localised flooding. Drop in sessions were also held so that individual property owners could talk to with Council staff about any issues affecting their property. Following the public meeting Council worked with the Leeston Community Committee to investigate a number of ideas and suggestions which were discussed at a further community meeting. All ratepayers were then given the opportunity to provide feedback via a questionnaire, 77% of survey forms received voted in favour of work progressing to upgrade the stormwater system. Residents also had the option to vote on which option they preferred. This resulted in the construction of the Leeston bypass, all stages are due to be completed by 2020 (Stage 1 and 2 are already complete).

The Council has also undertaken 'Rapid Flood Hazard Assessment' modelling for its main townships. The modelling uses DHI MIKE 21 to simulate rainfall on grid with the outputs processed through ArcGIS producing maps illustrating a range of flood deeps during different rainfall intensities and durations.

Council is also responsible for managing 10 Land Drainage schemes which includes one flood protection scheme (to provide flood protection for Arthurs Pass). The focus of the Land Drainage schemes is to drain groundwater and stormwater from land to ensure land productivity rather than the protection of public health itself. Although, both areas of activity do contribute towards the management of risks to public health.

Elsewhere in the district the stormwater management network consists predominately of private onsite soakage and private flood protection banks.

### Current and Future Demands

The future changes in the district have already been outlined in this assessment. This indicates a pattern of steady growth. The expectation is that most of this growth will occur on land in the major townships, which

is currently unserviced (commonly known as greenfield developments). The district plan outlines where development can be undertaken and requires new development to be adequately serviced by appropriate infrastructure. This requires developers to install water, wastewater and stormwater reticulation. The developer must assess and design networks that ensure there are no capacity issues and that each lot has a connection to the Council network when available. Water networks must have appropriately sized reticulation to provide adequate pressure for each property and for operation of fire hydrants. Where possible developments are serviced by gravity sewer and developers must show that reticulation has been sized to accept the flow from the contributing catchment. If this cannot be achieved pump stations or a pressurised sewer network can be installed. Stormwater networks vary over the district and will either involve stormwater runoff being discharged to ground or into a Council owned reticulated network. Where treatment is required swale, basins or ponds may need to be installed.

After a year, these developments are vested in Council with the exclusion of pump station and stormwater facilities which have a defects period of two years. Although developers provide the infrastructure, Council oversees this process and work with developers to upgrade infrastructure where required to ensure the network functions efficiently and effectively. Council also undertakes master planning in conjunction with the LTP process to ensure the forecasted growth will not create capacity constraints and therefore the relevant infrastructure is upgraded in time.

If development is located beyond the reach of Council it will still need to make appropriate provision for water, wastewater and stormwater. Proposals designed to service additional communities such as community halls and sports clubs will increase the potential for health risks associated with the provision of water supply, treatment and maintenance; wastewater collection, treatment and discharge; and stormwater discharge.

## 6.11 Improvement Planning

Throughout this section a number of specific actions to improve the way in which the Council identifies and manages its growth and demand associated with the 5Waters activity. These actions are summarised below in Table 6-6.

**Table 6-6 AM Improvement Items – Growth and Demand**

| Section Ref | Improvement Opportunities | Priority | Timing |
|---|---|---|---|
| 6.1 | Monitor and revise growth predictions for the district as growth continues | Medium | Every 3 years |
| 6.9.2 | Develop a demand management plan for all 5Water Services | Medium | 2019/20 |
| 6.9.2 | Review the demand management plan for Water | Medium | 2018/19 |

| | | | |
|---|---|---|---|
| 6.9.2 | Develop a water loss strategy | Medium | 2019/20 |
| 6.9.2 | Reasonable Use Model (recognised more appropriately as an improvement item in Section 8) | High | 2018/19 |
| 6.9.2 | Develop a water supply strategy | Medium | 2020/21 |

# 7.0 LIFECYCLE MANAGEMENT

This section outlines what is planned to manage and operate the assets at an agreed level of service while optimising lifecycle costs. It covers asset condition and criticality, operation and maintenance plan, renewal replacement plan, asset acquisition and disposal plan.

Lifecycle asset management focuses on management options and strategies considering all relevant economic and physical consequences, from initial planning through to disposal. The effective application of asset management principles will ensure the reliable delivery of service and reduce the long-term cost of ownership and in this way reduce service costs[28]. A well-structured lifecycle management plan will reduce the long term costs of ownership and in so doing reduce the service cost.

The Lifecycle Management Programmes cover the three key categories of work necessary to achieve the required outcomes from the 5Waters Activity. These key categories are:

- **Operations and Maintenance Plan**:
- To ensure efficient operation and serviceability of the assets so that they achieve their service potential over their useful lives. This includes the day-to-day work to keep the assets operating.
- **Renewal Plan**:
- To provide for the progressive replacement of individual assets that have reached the end of their useful lives (restores the original capacity)
- **Development Plan**:
- To improve parts of the system currently performing below target service standards and to allow development to meet future demand requirements

Maintaining the service potential of the assets and ensuring that the assets achieve that potential

Closing service gaps.

Meeting the future demand

The fourth category is the disposal programme (sale, disposal or relocation); while not as critical as the other four areas it still plays a role in the lifecycle management.

## 7.1 Asset Types

The 5Waters activity utilises a range of assets. The 5Waters assets are grouped into the following nine asset type groups below:

[28] IIMM 2006: Section 2.5.4

1. ***Water Network Assets*:** Reticulation level assets supplying potable water covering pipes, laterals, valves, hydrants, supply points and chambers.
2. ***Water Facility Assets*:** Encompasses all assets contained within a water facility such as pump stations, reservoirs, chambers, bores, water treatment (filtration, disinfection and dosing), SCADA and control assets.
3. ***Wastewater Network Assets*:** Reticulation level wastewater assets covering pipes, laterals, valves, manholes and chambers.
4. ***Wastewater Facility Assets*:** Encompasses all assets contained with a wastewater facility such as pump stations, chambers, wastewater treatment (aeration, filtration, disinfection), disposal, SCADA and control assets.
5. ***Stormwater Assets*:** Stormwater assets covering inlet structures, pipes, laterals, valves, manholes, chambers, basins, ponds and swales, tanks, outlet structures, and management devices.
6. ***Land Drainage Assets*:** All land drainage assets covering pipes, culverts, land drains, gates, valves, manholes, chambers, ponds, weirs outfall structures.
7. ***Land Drainage Facility Assets*:** Encompasses all assets contained with a land drainage facility.
8. ***Water Race Assets*:** All water race assets covering inlet structures, tunnels, pipes, valves, culverts, water race channels (Main, Lateral and Local), outfall structures and control structures.
9. ***Water Race Facility Assets*:** Encompasses all assets contained with a water race facility.

These asset types are structured in AMS, this is shown in
Figure 7-1 and Figure 7-2 below.

| Site | |
|---|---|
| Building | Building |
| Grounds | Zone |
| Land Use | Monitoring |
| Land Use | Sewer Pump Station |
| Land Use | Sewer Treatment Plant |
| Land Use | Water Intake |
| Land Use | Water Pump Station |
| Land Use | Water Race Intake |
| Land Use | Water Reservoir |
| Land Use | Water Treatment Plant |
| Site | Activity |
| Site | Non Asset Group |
| Site | Site |

| Sewer | |
|---|---|
| Chamber | Flush Tank |
| Chamber | Inspection Chamber |
| Chamber | Inspection Point |
| Chamber | Pig Chamber |
| Chamber | Rod Eye |
| Chamber | Septic Tank |
| Lateral | Gravity |
| Lateral | Pressure |
| Manhole | Inspection Chamber |
| Manhole | Round |
| Node | Break |
| Node | Start/End |
| Node | Tee 3 |
| Pipe | Gravity |
| Pipe | Rising |
| Scheme | Dummy Asset |
| Valve | Air |
| Valve | Air Gap Separator |
| Valve | Control |
| Valve | Gate/Sluice |
| Valve | Gate |
| Valve | Non Return |
| Valve | Scour |

| Land Drainage | |
|---|---|
| Channel | Drain |
| Channel | Pipe |
| Channel | Stopbank |
| Feature | Chamber |
| Feature | Flood Gate |
| Feature | Headwall |
| Feature | Node |
| Feature | Weir |
| Scheme | Dummy Asset |

| Stormwater | |
|---|---|
| Chamber | Box |
| Chamber | Inspection Point |
| Chamber | Tank |
| Chamber | Weir |
| Channel | Drain |
| Channel | Infiltration Trench |
| Channel | Swale |
| Channel | Versitank |
| Inlet | Outlet-Point-Headwall |
| Inlet | Outlet-Point-Kerb Adaptor |
| Inlet | Oultet-Point-Sump-Corner |
| Inlet | Outlet-Point-Sump-Dome/Leaf |
| Inlet | Outlet-Point-Sump-Footpath |
| Inlet | Outlet-Point-Sump-Road |
| Lateral | Gravity |
| Management Device | Basin |
| Management Device | Filter Bed |
| Management Device | Gate |
| Management Device | Oil Trap |
| Management Device | Proprietary Device |
| Management Device | Rain garden |
| Management Device | Silt Trap |
| Manhole | Inspection Chamber |
| Manhole | Round |
| Manhole | Square |
| Node | Break |
| Node | Start/End |
| Node | Tee3 |
| Node | Tee4 |
| Pipe | Gravity |
| Scheme | Dummy Asset |
| Soakhole | Boulder Pit |
| Soakhole | Manhole |
| Soakhole | Manhole / Horz Soakage |
| Soakhole | Modified |
| Valve | Flap |
| Valve | Gate/Sluice |
| Valve | Non Return |

| Water | |
|---|---|
| Chamber | Brake Pressure Tank |
| Chamber | Farm Tank |
| Chamber | Tank |
| Fire | Filling Point |
| Fire | Hose/Reel Box |
| Fire | Tank/Storage |
| Hydrant | Standard |
| Irrigation | Dripper |
| Irrigation | Headwork |
| Irrigation | Pop Up Sprinkler |
| Lateral | Pressure |
| Node | Break |
| Node | Start/End |
| Node | Tee3 |
| Node | Tee4 |
| Pipe | Irrigation |
| Pipe | Main |
| Pipe | Rider |
| Scheme | Account |
| Scheme | Dummy Asset |
| Supply Point | Combo Meter |
| Supply Point | Manifold/ Meter |
| Supply Point | Manifold/FlowControl |
| Supply Point | Manifold/MtrBkFlwPrv |
| Supply Point | Manifold/NonRestrict |
| Supply Point | Meter/ No Manifold |
| Supply Point | Valve-Ball |
| Supply Point | Valve-Gate |
| Valve | Air |
| Valve | Backflow Preventor |
| Valve | Butterfly |
| Valve | Control |
| Valve | Gate/Sluice |
| Valve | Non Return |
| Valve | Pressure Reducing |

| Water Race | |
|---|---|
| Channel | Aqueduct |
| Channel | Culvert |
| Channel | Lateral |
| Channel | Local |
| Channel | Main |
| Channel | Main Local Lateral |
| Channel | Pipe Sock |
| Channel | Siphon |
| Channel | Tunnel |
| Divide | Single |
| Gate | Double |
| Gate | Single |
| Inlet | Outlet-Point-Chamber |
| Inlet | Outlet-Point-Discharge |
| Inlet | Outlet-Point-Grill |
| Inlet | Outlet-Point-Headwall |
| Inlet | Outlet-Point-IrrigationTakePoint |
| Inlet | Outlet-Point-Manhole |
| Inlet | Outlet-Point-Shaft |
| Inlet | Outlet-Point-Soakhole |
| Instruments | Flow Meter |
| Node | Start/End |
| Scheme | Dummy Asset |
| Structure | Fish Screen |
| Structure | Pond |
| Structure | Weir |

**Figure 7-1 5Waters Asset Classes**

| Buildings | |
|---|---|
| Building | Envelope |
| Building | Room |
| Building | Services |
| Envelope | Canopies/SunScrn/Awn |
| Envelope | External Door |
| Envelope | External Wall |
| Envelope | External Wall Clad |
| Envelope | Fascia |
| Envelope | Foundations |
| Envelope | Gable |
| Envelope | Roof Cladding |
| Envelope | Roof Structure |
| Envelope | Roof Ventillators |
| Envelope | Skylight |
| Envelope | Soffit |
| Envelope | Spouting/Downpipes |
| Envelope | Window |
| Fitout | Audio |
| Fitout | Auto/Fire Exit Door |
| Fitout | Baby Change Table |
| Fitout | Bath |
| Fitout | Bollard |
| Fitout | Ceiling |
| Fitout | Ceiling Fan |
| Fitout | Cleaners Tub |
| Fitout | Computer |
| Fitout | Control Panel |
| Fitout | Decking/Boardwalk |
| Fitout | Dishwasher / Sterili |
| Fitout | Donation Box |
| Fitout | Ductwork |
| Fitout | Electronic Security |
| Fitout | Emergency Lighting |
| Fitout | Extractor Fan |
| Fitout | Fire |
| Fitout | Fire Alarm |
| Fitout | Fire Extinguisher |
| Fitout | Fitted Joinery |
| Fitout | Floor Covering |
| Fitout | Floor Structure |
| Fitout | Grab Rail |
| Fitout | Hand Basin |
| Fitout | Hand Drier |
| Fitout | Handrail/Balustrade |
| Fitout | Heat Detector |
| Fitout | Heat Pump |
| Fitout | Heater |
| Fitout | Hose Reels |
| Fitout | Hot Water Unit |
| Fitout | Information Sign |
| Fitout | Internal Door |
| Fitout | Internal SmkeStopDr |
| Fitout | Internal Wall Clad |
| Fitout | Internal Window |
| Fitout | Lighting |
| Fitout | Movable Partitions |
| Fitout | Mural |
| Fitout | Projector Screen |
| Fitout | Ramp |
| Fitout | Shower |
| Fitout | Sink |
| Fitout | Smoke Detectors |
| Fitout | Stage |
| Fitout | Stage Curtains |
| Fitout | Stairs |
| Fitout | Stalls |
| Fitout | Stove/Oven |
| Fitout | Toilet |
| Fitout | Urinal |
| Fitout | Vanity incl Basin |
| Fitout | Veranda |
| Fitout | Waste Disposal |
| Pool Equipment | Chemical Dosing Equi |
| Pool Equipment | Chemical Tank |
| Pool Equipment | Controls |
| Pool Equipment | Diving Board |
| Pool Equipment | Fence |
| Pool Equipment | Filters |
| Pool Equipment | Gate |
| Pool Equipment | Handrail |
| Pool Equipment | Heaters / Boilers |
| Pool Equipment | Hydroslide |
| Pool Equipment | Ladders |
| Pool Equipment | Piping |
| Pool Equipment | Pool Cover |
| Pool Equipment | Pump |
| Pool Equipment | Skimmers & Nozzles |
| Pool Equipment | Swimming Pool |
| Pool Equipment | UV Treatment |
| Pool Equipment | Valves |
| Power Supply | Switchboard/Fuse Box |
| Service | Air Conditioning |
| Service | Central Heating |
| Service | Electrical |
| Service | Sewer |
| Service | Stormwater |
| Service | Water Supply |

| P&E Safety |
|---|
| Elevated Walkway |
| Enclosure |
| Footbridge |
| Handrail |
| Ladder |
| Ladder Cage |
| Platform |
| Stairway |

| P&E Component | |
|---|---|
| Aerator | Blower |
| Aerator | Inline Fan |
| Aerator | Mixer |
| Aerator | Mixer-Compressor |
| Aerator | Mixer-Launder |
| Aerator | Mixer-Scraper Motor |
| Aerator | Submersible |
| Cabinet | |
| Chamber | Bore |
| Chamber | Bore Casing |
| Chamber | Flow Splitter |
| Chamber | Gallery |
| Chamber | Intake |
| Chamber | Sludge Box |
| Chamber | Structure |
| Chamber | Wet Well |
| Containment | Holding-Aeration Pond |
| Containment | Holding-Bioreactor |
| Containment | Holding-Clarifier |
| Containment | Holding-Cyclinder |
| Containment | Holding-Fuel Tank |
| Containment | Holding-Liner |
| Containment | Holding-Oxidation Pond |
| Containment | Holding-Pond |
| Containment | Holding-Pressure Vessel |
| Containment | Holding-Reservoir |
| Containment | Holding-Septic Tank |
| Containment | Holding-Tank |
| Disinfection | UV (S) Unit |
| Disinfection | UV (W) Unit |
| Disinfection | UV Lamp |
| Disposal | Border Dyke |
| Disposal | Centre Pivot |
| Disposal | Disposal Point |
| Disposal | Drip Field |
| Disposal | Field |
| Disposal | Infiltration Basin |
| Disposal | Overland Flow Area |
| Disposal | Soak Pit |
| Disposal | Soakage |
| Disposal | Subsurface Wetland |
| Lifting | Beam |
| Lifting | Davit |
| Lifting | Davit (Lifting Socket) |
| Lifting | Davit/Gantry |
| Lifting | Gantry |
| Lifting | Hoist |
| Package Plant | |
| Polymer Plant | |
| Screen / Filter | Cartridge |
| Screen / Filter | Filter |
| Screen / Filter | Motorised Screw |
| Screen / Filter | Rock Bed |
| Screen / Filter | Screen |
| Screen / Filter | Soil Bed |
| Screen / Filter | Well |
| Structure | Outlet Structure |
| Structure | Surface Intake |
| Structure | Tank Stand |
| Structure | Weir |

| P&E Electrical | |
|---|---|
| Control | Cable |
| Control | ICA Component |
| Control | Soft Starter |
| Control | Supply |
| Control | Switchboard |
| Control | UPS |
| Control | VSD |
| Supply | Generator |
| Supply | Generator Socket |
| Supply | Generator Mobile |
| Supply | Harmonic Filter |

| P&E Instrumentation | |
|---|---|
| Dosing | Dose Controller |
| Dosing | Eductor |
| Dosing | Regulator |
| Meter | Dissolved Oxygen Meter |
| Meter | Flow |
| Meter | Lysimeter |
| Meter | Turbidity Meter |
| Meter | UV Intensity Meter |
| Meter | UV Trans Meter |
| Sensor | Air Temperature |
| Sensor | Chlorine Analyser |
| Sensor | DO Probe |
| Sensor | Float Switch |
| Sensor | H20 Monitor |
| Sensor | Level Probe |
| Sensor | Level Transducer |
| Sensor | Ponding Sensor |
| Sensor | Pressure Gauge |
| Sensor | Pressure Transducer |
| Sensor | Weather Station |
| Switch | Flow |
| Switch | Pressure |

| P&E Electrical |
|---|
| Centrifuge |
| Motor |
| Muncher |
| Pump |
| Pump and Motor |
| Sludge Manager |

| P&E Pipework |
|---|
| Diffuser |
| Fitting |
| Gravity Pipe |
| Hydrant |
| Infiltration Gallery |
| Irrigation Pipe |
| Pipe |
| Pressure Pipe |
| Sample Tap |
| Valve |
| Vent |

| P&E Telemetry | |
|---|---|
| Communications | Aerial |
| Communications | Aerial Pole |
| Communications | Ethernet |
| Communications | Modem Cellular |
| Communications | Modem Radio |
| Communications | Radio |
| Communications | Router |
| Power Supply | Battery |
| Power Supply | Battery Charger |
| Power Supply | DC Convertor |
| Power Supply | Solar Panel |
| Power Supply | Solar Regulator |
| Remote Terminal Unit | Card Reader |
| Remote Terminal Unit | HMI Display |
| Remote Terminal Unit | I/O Expansion |
| Remote Terminal Unit | RTU Hardware |

## Figure 7-2 5Waters P&E Asset Classes

A summary of material and diameter for water supply pipes is shown below in Figure 7-3 and Figure 7-4.

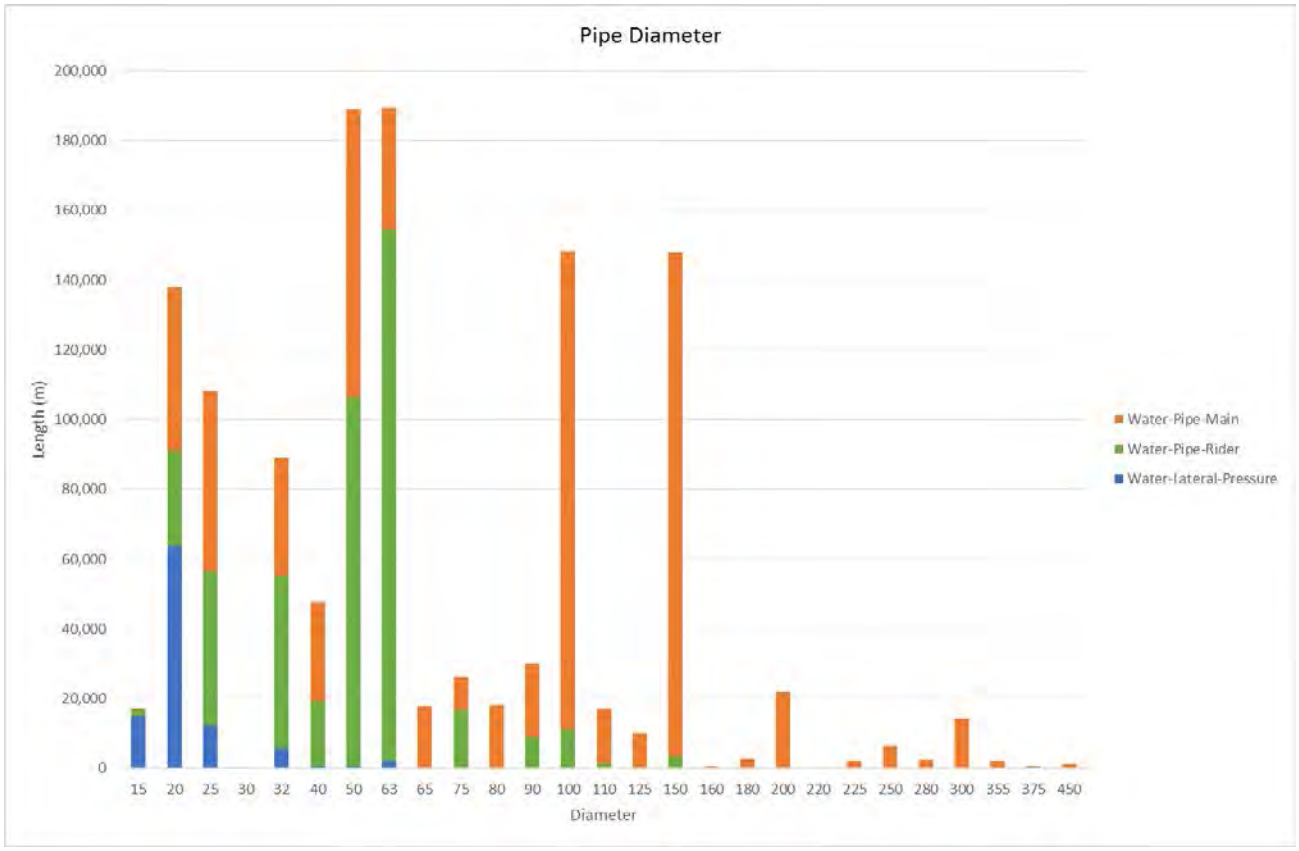



**Figure 7-3 Water Pipe Diameter**

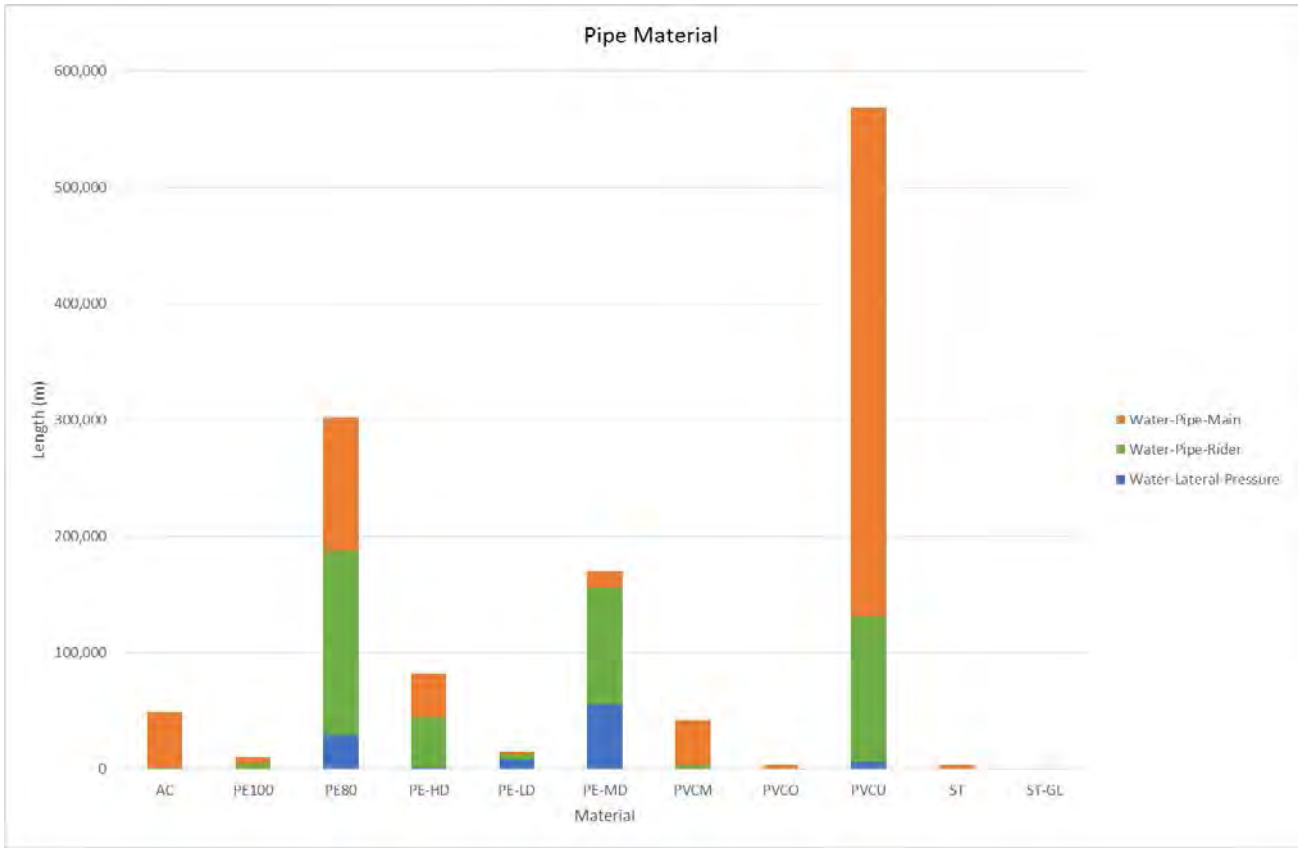



**Figure 7-4 Water Pipe Material**

A summary of material and diameter for wastewater pipes is shown below in Figure 7-5 and Figure 7-6.

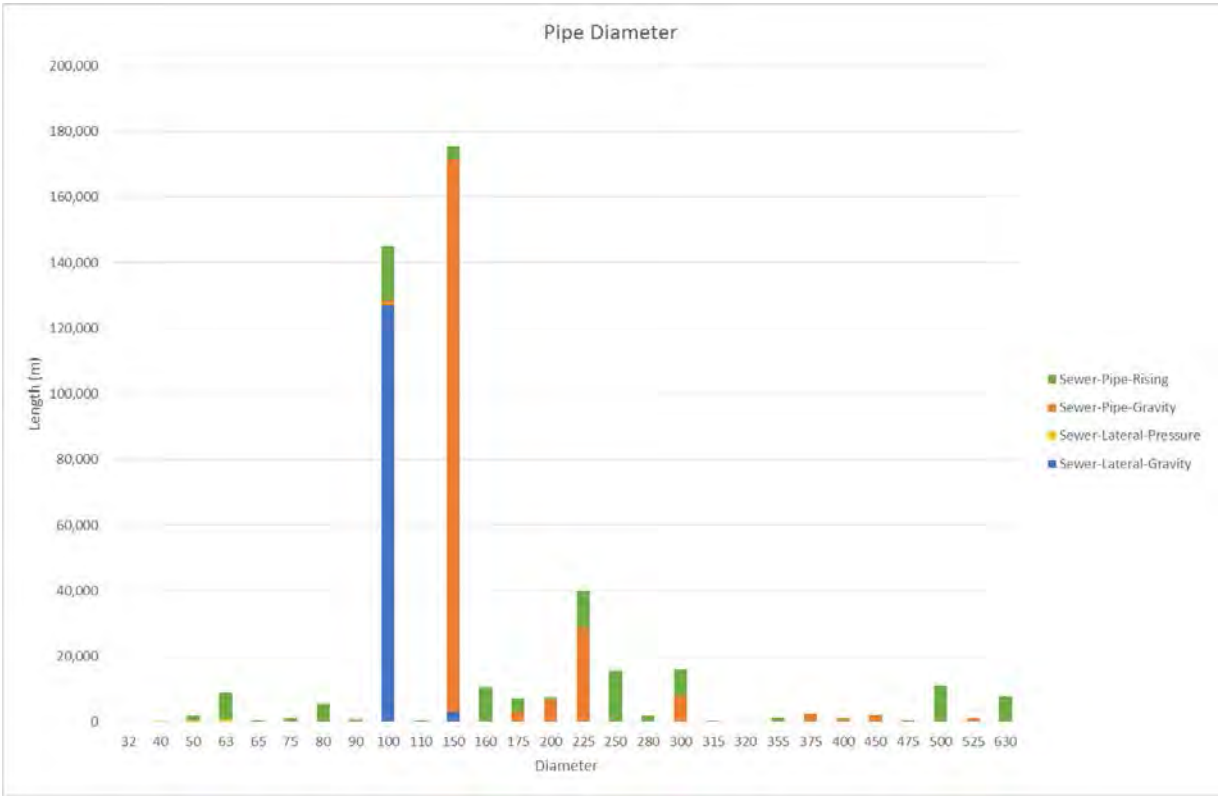



**Figure 7-5 Wastewater Pipe Diameter**

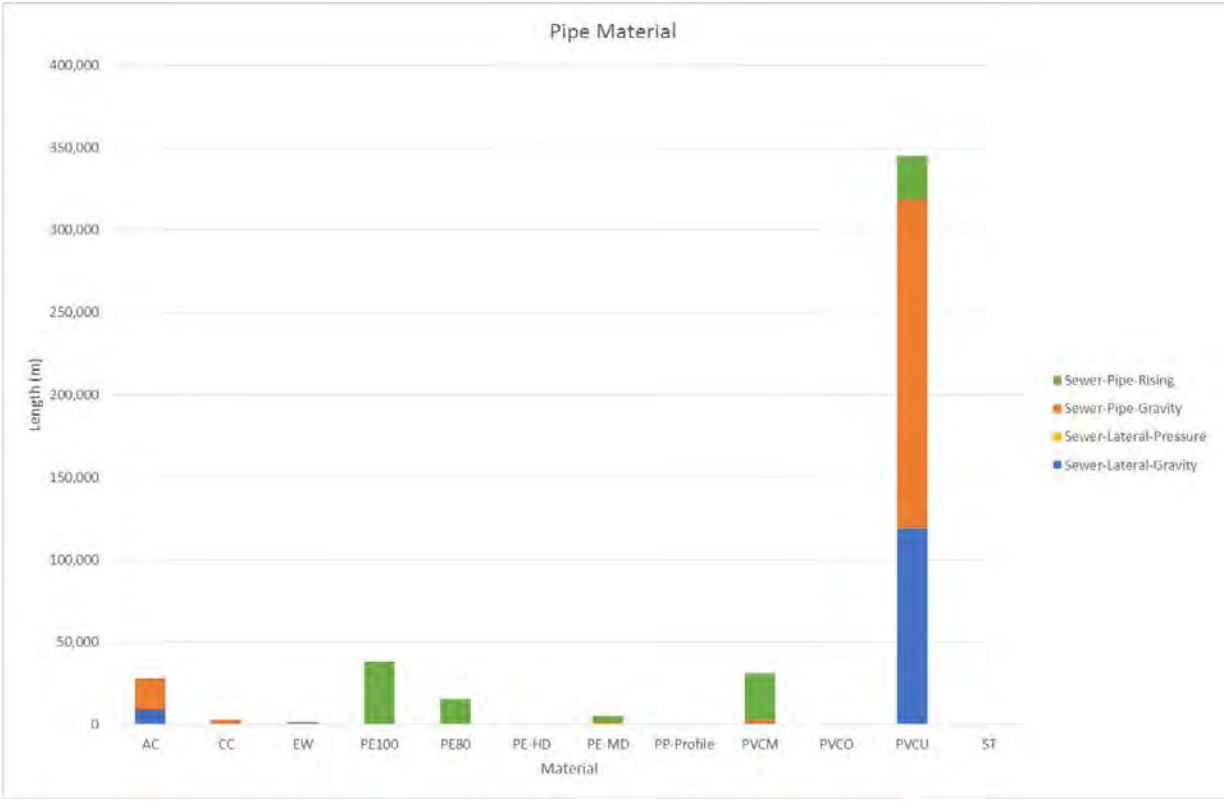



**Figure 7-6 Wastewater Pipe Material**

A summary of material and diameter for stormwater pipes is shown in Figure 7-7 and Figure 7-8 below.

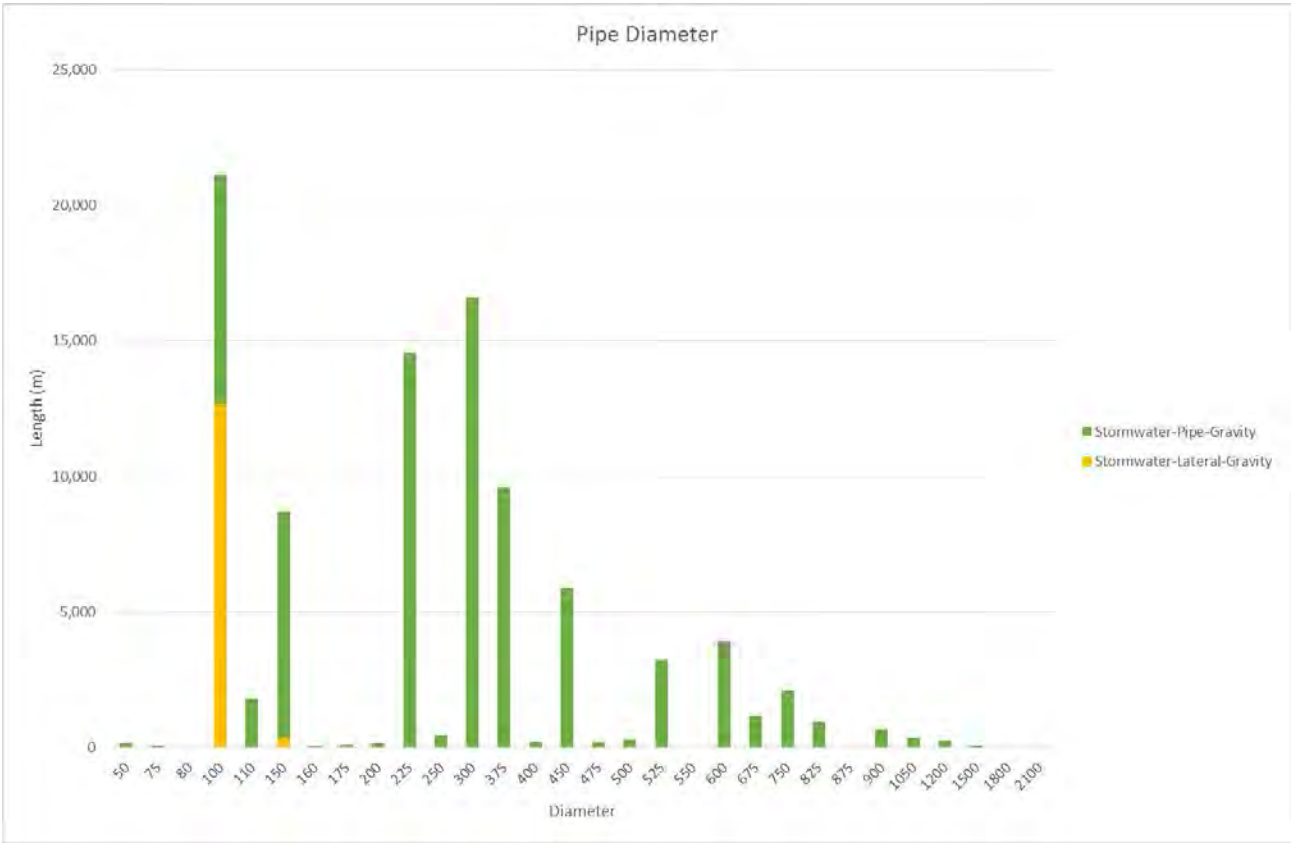



**Figure 7-7 Stormwater Pipe Diameter**

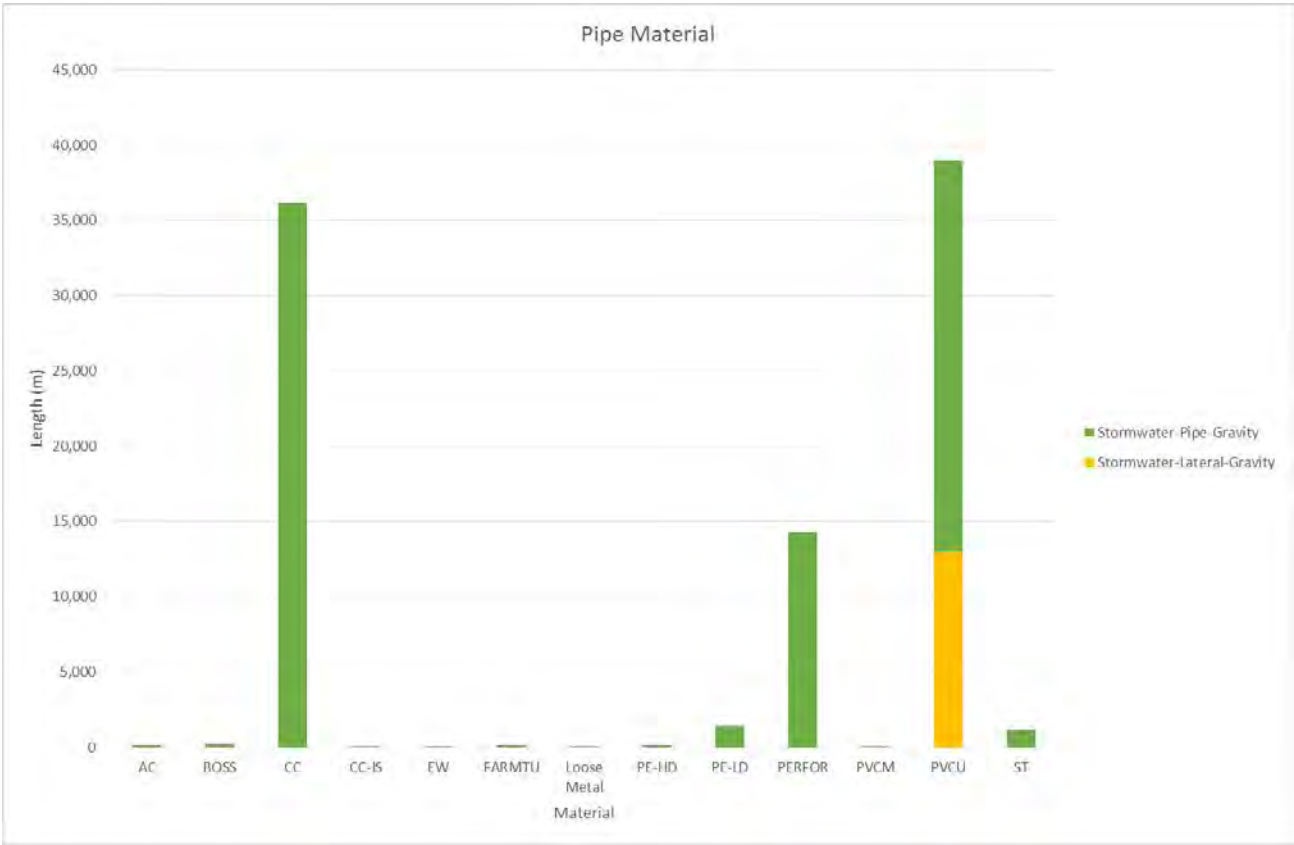



**Figure 7-8 Stormwater Pipe Material**

A summary of material and diameter for land drainage pipes is shown below in Figure 7-9 and Figure 7-10.

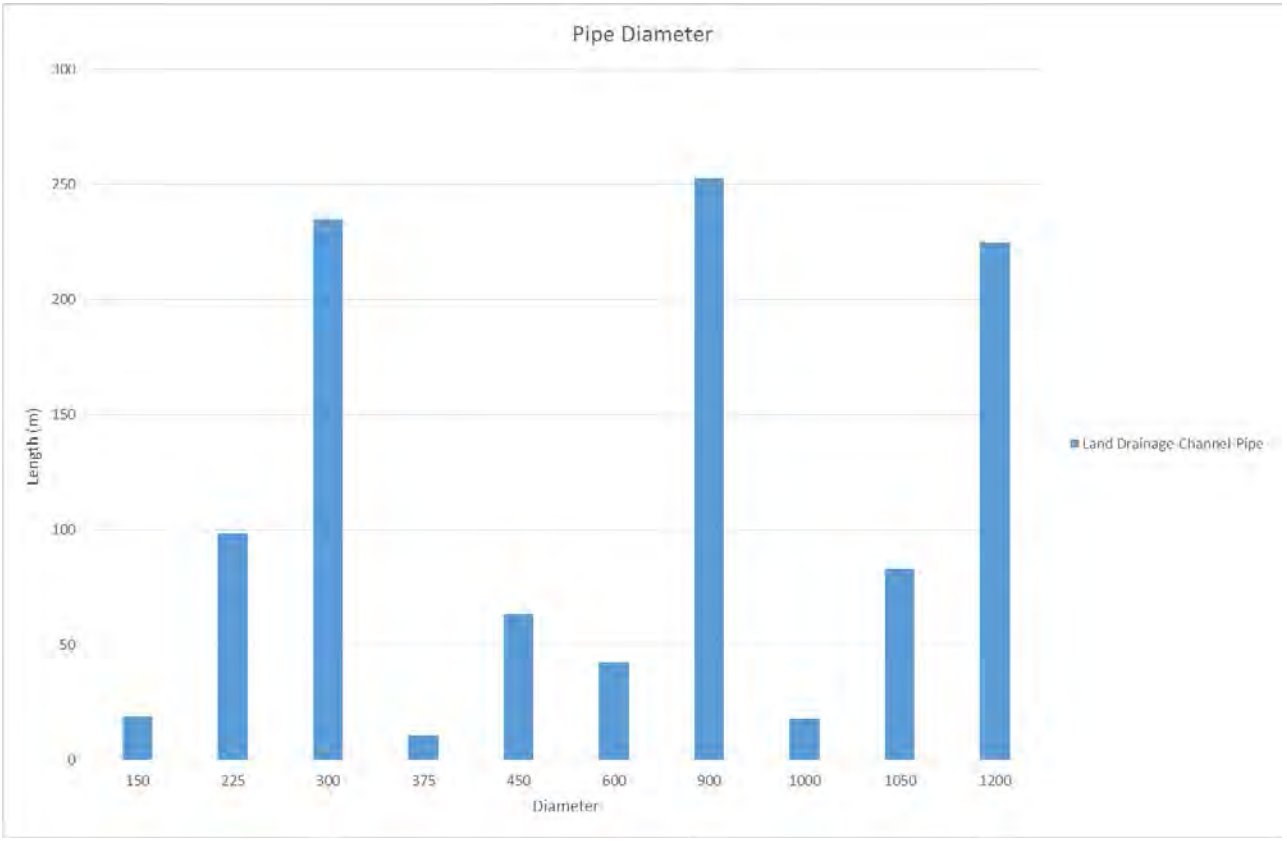



**Figure 7-9 Land Drainage Pipe Diameter**

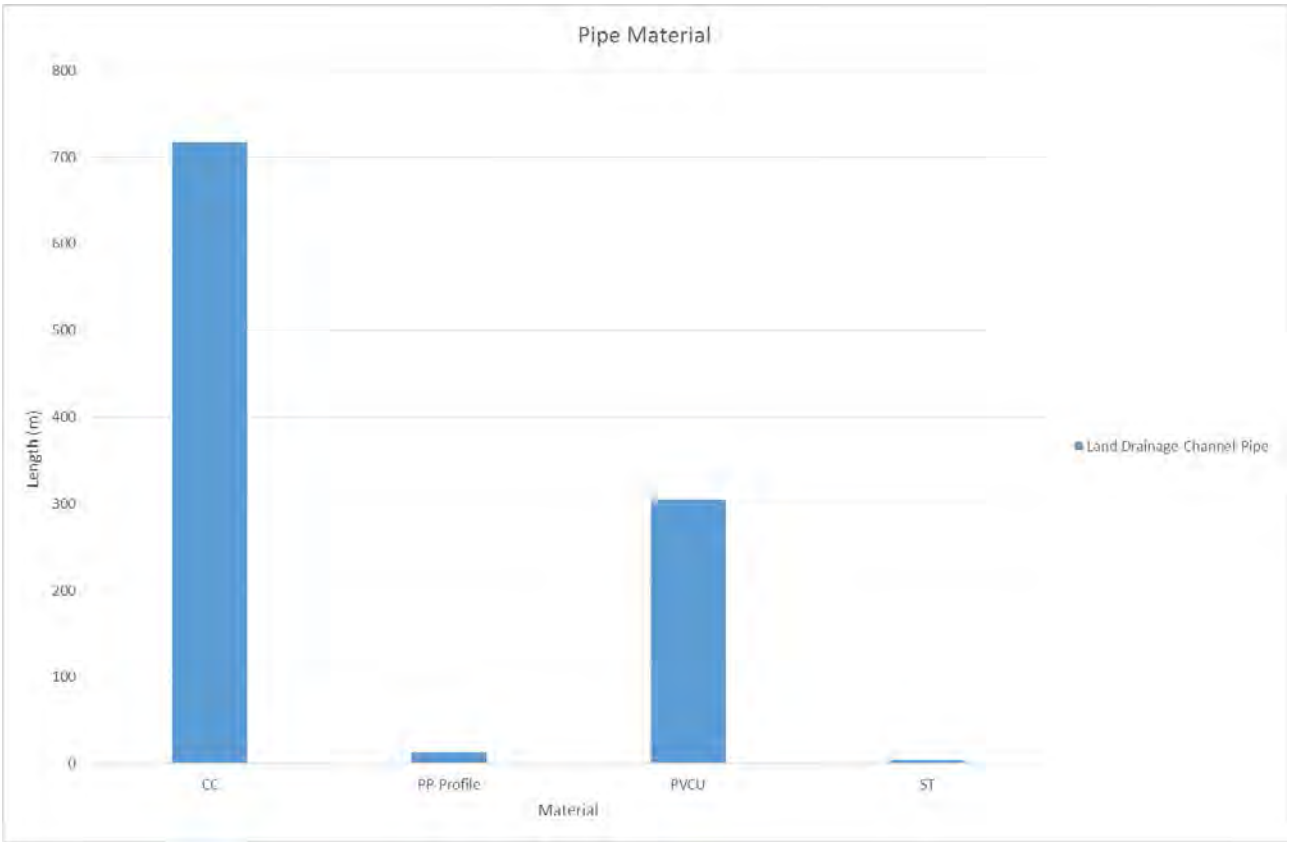



**Figure 7-10 Land Drainage Pipe Material**

A summary of material and diameter for water race pipes is shown in Figure 7-11 and Figure 7-12 below.

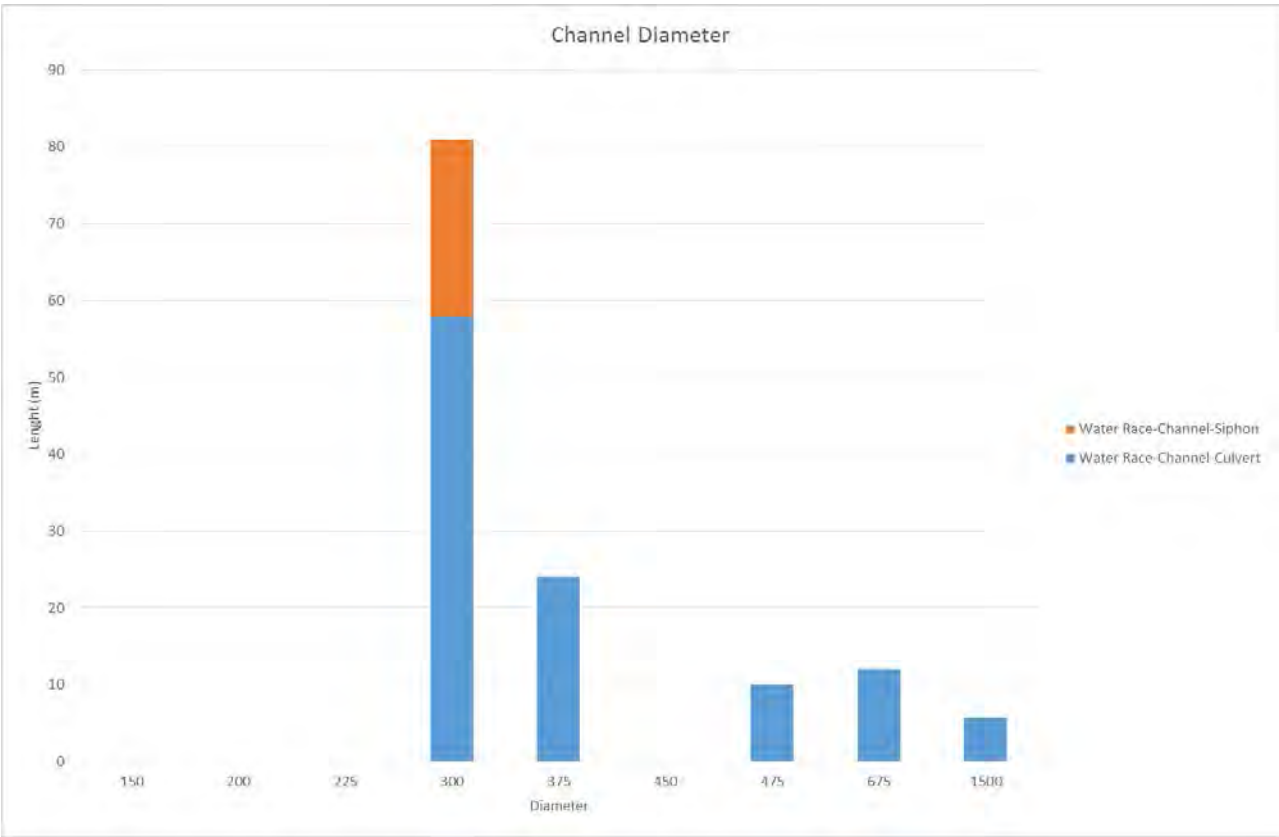



**Figure 7-11 Water Race Pipe Diameter**

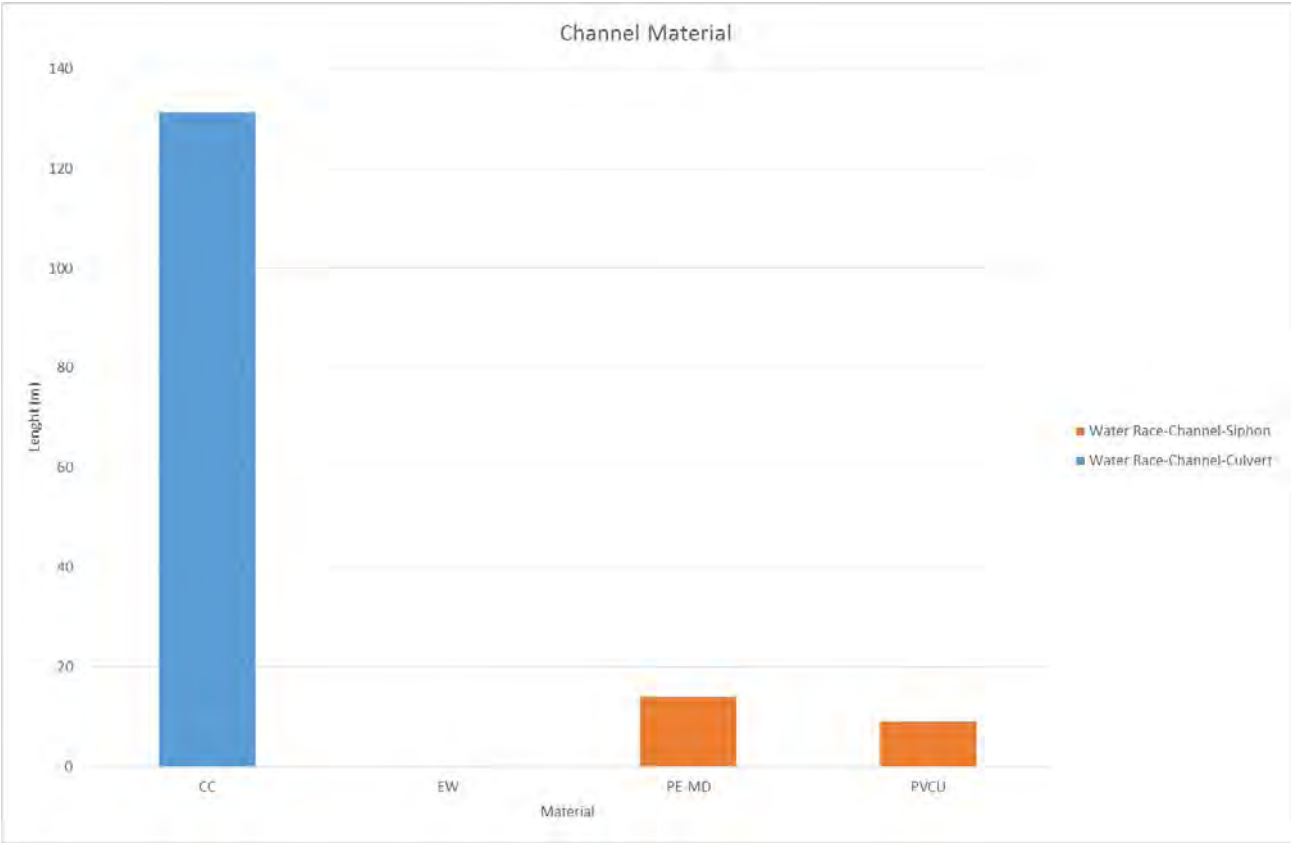



**Figure 7-12 Water Race Material**

## 7.2 Asset Capacity and Performance

### 7.2.1.1 Water Supply Scheme Capacity

Water supply capacity assessments have been completed for all of the community drinking water supplies. These assessments have been completed to varying levels of detail relative to the nature of the supply, known issues, and anticipated growth pressures. The system capacity for these schemes, and details about the new well requirements, is located in Volume 2: Water Supply.

**Hydraulic Models**

Darfield, Kirwee, Lincoln, Leeston and Doyleston, Prebbleton, Rolleston, Southbridge and West Melton water supplies have been assessed using the existing hydraulic models to develop a higher level of understanding and confidence in the system capacities and potential to accommodate growth. These are the main townships and rapidly developing areas.

In response to the accelerated growth within the Selwyn District and the introduction of the Canterbury '*Land Use Recovery Plan'*, hydraulic models have been used to plan future water infrastructure for the water supplies. Hydraulic models have been built and calibrated to international best practice to carry out the *'30-year Water Infrastructure Master Planning'*.

The master planning provides an assessment of the sizing and timing of new infrastructure for new water sources (wells) and pipelines to service growth. Part of the master planning requires a water balance to be developed to forecast growth, using historical peak demand per household. The water balance forecasts the peak instantaneous flow per year versus the water resources available to determine the staging of new wells. The well staging assumes that one well is redundant for each water supply, to take into consideration maintenance of wells, planning/timing of new wells and security of supply i.e. to maintain average/peak demand.

**Other Capacity Assessments**

Simple assessments using basic information and knowledge have been completed for Castle Hill, Dunsandel, Kirwee, Springfield, Sheffield/Waddington, Springfield and Tai Tapu/Otahuna water supplies. These are smaller towns where growth is not anticipated and/or surplus capacity is available.

A low level assessment has been completed for Arthurs Pass, Claremont, Edendale, Johnson Road, Jowers Road, Lake Coleridge, Rakaia Huts, Raven Drive, Taumutu, Te Pirita and Upper Selwyn Huts. These supplies have typically been developed for a discrete group of properties and no further connections are anticipated/ permitted. Any adjacent development would typically need to provide new water supply infrastructure.

These supplies are rural subdivision supplies (e.g. Edendale), alpine villages (e.g. Arthur's Pass), and recreational villages (e.g. Rakaia Huts).

Malvern Hills and Hororata-Acheron are two large rural water schemes, each comprising two supply areas. These are restricted supplies where water is trickle fed into consumer tanks via a restrictor, which limits the daily take to an agreed volume. Water is supplied for both domestic purposes and stock/ agricultural use.

#### 7.2.1.2 Water Pipe Performance

The water hydraulic models were used to model pipe head loss and consequently to measure the performance of pipes in the network in early 2018. This information is yet to be analysed, mapped in GIS and stored in AMS.

#### 7.2.1.3 Wastewater Scheme Capacity and Pipe Performance

The Council has developed two wastewater models for the major townships. The Ellesmere Wastewater Model includes the townships of Doyleston, Leeston and Southbridge. The Eastern Selwyn Sewer Model includes the townships of Rolleston, Prebbleton, Lincoln, Springston and West Melton. A hydrological and hydraulic model of the two catchments were developed using InfoWorks ICM v6.0 modelling software. This was based primarily on Geographical Information Systems and supplemented by drawings (both design and as-built), operations and maintenance manuals, site visits, and operator knowledge.

The purpose of the models are to ensure that Council has accurate knowledge of the operational performance and hydraulic capacity of the:

v. Ellesmere wastewater reticulation network, from collection through conveyance and pumping, to discharge at the Ellesmere Wastewater Treatment Plant (WWTP); and

vi. Eastern Selwyn Sewerage Scheme (ESSS) reticulation network from collection through conveyance and pumping to discharge at the Pines WWTP.

Council plans to use these models to inform future development in response to growth and for operational purposes.

## 7.3 Asset Condition

A condition grading model was adopted by Council in 2014 utilising three different data sources:

i. CCTV;

ii. A condition formula; and

iii. Condition grades assigned by the maintenance contractor.

A condition rating was developed for pipes with expertise from Opus International Consultants. A Condition Grade (scale 1-5) was evaluated for pipes as a function of the percentage of life remaining. This is based on:

i. Alignment of each pipe material useful life;

ii. Pipe use (e.g. water supply);

iii. Pipe Diameter; and

iv. Pie age at time of assessment.

Then the following equation is applied to each asset and then classified according to Table 7-1.

**Equation 1 Remaining Useful Life (RUL)**

$$RUL\ (\%) = 1 - \left(\frac{Assessment\ Year - Year\ Installed}{Useful\ Life}\right) * 100$$

**Table 7-1 Condition Grading**

| Condition Grade | Remaining Useful Life Range | | Condition Description |
|---|---|---|---|
| 1 | 75% | >75% | Very Good |
| 2 | 50% | >74% | Good |
| 3 | 25% | 46% | Moderate/Adequate |
| 4 | 3% | 24% | Poor |
| 5 | ≤0% | 2% | Very Poor |

Further details regarding the methodology is located in “Pipe Data Management 5Waters”.

Closed circuit television (CCTV) inspection of wastewater gravity mains is also undertaken for various reasons. In general these include: locating sources of inflow, checking grades, confirming satisfactory installation at the time of asset vesting and locating blockages. CCTV data exists for 13% of our wastewater pipes, shown in Figure 7-13 below.

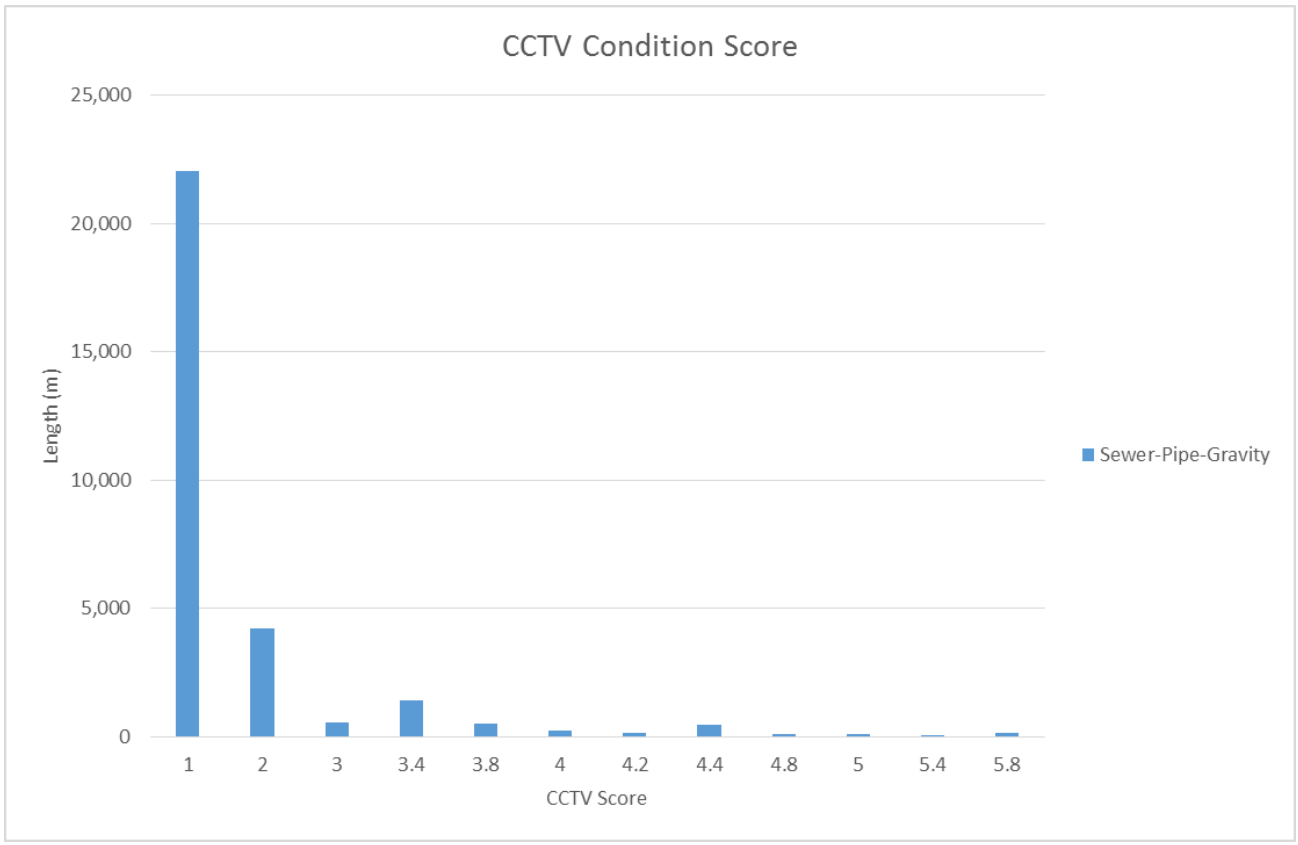



**Figure 7-13 CCTV Condition Score for Wastewater Pipes**

The condition grading model is applied to pipes across the 5 Waters. The model assigns condition grades in the following basis in priority order:

i. CCTV Inspection value if under 10 years old; then

ii. Asset Condition Formula; then

iii. Maintenance contractor assigned value.

The following graphs illustrate the condition ratings of pipe within the district.

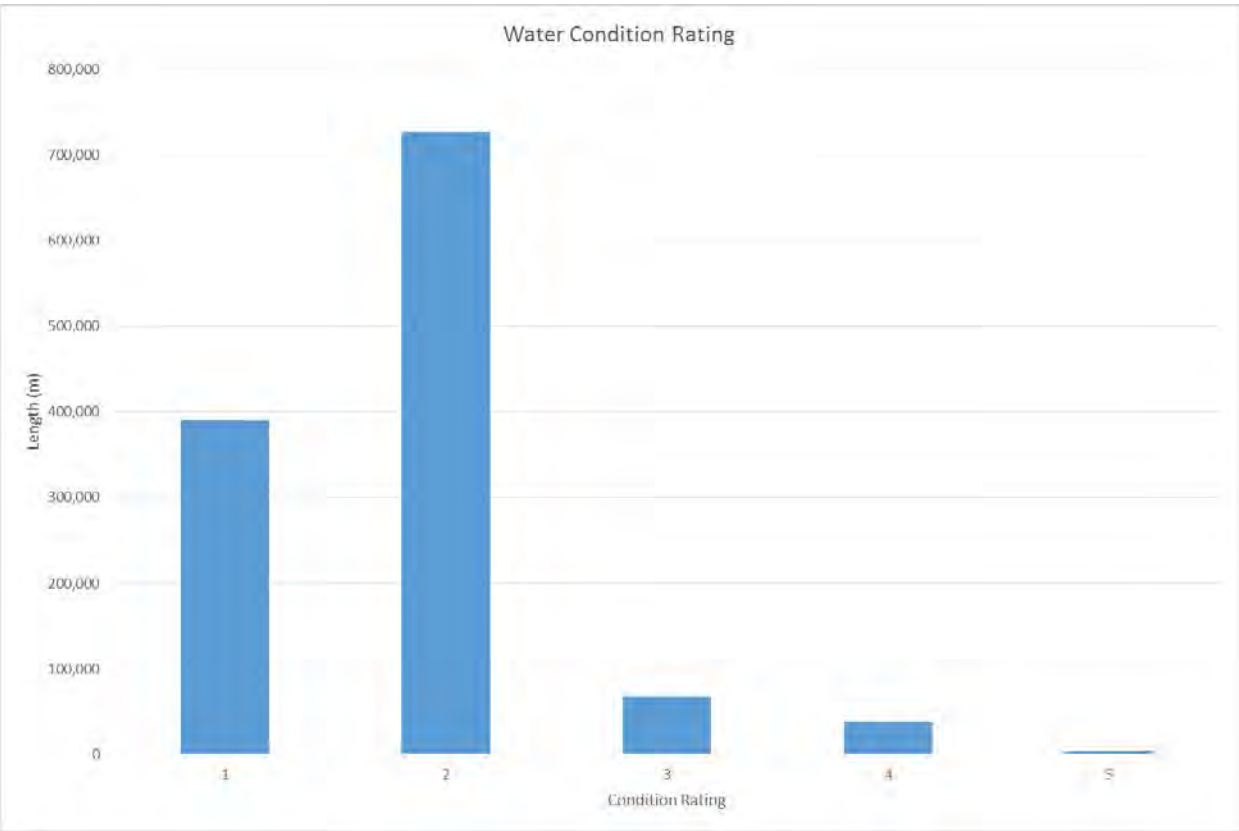



**Figure 7-14 Water Pipe Condition Rating**

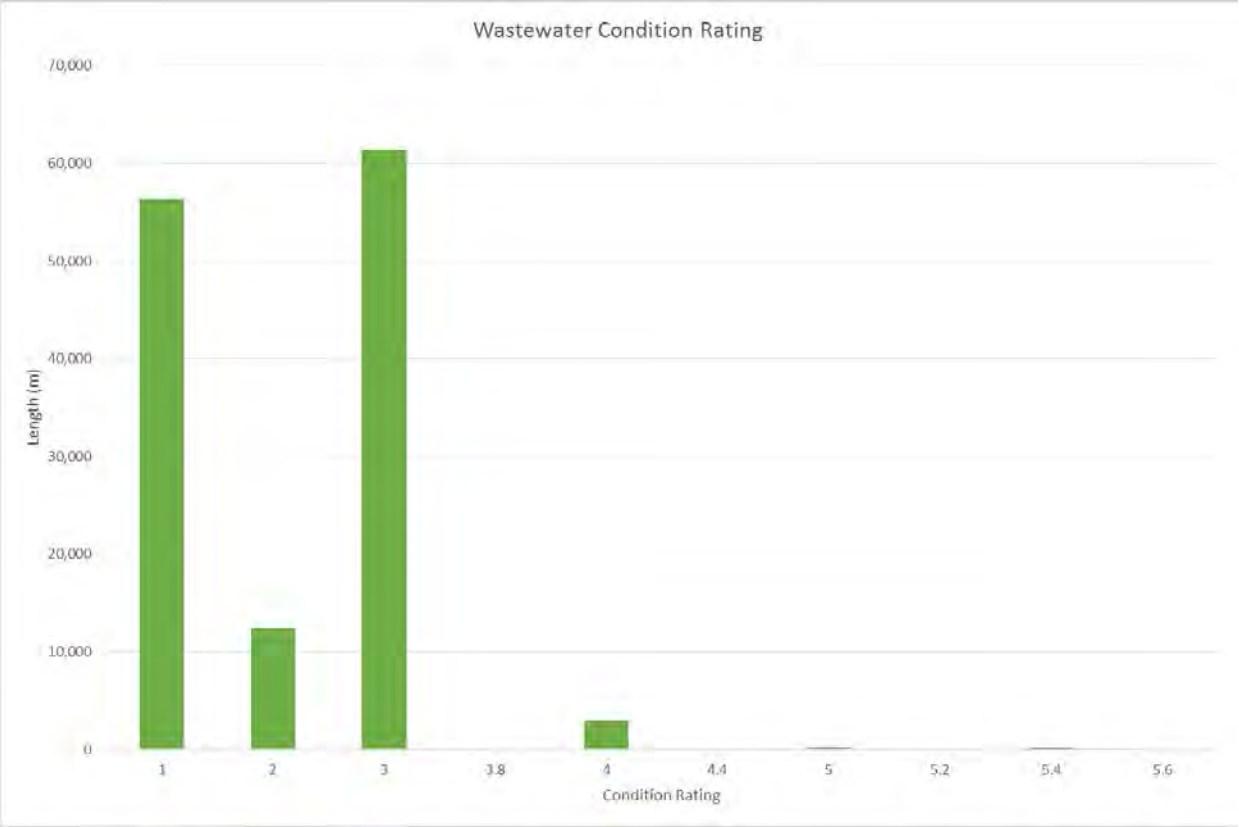



**Figure 7-15 Wastewater Pipe Condition Rating**

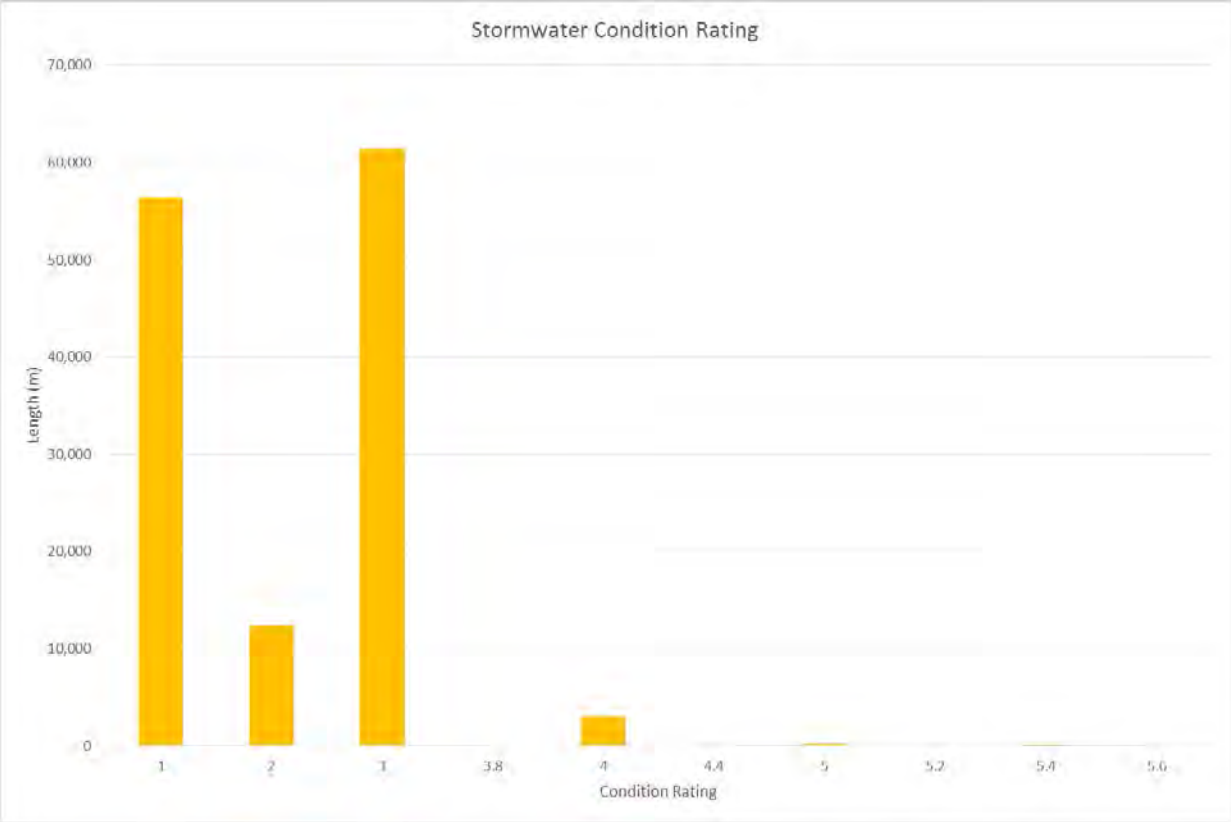



**Figure 7-16 Stormwater Pipe Condition Rating**


**Figure 7-17 Land Drainage Pipe Condition Rating**

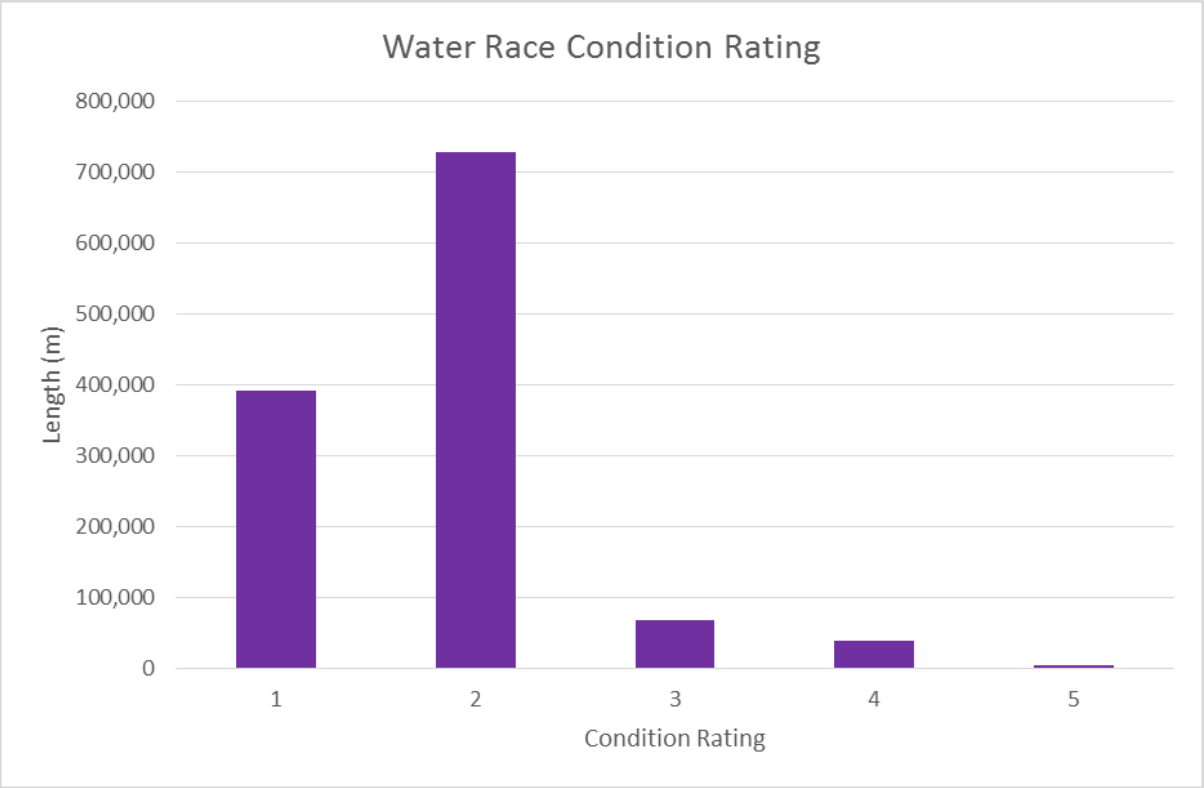



**Figure 7-18 Water Race Pipe Condition Rating**

Condition assessment is currently limited to pipes, therefore an improvement item is to extend this model and determine the condition across the full range of asset types.

## 7.4 Asset Criticality

Critical assets are "those which have a high consequence of failure, but not necessarily a high probability of failure". These assets are typically the most important to the organisation and its customers, irrespective of the likelihood of a failure of the asset.

Asset criticality allows the assets to be prioritised, so that they can be managed more proactively in order to mitigate the risk associated with their failure. The proactive management approach includes:

- Priorities for undertaking condition assessments;
- Adjusting economic lives with respect to renewal profiles;
- Prioritising/deferring renewals;
- Prioritising expenditure;
- Operation and maintenance planning; and
- Priorities for collecting asset information to the required level of confidence.

In 2017 the asset criticality model was re-run. This included a model for sites which was reviewed. A consequence based assessment was used which considered the implications of asset failure in terms of its economic, social, cultural and environmental consequences.

#### 7.4.1.1 Methodology

Criticality can be represented by the following basic equation:

*Criticality = Effect x Duration x Number affected x Sensitivity*

There are a number of elements that influence an asset's criticality. The following were included in the assessment of the raw Criticality Score for reticulation line assets:

- **Service Type:** The community has different sensitivities to the loss of different services. Therefore assets were grouped according to the five service types.
- **Size:** Size influences the cost associated with failure and size can typically provide a good approximation to the relative number of people affected.
- **Depth:** Depth influences the cost associated with failure and the duration of the loss of service.
- **Dewatering and Sheet piling:** These influence the cost associated with failure and the duration of the loss of service.
- **Location within a Road Carriageway:** When compared to an equivalent failure within an adjacent berm, the failure of an asset under a road has a greater associated cost and will impact on a greater number of people.

The raw Criticality Score was adjusted on these assets for Social, Economic, Cultural or Environmental influences. For the purpose of this assessment this was accounted for by identifying those assets within, or adjacent to, any of the following significant locations:

- **Critical Customers:** These include Aged Residential Care Facilities, Medical Centres, Hospitals, Community Care Facilities, Pharmacies, Medical Practices, Welfare Centres, and Dialysis Patients. These customers are considered to be relatively more sensitive to loss of service and some of these also effectively increase the number of people affected by a failure.
- **Schools:** These customers are considered to be relatively more sensitive to loss of service and they also effectively increase the number of people affected by a failure.
- **Business Zone:** Failures within a business zone would have a relatively greater economic effect and would typically affect more people.

- **Prisons:** These customers are considered to be relatively sensitive to unplanned asset failure. These locations also increase the relative number of people affected and, due to the relative complexity of undertaking construction works, potentially the duration of disruption.
- **State Highways:** In addition to the factors applied to work within roads already covered within the raw criticality score, asset failures under State Highways are considered to introduce even greater cost and disruption effects.
- **Railway lines:** Failures under railway lines have relatively greater effects on cost and disruption.
- **Cemeteries:** For cultural reasons, the community is relatively more sensitive to asset failure within cemeteries.
- **Historical or Cultural Locations:** The community is relatively more sensitive to asset failure adjacent to these locations. This sensitivity is heightened further if the nature of the failure has the potential to damage the significant structure / location. At certain times of the year, failure in these locations could also affect a relatively higher number of people.
- **Reserves:** Depending on the service type, reserves could have a relatively greater sensitivity to an asset failure and / or a failure could affect a relatively greater number of people.
- **Significant Natural Areas:** Depending on the service type, these areas could have a relatively greater sensitivity to an asset failure.
- **Waterways:** Depending on the service type, these areas could have a relatively greater sensitivity to an asset failure.

Once these assets were tagged a criticality score was assigned to the asset which determine where it fell in the criticality band: high, medium-high, medium, low-medium, and low.

Point assets associated with the pipe assets were assigned the same criticality. For example a pipe tagged with low criticality also tagged its associated hydrant or manhole with low criticality.

Sites or facilities, such as pump stations, were also tagged with their associated pipes criticality leaving or entering the site. These sites were reviewed and some scores were manually adjusted where appropriate.

The results of the criticality analysis are stored in GIS and AMS.

#### 7.4.1.2 Results

A summary of the criticality results for the reticulation asset by length is provided below in Figure 7-19 and Table 7-2. The majority (72%) of reticulation assets are classed as low criticality with 0.9% being classed as high criticality. Wastewater has the longest length of assets where the criticality is classed as high.

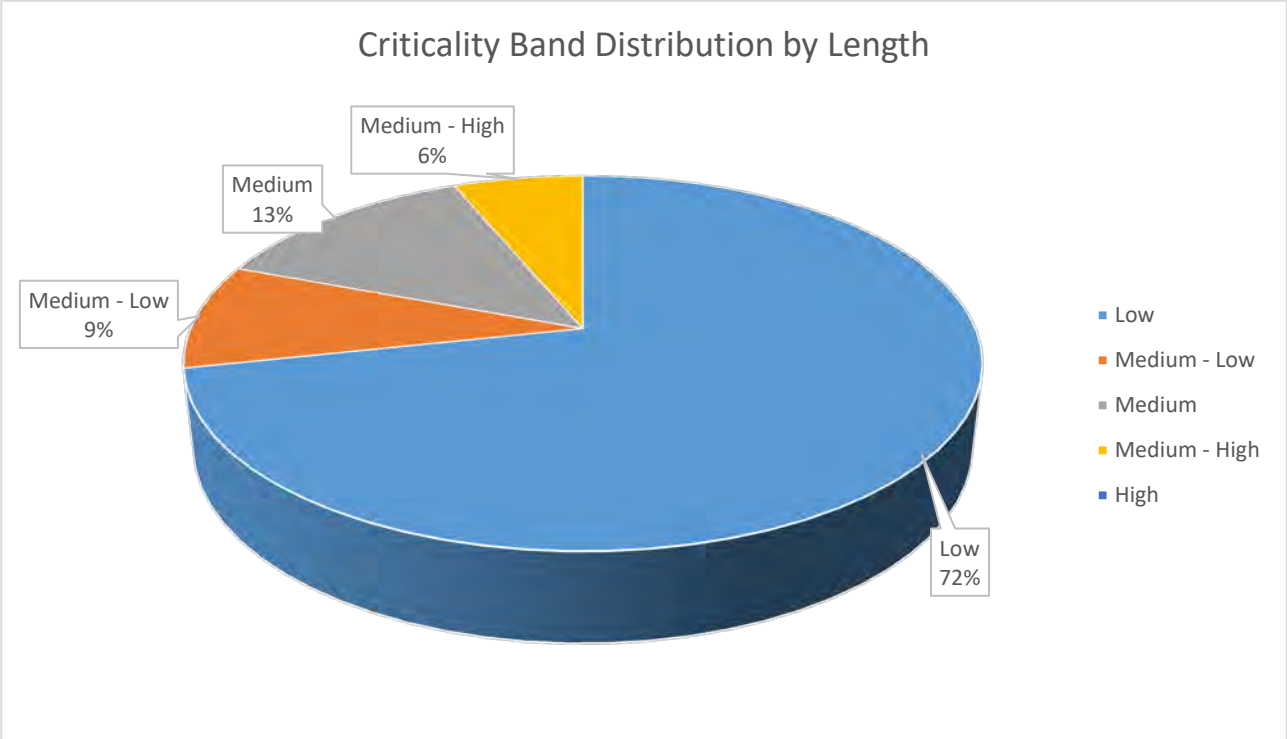



**Figure 7-19 Criticality Band distribution for the 5Waters Activities**

**Table 7-2 Criticality Results for 5Waters Reticulation Assets**

| Criticality Band | Land Drainage | Wastewater | Stormwater | Water | Water Race | Total |
|---|---|---|---|---|---|---|
| Low | 262,863 | 303,434 | 157,286 | 855,376 | 1,280,518 | **2,859,478** |
| Medium-Low | 33,362 | 84,427 | 10,212 | 251,157 | 416,329 | **795,487** |
| Medium | 47,712 | 28,240 | 13,649 | 125,956 | 23,223 | **238,780** |
| Medium-High | 23,025 | 32,954 | 4,902 | 87,940 | 9,374 | **158,195** |
| High | | 26,632 | 321 | 9,218 | 574 | **36,745** |
| **Total** | **366,962** | **475,688** | **186,369** | **1,329,647** | **1,730,019** | **4,088,685** |

For Plant sites the distribution is similar with only three sites being classed as high, this is shown below in Table 7-3.

**Table 7-3 Plant Sites and Criticality**

| Criticality Band | No. of Plant Sites |
|---|---|
| Low | 36 |
| Medium-Low | 41 |
| Medium | 33 |
| Medium-High | 21 |
| High | 10 |
| **Grand Total** | 141 |

Further information on the criticality results in located in Volume 2, 3, 4, 5 and 6 at a scheme basis. Further details regarding the methodology is located in "5Waters Criticality Assessment, Asset Criticality Report".

### Priorities for Critical vs Non-Critical Assets

The failure of a critical asset suggests that maintenance, refurbishment or asset renewal should be carried out at an earlier stage in the asset lifecycle than would be the case for a non-critical asset. Typically, the risk of asset failure increases as its condition deteriorates, so for a critical asset the intervention should be programmed before the condition reaches a pre-determined threshold in order to minimise the risk of asset failure.

For non-critical assets, where the consequence of failure is minimal, a possible asset management strategy is to allow the asset to "run to failure". For example a non-essential pump which can easily and quickly be replaced without disrupting the service provided to customers can be left to replaced when it fails to operate.

Prioritisation relating to asset criticality is also discussed in Section 0 Critical Assets Priorities.

In the future, subject to the availability of resources, it is intended that selection and prioritisation criteria for asset renewals and new asset investment will put a greater emphasis on condition, performance, risk and failure history assessment. This approach will utilise Optimised Decision Making (ODM) tools such as:

- Intervention (condition trigger) based renewal programs for critical assets based on service impact analysis.
- Risk-based economic analysis – economic quantification of the risk exposure comparing this with the capital costs of a project. This approach is also known as Failure Mode Effects and Criticality Analysis and is expected to be achieved through an interactive AMS/GIS workspace.

- Multi-criteria analysis – rating the effectiveness of a project against a range of evaluation factors, e.g. social, environmental, financial, growth, etc. outcomes.

Development of this approach has been included as an Improvement Plan task.

### Asset Criticality at an Operational Level

The integration of criticality into the day to day operation and management of the 5Waters is an integral part of the 5Waters strategy with the following:

- Criticality assessments of assets within the 5Waters allows all staff involved in the management, administration and operation of the services to have the ability to ascertain via GIS, AMS or handhelds the location and relevant details of critical assets;
- Priority will be given to ensuring that data confidence ratings for high criticality assets are high;
- Priority will also be given to managing the assets better. The Maintenance Contract C1170 Variation (June 2014) includes requirements for inspection of assets that vary with criticality for facilities, mains, hydrants, air valves, manholes etc. Inspections will also improve data confidence in the quality of asset data;
- Renewal strategy that facilitates the renewal of critical assets in a proactive manner;
- Condition assessments will be dependent on asset criticality and the percentage of life expectancy still attributed to the asset; and
- Workshops for operational staff on the background and requirements of criticality.

## 7.5 Asset Valuations

MWH New Zealand Ltd was commissioned by Selwyn District Council to value its water supply, wastewater, stormwater, land drainage and water race assets as at 30 June 2017.

The current valuation shows a total value of assets of $602 million, depreciated replacement cost of $468 million and annual depreciation of $7.3 million.

The purpose of the valuation is for reporting utility asset values in the financial statements of Council and for determining renewal funding. Table 7-4 and Figure 7-20 below provide a summary of the 2017 5Waters valuation.

**Table 7-4 Summary of Utility Asset Values at 30 June 2017**

| Asset Group | Replacement Cost ($) | Depreciated Replacement Cost ($) | Annual Depreciation ($/yr) |
|---|---|---|---|
| Water Supply | $149,154,316 | $104,508,900.40 | $2,769,691.93 |
| Wastewater | $242,076,194 | $199,111,828.91 | $3,536,283.72 |

| | | | |
|---|---|---|---|
| Stormwater | $56,675,489 | $51,099,727.81 | $591,898.65 |
| Land Drainage | $43,168,585 | $42,702,283.05 | $14,481.96 |
| Water Race | $110,874,534 | $70,742,537.33 | $394,456.34 |
| **Total Value** | $601,949,118 | $468,165,277.50 | $7,306,812.60 |

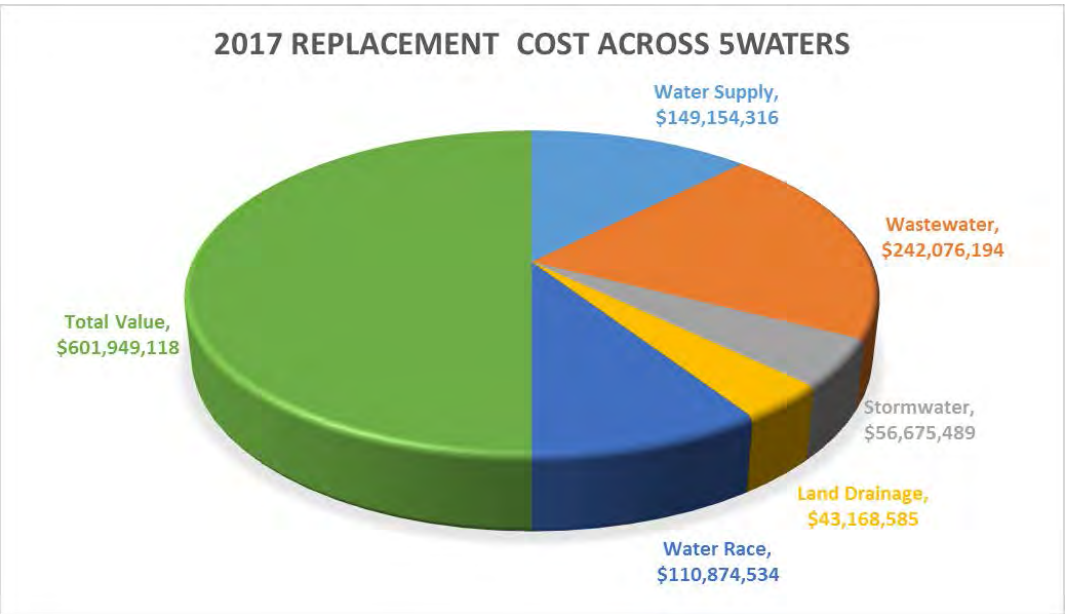



**Figure 7-20 Replacement Value across the 5Waters**

## Water

The water supply reticulation assets include the pipes, fittings, fire hydrants, supply points, plant and equipment items. The replacement cost, depreciated replacement cost and annual depreciation of the stormwater assets by scheme are summarised in Figure 7-21.

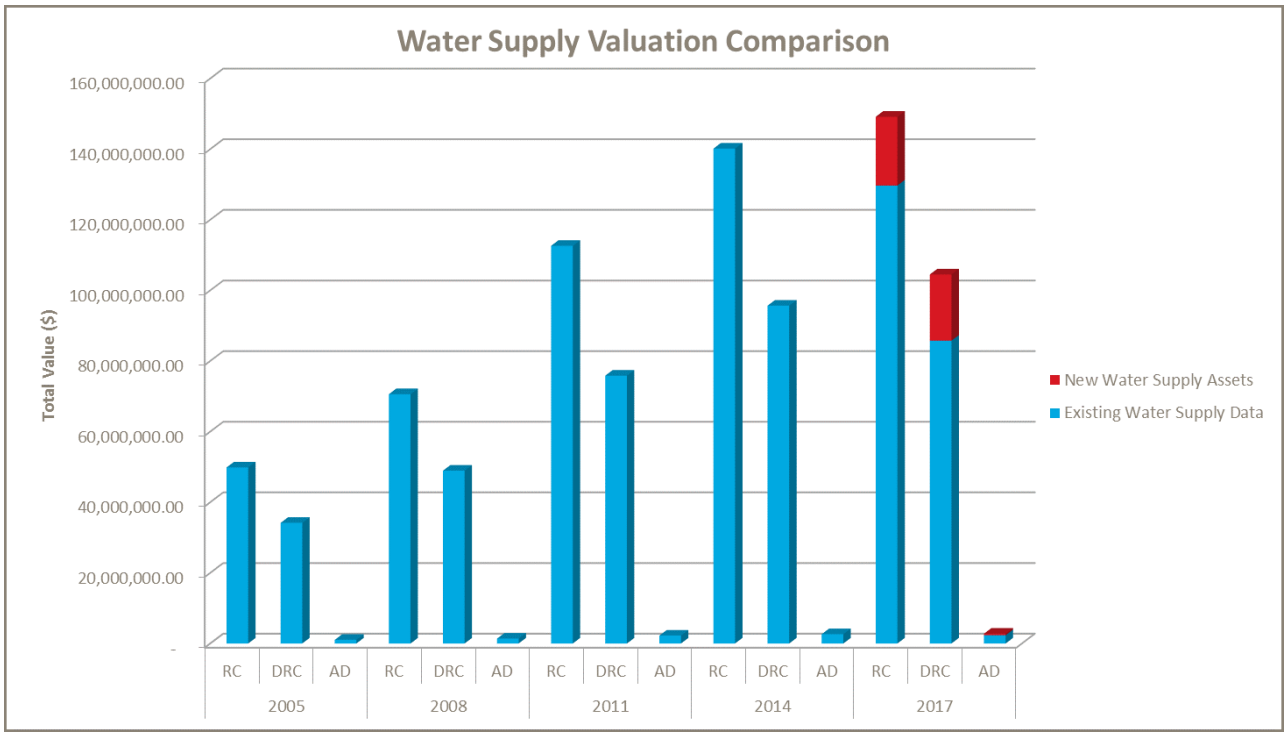



**Figure 7-21 Water Asset Valuation Summary 30 June 2017**

Overall the water supply assets have increased in depreciated replacement value by 9.2% and annual depreciation by 5.5%.

## Wastewater

The wastewater reticulation assets include the pipes, fittings, manholes, chambers and plants and equipment items. The replacement cost, depreciated replacement cost and annual depreciation of the wastewater assets are summarised in Figure 7-22 below.

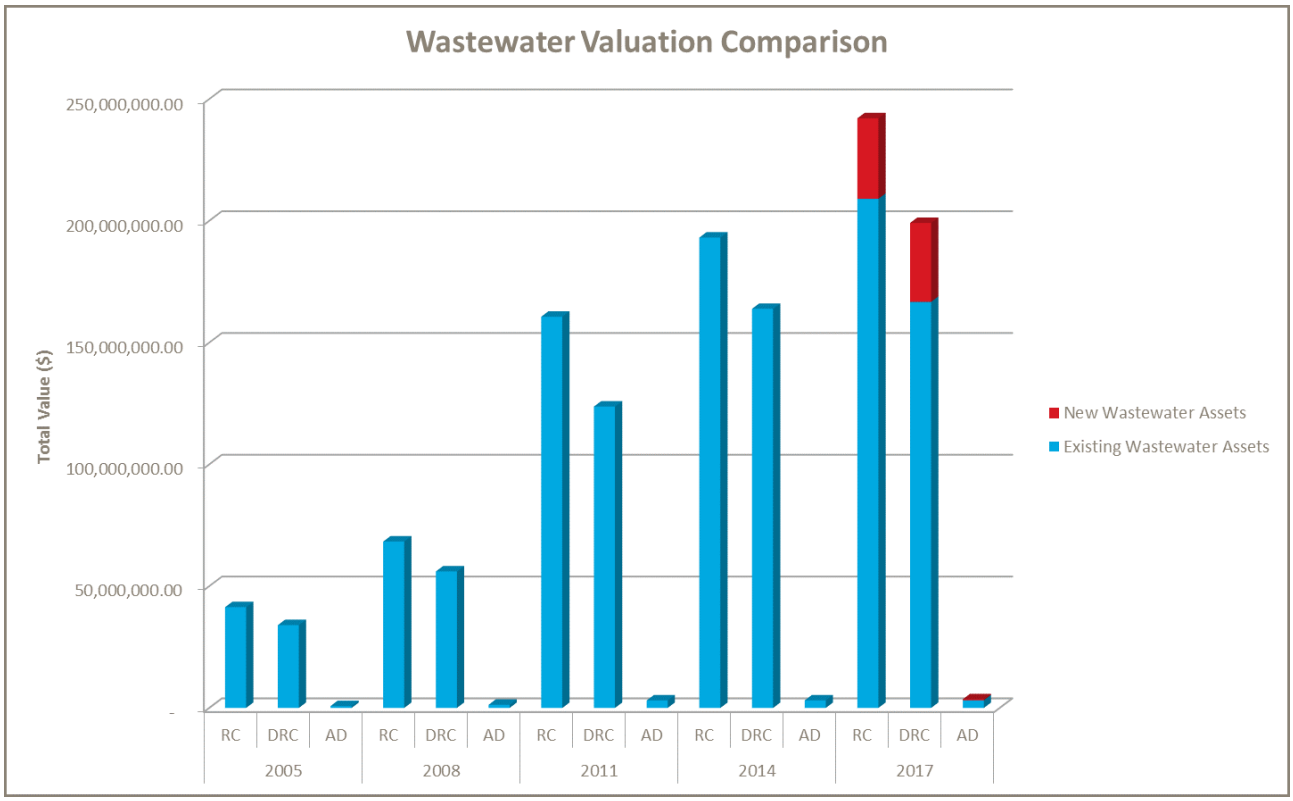



**Figure 7-22 Wastewater Asset Valuation Summary 30 June 2017**

Overall the wastewater assets have increased in depreciated replacement value by 21.5% and annual depreciation by only 14.7%.

### Stormwater

The stormwater reticulation assets include pipes, fittings, detention areas, pump stations and soakage pits. The replacement cost, depreciated replacement cost and annual depreciation of the stormwater assets by scheme are summarised in Figure 7-23 below.

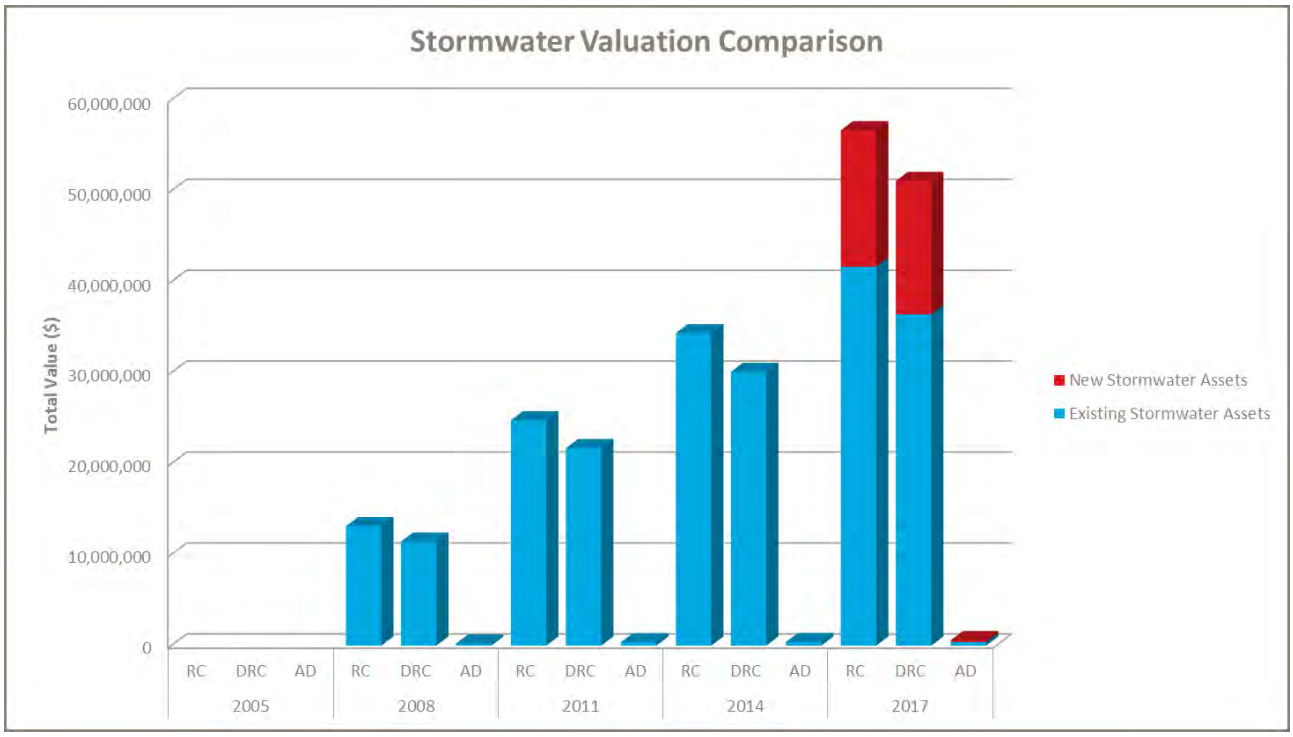



**Figure 7-23 Stormwater Asset Valuation Summary 30 June 2017**

Overall the stormwater assets have increased in depreciated replacement value by 69.8% and annual depreciation by 51.7%.

## Land Drainage

The land drainage assets include the open channels, pipes, structures and a pump station. The replacement cost, depreciated replacement cost and annual depreciation of the land drainage assets are summarised in Figure 7-24 below.

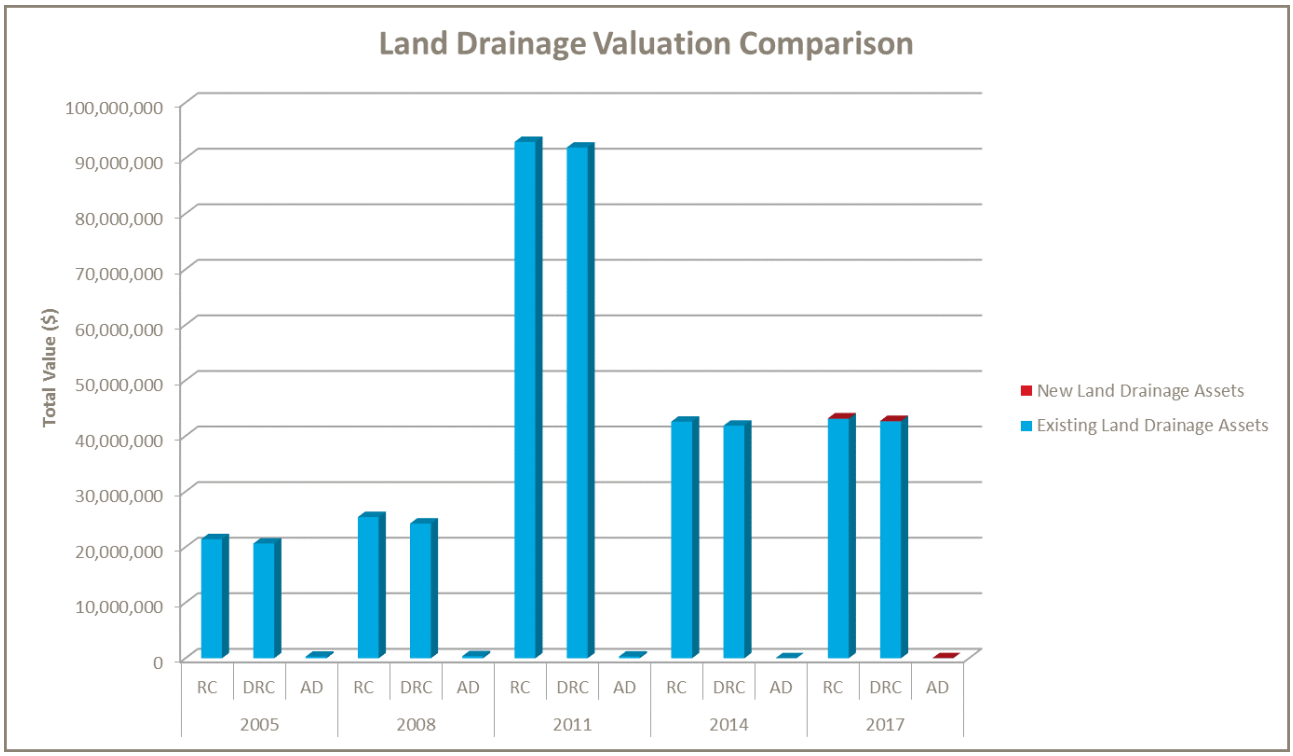



**Figure 7-24 Land Drainage Asset Valuation Summary 30 June 2017**

Overall the land drainage assets have increased in depreciated replacement value by 2% and decreased in annual depreciation by 30.4%.

## Water Races

The water race assets include culverts, channels, divides, gates, nodes, inlets/outlets, structures, tunnels, syphons, aqueducts and instruments. The replacement cost, depreciated replacement cost and annual depreciation of the water race assets are summarised in Figure 7-25 below.

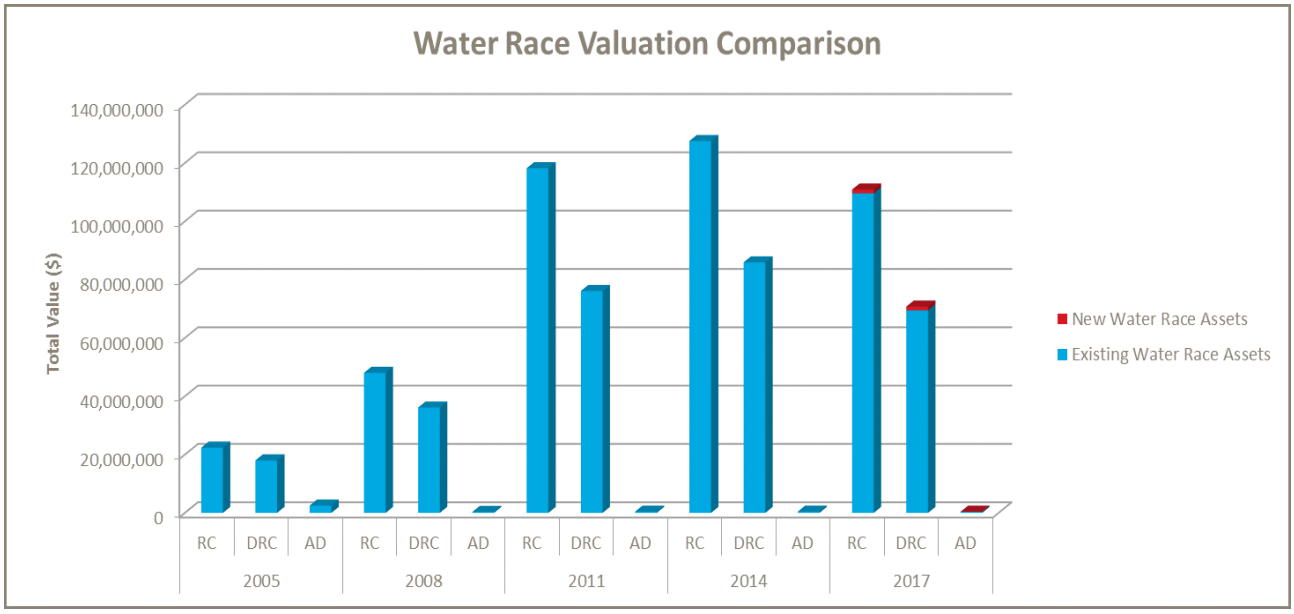


**Figure 7-25 Water Race Valuation Summary as at 30 June 2014**

Overall the water race assets have decreased in depreciated replacement value by 17.6% and in annual depreciation by 6.9%.

## Non-Depreciated Assets

The table below summarises the asset components which have not been depreciated, as outlined in NZIAVDG.

**Table 7- Non-Depreciated Asset Summary**

| Land Drainage | Water Race | Stormwater |
|---|---|---|
| Channel-Drain | Channel – Lateral | Channel-Drain |
| Stop bank | Channel - Main | Channel-Swale |
| | Channel - Local | Management Device - Basin |
| | Structure - Pond | |

## Base Useful Lives

The Base Useful Lives for each asset type as published in the NZIAVDG Manual were used as guidelines for the lives of the assets in this valuation. The lives used in this valuation were determined as follows:

- Using the base useful life in NZIAVDG and knowledge of Council's assets and their performance, a set of "Lives" for the various asset types was determined.
- There are particular assets that are older than the applicable life but are still in use. For these assets a minimum remaining life is applied. The minimum remaining life for pipelines and civil assets is 3 years beyond the asset's actual life and for mechanical and electrical assets is 2 years beyond the asset's actual life. This is the life used for the valuation of this particular asset.
- Generally lives were taken from the mid-range of the typical lives indicated in the Valuation Manual where no better knowledge is available.

The tables presenting an overview of the standard asset lives used by Councils for the 5Waters facilities and network assets can be found in the valuation report titled "5Waters Valuation Report – September 2014".

## Data Confidence

A significant effort has been made to improve data confidence. The confidence level for base data used for the valuation has been assessed as detailed in the tables below. This is based on the Water New Zealand guidelines for Infrastructure Asset Grading Standards, shown in Table 7-5.

### Table 7-5 Data Confidence Gradings

| Grade | General Meaning |
|---|---|
| A | **Highly Reliable**<br>Data based on sound records, procedure, investigations and analysis which is properly documented and recognised as the best method of assessment. |
| B | **Reliable**<br>Data based on sound records, procedure, investigations and analysis which is properly documented but has minor short comings; for example the data is old, some documentation is missing and reliance is placed on unconfirmed reports or some extrapolation and recognised as the best method of assessment. |
| C | **Uncertain**<br>Data based on sound records, procedure, investigations and analysis which is incomplete or unsupported, or extrapolation from a limited sample for which grade A or B data is available. |
| D | **Very Uncertain**<br>Data based on unconfirmed verbal reports and/or cursory inspection and analysis |

The data confidence is rated by asset class in Table 7-6 below and Table 7-7 shows the rating confidence by attribute which provides an overall assessment of the valuation confidence.

### Table 7-6 Data Confidence Bay Asset Class

| Asset | Attribute Confidence |
|---|---|
| Water Network Assets | A-B |
| Water Facility Assets | B-C |
| Sewer Network Assets | A-B |
| Wastewater Facility Assets | B-C |
| Stormwater Assets | B-C |
| Land Drainage Assets | B-C |
| Water Races Assets | B-C |

### Table 7-7 Valuation Confidence Summary

| Attribute | Confidence Level | | | |
|---|---|---|---|---|
| | **D**<br>Very Uncertain | **C**<br>Uncertain | **B**<br>Reliable | **A**<br>Highly Reliable |
| Integrity of the asset data | | | | |
| Determination of unit rates | | | | |
| Determination of asset lives | | | | |
| Condition and performance data | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Consideration of optimisation | | | | | |
| Overall valuation | | | | | |

## 7.6 Complying with Environmental Management Requirements

There are mandatory environmental standards set by Environment Canterbury which the Council adheres to. This legislation is outlined in detail in Section 2: Strategies, Objectives and Legislation. Achieving good environmental practise within the Council's asset management processes requires robust resource consents compliance and monitoring procedures.

### Resource Consents, Compliance and Monitoring

It is important that Council manages its share of the District's natural water resources responsibly. Resource consents are held for the various activities relating to the 5Waters activities such as abstraction and disposal. These consents have conditions to ensure the resources are managed sustainably.

#### 7.6.1.1 Planning for Consent Expiry

Figure 7-26 identifies water resource consents which are due to expire in the future. Two consents expire in the three year LTP period. From 2025, a significant number of consents will expire, as shown in Figure 7-26 below. While this is a matter for future plans to recognise and track, an assessment has been included in the Risk Management analysis (Section 9.2).

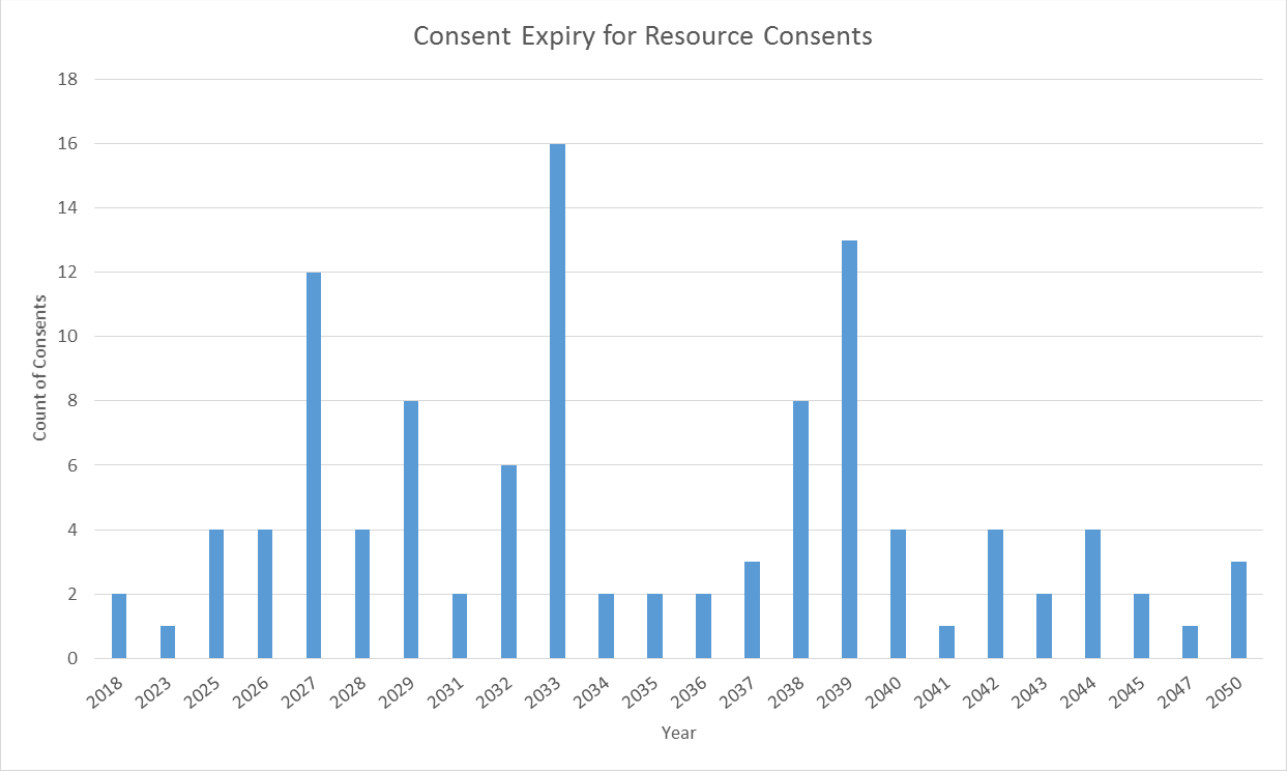



**Figure 7-26 Consent Expiry Dates for 5Waters Resource Consents**

The consents currently held will, for the majority of schemes, allow long term security of water resource requirements. ECan has the power to vary consent conditions on an annual basis, but to date has given no such indication.

#### 7.6.1.2 Consent Reporting

Consent reporting within the Council for 5Waters is the responsibility of the Water Services Service Delivery group. Information for wastewater consenting is prepared on a monthly basis for monthly environmental reporting to Environment Canterbury. Reporting on water supplies and water race resource consents is reported to Environment Canterbury through the AMS system. The data is pulled into the AMS System from the SCADA system. In 2018 with the further development of the resource consents database in AMS this will enable more structured reporting of resource consents (Refer to Section 0 and 0).

## 7.7 Operations and Maintenance Plan

The maintenance strategies for Council are based around the development and implementation of practices that minimise the risks of asset failure and ensure that failed assets are restored with minimal disruption to levels of service and compliance. There are three categories of maintenance:

- Reactive Maintenance - corrective work carried out in response to customer queries, stakeholder demands, and reported problems and defects with the supply / treatment systems and their associated networks.

- Scheduled Maintenance - includes the routine inspection and/or regular maintenance of selected assets.
- Instructed Maintenance – additional maintenance, capital works and replacement (renewal) of assets.

Council has a legal obligation to protect its customers, its infrastructure and the welfare of its employees and service providers. In order to minimise the risk of failing to deliver its levels of service or achieve legal compliance, the on-going operation and maintenance of the 5Waters services requires planning, skills, and resources as well as adequate funding.

### Management Strategies and Practices

The well-developed operational practices used by Council and its maintenance contractors are targeted at ensuring continuous asset performance and optimising the cost of service delivery. Poor operational practices have both immediate and long term impact on maintenance costs (physical and material resources), health and well-being.

The management strategies that are used are detailed below along with their effectiveness within the 5Waters.

**Table 7-8: Operation and Maintenance Strategies**

| Strategy | | Objectives | Council Processes and Practises |
|---|---|---|---|
| Maintenance | | | |
| Scheduled Maintenance | Scheduled maintenance includes the routine inspection and/or regular maintenance of selected assets. | Scheduled maintenance is required to ensure continued and effective operation of critical Council assets. Examples of these tasks are pump inspections, calibration of UVT and turbidity meters and facility checks (timing of which is subject to the criticality of the asset). | Intermediate |
| Performance outcomes and indicators | Measurement of actual performance against level of service indicators | Measurement of actual performance against KPI in maintenance contract that are linked to LoS | Intermediate |
| 24/7 Operation | Operation of the infrastructure 24 hours a day, seven days a week | The Council maintenance contract requires operation of the infrastructure 24 hours a day, seven days a week | Comprehensive |
| Scheduled checks | Routine checks of facilities and network based on the assets criticality | The Council maintenance contract defines the period between scheduled checks subject to the criticality of that asset or facility. | Comprehensive |
| Reactive Maintenance | Reactive work is defined as corrective work carried out in response to customer queries, stakeholder demands, and reported problems and defects with the supply / treatment systems and their associated networks. | There are two types of tasks, SDC initiated work and Contractor initiated. Both are raised within Asset Management Information System (AMIS). Generally SDC initiated task include responding to asset failures and external customer complaints with the objective of identifying problems and restoring service in accordance with the required Contract response times and by the methods provided in the Contract.<br>Contractor initiated works are a means to raise observations in the field, either through reactive or scheduled work, for further attention. If the cost of work is under $500 or if the work is urgent and presents an imminent threat to health and safety or environmental impact, then works can proceed without approval. For all other tasks approval from SDC is required prior to undertaking the work. | Core |

| | | | |
|---|---|---|---|
| Redesign and Modification | Redesign may be necessary if an asset or system does not meet its operational objective. Similarly, modifications may be necessary to improve the operating characteristics | Redesign and modifications are undertaken in a methodical manner. Alternative options with both short and long term needs are assessed, and decisions made on those drivers. | Comprehensive |
| Operations | | | |
| Physical Works Monitoring | Contractors audits are carried out on a subset of completed works | Service delivery audits work (a representative sample) carried out by contractor to verify compliance with standards and guidelines, these are still appropriate and fair payment has been made. | Intermediate |
| Health and Safety Checks | | Checks undertaken randomly to ensure all work completed by Council and Contractor staff complies with regulations | Intermediate |
| Operation of Utilities | Networks and facilities are operated on defined parameters and standards set out Standard operating procedures | Water Supply utilities will be operated inline with Standard Operating Procedures (SOP's). Quality systems manuals will be developed or updated for high criticality assets and services | Intermediate |
| Leak Detection | To proactively detect and repair leaks within the water supply | Well considered water demand reduction strategies | Core |
| Infiltration management | Minimise infiltration into wastewater will extent the time for service capacity to be exceeded and minimise operational costs | | Core |
| Pressure and Flow Monitoring | Pressure and Flow Monitoring carried out in a defined and planned manner | Pressure and flow monitoring is carried out by Council staff to measure compliance with Levels of Service, to calibrate network models and to plan the development of new infrastructure | Intermediate |
| Energy Efficiency | Proactive energy management | Energy savings and management is carried out in a logical and planned manner for the facilities in a period in history where energy costs and availability are of high priority | Core |

| | | | |
|---|---|---|---|
| Service Interruptions | Service Interruptions within LoS requirements | All shutdowns or interruptions to service managed by the Maintenance Contractor to protect the quality of the water, the asset, and the service to the customer with the use of Standard Operating procedures and monitored by Key Performance Indicators | Comprehensive |
| Flow meter calibrations | Facilities flow meters are managed through the Installation, Calibrations and Maintenance process | Council Flow Meter Standard Operating Procedure encompasses water, wastewater and water race main flow meters, usually located at pump stations, treatment plants or other facilities. It does not involve individual property meters. The flow meter procedure details:<br>- Importance of Flow Data<br>- Reasons for Measuring Flow and the accuracy requirements<br>- Methodology for meter accuracy compliance (calibration)<br>- Installation compliance to manufacturers requirements<br>- Output testing from meters<br>- Reporting requirements by Service delivery | Intermediate |
| Area Water meters | Use of area water meters to gain greater understanding of water usage within specific areas of a community | There a number of zone meters within the communities of:<br>- Rolleston, Lincoln<br>- Prebbleton and Kirwee<br>- Malvern Hills and Selwyn Rural<br>The data obtained via data loggers is used for estimating leakage rates | Intermediate |
| Incident management | Council manages the escalation of minor to major incidents | Council has a structured approach in escalation of minor to major incidents:<br>- Minor incidents are managed by the contractor<br>- Medium issues are managed by the contractor in conjunction with Service delivery<br>- Major issues are managed by the contractor in conjunction with service delivery and asset management staff | Comprehensive |

| | | | |
|---|---|---|---|
| | | Involvement is also gauged against the potential consequences or asset criticality.<br>Standard Operating Procedures have been written and are used to assist in incident management i.e. wastewater overflows, water quality transgressions | |
| System Control and Monitoring | Appropriate level of surveillance for networks and facilities based on criticality | The councils SCADA system provides surveillance of a significant range of facilities and networks and provides:<br>- Alarms when equipment fails or when operating parameters are exceeded<br>- increase the knowledge of the asset operation therefore enabling efficiencies to be introduced<br>- All essential data retained for trending etc | Comprehensive |
| Customer Service | | | |
| Complaints process | Customer Service requests and complaints are integrated for all services and 24 hour complaints process to enable the achievement of LoS and maintenance contract requirements | All complaints and enquiries for matters relating to the 5Waters can be directed to Service Delivery centre/help desks –by telephone or email | Intermediate |
| Complaints monitoring | Compliance with the appropriate response and timing | Monitoring all tasks on a continuous basis via AMS to show noncompliance and trending | Core |

### Informing and Education of Users

In the past, informing and educating users of their responsibilities has been carried out by the scheme committees. The focus has been on the details of scheme operation "an operator's requirement" but should be redirected.

With a continued high growth rate, a move to improve public health and relatively high property turnover, and a central externally hosted customer call centre the need for frontline ratepayer education is required. The emphasis will be on advising:

- Broader level scheme purpose, policies / Bylaw and contact point arrangements; and
- Demand management and water conservations approaches and target.

### Operations and Maintenance Plans Standards, Procedures and Manuals

Council has undertaken development of Operation and Maintenance summary (O&M summary) for each scheme and/or facility. The O&M summary provides an overview of the key factors affecting performance of a system or facility, operational triggers, maintenance requirements and specific control philosophy. In addition the Council have undertaken a review and update of the scheme process drawings.

To maintain the appropriate level of service the operations and maintenance manuals should thoroughly cover the following:

- Full integration with Levels of Service, Activity Management Plans and Maintenance Contracts
- Contain the major elements of Risk Plans (including WSPs), Demand requirements, Renewals, Standards & Policies, Health and Safety, Environmental and Operational Plans
- Be updated on an on-going basis (minimum of every three years) with input from a representative group of customers
- Fully accessible to both Council officers and maintenance contractors (electronic controlled copies)

Council has undertaken development of Operations Manuals in 2015. Further work is required to integrate the AcMP, operations manual and AMS data to update these documents. A comprehensive Water Race Management Plan is fully operational and reviewed on an annual basis. This manual is an intricate part of the maintenance contract.

### Inspection & Maintenance Programme

The Operation and Maintenance (O&M) of Council's water, wastewater and stormwater systems is controlled and undertaken in accordance with the Utilities Operation & Maintenance Contract, C1241. The works undertaken under the contract are scheduled, recorded and audited by using Councils AMS system. A high degree of confidence exists that the works are carried out to the appropriate standard and at the appropriate intervals.

The Council O&M management approach and life cycle strategies are detailed in 5.0 Levels of Service and 7.0 Lifecycle Management.

### Operations and Maintenance Service Delivery

Council, at its meeting of 22 June 2016, approved acceptance of "C1241 Water Services Network Management Contract" from Sicon Ltd for a five-year period 01 July 2016 to 30 June 2021.

The intent of the Contract is to form a close working relationship between the Contractor and the Selwyn District Council to provide water services and achieve or exceed the expectations of the customers.

The key objective for all of the services (water, wastewater, stormwater and water races) is to provide our customers with the level of service they expect whilst complying with relevant standards and legislative requirements, protecting public health and safety, ensuring minimal impact on the environment and maintaining an acceptable financial cost. In addition to ensuring effective delivery of today's service, we also need to be planning to meet future service requirements and securing our ability to deliver appropriate services to future generations.

## 7.8 Renewal Replacement Plan

Renewal is defined as an activity which renews, restores, rehabilitates or replaces an existing asset to extend its economic life or service potential. Renewal does not increase the design capacity of the asset. This is an important difference. In a growth district such as Selwyn, assets are sometimes 'failing' due to reaching their performance e.g. pipes too small to carry any more water rather than due to 'old age' e.g. corrosion.

Council has placed considerable additional focus on identifying the remaining useful life of a component. These key activities and advances that have fed into determining renewals are summarised as follows:

- Significant improvement in quality of core asset data available for renewals planning;
- Introduction of AMS platform for data storage, management, reporting and interrogation, with improved GIS interfacing;
- Commencement of maintenance data capture in AMS to build history and allow for future enhancement of renewals planning;
- Development of hydraulic models for the major urban water and wastewater schemes that have allowed hydraulic performance to be evaluated and included in future renewals planning; and
- Additional analysis of AC condition assessment reports completed over last 10 years to provide a clearer picture of pipe deterioration rates, condition and renewal requirements.

This section describes the processes that Council use to identify and optimise renewals.

## Renewal Strategy

The renewal profile is generated by the AMS system for 120 years for all assets (currently In-Service and For-Future-Service) within the valuation period that are owned by the Council. Those assets that are due to expire or have expired but are still being utilised are given an extended life of 5 years. The renewal profile is based on an assets expiry date and valuation.

There are two key factors that have not been incorporated within the renewal profile at this stage are:

- Criticality; and
- Condition assessment.

A criticality model was developed by the Council in 2014. Criticality should drive the renewal decision making process. Criticality or the consequence of failure is a practical assessment of the economic, social, cultural and environmental drivers related to asset components. Section 7.4 details the process that Council applied for assessing criticality. Critical assets will be identified earlier for renewal, prompting specific investigation and confirmation of renewal requirement. The majority of 5Waters asset components have been allocated criticality levels – High, Medium-High, Medium, Medium-Low and Low.

A condition assessment model has been developed by Council in 2017. Condition assessments should also drive the renewal decision making process. Section 7.3 details the process that Council applied for assessing condition. Failing assets will be identified earlier for renewal, prompting specific investigation and confirmation of the renewal requirement. All 5Waters pipes have been allocated a condition rating.

The renewals profile will be refined to incorporate consideration of criticality in decision making and utilise asset maintenance history, condition and performance knowledge for key asset classes (e.g. AC pipes).

In 2017 spatial mapping was used to develop a renewals map in GIS which has multiple layers. This map:

i. Colours the asset due for renewal in five year bands;
ii. Colours the assets depend on their criticality category; and
iii. Colours the number of pipe faults in bands.

Spatial mapping has also been used to develop a 30 year project map for 5Waters and Roading projects. This map shows where future capital works are for 5 Waters and where the roading upgrades will take place. In terms of renewals this map is helpful because it can be used to determine whether any renewals are able to be moved forward in line with these works.

The renewal process used is shown below in Figure 7-27.

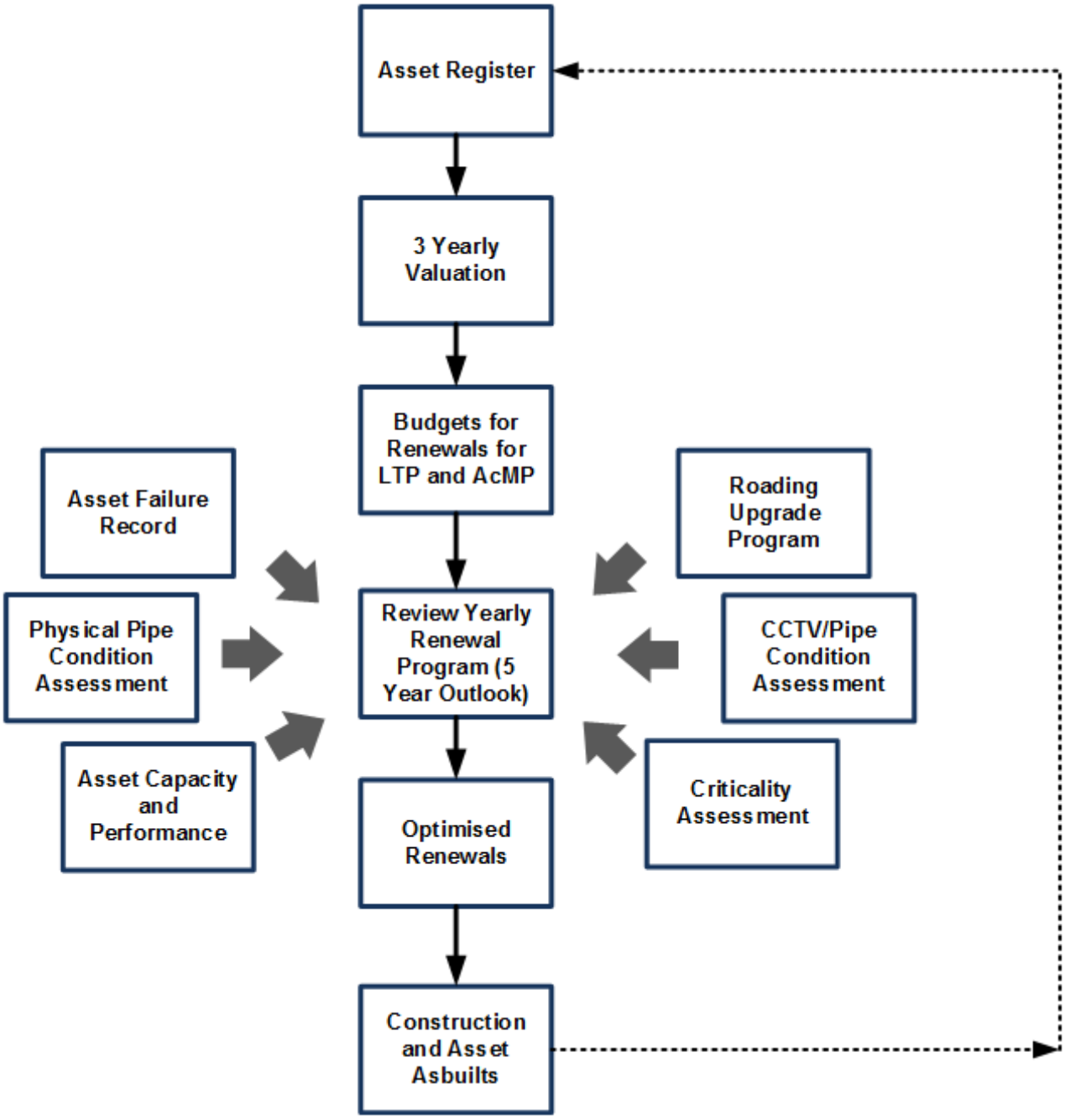



**Figure 7-27 Renewal Process Diagram**

#### 7.8.1.1 Water Races

The vast majority of the water race systems are open channels. Because these are proactively maintained the extent of renewals is low compared to the extent and age of the schemes. In fact, Council consider that because of obsolescence the asset disposal of water races as a whole is more likely to occur than the failure of individual components. However, where renewals are required typically these have been assessed on a year by year basis. Prior to 2010 water race renewals have been often deferred due to uncertainties such as the proposed closure of particular schemes and the likelihood of water take constraints being imposed through resource consents and significantly affecting the on-going operation of the existing assets.

The ability to assess renewals has historically been restricted due to a lack of asset register information about the water races. This is being resolved via additional data being obtained on critical assets.

The renewal of water race tunnels and other significant structures are not funded. The remaining useful life of these assets will be reviewed.

#### 7.8.1.2 Land Drainage

The majority of the Land Drainage scheme assets (by volume) are open channels. Historically land drainage renewal requirements have been assessed on a year by year basis or as assets fail. Consideration of renewals is normally carried out by the individual Land Drainage Committee in consultation with Council prior to the Annual Plan process.

#### Renewal Forecast

The renewals forecasts have been completed for a 120 year horizon. Renewals are funded across a 30 year period and these have been included in the renewal sections for each scheme (Volume 2,3,4,5 and 6). A summary of renewals for each 5water activity is shown in the following graphs.

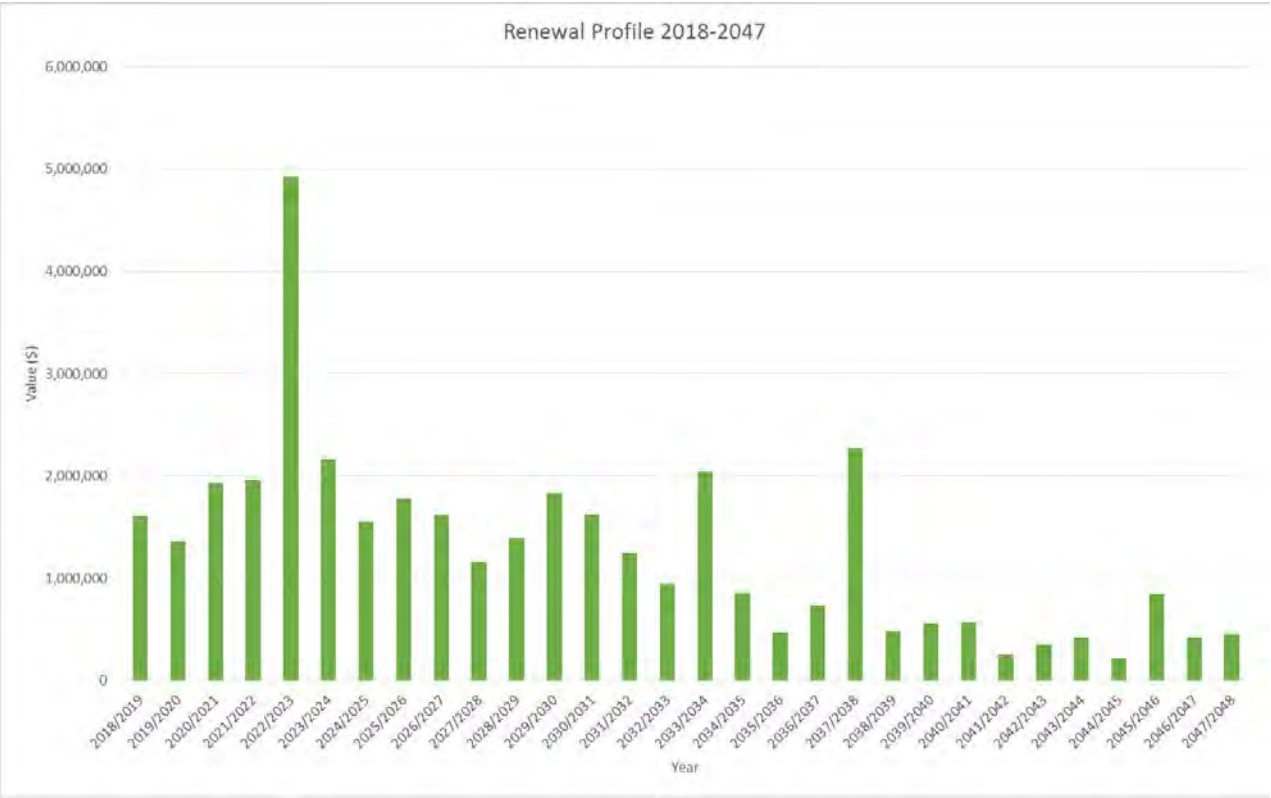



**Figure 7-28 Renewal Profile for Water Supply 2018/19 – 2047/48**

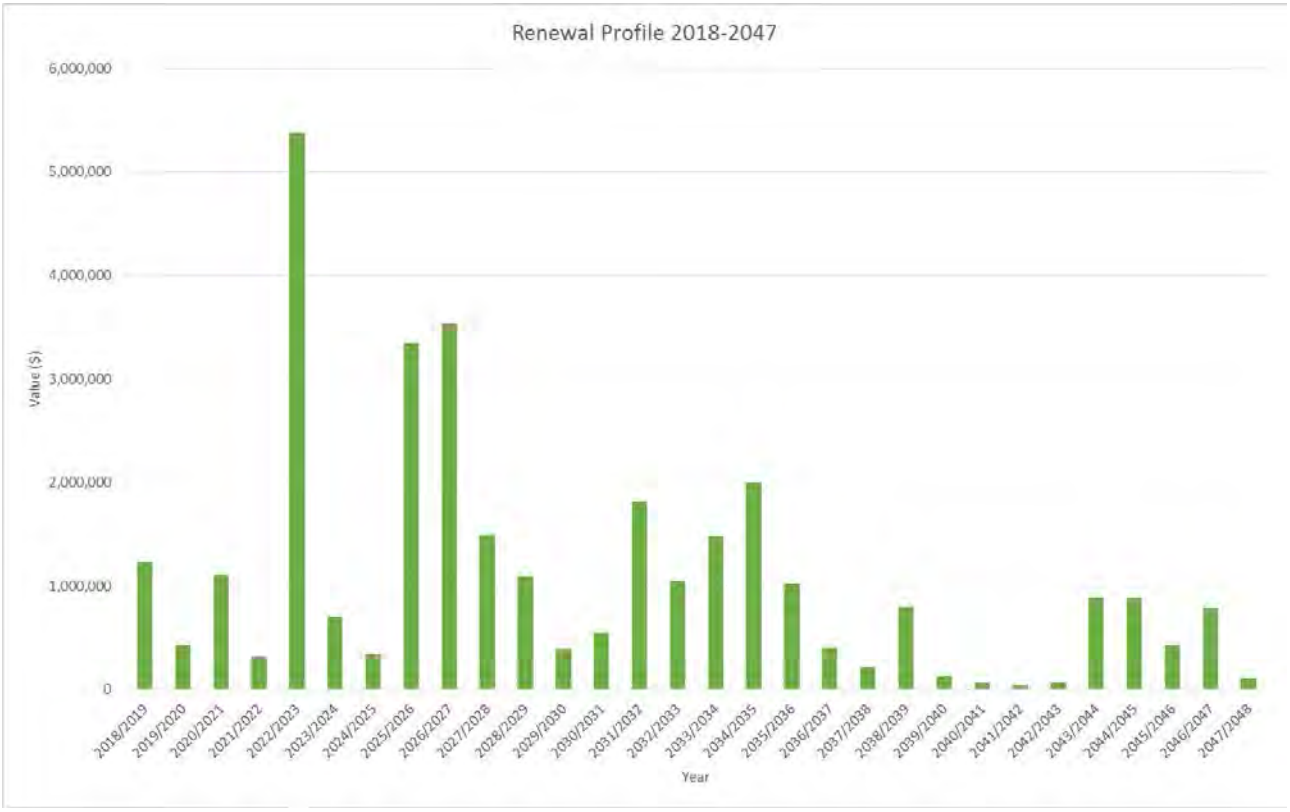



**Figure 7-29 Renewal Profile for Wastewater 2018/19 – 2047/48**

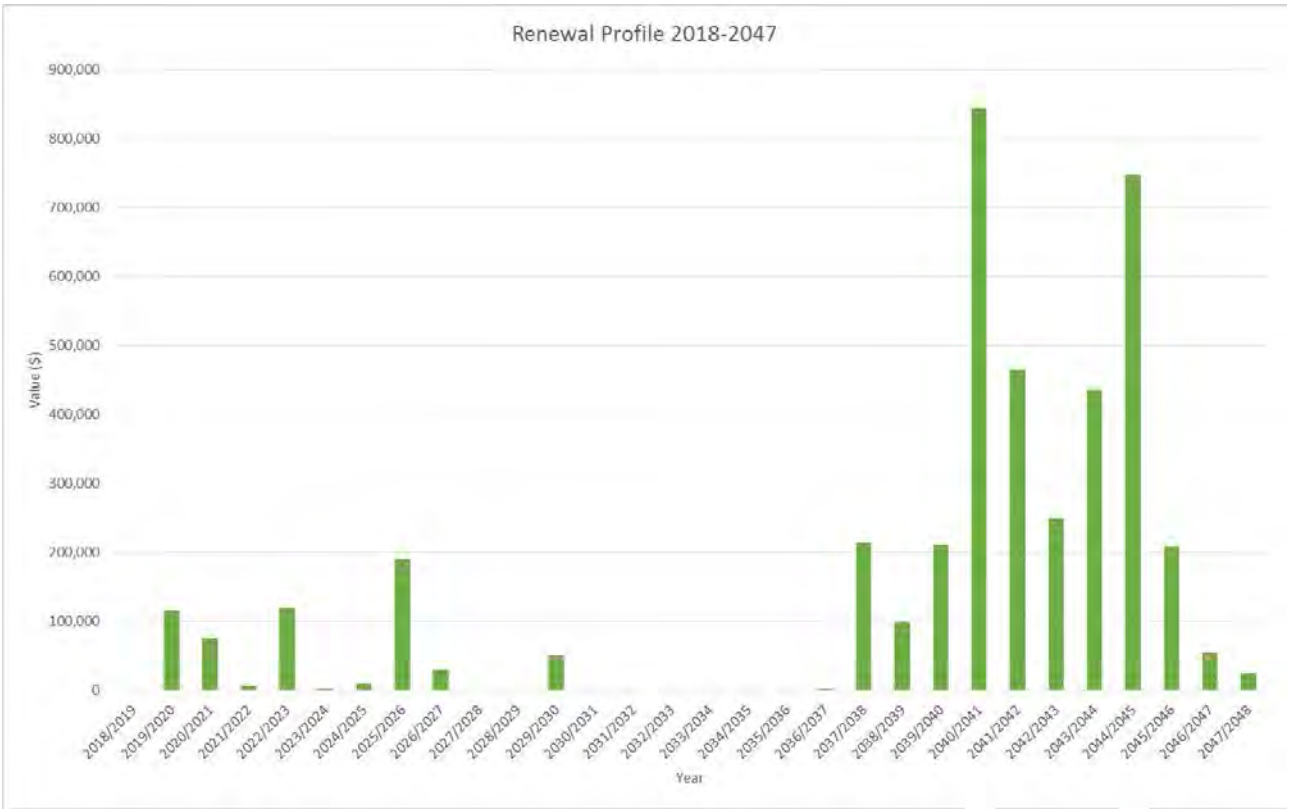



**Figure 7-30 Renewal Profile for Stormwater 2018/19 – 2047/48**

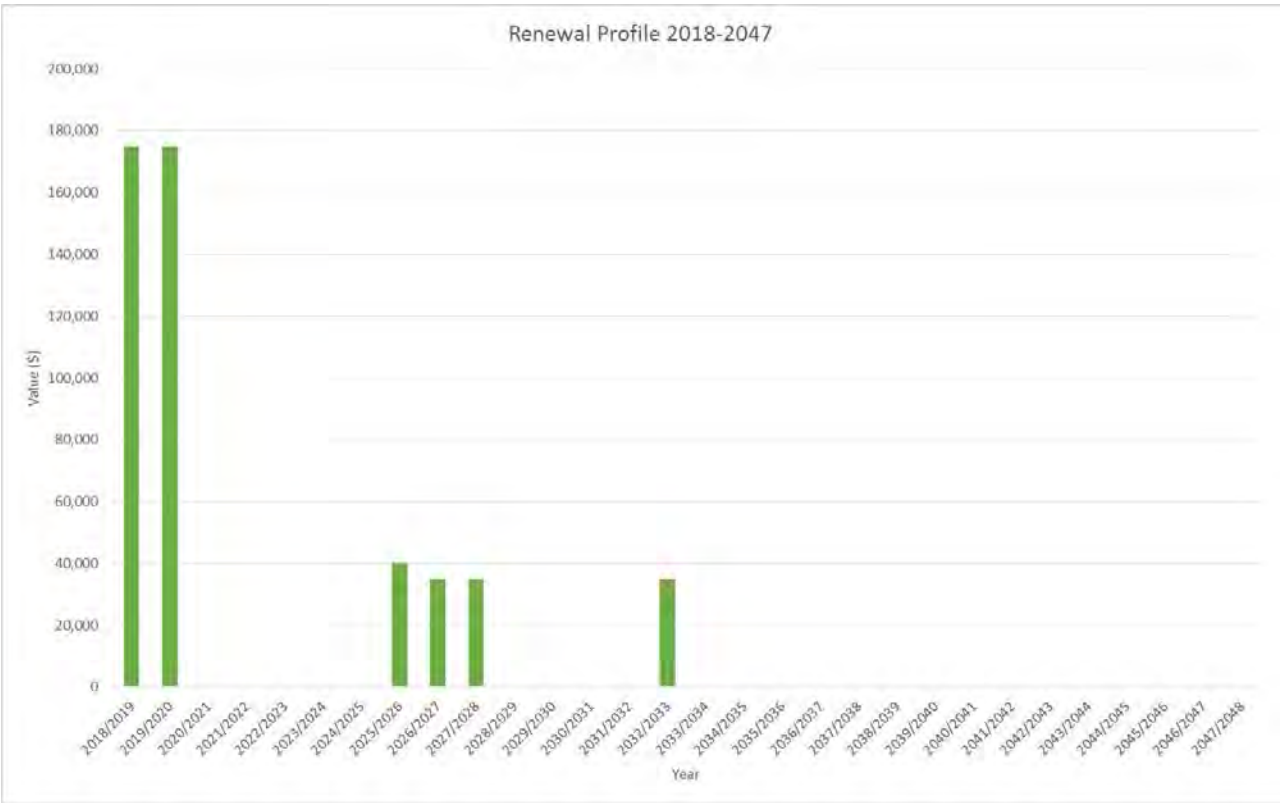



**Figure 7-31 Renewal Profile for Land Drainage 2018/19 – 2047/48**

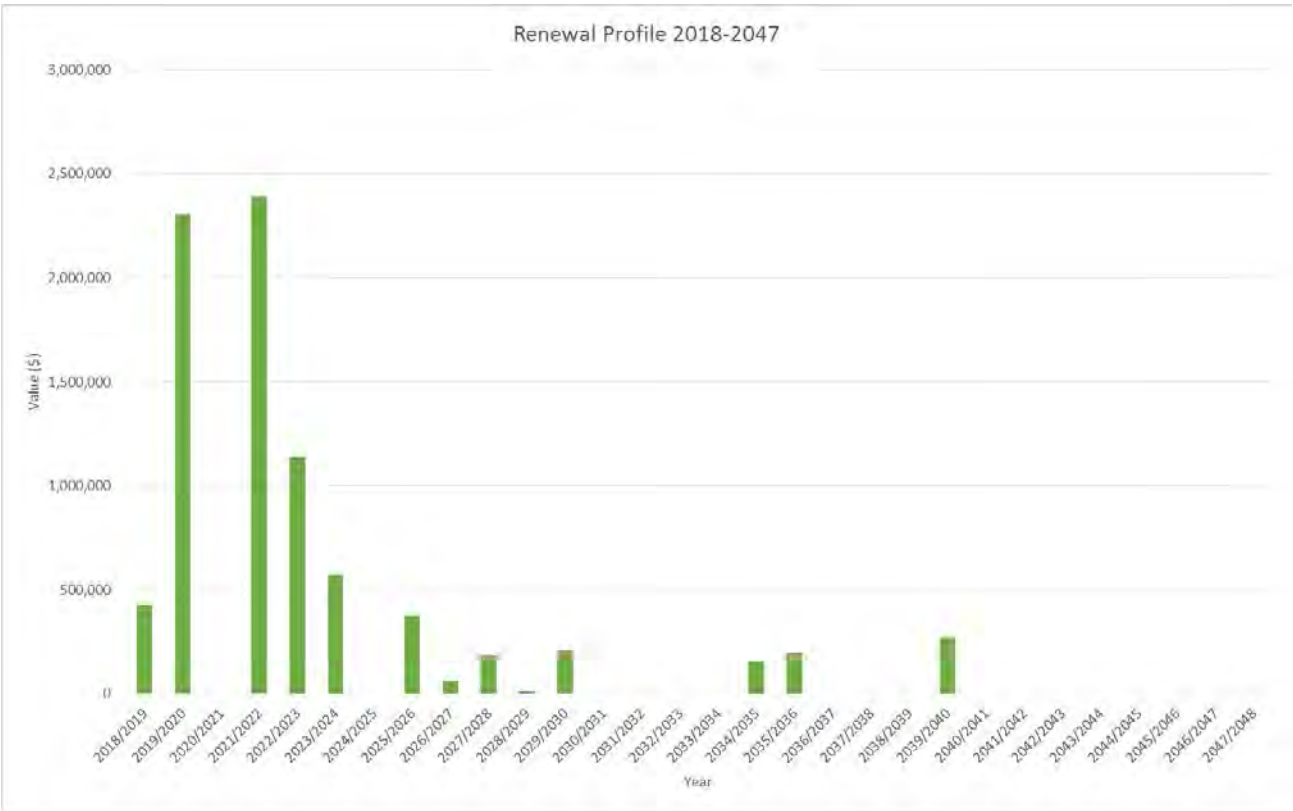



**Figure 7-32 Renewal Profile for Water Races 2018/19 – 2047/48**

#### 7.8.1.3 Deferred renewals

In some cases a decision is made to defer a required renewal because of:

- Asset life has exceeded the estimated life (remaining asset life is then revised);
- The cost is considered beyond the community's ability to fund and an alternative option is available;
- A proposed capital upgrade waiting in the wings; and
- A proposed disposal of that asset.

When renewal work is deferred there is an impact on the system's ability to achieve the required level of service standards e.g. ability to achieve reduces and this can cause increases in operating and maintenance risks and costs. A decision to defer is therefore made carefully in consultation with the community.

An example of a deferred renewal is the Kowhai Tunnel in the Malvern Water Race Scheme. The renewal of the tunnel is not shown in the renewal profile (Figure 7-32[29]). A project of $500,000 for remedial works to the tunnel has been completed which enabled the renewal of the tunnel itself to be pushed out a number of years.

## 7.9 Asset Acquisition and Development Plan

Asset creation means the provision of or improvement to an asset where the outlay can reasonably be expected to provide benefits beyond the year of outlay. The main reason for creating an asset is to satisfy or improve the level of service, provide for new demand or to provide a commercial return.

While the creation of assets through subdivision development is paid by the developer, works with associated the creation of Council assets is funded via loans or rates and is subject to the LTP and Annual Plan process.

The 30 year capital works programme is detailed in Section 11.0, inline with growth projections which are detailed in Section 6.0.

### Councils Holding Capacity (Policy T103)

Councils holding capacity is the dollar value or number of connections between what capacity is required to service the current population and what is being 'held' to service the future population. The Council, in making this decision to have holding capacity in a scheme, has to fund this cost until property owners, who create growth, repay it. Such a decision involves the Council now owning an asset in infrastructure as opposed to having money in the bank. Although this decision is effectively swapping one asset 'cash' for another asset 'infrastructure', cash earns interest.

[29] The renewal of the tunnel has been excluded in all tables and figures within this AcMP unless noted otherwise.

### New or vested assets

The Council receives assets that are vested in it, but there has been no direct exchange of funds. In the case of infrastructural assets, the value of exchange is deemed to be at the current valuation at the time of issue of the 224 Certificate. For all donated and subsidised assets, the initial value recorded is the current valuation value at the date of acquisition.

## 7.10 Asset Disposal Plan

All pipeline renewals have a corresponding disposal either through the pipes being removed and disposed of at the landfill, or being left in the ground if the infrastructure is renewed using 'no-dig' techniques. Similarly, replacement of components at treatment plants and pumping stations usually involves disposal of those items being renewed /upgraded.

### Disposals Strategy

In all cases asset disposal processes must comply with Council's legal obligations under the Local Government Act 2002, which covers:

- Public notification procedures required prior to sale;
- Restrictions on the minimum value recovered; and
- Use of revenue received from asset disposal.

When considering disposal options all relevant costs of disposal must be considered including:

- Evaluation of options;
- Consultation/advertising;
- Obtaining resource consents;
- Professional service, including engineering, planning and legal survey;
- Demolition/making safe;
- Site clearing, decontamination and beautification; and
- Buried assets remain in the ground unless economic to remove or they pose a potential hazard.

The use of revenue arising from the sale of any assets shall be decided by Council at the time of its consideration of disposal.

## 7.11 Lifecycle Funding - Renewals

It is critical that equity of funding for renewals between current and future (intergenerational) users occurs. While it is possible that some original scheme members will stay for 20 or more years having contributed to both the original capital costs and 20 years renewals, this will only account for the lower cost, high wear and

tear items renewals. Pipes, reservoirs, wells and the like have comparatively higher costs and would be renewal funded intergenerational e.g. 50-100 years away.

Council accepted in 2009 that predicted 30 year forward renewal costs would be funded for each scheme via rates. This has the advantage of allowing for actual renewals costs moving several years sooner or later than predicted with the average 30 year cost to be funded in 1/30$^{th}$.

Annual amounts are held in an interest bearing special fund. Funds are held against each scheme account, and rated at a level to recover all renewals works identified.

The closer a scheme gets to large infrastructure renewals the more it should focus on confirming the remaining useful life. Criticality (renewal strategy) assessment is the cornerstone of this programme. The renewal value charged is reviewed on a 3 yearly basis at the time of 5Waters asset revaluation.

Further details regarding renewals are provided in Section 11.0.

## 7.12 Improvement Planning

Throughout this section a number of specific actions to improve the way in which the Council identifies and manages lifecycle management associated with the 5Waters activity. These actions are summarised below in Table 7-9.

**Table 7-9 AM Improvement Items – Lifecycle Management**

| Section Ref | Improvement Opportunities | Priority | Timing |
|---|---|---|---|
| 7.2 | Use Water and Wastewater model outputs to create a spatial view of asset performance | High | 2018/19 |
| 7.2 | Improve the asset condition model by implementing a process to include new CCTV information | High | 2019/20 |
| 7.3 | Extend the asset condition model to incorporate all asset types | Medium | 2020/21 |
| 7.4 | Improve the asset criticality model by refining the criticality bands and making it automatically update within the AMS system. | High | 2020/21 |
| 7.4 | Further refine and improve the Asset Valuation module by making some of processes more automated | High | 2020/21 |
| 7.6.1 | Resource consent information and reporting to be provided through AMS (recognised more appropriately as an improvement item in Section 10) | High | 2018/19 |
| 7.8 | Improve the renewal model to include criticality and condition modelling of assets, and address the legacy of renewals. | High | 2018/19 |

# 8.0 INFRASTRUCTURE SUSTAINABILITY

This section describes the processes used by the Council for assessing and managing sustainability for the 5Waters Activity and its integration with Council's other activities. Infrastructure sustainability is a core part of the Council's vision for successful asset management. This section also addresses the possible implications of climate change and energy requirements relating to the 5Waters activity.

## 8.1 Sustainability Principles and 5Waters Levels of Service

The Sustainability Principles adopted by Council are inherent in the Levels of Service developed for the 5Waters Activity. The principles are as follows:

1. Make decisions based on the four aspects of well-being
2. Observe the Precautionary Principle to provide contingency and enable adaptability of our community
3. Seek "intra-generational" and "inter-generational" equity
4. Internalise environmental and social costs
5. Foster community welfare
6. Act to halt the decline of our indigenous biodiversity and maintain and restore remaining ecosystems
7. Consider, and promote the sustainability of our neighbouring communities and work with governing bodies for sustainable outcomes

The connections and interactions are many and complex, and occur on different levels. Some key relationships are elaborated on in Table 8-1.

**Table 8-1 Relationship between Levels of Service and Principles**

| | | Sustainability Principle | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Level of Service** | | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 1 | The community is provided with water services to a standard that protects their health (social well-being) and property (economic well-being) | Y | | | | Y | | |
| 2 | Customers are provided (social) and fairly charged (economic) for water services that meet their reasonable needs | Y | | Y | Y | Y | | |
| 3 | Nuisance effects of water services are minimised (social and economic) | Y | | | | Y | | |
| 4 | Water services are provided in a cost effective manner (economic) | Y | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 5 | Problems with water services are addressed in a timely manner and prioritised according to risk and need (social, economic, environmental) | Y | | | | | | |
| 6 | Service capacity is provided to accommodate growing communities, where this growth is sustainable (social, economic, cultural, and environmental) | Y | | Y | | | | |
| 7 | Adverse effects of water services on cultural and heritage values are minimised (cultural) | Y | | | | Y | | Y |
| 8 | Adverse effects of water services on the environment are minimised (environment) | Y | | | | | Y | Y |
| 9 | Greenhouse gas emissions from the provision of water services are minimised (environment) | Y | Y | | | | | Y |

## 8.2 Sustainable Development

Sustainable development focuses on the concept of intergenerational equity whereby the decisions and actions of an entity need to balance the needs of present and future generations. Consideration of four well-beings (economic, social, environmental and cultural) is essential in a sustainable development approach. From an asset management perspective, taking a sustainable approach is critical as many assets have long service life, therefore maintaining or future proofing these assets to meet the needs of current and future generations is necessary.

The 5Waters activity areas must be sustainable in a way that:

i. Does not exceed limits i.e. the resource will not be exhausted;

ii. Does not cause pollution;

iii. Does not generate unacceptable waste; and

iv. Focuses on equitable distribution of resources

Sustainability will be incorporated in strategic planning by both aligning strategic goals with sustainability concepts as well as incorporating the concepts in operational processes. Sustainability planning is important to asset management in ensuring that infrastructure services can facilitate the achievement of community well-beings. This means that our future communities will place at least as much value as we do on:

i. Unfettered access to clean drinking water;

ii. Land to discharge treated wastes especially wastewater effluent or wastewater;

iii. Suitable ground and water courses (drains) to treat and discharge stormwater and land drainage water; and

iv. Water races which provide multiple biodiversity and social needs.

### Water Resources within the Selwyn District

Selwyn District has access to water resources in the Upper Selwyn, Waimakariri and Rakaia rivers and ground water (confined and unconfined). Prior to early 2004 the ability to obtain resource consents to take water was viewed as a certainty. In 2004 Environment Canterbury introduced zoning to indicate the estimate of groundwater available and allocation limits. This was prompted by concerns from Environment Canterbury over significant increases of groundwater usage in many areas over recent years, as well as the preparation of the Natural Resources Regional Plan (NRRP), which addresses water allocation issues.

Groundwater resources in the Selwyn–Waimakariri and the Selwyn-Rakaia zones are considered to be fully allocated (overallocated). These are referred to as 'red zones'.

The implications of the District having over allocated zones are:

- In general, further groundwater takes will be considered as non-permitted activities, however consents will continue to be granted for community drinking water supplies;
- Future resource consents will be difficult (dollar cost and time) to obtain;
- Costs to obtain consents will be significantly higher with the applicant required to show that there is no significant effect on other water users;
- The consenting authority will require demand management practices to be implemented as part of the consent conditions; and
- The NRRP (Chapter 5 – WQN26) stipulates a maximum of 250 litres per day for human consumption when the water resource is at a low level. Management of usage at this low level is difficult if not impossible with existing demand requirements, scheme configurations e.g. no storage, community expectations and Health Act requirements.

Council proposes to build a reasonable use model for water consumption. This model would assess how much water is reasonable to use on each property connected to their water supply schemes. It will take into account domestic water use, parks and reserves water use, industrial water use and stockwater. Aqualinc Research Ltd were engaged to develop a model of this for the Selwyn District. This model will enable the Council to measure environmental impacts and implement demand management measures to ensure water used by ratepayers in not in excess of that which is deemed reasonable. The implemenation of this model in the GIS system is listed as an improvement item.

#### 8.2.1.1 New Start for Freshwater

In 2005, the Government embarked on a Sustainable Water Programme of Action, coordinated by the Ministries for the Environment, Agriculture and Forestry to determine how to use, protect and preserve water in a responsible and fair manner. From 2008, with a change in government this became the "New Start for Freshwater" and culminated in 2011 with a National Policy Statement on Freshwater management.

### Initiatives for 60 Year delivery of 5Waters

The 5Waters services will experience different demands over the next 60 years during population and demographic changes. While the district continues to consistently experience growth, the Council must be mindful that this may not always be the case. Six sustainability initiatives have been identified and whether they relate to growth and/or decline in the district is identified in Table 8-2.

**Table 8-2 Sustainability Initiatives**

| # | Initiative | Applies to Growth | Applies to Decline |
|---|---|---|---|
| 1 | Closely monitor growth and demand – with just in time provision of infrastructure – pipe networks, facilities | Y | Y |
| 2 | Monitor the condition of land affected by disposal of waste (stormwater, wastewater) to ensure good health | Y | Y |
| 3 | Monitor condition and quality of public water and stock water, with trigger levels set against standards. Develop "what if" action plans to address reducing water quality where encountered | Y | Y |
| 4 | Delivery of robust asset condition profile with renewals profile – funding in place to replace | Y | Y |
| 5 | Secure resources e.g. public water for community growth expectations, with strong focus on wise use of water / reuse | Y | |
| 6 | Work with agencies to deliver overarching cohesive solutions to water catchment issues, funding and resourcing where appropriate | Y | Y |

These initiatives will be reflected in asset management and the operations of water services assets.

### Future Development and Council Expectations of Developers

Sustainability in the lifecycle management of 5Waters services requires that all parties involved in its management carry out appropriate analysis and play their part.

In the case of developers, who provide 5Waters services via the subdivisions they create - delivery of poor quality, high operation cost assets leaves an intergenerational legacy of issues. These include early renewals and high operations costs.

Developers should carefully analyse and report to Council via both legislative processes on the lifecycle robustness, operation and replacement of their proposed work, including:

- RMA – land use and subdivision consent;
- Subdivision guidelines;
- Off-site (Council) and Onsite (wider development) capacity;
- LGA – engineering plans;
- Infrastructure materials;
- Installation techniques, ground type including surface soil moisture capacity;
- Recycling and Reuse – stormwater, water races, wastewater (grey water); and
- Operational and maintenance costs.

Council expects to undertake discussion with and receive appropriate information from developers in relation to the matters above. Its role is to confirm that vested development driven assets are fit for immediate and long term community needs. The same approach is also allied to Council delivered assets, including the Eastern Selwyn Wastewater Scheme.

### Financial Sustainability

Financial sustainability is the concept of securing stable and sufficient long-term funding and allocating it appropriately to ensure the costs of maintenance and upgrades of infrastructure are covered. This is an important concept of asset management as infrastructure should not be invested in if it is not sustainable to maintain and operate in the long term.

Financial sustainability can be utilised in asset management by incorporating these three concepts:

- District wide rates;
- Integration of schemes; and
- Shared projects.

#### 8.2.1.2 District Wide Rates

The Council introduced district-wide rates in 2015 for water, wastewater and stormwater schemes. This means that most people pay the same for these services, no matter where they live. This change in rating structure has helped keep these services affordable for smaller communities and recognises that service standards are increasingly being determined by government legislation and regulations.

The Council is proposing to introduce a new rating structure for the water race network, based on a standard district rate. There are currently three water race schemes within the district: Ellesmere, Malvern and Paparua. Over the past five years, however, substantial changes have been identified which are expected to change the need for and use of the schemes. These include Central Plains Water irrigation scheme and changing drivers for the current and future use of the water race network. Alongside these factors, the rating base of water race users is declining, and many of the assets in the system are ageing and nearing the end of their useful life. Although the demand for water races to supply water for livestock is declining, water races bring other benefits to the Selwyn community. These include environmental benefits such as providing a water source for wildlife, and habitat for some endangered species, along with aesthetic benefits to many townships and residential areas. This proposed new structure will ensure that land owners who benefit directly from access to water races still fund the majority of the costs, but that the wider community also contributes to the costs. Over time, as the traditional use of water races for farming declines, the wider community will pick up an increasing proportion of the costs.

The Council is proposing to review the rating structure of the Land Drainage activity during the period of this LTP. This is due to the increasing number of issues emerging for the land drainage schemes.

#### 8.2.1.3 Integration of Schemes

The Council has a number of small water schemes, however with the growth in the district, it may be possible to connect some smaller water supplies to larger schemes. This will lower the cost of providing services and ensure financial sustainability in the long term.

Scheme integration within the district to be investigated is:

- Connecting Edendale Water Supply to West Melton;
- Connecting the Johnson's and Jower's Road supplies to the West Melton supply; and
- Connecting some of the Darfield network to the Sheffield network.

The Branthwaite Drive water supply was integrated into the Rolleston scheme in late 2014. Armack Drive and Burnham water supply were connected to the Rolleston scheme in July 2015.

#### 8.2.1.4 Shared Projects

Shared projects are projects that resolve issues across one or more of the schemes or 5Waters. These projects are currently funded across all schemes they provide benefit to. For example, providing education, improving AMS functionality and running asset valuations.

#### Environmental Projects

A significant proportion of the 5Waters AcMP is implemented through projects. These projects have been gathered during the plans development and approved from 1 July 2018. As mentioned above, shared projects are projects that resolve issues across one or more of the schemes or 5Waters. Environmental initiatives

where taken will be implemented through shared projects. Examples of project work that is focussed on sustainability and environmental outcomes are:

- Establish a water quality monitoring program for land drainage schemes;
- Obtain a Global consent for land drainage activities;
- Prepare a stormwater catchment management plan; and
- Develop a water supply strategy.

### Impacts of other Activities

5Waters sustainable asset management cannot occur in isolation from other services. The interactions of other services are identified below:

i. Transportation: Stormwater conveyance and treatment to maintain trafficable surfaces and utilisation of common corridor for off-site services.

ii. Community Facilities: Water supply for sports fields and council houses.

iii. Social Services: growth needs and lifelines response during emergency events.

iv. Environmental Services/Planning and Building: Advice sought on capacity, cost and timing (availability) of service e.g. water supply.

v. Corporate Services: Impose contributions, fees and charges. Identify non-rated properties where rating should occur.

## 8.3 Climate Change

The Resource Management Act 2004 Amendment Act defined climate change as "a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to the natural climate variability."

Council's 5Waters Strategy has identified that:

> *"Council will proactively undertake studies to better quantify the potential impacts of climate change on demand and availability as it affects the district."*

It is necessary to consider climate change issues in relation to the 5Waters activity to ensure the sustainability of this activity and maintain the agreed levels of service. Climate change in relation to level of service are presented below in Table 8-3.

**Table 8-3 Key Level of Service Linkages**

| Level of Service | Key Linkages relating to Climate Change |
|---|---|
| The Community is provided with water services to a standard that protects their health and property | Failure to recognise and respond to potential climate change implications may compromise Council's ability to continue to provide safe drinking water and adequate drainage systems. |
| Customers are provided with and fairly charged for water services that meet their reasonable needs | Failure to recognise and respond to potential climate change implications may compromise Council ability to provide for reasonable needs of customers in the future. |
| Nuisance effects of water services are minimised | Climate change may cause additional nuisance effects in the future. These can be minimised by understanding and planning for climate change and implementation of proactive measures. |
| Water services are provided in a cost effective manner | A proactive approach to mitigation of future climate change effects will generally be more cost effective than a reactive approach when problems become evident. |
| Problems with water services are addressed in a timely manner and prioritised according to risk and need | Climate change is a key risk and should be considered in a risk management context. |
| Service capacity is provided to accommodate growing communities, where this growth is sustainable | Climate change may impact on demand and service capacity and needs to be considered in infrastructure capacity planning. |
| Adverse effects of water services on cultural and heritage values are minimised | If the impacts of climate change are not recognised, there is a risk that cultural values may be compromised – for example, where stormwater treatment capacity is exceeded by more intense storms. |
| Adverse effects of water services on the environment are minimised | Climate change impacts on environmental conditions (eg water availability) may require modification of existing activities (eg water takes) to minimise future impacts on the environment. |
| Greenhouse gas emissions from the provision of water services are minimised | Climate change could affect the mix of energy used by the activity |

## Implications for the Selwyn District

In 2016 a climate change study was commissioned to investigate the impact of climate cycles and trends on Council assets. The assessment looks out 32 years from 2018-2038 aligning with the 2018 Infrastructure Strategy and was undertaken by Aqualinc Research Ltd.

The assessment is a high level risk assessment, to identify the assets that are most likely to be affected by climate change. Priority areas were guided by a risk matrix that we developed in consultation with SDC at the outset of the study. The environmental factors that were identified as having the greatest impact were:

- Groundwater levels;
- Annual rainfall;
- Extreme rainfall;
- Alpine and foothill river flows (floods and low flows);
- Evapotranspiration; and
- Sea level rise.

Table 8-4 outlines the key conclusions that were determined in the study.

**Table 8-4 Key Conclusions**

| Environmental Factors | Conclusions |
|---|---|
| Temperature | – Average temperatures across New Zealand have increased 1°C over the last 100 years.<br>– By 2048 temperatures are projected to be 0.8°C warmer (on average) compared with the last 20 years (1995 to 2015). |
| Evapotranspiration | – Evapotranspiration rates are expected to increase by about 3% by 2048. |
| Mean annual rainfall | – There is no long term trend observed in mean annual rainfall on the Canterbury Plains, despite a 1°C increase in temperature.<br>– Canterbury Plains and foothill rainfall is likely to remain relatively unchanged over the next 30 years.<br>– Alpine rainfall may increase by over 5% over the next 32 years. |
| Extreme rainfall | – There is no observed long term trend in extreme rainfall events on the Canterbury Plains, despite a 1°C increase in temperature.<br>– Based on long term historic trends, we would not expect a statistically significant change in extreme rainfall on the Canterbury Plains over the next 32 years.<br>– MFE's generic New Zealand wide recommendation of allowing for an 8% increase in extreme rainfall magnitudes per 1°C increase in temperature is not evident in the historic record for the Canterbury Plains.<br>– The near negligible climate change projections of mean annual rainfall for the Canterbury Plains indicate the changes in extreme rainfall magnitudes are unlikely to be large.<br>– Current industry design guidelines to allow for an 8 % increase in extreme events per 1 oC warming appear to be conservative for the Canterbury Plains. We recommend further more detailed investigations is required before any changes are made to these guidelines |

| | |
|---|---|
| | – Extreme rain events in alpine areas (e.g. Arthurs Pass) could increase by 6-8%. |
| Other climate variables | – Climate change will have a relatively minor impact on the overall amount of snow in the high mountains of the Southern Alps and snow frequency on the Canterbury Plains.<br>– Average wind on the Canterbury Plains will remain relatively unchanged, while the number of very windy days could increase by 1 to 2 %. |
| Groundwater | – We expect climate change will have only a minor impact on groundwater levels over the next 32 years.<br>– Central Plains Irrigation has a much greater impact than climate change and will increase groundwater levels.<br>– Record low groundwater levels in 2016 are due to a combination of below average rainfall and increased pumping of groundwater for irrigation. |
| River flows | – Mean annual flows in the alpine rivers (e.g. Waimakariri and Rakaia) could increase by about 8% by 2048, as a result of increased precipitation.<br>– Foothill river flows may slightly decrease over the next 32 years, due to a small increase in evapotranspiration.<br>– We expect climate change will only have a minor impact on flows in lowland streams and drains. |
| Sea level rise | – Local sea levels have risen 0.19 m over the last 100 years.<br>– Sea levels could rise by a further 0.08 to 0.23 m by 2048<br>– Sea level rise will result in either the Te Waihora/Lake Ellesmere mouth needing to be opened more frequently and/or an increase in lake levels. Without any change in lake management lake levels would rise by 0.08 m to 0.23 m by 2048. This change is 10%- 30% of the Lake's normal operating range.<br>– Sea level rise may result in a minor increase in flooding frequency at Rakaia Huts.<br>– Sea level rise could have a minor impact on groundwater levels at the coast. Impacts quickly diminish and are very small beyond about 1 km inland. |

## Climate Change Implications for the Activity Areas

The risk matrix developed by Aqualinc Research Ltd in conjunction with Council is outlined in Table 8-5 below. Whether or not an asset is affected depends both on the assets sensitivity to change and the scale of change. These asset sensitivities were combined with predicted changes to give the expected impacts of Climate Change on assets.

**Table 8-5 Asset Vulnerability**

| Environmental factor | Water | Wastewater | Stormwater | Land Drainage | Water Races |
|---|---|---|---|---|---|
| Groundwater levels (upper plains) | High | Minor | Minor | Minor | Minor |
| Groundwater (lower plains) | Low | High | High | High | Low |
| Annual rainfall | Moderate | Minor | Minor | Minor | Moderate |
| Extreme rainfall (plains) | Moderate | High | High | High | Moderate |
| Extreme rainfall (foothills and alpine) | High | High | High | High | Moderate |
| Alpine river flows | Moderate | Minor | Minor | Minor | High |
| Foothills and lowland river flows | Moderate | Minor | Minor | Minor | High |
| Evapotranspiration (ET) | High | Minor | Minor | Minor | Minor |
| Sea level rise <0.23m | Minor | Low | Low | High | Minor |
| Snow and ice (excl. alpine river flows impacts) | Minor | Minor | Minor | Minor | Low positive |
| Temperature (excl. ET impacts) | Minor | Minor | Minor | Minor | Minor |
| Wind (excluding ET impacts) | Moderate | Moderate | Minor | Minor | Minor |

Table 8-6 outlines the predicted climate change for each of the 5Waters and Table 8-7 outlines the impact of this on the infrastructure assets.

### Table 8-6 Predicted Climate Change

| Environmental factor | Water | Wastewater | Stormwater | Land Drainage | Water Races |
|---|---|---|---|---|---|
| Groundwater levels (upper plains) | Minor | Minor | Minor | Minor | Minor |
| Groundwater (lower plains) | Minor | Minor | Minor | Minor | Minor |
| Annual rainfall | Minor | Minor | Minor | Minor | Minor |
| Extreme rainfall (plains) | Minor | Minor | Minor | Minor | Minor |
| Extreme rainfall (foothills and alpine) | Moderate | Moderate | Moderate | Moderate | Low |
| Alpine river flows | Small Increase | Small increase | Small increase | Small increase | Small increase |
| Foothills and lowland river flows | Low | Minor | Minor | Minor | Small decrease |
| Evapotranspiration (ET) | 3% Increase | 3% increase | 3% increase | 3% increase | 3% increase |
| Sea level rise <0.23m | 0.05-0.23m increase | 0.08-0.23m | 0.08-0.23m increase | 0.08-0.23m increase | 0.08-0.23m increase |
| Snow and ice (excl. alpine river flows impacts) | Minor | Minor | Minor | Minor | Minor |
| Temperature (excl. ET impacts) | 0.8 C increase | 0.8 C increase | 0.8 C increase | 0.8 C increase | 0.8 C increase |
| Wind (excluding ET impacts) | Low | Low | Minor | | Minor |

### Table 8-7 Asset Impact

| Environmental factor | Water | Wastewater | Stormwater | Land Drainage | Water Races |
|---|---|---|---|---|---|
| Groundwater levels (upper plains) | Minor | Minor | Minor | Minor | Minor |
| Groundwater (lower plains) | Minor | Minor | Minor | Minor | Minor |
| Annual rainfall | Minor | Minor | Minor | Minor | Minor |
| Extreme rainfall (plains) | Minor | Minor | Minor | Minor | Minor |
| Extreme rainfall (foothills and alpine) | Moderate negative | Moderate negative | Moderate | Moderate | Low |
| Alpine river flows | Minor positive | Minor | Minor | Minor | Small positive |
| Foothills and lowland river flows | Low negative | Minor | Minor | Minor | Low |
| Evapotranspiration (ET) | Low negative | Minor | Minor | Minor | Minor |
| Sea level rise <0.23m | Minor | Low negative | Low | Moderate to high | Minor |
| Snow and ice (excl. alpine river flows impacts) | Minor | Minor | Minor | Minor | Minor |
| Temperature (excl. ET impacts) | Minor | Minor | Minor | Minor | Minor |
| Wind (excluding ET impacts) | Low negative | Low negative | Minor | Minor | Minor |

Overall climate change impacts for each of the 5Waters activities are listed below.

**Water Supplies**

- *Climate change will probably have only a minor impact on most aspects of SDC potable assets over the next 32 years.*
- *Higher evapotranspiration may mean 1-2% higher peak water demands.*
- *Higher alpine flood flows may have some impact on Arthurs Pass, Castle Hill and Lake Coleridge water supply intakes.*

**Wastewater**

- *Climate change will probably have only a minor impact on most aspects of SDC wastewater assets over the next 32 years.*
- *Higher alpine rainfall and flood flows may result in an increase in stormwater inflows for the Arthurs Pass, Castle Hill and Lake Coleridge wastewater systems.*

- *An increase in sea level of up to 0.23 m may have an impact on Upper Selwyn Huts, Rakaia Huts and Lakeside wastewater systems.*

**Stormwater**

- *Climate change will probably have only a minor impact on most aspects of SDC stormwater assets over the next 32 years.*
- *Higher alpine rainfall and flood flows may result in an increased occurrence of surface flooding at Arthurs Pass, Castle Hill and Lake Coleridge.*
- *An increase in sea level of up to 0.23 m may have a minor impact on stormwater drainage systems at Rakaia Huts.*

**Land Drainage**

- *An increase in sea level of up to 0.23 m may impact on Lake Ellesmere/Te Waihora levels and parts of the land drainage network.*
- *A projected 6-8% increase in flood flows may impact on Arthurs Pass Bealey River flood protection systems.*
- *Other aspects of climate change will probably have only a minor impact on land drainage systems over the next 32 years.*

**Water Races**

- *Climate change will probably have only a minor impact on most aspects of the SDC water race system.*
- *An increase in alpine flood flows could result in a small increase in flood damage to intakes. Conversely higher alpine flows would improve reliability of supply.*
- *A potential minor reduction in flows in the Kowai River might have a small impact on reliability.*

## Response to Climate Change Implications for Water Supply

Environment Canterbury is responsible for the management and allocation of water resources in the district. As a major stakeholder in this resource, Council will need to work closely with Environment Canterbury to protect the water resource necessary to sustain district communities now and in the future. Proposed actions include:

- Work with ECan to improve management/allocation of the groundwater resource to halt/reverse declining groundwater levels for community and domestic purposes;
- Work with ECan to better understand the groundwater resource and promote efficient use of water in the district;
- Inform ECan of the potential implications on essential services and work with ECan to develop management strategies and contingency plans to ensure that these services can be maintained; and
- Assess reasonable water supply needs for current and future district communities and lobby ECan to implement policies and rules to protect sufficient water resources for the current and future needs of district residents.

These actions have been carried out where relevant, for example written submissions to Environment Canterbury regarding the LWRP. Council staff will continue to monitor Environment Canterbury's plans and policies.

## 8.4 Energy

The 5Waters activity is energy intensive, accounting for approximately half of Council's total electricity consumption. The major power demands are from water and wastewater pumping stations and treatment facilities. The direct use of fossil fuels is generally limited to emergency power generation equipment, but the indirect use of transportation fuels for operation and maintenance activities should also be considered when planning changes to energy management. Energy, in varying forms, is used during the construction and renewal of assets and the manufacture of materials used in construction, operation and maintenance of assets.

Carbon emissions for many current energy sources contribute to climate change. Figure 8-1 below shows the electrical energy costs forecasted during the LTP period as well as the past three years (one budget and two actual).

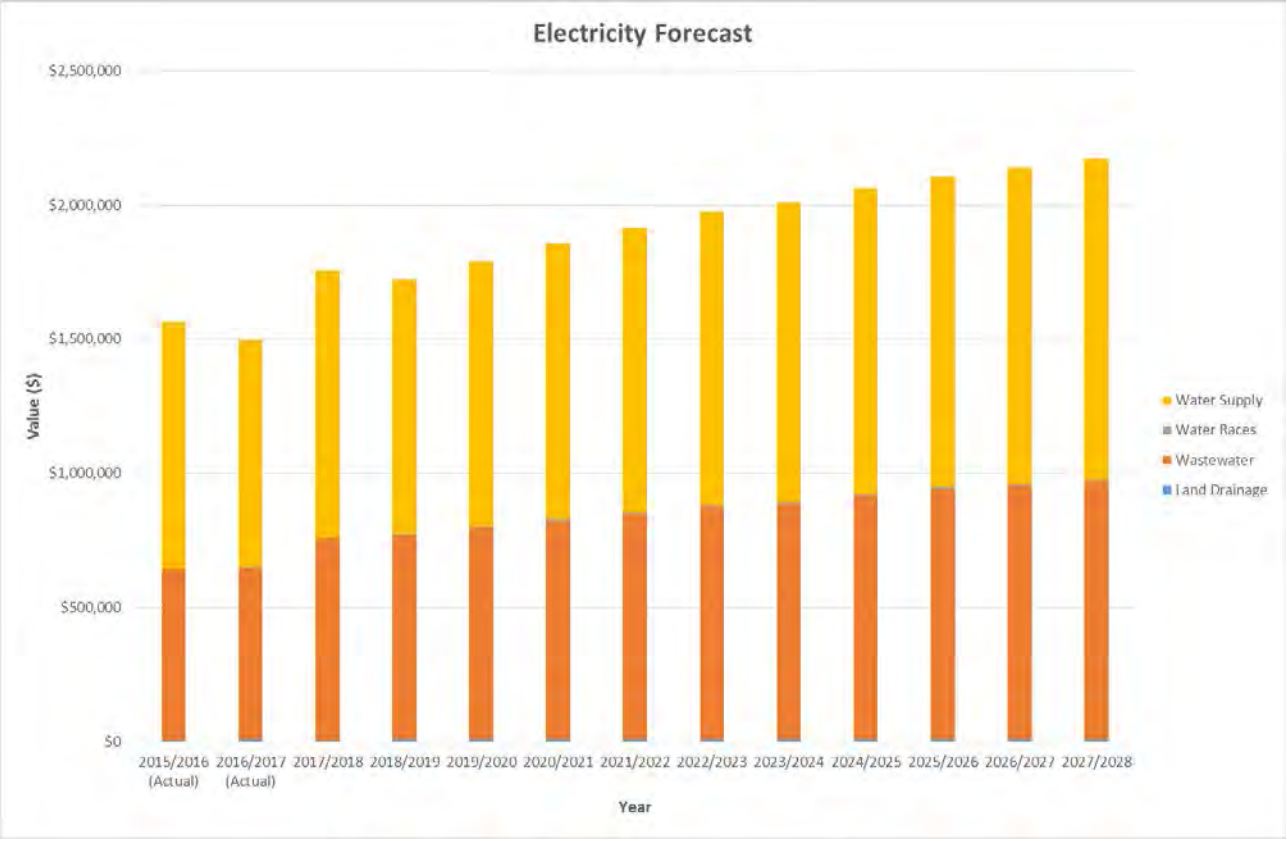



**Figure 8-1 Electrical Energy Forecast**

Energy prices have increased significantly over recent years, impacting on operational costs for the 5Waters activity. This trend is expected to continue.

Council's 5Waters Strategy has identified that:

- Council will monitor current and forecast fossil fuels prices and associated effects on its asset management and operation annually. It will identify effective and efficient opportunities to reduce usage and reliance on this energy source, and seek reliable and sustainable alternatives as they arise;
- Council will minimise the use of and conserve energy, as far as practicable while still meeting agreed levels of service. This will extend to all private services in time where a need is recognised; and
- Council will undertake to identify and reduce carbon emissions where a benefit is shown, through more efficient use of materials and services.

It is necessary to consider energy issues in relation to the 5Waters activity to ensure the sustainability of this activity and achieve/maintain the agreed levels of service. Key level of service linkages are presented below in Table 8-8.

**Table 8-8 Key Level of Service linkages**

| Level of Service | Key Linkages relating to Energy Use and Carbon |
|---|---|
| The Community is provided with water services to a standard that protects their health and property | The treatment of water and wastewater can be energy intensive and may lead to increased carbon emissions. |
| Customers are provided with and fairly charge for water services that meet their reasonable needs | If greater per capita demand is placed on water services, then energy costs and carbon emissions may rise. |
| Nuisance effects of water services are minimised | Indirect effects of increased energy use. |
| Water services are provided in a cost effective manner | Reducing / minimising energy demand will reduce exposure to increasing energy prices, improving cost efficiency. |
| Problems with water services are addressed in a timely manner and prioritised according to risk and need | Reliability of energy supply – loss of power or low fuel supplies may result in loss of service capability. |
| Service capacity is provided to accommodate growing communities, where this growth is sustainable | As communities grow, the energy requirements for water services will also grow. |
| Adverse effects of water services on cultural and heritage values are minimised | Increased energy use, in particular fossil fuels, can affect air quality |
| Adverse effects of water services on the environment are minimised | Reducing energy demand, and in particular fossil fuel demand will reduce environmental impacts from that energy production and use. |

| | |
|---|---|
| Greenhouse gas emissions from the provision of water services are minimised | Reduced use of fossil fuels and energy derived from fossil fuels, including energy embedded in construction materials and other consumables will reduce greenhouse gas emissions. |

### Electrical Energy Supply Contract

Electrical energy is supplied to approximately 240 sites, with range of infrastructure at each site including street lighting, water, wastewater and land drainage assets.

Selwyn District Council procures electricity directly from Meridian, and has an overarching supply agreement.

Electricity bills are received from Meridian but Council is currently unable to measure the number of kW used electronically. A solution to this would be to obtain electronic billing information from Meridian, allowing Council staff to monitor electrical energy usage (and costs) within the AMS. A platform will need to be built in AMS, this is listed an as improvement action for commencement in 2020/21.

### Alternative Energy Sources

In 2008, some preliminary work was undertaken to identify and evaluate alternative energy sources. This initially focussed on the potential to use solar panels and wind turbines to power low demand sites, e.g. telemetry installations. Capital costs far outweigh the very low annual energy cost savings making conversion of existing sites unattractive. Solar panels may be a viable option for new installations without an existing mains power supply.

Small solar/wind energy systems are not suitable for higher power demand sites such as UV water treatment plants and water/wastewater pumping stations. As part of the risk assessment process for Darfield deep well siting (2010-2011), water race use for generation of power was considered.

### On-Site Power Generation

Council own a number of diesel powered generators installed at key water and wastewater sites as standby emergency power supplies. There is potential to utilise these systems during peak power demand periods and take advantage of lower tariff structures.

Another option under consideration is to use the generation capacity to supply the main grid at peak times when the electricity spot price is high.

These options may provide net cost savings for Council, but need to be considered in a wider context for alignment with the Sustainability Principles. Any use of diesel generation capacity consumes non-renewal fossil fuels contributing to greenhouse gas emissions. A significant capital investment would be required to modify the existing equipment to supply power to the grid, and supply contracts would need to be negotiated that did not compromise the ability to use the generation capacity for the purpose for which it was originally intended.

## 8.5 Improvement Planning

Throughout this section a number of specific actions to improve the way in which the Council identifies and manages infrastructure sustainability associated with the 5Waters activity have been identified. These actions are summarised below in Table 8-9.

**Table 8-9 AM Improvement Items – Infrastructure Sustainability**

| Section Ref | Improvement Opportunities | Priority | Timing |
|---|---|---|---|
| 8.2.1 | Reasonable Use Model | Medium | 2018/19 |
| 8.2.3 | Monitor developers/developments to ensure sustainable infrastructure is provided in the district | Medium | Ongoing |
| 8.2.4 | Consolidate rates to ensure financial sustainability (recognised more appropriately as an improvement item in Section 11) | High | Ongoing |
| 8.2.4 | Integrate schemes where economically viable (recognised more appropriately as an improvement item in Section 11) | Medium | Ongoing |
| 8.3.3 | Extend the Climate Change study to 120 years to be in line with the lives of infrastructure assets | Low | 2019/20 |
| 8.4 | Monitor electrical energy usage within AMS | Medium | 2021/22 |

# 9.0 RISK MANAGEMENT

This section outlines the risks and the process of identifying risks that may affect the ongoing delivery of services from infrastructure. It covers these key areas:

- Business risk management processes;
- 5Waters risk management approach;
- Resilience of Infrastructure to Natural Disasters;
- Other considerations, in particular WSPs and regional plans;
- Risk management strategy; and
- Emergency management and Civil Defence.

## 9.1 Business Risk Management Processes

This section introduces business risk management processes used for the 5Waters Activity. Assessment and management of risk within the 5Waters provides defensible tools for communities and the Council to develop prudent work programmes that support sustainable development.

### Risk Policy

The 5Waters all risks management process follows best practice as described in the International Infrastructure Management Manual 2015 and the International Standard on Risk Management ISO 31000 2009 Risk Management - Principles and Guidelines[30], as shown in the diagram below.

The risk assessment process identifies “critical assets” and assesses the implications of service failure on Council’s customers, with the objective of optimising the service potential of the assets employed.

[30] Supersedes AS/NZS 4360:2004

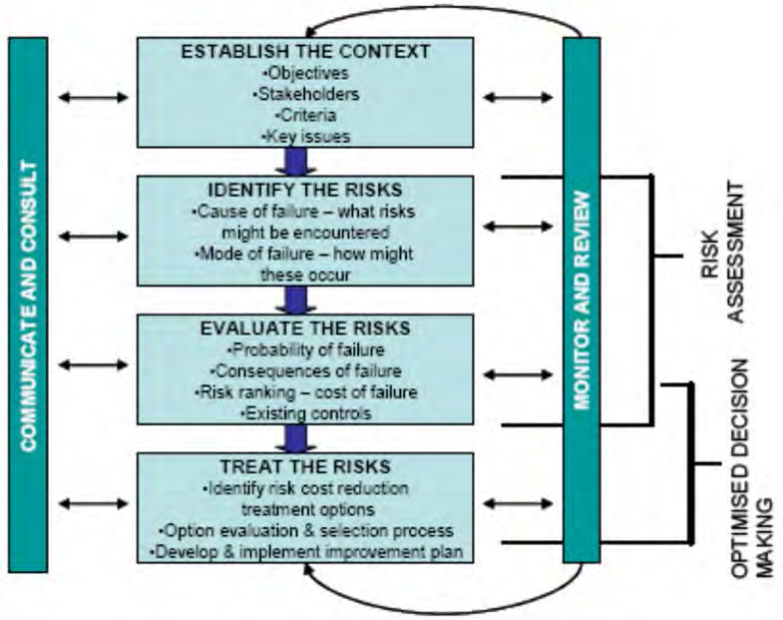



**Figure 9-1 Risk Management Process**

A corporate Risk Management Policy[31] aligned with AS/NZS ISO 31000 was formally adopted by Council in August 2017, with the following objectives:

- Achieving Council's goals, programs, targets with a commercially and politically acceptable level of risk;
- Ensuring all staff understand and fully accept their risk identification and control responsibilities;
- Ensuring all staff implement appropriate risk management processes naturally as part of their daily work;
- Establishing a best practice model for corporate governance and risk management for local government in New Zealand

The Policy Statement within this document states:

> To accomplish this Policy's purpose, the Council must establish and maintain an effective Risk Management Programme, to manage risks and incorporate the Councils risk appetite as expressed within the Risk Consequence table below.
>
> Roles and responsibilities for the fulfilment of this are expressed in the below section.
> This Risk Management Policy is the governing document in setting the requirements for risk management and risk appetite, for all types of risk, across the Council.

It defines four broad categories of risk, which are also categorised by organizational responsibility as illustrated in the tables below.

[31] SDC Risk Management Policy Framework, July 2016

**Table 9-1**

| Risk Category | Description |
|---|---|
| Strategic | Risks associated with high level goals that align to Councils Strategic direction and Long Term Plan |
| Operational | Risks associated with departmental functions and daily operations |
| Project | Risks associated with Project Management; |
| Compliance | Risks associated with regulatory/legislative requirements (H&S). |

This framework is consistent with the methodology used for the 5-Waters activity, and the 5Waters approach meets corporate expectations and requirements.

## Risk and Asset Management

Application of a systematic and consistent approach to risk assessment improves Council's ability to manage its assets within resource limitations and to prioritise expenditure and actions that can avoid or mitigate the effects of any event. The negative consequences of risk events can seriously impact public health and safety, incur financial loss or adversely affect public image. The risks identified might be relevant to many activities and be of concern at corporate level, or they might be localised, at an asset specific level.

As urban development increases the value of the built asset, and threshold limits for cultural and environmental impacts tighten, the need for more formal risk management practices increases. Mitigation strategies need to be put in place and reviewed continuously to achieve improvement to levels of service.

## Resilience

Communities rely on water services for their daily economic and social wellbeing. The ability of water services infrastructure to function during adverse conditions and quickly recover to acceptable levels of service after an event is fundamental to the wellbeing of communities.

Furthermore, the risks to critical infrastructure from hazards are increasing globally. These hazards can include natural, technological and social/political hazards. Some natural hazards are 'rare events', events which may previously have been considered extremely unlikely, but are instead occurring more frequently than previously expected.

The effects of such hazard scenarios can be exacerbated by the complex interdependencies that exist between modern infrastructure networks, and the existence of many different failure modes – all of which can affect the functioning of infrastructure.

The resilience of infrastructure to such events is therefore a key consideration in asset management planning, and both physical and organisational dimensions are significant.

The National Infrastructure Plan (2011) defined the concept of "resilience":

*"The concept of resilience is wider than natural disasters and covers the capacity of public, private and civic sectors to withstand disruption, absorb disturbance, act effectively in a crisis, adapt to changing conditions, including climate change, and grow over time".*

The following diagram illustrates the relationship between risk management's traditional 4R's, shock events, and components of resilience.

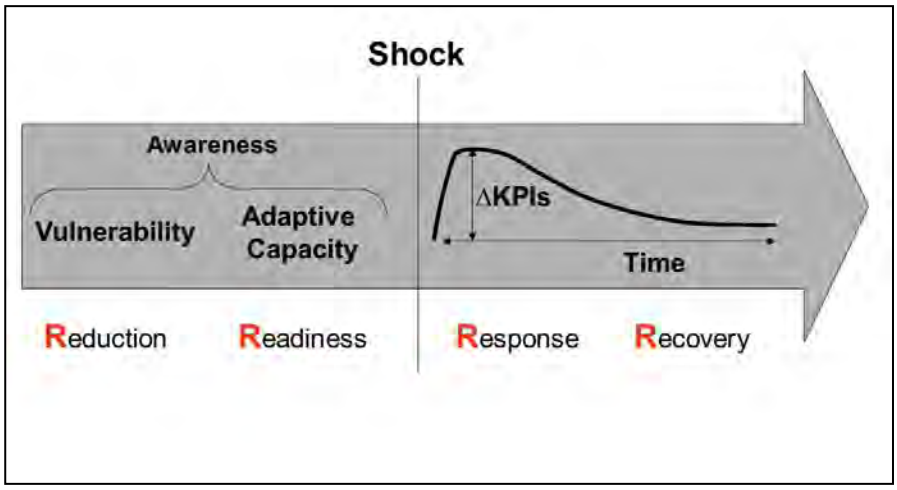



**Figure 9-2 Resilience and the 4R's**

Engineering measures such as asset strengthening can reduce the effects of an event, while readiness is about organisational preparedness.

Following the occurrence of an event or shock, initial short term response is followed by longer term recovery processes.

This diagram also illustrates the importance of pre-event awareness to resilience – firstly understanding the vulnerability of the assets, and secondly "adaptive capacity" a critical organisational capability for readiness.

Following the event, a sudden change in the levels of service being provided occurs, and it typically takes a much longer period for services to return to full normality.

Resilience requires more than good engineering – "technical" and "organisational" dimensions of resilience are both important:

i. Technical resilience relates to the ability of a physical system such as an infrastructural network to perform to an acceptable / desired level when subject to a hazard event; and
ii. Organisational resilience relates to the capacity of an organisation to make decisions and take actions to plan, manage and respond to a hazard event in order to achieve the desired resilient outcomes.

In this context, change readiness, relationships, leadership, culture, financial sustainability and insurance arrangements are important aspects.

### Asset Insurance

Asset Insurance is covered in Section 11.0 Financial Summary.

## 9.2 Risk Management Approach

### Integrated Approach

For the 5Waters Activity, risk assessment is integrated across the 5 services. Often, similar mitigation measures can be applied to reduce risk in more than one of the 5Waters activities. Furthermore, Council utilises a prioritisation system for capital expenditure and operational improvement projects which is based on evaluation of community benefit and cost and which allows, but does not require, preference for expenditure in one service over another. This approach is fundamental to allow sustainable management of water services.

If the levels of service are achieved, in tandem with legislative compliance, prudent investment and good financial management, then minimisation of the following should occur:

i. Exposure to public and general liability; and
ii. Risks derived from the operation of assets.

Risks arise from many areas of the 5Waters Activity. They can be derived from the use of physical assets (e.g. a pump or a pipe failure) or management of the services provided (e.g. failure to formalise procedures and reporting of incidents).

In addition to the risk evaluation process used to justify improvement projects as mitigation measures there are a number of other processes that Council uses for management of risk within the 5Waters asset portfolio. Often these are driven by legislative requirements. However, they are all integrated with the risk management approach and can be used as sources for identification of risk events.

### Strategic Approach

The strategic approach to management of 5Waters risks is to:

1. Apply assessment tools to evaluate gross, current and residual risk and derive potential mitigation measures, where considered necessary;
2. Document the assessment process and record potential mitigation measures. These measures can be used to signal the need to implement specific improvement projects or change or improve processes and practices;

3. Input improvement projects derived from this risk evaluation into the prioritisation process to derive expenditure programmes; and
4. Link prioritised projects to specific assets that are affected by the projects within the AMS.

Regular and timely monitoring of these strategies will ensure that changes/modifications to management and operation practices are effective.

## Statutory Requirements

### 9.2.1.1 Obligations as a Lifeline Utility

The Civil Defence and Emergency Management Act 2002 contains specific requirements in relation to Lifeline Utilities. In the Act the term "lifeline utility" means an entity named or described in Part A of Schedule 1, or that carries on a business described in Part B of Schedule 1".

The Act states the duties of lifeline utilities at Section 60:

> 60. Duties of lifeline utilities
>
> Every lifeline utility must—
>
> (a) ensure that it is able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency:
>
> (b) make available to the Director in writing, on request, its plan for functioning during and after an emergency:
>
> (c) participate in the development of the national civil defence emergency management strategy and civil defence emergency management plans:
>
> (d) provide, free of charge, any technical advice to any Civil Defence Emergency Management Group or the Director that may be reasonably required by that Group or the Director:
>
> (e) ensure that any information that is disclosed to the lifeline utility is used by the lifeline utility, or disclosed to another person, only for the purposes of this Act.

The Council's water supply, wastewater and stormwater networks are defined under the Act as lifelines. Further information is provided in Section 9.3 Resilience of Infrastructure to Natural Disasters.

### 9.2.1.2 Water Safety Plans

As discussed in Section 0 the Health (Drinking Water) Amendment Act 2007 required drinking water suppliers to prepare and implement a Water Safety Plan for any water supply serving more than 500 people. Council decided in 2010 that WSPs were to be completed and used as an alternative means of compliance with DWSNZ 2008. The key risks identified in WSPs are summarised in Section 9.4 Water Safety Plans.

## Risk Management Objectives

Risk events associated with the 5Waters Activity are often dominated by extreme consequences such as public health and high community cost. The context of these risks is heavily determined by national legislation and standards and by community expectation. Water services are expected by the community and their tolerance for failure of the services is generally low. The treatment of risks is usually undertaken to ensure there is intervention at the appropriate time.

The 5Waters goal is to ensure there are strong links between sustainability principles, community outcomes and levels of service. *The ultimate aim for completing any work is to minimise the risk of failing to deliver the levels of service for the community.*

The risk management approach addresses the following objectives:

1. Risk events must be distinguished from the projects that will improve levels of service. Projects are **outcomes** of risk evaluation. Risk evaluation highlights areas where achieving levels of service may not occur;
2. Projects are defined from mitigation measures and then fed into the project prioritisation process;
3. Once projects are prioritised and budgets are set, project programmes can be determined according to affordability; and
4. Risk evaluation provides a tool to define projects. In its absence, project creation can be adhoc and somewhat dependent on informal discussion and communication.

## Risk Management Methodology

Although risk management strategy and risk management processes essentially follow AS/NZS ISO 31000:2009 “Risk Management Principles and Guidelines”, the detail within evaluation methods may vary between utilities. The 5Waters process is fully detailed in a spreadsheet based system, adapted to suit an integrated 5Waters approach. Figure 9-3 summarises the process.

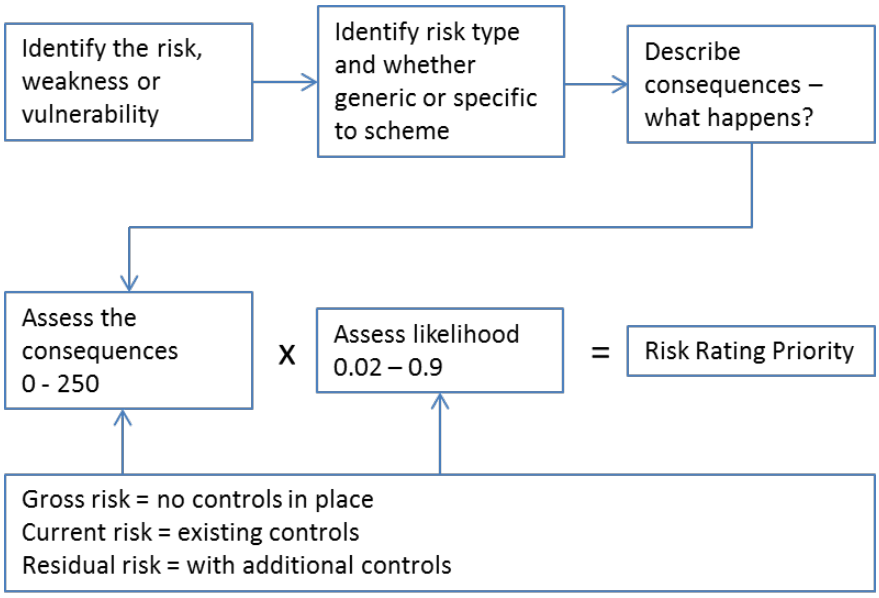



**Figure 9-3 Risk Evaluation Process**

More information on the process, including detailed consequence and likelihood rating tables, is provided in the report "5Waters Risk Assessment" dated June 2018.

#### 9.2.1.3 Consequences

Weighted consequences are evaluated for each risk event and linked to Council's levels of service. This assumes that the direct outcome of a risk event is failure to deliver one or more levels of service as listed below. Previous community consultation work established weightings for levels of service; as detailed in Table 9-2 below.

**Table 9-2 Levels of Service and Areas of Impact Weightings**

| Areas of Impact | Level of Service | Weighting |
|---|---|---|
| **Public Health & Safety, Contamination and Overflows** | The community is provided with water services that protect their health and property. | 0.19 |
| **Asset Performance** | Service capacity is provided to accommodate growing communities where this growth is sustainable. | 0.15 |
| | A continuous water supply service is provided to reticulated properties | |
| **Environment and Legal Compliance** | Adverse impacts on the environment are minimised. | 0.07 |
| | Greenhouse gas emissions from the provision of water services are minimised. | 0.05 |

| | | |
|---|---|---|
| **Historical or Cultural** | Adverse effects of water services on cultural and heritage values are minimised. | 0.03 |
| **Financial** | Customers are provided and fairly charged for water services that meet their reasonable needs (CAPEX charges) | 0.15 |
| | Water services are provided in a cost effective manner (Operational costs). | 0.15 |
| **Nuisance effects – odour, noise and aesthetics** | Nuisance effects of water services are minimised. | 0.07 |
| **Customer Service** | Problems with water services are addressed in a timely manner and prioritised according to risk and need. | 0.14 |

Weightings are considered to represent the maximum risk the applicable impact area presents i.e. the greater the weighting value = greater risk. An overall evaluation of consequence for any risk has been calculated as the sum of the impact for each level of service, multiplied by the specific level of service weighting.

#### 9.2.1.4 Likelihood

The probability of occurrence (likelihood) of an event occurring has been assessed using likelihoods ranging from Almost Certain to Rare:

**Table 9-3 Risk Likelihood**

| Descriptor | Rating | Likelihood | Score |
|---|---|---|---|
| Almost Certain | 1 | Expected to occur frequently and up to several times a year | 0.9 |
| Likely | 2 | Expected to occur at least once every 2-5 years | 0.4 |
| Possible | 3 | Could occur at least once every 5-10 years | 0.2 |
| Unlikely | 4 | May occur once in 10-20 years | 0.07 |
| Rare | 5 | May occur once in 50+ years | 0.02 |

#### 9.2.1.5 Risk Assessment Matrix

Consequences and likelihood scores are multiplied together to arrive at a combined risk score and relative level of risk as shown in Table 9-3.

It is important to note that risk priority ratings shown in Table 9-4 do not necessarily imply a priority for taking action. Where service failure cannot be allowed to occur even for rare events (e.g. due to the importance of the service to the community, such as a hospital) then a higher priority will need to be accorded. Critical

assets are those assets whose failure would impact on such important services. Section 0 describes the approach followed for critical assets.

**Table 9-4: Risk Ratings**

| | Consequence | | | | |
|---|---|---|---|---|---|
| **Likelihood** | Negligible | Minor | Moderate | Major | Catastrophic |
| Almost Certain | Moderate | High | Very High | Extreme | Extreme |
| Likely | Moderate | Moderate | High | Very High | Extreme |
| Possible | Low | Moderate | Moderate | High | Very High |
| Unlikely | Low | Low | Low | Moderate | High |
| Rare | Low | Low | Low | Low | Moderate |

**Table 9-5: Risk Priorities**

| Risk Priority Rating | | |
|---|---|---|
| **Risk Score** | **Level of Risk** | **Risk Response** |
| >50 | Extreme | Awareness of the event to be reported to Council.<br>Immediate action required to eliminate / mitigate / manage the risk.<br>Document risk and action in the AcMP. |
| 35 - 50 | Very High | Awareness of the event to be reported to Council.<br>Urgent action to eliminate / mitigate / manage the risk.<br>Document risk and action in the AcMP. |
| 14 - 35 | High | Risk to be eliminated / mitigated / managed as a priority and be actively monitored and reported on |
| 3.5 - 14 | Moderate | Manage risk through routine business procedures |
| <3.5 | Low | Monitor the risk |

### *Types of Risk*

The types of risk event include:

- Operational Failure;
- Asset Failure;
- Natural Disasters;
- Events and Incidents;

- Project Risks;
- Business Risks; and
- Environmental Risks.

#### 9.2.1.6 Calculation of Risk

**Gross risk, current risk** and **residual risk** have been calculated as a product of likelihood and consequence.

- **Gross risk** – the level of risk derived from an event or action if Council did nothing to mitigate.
- **Current risk** – takes account of what Council is currently doing to mitigate risk.
- **Residual risk** – takes account of additional controls or mitigation actions that could be taken to further reduce the risk.

### Prioritised Expenditure Programmes

The risk management process provides Council with a robust approach to derive expenditure programmes that are affordable, undertaken according to a determined priority, and derived from an assessment of the risk of failing to deliver levels of service.

Within these programmes individual projects may relate to:

- Management processes;
- Planning and feasibility;
- Operations and maintenance;
- Asset rehabilitation and renewal; and
- New asset development.

The application of the risk management process within the programme development and prioritisation decision making process is illustrated in Figure 9-4. As shown, risk events can arise or be identified from a variety of sources – such as analysis of asset information, strategic planning processes, audits or from external hazards and events.

An important part of the AcMP Improvement Plan is to integrate risk assessments within the asset management system (AMS). The current spreadsheet based assessment system will be migrated to AMS.

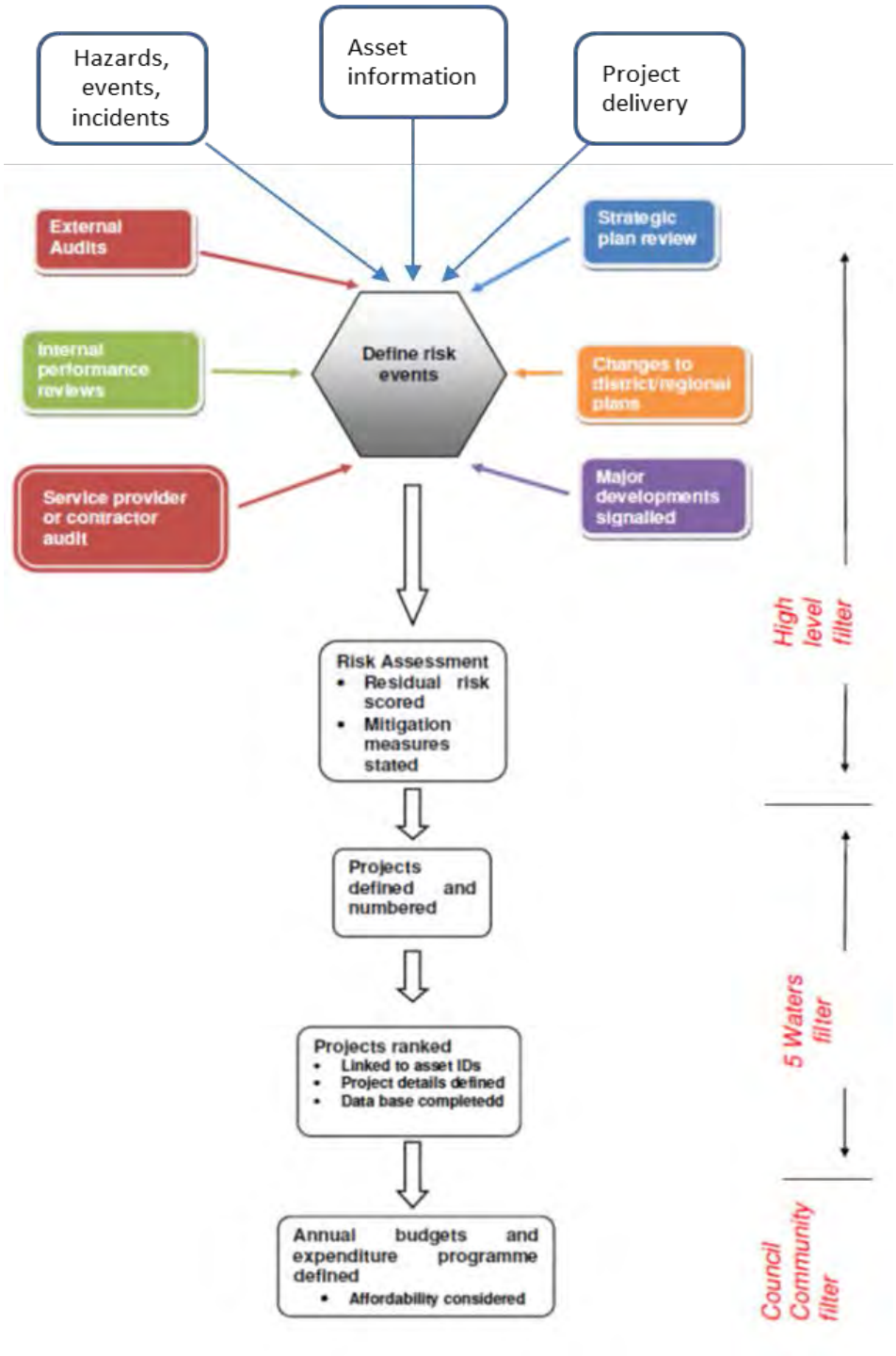



**Figure 9-4: Application of Risk Management Process to Programme Development**

## 9.3 Resilience of Infrastructure to Natural Disasters

### Natural Hazards

Selwyn District is subject to a wide range of natural hazards, including earthquake, flooding, tsunami, meteorological events (snow, wind), mass movement (land slip), and wildfire.

Typical effects on 5Waters infrastructure may include:

- Physical damage such as pipe breaks, plant and equipment damage, subsidence, collapse, destruction;
- Contamination such as wastewater entering water supply or other water systems; and
- Loss of automation capability.

Information about natural hazards is provided by agencies such as GNS and Environment Canterbury.

### Lifeline Utilities

For the purposes of this Plan all 5Waters activities are considered as Lifeline Utilities.

#### 9.3.1.1 Infrastructure Resilience

Infrastructure resilience is a significant issue for communities within the District and across the country, given the range of hazards that New Zealand is exposed to. Resilience is concerned not only with physical aspects relating to the assets but also with the organisation's capabilities in terms of aspects such as readiness and adaptability.

In considering the physical infrastructure itself, it is important to understand how resilient it is now compared to how resilient it should be. This addresses dimensions such as physical robustness, redundancy and design, in the context of specific hazard events. A key factor post-event is how quickly the assets can be reinstated, or service replacement can be put into place, to meet the community's immediate and short term needs before recovery gets underway.

To date, the Council has not carried out a comprehensive Lifelines Study or resilience assessment, but has built up a body of knowledge of the impacts of events that have occurred as noted above. Such a study would identify the nature, scale and locality of natural hazard events and carry out a risk assessment of the infrastructure which may be exposed to the hazard events, leading to the identification of mitigation actions for risk "reduction". These actions may range from updating design standards through to asset strengthening or replacement, based on priorities linked to the "resilience gap".

A number of hazard events are assessed in the risk register (refer subsequent sections), however these do not provide a complete "lifelines picture".

A "Lifelines Utilities Response Plan" was prepared in 2017 to provide guidance to asset managers and response personnel when an event occurs. This plan takes an all hazards approach identifying expected consequences and cascade effects. Further work is required to better understand the specific impacts of hazard events and the level of resilience actual vs desired.

#### 9.3.1.2 Interdependencies

An important aspect of the "lifelines approach" is the concept of "interdependencies", which addresses questions such as:

- What other utility services the network depends on – such as power or fuel at particular locations, or physical access by road or bridge; and, what is the level of this interdependency? (e.g. High, Medium, Low)?
- Is that utility fully aware of your need? What mitigation actions should that utility consider? How should their network be modified?
- What other utilities are dependent on your assets (e.g. pipes / cables on a bridge)? Are they aware of the vulnerability (if any) of your asset? If you are considering work on the asset would they reconfigure their assets? Might they be interested in paying to strengthen your asset to provide them with better protection?

Where a confluence of important lifelines occurs, such as multiple services crossing a single bridge, a "hot spot" exists. Such sites warrant particular, inter-utility cooperation to address the risks and reduce the potential impact of a cascade failure affecting multiple services.

Understanding of interdependencies is currently achieved through inter-utility communication and by regular involvement with the Canterbury Lifeline Utilities Group.

A preliminary rating of interdependencies between 5Waters activities, Solid Waste and Roading is included in the Lifelines Utilities Response Plan. This needs to be expanded to include other non-Council utilities, such as power, telecommunications and fuel.

## 9.4 Water Safety Plans

WSPs have a public health consequence focus and include improvement actions for maintenance and capital budgets. WSPs are important documents that guide and inform priorities for maintaining and improving water supply schemes, and their implementation is reviewed periodically by the Ministry of Health.

In addition to individual WSPs for each water supply scheme, an overarching document supersedes the previous Council document "Selwyn District Council, Public Health Risk Management Plan, Part 1: Overview". This document includes:

- List of water supply schemes;
- Methodology –including a risk assessment which is aligned with the approach described in this AcMP; and
- Contingency Plans – typical actions to address different types of event that could occur.

Individual Scheme WSPs typically include:

- Description and overview of the scheme;
- Critical points for managing hazards – e.g. bore;
- Risk assessment based on the four barriers to contamination
- Description of preventive and corrective actions;
- Improvements and action plans; and
- Contingency plans.

Each WSP includes a risk assessment worksheet which identifies risks at each of the following points in the supply system:

- Catchment and intake
- Treatment
- Storage and distribution
- Other

Significant issues and risks that may be identified in Council's WSPs include:

- Contamination of source water;
- Unsuitablility of raw water – e.g. due to turbidity;
- Lack of treatment or failure of the treatment system;
- Physical failure of the assets;
- Poor performance, for example over or under chlorination;
- Contaminant entry into the distribution system;
- Insufficient water available for abstraction and treatment; and
- Occurrence of natural hazard events.

Issues such as the environment within which well heads are located, the configuration of the scheme, whether or not the appropriate assets exist, and the condition of the assets are all typical examples of sources of risk.

The risks identified in WSPs are considered as part of the development of the 5Waters AcMP and associated programmes. This 5Waters integrated risk management approach ensures that WSP outcomes relating to public health risk are not viewed in isolation of other Council risks.

## 9.5 Summary of Key Risks

### Results of Risk Assessment

The following approach was followed in updating the risk register and determining priorities for the 2018 AcMP:

- Review and update the 2014 Risk Register[32], adding, deleting and modifying risks as appropriate across each of the 5Waters portfolios, and considering risks arising from natural hazard events.
- Consideration of risk events which affect critical assets, as higher criticality assets should receive a higher priority.
- Identification of risks specific to individual schemes, also for inclusion in WSPs.
- Review the list of risk-derived projects from the 2015 AcMP, rationalising, updating and reprioritising the list to provide appropriate recommendations for the 2018 AcMP.
- A list of risks and the results of the assessment process are tabulated in the report "5Waters Risk A ssessment" dated June 2018.
- The effectiveness of existing mitigations or controls is assessed by comparing the gross risk rating with the current risk rating, determining the risk reduction ratio.
- The effectiveness of additional mitigations or controls which are not yet in place is assessed by comparing the current risk rating with the residual risk rating, determining the risk reduction ratio.
- The risk reduction ratios are considered when prioritising actions.

### Very High and Extreme Business Risks

Gross risks rated as "very high" or "extreme" are listed in Table 9-6 below. This table describes the risk consequences and identifies the mitigation strategies or controls that either exist now or are proposed.

Proposed actions are taken forward into the project prioritisation process for future funding consideration.

The priorities of mitigation strategies or controls which are already in place are also considered in terms of scheduling or funding. Priorities are addressed in Section 9.6 Risk Management Strategy.

[32] This was documented in a report "5Waters Risk Assessment: 2015 Assessment" by AECOM

## Very High and Extreme Individual Schemes Risks

A range of “very high” or “extreme” risks have been identified for Water Supply and Wastewater schemes. These typically relate to capacity, growth, asset failure, treatment and contamination of water supplies, particularly where strong population growth is expected.

A full list is provided in the report “5Waters Risk Assessment” dated June 2018.

### Table 9-6 Business Risks Identified

| No. | Activity Type | Activity Type | Scheme(s) | Consequence or Outcome | Gross Risk Assessment |
|---|---|---|---|---|---|
| **1** | **High Level Policies, Procedures and Controls** | | | | |
| 1.01 | No clearly defined, documented strategy to guide long term delivery of activity | 5Waters | | Ad hoc decision making, waste of significant human, material and financial resources. Progress towards sustainable development not achieved as no adopted plan to follow. | High |
| 1.02 | No clear consistent approach to public consultation | 5Waters | | Non-compliant with LGA 2002 consultation requirements | High |
| 1.03 | Policies relevant to asset management are not in place or are incompatible or inconsistent | 5Waters | | Robust asset management input not able to be incorporated leading to significantly sub-optimal asset management decision-making (e.g. due to time constraints) | Medium |
| 1.04 | No clear Council policies or adopted views on sustainability, climate change, energy management. | 5Waters | | Rebuild, relocation (abandonment) of assets, cost on community and inability to provide service. Financial loss (liability for property damage) | Medium |
| 1.05 | Effective Bylaws not in place | 5Waters | | Inappropriate or non-controllable behaviour of customers leading to environmental or health problems, multiple complaints, increased costs to Council | High |
| 1.06 | Highly inaccurate or incomplete data / assumptions adopted by Council in strategic planning processes. | 5Waters | | Inappropriate sustainable development decisions are made by Council. Additional costs incurred in developing and implementing programs of work. | High |
| **2** | **Financial** | | | | |
| 2.01 | Absence of or poor quality long term financial planning | 5Waters | | Higher borrowing costs, increases intergenerational debt burden | High |
| 2.02 | Appropriate levels of service not aligned with funding and work delivery | 5Waters | | Levels of service not met due to lack of funding, as customers/Council not informed of implications | High |

| | | | | | |
|---|---|---|---|---|---|
| 2.03 | Whole of life costs of new asset development are not properly assessed | 5Waters | | Decision making not based on full lifecycle costs. Capital and operational costs do not reflect true costs. | High |
| 2.04 | Substantial unforeseen additional costs | 5Waters | | Reputation of Council considered poor due to significant budget over expenditure. Growing financial debt burden. | High |
| 2.05 | Valuation does not accurately reflect actual facilities | 5Waters | | Incorrect valuation leading to under or over recovery of depreciation funding. Concerns about robustness of plant and equipment valuation data. | High |
| 2.06 | Inappropriate insurance cover | 5Waters | | Cover does not provide funds for necessary asset replacement following an insurable event | Very High |
| **3** | **Organisation Management** | | | | |
| 3.01 | Failure to act on identified risks | 5Waters | | Potential legal action against council in the event it identified significant risk but did not act. Threat to public health and safety. Environmental and cultural degradation. | High |
| 3.02 | Lifelines plan not up to date or implemented | 5Waters | | Potential prolonged service outage (wide scale) from reasonably foreseeable naturally occurring events | High |
| 3.03 | Incomplete or inadequate Business Continuity Plan | 5Waters | | Business unable to recover rapidly following extreme event, resulting in significant public health issues | High |
| 3.04 | No internal audit policy and implementation | 5Waters | | Financial and legal action following failure to audit processes, including meeting legislative requirements | High |
| 3.05 | Below standard provision of professional and physical services | 5Waters | | Poor quality delivery or delay in delivery of projects. Possible project rework cascades impact on following projects. | Very High |
| 3.06 | Not meeting legislative requirements | 5Waters | | Legal action taken against council | Very High |

| | | | | | |
|---|---|---|---|---|---|
| 3.07 | No township or scheme representation committee in place | 5Waters | | Communication on works and costs not adequate | Medium |
| 3.08 | Poor Council relationships with Iwi and/or local Communities | 5Waters | | Difficulties with resource consents, possibility of increased costs and delays on projects, reputation of Council considered poor | High |
| 4 | **Human Resources** | | | | |
| 4.01 | Staff accountability to customers and employer not clear | 5Waters | | Poor relationships between staff and customers leading to poor reputation of Council | High |
| 4.02 | Institutional (staff) knowledge not left in form accessible by others and no productive focus on implementing staff succession | 5Waters | | Knowledge lost with staff leaving | High |
| 5 | **Health and Safety** | | | | |
| 5.01 | Poor health and safety culture, Health and safety risks not identified and managed | 5Waters | | High accident rate, Council faces legal claims in not meeting obligations | High |
| 6 | **5Waters Activity - General Risks** | | | | |
| 6.01 | Deferred renewal and maintenance not recorded | 5Waters | | Unexpected additional costs incurred due to greater impact of asset failure | High |
| 6.02 | Increasing numbers of easements, easements not recorded or obtained; loss of security of access to existing easements and assets on private land | 5Waters | | Unable to gain access to infrastructure to carry out maintenance or urgent repairs, may not be able to access assets without the legal right to cross private property | Medium |
| 6.03 | Wastewater or potable water not treated to acceptable standard | 5Waters | | Legal action and cultural offence, people ill and environment degraded | Extreme |
| 6.04 | Asset security (site) not adequate | 5Waters | | Ongoing or major repairs due to vandalism. Scheme unable to provide service for extended periods, significant costs incurred | High |
| 6.05 | Poor standard of asset construction | 5Waters | | Reduced asset life, additional remedial works required which may have ongoing costs | High |

| | | | | | |
|---|---|---|---|---|---|
| 6.06 | Operations Manuals not up to date or non-existent | 5Waters | | Poor operational control results in service failure and adverse health effects or environmental damage | Very High |
| 6.07 | Council operations have negative environmental impact on the districts natural and cultural resources/features | 5Waters | | Poor reputation of Council, public dissatisfaction, resource consent non-compliance, flora and fauna health reduced | High |
| 6.08 | Subdivision approvals process fails to deliver assets of appropriate quality. | 5Waters | | Increased maintenance costs, early renewal, reduced asset lives, higher rates of asset failure. | High |
| 7 | **5Waters Activity Management Plan** | | | | |
| 7.01 | 5Waters Activity Management Plan does not address the key issues and is not implemented appropriately | 5Waters | | Progress towards Sustainable development is not enabled.<br>LTP planning cycles, funding and staff work programmes do not deliver projects as planned and a significant backlog and misalignment with objectives occurs. | High |
| 7.02 | Insufficient funding available to implement the recommendations of the AMPs | 5Waters | | Projects deferred, increased lifecycle costs, service levels decline, risk of asset failure increases | High |
| 7.03 | Network modelling and condition assessments not undertaken | 5Waters | | Renewals works not undertaken or completed as expected by criticality rank. Capital work programme not optimised. Future asset works programme not optimised | High |
| 7.04 | As built information incomplete or slow to be provided from external parties eg contractors | 5Waters | | Inability to locate, repair assets within a suitable time. Higher costs due to delayed response from contractors | High |
| 7.05 | Criticality assessment not undertaken and maintained | 5Waters | | Failure of critical assets leads to service failure and adversely affects people and environment | High |
| 7.06 | Asset Risk Register and Risk Plan not implemented | 5Waters | | Failure of service eg wastewater treatment, water pumping as maintenance work not completed on time | Very High |

| | | | | | |
|---|---|---|---|---|---|
| 7.07 | Asset Management system not kept up to date with data on the condition, performance or maintenance history of the assets. | 5Waters | | Failure of operational systems where maintenance work programme not kept up to date based on data and instrumentation responses | Very High |
| 7.08 | Asset management decisions based on poor data | 5Waters | | Poor council, community and consent reporting. Decisions may not be accurate or mistimed. Scheme failures, mistimed capital works. | High |
| 8 | **Resource Consents, Designations and Conservation Orders** | | | | |
| 8.01 | Appropriateness of land use zoning / designations for community well sites | 5Waters | | Lack of controls in the District Plan for well sites, does not provide barrier from other land use activities leading to contamination of water supply. | High |
| 8.02 | Applications for consents | 5Waters | | Consents not granted or granted with restrictive conditions that force change in use and additional costs | High |
| 8.03 | Resource consents not complied with, failure to monitor consent conditions to the required standard | 5Waters | | Council faces legal action where consents conditions not met or not applied for. Unaware of significant non-compliances which leads to damage to environment and cultural values and subsequent prosecution. Public dissatisfaction. | High |
| **9** | **General Risks – Wastewater** | | | | |
| 9.01 | Onsite disposal of primary treated septic tank sewage to ground | Wastewater | Darfield, Kirwee | Downgradient contamination of water supplies, inter-generational degradation of groundwater | High |
| 9.02 | Growth projections do not occur and affect project affordability | Wastewater | Rolleston, Lincoln, Prebbleton, West Melton, Springston | Council rates district users for costs where they have no direct benefit | High |
| 9.03 | Location of treatment plants - Encroachment on STP by residential properties (NIMBY) | Wastewater | Lincoln | Complaints and resistance from neighbours alongside the activity, restrictions on STP activity drive up costs | Medium |

| | | | | | |
|---|---|---|---|---|---|
| 9.04 | Fat and contaminant buildup | Wastewater | All schemes | Overflow to environment from network, odour, users LoS adversly impacted | Medium |
| 9.05 | Impaired treatment plant operation due to lack of operational staff | Wastewater | All schemes | Disruption to service, Non compliance with DWS, non compliance with resource consents | High |
| 9.06 | All Asbestos Cement pipe schemes - earlier than predicted failure of AC pipe | Wastewater | All schemes | Increased leakage/loss earlier than predicted renewals funding costs | High |
| 9.07 | Reticulation has insufficient capacity during high rainfall periods due to stormwater ingress and infiltration | Wastewater | All schemes | Overflow of reticulation<br>Detrimental environmental effects<br>Health hazard | High |
| 9.08 | Treatment plant capacity insufficient during high rainfall periods | Wastewater | All schemes | Non compliance with resource consent conditions; multiple illnesses result | High |
| **10** | **General Risks - Water** | | | | |
| 10.01 | Contamination in previously secure public water supply | Water | All schemes | Community sickness, non compliance with Drinking Water Standards, significant remediation costs | High |
| 10.02 | Surrounding activities could contaminate public water supply | Water | All schemes | Community sickness, non compliance with Drinking Water Standards, significant remediation costs | High |
| 10.03 | Deep Well Groundwater levels drop below well intake screen | Water | All schemes | No alternative source or low quality alternative | Very High |
| 10.04 | Lack of bore and reservoir water turnover | Water | All schemes | Loss of residual / Contamination resulting in illnesses | High |
| 10.05 | Imposition of 3rd tier minimum take restrictions | Water | Jowers Road, West Melton, Johnson Road, Edendale | Minimum water use permitted, fire risk and impact on outside flora/fauna | High |
| 10.06 | Small rating base with high operational and renewal costs | Water | Jowers Road, Raven Drive, Te Pirita, Rakaia Huts Upper Selwyn Huts | High cost on property owners, financial stress | High |
| 10.07 | Insufficient quantity of water available for reasonable needs | Water | All schemes | Significant level of customer complaints, stock stress | High |

| | | | | | |
|---|---|---|---|---|---|
| 10.08 | Significant overallocation of water supply | Water | All schemes | Pressure drops, insufficient fire flow water, siphoning | Medium |
| 10.09 | Reservoirs have insufficient capacity at peak times | Water | All schemes | Pressure and flows reduce, insufficient fire flow water, siphoning | Very High |
| 10.10 | Treatment plant cannot meet demand eg UV system | Water | Dunsandel, MHRWS (Hartleys and Dalethorpe), SRWS (Glentunnel), Sheffield, Lake Coleridge, Arthurs Pass | Partially or untreated water is delivered to customers | Very High |
| 10.11 | Bore failure resulting in loss of production > 24 hours | Water | All schemes | Community is without sufficient water to meet basic needs | Medium |
| 10.12 | Lack of Backflow prevention | Water | All schemes | Required backflow not installed or fails due to no maintenance resulting in illness or death | High |
| 10.13 | Water testing results are of poor quality or inconsistent | Water | All schemes | Unaware of potential threats to public health, resulting in illnesses. | High |
| 10.14 | Poor management of Council water supply schemes operated by committees | Water | All schemes | Consent non-compliances, higher lifecycle costs, premature asset failure | High |
| **11** | **General Risks - Land Drainage** | | | | |
| 11.01 | Poor management of Council land drainage schemes operated by committees | Land Drainage | | Consent non-compliances, higher lifecycle costs, premature asset failure | Medium |
| 11.02 | CPW may impact ground water levels and function of drains | Land Drainage | | Reduced functionality of land drainage assets | Medium |
| 11.03 | Environmental impact of poor drain maintenance practices | Land Drainage | | Adverse environmental impacts | High |
| 11.04 | Increased cost for monitoring and achieving compliance with consents | Land Drainage | | Increased operating and capital costs | High |
| 11.05 | No process for converting private to classified drains | Land Drainage | | Loss of knowledge of the asset base leading to poor decisions and customer response | Medium |

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|---|---|---|---|---|---|
| 11.06 | Non optimised drain cleaning practices | Land Drainage | | Poor and expensive operations, poor water quality, loss of key committee members may also result in loss of knowledge | High |
| 11.07 | Extreme rainfall and flooding of rivers, causing them to enter the drainage system or overtop existing stopbanks and enter townships | Land Drainage | Hororata, Bealey River, All | Drainage system in Hororata township having insufficient capability, flooding of farmland for extended period, flooding of State Highway and buildings | Low |
| **12** | **General Risks - Stormwater** | | | | |
| 12.01 | Public health and safety | Stormwater | | Public injury, drowning. Public perception of dangers of open stormwater systems | Medium |
| 12.02 | Sediment from subdivisions | Stormwater | | Siltation of water bodies | High |
| 12.03 | Flooding resulting from heavy rainfall events | Stormwater | | Flooding occurs without adequate warning to residents | Medium |
| 12.04 | Urban stormwater quality | Stormwater | | Environmental contamination, health risks (eg Urban stormwater containing heavy metal contaminants reaches downgradient water supplies), cultural impacts | Very High |
| 12.05 | Inadequate overland flow paths, Overland flow paths not maintained | Stormwater | All | Flooding of property<br>Flooding of sewer system | High |
| **13** | **General Risks - Water Races** | | | | |
| 13.01 | Closure of water races | Water Races | | Increasing impacts for closure, impacts water/cost viability. No protocol for closure | Medium |
| 13.02 | Loss of knowledge | Water Races | | Loss of contractor knowledge leading to poor decisions. | Medium |
| 13.03 | Poor asset data | Water Races | | Poor asset management decisions | Medium |
| 13.04 | Public Health and Safety risks at intakes | Water Races | | Public injury, drowning. | Medium |
| **14** | **Miscellaneous Risks yet to be Assigned** | | | | |
| 14.01 | Climate change impacts | | | | Low |

| | | | | | |
|---|---|---|---|---|---|
| 14.02 | Leeston high water table impacts | | | | Low |
| 14.03 | Infiltration over ground - lift manholes | | | | Low |

## 9.6 Risk Management Strategy

### Prioritisation of Expenditure to Manage Risks

The successful management of 5Waters activities is dependent on the coordination of a multitude of activities that generates a work programme for planning, designing, construction, operation, maintenance and monitoring of the assets. The risk evaluation process provides a mechanism to derive projects for potential inclusion in the works programme once they are "filtered" through a prioritisation process.

There are inevitably competing demands placed on 5Waters Operations and Maintenance (O&M) and capital expenditure budgets. Decision making processes must ensure that expenditure is allocated fairly and wisely according to the needs of existing and future generations and in a way that is affordable.

The outcome of the risk assessment process is a list of actions or projects which are identified as mitigation measures or controls for each of the risk events. These projects each have a residual risk score and associated risk priority rating, and are fed into the project prioritisation process for capital and operational expenditure programmes. These actions may fall into one or more categories, such as listed below:

- Management actions;
- Operational actions – e.g. readiness planning;
- Maintenance and renewal planning and decision-making – e.g. changes in prioritisation of work; and
- Capital investment – new assets, strengthening, capacity building, etc.

This risk management approach allows Council to derive a robust expenditure programme that is affordable, undertaken according to a determined priority and derived from an assessment of the risk of failing to deliver levels of service.

### Critical Assets Priorities

Lifecycle management considerations relating to critical assets were discussed in Section 7.4 Asset Criticality. Typically, assets are replaced when there is unacceptable risk to levels of service because of:

i. Asset condition
ii. Operability issues
iii. Vulnerability to external influences (earthquake, flood, fire etc)

When making asset management expenditure decisions priority needs to be given to risks affecting critical assets. Decisions need to be driven from a service perspective – considering the risks of disruption or loss of the ability to deliver the levels of service.

In relation to the risk management strategy, priority is to be established as follows:

- Firstly, prioritisation of the asset base in terms of asset criticality; and

- Secondly, managing and mitigating risk, prioritised according to the level of risk.

## 9.7 Civil Defence Emergency Management

### Civil Defence Emergency Management Act

The Civil Defence Emergency Management (CDEM) Act 2002 requires Local Authorities to coordinate Plans, Programmes and Activities related to CDEM across the areas of Risk Reduction, Readiness, Response and Recovery. It also encourages cooperation and joint action within regional groups. Management systems for civil defence emergencies are detailed in the Council CDEM plan.

The Act also prescribes specific duties expected of lifeline utilities, as described in Section 0.

### Lifelines Utilities Response Plan

A Utilities Lifelines Response Plan has been prepared for key Council utility services including the 5Waters, and is to be reviewed and updated. The Plan considers natural hazard events including earthquake, flooding, meteorological (snow/wind) and mass movement (land slip), and also takes account of fire and civil disruption events. The principal objectives of the Plan are to:

- Provide a management tool that identifies natural hazards for individual utilities;
- Identify the consequences of natural hazards;
- Identify immediate remedial actions;
- Define restoration levels, priorities and issues;
- Identify long term risk management issues; and
- Ensure that Emergency Management knowledge is retained within Council.

The Lifelines Response Plan details the hazards, possible cascading effects and the interventions that may be applicable. It does not consider the effect on any individual community as these will change with the extent of the hazard (e.g. the depth and extent of snow) and the extent and makeup of the utility service (e.g. if the water supply has a standby generator).

Following any natural hazard event that affects any utility, an assessment to ascertain the extent of damage, intervention required, priority of reinstatement and the resource requirements should be carried out at an early stage. The Effects and Intervention Lists contained in the Plan can be used to ensure all contingencies are considered. The interconnectivity and interdependence between the 5Waters as well as other utilities both during and after an event is very important and has been identified in the Plan.

### Business Continuity

While emergency response describes processes and systems to address the provision of service needs in the community, business continuity has a more internal focus and is aimed at allowing an organisation to

continue functioning when a disaster event occurs. The following plans and processes have been established to help ensure business continuity:

- **Pandemic Business Continuity Plan**: This Plan provides guidelines and procedures to be followed to ensure Council can maintain its critical infrastructure obligations, as well as its responsibilities under the Civil Defence Emergency Management Act 2002 if a pandemic event has an effect on the district. This plan is updated from time to time.
- **Succession Planning**: This is necessary to reduce the risk associated with staff leaving the organisation and also forms part of the business continuity process. Succession planning allows institutional knowledge to be passed on, and assists in ensuring continuity of organisational culture. To this end the 5Waters AcMP is quite detailed to ensure all relevant documents and information required for appropriate decision making are recorded and knowledge transfer can occur even in the absence of key staff. Succession planning is further discussed in Section 0 Succession Planning.

Further arrangements need to be established and documented, including:

- Alternate operational headquarters for 5Waters should the Council office be uninhabitable;
- Arrangements for remote access or manual access to critical information;
- Back-up availability of personnel; and
- Other support resources and equipment to enable the lifeline utility to be able to continue to function.

### 5Waters and the 4Rs

Table 9-2 earlier described the 4Rs of risk management. The following table indicates the status of 5Waters in each of these key areas, highlighting the future actions required.

**Table 9-7 Risk Reduction, Readiness, Response and Recovery Status**

| 4Rs | Description | 5Waters Future Actions Required |
|---|---|---|
| Reduction | Identifying hazards, describing risks, and taking actions to reduce the probability or consequences of potential events on the assets and the services they deliver | Proactive approach.<br>Carry out specific lifelines risk assessments and identify and implement mitigation strategies, asset strengthening and risk management controls. |
| Readiness | Planning and preparation required to enable agencies and communities to respond to and recover from an emergency event | Proactive approach.<br>Develop, review, and update Emergency Response Plans, Mutual Aid Agreements and Emergency Procedures, including clear definition and allocation of staff and contractor roles and responsibilities.<br>Provide training to staff and contractors in the use of these plans.<br>Understand how the services and assets are likely to be affected and what the priorities for response are likely to be.<br>Develop relationships with other lifeline utilities and an understanding of critical interdependencies. |

| | | |
|---|---|---|
| Response | Addressing immediate service problems after an emergency event has occurred | Reactive approach.<br>Provide trained 5Waters resources for response activities.<br>Implement response plans, mutual aid agreements and other plans as appropriate.<br>Participate in CDEM response and Lifelines coordination activities. |
| Recovery | Addressing the long-term recovery to normality needs of the community | Mix of proactive and reactive approach.<br>Participate in community recovery and Lifelines coordination activities. |

## 9.8 Monitoring, Review and Improvements

This section describes processes for monitoring achievement of the risk management programme, reviewing the risk register, and identifying improvements in risk management processes, systems and data for inclusion in the overall AcMP Improvement Plan.

### Monitoring

Implementation of the risk mitigation actions and controls will be monitored by the Asset Manager Water Services as part of normal business reporting procedures.

Risks and mitigation actions or controls which are determined to be significantly less effective than expected will trigger a re-assessment of the risk and its management strategy.

### Review Risk Register

The risk register contained in the report "5Waters Risk Assessment" dated June 2018 will be formally reviewed on an annual basis and any changes recorded. Implications involving changes in budget requirements or lifecycle asset management tactics in the 5Waters AcMP will be recorded by way of update to the AcMP.

At the same time, the risks identified in WSPs will also be reviewed.

New risks or existing risks that are assessed as Extreme or Very High shall be reported to Council and addressed in the timeframes required. All risks shall be managed in accordance with the requirements of Table 9-3 relating to their relative rating.

Where significant new risks or additional risks are identified between the formal reviews they shall be assessed and recorded in the risk register and dealt with according to their risk rating.

### Improvement Planning

Throughout this section a number of specific actions to improve the way in which the Council identifies and manages risk associated with the 5Waters activity. These actions are summarised below in Table 9-8 below.

**Table 9-8: AM Improvement Items – Risk Management**

| Section Ref | Improvement Opportunities | Priority | Timing |
|---|---|---|---|
| 9.2.6 | Integrate risk assessments within the asset management system | Medium | 2021/22 |
| 9.3.2 | Carry out an interdependencies assessment between Council utilities and other lifeline utilities, such as power, telecommunications and fuel. | Medium | 2021/22 |

# 10.0 ASSET MANAGEMENT PROCESS AND PRACTISES

This section outlines the information available on the assets, information systems used and process used to make decisions on how the assets are managed. It also provides details on planning for monitoring the performance of the AcMP.

## 10.1 Information and Data Systems

The information and data systems available to Council staff are shown below in Figure 10-1 and discussed in greater detail within this section.

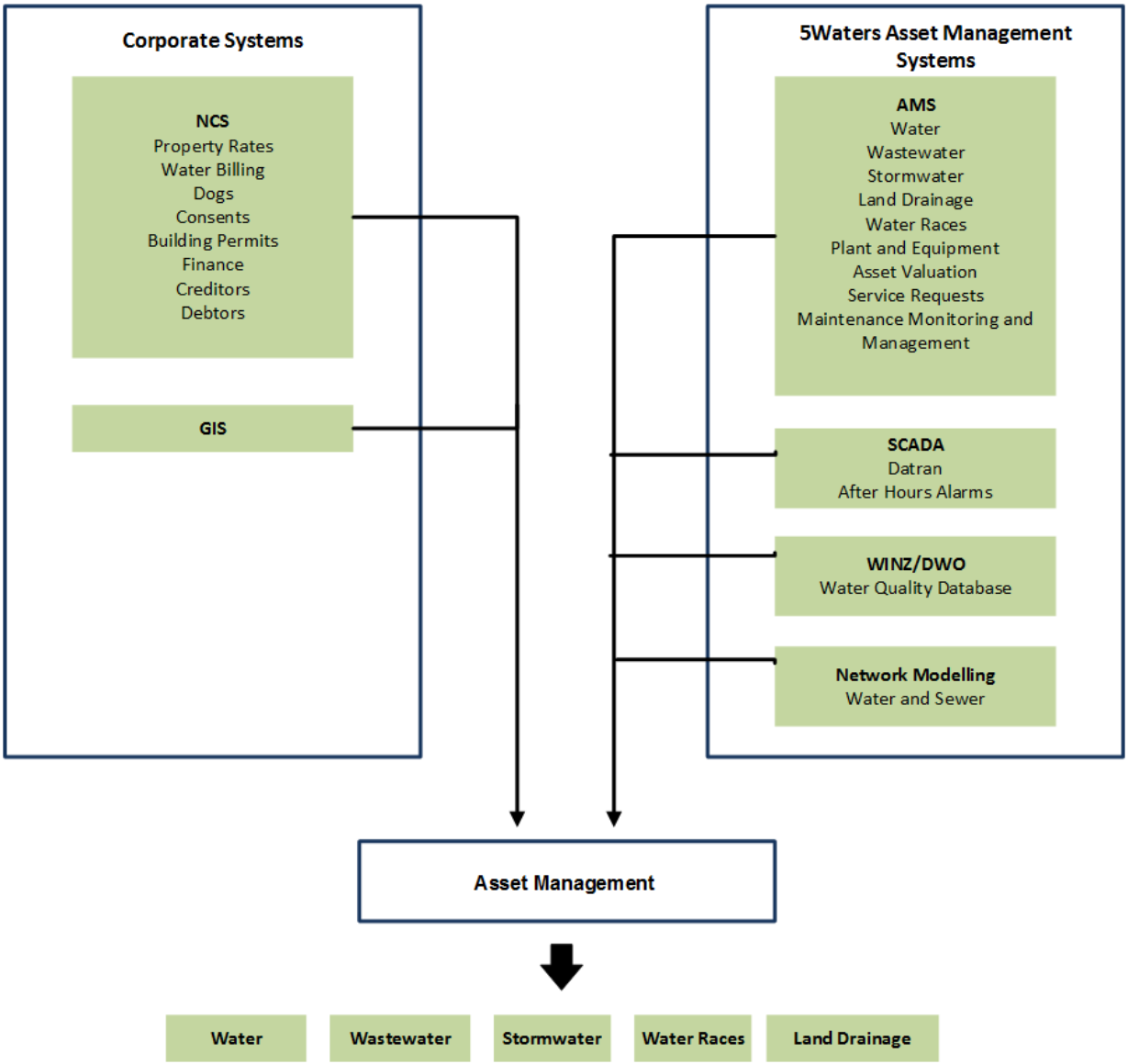


**Figure 10-1 Council Existing Information and Data Systems**

### AMS

The Asset Management Information System (AMS) provides Council staff with the ability to obtain, store, analyse and report on the significant quantities of data that is or will be available associated with the 5Waters.

The AMS system was set up in 2011 and is an SQL platform linked directly to GIS. AMS includes modules for water, wastewater, stormwater, water races, plant and equipment, customer service and work management and planning.

AMS is utilised extensively across all of the 5Waters services for:

- Cost claim processing;
- Key performance indicator measurement;
- Management of planned maintenance;
- Asset validation;
- Maintenance contract reporting;
- Integration with Council's customer complaints system to track a request for service and the subsequent provision of service by the Contractor or Council staff; and
- Implementing a robust capital works process that allows reporting on assets decommissioned, replaced or vested during the period including plant/equipment assets.

The use of AMS will increase significantly over the coming years as Council staff become more familiar with its capabilities and processes through training and practical use. As part of the AMS system implementation policies, practices and process associated with data management have been established and are continuing to evolve. These include but not limited to data integrity and advanced asset management.

#### 10.1.1.1 AMS Development

The AMS system is central to good asset management practice. Development and improvements to the AMS system are constantly occurring. This section outlines the overall functionality of the AMS at the present and where the development will occur over the coming years.

There are six modules within the asset management system. These are as follows:

1. Asset Register: This modules stores core attributes of the asset that define its type and functionality at the time of construction or installation.
2. Asset Valuation: This module calculates asset valuation and depreciation in accordance with current accounting practises.

3. Customer Service Request and Maintenance Management: This module captures service requests, maintenance carried out and payment to the maintenance contractor.
4. Condition Assessment: This module measures the level of structural deterioration and indicates the remaining useful life of assets.
5. Operations and Performance Management: This module reports performance of assets against level of service relating particularly to reliability and efficiency.
6. Risk Management and Criticality. This module calculates the risks (including criticality, consequence, likelihood and failure ratings) associated with respective assets.

Within each module, the AMS system has been developed to provide particular functionality. Improvements and extensions to this capability is required to provide advanced asset management. This is outlined in Table 10-1 below.

**Table 10-1 AMS Functionality and Development**

| Module | Function | Description |
|---|---|---|
| Asset Register | Current Functionality | Identifies assets and their spatial location |
| | | Stores core attributes of assets |
| | | Generates reports with asset information/statistics and allows generation of customisable reports |
| | | Shows confidence of asset information |
| | Improvements | Improve linear asset register |
| | | Improve plant asset register |
| | | Finish adding Pines II into AMS |
| | | Capture replaced/renewed assets in AMS |
| Asset Valuation | Current Functionality | Calculates DRC, RC, AD |
| | | Basic valuation output |
| | | Sets minimum remaining life for different types of assets that have exceeded their theoretical life |

| | | |
|---|---|---|
| | | Takes into account placement of assets e.g. dewatering, road or berm |
| | Improvements | Customisable reports/comparisons to previous valuations |
| | | Improve how base rates are entered into AMS |
| | | Build an optimised renewal profile |
| Customer Service Request and Maintenance Management | Current Functionality | Capture and categorises customer service requests |
| | | Dispatches job requests to internal staff and external contractors |
| | | Priorities on fault type |
| | | Processes claim to maintenance contractor |
| | Improvements | Prioritises real time reporting on maintenance KPIs |
| | | Enables draft changes to asset information (attributes) in the field, which is then verified before saved |
| Condition Assessment | Current Functionality | Record condition 1-5 against each asset |
| | | Calculate a condition grade if no condition information exists (for pipes only) |
| | Improvements | CCTV information assigned to asset |
| | | Record changing condition of assets |
| | | Summary reports of network condition |
| | | Forecast how assets condition will change over time |
| | | Improve renewal profile with condition (based on task data) |
| Operations and Performance Management | Current Functionality | Stores resource consents held with Environment Canterbury as assets |
| | Improvements | Store conditions from Environment Canterbury consents |

| | | |
|---|---|---|
| | | Monitor these resource consent conditions through AMS |
| | | Store water sampling results in AMS |
| | | Monitor electrical energy usage |
| Risk Management and Criticality | Current Functionality | Criticality Rating for each asset |
| | Improvements | Assign consequence, likelihood and failure rating to assets |
| | | Calculate an overall criticality and risk ranking for each asset using criteria ranking and weighting |
| | | Allocate risks to specific staff for monitoring and action |

In 2015 an AMS Steering group was set up. This steering group provides future direction for AMS across all operations teams (including Water, Roading, Property and Reserves, and IT). It is also anticipated that the steering group will write future work plans for the 5 Waters side of AMS, including but not limited to those in Table 10-1.

### SCADA and Telemetry

Council has operated a "Datran" SCADA (Supervisory Control and Data Acquisition software) since 1993. SCADA is used to control the functions of plant items and pump stations along with alarm monitoring for a majority of facilities within the district (110 sites). For example, SCADA is currently used at the Paparua water race intake for controlling the inflow into the Paparua scheme, and recording the flow at the intake. Figure 10-2 details the over view of the SCADA system for the individual out stations.

The SCADA system is used for:

- Trending of historical (data is available back to 2000)
- Alarm monitoring (operators informed of alarms via mobile phones )

Monitoring of the 5Waters by the Councils SCADA systems have grown to the point that without current monitoring systems the existing Levels of Service would not be sustainable. The ability for Council to ascertain faults (reported via the SCADA) and instigate repairs without affecting the service to the consumer has significantly increased efficiency and reliability of the 5Waters.

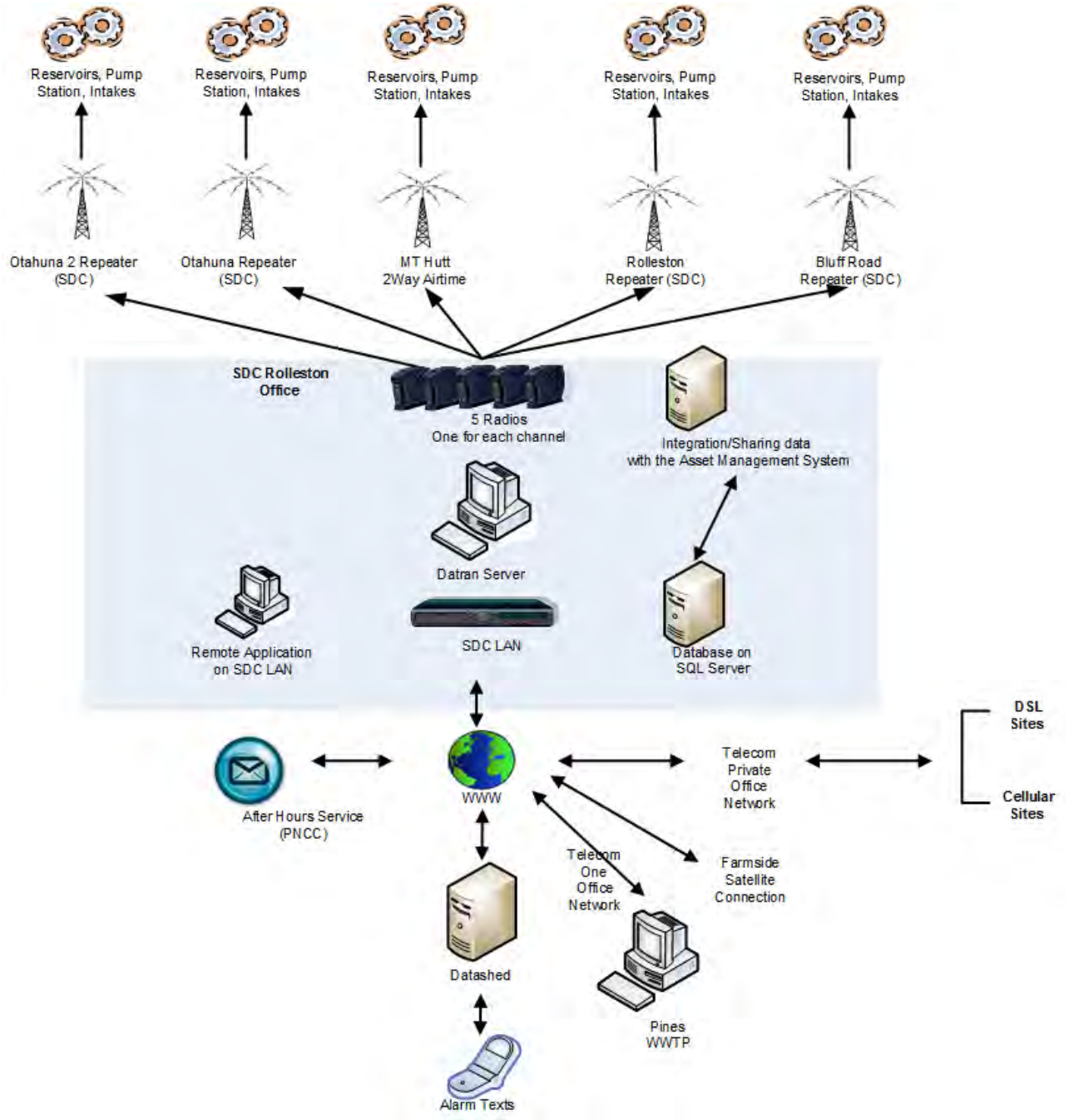


**Figure 10-2: SCADA Overview**

### 10.1.1.2 Future Strategy for Councils SCADA

A long term strategy for the on-going use of SCADA will be developed over the next three years. Currently the Councils vision is to:

- Be at the forefront of SCADA by implementing new beneficial technologies as they become available;
- Increase use of reporting functions using Data from the SCADA system integrated with data from the Asset Management System;
- Increase availability of information to maintenance operators in a format that will enable increased efficiencies in operation and management;

- Maintain system at a high level to ensure system reliability and on-going reporting ability; and
- Install SCADA at all Water Race intakes and main divides over a three year period.

As the scale of the SCADA system grew, functionality and importance has changed significantly since 1993 it was considered that the SCADA system should be reviewed in 2012. The extent of the review is outlined in Table 10-2 below.

**Table 10-2 Outcomes**

| Review Item | Outcome |
|---|---|
| **Current Utilisation** | New sites are being added for new developments |
| **Risk Associated with Failure** | During recent events problems were identified with alarm and data reporting due to long power failures |
| **System Interface with onsite controls** | As we look to improve on site controls we are bringing some sites in to be controlled by the SCADA system rather than hardwired (inflexible) controls in the electrical switchboard |
| **Data Management and Reporting** | As we collect more data and store it in the Datran database reporting tools are being integrated with the Asset Management System to provide seamless reporting for long term asset management. Day to day operational data can be viewed by the Datran trending application. Data is stored on the Council SQL server machine, backup of this data is managed by Council's ICT team. |
| **System Data Security** | As sites are upgraded short term data storage is being implemented on site so that in the event of communications problems with the central server data can be retrieved at a later time to minimise loss |
| Reliability and Renewals | So that data storage can be implemented on site and that data can be retrieved older sites are being replaced with current generation equipment and the communications network upgraded |

Another review will be undertaken when a long term strategy for SCADA is developed.

#### 10.1.1.3 After Hours Alarms

In addition to the Sicon operators getting text messages for alarms, alarms are emailed to the Palmerston North City Council Call Centre (PNCC) outside normal working hours. Sicon operators are then contacted via telephone. All calls are logged into PNCC's knowledge base system which generates emailed job reports back to Council.

### Public Enquires & Concerns (Requests for service or Tasks)

To assist reactive maintenance Council deploys a customer service request via AMS. Customer request for service (service requests) are received through the customer service officers during business hours and ANSATEL service after hours. Service requests are recorded via AMS and forwarded to the appropriate

council staff or maintenance contractor for action. The service requests are recorded with the appropriate details (name, location, issue, priority etc) to enable tracking of the problem.

The receiving Council staff member or maintenance contractor is required to action the enquiry within a specified period. Once the issue is resolved to Council's requirement, the details are updated with completion time/date and any issues.

### After Hours Calls

The afterhours emergency response service is a critical process due to the requirement of a 24/7 service to the community. The Council uses ANSATEL (emergency response service provided to council by Palmerston North City Council) for its after hours service. ANSATEL provides Council with a 24 hour service outside normal business hours that monitor all SCADA alarms, screens messages and patches calls for action through to the appropriate maintenance contractor or council duty officer.

### WINZ 7 (Water Information New Zealand) and DWO (Drinking Water Online)

Water quality monitoring data is loaded into DWO by the contractor, Food and Health Standards Limited. DWO is an online system developed by the Ministry of Health and is used by Councils around New Zealand to manage data quality for drinking water supplies. The system is live which means data sharing between Contractors, Councils and Drinking Water Assessors is available. This system is still being developed and some aspects have limited functionality, for example there is no reporting module.

Prior to June 2017 water quality monitoring data was loaded into WINZ. WINZ is a desktop based system and currently all historical information is still stored within this program.

### Resource Consents Monitoring

Council is currently implementing a resource consents monitoring and reporting database in AMS. Each consent is kept as a separate record in AMS. The next step is to capture consent conditions which will enable Council staff to monitor the consents better for compliance purposes.

### Geographical Information Systems (GIS – Map Viewer)

Council uses "Local Maps (Selwyn Maps)" as its front end GIS system. GIS is fully integrated with the AMS. GIS is a major investigative tool as part of the analytical process to determine maintenance and replacement programmes for reticulation networks. Selwyn Maps is available to all Council Staff (at all Service Centres) and used extensively through all Councils activities.

### Financial Management System (NCS)

All Council activities are required to have their financial results reported externally in a way that complies with generally accepted accounting practice (GAAP) in New Zealand. This is currently in accordance with International Accounting Standards – IAS16. The International Accounting Standards are determined by the Institute of Chartered Accountants of New Zealand. The finance activity ensures that GAAP is complied with

by regular updates to the Council's Accounting processes, and the ongoing formal and informal training and education of staff in departments throughout the Council.

The activity relies on the Council's core financial systems which include:

- NCS accounts payable, fixed assets, inventory, time entry, work orders, and general ledger; and
- Accounts receivable, cash receipting, bank management and rates, plus inputs from other Local Government regulatory systems such as Person/Property, Infringements, Licensing, Consents.

Monthly and yearly expenditure reporting is presented to Council staff, Council representatives and Scheme Committees.

## 10.2 Data Management/Quality

Accurate asset information is central asset management. However, maintaining asset information is a constant task.

The 2017 valuation rated the integrity of asset data as B – reliable. Where reliable is defined as (based on the Water New Zealand guidelines for Infrastructure Asset Grading Standards):

> *Data based on sound records, procedures, investigations and analysis which is properly documented but has minor short comings: for example the data is old, some documentation is missing and reliable is placed on unconfirmed reports or some extrapolation and recognised as the best method of assessment.*

An improvement program to update asset data quality will be established in 2018 to:

- Update historical asset information;
- Create a process to update asset records as maintenance occurs; and
- Ensure the maintenance contractor has an ability to update certain attributes when out in the field.

In 2014 a restructure of asset data (in particular, asset classes) occurred within the AMS system. This has improved data management. Reviews of asset classes will be later in the next LTP, once it has been used frequently by all user groups.

## 10.3 IT Responsibility

The responsibility for asset information security rests with the IT department administrators. The data is backed up at regular intervals and backup files are stored in secure lock-ups. Each system has a stepped password access system in place, allowing some staff to view the data only, and others to add and edit it. Data manuals are available that explain the various procedures.

## 10.4 AcMP Preparation

### LTP Planning

To ensure that staff were thinking and working towards a common LTP goal, council management implemented activity management planning meetings. The group consists of the asset manager of utilities, four asset managers, asset management support planners and the finance manager. Planners are included in the discussion where required. The meeting is chaired by an external consultant who brings knowledge and experience regarding asset management.

Presentations and workshops were held with Council from July 2017 to November 2017. This was to raise Issues, table reports, and to seek resolution on matters such as assumptions and uncertainties, and funding.

### Staff Review

This AcMP has been prepared by the Asset Manager of Water Services along with his support planner. Waugh Consultants, OPUS International Consultants and AECOM have all provided input into this plan.

Council staff including personnel from Service Delivery, Corporate and Planning disciplines have been involved in providing information for this AcMP. An in-house informal review has occurred by the Service Delivery team, particularly in Volume 2, 3, 4, 5, and 6 where the scheme detail is.

## 10.5 Quality Assurance

### Audits

To establish and ensure the on-going improvement of the quality of Council's systems, audits of financial, technical and performance systems need to be routinely implemented.

## 10.6 Financial Audits

The Local Government Act requires that independent annual financial audits be undertaken on the operations of Council – such audits may include all significant activities such as asset management planning. The auditor's opinions are included in the Annual Report.

### Information System Audits

System audits will be undertaken at regular intervals to access the appropriateness and performance of asset management systems, data and processes. The audits will identify the current status of asset management processes, systems and data and produce targets for asset management practices to be achieved in following years. A programme of recommended actions will continue to be developed for asset management processes, systems and data.

### Technical Audits

Technical audits (peer reviews) will be undertaken at regular intervals to assess and identify compliance with statutory requirements. This will include the following:

- The quality of the plan in terms of completeness, objectivity, logic, technical content and presentation;
- Perceived strengths and weaknesses for plan improvement; and
- Recommended specific areas for plan improvement.

Technical audits will be undertaken using a combination of external and internal reviewers.

### Performance Audits

Performance audits will establish whether the stated objectives for the operation of the asset have been achieved.

Measurement of the success of the operation of the asset will be assessed using the results of:

- Customer satisfaction surveys;
- Key service criteria objectives compliance; and
- Benchmarking surveys.

These measurements will determine the public view of how well the levels of service have been achieved, an objective measure against stated key service criteria and national measures of relative performance. The performance audits will also be used in on-going customer consultation regarding future standards and requirements of the customers in the provision of service.

## 10.7 Improvement Planning

Throughout this section a number of specific actions to improve the way in which the Council identifies and manages asset processes and practises associated with the 5Waters activity. These actions are summarised below in Table 10-3.

**Table 10-3 AM Improvement Items – Asset Management Processes and Practises**

| Section Ref | Improvement Opportunities | Priority | Timing |
|---|---|---|---|
| 10.1.1 | AMS improvements and extensions to functionality[33] | High | Ongoing |
| 10.1.2 | A long term strategy for the on-going use of SCADA will be developed over the next three years | Medium | 2019/20 |
| 10.1.6 | Further develop resource consents database in AMS | Medium | 2019/20 |

[33] AMS improvements have not been listed separately, please refer to Table 10-1.

| | | | |
|---|---|---|---|
| 10.2 | Develop and maintain an improvement program to update asset data information. | High | 2018/19 |
| 10.4 | Improve the AcMP preparation process by preparing a plan in January 2020 | Low | 2020/21 |

# 11.0 FINANCIAL SUMMARY

This section outlines the financial projections and funding requirements for managing the 5Waters Activity for the next ten years. Managing and allocating funding determines the provision of infrastructure within the 5Waters Activity. This section also addresses the proposed change in rating, key assumptions made in this plan and asset insurance.

## 11.1 Financial Trends

Financial trends from the previous four years are shown below in Figure 11-1, Figure 11-2, Figure 11-3, Figure 11-4 and Figure 11-5.

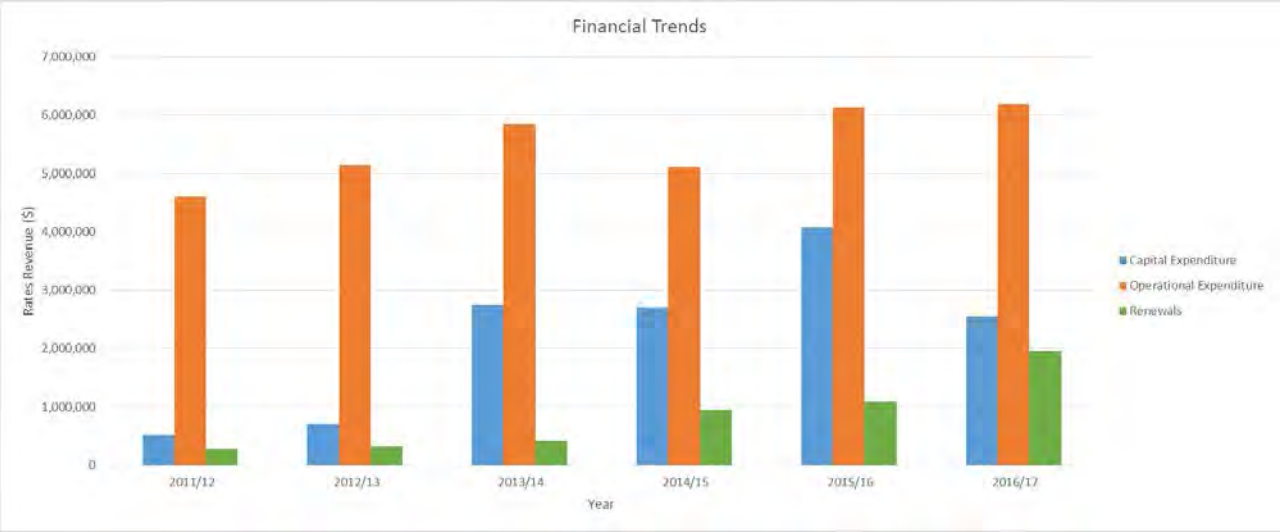


**Figure 11-1 Financial Summary for Water Activity**

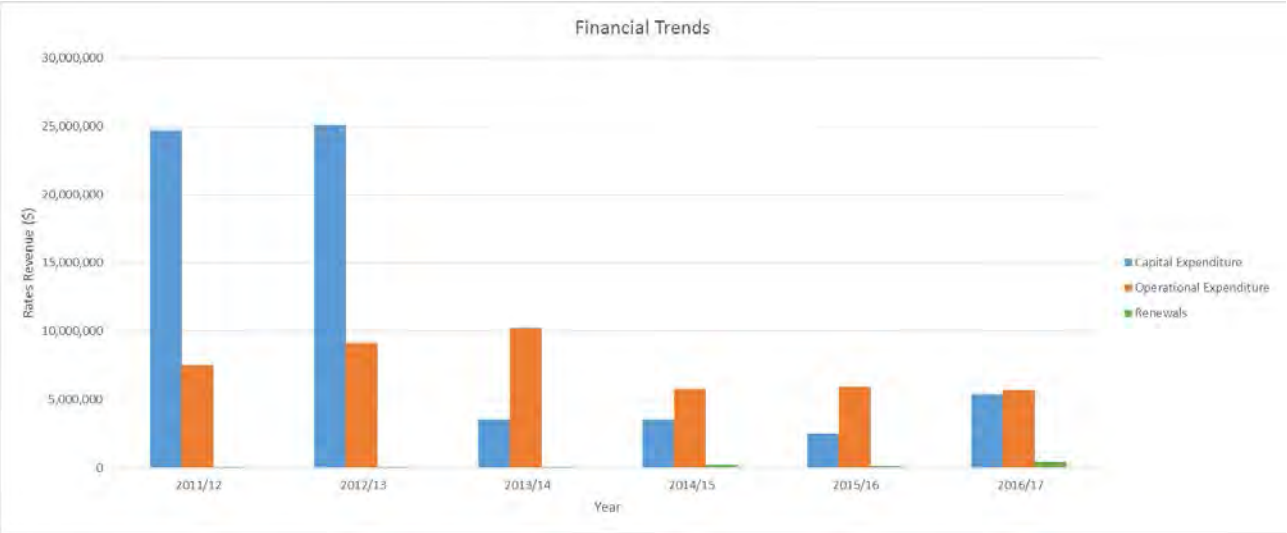


**Figure 11-2 Financial Summary for Wastewater Activity**

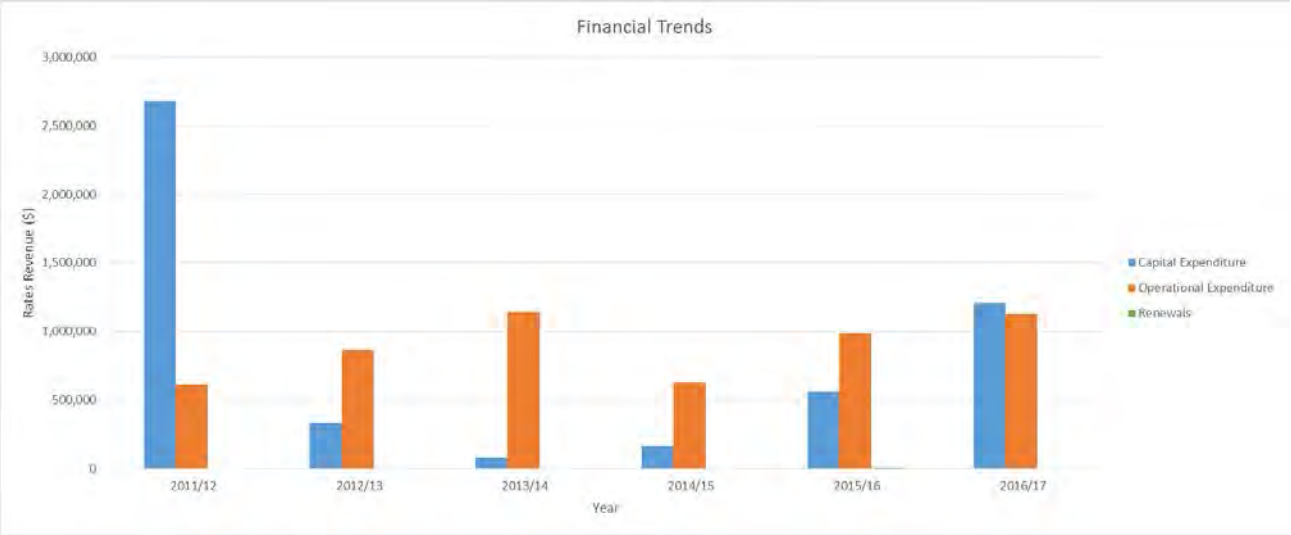


**Figure 11-3 Financial Summary for Stormwater Activity**

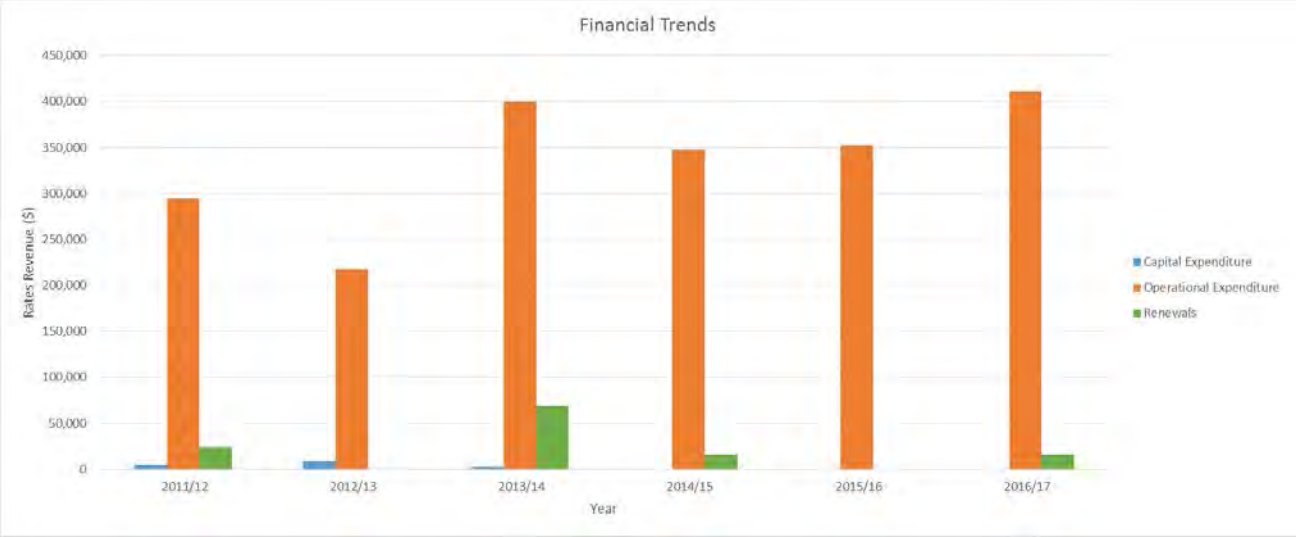


**Figure 11-4 Financial Summary for Land Drainage Activity**

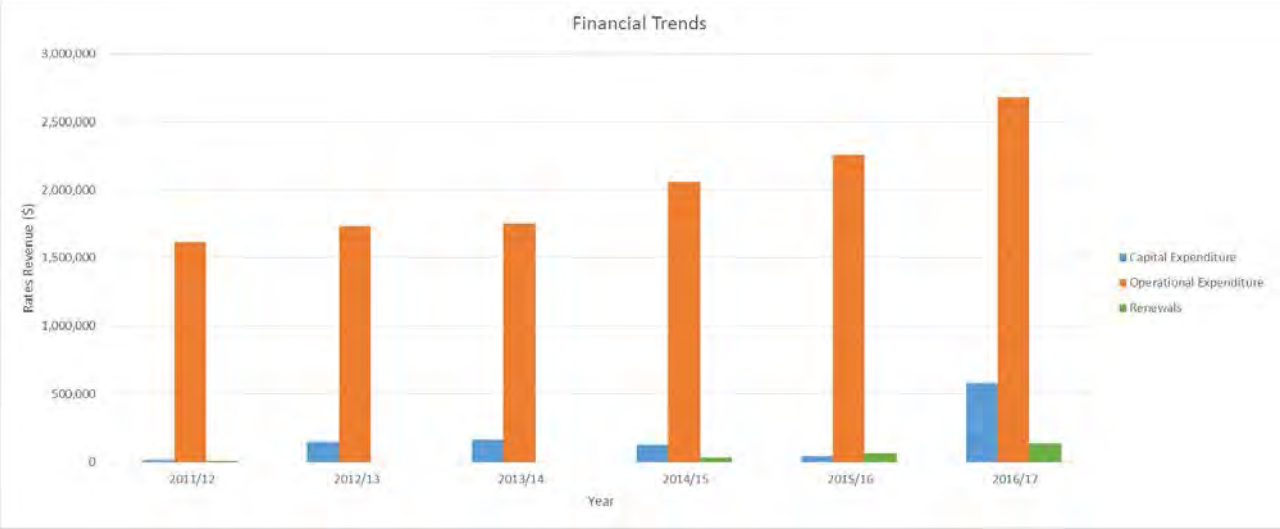


**Figure 11-5 Financial Summary for Water Races Activity**

These trends were used to forecast the financial projections for the next ten years. In these graphs the Operational Expenditure includes depreciation, support charges and operational projects.

## 11.2 Financial Statements and Projections

A high level summary of projects is provided in Section 3.0 Activity Areas, with financial summaries for each scheme presented in Volume 2-6 of this plan. The financial summaries presented should be viewed noting:

a) Allowance for CPI – consumer price index adjustments 'inflation' has not been included; and

b) All data is held in NCS – the Napier Computer Systems database through which Council conducts the majority of its financial rates storage and reporting.

The 10 Year financial programme for the 5Waters is divided into the following categories:

a) Expenditure – Operations and Maintenance;

b) Projects – either specific or jointly funded;

c) Capital Projects - result in new assets; and

d) Renewals - replacement of assets on a like for like basis within a 20 year horizon.

Across all of the 5waters the 10 year funding program for the next ten years is shown below in Figure 11-6.

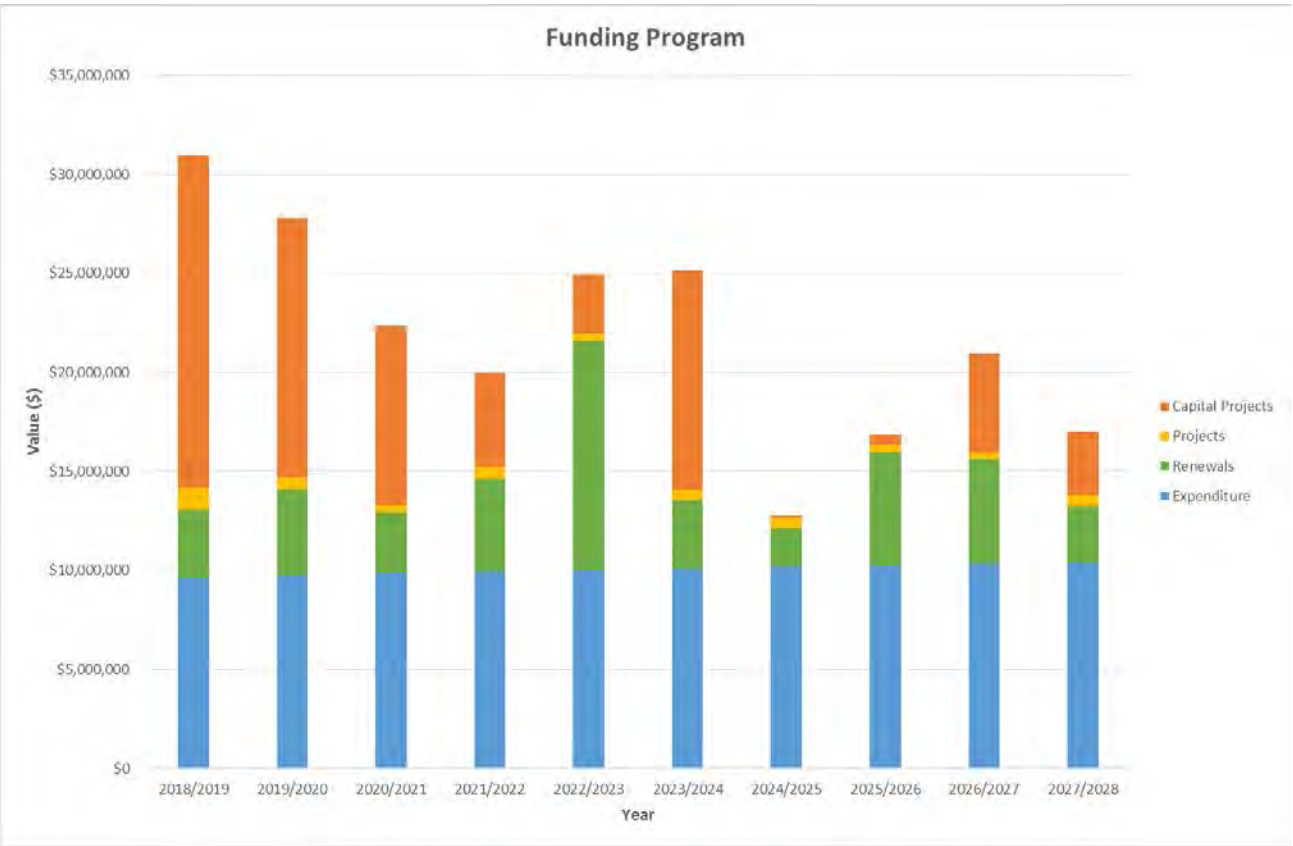


**Figure 11-6 Funding Program for 2018-2028**

The remainder of this section details the financial projections across these four categories.

## Expenditure

Expenditure consists of operational and maintenance costs. Figure 11-7 shows the expenditure forecasted to maintain and operate the 5Waters schemes.

The majority of expenditure is reactive and scheduled maintenance undertaken in the under contract C1241 Water Services Networks Operations and Maintenance. Other expenditure includes electricity costs and consent application fees.

For the operations and maintenance costs, staff review the claim (consisting of water, water races, wastewater and stormwater activities) in AMS on a monthly basis. Claim items or "jobs" are accepted, or queried and amended before being accepted for payment. This enables staff to ensure that the contractor has provided all necessary information and data attributes. Land drainage is mostly managed outside of AMS and is not included under contract C1241.

Council's Corporate team also review the financial data on a quarterly basis. CPI adjustment is not provided in the financial data in this AcMP, though has been included in the Corporate groups forecasting.

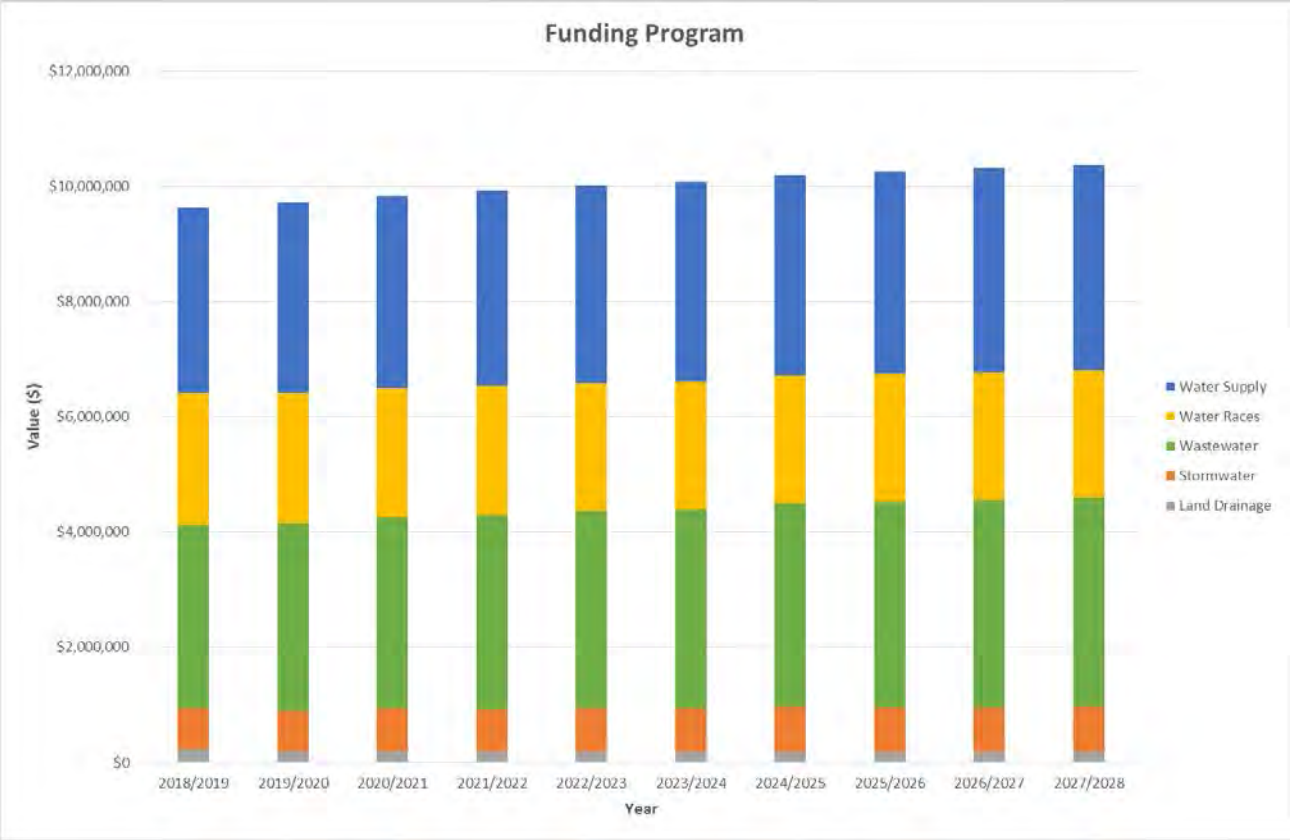


**Figure 11-7 Funding Program - Expenditure**

## Projects

Projects are investigations, decisions and planning activities which exclude capital works. Projects are driven by growth, regulatory and Levels of Service demands. This includes applying for resource consents and running asset valuations via the AMS system. Each project is allocated to a year or years, with costs spread across applicable schemes who share jointly in the benefit of the work undertaken. Figure 11-8 below details the projected spending for projects across the 5Waters for the next ten years.

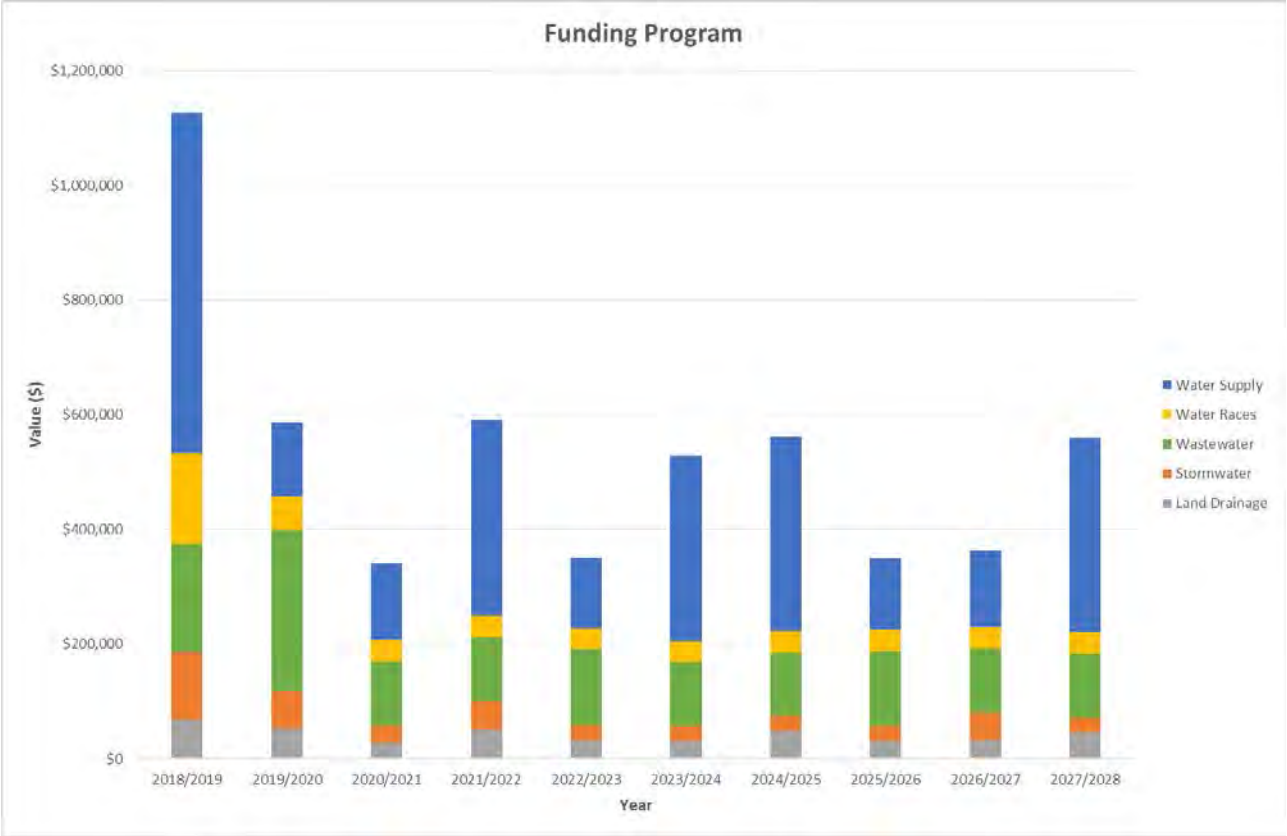


**Figure 11-8 Funding Program – Projects**

The split of level of service (LoS) verse Growth projects for the next ten years are shown below in Figure 11-9.

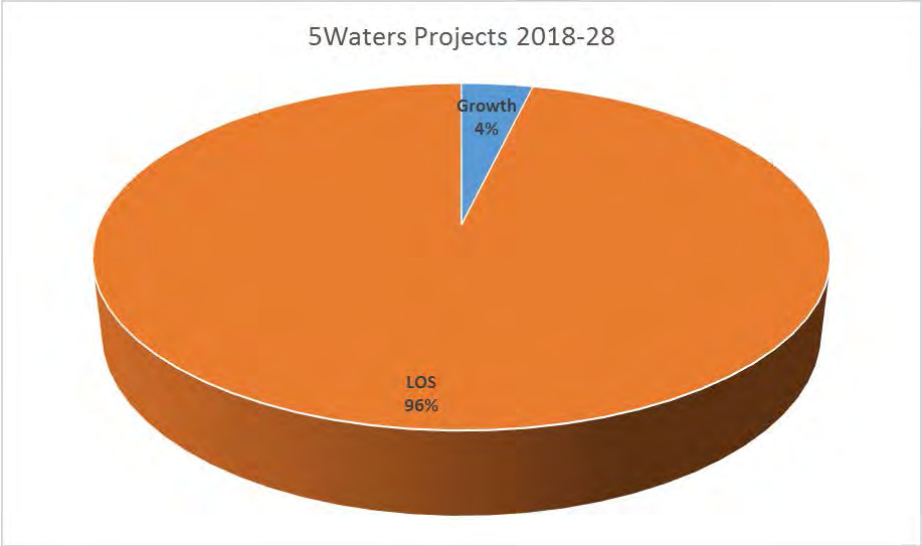


**Figure 11-9 LoS and Growth Projects**

## Capital Projects

Capital projects are activities involving physical works. Capital works are divided into growth and levels of service categories. The basis for these capital works is robust. For example, installation of new Rolleston

water wells is based on detailed water modelling (actual usage), BERL growth predictions and flow and pressure requirements. Works budgets are based on recent quotes for similar work, where applicable.

Capital levels of service works e.g. pipeline extensions (driven by development of subdivisions) and installing UV treatment (driven by increasing legislative requirements). Figure 11-10 below details the projected spending for projects across the 5Waters for the next ten years.

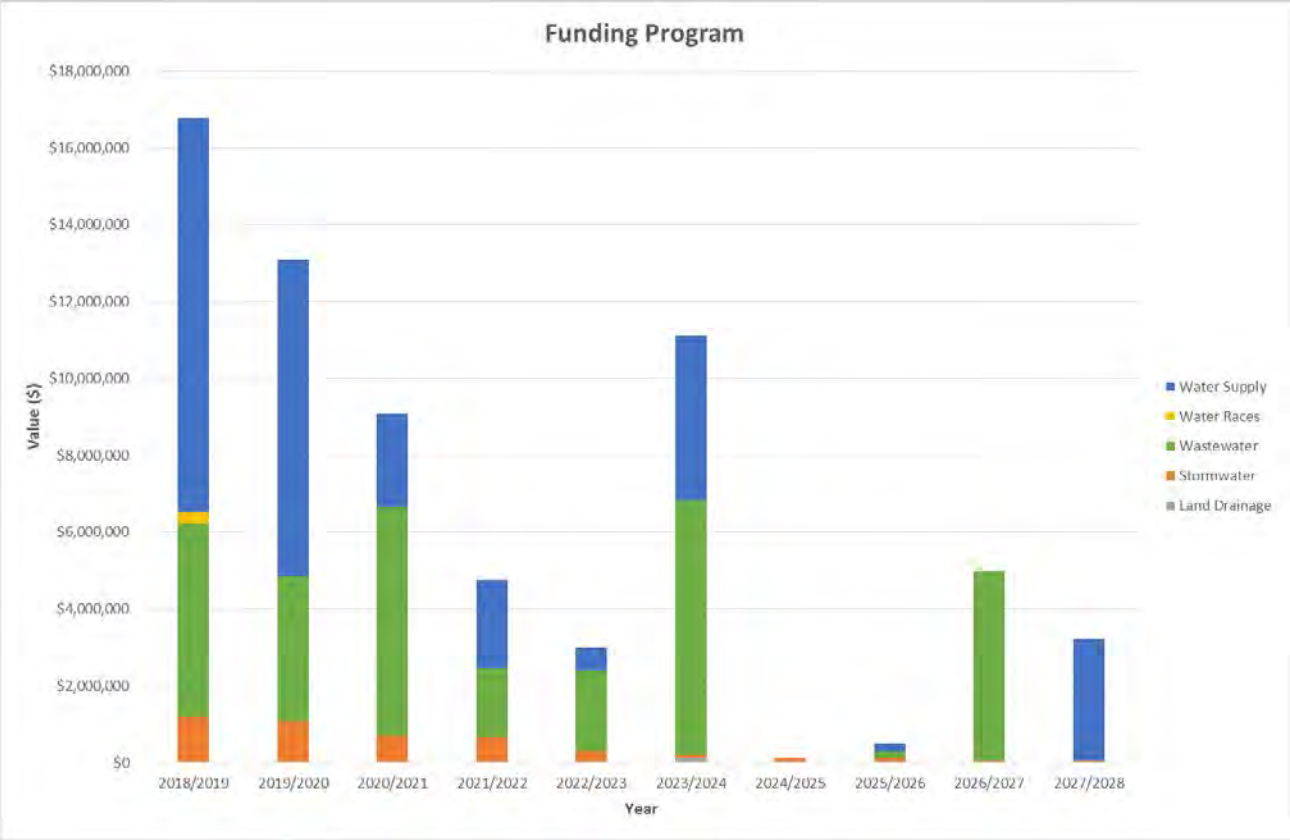


**Figure 11-10 Funding Program – Capital Projects**

The split of level of service (LoS) verse Growth projects for the next ten years are shown below in Figure 11-11.

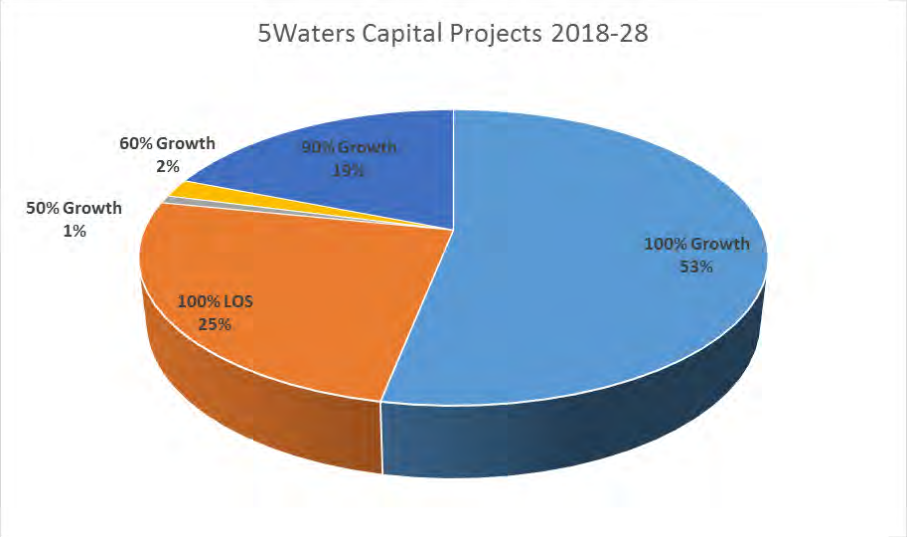


**Figure 11-11 LoS and Growth Capital Projects**

## Renewals

Renewals are the replacement of assets which are nearing or exceeded their useful life as detailed in 7.8 Renewal Replacement Plan.

All schemes fund their renewal costs through their rates. This will provide sufficient funds for the proper upkeep of the assets. The total renewal costs expected to be incurred over the next 30 years (in line with the renewal program) will be funded on an even basis for this period. This approach will:

- Smooth out the generally uneven annual costs of renewals work;
- Ensure that Council can maintain the integrity of the scheme assets; and
- The scheme users now and in future generations will pay a fair charge that reflects the cost of operating and renewing the scheme over the next decade.

A renewals register has been developed on the back of the 2017 valuation process. A detailed review of assets was undertaken during this process – refer to 7.0 Lifecycle Management which details asset confidence, condition and valuation. It is appropriate to note that the value of the 5Waters assets are $ 0.60 billon. This has been developed and reviewed in conjunction with MWH. Annual depreciation or consumption of the asset is $7.3 million. This excludes open naturalised channels.

As the asset value increases, so does the renewals funding required to replace it. The level of funding for some communities for equipment and reticulation renewals in the next 5-30 years is a significant portion of the annual incomes for the individual schemes. A significant level of renewal works have been identified in 2022/2023. In 2022/23 the majority of these works consists of two components:

i. Assets not renewed and carried forward from the 2015-25 LTP; and
ii. Assets that have a predicted renewal in the 2022-2023 period.

It is expected that assets in group i above will be, via further assessment, replaced within 5 years of the predicted renewal year. To ensure the most sustainable use of asset is achieved, Council staff will review the need for renewals based on the assets criticality, actual condition and any other relevant information. This includes a review of maintenance records. Table 11-1 and Figure 11-12 show the renewal profile for the next 30 years. This summary does not include non-depreciated assets, these asset types are listed in Section 7.5 Asset Valuations.

**Table 11-1 Renewal Profile 30 Years**

| 5Waters | 2018/19-2022/23 | 2023/24-2027/28 | 2028/29-2032/33 | 2033/34-2037/38 | 2038/39-2042/43 | 2043/44-2047/48 |
|---|---|---|---|---|---|---|
| Land Drainage | 350,000 | 110,000 | 35,000 | | | |
| Wastewater | 8,463,888 | 9,423,357 | 4,902,225 | 5,126,007 | 1,089,770 | 3,102,018 |
| Stormwater | 317,801 | 233,645 | 51,866 | 215,814 | 1,868,131 | 1,472,240 |
| Urban Water | 11,795,997 | 8,277,724 | 7,051,041 | 6,379,315 | 2,247,069 | 2,383,186 |
| Water Races | 6,262,054 | 1,200,579 | 226,718 | 357,385 | 271,629 | |
| **Total** | 27,189,740 | 19,245,305 | 12,266,851 | 12,078,520 | 5,476,598 | 6,957,444 |

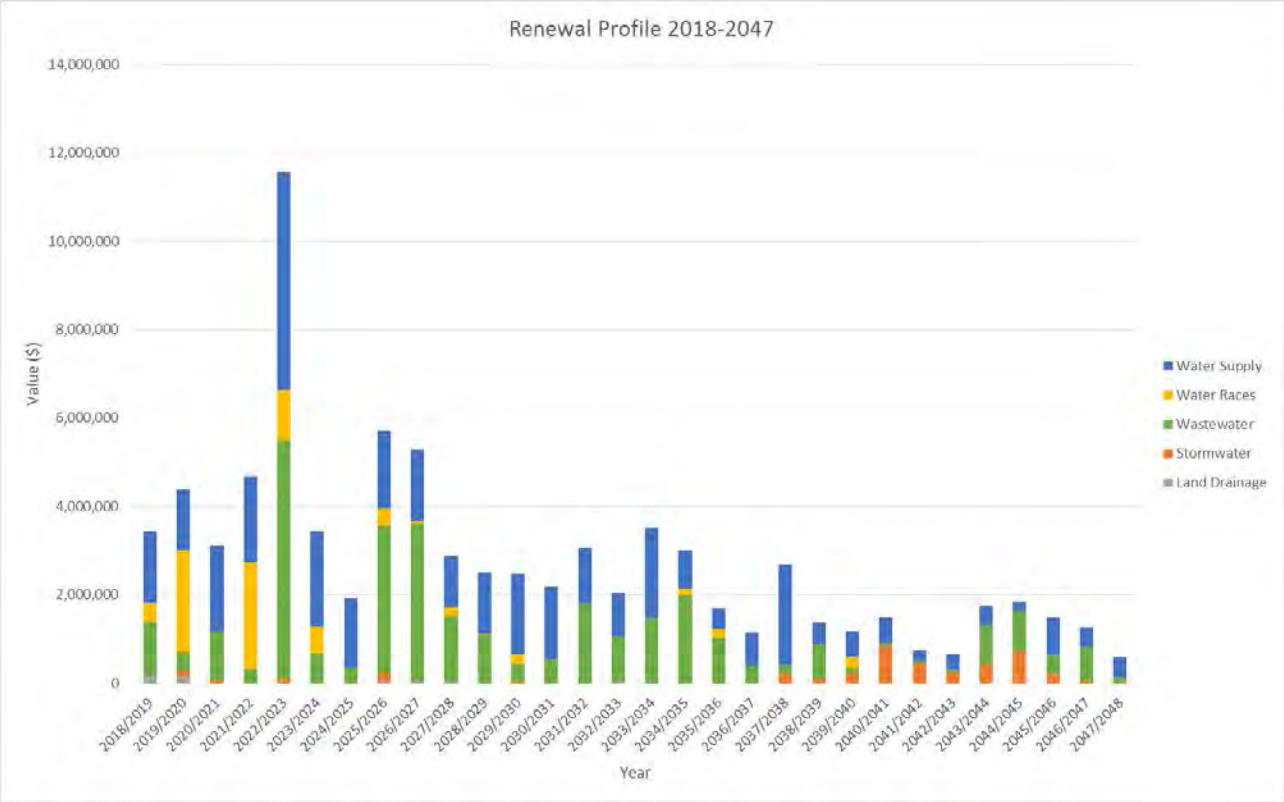


**Figure 11-12 30 Year Renewals Summary**

#### 11.2.1.1 Depreciation

The base value of an asset reduces in accordance with the wearing out over the asset's life arising from use, the passage of time, or obsolescence.

Depreciation is a measure of how much of an assets value has been used up. For example, if an asset will last for 50 years, the annual depreciation charge is 1/50th of the value of the asset. The Council gets all land, building and infrastructure assets revalued every three years to ensure the value is a true reflection of the replacement cost of that asset. Accordingly, this means that the annual depreciation charge also reflects the replacement cost of the asset. It is the asset valuers role to appropriately identify the level of depreciation, though this will be better achieved through more robust data e.g. condition assessment.

Annual depreciation is calculated by Council on a straight line basis – i.e. the replacement cost of the asset less its residual value divided evenly over its useful life. The Council has previously consulted with the Community and decided not to fund depreciation via targeted rates for 5Waters activities. Council instead funds renewals expenditure.

This AcMP has been assembled on the basis that all schemes covered by the 5Waters undertake to fund their renewal costs through their rates. The total renewal costs expected to be incurred over the next 30 years will be funded on an even basis for this period resulting in a smoothing out the generally uneven annual costs of renewals work. This approach to renewals funding will mean the Council can maintain the integrity of the scheme assets and the scheme users will pay a charge that reflects the true cost of operating and renewing the scheme over the next decade.

## 11.3 Funding strategy

Provision of new infrastructure and operations and maintenance of existing assets is funded by a mixture of rates and development contributions. The funding strategy is outlined in the Revenue and Financing Policy.

Over the period of the 10 year plan, Council's intends to ensure the financial position is neutral at a minimum. This is a general rule, with recognition of particular renewals and capital works directing this position on a scheme by scheme basis.

### Rating

**Existing Rating System**

A districtwide rate exists for water and wastewater services. This means that most people pay the same for these services, no matter where they live.

The approach to funding land drainage and water races is different as only those who benefit (directly or indirectly) pay, termed targeted rating.

The Councils financial year commences 1 July annually. Therefore any reference to 201#-201# is for a 12 month period 1 July to 30 June.

Presently the owners of properties that are connected to a:

- Public water supply pay a district wide rate based on either a flat rate and/or the amount of water they use.
- Wastewater scheme pay a district wide rate based on a flat rate.
- Water race scheme pay a targeted user charge and/or area rate and or irrigation rate as appropriate. Targeted rates vary from water race scheme to water race scheme.
- Land drainage scheme pay a targeted rate based on the level of benefit – via classification system.
- Stormwater scheme pay a district wide rate based on a serviced area.

In some areas where properties are capable of being connected but which are not connected, the owner pays an availability charge i.e. half rate in recognition of the benefits of being able to connect when they wish.

**Proposed Rating System**

The Council is proposing to introduce a new rating structure for the water race network, based on a standard district rate. There are currently three water race schemes within the district: Ellesmere, Malvern and Paparua. Over the past five years, however, substantial changes have been identified which are expected to change the need for and use of the schemes. The water races bring other benefits to the Selwyn community rather than just the traditional demand for water for livestock. A change in rating will ensure that land owners who benefit directly from access to water races still fund the majority of the costs, but that the wider community also contributes to the costs. Over time, as the traditional use of water races for farming declines, the wider community will pick up an increasing proportion of the costs.

The current rating structure for water races is complicated, with 10 different rating factors operating across the three networks. Water race rates are paid by rateable properties in each rating area where the service is available, and in addition some rural areas and townships pay a public good rate to reflect the broader benefit of water races. The proposed new rating structure provides three standardised rating factors to replace the existing 10 rating factors. The new structure is provided below.

**Table 11-2 Proposed Rating Structure**

| Rate applies to | Rate type (incl. GST) | Start value | Yearly rate % increase |
|---|---|---|---|
| Water race user | Annual change revenue | $300 | 6.0% |
| Water race user | Per hectare revenue | $17 | 6.0% |
| Al ratable properties | Public/environmental rate revenue | $20 | 10.0% |

The Council is proposing to review the rating structure of the Land Drainage activity during the period of this LTP. This is due to the increasing number of issues emerging for the land drainage schemes.

Figure 11-13 below shows the predicted funding that will be received over the LTP period.


**Figure 11-13 Targeted Rates Revenue 2018-2028**

**Financial Affordability and Sustainability**

Section 0 outlines the principle of financial sustainability. It states that in terms of asset management financial sustainability can be managed through:

- District wide rates;
- Integration of schemes; and
- Shared projects.

This section has already detailed the new proposal for a water race district wide rate which will help ensure financial sustainability and affordability.

Scheme integration was also discussed in Section 0. It stated that the Council has a number of smaller water schemes, although the continued growth within the district may enable some schemes to be joined together. This will lower the cost of providing services and ensure financial sustainability in the long term.

Scheme integration within the district to be investigated is:

- Connecting Edendale Water Supply to West Melton;
- Connecting the Johnson's and Jowers Road supplies to the West Melton supply; and
- Connecting some of the Darfield network to the Sheffield network.

The Branthwaite Drive water supply was integrated into the Rolleston scheme in late 2014. Armack Drive and Burnham water supply were connected to the Rolleston scheme in July 2015.

Shared projected are another way to share costs across a number of schemes who receive the benefit. As mentioned previously, examples of these projects are providing education, improving AMS functionality and running asset valuations. Often these projects are required as they relate to government regulation or enhancing processes. Jointly funded it shares the burden and enables a better solution.

### Development Contributions

Territorial authorities may require contributions to the cost of infrastructural developments under the Local Government Act 2002 (the Act) and the Resource Management Act 1991 (the Resource Management Act).

The purpose of development contributions is to enable territorial authorities to recover from those persons undertaking development a fair, equitable, and proportionate portion of the total cost of capital expenditure necessary to service growth over the long term.

In determining whether development contributions are an appropriate funding source for different activities, the Council considers, for each of its activities:

- The community outcomes to which the activity primarily contributes;
- The distribution of benefits between the community as a whole, any identifiable part of the community, and individuals;
- The period in which benefits are expected to occur;
- The extent to which the actions or inaction of particular individuals or a group contribute to the need to undertake the activity; and
- The costs and benefits, including consequences for transparency and accountability, of funding the activity distinctly from other activities.

The Council then considers the overall impact of any allocation of liability for revenue needs on the current and future wellbeing of the community.

A development contribution is required in relation to a development when:

- The effect of that development requires the Council to construct new or additional assets for any network infrastructure, reserves or community infrastructure; and

- The Council has to incur capital expenditure to increase the capacity of existing assets (e.g. network infrastructure, reserves and community infrastructure) to support the growth from development.

The effect of development in terms of the impact on assets includes the cumulative effect that a development may have in combination with another development. A Development Contributions Policy also enables the Council to require a development contribution that is used to pay, in full or in part, for capital expenditure already incurred by the Council in anticipation of development.

The Council will not require a development contribution for network infrastructure, reserves or community infrastructure in the following cases:

- Where it has, under section 108(2)(a) of the Resource Management Act , imposed a condition on a resource consent requiring that a financial contribution be made in relation to the same development for the same purpose; or
- Where the developer will fund or otherwise provide for the same reserve, network infrastructure, or community facilities; or
- Where the territorial authority has received or will receive funding from a third party for the same purpose.

Where possible, capital works associated with maintaining levels of service (due to growth) or improving levels of service e.g. water quality, will be funded from development contributions. Further information can be in the Councils development contribution policy as required by section 102 (2)(d) of the Act, included in this LTP.

### Capitalisation

Asset costs are initially recorded in the capital expenditure ledger, for the initial aggregation of costs and Annual Plan reporting. The balance in this ledger represents the amount of work in progress at any given time.

On a yearly basis, the value of completed assets or completed stages of major assets are transferred out of work in progress into the fixed asset register. The transfer is driven by the Certificate of Practical Completion and 224 Certificate in relation to subdivisions. The value of the assets is broken down into asset type.

Any significant subsequent expenditure after the initial recording of an asset can be capitalised under two conditions. These are if:

- It is probable that the expenditure will result in a higher Level of Service, or increase the useful life over the initial expected Level of Service or useful life; and

- The expenditure was necessary to obtain the previously expected Level of Service or useful life, and would have been considered part of the initial costs, but for the period of expenditure.

### Vested Assets

The Council receives assets that are vested in it, but there has been no direct exchange of funds. In the case of infrastructural assets, the value of exchange is deemed to be at the current valuation at the time of issue of the 224 Certificate. For all donated and subsidised assets, the initial value recorded is the current valuation value at the date of acquisition.

For the period ended 30 June 2016 $17.17million in assets were vested to Selwyn District Council. A trend of vested assets is shown below by Figure 11-14.

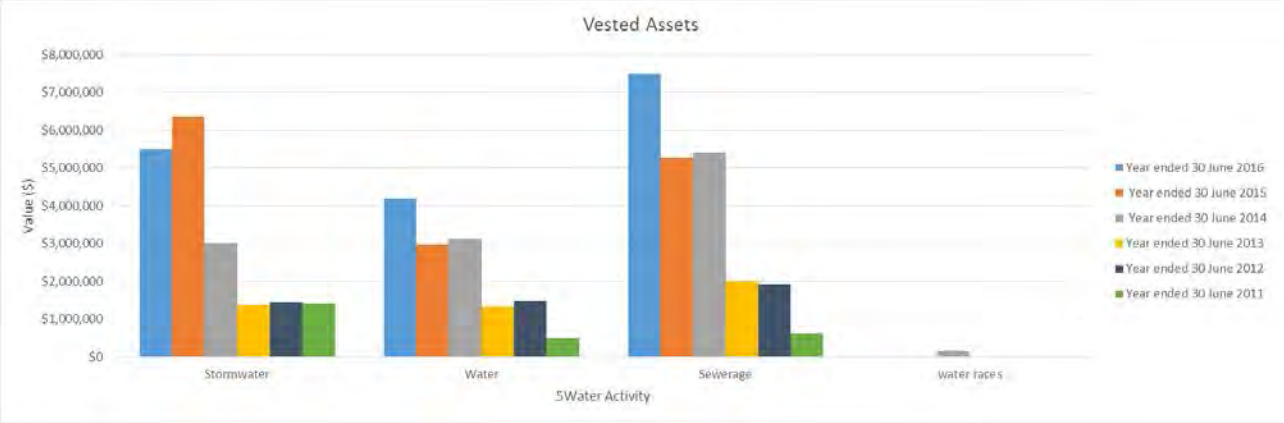


**Figure 11-14 Vested Assets 2011-2016**

### Future debt requirements

Council's policy on maintenance accounts is that operating accounts are allowed to be in deficit for 3 years with no interest charged.

From a borrowing position, Council has a debt ceiling of $130 million in 2018. Future revenue increases will raise this limit over the next 10 years. Current projects are that the Council will remain well within its limits over the next ten years. The ESSS exposes the council to some financial risk as funding of its finance costs is by way of development contribution, which is an uncertain revenue source. To mitigate this risk the Council has resolved that it will charge a targeted rate if required to offset any shortfalls. ESSS debt was at approximately $19 million at 30 June 2017.

## 11.4 Asset Insurance

The Council has insurance cover for the 5 Water services, property and staff as detailed in the Table 11-3 below.

Pre the September 2010 earthquake, the Council was able to obtain insurance cover for "all perils" being fire, flood, earthquake and other natural disasters. This cover was in place until 30 June 2011, but cover for

infrastructural assets could not be obtained during the period 1 July 2011 to 30 June 2014. Due to this lack of cover, the council instigated a risk management strategy where $10 million of its general funds cash was "ring fenced" for use as replacement funding of earthquake damaged underground assets. Since 1 July 2014 Council has obtained underground asset cover from a private insurer that provides a local share (40%) to a value of loss of $100 million with a further central government share (60%) to a value loss of $150 million being a total of $250 million. Council's underground assets were valued at $602 million as at 30 June 2017. The excess on the private policy is $5 million and the above mentioned cash reserve would fund this excess plus any excess on a claim against central government. The difference between the insured loss and total value of the assets recognises that when assets are damaged by earthquakes, there is only a remote possibility of total loss and thus the lower value of $250 million is an acceptable level of insurance cover.

**Table 11-3: 5Waters insurance Provision**

| Components / Items | Public Liability | Professional Indemnity | Machinery Breakdown (Note 1) | Material Damage Aboveground Assets | Material Damage Underground Assets |
|---|---|---|---|---|---|
| Reticulation | | | | ✓ | ✓ |
| Treatment Plants & Pump Stations | | | ✓ | ✓ | ✓ |
| Electrical | | | ✓ | ✓ | ✓ |
| Mechanical | | | ✓ | ✓ | ✓ |
| Structural | | | | ✓ | ✓ |
| Staff | ✓ | ✓ | | | |
| Council Vehicles | | | | ✓ | |
| Private property damage related to 5Waters damage | ✓ | | | | |

✓ Indicates coverage by that particular insurance type

(Note 1): There are a number of exclusions with this policy.

## Insurance Process and Practices

All existing, new and vested assets have suitable insurance cover with all these assets held in the Councils AMS system. A valuation of these assets is undertaken 3-yearly with the revalued insurance values provided to Property and Commercial staff to amend the insurance cover.

On an annual basis insurance cover is automatically provided for all new assets constructed or vested in any one year without the Council insurer requiring notification. This automatic cover is provided on the basis that the insurer will be notified of the new assets as soon as practicable after the end of the financial year.

With the end of financial year complete these new additions are provided to Councils Corporate Services for inclusion on the Council insurance register.

## 11.5 Key Assumptions

In 2017, Council adopted a set of assumptions for use during the preparation of AcMPs which underpinned the 2018-2028 LTP. This section outlines these assumptions. To ensure consistency across all activities, these assumptions have been prepared by an Activity Management Plan Steering Group for all infrastructural asset based activities. This section provides an update to the initial assumptions and related uncertainties tabled and discussed by the steering group in September 2017.

## Table 11-4 Significant Assumptions & Uncertainties for the Selwyn Long Term Plan 2018-2028

| Activity | Asset Management Area | Assumption area | Source Of Information | Stated Assumption | Level of Uncertainty (Jan 2015) | Risk | Potential Impact/Consequence if Assumption Wrong |
|---|---|---|---|---|---|---|---|
| **All** | **Financial** | **Fees and charges** | | Operational revenue is based on current service charges and, in the future, it is assumed charges for services will vary little from present day apart from inflation adjustments. | Low | Fees will be insufficient to meet expenses | Council may review its existing fee structures and charging policy which would affect revenue streams. Adjustments can be made via the Annual Plan process. |
| **All** | **Financial** | **Investments** | The Council | The funds may be invested externally or internally at the Council's cost of capital. | Low | There is a risk that the Council will revise this policy and allocate these funds differently. | Should the Council allocate or retain these funds differently, there will inadequate funds for roading improvements, or the income available to support the general rate requirement will reduce and the Council may need to increase rates or reduce expenditure. |
| **All** | **Financial** | **Renewal Funding & Programme** | | 5Waters: A minimum 30 year renewal plan is followed, with funding via targeted scheme funding, general rates, and external sources as relevant to the asset. No depreciation funding occurring for any assets on the basis that actual identified renewal needs form the basis of ongoing funding needs. | Low | That renewal planning in inappropriate and there are funding consequences | Condition assessments and deterioration modelling of assets establish renewal needs and programmes. Current users may consume the assets but not contribute their share of the use they have made. Costs would then be carried by future users without the benefit having been received. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **All** | **Financial** | **Renewal Funding & Programme** | | Transportation: A minimum 10 year renewal plan with indicative renewal out to 30 years is followed, with funding via general rates, and external sources as relevant to the asset. It is noted that NZTA financial assistance is only allocated in three-year blocks. No depreciation funding identified for any assets on the basis that actual identified renewal needs form the basis of ongoing funding needs. | Low | That renewal planning in inappropriate and there are funding consequences | Condition assessments and deterioration modelling of assets establish renewal needs and programmes. Current users may consume the assets but not contribute their share of the use they have made. Costs would then be carried by future users without the benefit having been received. |
| **All** | **Financial** | **Renewal Funding & Programme** | | Property: The renewals programme has been developed from condition assessments to component level for most asset groups. Remaining useful life has been calculated using standard industry lives and input will be sought from management committees where appropriate to refine programmes. It is assumed that this will provide a realistic renewals programme that ensures assets continue to deliver | Low | That renewal planning in inappropriate and there are funding consequences | Condition assessments and deterioration modelling of assets establish renewal needs and programmes. Current users may consume the assets but not contribute their share of the use they have made. Costs would then be carried by future users without the benefit having been received. |

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| | | | | services to required standards. | | | |
| **All** | **Financial** | **Resource consents** | The Council | It is assumed that the conditions of Resource Consents held by the Council (requirements and costs) will remain similar to current levels, and that the Council will obtain the necessary Resource Consents for planned projects and ongoing needs in the future. | Moderate | There is a risk that the consent conditions will change or that consent will not be obtained for the Council projects. | If consent conditions change, expenditure may increase to comply with the conditions and this may have an impact on rate levels. If consents cannot be obtained for planned projects, the project may be delayed or may not go ahead. |
| **All** | **Growth** | **Tourism** | | That tourism numbers will increase at a similar rate to population growth and that facilities will be adequate | Moderate | That unexpected tourism growth will put pressure on facilities that was not anticipated | Facilities will be overused and/or pollution occurs |
| **All** | **Lifecycle** | **Central Plains Irrigation Scheme** | The Council | Following on from the successful completion of Stage 1 of the Central Plains Water Ltd Scheme supplying surface water to 23,000 Ha in the Te Pirata Area; Infrastructure is being constructed to irrigate 20,000 Ha in the Darfield area (Stage 2), and 4300 Ha in the Sheffield/Springfield area. | Moderate | There is a risk that the scheme proceeds more quickly or slowly than assumed | If the impacts of the establishment of the scheme are not understood then planning for ongoing use (or ease of use) will be incorrect. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **All** | **Lifecycle** | **Data Quality and Management** | | Investment in maintaining and developing the required level of quality data to efficiently operate and predict issues. | Low | Insufficient information leads to poor decisions | Incorrect data or inefficient or use of available data may result in relatively poor decisions on investments in operational, maintenance, renewal and capital, projects both in the short and long term. |
| **All** | **Lifecycle** | **Major Project & Capital Works** | | Will be estimated on the basis this work is facilitated by external consultants. Construction Projects costs estimated using the following:<br>a. Estimate +/- 25%<br>b. Where designed +/10%<br>c. Post tender +/-5% | Moderate | Project scoping and estimates are insufficient for budgeting purposes, or are excessive for potential projects | Conservative funding approach, staff may have capacity to undertake some work.<br><br>Particular skill sets in high demand may attract higher costs. |
| **All** | **Lifecycle** | **New Technologies** | | There will be no new technologies deployed that will significantly change the demand for or of provision of services. | Low | Service delivery is poorly aligned with community demand | Inefficient of ineffective provision of services in the traditional manner when other alternatives maybe available. |
| **All** | **Lifecycle** | **Planning Horizons** | | It is assumed that the planning horizon for growth (30-45 years) and asset lifecycles (30 years plus) are sufficient to inform the ten year | Low | Nil | Planning is less robust for long term decision making. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | forecasts included in the LTP. | | | |
| **All** | **LoS** | **Iwi relationship** | | Council will foster and positively develop its relationship with Iwi. | Low | An ineffective relation causes misunderstandings and delays in planning and consent applications | A poor relationship may result in delays and additional costs in completing District Plan variations, Water Conservation Order matters and Structure Planning as delays and resources concentrated or within drawn at critical points in Councils work programmes. |
| **All** | **LoS** | **Procurement of Services** | | Procurement will be provided that delivers the defined LoS within budget, at a similar cost to that presently incurred in accordance with the Asset Procurement Strategy. | Moderate | Service providers cannot be secured and/or costs are greater than expected | A change in procurement model may result in unacceptable reduction in LoS. |
| **All** | **LoS** | **Service delivery modes & contracts** | | It is assumed that there will be no significant changes to current modes of service delivery for each service area or variations in terms of contract prices (above inflation and inventory adjustments) for current operations and maintenance contracts. Council will continue to consider collaboration opportunities and assess changes to service delivery on a case by case basis. | Moderate | That service delivery modes do not demonstrated value for money outcome. That changes to service delivery modes are enforced. | Maintenance contracts may be re-tendered during the plan period. If maintenance and service contracts are consolidated and/or re-tendered there is a possibility contract prices will be higher than anticipated. This would require Council to either increase rates and/or operating revenue if efficiencies cannot be found or it may consider reducing levels of service. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **All** | **LoS** | **Service Delivery** | | That reviews of service delivery modes (LGA 2002 s17) will not initiate significant changes to service delivery modes | Moderate | That service delivery modes do not demonstrated value for money outcome. That changes to service delivery modes are enforced. | That there is a drive for a change in service delivery modes affecting management and providers |
| **All** | **Sustainability** | **Gravel extraction potential** | | It is assumed that sufficient gravel will be available for projects proposed. It is acknowledged that Council's Gravel Management Strategy proposes a wider range of sources than Council managed sites in future, this may be associated with a different cost structure. | Moderate | That there will inadequate supply from commercial or Council sources | If volumes of gravel available from various sources are considerably lower than anticipated, this may necessitate a greater reliance on Council or purchase of alternative sites or consideration of other supply sources/options. Consequently the cost of gravel supply would increase. |
| **5Waters Transportation** | **Lifecycle** | **Asset Condition** | | The condition and remaining typical life have been accurately assessed, permitting appropriate renewal forward programmes to be developed and routinely updated. | Moderate | Asset renewals are required earlier than expected | Earlier replacement of assets than forecast and budgeted. Scale of replacement will impact on funding that may produce funding peaks. |
| **5Waters Transportation** | **Lifecycle** | **Asset lives** | | Asset lives have been adopted from the best information available at the time of assessment.<br><br>Asset lives will not be | Moderate | Asset renewals are required earlier than expected | Renewal cycles and associated Funding to support this may require change, generally this is seen as an increase in funding. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | modified due to the 2010 and 2011 earthquakes unless an assessment indicates otherwise. | | | |
| **5Waters Transportation** | **Sustainability** | **Criticality (consequence of failure)** | | Staff will target resources based on the level of criticality and risk (highest to lowest where criticality has been assessed). | Low | Prioritisation is inappropriate | Consent non-compliance, enforcement cost, additional operational, maintenance and capital (remedial) works may result from incorrect assessments and targeting |
| **5Waters** | **Financial** | **Government Funding** | | Our communities will not qualify for central government funding to improve sewer or water scheme works e.g. water quality upgrades. | Low | Nil | Schemes will have covered cost of improvements directly. |
| **5Waters** | **Financial** | **National Policy Statement on Freshwater Management** | | It is assumed that any changes to the operation of Council's 5 Waters systems required by the implementation of the National Policy Statement on Freshwater Management can be addressed within existing budgets. | Moderate | There is a risk that the requirements will be greater than expected | Management and operational changes will be required to capital works and operations programmes as well, as the funding of these programmes. |
| **5Waters** | **Growth** | **Demand Management** | | Demand management techniques will be applied and implemented as appropriate to networks, schemes and service areas | Moderate | Consumption exceeds supply | 5Waters Consumption beyond current pipe capacity or consented quantities by existing users may mean additional connections will only be available at unreasonably higher |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | both in the Council and user management areas. | | | cost. Efficiencies in scheme use may not be achieved; e.g. cost effective reduction in groundwater infiltration to sewer lines may not be possible. |
| **5Waters** | **Lifecycle** | **Stormwater Management (townships)** | | Management Plans will be completed and consented in all townships.<br>That budgets will be sufficient for implementing the required actions | Moderate | Plans are not completed or consenting affecting compliance and overall planning success | Administration and monitoring of many small consents in townships will become more complex as development continues and NRRP/L&WP operative rules result in further resource (cost) increases. |
| **5Waters** | **LoS** | **Darfield/Kirwee Wastewater disposal** | | There will be a clear community preference arising from the 2017/18 Annual Plan process | Moderate | That there will be no clear direction to pursue | That without a mandate, a decision to proceed or not proceed proves incorrect |
| **5Waters** | **LoS** | **Fluoridation** | | That there will be no requirement imposed to floriate SDC Managed Water Supplies | Moderate | That fluoridation will be imposed on schemes along with the associated costs | Unbudgeted capital works and operations costs will result if fluoridation is required by the District Health Board |
| **5Waters** | **LoS** | **Havelock North Water Supply Enquiry** | | That any additional actions arising from the Havelock North Water Enquiry can be accommodated with current management practices and budgets. | Moderate | That additional management actions will be imposed on schemes along with the associated costs | Unbudgeted capital works and operations costs will result if treatment or reticulation management process changes are required |
| **5Waters** | **LoS** | **Stormwater Levels of Service** | | Community expectations for stormwater services across district township will increase over time, but there will be no urgent | Moderate | That there will be a demand for services that exceeds allocated budgets | Unbudgeted capital works and operations costs will result |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | demand for extensive new networks and / or flood protection works within the first three years of the LTP | | | |
| **5Waters** | **LoS** | **Chlorine treatment of water supplies** | | Council will adopt a risk management approach for the assessment and use of chlorine treatment in its water supplies. | Moderate | That widespread chlorination will be required above the risk currently assessed. | Unbudgeted capital works and operations costs will result if treatment or reticulation management process changes are required |
| **5Waters** | **LoS** | **Upper Selwyn Huts Wastewater disposal** | | There will be a clear community preference arising from the 2017/18 Annual Plan process | Moderate | That there will be no clear direction to pursue | That without a mandate, a decision to proceed or not proceed proves incorrect |
| **5Waters** | **Sustainability** | **Groundwater Source** | | That groundwater nitrate levels will remain below the Maximum Acceptable Values (MAV) over the next ten years. | Low | The nitrate levels rise to a value that affects cost effect treatment of water supplies | That additional treatment will be required, affecting works programmes and expenditure required. Otherwise new sources mat be needed. |
| **5Waters** | **Sustainability** | **Groundwater Source** | | Secure ground water status will be lost over the next ten years on bores located in semi aquifers and bored less than 30m deep in confined aquifers. | Moderate | That there will be a greater change to groundwater sources than expected. | That additional water sources will be required, affecting works programmes and expenditure required. |

## 11.6 Forecast Reliability and Confidence

The AcMP and financial projections are based on the best available data. Correct financial projections and accuracy of data is pivotal to effective asset and financial management. The same confidence grading as the asset valuation (shown in Table 11-5 below), where data confidence is classified on a four tier scale, was used to determine a forecast reliability and confidence grade.

**Table 11-5 Data Confidence Grading**

| Grade | General Meaning |
|---|---|
| A | **Highly Reliable**<br>Data based on sound records, procedure, investigations and analysis which is properly documented and recognised as the best method of assessment. |
| B | **Reliable**<br>Data based on sound records, procedure, investigations and analysis which is properly documented but has minor short comings; for example the data is old, some documentation is missing and reliance is placed on unconfirmed reports or some extrapolation and recognised as the best method of assessment. |
| C | **Uncertain**<br>Data based on sound records, procedure, investigations and analysis which is incomplete or unsupported, or extrapolation from a limited sample for which grade A or B data is available. |
| D | **Very Uncertain**<br>Data based on unconfirmed verbal reports and/or cursory inspection and analysis |

The estimated confidence level and reliability of data used in this plan is shown in Table 11-6 below.

**Table 11-6 Data Confidence Assessment for Data Used**

| Data | D | C | B | A | Additional Information |
|---|---|---|---|---|---|
| Growth Projections | | | | | Based on projections from the planning department |
| Asset Value and Useful lives | | | | | Sourced from 5Waters Valuation Report 2017 |
| Condition Modelling | | | | | Condition modelling only exists for pipes within the reticulation network |
| Demand and Capacity | | | | | Based on outputs from water models run by Opus Consultants for major growth areas and desktop review for smaller schemes |
| Operations and Maintenance Budgets | | | | | Based on C1241 pricing and previous trending |

| | | | | | |
|---|---|---|---|---|---|
| Projects and Capital Projects Budgets | | | | | Based on consultant reports, engineer estimates and staff experience |
| Network renewals and renewal budgets | | | | | Sourced directly from the 2017 asset valuations |
| Overall Confidence and reliability | | | | | |

Overall, the data confidence is assessed as a reliable confidence level for data used in the preparation of this AcMP.

Asset management issues that impact on the confidence have been identified for improvement throughout this AcMP. To improve the process of budgeting and forecasting going forward, it is suggesting that budgeting editing software could be used. This could be linked with NCS, therefore eliminating the manual checking of spreadsheets by asset management and the corporate team. This will also give the service delivery team a greater opportunity to input cost estimates for projects and suggest additional projects.

### Compliance with GAAP

All Council activities are required to have their financial results reported externally in a way that complies with generally accepted accounting practice (GAAP) in New Zealand. This is currently in accordance with International Accounting Standards – IAS16. The International Accounting Standards are determined by the Institute of Chartered Accountants of New Zealand. The Finance Activity ensures that GAAP is complied with by regular updates to the Council's Accounting processes, and the on-going formal and informal training and education of staff in departments throughout the Council.

The activity relies on the Council's core financial systems which include:

- NCS accounts payable, fixed assets, inventory, time entry, work orders, and general ledger
- Accounts receivable, cash receipting, bank management and rates, plus inputs from other Local Government regulatory systems such as Person/Property, Infringements, Licensing, Consents.

Monthly and yearly expenditure reporting is presented to Council staff, Council representatives and Scheme Committees and identifies current concerns and trends.

## 11.7 Improvement Plan

Throughout this section a number of specific actions to improve the way in which the Council manages its financial forecasting and funding associated with the 5Waters activities. These actions are summarised below in Table 11-7.

### Table 11-7 AM Improvement Items – Financial Summary

| Section Ref | Improvement Opportunities | Priority | Timing |
|---|---|---|---|
| 11.2.1 | Consolidate rates to ensure financial sustainability | High | Ongoing |
| 11.2.1 | Integrate schemes where economically viable | Medium | Ongoing |
| 11.5 | Implement a form of budget editing software | Medium | 2020/21 |
| 11.5 | Use the budget editing module for 2021-31 LTP | Medium | 2020/21 |

# 12.0 IMPROVEMENT PLAN

Improvements are always being made towards better Asset Management and within the AcMPs. This section outlines current and future asset management practises and provides the details of future improvements to be made over the next three years. These improvements will increase the confidence level of this asset management plan.

Asset management in New Zealand has developed over the last 15 years in response to the requirement to justify and improve the level of investment in and management of community focussed infrastructure. Evolution in AcMP thinking is also occurring and has impacted on plan focus. Asset Management international standards are considered to be a key future driver for change.

This is the eighth utilities AcMP produced by Council with the first individual AcMP being produced in 1998 for water and wastewater. AcMPs built on this format and now have Volume 1 detailing generic information followed by a separate volume for each of the 5Water services (Volume 2,3,4,5, and 6).

The objectives of this improvement plan are:

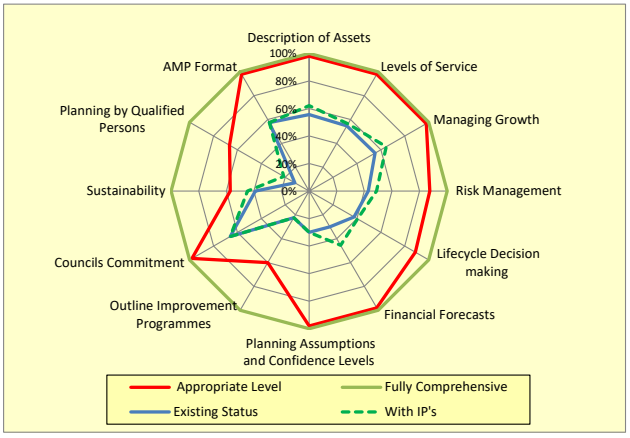
- Alignment to asset management policy;
- Adherence to government legislation;
- An adequate program to match funding budgeted;
- Prioritisation of improvements; and
- Achievable program to improvement infrastructure planning overall.

The development of this Plan is based on existing levels of service, the best available most current information and the knowledge of Council Staff. This AcMP will be the subject of annual updating and incremental improvement over time.

## 12.1 AcMP Compliance Status

Historically, the compliance status reports were used indicate the level of asset management. In 2009 the AcMP Compliance Status Report indicated that the AcMPs were at or exceed a 'core' level. Given that Council has adopted an 'intermediate' or core plus level of asset management practice, there was scope for improvement in a majority of areas. The detailed analysis carried out on the 2009 AcMP Compliance status in 2010 is shown in Figure 12-1 below.

| 2009 5Waters AcMP | 2011 5Waters AcMP |
|---|---|



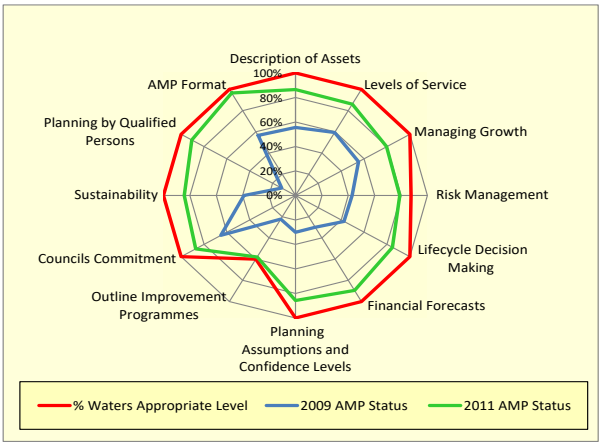




**Figure 12-1: 5Waters AcMP Compliance Status**

It is acknowledged that over the past few years there has been a focus for Council on managing the high levels of growth experienced.

In 2015 during the writing of the Activity Management Plans a high level review was undertaken by MWH Consultants. This was ensure that plans met statutory requirements and that contents of them were following best practice. Following the publishing of the AcMPs in 2015 MWH Consultants completed a final review of the finished documents. This review discussed a range of areas in which the AcMPs could be improved.

In 2017 a self-assessment of the AcMP using the asset management maturity assessment matrix produced by the treasury was undertaken. This matrix forms part of the Treasury Investor Confidence Rating system for asset intensive government agencies. The matrix, which is based on the International Infrastructure Management Manual (IIMM), was first produced by Treasury in 2011 and refreshed in 2016 to reflect the updated version of the IIMM which was released in 2015. AECOM was commissioned to review the self-assessment carried out by Selwyn District Council, suggest amendments to scores and targets where changes were considered appropriate and provide comments to expand the findings of the reviewer. The Treasury asset management maturity matrix was not designed as an asset management plan assessment system, but as a system to assess organisational asset management practices more broadly. As an asset management plan will generally summarise an organisation's approach to asset management, the matrix can also be used to review asset management plans. A summary of the final scoring from the assessment is provided in Table 12-1 below.

**Table 12-1 Scoring Summary**

| Ref | Question | Section | Current Score | Future Target |
|---|---|---|---|---|
| IIMM 2.1 | 1 | AM Policy and Strategy | 60 | 70 |
| IIMM 2.2 | 2 | Levels of Service and Performance Management | 65 | 70 |
| IIMM 2.3 | 3 | Forecasting Demand | 65 | 70 |
| IIMM 2.4 | 4 | Asset Register Data | 65 | 75 |
| IIMM 2.5 | 5 | Asset Performance and Condition | 55 | 65 |
| IIMM 3.1 | 6 | Decision Making | 65 | 70 |
| IIMM 3.2 | 7 | Managing Risk | 65 | 70 |
| IIMM 3.3 | 8 | Operational Planning | 60 | 70 |
| IIMM 3.4 | 9 | Capital Works Planning | 65 | 70 |
| IIMM 3.5 | 10 | Financial Planning | 65 | 70 |
| IIMM 4.1 | 11 | Asset Management Leadership and Teams | 70 | 70 |
| IIMM 4.2 | 12 | Asset Management Plans | 65 | 75 |
| IIMM 4.3 | 13 | Management Systems | 60 | 65 |
| IIMM 4.4 | 14 | Asset Management Information Systems | 70 | 70 |
| IIMM 4.5 | 15 | Service Delivery Mechanisms | 65 | 70 |
| IIMM 4.6 | 16 | Audit and Improvement | 60 | 65 |

Overall AECOM suggested:

*Staff of Selwyn District Council have succeeded in producing a comprehensive and well structured Activity Management Plan. It is logically structured, comprising a higher level AcMP covering all 5 Waters (Volume 1) and "sub-plans" providing additional detail for each of the waters (Volumes 2-6).*

*The Activity Management Plan comprises approximately 1700 pages across all 6 volumes. The reason for including a large quantity of information in the Activity Management Plan is appreciated and will support the retention of institutional knowledge about the 5 Waters and effective succession planning. Staff of Selwyn District Council are to be commended for the effort that has clearly gone into this Activity Management Plan.*

In addition, AECOM carried out an assessment of compliance of the 5 Waters Activity Management Plan with applicable requirements of Schedule 10 of the Local Government Act 2002. AcMPs are the accepted means

through which compliance with Schedule 10 can be demonstrated. AECOM considered that the plans are compliant with the relevant provisions of the Local Government Act 2002 Schedule 10 "Long-term plans, annual plans, and annual reports" and that it provides an appropriate basis for input to the Council LTP.

In 2014 the International Organisation for Standardisation (ISO) published the ISO 55000 series of asset management standards. The ISO 55001:2014 Standard sets out the requirements for an integrated, effective management system for asset management. With the ISO 55001 Standard now emerging as the international benchmark against which asset management maturity is measured, organisations are increasingly assessing the adequacy of their asset management practices relative to the requirements of that Standard. Therefore, AECOM was commissioned by Council to carry out assessments of the SDC 5 Waters Activity Management Plan relative to the ISO 55001 Standard. Scoring an average of 1.62 across all ISO 55001 requirements. This places Council approximately midway between "aware" and "developing" in terms of their asset management practices.

The reviews completed by AECOM have helped form part of the improvement plan within this AcMP. The 5Waters asset management team will continue to aim to achieve an 'intermediate' level of asset management maturity during this LTP.

## 12.2 Key Improvements since 2015

The 2015 AcMP had a comprehensive improvement plan. Table 12-2 outlines key improvement items that have been completed.

**Table 12-2: Improvement Changes**

| Section | Ref | Improvement Item |
|---|---|---|
| Strategies, Objectives and Legislation | 2.4.5 | Review ISO 55000 Asset Management 2014 Standards |
| Growth and Demand | 6.5.2 | Develop a demand management plan for Water services |
| | 6.6 | Undertake a Water and Sanitary Services Assessment |
| Lifecycle Management | 7.2 | Develop wastewater models for the major townships. |
| | 7.4 | Improve the asset criticality model |
| | 7.4 | Improve Valuation Model |
| Infrastructure Sustainability | 8.3.3 | Undertake a climate change analysis for wastewater, stormwater, land drainage and water races. Also update the analysis for water supply. |
| Risk Management | 9.3.2 | Update the "Utilities Lifelines Response Plan" with a particular focus on the resilience of critical assets and systems. |
| Financial Summary | 11.2.1 | Consolidate rates to ensure financial sustainability |

| | | |
|---|---|---|
| | 11.2.1 | Integrate schemes where economically viable |

## 12.3 Improvement Program

This activity management plan has been prepared using information contained in the 2015 Asset Management Plan, the 2017 asset valuation, and knowledge of current asset management practice. Levels of service and performance measures have been redefined to reflect the scope of the 5Waters activity as well as recent legislative requirements.

As an input to this plan, much work has been undertaken in looking at the future development of the District, although this has tended to focus more on population and settlement rather than economic activity. A review of risks has been carried out, and this will need to be considered in more detail and a full risk register developed with risks prioritised and mitigation actions planned. Using asset data, such as age, condition and performance, and with an understanding of significant risks, financial programmes have been updated from those prepared for the 2018-2028 LTP. Improvement items that have not been completed from the 2015 improvement plan, where deemed still relevant have been included in the 2018 improvement plan.

Throughout this AcMP a number of specific actions to improve the way in which the Council identifies and manages assets were identified for the 5Waters activity. These actions are summarised below in Table 12-3.

**Table 12-3 AM Improvement Items**

| Section | Ref | Improvement Items | Priority | Timing |
|---|---|---|---|---|
| Strategies, Objectives and Legislation | 2.4 | Review legislation changes before next AcMP | Low | 2020/21 |
| | 2.4.16 | Implement aspects identified to work towards compliance of ISO 55001 Asset Management Standards | Low | 2018/19 |
| | 2.5.1 | Continue to monitor Environment Canterbury's plans and policies and make submissions where appropriate | Medium | Ongoing |
| | 2.6.2 | Review and Update 5Waters Strategy | High | 2020/21 |
| | 2.6.13 | Update Policy Manual if required | Medium | Every 3-5 Years |
| | 2.6.5 | Review and Update of the Asset Management Policy | Medium | 2020/21 |
| | 2.6.10 | Review the Engineering Code of Practice and other Standards | High | 2018/19 |

| | | | | |
|---|---|---|---|---|
| | 2.7 | Monitor Government Legislation | Medium | Ongoing |
| | 2.7 | Monitor the outcomes of Three Water Review | High | 2018/19 |
| Management and Organisational Structure | 4.1 | Continue to define the boundary between Asset Management and Service Delivery | High | Ongoing |
| | 4.4 | Continue to involve Stakeholders in decisions where necessary | Medium | Ongoing |
| Levels of Service | 5.3.4 | Continue to refine key performance measure targets | Medium | Every 3 years |
| | 5.3.4.3 | Continue to improve capture of key performance indicator information within our AMS system | Medium | Ongoing |
| Growth and Demand | 6.1 | Monitor and revise growth predictions for the district as growth continues | Medium | Every 3 years |
| | 6.9.2 | Develop a demand management plan for all 5Water Services | Medium | 2019/20 |
| | 6.9.2 | Review the demand management plan for Water | Medium | 2018/19 |
| | 6.9.2 | Develop a water loss strategy | Medium | 2019/20 |
| | 6.9.2 | Develop a water supply strategy | Medium | 2020/21 |
| Lifecycle Management | 7.2 | Use Water and Wastewater model outputs to create a spatial view of asset performance | High | 2018/19 |
| | 7.2 | Improve the asset condition model by implementing a process to include new CCTV information | High | 2019/20 |
| | 7.3 | Extend the asset condition model to incorporate all asset types | Medium | 2020/21 |
| | 7.4 | Improve the asset criticality model by refining the criticality bands and making it automatically update within the AMS system. | High | 2020/21 |
| | 7.4 | Further refine and improve the Asset Valuation module by making some of processes more automated | High | 2020/21 |
| | 7.8 | Improve the renewal model to include criticality and condition modelling of assets, and address the legacy of renewals. | High | 2018/19 |
| Infrastructure Sustainability | 8.2.1 | Reasonable Use Model | Medium | 2018/19 |

| | | | | |
|---|---|---|---|---|
| | 8.2.3 | Monitor developers/developments to ensure sustainable infrastructure is provided in the district | Medium | Ongoing |
| | 8.3.3 | Extend the Climate Change study to 120 years to be in line with the lives of infrastructure assets | Low | 2019/20 |
| | 8.4 | Monitor electrical energy usage within AMS | Medium | 2021/22 |
| Risk Management | 9.2.6 | Integrate risk assessments within the asset management system | Medium | 2021/22 |
| | 9.3.2 | Carry out an interdependencies assessment between Council utilities and other lifeline utilities, such as power, telecommunications and fuel. | Medium | 2021/22 |
| Asset Management Processes and Practices | 10.1.1 | AMS improvements and extensions to functionality[34] | High | Ongoing |
| | 10.1.2 | A long term strategy for the on-going use of SCADA will be developed over the next three years | Medium | 2019/20 |
| | 10.1.6 | Further develop resource consents database in AMS | Medium | 2019/20 |
| | 10.2 | Develop and maintain an improvement program to update asset data information. | High | 2018/19 |
| | 10.4 | Improve the AcMP preparation process by preparing a plan in January 2020 | Low | 2020/21 |
| Financial Summary | 11.2.1 | Consolidate rates to ensure financial sustainability | High | Ongoing |
| | 11.2.1 | Integrate schemes where economically viable | Medium | Ongoing |
| | 11.5 | Implement a form of budget editing software | Medium | 2020/21 |
| | 11.5 | Use the budget editing module for 2021-31 LTP | Medium | 2020/21 |

## 12.4 Funding Asset Management Improvements

The improvements identified relate to practises and processes used within Council. While some improvements will occur through improvements to the delivery of services, for example improved data collection within the maintenance contract, others are specific to asset management.

[34] AMS improvements have not been listed separately, please refer to Table 10-1.

The 5Waters AcMP is often implemented through projects. These projects have been gathered during the Plans development, and are approved from 1 July 2018. Projects are identified as strategic and operational – driven by the objective of achieving a satisfactory level of service.

## 12.5 AcMP Review and Monitoring

This AcMP will continue to be developed over time to incorporate further advanced asset management techniques, make use of improved data collection and management systems, respond to legislative and policy changes, and address evolving issues.

This Plan will be reviewed periodically as circumstances change, and will be comprehensively reviewed at intervals of three years via the Special Consultative Procedure. Each review will be completed in line with whole of Council LTP delivery plans.

A brief program for the 3 yearly review of the plan for 2021 is shown below in Table 12-4.

**Table 12-4 Key Timeframes to Achieve**

| Key Objective | Completion Month |
|---|---|
| Generate AcMP Document Template | December 2019 |
| Start 2017 Asset Valuation | January 2020 |
| Final valuation report | September 2020 |
| Complete LTP Final Budget | October 2020 |
| Renewal Profile generated | September 2020 |
| Review Asset Capacity and Performance, Criticality and Condition Assessment Models | January 2021 |
| Complete AcMP word documents | February 2021 |
| AcMPs approved by Council and published on website | June 2021 |

A brief program for external review and audit for 2021 is shown below in Table 12-4.

**Table 12-5 Key Timeframes for Audit**

| Key Objective | Completion Month |
|---|---|
| Completeness audit by external consultant | January 2021 |

| | |
|---|---|
| Detailed review by external consultant | February 2021 |
| AcMPs submitted to Audit | February 2021 |
| AcMPs Submitted to Council and Published to the Public | April 2021 |

As this section relates to the improvement plan itself, no improvement items arise. The improvement plan for this AcMP will be reviewed 3 monthly to measure progress towards the items.