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2015-2025

Water Supply Services Activity Management Plan

TIMARU TDC DISTRICT COUNCIL

Drainage and Water Unit
District Services Group

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EXECUTIVE SUMMARY

The Timaru District Water Supply Services Activity Management Plan (AMP) 2015-2025 is a Plan for how Timaru District Council (TDC) will deliver water supply services in the next 10 years according to agreed levels of service. It has been developed and written by TDC's Drainage and Water Unit (DWU) asset managers with contributions from operations staff that have experience dealing directly with issues at the field. The AMP is organized in two parts: Part A provides the overview of the Water Supply Activity and describes the general practices, issues and planned approaches that apply to the District's 12 water schemes. Part B provides the specific details on the assets, issues and future works on the schemes.

Part A

This AMP is the mid-level plan in the 3-tier hierarchy of TDC's plans relating to the District's water supply services. The higher level plan is the Long Term Plan which provides the overall direction for the water supply activity. It sets out the Vision, Community Outcomes and Priority Areas to be pursued for the District in the next 10 years. The lower level plan is the Annual Plan which translates the AMP into a yearly programme of action.

The AMP is circumscribed by pertinent provisions of legislations, policies and plans that govern the use of water resources, such as the Resource Management Act, the Local Government Act, the Drinking Water Standards of New Zealand, the Health Act, the Canterbury Water Management Strategy, and the Canterbury Land and Water Regional Plan, among others.

TDC, through the DWU, collaborates with groups that have various roles relevant to the effective delivery of water supply services. Internally, these are the corporate planning and finance units, transport unit, district planning, building unit, the regulatory services group, IT unit and customer services. Externally, TDC collaborates with the Mackenzie and Waimate District Councils through the Downlands Water Supply Joint Standing Committee in the shared governance of the Downlands Water Supply, the Community Boards of Geraldine, Pleasant Point and Temuka, the Environment Canterbury, the Canterbury DHB, and TDC's work/service contractors.

TDC delivers water supply services for residential, commercial, industrial and stockwater purposes. It considers individuals and/or groups that have direct or indirect use of TDC's water supply services as stakeholders in the Activity due to the interests they represent as consumers, regulators or as advocates for the environment and other socio-cultural concerns. These include Timaru District residents, ratepayers and visitors; local industries and businesses; community groups; civic organisations; Te Runanga O Arowhenua; and other governmental bodies.

The Activity and Strategic Direction

There are 12 water supplies being managed by TDC consisting of:

Six (6) urban drinking schemes for Geraldine, Peel Forest, Pleasant Point, Temuka, Timaru and Winchester;

Four (4) rural drinking schemes for Downlands, Orari, Seadown and Te Moana; and

Two (2) stockwater schemes for Beautiful Valley and Rangitata-Orari

The AMP is guided by the strategic direction set out in the Timaru District's Long Term Plan 2015-2025 Vision, Outcomes and Priorities. The AMP contributes to the attainment of the District's four Strategic Priorities, namely:

- Investing in community
- Promote integrated, highly liveable communities
- Support areas of economic and District strength
- Ensure critical infrastructure meets future needs

The following are key issues addressed in this AMP:

- Meeting drinking water standards
- Changes in national and regional plans/policies
- Effects of climate change
- Changes in demand
- Asset renewals
- Affordability of the service

The Services We Provide

TDC commits to provide the following Levels of Service:

- Provide safe drinking water
- Maintain excellent water supply network services
- Provide demand management of water supply services
- Deliver affordable water supply services
- Deliver water services according to the required environmental standards
- Maintain excellent customer services

Activity Management Practices

The current practices in managing the Water Supply Activity were assessed by TDC asset managers vis-à-vis an aspired level of practice using the IIMM 2011 AM Maturity Index as guide. Issues were identified and activities to achieve the aspired level of practice are summarized in the AMP Improvement Plan.

The Activity Management Team is comprised of staff of the Drainage and Water Unit of TDC's District Services Group.

Activity management covers the following:

Asset Lifecycle Management

Operational planning is largely carried out through the demand management strategies designed to address particular issues in each water supply. The hydraulic models for the schemes are recalibrated to determine any significant impacts from changes in water use requirements. Formal business continuity planning has been identified as a gap in current practice and is included in the AMP's Improvement Plan.

Maintenance planning is carried out by TDC staff in conjunction with contractors. The role of TDC staff is to identify the preventative maintenance requirements of the schemes and organise the reactive maintenance so that the work is carried out in a cost effective and timely manner.

Preventative maintenance for the networks is issued once at scheduled times during the year and in some areas, twice or thrice yearly. The proactive maintenance packages are issued in bulk for "like" assets to City Care Limited currently contracted to TDC, who respond and report back to Council.

Reactive maintenance is planned for by utilising technology and mainly City Care staff under the direction of Contract 2080. The contract specifies the acceptable repair methods, the maximum response time, sterilisation and sampling requirements as well as qualification requirements.

The maintenance of the plant is carried out by TDC operators during routine visits and who will use specialist assistance when necessary. Maintenance of the reticulation is performed both in-house and by contract Maintenance Contract 2080. The maintenance contract also requires all water shut downs to be reported to Council. A procedure to ensure the MOH is notified if the outage exceeds 8 hours has been established. Council's responsibilities cover pressure and flow management, leak detection, contract supervision and audit, public liaison, and approvals for new connections.

Renewals planning follow cyclic renewal strategies that provide for the progressive replacement of individual assets that have reached the end of their useful life. The rate of asset renewal is intended to maintain the overall condition of the asset system at a standard, which reflects its age profile, and ensures that the community's investment in the District's water supply infrastructure is maintained.

Planning for asset upgrading and building/acquiring new assets is usually driven by the need to comply with mandatory requirements (e.g., Health Act's Drinking Water Standards), address growth in demand, to improve system capabilities or levels of services, or respond to other significant issues. For reticulation assets, the decision to upgrade or build new asset may be driven by the need to ensure security of supply, increase capacity, or to extend the service due to growth and development.

TDC ensures that 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 services are renewed using 'no-dig' techniques or the asset is replaced in a new

location. Similarly, replacement of components at treatment plants and pump stations usually involves disposal of those items being renewed/upgraded. These are disposed of in an appropriate manner with pumps and metal components sold for scrap metal.

Generally, buried assets remain in the ground unless economic to remove or they pose a potential hazard. In all cases asset disposal processes must comply with Council's obligations which include public notification procedures prior to sale, and use of revenue received from asset disposal.

Demand Management

TDC's goal in managing demand is to deliver the agreed Levels of Service through strategies that are appropriate to the requirements of each scheme. Details are in Part B on strategies for managing demand by scheme.

In general, TDC considers the following as the major drivers of demand for water supply services in the District: a) population and household changes; b) industrial/commercial development; c) stockwater demand; d) land use change; e) tourism; f) climate change; g) resource consents and other policy requirements.

Risk Management

The Risk Management Framework adopted for this Activity follows the AS/NZS 4360 (2004, 2009) risk standard. Managing risks permeates all aspects of managing TDC's water supply activity to guard against service level failures. For the current AMP period, the following risks remain as priority concerns in managing our water supplies: a) high demand; b) consent restrictions; c) water availability; d) natural disasters; e) financial; f) climate change; g) operational risks.

Most of the treatments for these risks are already existing business practices. Those that require significant cost to implement (e.g., additional treatment, additional capacity, etc) are being programmed. Specific details on risks and treatments associated with individual water supplies are provided in Part B.

Water Safety Plans (WSP), formerly known as Public Health Risk Management Plans, are required under the Health Act for drinking water schemes. TDC has prepared WSPs on its drinking water supplies. The objective of a WSP is to ensure public water suppliers develop operational practices which will reduce the likelihood of contamination and how to respond and minimise contamination events.

All major plant and reticulation assets have been rated for criticality. The information is held against the assets in the Hansen Asset register and is included in the asset renewal criteria. Part B identifies the critical assets associated with individual water supplies and how they are managed. TDC's Land Transport Unit has been notified of the most critical water supply assets for consideration in their risk management/emergency response plan.

Information Management

Information management for water supply services covers asset data management and customer service information. Information is collected, processed, stored and maintained within various systems that make up the information network. Some component systems are enabled for interfacing to facilitate data accessibility, validation, analysis and reporting. The following are the component systems of the network: a) Asset Information Management System (AIMS) using Hansen 8 Software; b) Corporate Information System using Civica Authority Software; c) Hydraulic models using the InfoWorks Software; d) Geographic Information System (GIS); e) Telemetry (SCADA) using the Abbey System; and f) Water New Zealand Database (WINZ).

Financial Management

The Financial Projections in this AMP are anchored on TDC's corporate Financial Strategy contained in the 2015-2025 Long Term Plan. The Financial Strategy states TDC must manage its finances prudently, while sustainably promoting the current and future interest of the community.

Council is required to adopt a Development or Financial Contributions Policy under section 102 of the Local Government Act 2002 (the Act). Capital contributions are charged when new connections are made to a water supply. The contribution is dependent on the scheme and is calculated from impacts each new connection has on the scheme. The cost of reticulation upgrade that is attributed directly to a property development is recovered from that development as financial contributions under the District Plan. Some schemes do not have a financial contribution but all costs to connect are met by the applicant.

Generally, each water supply is self funding, except with the Timaru, Temuka, Geraldine, Pleasant Point, Winchester, and Peel Forest Water Supplies merged into one Urban Water Supply for funding purposes, with consumer income offsetting expenditure. Each water supply has a set of standard charges based on various units of charging. The standard charges include uniform annual water charge, units of water allocation, connection charges, area charges and extra-ordinary water volume charges.

A 10-year financial projection is prepared for this AMP. DWU asset managers were primarily responsible to develop the expenditure projections from the identified capital and operational works. Unit costs were based on current year dollar prices. The inflation factor will be applied at corporate stage processing of the whole TDC budget. TDC Finance Unit is responsible to finalize the budget.

Part B

Part B discusses asset management at scheme level. It provides a detailed description of the assets in each water scheme, categorized into i) Urban Schemes; ii) Rural Schemes; and iii) Stock Water Only Schemes. It outlines the issues to be addressed within the AMP period and the works planned to address these.

B1. Urban Schemes

The urban water schemes consist of the Geraldine, Peel Forest, Pleasant Point, Temuka, Timaru and Winchester water supplies. They are operated as individual water supplies but funded as a single scheme. Plant and reticulation renewals are common undertakings for all urban water schemes in the next 10 years.

Geraldine Water Supply

The Geraldine Water Supply is an urban water scheme with firefighting capacity. Its water comes from four 12m deep wells/bores near the Orari River. Around 1,438 connections to properties are served. The scheme also supplies stock and domestic water to a portion of the Te Moana Water Supply for some or all of the year.

The asset components of the scheme consist of a bore field with a treatment plant and a reservoir. The treatment plant and reservoir are equipped with telemetry device. There are approximately 25km of water mains within the reticulation.

Major works for the scheme in the next 10 years relate to the implementation of the Geraldine Area Wide Water Supply Strategy. It will address security of supply in the Geraldine area.

Peel Forest Water Supply

Peel Forest Water Supply is a small scheme supplying drinking water to 35 houses in the residential area of the township. The water is piped from a spring through a small treatment plant, where it is chlorinated, and pumped into a storage tank. It is then gravity fed down the main road and into Dennistoun Road.

The asset components of the scheme consist of a spring intake, a pump, a treatment plant, telemetry and a storage tank. The reticulation consists of 1.47 km of PE pipe. The scheme has no fire fighting capacity and it is anticipated to remain this way in the future. The scheme has no capacity for new connections.

Treatment process upgrade is required to improve quality and maintain safety of water supply. Expansion of the treatment facility is underway with renewals programmed within the 10 year period of this AMP.

Pleasant Point Water Supply

Pleasant Point water supply was initially reticulated during the late 1930s as part of the Downlands Water Scheme. Water is now sourced from two bores and an infiltration gallery. The water is firstly aerated and then passes into a 136m3 concrete reservoir. The scheme currently serves 612 connections to properties.

The asset components of the scheme consist of: an infiltration gallery, 2 bores, a pump station, a treatment plant, a reservoir, and telemetry. There are approximately 15.4 km of pipe within the reticulation.

Planned capital works in the next 10 years are aimed to address security of supply and improve fire fighting capacity. These cover headworks, treatment, storage and pumps.

Temuka Water Supply

Temuka water comes from a spring and four shallow wells at Orari and is piped to the Orari Reservoir where it is treated with ultraviolet (UV) light and chlorine to make it safe. The scheme currently serves approximately 2,101 water supply connections.

The asset components of the scheme consist of: a spring intake and 4 bores, a pump station, a treatment plant, a reservoir and telemetry. There are approximately 52.37 km of pipe within the reticulation.

Planned capital works in the next 10 years are aimed to maintain supply during treatment and trunk main outages, as well as to improve firefighting capacity. Works will cover renewal of the trunk main, reservoir and pumps.

Timaru Water Supply

Timaru's public water supply has steadily evolved since initial installation with a water race from the Pareora River during the 1880s. The present supply is a direct surface intake, via a 7 metre high weir, from the upper Pareora River source as well as from an infiltration gallery within the Opihi River. There is no storage available at either source.

The water from the Pareora and Opihi sources is stored at the Claremont Reservoir. From the raw water reservoir, the water passes through ozone treatment, is dosed with chlorine and then pH corrected and pumped into the second reservoir. The treated water reservoir stores approximately four days demand.

The Timaru scheme currently serves approximately 13,016 water supply connections. The asset components of the scheme consist of the Pareora and Opihi intakes, Rosewill pump station, Claremont reservoir and treatment plant, Geniti pump station and reservoir, and approximately 321.78 km of water mains.

The major works planned for the Timaru Water Supply address key issues of security of supply, meeting drinking water standards and improving firefighting capacity, among others. Capital works include renewal of the Pareora pipeline, mains upgrades for firefighting, treatment plant and intakes renewal and upgrades, and an alternative supply main in the Washdyke area.

Winchester Water Supply

The Winchester water supply is a small on-demand scheme supplying the Winchester township. The asset components of the scheme consist of a treatment plant, pumps, storage tanks and approximately 3.75 km of water mains.

Customers of the Winchester Scheme are predominantly domestic or related to a domestic and farming population. The scheme currently has 154 service connections.

Water treatment and source are identified areas for improvement in the next 10 years.

B2. Rural Schemes

Downlands Water Supply

The Downlands Scheme supplies some 78,000 hectares within the Timaru, Waimate and Mackenzie districts. The scheme has 6 intakes with 4 separate reticulation systems.

There is a *Downlands Joint Standing Committee made up of 5 representatives appointed by TDC and 3* members appointed by the Mackenzie and Waimate District Councils to oversee the governance of the scheme. TDC is responsible for the management and operation of the water supply and uses contractors to carry out maintenance work.

The reticulation network of the Downlands Scheme has approximately 987 km of water mains.

Customers of the Downlands Scheme are either residential or farm properties. Water is supplied for domestic and stock water use. It is a restricted supply which requires on-site storage. Security of supply and meeting drinking water standards are the priority focus for the Downlands Scheme in the next 10 years. Major programmed capital works include upgrading of the Te Ngawai trunk main and intake, upgrading of the treatment plant, and increasing storage capacity (raw and treated water).

Orari Water Supply

The Orari water supply is restricted for domestic and stock water use. There are no separate plant facilities held for Orari Water Supply as treated water is supplied from the Temuka Water Supply. There are about 7.95 km of pipes in the Orari reticulation network.

Customers of the Orari Scheme are predominantly domestic or lifestyle property owners. There are currently 134 units rated within the scheme. The scheme has minimal stock water demand.

There are no significant issues identified with the scheme. Demand has remained unchanged. There are no plant assets in the Orari Scheme as treated water is supplied from the Temuka Scheme. Pipe assets are in good condition and renewals are not required in the next 30 years.

Seadown Water Supply

The Seadown scheme supplies both stock and drinking water. There are currently 671 units rated within the scheme. The assets consist of a bore, pumps, treatment plant, reservoir and approximately 172 km of water mains.

The scheme is predominantly a demand system although on-site storage is required for domestic use. TDC supplies water into most troughs and every tank.

Storage renewal, treatment and source upgrade are the priority improvement works in the next 10 years.

Te Moana Water Supply

Customers of the Te Moana Scheme are predominantly domestic or farming. There are no large consumers of water on the scheme. The scheme currently serves 958 connections. Length of reticulation is around 213.51 km.

The Te Moana Intake has no treatment process for protozoal removal. The current preferred option is to purchase all water from Geraldine. Also, the Te Moana scheme has reached its original capacity. Additional water is being purchased from Geraldine to supplement the main intake.

Network capacity upgrades are the major focus of work in the Te Moana Water Supply.

B3. Stock Water Only Schemes

Beautiful Valley Stockwater Scheme

The Beautiful Valley Stockwater Scheme is located approximately 30 km northwest of Timaru. The Scheme is a piped stockwater supply. Length of reticulation is around 18.72 km. There are currently 41 units rated within the scheme. Customers of the Beautiful Valley Scheme are predominantly farm related stock troughs and other stock water facilities.

Beautiful Valley is a very small scheme and no additional water is available at the source. There are no plans to cater for additional demand at present.

There are no significant issues identified. The scheme has no expansion capacity and demand has not changed and is expected to remain unchanged within the AMP period. Improvement of the intake is programmed in Year 10 of this AMP.

Rangitata-Orari Stockwater Races

The RO Stockwater Races has been in existence for many years, drawing water from the Orari River and delivering stockwater via an extensive network of open races eastwards to the coast. The total area of the RO stockwater scheme is around 16,700 hectares. Some significant modifications to the water race network have occurred as a result of the establishment of the Rangitata South Irrigation Scheme in the area which is upgrading then utilizing parts of the races for conveying irrigation water. This will provide a greater reliability in the delivery of stockwater.

A large number of RO ratepayers are also shareholders in the RSI. There are also a number of RO ratepayers who are not irrigation shareholders and who wish to remain on the RO stockwater scheme, and a number of ratepayers who wish to permanently withdraw from the scheme. A number of surveys have been conducted with ratepayers by the irrigation developer and Council and an area of approximately 1,810 hectares has been identified as potentially withdrawing from the stockwater scheme.

A new resource consent will be applied for in 2016. Planned works within the next 10 years will cover renewal of the races and the fish screen.

PART A – OVERVIEW AND GENERAL ACTIVITY MANAGEMENT INFORMATION

1 INTRODUCTION

1.1 ASSET MANAGEMENT PLAN DEVELOPMENT AND REVIEW PROCESS

Plan Development Cycle

The Timaru District Water Supply Activity Management Plan (AMP) is a rolling ten year indicative plan of how Timaru District Council (TDC) will provide water supply services to deliver the agreed levels of service defined in its Long Term Plan. The AMP is updated every three years in line with the Long-Term Plan development cycle. Its structure and content is based on the framework prescribed in the International Infrastructure Management Manual which gives emphasis on the impacts of risk and demand to the Activity and how these are managed (see Figure 1 below).

A Project Team comprised of TDC's Drainage and Water Unit (DWU) asset managers collectively developed and wrote this AMP with inputs from staff involved in the operation and maintenance of the assets.

The AMP is reviewed annually in line with the preparation of the Annual Plan, during which planned works and budgets for the year are firmed-up. The 3-yearly review and updating of the AMP is a more comprehensive process that includes stocktaking of the condition and performance of assets at the time and an assessment of the relevance and effectiveness of the strategies and practices in place. The resulting updated AMP document reflects the improvements and other changes in the water supply activity over the previous plan.

This AMP for the period 2015-2025 is a fifth generation plan for the Timaru District's water supplies. Previous AMPs contain significant information and serve as repository of relevant background material on present management practices.

AMP Format

Part of the improvements in this AMP is its new format. Compared with previous editions, this AMP is organized into two main parts: Part A provides the overview of the Activity and describes the general practices, issues and planned approaches that apply to all the water schemes. Part B provides the specific details on the assets, issues and future works on each scheme. It is intended that this alignment of information will make it easy for any reader to locate the information they require; and for asset managers/decision-makers/stakeholders to easily identify how specific concerns in the schemes relate with the broader objectives of managing the Council's entire water supply activity.

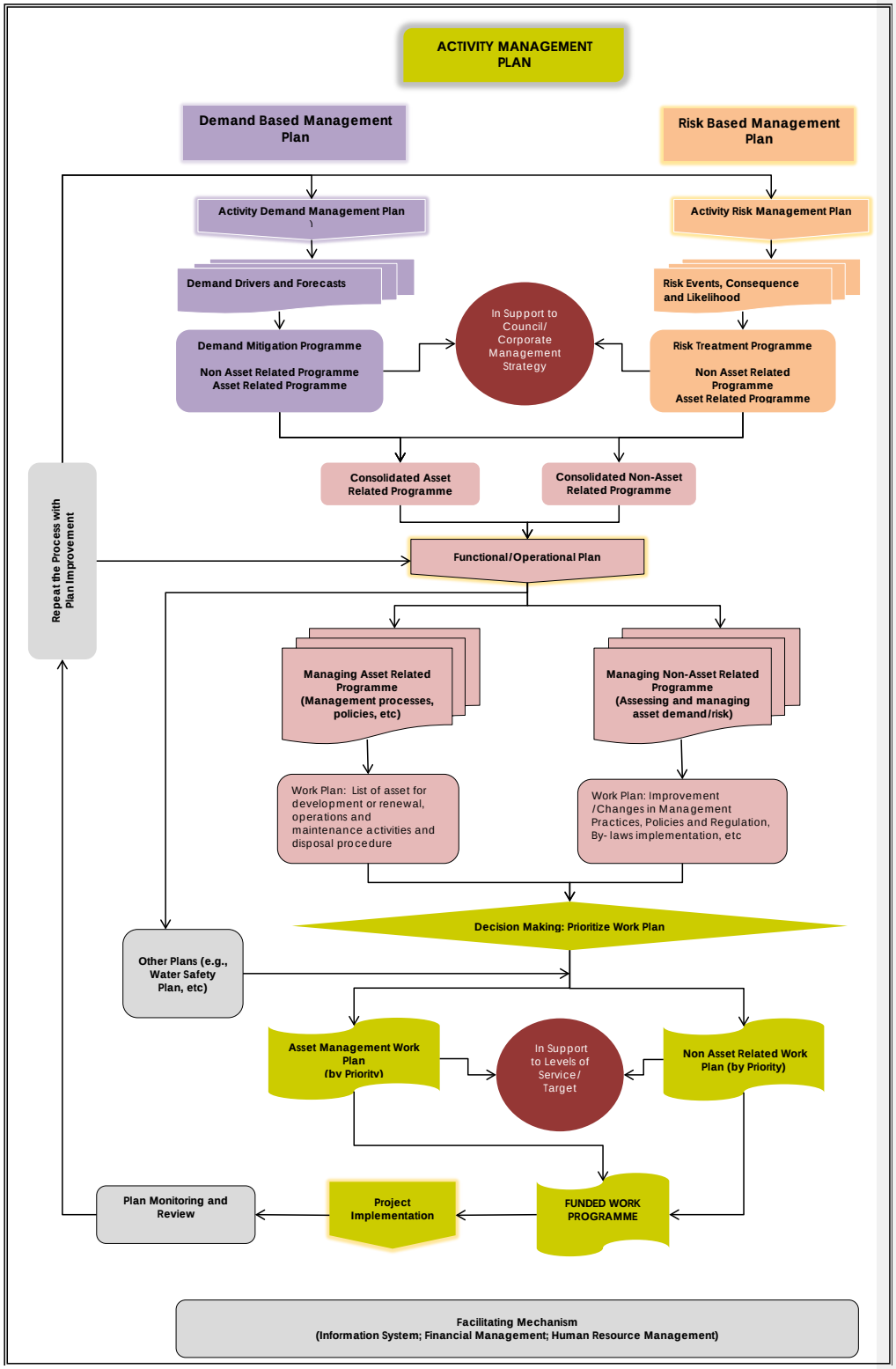

Figure 1: **Water Activity Management Planning Framework**

1.2 OBJECTIVE OF THE PLAN

The objective of the Plan is to address how Levels of Service will be met, as well as how present and future needs will be cost-effectively managed. This will be achieved through a systematic approach in managing the assets and in responding to the changing needs and expectations of the Timaru District water consumers, ensuring that legislation and policies are being complied with, and that there is better targeting of priority works.

1.3 RELATIONSHIP WITH OTHER PLANS AND POLICIES

Internal Plans

This AMP is the mid-level plan in the 3-tier hierarchy of TDC's plans relating to the District's 12 public water supplies (see Figure 2 below).

The Long Term Plan provides the overall direction for the water supply activity. It sets out the Vision, Community Outcomes and Priority Areas to be pursued for the District in the next 10 years. It provides the general planning parameters for water supply services in terms of the projected growth and development of the District, levels of service commitments, and TDC's infrastructure and funding strategies. In 2015 TDC is also required to develop and adopt an *Infrastructure Strategy* covering a period of at least 30 consecutive years. The purpose of the Infrastructure Strategy is to identify significant infrastructure issues and the options for managing them.

This AMP, as the tactical plan, fleshes out the future directions set out in the LTP. It provides the details of how TDC will operate and manage the District's water supply schemes within this AMP period. It has the same 10-year coverage period as the LTP. The budget forecast in this AMP is projected for a 10 year period, making up the first 10 years of the 30-year Infrastructure Strategy. As in previous AMPs, capital works/projects to be carried out in the first 3 years of the Plan are identified in detail. The remaining 7 years are provided in outline with only indicative levels of capital funding requirements. The AMP is reviewed and updated alongside the 3-yearly review of the LTP.

The Annual Plan translates the AMP into a yearly programme of action. It contains a firmed-up list of capital works/projects that address specific issues on asset condition and performance, demand and risk. Performance against the Annual Plan is reported yearly in TDC's Annual Report, highlighting the Activity's contribution to the Community Outcomes set out in the LTP.

Other internal plans

There are other TDC plans considered in this AMP, such as the Timaru District Plan, which for example may influence changes in demand for water arising from land use changes. The District Plan also provides guidance on financial contributions relating to water supply infrastructure provided by TDC.

This AMP also endeavoured to be consistent with the direction of other TDC Activity Plans that impact on water supply services (e.g., buildings, parks and recreation, etc).

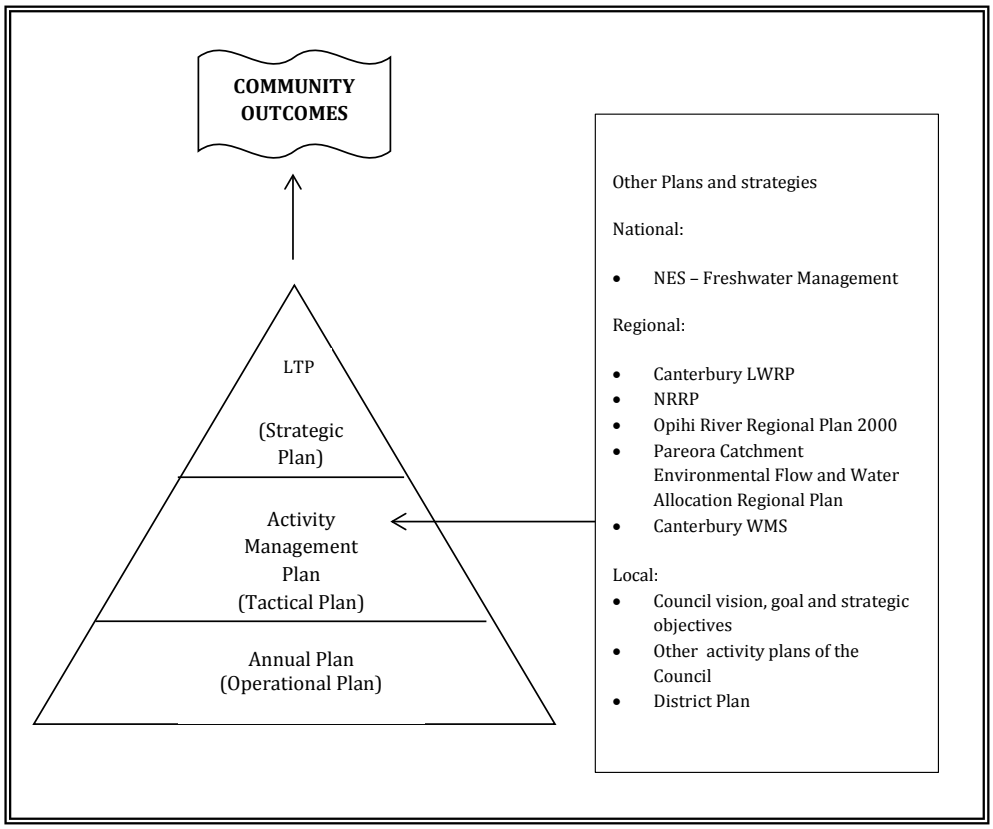

Figure 2: TDC Hierarchy of Plans

External Plans and Policies

TDC recognises the role of other bodies involved in the water sector. This AMP is guided by the policies, requirements and strategies in the following documents that evolved from the Resource Management Act 1991. The provisions in these plans/policies impact on the operation and management of Timaru District's public water supplies:

1. Canterbury Regional Policy Statement (CRPS)

   The Canterbury Regional Policy Statement sets the framework for resource management in Canterbury. It provides an overview of the significant resource management issues facing the region, and sets out objectives, policies and methods to address the region's resource management issues. Its goal is the integrated management of the region's natural and physical resources.

Territorial authorities must give effect to the CPRS through their District Plan. The District Plan, as stated in "Other internal plans" above may influence changes in demand for water arising from land use changes.

2. Canterbury Land and Water Regional Plan (LWRP)

   The decisions version of the proposed plan was released in December 2013. At June 2014 this plan has had 8 appeals and will be fully implemented after the Environment Court Hearing expected to be in early 2015. This establishes rules for land and water management throughout Canterbury.

   The plan is in 16 sections. Those relevant to TDC are sections 1 and 2, introducing the plan and how it operates; Sections 3-5 the Objectives, Policies and Region-Wide rules; and Section 14 – the rules within the Orari-Opihi-Pareora (OOP) Zone. All TDC water supplies are within the OOP Zone.

   A major focus of the plan is to halt deterioration of the land and waterways, initially by nutrient management, until the Zone rules set out how each community wishes to best manage the resources within its zone. The OOP Zone chapter is due for release in 2017/18.

3. Natural Resources Regional Plan (NRRP)

   This plan sets out the rules for the management of all natural resources within Canterbury. It is currently operational, although the proposed LWRP is also taken into consideration. Once the LWRP is fully implemented, only the air quality chapter will remain in effect.

4. Canterbury Water Management Strategy (CWMS)
   The Canterbury Management Strategy commenced in 2010. It provides for a collaborative management of Canterbury's water resources to better balance environmental and economic goals. It is implemented through CWMS zone committees who work collaboratively to develop effective water management solutions that deliver economic, social, cultural and environmental outcomes in consultation with the local community. TDC is a member of the Orari-Opihi-Pareora Zone Committee.

5. Opihi River Regional Plan 2000 (ORRP)

   This Plan provides outline in terms of water allocation and discharge of water to water bodies within the Opihi Catchment. This will be amended and incorporated within the review of the OOP Zone in 2017/18.

6. The Pareora Catchment Environmental Flow and Water Allocation Regional Plan - This sets out how water quantity will be managed primarily through low flow restrictions with limited water harvesting. The plan encourages TDC to release water from the Pareora Pipeline in the spring to sustain the flow within the Pareora River.

1.4 RELATIONSHIP WITH LEGISLATION

The approaches in this AMP are circumscribed by the requirements of the following legislation:

The Local Government Act 2002 (LGA)

This Act defines the purpose of local government as including meeting current and future needs of communities for good quality local infrastructure that is most cost effective for households and businesses, where good quality infrastructure means efficient, effective and appropriate to present and anticipated future circumstances. Part 6 of the Act prescribes the processes and content of the Long Term Plan, Annual Plan, Annual Report and Infrastructure Strategy. Part 7 sets out specific obligations and restrictions in relation to the delivery of water services. Schedule 10 of the Act outlines the requirements for Council's long term plans. AMPs provide key inputs to long term plans for infrastructure activities managed by local authorities such as water supply services.

The Health Act 1956

This Act places 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.

In 2007 amendments to the Health Act imposed a range of duties on drinking water supplies, including duties to monitor drinking water, and take all practicable steps to comply with the New Zealand Drinking Water Standards. Water Safety Plans are required to be developed and implemented for all water supplies, with the smallest supplies due by 2016.

The Drinking Water Standards for New Zealand (DWSNZ)

The Drinking Water Standards for New Zealand 2005 (Revised 2008) contain comprehensive information for owners and operators to assist in the management of public and private drinking-water suppliers. The DWSNZ specifies the maximum acceptable value (MAV) of determinants within drinking water along with the compliance criteria (sampling and monitoring) and reporting requirements, and remedial actions.

The Resource Management Act 1991 (RMA)

This Legislation promotes the sustainable management of natural and physical resources.

It describes the functions of Regional Councils and Territorial Authorities under this Act, including the establishment, implementation and review of objectives, policies and methods to achieve integrated management of the resources. The RMA requires local authorities to recognise national environmental standards, national policy statements and regional plans, and prepare, implement and administer district plans. Compliance with the RMA is achieved through resource consents compliance.

The National Policy Statement for Freshwater Management 2014 (NPS-FM)

The NPS took effect on 1 August 2014, superseding NPS-FM 2011. It directs regional councils to consider specific matters about fresh water when they are developing regional plans for fresh water. Decision-makers under the RMA must have regard to the NPS in consenting decisions. The Freshwater NPS is intended to drive national consistency in local RMA planning and decision-making while allowing for an appropriate level of regional flexibility. The NPS sets in place a strengthened limits-based regime for water management.

National Environmental Standard for Sources of Human Drinking Water

Regional Councils are required to ensure that effects of activities on Drinking Water Sources are considered in decisions on Resource Consents and Regional Plans. ECan does this by including Community Drinking Water Protection Zones in the NRRP and LWRP.

The RMA (Energy and Climate Change) Amendment Act 2004

This Act amended the RMA (1991). It requires Local Authorities to plan for the effects of climate change.

Civil Defence Emergency Management Act 2002

This Act requires a local authority to ensure it is able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency; and to plan and provide for civil defence emergency management within their own district. These duties are in addition to the requirement to be part of, and carry out the functions and obligations of a member of, a CDEM Group.

The Building Act 2004

This Act provides a regulatory framework for building work, establishes a licensing regime and sets performance standards to ensure buildings have attributes that contribute to the health, safety, physical independence and wellbeing of people, including provision of safe water supply.

Timaru District Consolidated Bylaw 2013

Section 146 of the Local Government Act 2002 provides that a Territorial Authority may make Bylaws in its district for purposes of regulating, managing, protecting or for preventing the use of the land, structures, or infrastructure associated with water supply services. Chapter 15 of the Timaru District Consolidated Bylaw 2013 applies to water supply and other water services provided by the Council.

Mandatory Non-Financial Performance Measures Rules 2013

The Local Government Minister has required local authorities to incorporate mandatory performance measures for water supply services in the development of their 2015-2025 long-term plans. These measures will be reported against levels of service in the 2015/2016 annual reports.

The Health and Safety in Employment Act 1992

Council must ensure the safety of the public and all workers (including contractors) when carrying out works.

1.5 KEY RELATIONSHIPS

Within the TDC organisation, DWU as the primary implementer of this Activity reports to and liaises with the District Services Committee (DSC) on governance and policy concerns requiring resolution or approval at the Council Committee level. The DSC is composed of elected members of the Council.

DWU also collaborates with other units within TDC for their various roles relevant to the effective delivery of water supply services. These include the corporate planning and finance units of the corporate services group, transport unit, district planning and building units of the regulatory services group, IT unit and customer services.

Externally, TDC shares governance of the Downlands Water Supply with the District Councils of Mackenzie and Waimate. There is a Downlands Water Supply Joint Standing Committee made up of 5 representatives appointed by TDC and 3 members appointed by the Mackenzie and Waimate District Councils to oversee the governance of the scheme.

TDC maintains relationship with the community boards of Geraldine, Pleasant Point and Temuka. The boards provide venue for discussing community issues that may include water concerns.

TDC also maintains relationship with ECan and the Canterbury DHB for coordination and guidance in complying with resource consents and drinking water standards, respectively.

Works and/or services contracting is a service delivery mode used by TDC for major water supply projects and reticulation maintenance. Regular liaison with contractors helps ensure effective and efficient delivery of services.

Stakeholders

We consider individuals and/or groups that have direct or indirect use of TDC's water supply services as stakeholders in our Activity due to the interests they represent as consumers, regulators or as advocates for the environment and other socio-cultural concerns. They include:

- Timaru District residents, ratepayers and visitors
- Local industries and businesses
- Community groups
- Civic organisations
- Te Runanga O Arowhenua
- Other governmental bodies

Their interests are considered in the design of this AMP.

2 THE ACTIVITY

2.1 ACTIVITY DESCRIPTION

The Water Supply Services Activity covers the safe and effective taking of water from the source; and its treatment, storage and distribution to urban and rural parts of the District. Quality water is delivered for residential, commercial, industrial and stockwater purposes. Water is not supplied for irrigation or horticultural purposes.

This AMP covers the 12 water supplies being managed by TDC's Drainage and Water Unit, namely:

> *Six (6) urban drinking schemes for Geraldine, Peel Forest, Pleasant Point, Temuka, Timaru and Winchester;*
>
> *Four (4) rural drinking schemes for Downlands, Orari, Seadown and Te Moana; and*
>
> *Two (2) stockwater schemes for Beautiful Valley and Rangitata-Orari*

The urban schemes are on-demand at the tap.

The rural drinking water and stockwater schemes are flow control supplies (using restrictors) to storage tanks, except the Seadown scheme which supplies directly to stockwater troughs.

The Rangitata-Orari water race scheme supplies stockwater to water races on or adjacent to scheme properties.

Refer to Appendix 1 for summary information on the components of the schemes and to Appendix 2 for the location of the schemes.

This AMP does not cover the water supplies for the Stratheona Huts and Rangitata Huts which are managed by TDC's Property Unit.

2.2 ACTIVITY RATIONALE

TDC's involvement in water supply services emanates from the purpose of local government, as stated in the Local Government Act 2002, which "provides for local authorities to play a broad role in meeting the current and future needs of their communities for good quality local infrastructure, local public services and performance of regulatory functions." (Part 1, Section 3d).

Water supply services are vital to the quality of life and public health of Timaru District's residents. The rationale for TDC's involvement in water supply services was resolved in 1997 and remains, as follows:

"It is currently seen as being for the collective benefit of the Community for Council to act on behalf of the users to provide water supply services, and there is also a community health factor benefit."

2.3 Activity Contribution to Sustainable Development

The Principles Relating to Local Authorities stated in Section 14 of the Local Government Act 2002 provides that: "in taking a sustainable development approach, a local authority should take into account -

- the social, economic, and cultural interests of people and communities;
- the need to maintain and enhance the quality of the environment; and
- the reasonably foreseeable needs of future generations."

The IIMM 2011 defines sustainability as "the capacity to endure; in the context of AM it is about meeting the needs of the future by balancing social, economic, cultural and environmental outcomes or needs when making decisions today."

The principle of sustainability is reflected in the statement of the Activity Rationale (Section 2.2) which, in line with the purpose of local government, seeks to meet current and future needs of communities. Specifically, the following practices demonstrate specific ways by which TDC is actively integrating sustainability in various aspects of delivering water supply services:

1) Staff have been actively involved in community groups established by ECan to determine the rules for managing the environmental flow requirements to sustain and ultimately improve the health of the rivers.

   Section 14 of the LWRP, the section which covers all TDC takes is due for a review in 2017/18. Included in the review will be sub-regional rules which may differ from the regional rules set out in the LWRP. To facilitate the review a number of additional catchment groups are being established. TDC will participate in the review via these community groups.
2) Less reliance on chemical inputs in water treatment processes
3) Promoting sustainable consumption of water through consumer education and technical assistance provided by TDC
4) Leakage reduction in the network system
5) Application of asset management practices to facilitate asset renewal at the most appropriate time considering age, material type, maintenance history, and other asset condition factors
6) Carbon footprint reduction through lower energy use (e.g., preference to gravity over pumps in water scheme designs)
7) Equitable use of water resources through metering of large users

In the future, TDC may look at including a criteria at design stage to reduce "embedded carbon" in its water infrastructures, such as use of eco-friendly materials and processes.

Within this AMP period, TDC will adopt core indicators for monitoring the sustainability of its water supply operations.

2.4 SIGNIFICANT EFFECTS OF THIS ACTIVITY

This Activity is intended to have significant positive effects. These are the benefits accruing to the community from:

- efficiency gains from systems that ensure safe, collective treatment and distribution of water
- high quality water that is essential to operate businesses and provide critical public services (e.g., hospitals) in the District
- infrastructure services that deliver stock water requirements and promote agricultural growth
- potable water supplies that sustain healthy living

Conversely, issues may occur while carrying out this activity, potentially resulting in the following negative impacts:

- Depletion of water sources due to high demands
- Substantial costs incurred by businesses due to unavailability or severely restricted use of water
- Water charges becoming unaffordable to consumers as Council tries to recover the added cost of improvements to meet legislated water safety requirements
- Increased charges borne by ordinary consumers when a major industrial customer leaves or stops operating in Timaru

To mitigate these anticipated negative effects, Council will continue to carefully investigate options regarding available sources and their management. Preservation of the District's water resources is an important sustainable development issue. Council will improve water use efficiency measures through timely repair of network defects and increase consumer education on water conservation.

TDC will also continue to investigate options for water supply treatment and to implement appropriate measures for increasing operational efficiency of water supply services to maintain affordability of water charges.

3 STRATEGIC DIRECTION

This AMP is guided by the strategic direction set out in the Timaru District's Long Term Plan 2015-2025 Vision, Outcomes and Priorities.

3.1 VISION, OUTCOMES AND PRIORITIES FOR TIMARU DISTRICT

TDC has a four-pronged Vision for the District outlined as follows:

> *Lifestyle* - fantastic sustainable lifestyle second to none. We live in a pretty special place. We want to keep it that way. We want to make it even better for ourselves, our children, their children.
>
> *Economy* - thriving and innovative economy where opportunities abound. Our economy is essential to our future. We need it to grow innovatively and sustainably.
>
> *Identity* - strong and enviable reputation and identity. We want to forge and strengthen a reputation and identity that other districts may aspire to.
>
> *Leadership* - inspiring, people-focused leadership. We want a district where we build on our strengths, minimise our weaknesses, challenge our threats and grasp our opportunities. This takes leadership.

To realize the Vision, TDC aims to achieve the following Community Outcomes:

1 High quality infrastructure to meet community and business needs
2 Smart economic success supported and enabled
3 Communities that are safe, vibrant and growing
4 People enjoying a high quality of life
5 A strong identity forged and promoted
6 A valued, healthy and accessible environment

TDC has identified the following four priority areas it believes are essential to enable it to work towards the Vision and Community Outcomes:

> Priority 1: Investing in community
>
> Priority 2: Promote integrated, highly liveable communities
>
> Priority 3: Support areas of economic and district strength
>
> Priority 4: Ensure critical infrastructure meets future needs

3.2 ACTIVITY CONTRIBUTION TO DISTRICT VISION, OUTCOMES AND PRIORITIES

Water Supply Services has primary contribution through its direct inputs to five of the six Community Outcomes as summarised in the Table below. It has secondary contribution to the "identity" outcome through its support to a quality of life that Timaru District can be proud of.

The Activity directly contributes to the District's four strategic priorities.

Table 1 outlines what will be done and the corresponding management measures.

Table 1: Water Supply Activity Contribution to Outcomes and Strategic Priorities

VISION	COMMUNITY OUTCOMES	WATER SUPPLY ACTIVITY CONTRIBUTION TO OUTCOMES	WATER SUPPLY ACTIVITY SUPPORT TO STRATEGIC PRIORITIES	
			STRATEGIC PRIORITIES	WATER SUPPLY ACTIVITY SERVICE STATEMENT
Lifestyle We live in a pretty special place. We want to keep it that way. We want to make it even better for ourselves, our children, their children. **Economy** Our economy is essential to our future. We need it to grow innovatively and sustainably **Identity** We want to forge and strengthen a reputation and identity that makes us the envy of other places. **Leadership** We want a district where we build on our strengths, minimise our weaknesses, challenge our threats and grasp our opportunities. This takes leadership.	High quality infrastructure to meet community and business needs	Provision of quality water systems that meet the District's needs	Investing in community Promote integrated, highly liveable communities Support areas of economic and District strength Ensure critical infrastructure meets future needs	Provide good quality potable water to the District communities Ensure sustainable water quantities are available for urban, business and rural needs Plan for water supply infrastructure to meet future community needs Ensure adequate water available for emergency situations
		Provision of water systems that cater for future growth and development.		
	Smart economic success supported and enabled	Provision of cost-effective water services.		
	Communities that are safe, vibrant and growing	Provision of safe drinking water that protects and maintains public health and the environment.		
	A valued, healthy and accessible environment			
	People enjoying a high quality of life	Provision of water systems that showcase excellent customer service standards.		
	A strong identity forged and promoted	Support to quality of life that Timaru District can be proud of		

3.3 ISSUES IN THE NEXT 10 YEARS

The following issues will have an impact on TDC's water supply services in this AMP period. Their significance at scheme level of operations has been assessed with details provided in Part B under Summary of Issues.

1 Meeting drinking water standards – under amendments to the Health Act, TDC is required to take all practicable steps to comply with the Drinking Water Standards for New Zealand (DWSNZ) for all drinking water supplies. An approved Water Safety Plan (formerly Public Health Risk Management Plan) must be implemented addressing identified public health risks within set timelines. Some high and extreme risks have been identified in a number of TDC operated water supplies, largely requiring upgrading of water treatment processes and construction of water treatment infrastructure. Upgrades of water treatment facilities have already been completed at Pleasant Point, Temuka, Seadown and Pareora township (Downlands). Upgrades are planned for the remaining drinking water supplies. Rationalising water supply scheme intakes and treatment plants will be considered as part of the process.

2 Changes in national/regional plans and policies – water is a highly regulated resource, with national and regional policies, standards and plans directing how Council must utilize it (i.e., quantity of takes, quality of drinking water supplies, etc). These regulations are continually evolving with associated changes in requirements that impact on Council's operation of its water supplies. An example is the Canterbury Land and Water Regional Plan which will replace the relevant provisions of the NRRP on water supplies. More stringent water management under the LWRP may mean higher resource consent requirements for TDC's water supplies. Council must comply with these policy and regulatory requirements to continue to operate its water supplies. TDC's plans must consider the work and budget implications of these regulatory requirements.

3 Effects of climate change – increased frequency of droughts diminishes the availability of source water and has associated water take restrictions; increased frequency of high intensity rainfalls impact on raw water quality and the need for more complex treatments. TDC will continue to carefully investigate options regarding available sources and their management.

4 Meeting changes in demand – meeting the water supply requirements of consumers is the paramount objective of TDC's water supply services. However, there are many competing considerations of the use of water, such as recreation to industry use. These competing demands place pressure on water resources in the Timaru District. The schemes managed by TDC are subject to resource consent conditions which limit the amount of water that can be taken from the source. Significant growth in demand for TDC's water supplies may result in the need for substantial infrastructure upgrades.

While population and household growth in the District is not expected to have significant impact on water supply requirements over the next 10 years, land use change and industry growth may potentially have major impacts in terms of infrastructure and the quantity of water required.

Six of the 12 schemes supply water for stock use. Most of these schemes have on-farm flow control (restrictors) and currently have limited ability to meet any future increases in agricultural demand. TDC needs to continue to investigate options to improve delivery mechanisms in several schemes, including Downlands, Seadown and Te Moana.

TDC needs to consistently advocate for improved consumer use of water to ensure that the Council's water supplies continue to meet demand now and in the future.

5 Asset Renewals – a significant amount of the District's water supply network will need replacing based on age and performance issues. An assessment based on the remaining life of the pipe assets indicates there are significant renewal costs in the next ten years. TDC is carrying out further pipe condition assessment based on other factors such as asset performance and maintenance history in order to confirm the renewals programme.

6 Affordability of the service – consumers expect good quality water to be available on demand in reasonable quantities at a reasonable price. The cost of water is likely to increase over the next 10 years as the above issues are addressed. TDC will continue to investigate options for water supply in order to provide the most cost effective service. Charges will be monitored and set at as affordable level as possible.

4 THE SERVICE WE PROVIDE

4.1 CUSTOMER PROFILE

Who are our customers?

TDC's 12 water supplies serve urban and rural customers for a range of purposes including domestic, commercial, industrial and stockwater use. These supplies do not cater to irrigation or horticultural users.

How do we engage with our customers?

There are several avenues that TDC makes available for customers to provide feedback on water supply services. This AMP is informed by comments gathered from consumers through the following:

a. Customer service desk – for lodging service requests and feedback on services (i.e., comments, complaints etc)
b. TDC website - option to carry out water services transactions and/or provide feedback online
c. Inspections – visit by TDC technicians/officers/agents. It provides an opportunity for customer feedback
d. Notice board – for disseminating information as well as gathering feedback on TDC activities
e. Public forum (during Council or Community Board meetings) – opportunity for members of the public in general to ask questions of, or put a particular case to the Council or the Community Board on policy matters or matters relating to a particular ward, including water supply concerns.
f. Special consultative procedures on the LTP and Annual Plan consultations – for gathering comments, suggestions and other submissions on proposals contained in the plans
g. Specialised customer survey/research – needs-based study of consumers who may be affected by particular water supply issues
h. Community survey - a survey of users/public satisfaction with TDC's services including water supply
i. Specialised stakeholder meetings – needs-based meetings with identified stakeholder and special interest groups regarding particular water supply issues.

We will continue to rely on these mechanisms to get customer feedback on the performance of the water supply services and determine any gaps in the levels of service.

4.2 KEY SERVICE DRIVERS

The Levels of Service in this Activity are primarily driven by the need to meet legislated requirements, to fulfil customer expectations, and to maintain affordability of the service.

Key Legislation

Local Government Act 2002 – Section 10(1)(b) of the Act states that the purpose of local government is to meet current and future needs of communities for good quality local infrastructure in a way that is most cost effective for households and businesses. Section 10(2) of the Act defines good quality as efficient, effective and appropriate to present and anticipated future needs. TDC ensures it adheres to this mandate through the life cycle management of the water supply assets.

Resource Management Act/Resource Consents - TDC has a number of consents to take water. Several recent consents, such as Temuka, allow for the total volume of take to come from several sources, which makes operations simpler regarding consent compliance on this matter. Annual volumes are being imposed as consents are renewed. Only the Beautiful Valley and Te Moana River consents have no capacity left for additional demand. The Rangitata-Orari scheme and Pareora River consents expire in the term of the AMP. Other consents are held to enable maintenance of pipes and operation of intakes usually within rivers as necessary. Only Downlands and the Pareora pipeline have consents that allow reticulation maintenance in rivers or creeks.

Health Act/Drinking Water Standards New Zealand - The Health Act states “every drinking-water supplier must take all practicable steps to ensure that the drinking water supplied by that supplier complies with the drinking-water standards”, and “a drinking water supplier complies with subsection 1 if the supplier implements those provisions of the supplier’s approved water safety plan relating to the drinking water standards.”

Only Geraldine, Pareora township, Pleasant Point, Seadown, Temuka and Timaru have treatment capable of meeting the DWSNZ, but operations to fully comply are difficult.

Compliance with the DWSNZ will require significant treatment upgrades for the remaining water supplies. Disinfection processes will not be adequate.

Local Government Non-Financial Performance Measures Rules - These Rules set out mandatory performance measures that Council will need to monitor, measure and report on from 2015. There are 7 performance measures for reporting on water supply services specified in these rules.

Customer Expectations and Affordability

Consumers expect that TDC's water supply services will match the demands and growth of the Timaru District. There is often an expectation that water supply services will be available for new development areas and for expansion of delivery areas on the periphery of existing networks.

Consumers generally need to feel that they are getting value for the rates and charges they pay. When rates and charges increase, the community consequently expects that there will be an improvement in the services they receive, either in the form of reduction in issues or higher quality of customer care.

The recent Community Survey held April/May 2014 gathered feedback from direct users as well as the general public on Council's water supply services. It is notable that there is an uptrend in user as well as in the overall/general public satisfaction with our water services over the last 3 survey periods (2014, 2011 and 2008). Survey respondents were also highly satisfied they are getting good value for their money in our services.

4.3 LEVELS OF SERVICE

The Levels of Service (LOS) for this Activity describe the standard of service that TDC commits to provide to realize the envisaged Community Outcomes, as shown in Table 2 below.

Table 2: Community Outcomes and Water Supply Activity Levels of Service

COMMUNITY OUTCOMES	ACTIVITY CONTRIBUTIONS TO OUTCOMES	CUSTOMER CORE VALUES	LEVELS OF SERVICE
High Quality Infrastructure to meet community and business needs	Provision of quality water systems that meet the District's needs.	Quality	Provide Safe Drinking Water
			Maintain excellent water supply network services
	Provision of water systems that cater for future growth and development.	Responsiveness	Provide demand management of water supply services
Smart economic success supported and enabled	Provision of cost-effective water services.	Affordability	Deliver affordable water supply services
Communities that are safe, vibrant and growing	Provision of safe drinking water that protects and maintains public health.	Safety	Deliver water services according to required environmental standards
A valued, healthy and accessible environment			

COMMUNITY OUTCOMES	ACTIVITY CONTRIBUTIONS TO OUTCOMES	CUSTOMER CORE VALUES	LEVELS OF SERVICE
People enjoying a high quality of life	Provision of water systems that showcase excellent customer service standards.	Efficiency	Maintain excellent customer service
A strong identity forged and promoted	No direct contribution	n/a	n/a

The Levels of Service represent a balance between the desired service standard and the cost of providing it. These were established formally with the development of Council's Long Term Council Community Plan in 2003, and have been reviewed during each of the 3-yearly updating cycles of the Long Term Plan.

TDC's Annual Reports for the past plan periods (2003-2015) showed that Council has met most of the LOS for this Activity. The Community Survey done in 2014 indicated that TDC customers were generally highly satisfied with the services they received.

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There are no significant changes in LOS statements identified in this AMP. Improvements are as follows:

- "Provide water supply services that meet community demand" reworded as "Provide demand management of water supply services"
- "Minimise unplanned interruption to water supply services" reworded as "Maintain excellent water supply network services"
- "Provide water with an acceptable taste, odour and appearance" was combined with "Maintain excellent customer service", in line with the new reporting requirement on mandatory performance measures (discussed later in this Section).

A LOS review for each water supply scheme is planned within this AMP period to assess LOS options and costs in consultation with communities.

Performance Measures and Targets

Performance measures and targets have been defined for each LOS to compare actual outcomes against standard or desired outcomes. TDC has a mix of customer and technical performance measures, the core of which are monitored for the Annual Report. The technical measures relate to legislative compliance and asset performance while the customer performance measures relate to quality of service and value for money.

A number of the technical measures are also held for internal monitoring by DWU of its organizational performance, as the primary manager of this Activity. These internal measures are not included in the Annual Report to the public.

As an improvement in this AMP, some enhancements (bold print in Table 3 below) were carried out on performance measures and targets to reflect realistic goals within the AMP period.

Table 3: Performance Measure and Target Improvements

Level of Service	Performance Measure	Target
Maintain excellent water supply network services	Water supply pressure provided at service connection for urban schemes (internal)	**Report on complaints of inadequate water supply at point of supply (urban)**
	Flow at service connection for rural schemes (internal)	At least **95%** of rural scheme service connections have a normal minimum operating pressure of >150kPa as predicted by hydraulic models
		Report on notifications of inadequate water supply at the point of supply for rural schemes
	Outages to urban **and rural** scheme properties (LTP)	**All outages >8 hours reported to the Ministry of Health (MOH)**
Provide safe drinking water	**Comply with Water Safety Plan as audited by Drinking Water Assessor** (internal)	**Full compliance**

Local Government Mandatory Non-Financial Performance Measures

Of particular note in this AMP is the inclusion of the *Non-financial Performance Measures* mandated by the Local Government Minister to be incorporated in the LTP 2015-2025. Council is required to report to the Local Government Minister on these performance measures.

While these mandatory measures coincide with TDC's existing performance measures for water supply services, there will be significant work involved in complying with the required reporting details. TDC will develop datasets fitted to this mandatory requirement.

Refer to Appendix 3 **for the detailed table on Levels of Service, Performance Measures and Targets for the period 2015-2025.**

4.4 SERVICE DELIVERY

TDC owns all the infrastructure assets although the Downlands Water Supply assets are shared jointly with Timaru, Waimate and Mackenzie District Councils on a 82:14:4 ratio respectively. Core service functions of asset operation and management, inspection, project supervision and customer services are carried out in-house by staff of TDC's DWU, as shown in the organizational chart in Appendix 5.

To augment in-house capacity, TDC uses private contractors on a needs basis to carry out identified tasks such as: i) maintenance and repair of the water pipes network; ii) physical works to build or renew assets; iii) some pre-engineering/engineering designs; and iv) special studies in support of planning/policy development. In general, contracting of works/services to the private sector is permissible and justified for reasons of cost effectiveness and when a specialist skill is required.

Contract Management

TDC's civil works procurement and contract administration is governed by the provisions of NZS3910 NZ Standard Conditions of Contract for Building and Civil Engineering Construction. TDC is implementing the adoption of the 2013 version of this standard. Previous contracts have used the 2003 version. Relevant provisions of NZS3910 are also used to procure and administer service contracts, such as for maintenance works, consulting services, etc.

The maintenance of the reticulation is contracted out in a single contract, currently Contract 2080 (TRIM document #812087). The Maintenance Contract requires the contractor to have qualified staff to deal with all systems malfunctions within the specified response times. When urgent repairs are required, the Maintenance Contractor is authorised to undertake all work as necessary to make the asset safe, or to stabilise the site/situation.

Although the facilities' operations are carried out by TDC in-house operators, assistance for specialist work is often contracted out. A variety of engineering firms assist and Industrial Controls South Canterbury do most of the electrical work.

The DWU has a register of Approved Contractors (TRIM document #444130) who are authorised to work on the TDC reticulation once appropriate approvals are obtained, either through the service consent or engineering plan approval processes. New connections where the consumer meets all the costs must be done by any approved contractor.

A Contractors Liaison Meeting is held annually to discuss issues and provide an indication of Council's yearly work programme.

TDC has noted the requirements in Section 17A Delivery of Services Review of the Local Government Amendment Act 2014 and will undertake any necessary actions that apply to water supply services within the timeframes set by the law.

5 ACTIVITY MANAGEMENT PRACTICES

OVERVIEW

The TDC Asset Management Policy adopted in 2008 (TRIM document #882510) sets a standard methodology for determining the appropriate practice in managing Council's assets. The office of the Auditor General cited the policy in its report on "Asset Management for Local Entities: Learning from Local Government Examples" as a case study on "Essentials of Asset Management" (TRIM document #647170). In particular, the report stated "Asset management needs a planned approach with those involved well-organised and clear about what is expected of them. An asset management policy can be a good way to set this out".

The objective of the Policy is to ensure that Council's service delivery is optimised to deliver agreed community outcomes and levels of service, manage related risks, and optimise expenditure over the entire lifecycle of the service delivery, using appropriate assets as required.

The Asset Management Policy requires that the management of assets be in a systematic process to guide planning, acquisition, operation and maintenance, renewal and disposal of the required assets. Delivery of service is required to be sustainable in the long term and deliver on Councils economic, environmental, social, and cultural objectives.

For this AMP and using the IIMM 2011 AM Maturity Index as guide, TDC re-examined the current activity management practices, identified the gaps/issues and set out an aspired level of practice to be achieved in the next 10 years.

Twelve areas of activity management practices were examined. A number of these are currently at Core level while a few are Advanced. Generally, the practices are between Core and Intermediate levels of maturity. Result of the gap assessment is shown in Appendix 4. The Improvement Plan in Section 8 shows what TDC will do in the next 10 years to achieve the appropriate practice.

The following sections describe TDC's current general practices in managing this Activity. Part B sets out the specific details in managing the Activity on a scheme level.

5.1 ASSET MANAGEMENT TEAM

The DWU of TDC's District Services Group is responsible to operate and manage the 12 public water supplies. Skills required of staff are reflected in the position titles as shown in Appendix 5 (Drainage and Water Organizational Chart). Individual position descriptions provide the scope of staff responsibility in the Activity.

The aim of this AMP is to set realistic and achievable goals within the term of the plan. Greater emphasis is being placed on the responsible management, distribution, operation and maintenance of existing and future water sources as required by legislations such as the Health Act and by regional plans such as the LWRP.

Activity management practices are carried out to TDC's standard of service quality, policies and approved procedures; and in accordance with Council's adopted industry-recognised or accepted technical standards of practice, as contained in the following key documents:

- TDC Corporate Management Policies
- TDC Health and Safety Manual
- Drainage and Water Code of Practice
- NZ Water Industry Code of Practice on Water Meter
- NZ Water Industry Code of Practice on Backflow Prevention
- Operations Manual (by water scheme)
- NZ Engineering Standards
- Local and International Best Practice
- Other industry-recognised standards

This AMP, as well as previous AMPs, serves as repository of information that will assist staff, particularly those new in the service, gain knowledge of the history of the Activity including awareness of how business practices have evolved, gaining insight into the improvements that have been carried out. Having AMPs mitigates the risk associated with staff leaving the organisation as it helps institutional knowledge to be passed on, for continuity of organisational culture.

There is scope for increasing efficiency in carrying out staff functions. Better coordination of tasks and more formalized documentation and reporting procedures are planned improvement areas within this AMP period.

The Drainage and Water Code of Practice will be updated in line with developments in industry practice and standards and to address deficiencies and/or requirements identified by staff.

TDC will continue to assist capacity development of staff through upskilling and projects that will extend their responsibilities and experience.

5.2 DESCRIPTION OF ASSETS

WHAT ASSETS DO WE HAVE

Water supply assets managed by TDC include 19 water intakes, 11 treatment plants, 27 reservoirs, 18 storage tanks, 21 pump stations, 26 telemetry sites, and land vested to TDC where assets are located. The total length of the pipe network is about 1,820 kilometers.

The asset register in Hansen holds information on the attributes of our water supply assets. Part B provides details on the assets held at each water scheme.

Plant Assets

Plant assets collectively consist of the intakes, treatment plants, reservoirs, pump stations and telemetry, generally characterised as follows:

Intake - used for taking water, include an infiltration gallery (gravity or pumped), bore (pumped), or surface water intakes (gravity or pumped)

Treatment Plant – facility where water is treated prior to entering the reticulation. They are usually at the intake. Treatment methods for protozoa are: Ozone for Timaru and UV for Geraldine, Pareora, Pleasant Point, Seadown and Temuka, or chlorine for all TDC sources except Geraldine and Pleasant Point.

Reservoirs - for storage of water within in-ground concrete reservoirs with a membrane cover and or occasionally with a membrane liner and cover, above ground concrete reservoir or a group of small tanks. Reservoirs may have chlorinators to increase chlorine levels but they are not considered to be treatment plants.

Pump Station – for pumping water to a higher level. They are either at an intake or reservoir or within the pipework to boost pressure. A typical TDC pump station facility includes: pump, flow and pressure monitoring equipment, pipework, electrical switchboard, and telemetry. Some pump stations in TDC's treatment plants have PLC and generator or generator plug facility.

Telemetry - based at critical sites allowing recording of instantaneous outputs and sending alarms. The frequency of storing data depends on the use of the data. Monitoring to meet the DWSNZ requires data to be stored every minute. Most data is recorded every 15 or 60 minutes.

The telemetry computer (base station) is within the TDC Office in King George Place.

Table 9 and Table 16 in Part B have a list of assets at each urban and rural water supply, respectively.

Full profile of the reticulation network is held in TRIM document # 893046.

Land Assets

The water facilities are all built on land as categorized in Tables 9 and 16.

Only land owned by TDC is considered assets for the Water Supply Services. Where a facility is on private land or Crown Land the TDC has an informal easement to access and maintain the facility site. Land maintenance is covered within the budget for the facility situated on the land.

The Pareora River Scenic Reserve is vested in TDC to enable the management and operation of Timaru Intake on the Pareora River. The 206 ha reserve include native bush, river flats and the Pareora River. Some native plants have been recently discovered within the reserve. Being a reserve, there is a requirement under the Reserves Act 1977 to have a management plan. This Plan (TRIM document #160783) was developed in 2003 and has been submitted to the Department of Conservation. The budget for reserve allows for pest control, weed control and limited planting aimed at enhancing the river to compensate for the reduction in water volume.

Reticulation

Refer to discussion in Part B Section B1 (Urban), B2 (Rural) and B3 (stockwater).

Asset Condition and Performance

All assets have a nominal life, and should perform for that time. As the nominal life is near additional checks may be carried out. The asset may be good condition until failure occurs. This should be close to the life expectancy. If an asset has no redundancy then the replacement asset will be purchased and held as a spare when the nominal life is reached.

Plant Assets

The condition of the plant assets is usually dependent on age. The condition is also determined by the ability of the plant to perform an output. These outputs are monitored on a continuous basis e.g. pressure produced by a pump. Periodic checks are carried out on the assets and trended allowing a visual display which can alert to a change in performance.

With the exception of infiltration galleries, bores and submersible pumps and in ground reservoirs, most assets are situated above the ground and are readily accessible for inspection.

Pump stations and treatment plants are visited regularly, often at least weekly. During these visits, an informal inspection and listening to equipment occurs giving an indication of the condition of these assets along with the carrying out of maintenance activities.

See plant facilities condition assessment report in TRIM document #829869.

Plant performance is measured in a number of ways. These include:

- Operational Records. Staff visits most facilities regularly, often for water sampling, or analysis reasons. These visits may detect issues.
- Maintenance records. On-going maintenance issues are a measure of plant performance that can result in further investigation.
- Telemetry. Outputs from a facility with telemetry are monitored on a continuous (15 minutes) basis. This information is trended. If an output passes through an alarm level, the operator is alerted immediately. These alarms may indicate non-performance of an asset at the facility but may also indicate leakage or high demand within the reticulation.
- Water Quality Monitoring. Non-performance of a treatment process will show up with water quality monitoring. This can be via telemetry or from the water sampling program.
- Professional Services are commissioned when considered necessary to focus on a condition assessment of plant to augment the overall plant performance and for the development of plant renewal strategies.
- Periodic checks on performance and visual inspections by experienced personnel, e.g. switchboards are inspected annually using infrared cameras.
- Maintenance by specialised contractors.
- Age of the asset.

Reticulation

Assessment of pipe condition is a yearly programme. Council's strategy is to sample pipe in every category (e.g. a combination of year of installation, size, materials, etc) to establish a general assessment of the pipe condition.

The condition of other assets such as valves and hydrants are assumed to be the same as the pipes because these assets are renewed at the same time as the renewal of the water main. If these assets fail before the scheduled pipe renewal, they are replaced as part of the maintenance program.

To improve current practice, TDC will further develop the system for monitoring condition and performance of the reticulation network through more systematic pipe sampling, leak detection and hydraulic modelling. This process will improve timeliness of maintenance and asset renewal.

Related documentation of the 2014 pipe condition assessment is in TRIM folder #F7286.

The reticulation performance is monitored to provide input into the Council's lifecycle management strategies. Maintenance information of programmed and reactive maintenance is captured against individual asset components. These records validate asset attributes which impact on the confidence of the data held in the AIMS. The records are also used to provide spatial verification in the Council's GIS. Demand information is stored via Telemetry (real time) and a database of data logger information that is downloaded manually through site visits. (not real time PMAC software).

The combination of the above information sources provides an output to “all mains hydraulic models” for most reticulated schemes. The networks are developed as “peak demand hydraulic models” and “average demand hydraulic models.” The hydraulic models break the performance of the reticulation into demand performance, fire fighting capability performance, performance impact of renewal and development, all of which have an influence on the sustainability of the scheme.

With the continual change of the schemes, the hydraulic models are part of a managed model calibration programme that is reviewed and recalibrated every three years if changes of the network are not significant (e.g., replacing like for like). The next series of model calibration is scheduled for 2015.

Shadow or full calibration is, however, carried out at any time when deemed necessary for making decisions on large capital outlay projects.

The InfoWorks Hydraulic Model reports are held in the DWU library.

Asset Criticality

A criticality rating is held in Hansen against all plant facilities and pipe assets. The information is used in rating assets for renewal.

The full assessment report on criticality of water assets is in TRIM document #829869. Criticality rating is based on the estimated level of the consequences if the asset failed, as described below.

Table 4: Asset Criticality Rating Scale

Criticality Rating	Level	Description
A	High	Asset components considered so important that contingency plans in the event of their failure must be in place to avoid unacceptable loss of service.
B	Medium	Asset components that is important to the effective day to day operation of the system where redundancy or contingency should be available for restoration of service within a reasonable time.
C	Low	Asset components which can fail without affecting the operation and service and where repairs or renewal can be realistically deferred.

The consequences of asset failure are categorized according to the following criteria:

Table 5: Criteria for Scoring Consequences of Asset Failure

Criteria	Description	Point Score
Environmental Impact	Nil	0
	Minor	4
	Moderate	6
	Extreme	10
Type of Customer	Industrial	5
	Large Industrial	7
	High Risk (hospitals, schools, retirement homes)	10
Disruption to Customers	None	0
	< 20	2
	Up to 100	5
	Up to 1000	8
	> 1000	10
Risk to Public Health and Safety	Nil	0
	Remote	4
	Single Injury	6
	Multiple Injury	10
Difficulty of Repair	< ½ day	4
	< 1 day	6
	1-3 days	8
	> 3 days	10
Cost of Repair	< $1000	4
	$1k - $5k	6
	$5k - $25k	8
	> $25k	10

5.3 Asset Lifecycle Management

Operational Planning

Operational planning is largely carried out through the demand management strategies designed to address particular issues in each water supply. See Part B for details. The hydraulic models for the schemes are recalibrated to determine any significant impacts from changes in water use requirements.

Maintenance Planning

TDC maintenance planning of plant and networks is structured to support the community outcomes through helping to deliver the levels of service for water supply.

The planning of maintenance is carried out by TDC staff in conjunction with contractors.

The role of the TDC staff is to identify the preventative maintenance requirements of the schemes and organise the reactive maintenance so that the work is carried out in a cost effective and timely manner.

Preventative maintenance for the networks is issued once at scheduled times during the year and in some areas, twice or thrice yearly. The proactive maintenance packages are issued in bulk for "like" assets to City Care Limited currently contracted to TDC, who respond and report back to Council via technology-based systems. The information returned is held in TDC's Asset Information Management System (AIMS).

Reactive maintenance is planned for by utilising technology and mainly City Care staff under the direction of Contract 2080. The contract specifies the acceptable repair methods, the maximum response time, sterilisation and sampling requirements as well as qualification requirements.

The reporting generated from the information returned to Council's AIMS is used to support the agreed levels of service, e.g., response times to be met within a certain period of time. Another example of the data use is analysis of chronic or extensive failures. All feedback from the Contractor is captured and analysed and effectively addressed.

The maintenance of the plant is carried out by TDC operators during routine visits and who will use specialist assistance when necessary. Maintenance of the reticulation is performed both in-house and by contract Maintenance Contract 2080. The maintenance contract also requires all water shut downs to be reported to Council. A procedure to ensure the MOH is notified if the outage exceeds 8 hours has been established.

Council's responsibilities cover pressure and flow management, leak detection, contract supervision and audit, public liaison, and approvals for new connections.

There is currently limited water facilities maintenance data collected and recorded in Hansen. Over this AMP period, TDC will develop system improvements to collect all relevant plant and reticulation maintenance data including failure history, frequency of repairs, and cost of maintenance into Hansen. The aim is to have more robust information for planning maintenance works and general asset management.

Over the long term, we aim to have in place a comprehensive database on the maintenance history of all major assets that will enable better fault tracking process, help better understand asset failure modes, integrate asset criticality considerations in works planning, and optimise maintenance and renewals.

Capital Works Planning

Capital works are generally identified from operational issues. Capital works include asset renewals/replacements and asset upgrades/improvements.

Renewals Planning

Renewals planning follow cyclic renewal strategies that provide for the progressive replacement of individual assets that have reached the end of their useful life. The rate of asset renewal is intended to maintain the overall condition of the asset system at a standard, which reflects its age profile, and ensures that the Community's investment in the District's sewer infrastructure is maintained.

The level of expenditure on cyclic asset replacement varies from year to year reflecting:

- The age profile of the system (asset life)
- Physical condition assessment of assets (sampling, CCTV, etc)
- Criticality of the asset
- Maintenance repairs and blockages
- Customer service issues
- Performance monitoring (e.g., inflow and infiltration monitoring, leak detection)

Table 6 below sets out details of the cyclic renewal strategies adopted in this AMP.

Table 6: Asset Renewal Strategy

Strategy	Objective/ Description
Identification of renewal needs	Renewal/replacement needs are identified by analysing condition reports, maintenance records (asset failure and expenditure history), leakage, water quality test reports, I & I monitoring reports/infiltration studies, CCTV, service request records, and observations of staff and contractors. Renewal forecasts are based on an assessment of remaining asset lives. Industry base lives are used as a starting point and continually reviewed as part of the physical sampling carried out. Customer feedback is essential for monitoring asset performance and achieving levels of service. The feed back is quite often the early warning system that a problem maybe developing and can lead to more formal investigations. Asset renewal programmes are prepared from specific renewal needs identified from the above information and assessed in conjunction with Land Transport Unit and hydraulic performance. Long-term asset renewal programmes are prepared from the remaining life profiles for the assets.
Prioritisation of renewal projects	Renewal projects are justified and prioritised using a risk based process. Decisions on renewal works consider the short and long-term effects on the operating and structural integrity of the system. Renewal works are designed and undertaken in accordance with industry standards (or known future standards) and system design loadings. Short-term renewal priorities are reassessed annually taking account of additional information that becomes available.
Deferred Renewals	The quantity and impact of deferred renewals (if any) is tracked. The Council recognises that although the deferral of some items on cyclic renewal programmes will not impede the operation of many assets in the short term, repeated deferral will create a future Council liability. As Council currently funds asset renewals from depreciation deferred renewals are not expected.

Strategy	Objective/ Description
Inspections prior to major road works	The condition of sewer pipelines will be inspected prior to major road works to identify the risk of the road being damaged by pipeline failure or the need for pipeline replacement in the short/medium term. Pipelines in poor condition will be programmed for replacement prior to or in conjunction with the road works.

TDC carries out a matrix assessment that assesses renewals based on:

- Criticality
- Condition
- Soil type for reticulation assets
- Risk
- Maintenance
- Asset performance

A flowchart diagram illustrating the decision-making process following these strategies is shown in Appendix 6 (also in TRIM document 892825).

Data improvement will be carried out for the next round of renewals assessment.

Upgrades and New Asset Planning

TDC's practice in upgrading and building/acquiring new assets is usually driven by the need to comply with mandatory requirements (e.g., Health Act's Drinking Water Standards), address growth in demand, to improve system capabilities or levels of services, or respond to other significant issues.

For reticulation assets, the decision to upgrade or build new asset may be driven by the need to ensure security of supply, increase capacity, increase resilience (e.g., duplicate main), or to extend the service due to growth and development.

Asset Disposal

TDC ensures that 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 services are renewed using 'no-dig' techniques or the asset is replaced in a new location. A work order report records each disposal and the details put in the AIMS database. Similarly, replacement of components at treatment plants and pump stations usually involves disposal of those items being renewed/upgraded. These are disposed of in an appropriate manner with pumps and metal components sold for scrap metal.

Generally, buried assets remain in the ground unless economic to remove or they pose a potential hazard.

In all cases asset disposal processes must comply with Council's obligations which include public notification procedures prior to sale, and use of revenue received from asset disposal.

5.4 Demand Management

TDC's goal in managing demand is to deliver the agreed Levels of Service through strategies that are appropriate to the requirements of each scheme. Details are in Part B on strategies for managing demand by scheme.

In general, demand for water is primarily driven by demographic and economic growth factors. Water use intensifies alongside positive movements in the growth factors.

The direction of the growth factors considered in this section as major drivers of demand for water supply services in the District considered the findings in the paper "Timaru District & South Canterbury Economic and Growth Scenarios" (October 2014) prepared for TDC by Waugh Infrastructure Management Ltd.

Population and household growth figures are based on the report prepared by Natalie Jackson Demographics Ltd (August 2014) (TRIM document #898320). Council has adopted the report's medium-growth scenario in the District's LTP and AMPs for the next 10 years.

(1) Population Change

Population has a direct correlation with the demand for water. In 2012-2013, the average water consumption in Timaru's urban water supplies averaged 292 litres/person/day. The more consumers, the greater will be the total volume of water required. The medium-growth scenario projects the District population will increase to 48,293 (+6.4%) by 2028 which includes the 2015 AMP period.

The impact of the projected change in population to demand for water will be assessed through calibration of the hydraulic models. Significant implications on design capacities of assets and/or levels of service will be addressed to meet the requirements.

(2) Household Change

Similarly, demand for water normally increases with growth in number of households served. The number of households in the District is expected to increase to 20,680 (+10.8%) by 2028 which includes the 2015 AMP period. As with population, this data will be used in calibrating the scheme hydraulic models to assess impact of household growth on the capacity of water supply infrastructure.

(3) Industrial/Commercial Development

The Timaru urban area has experienced sustained economic growth over the past few years. This has been observed to occur mainly as industrial growth in the Washdyke area and commercial growth.

The TDC District Planning Unit's guidance document on growth assumptions for this AMP period (TRIM document # 895888) cites the findings in the 2007 study on the structure, trends and changes in demand relating to retail, industrial and residential activity in the Timaru District (TRIM document #500378) as still being currently relevant. The study identified that the two areas anticipated to experience the largest increase in demand for industrial land are Washdyke, and potentially land in Southport to be used in conjunction with the operation of the Port.

In terms of implications to demand for water supply services, any proposed major new "wet" industry would be specifically assessed to determine the capacity of the existing infrastructure to supply water. A single industry could create significant additional demand. Conversely, closure of any of the existing major industries could have a significant effect on the cost to supply water to the community. As there are fixed costs regardless of the total volume of water supplied, departure by large industries will reduce revenue that may lead to increased charges borne by remaining users

(4) Agriculture (Stock Water)

Of the District's 12 schemes, there are 6 which supply water for stock purposes. The Waugh Report cites that dairying will further intensify with implications on demand for irrigation water for fodder production. This trend can have significant adverse impact on TDC's water supplies that are allocated from the same source as irrigation schemes.

Based on the traditional mixed sheep and beef farming, TDC schemes provide design water allocation volumes of 56 or 72 litres/ha/day. Additional water is not available if a property requires a water allocation greater than the scheme design. The exception is a temporary increase for dairying support. There are properties where there is a historical greater allocation as the farm had a large demand prior to changing from a demand to a restricted scheme.

Stock water demand is further discussed in Part B for relevant rural water supplies.

(5) Land Use Change

Global commodity markets are driving changes in land use in the rural sector. There has been a significant increase in dairy farming with many dry stock farm conversions to dairy. This does not directly impact on demand as Council does not supply water for irrigation. However, dairy farms require treated water for washing of vats and the milking parlour which may impact on demand as conversions continue.

The development of an increasing number of life style blocks on the fringes of urban areas creates a different demand on water supplies. These properties use water allocations that were originally for stock-water, or the houses have to rely on rainwater for the domestic supply. This increases the demand on Council to supply drinking water for these properties as these consumers generally do have expectations for an increase in the LoS.

Re-zoning areas from rural to urban or to industrial will impact on the water supply. The reticulation will need to be developed to ensure appropriate volumes of water and reticulation are available. Prior to re-zoning, an area to urban the requirement for this land is assessed in detail. In fill housing is encouraged as this has a much lesser impact with little reticulation modifications needed to supply an increased volume.

We are closely monitoring this indicator through the Council's District Plan. Demand implications are assessed when cases are identified.

(6) Tourism

Tourism in South Canterbury is a growing sector. The District has many recreational activities and is the gateway to many tourist destinations such as Aoraki - Mt. Cook, Queenstown, Dunedin and Christchurch. Safe drinking water is of paramount importance in preserving the image of a safe and healthy environment in which to travel and stay.

Increase in tourism activity may bring about an increase in demand for water in terms of added requirements by business facilities as well as by increased number of visitors in the District. Water use by tourism facilities is trended and significant changes are investigated for any implications on demand for water supply services.

(7) Climate Change

Climate change may cause water take restrictions, reduce raw water quality meaning more complex treatment processes, diminish the availability of source water, cause more frequent river 'freshes' and force changes in water use. Demand management strategies are developed for each water supply to help deal with these issues (see Part B).

(8) Resource Consents and Other Policy Requirements

Resource consent requirements and other mandatory requirements for water supplies discussed in Section 1.4 impact on quality, quantity, delivery and use of water. These were assessed for relevance and effect on service delivery in each water scheme, and appropriate demand strategies developed (see Part B).

5.5 Risk Management

Background

The Risk Management Framework adopted for this Activity follows the AS/NZS 4360 (2004, 2009) risk standard illustrated in Appendix 7. Managing risks permeates all aspects of managing TDC's water supply activity to guard against service level failures.

A risk assessment of the 12 water supplies, including the Telemetry System and Asset Information System, was completed in 2012 Details are in TRIM document #808045. A comprehensive risk management programme was subsequently developed which identified the treatment for all recognised risks, as well as the staff responsible for action. Highlights are as follows:

There are four categories of risk sources in TDC's water supplies, namely;

1. External - events largely beyond the control of the organisation like natural events and people.

2. Physical (Asset and Equipment) – events mainly associated with the failure of the assets and equipment.

3. Service Delivery – events largely caused by breakdown of operational processes, failure from service provider/contractors and human factors.

4. Management and Planning – events associated with human resource, designs, planning projections and assumptions and financial risks.

The consequence from the risk events ranged from insignificant, minor, moderate, and major to catastrophic. This was assessed in terms of cost to public health, corporate image, environment, health and safety, third party damage or loss, and loss of revenue.

Treating the risks involves balancing what we need to do with what we can afford. TDC's treatment options for water supply services include the following:

- Avoiding the risk by deciding not to start or continue with the activity that gives rise to the risk
- Taking or increasing risk in order to pursue an opportunity
- Removing the risk source
- Changing the likelihood
- Changing the consequence/s
- Sharing the risk with another party or parties
- Retaining the risk by informed decision

Most of the treatments identified in the assessment report are already existing business practices (e.g., aging assets are programmed for renewal, works are done by approved contractors, Water Safety Plans are implemented, critical assets are identified, etc). Those that require significant cost to implement (e.g., additional treatment, additional capacity, etc) are being programmed. Specific details on risks and treatments associated with individual water supplies are provided in Part B.

Water Safety Plans (WSP), formerly known as Public Health Risk Management Plans, are required under the Health Act for drinking water schemes. The objective of a WSP is to ensure public water suppliers develop operational practices which will reduce the likelihood of contamination and how to respond and minimise contamination events. Therefore, a WSP identifies the risks associated with a public water supply and provides a plan to manage those risks. It does not measure compliance with the DWSNZ 2005.

The WSPs are required to be approved by a Drinking Water Assessor (DWA). The DWA will carry out audits to ensure the Plans are being used. The Plans are continually monitored and updated and will be reviewed at least 5-yearly.

WSPs are currently internal documents held in TDC's corporate information/document system (TRIM). Appendix 8 shows the status of TDC's Water Safety Plans.

Summary of Significant Risks

For the current AMP period, the following risks remain as priority concerns in managing our water supplies:

High Demand - demand for water at times can exceed the capacity of the infrastructure in some schemes, like pumps and pipe capacities.

This can in effect be "self regulating" in that the demand is limited to the capacity of the infrastructure. However, this poses risks with the potential of some properties receiving no water, with associated health risks and inconvenience, insufficient pressure being maintained in the reticulation, storage volumes being reduced, and insufficient fire fighting supply.

Or, the demand (and supply) can at times exceed the consented volumes or flow rates. The risk associated with this is non-compliance with resource consents conditions and subsequent prosecution, or a throttling of supply to meet the consent requirements and subsequent excess demand issues as noted above.

Consent Restrictions - restrictions on abstraction consents limit the amount of water that can be taken during low river flow periods for some schemes. This can significantly reduce the amount of water available to meet demand. There is a significant risk that severe restrictions and rationing might be imposed on individual water users, with potentially significant economic implications. Currently, this level of restriction in Timaru is assessed as having a 5% chance of occurring in any one year.

Again, the risk associated with this event is consent non-compliance or excess demand consequences.

Water Availability - the potential exists for the availability of source water to be insufficient to meet consented abstraction limits and therefore not meet demands particularly during extreme dry weather conditions.

Natural Disasters - although the probability of occurrence is low, natural disasters such as earthquakes, storms, floods, snow storms, winds and tsunamis do present a high risk.

TDC is a member of the Canterbury Civil Defence Emergency Management (CDEM) Group established under the Civil Defence Emergency Management Act 2002. Arrangements for managing emergencies in a coordinated, multi-agency manner are specified in the Canterbury CDEM Group Plan. As an integrated part of the Group Plan, the TDC Local Arrangement document (Doc#291104) specifies the unique local operational arrangements.

Financial - the Health (Drinking Water) Amendment Act requires all practicable steps to be taken for drinking water to comply with the DWSNZ. This will require significant water treatment upgrades at a number of water supply sources throughout the District. This in turn will result in significant cost increases for some consumers. The financial risk is that these costs that are a result of requirements of legislation may be unaffordable to consumers and may be a burden on ratepayers and a disincentive for people to live, work, play and do business in the District.

There are also financial risks associated with the changing demographics of the District, a demand for an expanding infrastructure to serve more areas, with the existing areas served by an ageing infrastructure. The cost to operate, maintain and renew the infrastructure increases while the community is getting older, with more people on fixed incomes, and fewer with less income per household.

Another financial risk relates to the potential departure of high use industrial consumers. The water charges are based on an annual charge (for each scheme) for a domestic connection and use, with volumetric charges made for industrial water users that consume in excess of a typical domestic connection. Significant revenue is obtained from industrial volumetric charges.

A large proportion of the cost to supply and deliver the water is fixed, which will be incurred regardless of the total volume of water supplied. Therefore if a high use industrial consumer were to depart, these fixed costs would result in higher annual and volumetric charges.

Climate Change - the risks associated with climate change relate to the availability and quality of source water, such as an increasing frequency of drought resulting in the probability of severe restrictions being imposed increasing above the 5% chance of occurring in any one year. More frequent and intense rainfall can also affect the quality of raw water making it more difficult to treat to drinking water standards.

Operational Risks – the Water Safety Plans have identified inadequate treatment, inadequate storage and backflow as significant risks in TDC's large drinking water supplies. Details are in Part B.

Risk Treatment

The following comprise the major courses of action that will be/continue to be pursued to mitigate or eliminate the significant risks identified above:

- Consumer education on water conservation
- Imposition of hosing bans and other water restrictions
- Leak management programmes
- Monitoring telemetry and alarms
- 24 hour, 365 day call-out service
- Infrastructure development and renewals programmes
- Liaison with high water users
- Treatment process upgrades
- Implementing Water Safety Plans for drinking water supplies
- Backflow prevention/testing

Risk to Critical Assets

All major plant and reticulation assets have been rated for criticality. The information is held against the assets in the Hansen Asset register. Risks associated with our critical water supply assets were derived as a product of the asset's criticality (measured in terms of consequence of asset failure) and physical condition (measured in terms of state of newness or deterioration of the asset). Overall, a combination of "low criticality/excellent condition" poses insignificant risk. Conversely, a combination of "high criticality/very poor condition" poses very high risk of asset failure.

Part B identifies the critical assets associated with individual water supplies and how they are managed.

TDC's Land Transport Unit has been notified of the most critical water supply assets for consideration in their risk management/emergency response plan.

Provisions for effects of failures

Emergency Response and Business Continuity Plans are being developed as part of the Water Safety Plan requirements for drinking water supplies. These plans will outline strategies to recover critical functions by getting the assets back up and running should a future loss occur.

TDC is equipped with an emergency response mechanism led by its Civil Defence Emergency Management Team who will deal with events from natural, man-made or technological disasters that may result in water supply loss due to asset failure/damage. In addition, emergency response and contingency plans are currently also being developed as part of the Water Safety Plan improvements.

Insurance of Assets

TDC's water supply assets are insured to the value of the cost to replace them. Insurance of the assets mitigates financial risks to TDC and increases resilience of the water service utilities to events that may damage the assets.

5.6 INFORMATION MANAGEMENT

Information management for water supply services covers asset data management and customer service information. Information is collected, processed, stored and maintained within various systems that make up the information network, as shown in Figure 3 and described below. Some component systems are enabled for interfacing to facilitate data accessibility, validation, analysis and reporting. *Further work to enhance system linkages will be carried out as an improvement in this AMP period.*

Asset Information Management System (AIMS)

Asset data management is primarily carried out using Hansen 8, an asset management application for maintaining a register of assets and recording of information on assets.

Currently, the core data for assets in the AIMS underpins spatial representation of asset attributes and lifecycle information. This core data also provides the technical basis for the hydraulic modelling capability of the Council.

Asset information data on water supply is held to a component level. Examples of the reticulation components are pipes, valves, rural water tanks, etc. The Plant information components typically consist of buildings, pumps, treatment facilities, instrumentation and telemetry.

Hansen records:

- Asset information such as size, type, age, which can be linked to the GIS spatial database
- Maintenance history including time, cost, and performance indicators
- Work Order Data
- Condition Data
- Criticality
- Risk of Failure data (to be held in the future)
- Resource Consent Conditions monitoring data
- Valuation Data

Data build-up is ongoing. The facility assets data is currently being checked to enable full use of the Hansen System. All data are subject to on-going checks via work reports from maintenance activities.

Data Confidence

The AIMS data for the water schemes have been sourced from existing drawings and plans, which in turn came from original records and as-builts. There is relatively high confidence in the completeness of water assets data based on the quality of the original information, and the numerous checks carried out during the transfer of this information, including GIS and software modelling programmes.

Data confidence in the condition of above ground assets is high as these assets are accessible and able to be checked routinely.

There is lower confidence in condition data for below-ground assets/pipes. The process to collect pipe condition data is established but levels of accuracy of data may decline with the age of the data (i.e., date when the assessment/survey was undertaken). Due diligence is exercised when using older data. Field validation is carried out as required to confirm asset condition before major works are undertaken.

Formal data accuracy grading and confidence rating will be carried out in this AMP period as part of the Improvement Plan.

Corporate Information System

TDC currently uses Civica's Authority as its Corporate Information System. This holds all the financial, rating and situation data. All customer requests relating to water service or quality complaints or queries are held in this information system. This system also features a 24/7 Call-out Service where all complaints from the public can be reported in 24 hours.

Registers are held for: i) Backflow Preventors (protection of the water supply from contamination); ii) Water Scheme and Tank Database (demand management for all water schemes); and iii) Water Billing (invoicing high users of water).

A component of TDC's corporate information system is an electronic document management system using the HP TRIM software. TRIM holds electronic records of documents pertaining to water supply. Documents not saved in TRIM, such as water models, are stored in a dedicated driver within the Council network.

TDC's website also hosts information on Timaru District's water supplies, such as briefs on water supply schemes, water fees and charges, backflow prevention, water metering, and occasional public advisories.

Hydraulic Model

Council uses the InfoWorks Hydraulic Software to model water schemes in order to provide efficient and sustainable distribution of high quality water to the community, at an acceptable pressure and with minimal leakage losses. The InfoWorks software is a state-of-the-art network hydraulic modelling package being actively developed by Innovyze. The software is capable of modelling complex components such as pumps with variable speed drives and control valves with remote parameter inputs.

The models are used to assist in design, renewals and developments which can identify deficiencies in the networks and the impact that property development may have. Water mains that have been identified as not meeting the required performance criteria are then scheduled for renewal/upgrade.

Hydraulic software models of the water supply pipe network and utilities are required to enable TDC to:

- Determine accurately the existing capacity of the system
- Scenario Modelling to assess the impacts of changes and predicted growth areas
- Identify inadequate sections of the system
- Operate the system in the most efficient manner
- Determine the impact of further development on the system
- Identify system upgrading requirements
- Compare options for upgrading the Water Supply System

The upgrades to resolve pressure and fire fighting issues are being confirmed through the water network models. The models have been developed and are regularly calibrated from data being collected with pressure data loggers distributed within the reticulation system. External assistance with the models has been sought through Consultants.

The TDC water supply model is a mature model and requires on-going development such as:

- Leakage and demand assessments
- Data logger and meter calibration (shadow calibration)
- Master model upgrading (full calibration)

Geographic Information System (GIS)

The information in the GIS database and the system's data transformation tools and analytical functions provide significant material for asset management and decision-making. An example is spatial data and network attributes imported from the GIS system into InfoWorks provide the basis for "All Mains" models (see Hydraulic Model discussion above).

Telemetry

Telemetry is installed in 10 of the 12 water schemes operated by Council. Telemetry data is used for water management applications, including water quality and equipment surveillance functions. Having data available in almost real time allows quick reactions to occurrences in the field. Also, historical telemetry data is relied upon for water model calibration. Other applications include leak detection in distribution pipelines, AMR (automatic meter reading), groundwater monitoring and stream gauging.

The current telemetry system measures the following and provides alarms that have been set for the system:

- Water level
- Pump operations
- Chlorine and UV level
- Water turbidity
- Water pressure
- Flow rate and volume
- Water Inflow and Outflow

Telemetry sites are polled every 15 minutes. Pre-set alarms are triggered on site in between polls, provided they are set to do so.

For compliance purposes, some sites record water quality and flow data every minute and then download the information to the master unit every hour. This information is not used for telemetry alarms or trends.

The telemetry data is transferred to the SQL (Structured Query Language) database daily at the Claremont server to make the repetitive information much easier to handle.

The DWSNZ requires water treatment data for continuous monitoring to be collected every minute and be readily available for 10 years. As sites of over 500 populations monitor a minimum of 5 functions the management of the data is critical.

Reports are automated daily for compliance and management purposes.

There are a number of preset reports. Customised report writing is also enabled.

Access to the website allows the reports to be re-run for any period. To view a report:

1. Website: http://10.6.62.14/icsc/
2. Select reports
3. Select report start time and report stop time
4. Select the scheduled report

Water Industry New Zealand (WINZ) Database

All water sample results are imported to the WINZ database. The majority of samples are taken for e-coli. However, at the time of sampling, measurements of turbidity, and within chlorinated system, FAC Calculations are made each quarter to determine bacterial compliance against DWSNZ. In addition, UV transmittance, turbidity frequently ask questions, nitrate and cryptosporidium are also inputted. Information collected via telemetry every minute for protozoal compliance is summarized every quarter and a compliance questionnaire completed. Protozoal compliance is recorded within WINZ.

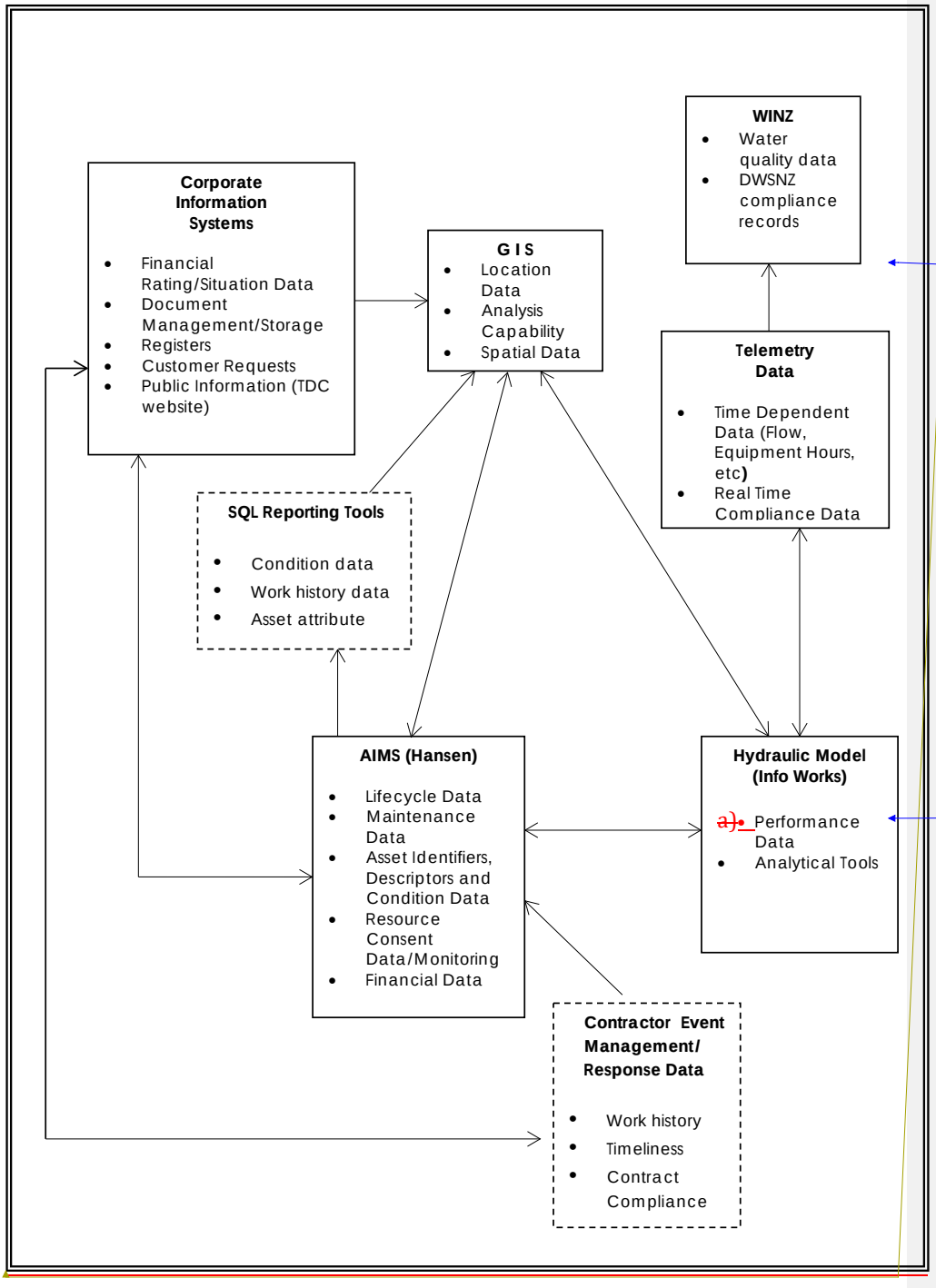

Figure 3: **TDC Water Supply Services Information Network**

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6 PLANNING ASSUMPTIONS

The development of this AMP was guided by TDC's *Significant Long Term Plan 2015-25 General and Financial Assumptions* (TRIM Document # 892135). The LTP assumptions reflect the issues that may impact on Council activities in the next 10 years, including their anticipated effects.

For the Water Supply Activity, this AMP applied assumptions to deal with the possible changes in factors that are considered to have significant influence or impact in operating the District's water supply services within the next 10 years. These include the following:

- TDC's role in water supply services
- Impacts of climate change
- Demand
- Costs
- Levels of service
- Asset information
- Meeting firefighting requirements

The Assumptions were based on the assessment of information current at the time of writing of the AMP. Risks and consequences of variation to the assumptions were identified. There are no high level risks in the Assumptions. Identified mitigation measures will be carried out to deal with the uncertainties around the assumptions. Refer to details in Appendix 9.

7 FINANCIAL PLANNING

This Section outlines the considerations in planning the financial requirements for water supply services. Detailed capital expenditure projections are in Part B of this AMP. A 30-year financial projection is prepared for this AMP in line with the 30-year Infrastructure Strategy requirement of the Local Government 2014 Amendment Act.

7.1 TDC'S FINANCIAL STRATEGY

The Financial Projections in this AMP are anchored on TDC's corporate Financial Strategy contained in the 2015-2025 Long Term Plan, which balances affordability with:

- The need to maintain, replace and renew core infrastructure
- Community needs and aspirations for new and improved community infrastructure
- The obligation under law to build new infrastructure of a higher standard

The Financial Strategy states TDC must manage its finances prudently, while sustainably promoting the current and future interest of the community.

Inflation factor

TDC recognizes that inflation is faced by the Council and inevitably means the cost of providing services will increase over the next 10 years and these increases will affect the level of rates.

TDC's approach is to include inflation based on the Local Government Cost Index (LGCI) prepared by Berl Economics. Annually, budgets are reviewed to more accurately reflect price movements.

Asset development and renewal expenditure

Asset development expenditure is for purchasing, building, replacing or developing the District's assets. For each asset category, the AMPs are considered the key planning tool for the maintenance, future renewal and additional assets required to meet increased levels of services or growth in the District.

Renewals of assets are generally funded from reserves which have been previously funded from rates. If there are insufficient funds in the appropriate reserve for the renewal expenditure, Council has elected to borrow to pay for some of the renewals.

Level of service improvements and growth assets are generally funded from capital contributions in the form of contributions (financial contributions and cash in lieu of reserves). This is to ensure that the costs are spread across generations that utilise the assets.

Depreciation fund

TDC calculates depreciation fund requirement based on the long term projected renewals of the assets. Depreciation is funded from rates.

7.2 WATER SUPPLY FUNDING STRATEGY

Financial Contributions

Council is required to adopt a Development and/or Financial Contributions Policy under section 102 of the Local Government Act 2002 (the Act). Development Contributions provide Council with a method to obtain contributions to fund infrastructure required due to growth. TDC does not intend to implement a Development Contributions Policy as outlined in Section 106 of the Act at this time. TDC has an operative Financial Contributions Policy as set out in Part D, Section 6 of the Timaru District Plan. The existing Financial Contributions Policy allows the Council to apply a charge for water, sewer, stormwater and open space and recreation. The financial contribution is a contribution from developers of cash or kind, or a mix of these. Financial contributions are provided for under the Resource Management Act 1991 and are used to offset or mitigate any adverse impacts on the natural and physical environment including utilities, services or a new development. Amounts to be funded from financial contributions for water supply, sewer and stormwater services will be determined from Council decisions at the time of development.

The cost of reticulation upgrade that is attributed directly to a property development is recovered from that development as financial contributions under the District Plan.

Capital contributions are charged when new connections are made to a water supply. The contribution is dependent on the scheme and is calculated from impacts each new connection has on the scheme.

Some schemes do not have a financial contribution but all costs to connect are met by the applicant.

Details of the provisions can be found in the District Plan document under Section D: General Rules - 6.5: Water, Sewer, Stormwater and Open Space and Recreation Contributions.

Rates, Fees and Charges

Generally, each water supply is self funding, except with the Timaru, Temuka, Geraldine, Pleasant Point, Winchester, and Peel Forest Water Supplies merged into one Urban Water Supply for funding purposes, with consumer income offsetting expenditure. Each water supply has a set of standard charges based on various units of charging. The standard charges include uniform annual water charge, units of water allocation, connection charges, area charges and extra-ordinary water volume charges.

Details of the 2014-15 Water Rates and Charges are in TRIM document # 869025.

7.3 ASSET VALUATION

Asset valuation is key in TDC's financial planning. The responsibility to carry out asset valuation lies primarily with TDC's Finance and Property Units.

DWU carries out asset valuation for insurance purposes.

The water assets were valued for fair book value and depreciation purposes in 2005. Additions subsequent to the valuation are recorded at cost. In 2013 the water assets were valued for full replacement value for insurance purposes. As a result of the Christchurch earthquakes, Council revisited the insurance valuation and requested that a new valuation be produced. The final values were separated into *above ground assets* and *below ground assets*. The *below-ground assets* are insured by Local Authority Protection Programme (LAPP). The *above-ground assets* are insured by Council's general insurance policy.

Water asset managers utilize asset valuation information in planning future work and costs to replace or renew fully depreciated/expired assets.

Asset Valued

The water supply asset valuations completed in July 2005 (by Maunsell Ltd) covered the following asset groups:

- Wells, Intakes and Infiltration Galleries
- Treatment Facilities
- Mains and Service Lines
- Tanks and Reservoirs
- Hydrants
- Meters
- Valves & Air Valves

The valuation was carried out in accordance with the NZ Equivalent to International Accounting Standard 16, "Property, Plant and Equipment" (NZ IAS 16), and the Infrastructure Asset Valuation and Depreciation Guidelines 2002 issued by the NAMS Group of Ingenium.

All assets were valued using optimised depreciated replacement cost (ODRC). An ODRC valuation requires determination of quantities of assets optimised to relate to those required for current service delivery and foreseeable demand, unit rates that reflect replacement with modern engineering equivalent assets, effective lives that take account of local influences, and depreciation that defines current value given a definable remaining life.

Optimised Depreciated Replacement Cost = today's cost of replacing the asset with another asset which provides the same level of service most efficiently and depreciated over the life of the asset to reflect its current value and remaining economic life.

The future forecast of asset values can be summarised as follows:

- Major capital expenditure shown in water treatment works and pipelines will increase the asset value
- Vested assets from subdivisions will be added to the fixed asset register and will increase the asset value.
- The asset renewal programme may increase the average residual life which in turn will progressively increase the valuation.

Refer to TRIM Document #371288 for the 2005 Asset Valuation Report.

7.4 Water Supply Services Expenditure Plan

The methodology in developing the 30-Year Expenditure Plan for Water Supply Services followed TDC Finance Unit's convention of categorising costs into two general budget headings, namely: capital expenditures and operating expenditures.

DWU asset managers were primarily responsible to develop the expenditure projections from the identified capital and operational works. Unit costs were based on current year dollar prices.

Details of the 10-year Expenditure Plan for Water Supply Services are in TRIM document #897882.

The inflation factor will be applied at corporate stage processing of the whole TDC budget. TDC Finance Unit is responsible to finalize the budget.

Refer to Part B for details on the planned capital work and budget by water scheme. (information to be added when corporate budget is finalised)

8 IMPROVEMENT PLAN

The activities in this Improvement Plan were identified from the gap analysis of TDC's current activity management practices against what the aspired level of practice should be (refer to earlier discussion in Section 5).

Development of detailed action plans and timeframes will be carried out as part of the implementation of this Improvement Plan.

Table 7: Water Supply Services Activity Management Practice Improvement Plan

<table>
<tr><th>Management Practice</th><th>Improvement</th></tr>
<tr><td>Description of Assets</td><td>
Asset Register:

• Develop Hansen's use in the management of water supply facilities (i.e., data, work orders, invoicing, etc)
• Implement data improvements -
o Sampling, investigation and location of the rural network assets
o Service laterals information
• Implement workflow improvements
o updating of asset registers to include capital works as-built data, costs, etc

Implement information system improvements:

o Hansen-InfoWorks-TRIM documentation links
o Information upkeep (updating, quality checks, audit)
o Set up core reports from Hansen (e.g., for valuation, renewal forecasting)

Asset Condition:

• Develop and implement condition assessment workflow
o utilise maintenance contractor for sampling when doing repairs
o Carry out data quality audit of sample assessments
o Ensure timely recording into AIMS of data from condition assessment programme
o Develop systematic recording of asset condition data into AIMS from routine inspections by TDC technicians

Asset Data Confidence:
• Formally assess and rate condition grade of assets and confidence grade of plant and reticulation asset data, using the IIMM as guide
o Benchmark condition grade of data held in the AIMS

<table>
<tr><th>Grade</th><th>Description</th><th>Accuracy</th></tr>
<tr><td>1</td><td>Accurate</td><td>100%</td></tr>
<tr><td>2</td><td>Minor inaccuracies</td><td>± 5%</td></tr>
<tr><td>3</td><td>50% estimated</td><td>± 20%</td></tr>
<tr><td>4</td><td>Significant data estimated</td><td>± 30%</td></tr>
<tr><td>5</td><td>All data estimated</td><td>± 40%</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td></td><td>
Benchmark confidence grade of asset data in AIMS
<table>
<tr><th>CONFIDENCE GRADE</th><th>DESCRIPTION</th></tr>
<tr><td>A Highly reliable</td><td>Data based on sound records, procedure, investigations and analysis, documented properly and recognised as the best method of assessment. Dataset is complete and estimated to be accurate ± 2%.</td></tr>
<tr><td>B Reliable</td><td>Data based on sound records, procedures, investigations and analysis documented properly but has minor shortcomings, for example some data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate ± 10%</td></tr>
<tr><td>C Uncertain</td><td>Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which Grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated ± 25%.</td></tr>
<tr><td>D Very uncertain</td><td>Data based on unconfirmed verbal reports and/or cursory inspection and analysis. Dataset may not be fully complete and most data is estimated an extrapolated. Accuracy ± 40%.</td></tr>
<tr><td>E Unknown</td><td>None or very little data held.</td></tr>
</table>
Incorporate asset condition grade and confidence ratings in the asset renewal strategy
</td></tr>
<tr><td>Levels of Service</td><td>
Identify LOS Options and Costs in consultation with communities
</td></tr>
<tr><td>Managing Demand</td><td>
Hydraulic Model Recalibration – review parameters, standards, assumptions, etc. Incorporate Growth Projections (growth and economy) into demand forecasting.
Implement Leak Detection and Reduction Programme
Develop and Implement Consumer Education Programme (Water Conservation, etc)
</td></tr>
<tr><td>Risk Management</td><td>
Develop a Risk Register
Risk Register Monitoring
Emergency Response and Business Continuity Planning
Project based risk assessments with regular revisions
</td></tr>
<tr><td>Lifecycle Decision Making</td><td>
Operational:
Develop and implement Demand Management Plan
Monitoring and analysis of asset utilization
Improve staff knowledge of models used
Improve upkeep of models used
Maintenance Planning:
Improve practice in collecting relevant plant and reticulation maintenance data including failure history, frequency of repairs, and cost of maintenance into Hansen.
Capital Works Planning:
Alignment with District Plan objectives on subdivisions, etc. Model water services with these demands in place
Develop workflow to ensure capital projects are fully scoped and costs correctly estimated
</td></tr>
</table>

	• Adopt lifecycle based decision making • Develop a formal decision making process to evaluate all aspect of capital works • Implement sensitivity analysis to critical assumptions • Improve data collection and analysis for renewals programming
Financial Forecasts	• Improve valuation process (towards enabling automation based from Hansen info) • Improvement within Hansen on asset replacement cost
AMP Format, Planning Assumptions and Confidence Levels, Planning by Qualified Persons	Internal Drainage & Water Unit user review Internal TDC peer review External expert review
Outline Improvement Programmes	Improvement Programmes from the Improvement Plan developed in detail, with agreed key responsibilities and set timeframes. Implementation of Improvement Plan is monitored and improvements documented.
Council's Commitment	• Quality Management: (Linked to info system management) • Better coordination, communication between/among teams • Establish/formalize workflows (who will do what, when, how, etc) • Develop process for internal checks and balances (internal DWU, District Services and DWU)
Sustainability	Identify and adopt core measures for monitoring sustainability of water supply services

8.1 ASSET MANAGEMENT PLAN REVIEW

Review of this AMP will be done annually as part of the preparation of DWU's Yearly Unit Report (an internal document). The review will also be adopted as a standard procedure in developing the succeeding Annual Plan 2016-2017 and Annual Plan 2017-2018 to account for improvements and other changes in the Activity.

Table 8: AMP Review Plan

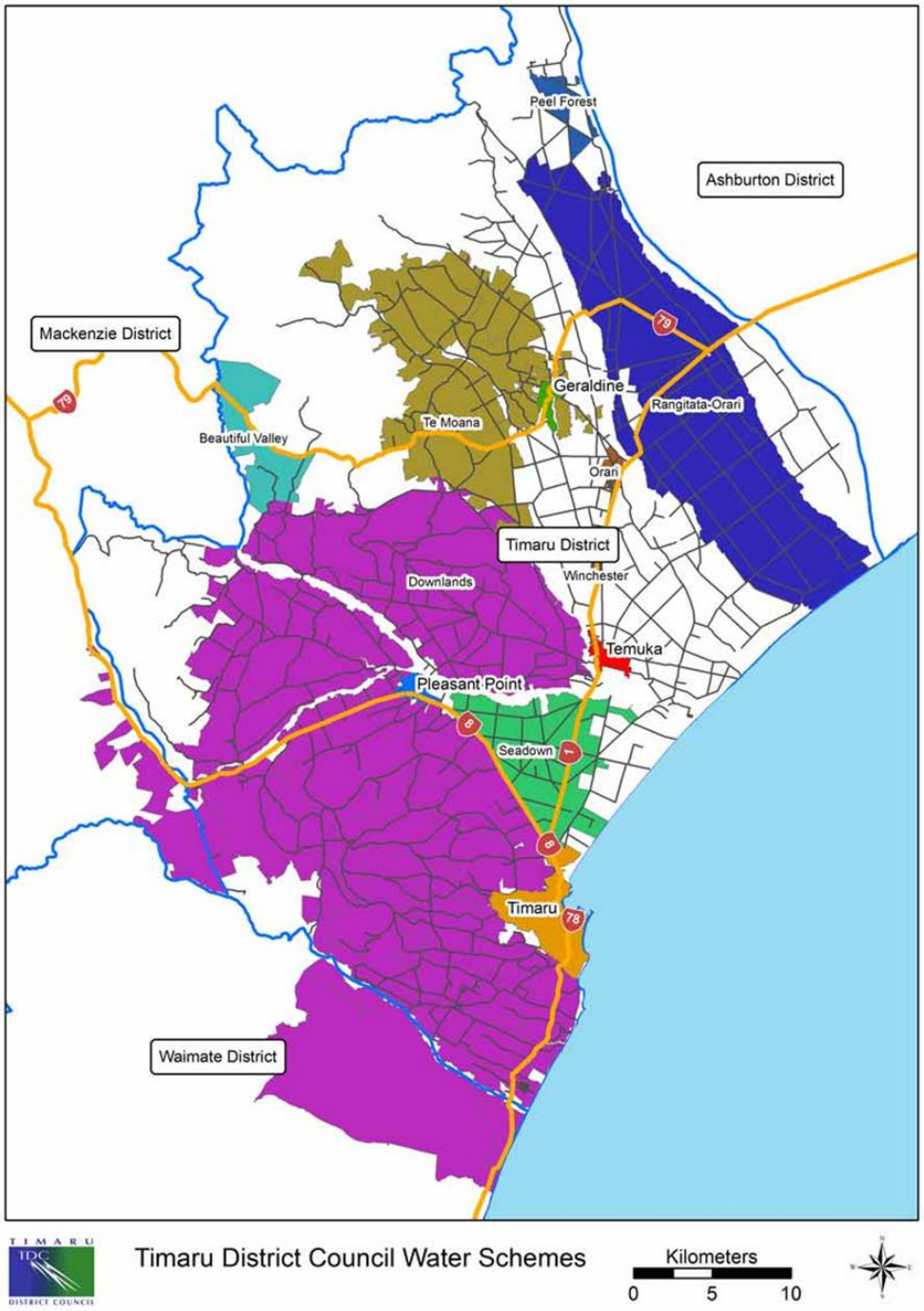
Item	Date	Output	Remarks
AMP 2015-2018 Peer Review			
Annual Report to Council		Annual Report 2015-2016	
1st AMP Review	30 May 2016	Unit Yearly Report 2015-2016 Annual Plan 2016-2017	
		AMP changes documented; appended to the AMP	
		District Services Group Manager, Corporate Planning formally notified of AMP changes	
Annual Report to Council			
2nd AMP Review	30 May 2017	Unit Yearly Report 2016-2017 Annual Plan 2017-2018	
		AMP changes documented; appended to the AMP	
		District Services Group Manager, Corporate Planning formally notified of AMP changes	

PART A - APPENDICES

Appendix 1: Water Schemes Profile

SCHEME	RETICULATED POPULATION	NO. OF CONNECTIONS	PURPOSE	CLASSIFICATION/TYPE OF SUPPLY	FIRE FIGHTING SUPPLY*	LENGTH OF RETICULATION (km)	TREATMENT
1. Beautiful Valley	Nil	41 UNITS	Stock Water	Rural/Restricted	No	18.72	None
2. Downlands	5,103	2,748	Stock and Drinking Water	Rural/Restricted	No	986.70	Aerator and Chlorinator
				Rural/On- site Storage			Ultra Violet (UV) and Chlorine
3. Geraldine	2433	1,438	Drinking Water	Urban/On-demand	Yes	24.82	Cartridge filters and UV reactor
4. Orari	169	134 UNITS	Stock and Drinking Water	Rural/Restricted	No	7.95	Water Supplied from Temuka Headworks
5. Peel Forest	63	35	Drinking Water	Urban/On Site Storage	No	1.47	Aerator, pH Correction and Chlorinator
6. Pleasant Point	1282	612	Drinking Water	Urban/On Site Storage and On-demand	Yes	15.40	UV reactor
7. Rangitata Orari	Nil	540 UNITS	Stock Water	Water Races	No	230 (water race)	None
8. Seadown	896	671 UNITS	Stock and Drinking Water	Rural/On- demand and Restricted	No	172.08	Aerator and Chlorinator
9. Te Moana	1220	958	Stock and Drinking Water	Rural/Restricted	No	213.51	Sand filter, Chlorinator and some water supplied from Geraldine
10. Temuka	4199	2,101	Drinking Water	Urban/On-demand	Yes	52.37	Aerator, Chlorinator and UV reactor
11. Timaru	26,019	13,016	Drinking Water	Urban/On-demand	Yes	321.78	Ozone, Chlorinator and pH correction
12. Winchester	247	154	Drinking Water	Urban/On-demand	No	3.75	Aerator and Chlorinator

**Determined based on TDC Code of Practice*



Appendix 2: Location of TDC's Water Supplies

Appendix 3: Water Supply Levels of Service, Performance Measures and Targets

Levels of Service	Performance Measure	Target			
		2015/16	2016/17	2017/18	2018/25
(1) Provide Safe Drinking Water	Mandatory PM 1 (safety of drinking water): The extent to which the local authority's drinking-water supply complies with: a) Part 4 of the drinking-water standards (bacteria compliance criteria), and	Bacterial compliance – all schemes	Bacterial compliance – all schemes	Bacterial compliance – all schemes	Bacterial compliance – all schemes
	b) Part 5 of the drinking-water standards (protozoal compliance criteria)	Protozoal compliance – 1. Downlands – Pareora, Hadlow 2. Orari 3. Pleasant Point 4. Seadown 5. Temuka 6. Geraldine 7. Timaru	Protozoal compliance – 1. Downlands – Pareora, Hadlow 2. Orari 3. Pleasant Point 4. Seadown 5. Temuka 6. Geraldine 7. Timaru 8. Winchester 9. Peel Forest	Protozoal compliance – 1. Downlands – Pareora, Hadlow 2. Orari 3. Pleasant Point 4. Seadown 5. Temuka 6. Geraldine 7. Timaru 8. Winchester 9. Peel Forest	Protozoal compliance – 1. Downlands – Pareora, Hadlow, Springbrook, Rural Downlands 2. Orari 3. Pleasant Point 4. Seadown 5. Temuka 6. Geraldine 7. Timaru 8. Winchester 9. Peel Forest 10. Te Moana
	(Int)* Comply with Water Safety Plan as audited by Drinking Water Assessor	Full compliance	Full compliance	Full compliance	Full compliance
(2) Maintain excellent water supply network services	Mandatory PM 2 (maintenance of the reticulation network): The percentage of real water loss from the local authority's networked reticulation system (including a description of the methodology used to calculate this)	To be determined	To be determined	To be determined	To be determined

Levels of Service	Performance Measure	Target			
		2015/16	2016/17	2017/18	2018/25
	(Int) Total network water loss	Report and trend: • Infrastructure Leakage Index (ILI) for urban schemes • Losses per km for rural schemes	Report and trend: • Infrastructure Leakage Index (ILI) for urban schemes • Losses per km for rural schemes	Report and trend: • Infrastructure Leakage Index (ILI) for urban schemes • Losses per km for rural schemes	Report and trend: • Infrastructure Leakage Index (ILI) for urban schemes • Losses per km for rural schemes
		Complete 25% of Rural Jet/Tank Inspection	Complete 25% of Rural Jet/Tank Inspection	Complete 25% of Rural Jet/Tank Inspection	Complete 25% of Rural Jet/Tank Inspection annually
		Develop Leak Detection Programme and report on number of kilometres inspected	Implement Leak Detection Programme and report on number of kilometres inspected	Implement Leak Detection Programme and report on number of kilometres inspected	Implement Leak Detection Programme and report on number of kilometres inspected annually
	(Int) Water supply pressure provided at service connection for urban schemes	At least 95% urban scheme service connections have a normal minimum operating pressure of >200 kPa as predicted by hydraulic models Report on notifications of inadequate water supply at point of supply for urban schemes	At least 95% urban scheme service connections have a normal minimum operating pressure of >200 kPa as predicted by hydraulic models Report on notifications of inadequate water supply at point of supply for urban schemes	At least 95% urban scheme service connections have a normal minimum operating pressure of >200 kPa as predicted by hydraulic models Report on notifications of inadequate water supply at point of supply for urban schemes	At least 95% urban scheme service connections have a normal minimum operating pressure of >200 kPa as predicted by hydraulic models Report on notifications of inadequate water supply at point of supply for urban schemes
	(Int) Flow at service connection for rural schemes	At least 95% of rural scheme service connections have a normal minimum operating pressure of >150 kPa as predicted by hydraulic models Report on notifications of inadequate water supply at the point of supply for rural schemes	At least 95% of rural scheme service connections have a normal minimum operating pressure of >150 kPa as predicted by hydraulic models Report on notifications of inadequate water supply at the point of supply for rural schemes	At least 95% of rural scheme service connections have a normal minimum operating pressure of >150 kPa as predicted by hydraulic models Report on notifications of inadequate water supply at the point of supply for rural schemes	At least 95% of rural scheme service connections have a normal minimum operating pressure of >150 kPa as predicted by hydraulic models Report on notifications of inadequate water supply at the point of supply for rural schemes
	(LTP) Outages to urban and rural scheme properties	All outages >8 hours reported to MOH	All outages >8 hours reported to MOH	All outages >8 hours reported to MOH	All outages >8 hours reported to MOH
(3) Maintain excellent customer service	Mandatory PM 3 (fault response times): Median attendance and resolution times for urgent and non-urgent callouts for water supply faults and	• The median response time to attend urban urgent callouts will be less than 1 hour • The median time to	• The median response time to attend urban urgent callouts will be less than 1 hour • The median time to	• The median response time to attend urban urgent callouts will be less than 1 hour • The median time to	• The median response time to attend urban urgent callouts will be less than 1 hour • The median time to

Levels of Service	Performance Measure	Target			
		2015/16	2016/17	2017/18	2018/25
	unplanned interruptions in the network.**	resolve urban urgent callouts will be less than 4 hours. • The median time to attend rural urgent callouts will be less than 4 hours. • The median time to resolve rural urgent callouts will be less than 8 hours. • The median time to attend and resolve all non-urgent callouts will be reported.	resolve urban urgent callouts will be less than 4 hours. • The median time to attend rural urgent callouts will be less than 4 hours. • The median time to resolve rural urgent callouts will be less than 8 hours. • The median time to attend and resolve all non-urgent callouts will be reported.	resolve urban urgent callouts will be less than 4 hours. • The median time to attend rural urgent callouts will be less than 4 hours. • The median time to resolve rural urgent callouts will be less than 8 hours. • The median time to attend and resolve all non-urgent callouts will be reported.	resolve urban urgent callouts will be less than 4 hours. • The median time to attend rural urgent callouts will be less than 4 hours. • The median time to resolve rural urgent callouts will be less than 8 hours. • The median time to attend and resolve all non-urgent callouts will be reported.
	(Int) Response time to fault or unplanned interruption	≥85% of service requests are responded within the given time in the maintenance contract	≥85% of service requests are responded within the given time in the maintenance contract	≥85% of service requests are responded within the given time in the maintenance contract	≥85% of service requests are responded within the given time in the maintenance contract
	Mandatory PM 4 (customer satisfaction): The total number of complaints received by the local authority about any of the following: (a) Drinking water clarity (b) Drinking water taste (c) Drinking water odour (d) Drinking water pressure or flow (e) Continuity of supply (f) The local authority's response to any of these issues - expressed per 1000 connections to the local authority's networked reticulated system	10 or fewer complaints received per 1000 connections	10 or fewer complaints received per 1000 connections	10 or fewer complaints received per 1000 connections	10 or fewer complaints received per 1000 connections

Levels of Service	Performance Measure	Target			
		2015/16	2016/17	2017/18	2018/25
	(LTP) Water supply services user satisfaction level (Determined from 2-yearly community survey. The last survey was done in 2013/2014.)	≥85% of users are satisfied with water supply services	No survey this year	≥85% of users are satisfied with water supply services	≥85% of users are satisfied with water supply services
	(LTP) Water supply services overall satisfaction level (Determined from 2-yearly community survey. The last survey was done in 2013/2014.)	≥85% of the District's residents are satisfied with water supply services	No survey this year	≥85% of the District's residents are satisfied with water supply services	≥85% of the District's residents are satisfied with water supply services
(4) Provide demand management of water supply services	Mandatory PM 5 (demand management): The average consumption of drinking water per day per resident within the territorial authority district.	To be determined	To be determined	To be determined	To be determined
	(Int) Water conservation measures	Annually report and trend water use	Annually report and trend water use	Annually report and trend water use	Annually report and trend water use
		Develop and Implement a Demand Management Strategy (DMS) and Water Conservation Education Programme (WCEP)	Implement DMS and WCEP	Implement DMS and WCEP	Implement DMS and WCEP
(5) Deliver water services according to required environmental standards	(LTP) Compliance with resource consent conditions***	Compliance with resource consent conditions	Compliance with resource consent conditions	Compliance with resource consent conditions	Compliance with resource consent conditions
(6) Deliver affordable water services	(LTP) Customer satisfaction with value for money of water supply services (Determined from 2-yearly community survey. The last survey was done in 2013/2014.)	≥85% of users think water supply services are good value for money	No survey this year	≥85% of users think water supply services are good value for money	≥85% of users think water supply services are good value for money
	(LTP) Operating cost of combined water supplies	Actual operating cost within budget	Actual operating cost within budget	Actual operating cost within budget	Actual operating cost within budget

Levels of Service	Performance Measure	Target			
		2015/16	2016/17	2017/18	2018/25

*Int = Internal performance measure not reported in TDC's Annual Report

** Attendance time applies from the time TDC receives notification to the time service personnel reach the site. Resolution time applies from the time TDC receives notification to the time service personnel confirm resolution of the fault or interruption. An urgent callout is one that has P1 priority rating and leads to a complete loss of drinking water supply.

***Other than for minor breaches of consent conditions

Appendix 4: AMP Practices Gap Analysis

IIMM INDICATOR	MINIMUM	CORE	INTERMEDIATE	ADVANCED
Understanding and Defining Requirements				
2.1 **AM Policy Development**	Corporate expectations expressed informally and simply, e.g. "all departments must update AM plans every three years.	Defined policy statements for all significant activities. Clear linkage to corporate goals. Policy supported by high level action plans with defined responsibilities for delivery. (2014=65%)	AM Policy and Strategy reviewed and adopted by Chief Executive each year. Expectations of each activity area defined with detailed action plans, resources, responsibilities and timeframes. (2025=75%)	AM Policy and Strategy fully integrated into the organization's business processes and subject to defined audit, review and updating procedures?
2.2 **Levels of Service and Performance Management**	Asset contributions to organization's objectives and some basic levels of service have been defined.	Customer Groups defined and requirements informally understood. Levels of Service are in place covering a range of service attributes. Annual reporting against performance target. (2014=60%)	Customer Group needs analysed. Costs to deliver alternate key levels of service are assessed. Customers are consulted on significant service levels options. (2025=70%)	Levels of service consultation strategy developed and implemented. Technical and customer levels of service are integral to decision making and business planning
2.3 **Demand Forecasting**	Demand forecast based on experienced staff predictions, with consideration of known past demand trends and likely future growth patterns.	Demand forecast based on robust projection of a primary demand factor (e.g. population growth) and extrapolation of historic trends. Risk associated with demand change broadly understood and documented. (2014=60%)	Demand forecast based on mathematical analysis of past trends and primary demand factors. A range of demand scenarios is developed (e.g. high/medium/low). (2025=75%)	As for 'intermediate', plus risk assessment of different demand scenarios with mitigation actions identified.

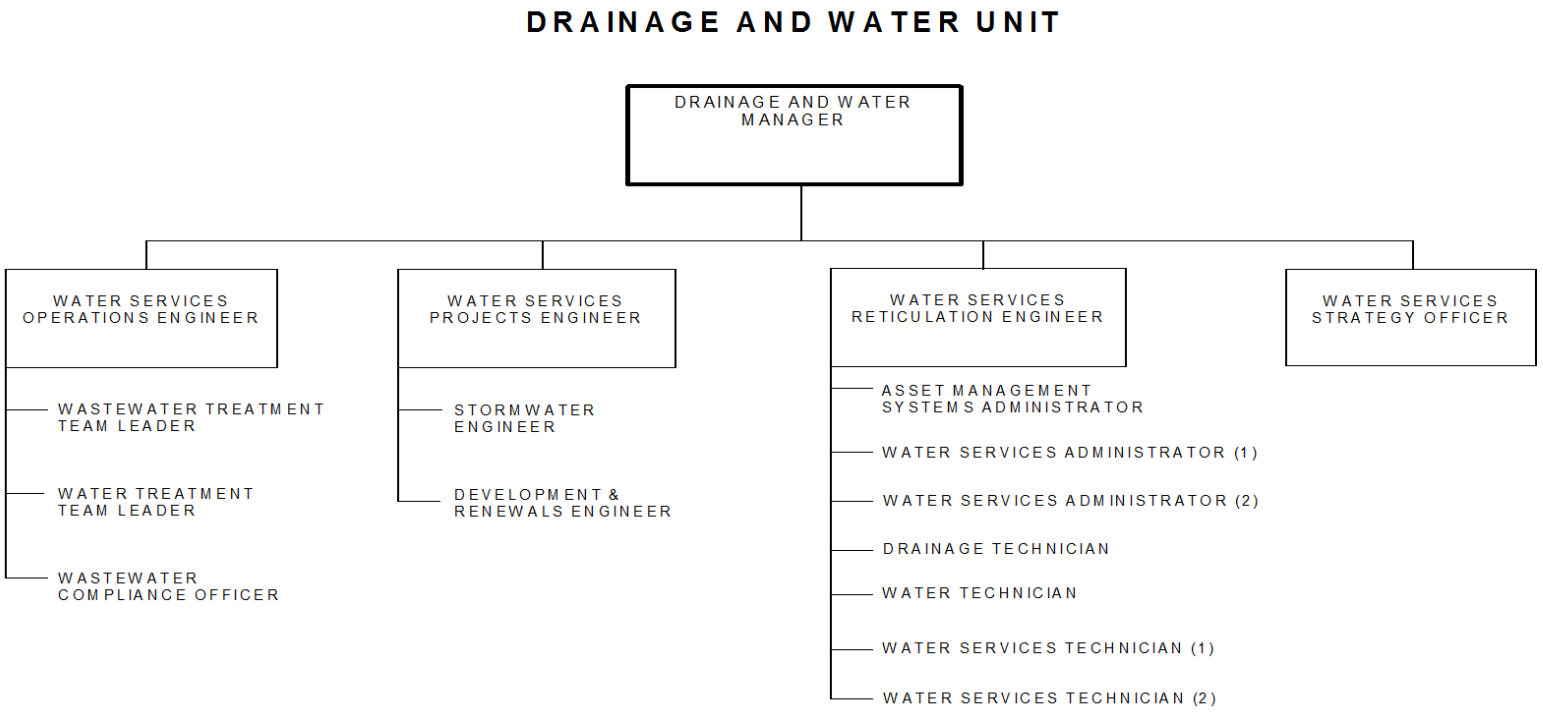
IIMM INDICATOR	MINIMUM	CORE	INTERMEDIATE	ADVANCED
2.4 **Asset Register Data**	Basic physical information recorded in a spreadsheet or similar (e.g. location, size, type), but may be based on broad assumptions or not complete.	Sufficient information to complete asset valuation – as for minimum plus replacement cost and asset age/life. Asset hierarchy, asset identification and asset attribute systems documented.	A reliable register of physical and financial attributes recorded in an information system with data analysis and reporting functionality. Systematic and documented data collection process in place. High level of confidence in critical asset data. (2014=75%)	Information on work history type and cost, condition, performance, etc. recorded at asset component level. Systematic and fully optimized data collection programme. Complete data base for critical asset; minimal assumption for non-critical assets. (2025=100%)
2.5 **Asset Condition**	Condition assessment at asset group level (top-down). Supports minimum requirements for managing critical assets and statutory requirements (e.g. safety)	Condition assessment programme in place for major asset types, prioritized based on asset risks. Data supports asset life assessment. Data management standards and processes documented. Programme for data improvement developed. (2014=60%)	Condition assessment programme derived from benefit-cost analysis of options. A good range of condition data for all asset types (maybe sampling based). Data management processes fully integrated into business processes. Data validation process in place. (2025=85%)	The quality and completeness of condition information supports risk management process, lifecycle decision making and financial/ performance reporting. Periodic reviews of programmes suitability carried out.
2.6 **Risk Management**	Critical asset understood by staff involved in maintenance/renewal decisions.	Risk framework developed. Critical assets and high risks identified. Documented risk management strategies for critical assets and high risks. (2014=60%)	Systematic risk analysis to assist key decision-making. Risk register regularly monitored and reported. Risk managed consistently across the organization. (2025=75%)	Formal risk management policy in place. Risk is quantified and risk mitigation options evaluated. Risk is integrated into all aspects of decision making.

IIMM INDICATOR	MINIMUM	CORE	INTERMEDIATE	ADVANCED
Developing Asset Management Lifecycle Strategies				
3.1 **Decision Making**	AM decisions based largely on staff judgment and agreed corporate priorities.	Formal decision making techniques (MCA/BCA) are applied to major projects and programmes. (2014=65%)	Formal decision making and prioritization techniques are applied to all operational and capital asset programmes within each main budget category. Critical assumption and estimates are tested for sensitivity to results. (2025=75%)	As for 'intermediate', plus. The framework enables projects and programmes to be optimized across all activity areas. Formal risk- based sensitivity analysis is carried out.
3.2 **Operational Planning**	Operational responses are understood by key staff, but plans not well- documented, mainly reactive in nature. Asset utilization is measured for some key asset but is not routinely analyzed.	Emergency response plan developed. Demand management is considered in major asset planning. Asset utilization is measured for critical asset groups and is routinely analyzed. (2014=40%)	Emergency response plans and business continuity plans are routinely developed and tested. Demand management is a component of all operational decision making. Asset utilization is measured and analyzed for most asset groups. (2025=70%)	Operational plans routinely analyzed, tested and improved. Formal debriefs occur after incidents. Asset utilization measured real-time and effectiveness analyzed across all asset groups. Operational programmes are optimized using benefit-cost and risk analysis.
3.3 Maintenance Planning	Organizational objectives and how asset functions support these are understood. Compliant with legislation and regulations. Maintenance records maintained.	Asset criticality considered in response processes. Fault tracking and closure process. Strategy for prescriptive versus performance-based maintenance developed. Key maintenance objectives established and measured. (2014=40%)	Contingency plans for all maintenance activities. Asset failure modes understood. Frequency of major preventative maintenance optimized using benefit-cost analysis. Maintenance management software implemented. (2025=70%)	Forensic root cause analysis for major faults. Optimization of all reactive and planned programmes alongside renewal planning. Procurement models fully explored.

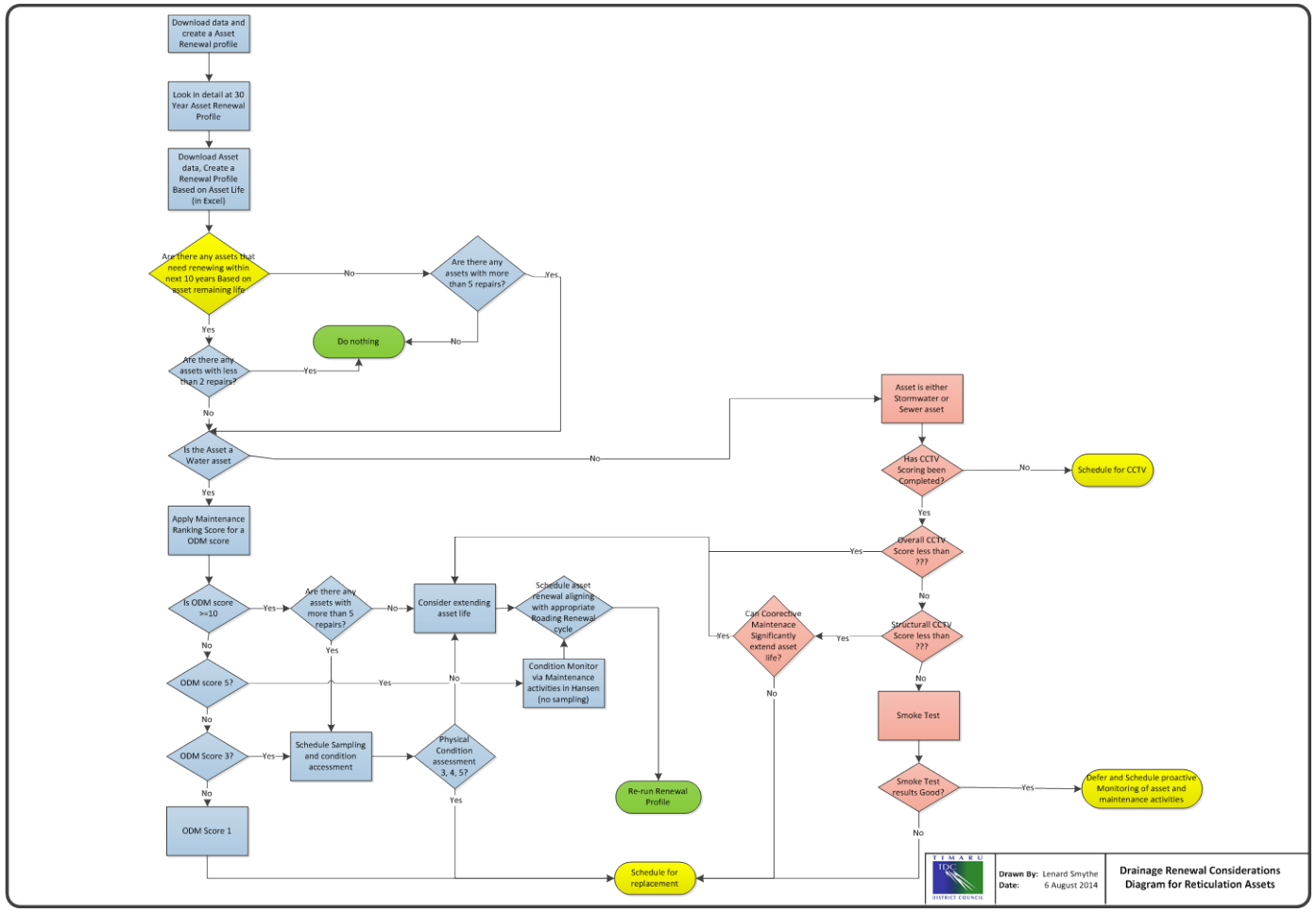
IIMM INDICATOR	MINIMUM	CORE	INTERMEDIATE	ADVANCED
3.4 Capital Works Planning	There is a schedule of proposed capital projects and associated costs, based on staff judgement of future requirements.	Projects have been collated from a wide range of sources such as hydraulic models, operational staff and risk processes. Capital projects for the next three years are fully scoped and estimated. (2014=50%)	As for 'Core' plus formal options analysis and business case development has been completed for major projects in the 3-5 year period Major capital projects for the next 10-20 years are conceptually identified and broad cost estimates are available. (2025=80%)	Long-term capital investment programmes are developed using advance decision techniques such as predictive renewal modelling (refer Section 3.1).
3.5 Financial and Funding Strategies	Assets re-valued in compliance with financial reporting and accounting standards. 10-year financial forecasts are based on extrapolation of past trends and broad assumptions about the future. Expenditure categories compliant with FRS.	Asset revaluations have a 'C' grade data compliance* 10+ year financial forecasts based on current AMP outputs. Significant assumptions are specific and well reasoned. Expenditure captured at a level useful for AM analysis. (2014=50%)	Asset revaluations have a 'B' grade data compliance* 10+ year financial forecasts based on current comprehensive AMPs with detailed supporting assumptions/reliability factors. Asset expenditure easily linked to finance databases. (2025=70%)	Asset revaluations have a 'A' grade data compliance* 10+ year financial forecasts based on comprehensive, advance AM plans with detailed underlying assumptions and high confidence in accuracy. Advanced financial modelling provides sensitivity analysis, demonstrable whole of life costing and cost analysis for level of service options.

IIMM INDICATOR	MINIMUM	CORE	INTERMEDIATE	ADVANCED
Asset Management Enablers				
4.1 **AM Teams**	AM allocated primarily to one or two people who have AM experience	Cross-Council coordination occurs through a Steering Group or Committee. AM training occurs for primary staff. The executive team have considered options for AM functions and structures.	All staff in the organization understands their role in AM, it is defined in their job descriptions and they receive supporting training aligned to that role. (2014=70%) (2025=80%)	A formal AM capability building programme is in place and routinely monitored. The AM structure has been formally reviewed with consideration of the benefits and costs of options.
4.2 AM Plans	Plan contains basic information on asset, levels of service, planned works and financial forecasts (5-10 years) and future improvements.	As for 'Minimum' plus executive summary, description of services and key critical assets, top-down condition and performance description, future demand forecasts, description of supporting AM processes, 10-year financial forecasts, 3-year improvement plan. (2014=65%)	As for 'Core' plus analysis of asset condition and performance trends (past/future), effective customer engagement in setting LoS, ODM/risk techniques applied to major programmes. (2025=75%)	As for 'Intermediate' plus evidence of programmes driven by comprehensive ODM techniques, risk management programmes and level of service/cost trade-off analysis. Improvement programmes largely complete with focus on-going maintenance of current practice.
4.3 **Information Systems**	Asset register can record core asset attributes – size, material, etc. Asset information reports can be manually generated for AMP input.	Asset register enables hierarchical reporting (at component to facility level). Customer request tracking and planned maintenance functionality enabled. System enables manual reports to be generated for valuation, renewal forecasting. (2014=50%)	More automated analysis reporting on a wider range of information. Key operations, unplanned maintenance and condition and performance information held. (2025=80%)	Financial, asset and customer services systems are integrated and all advanced AM functions are enabled.

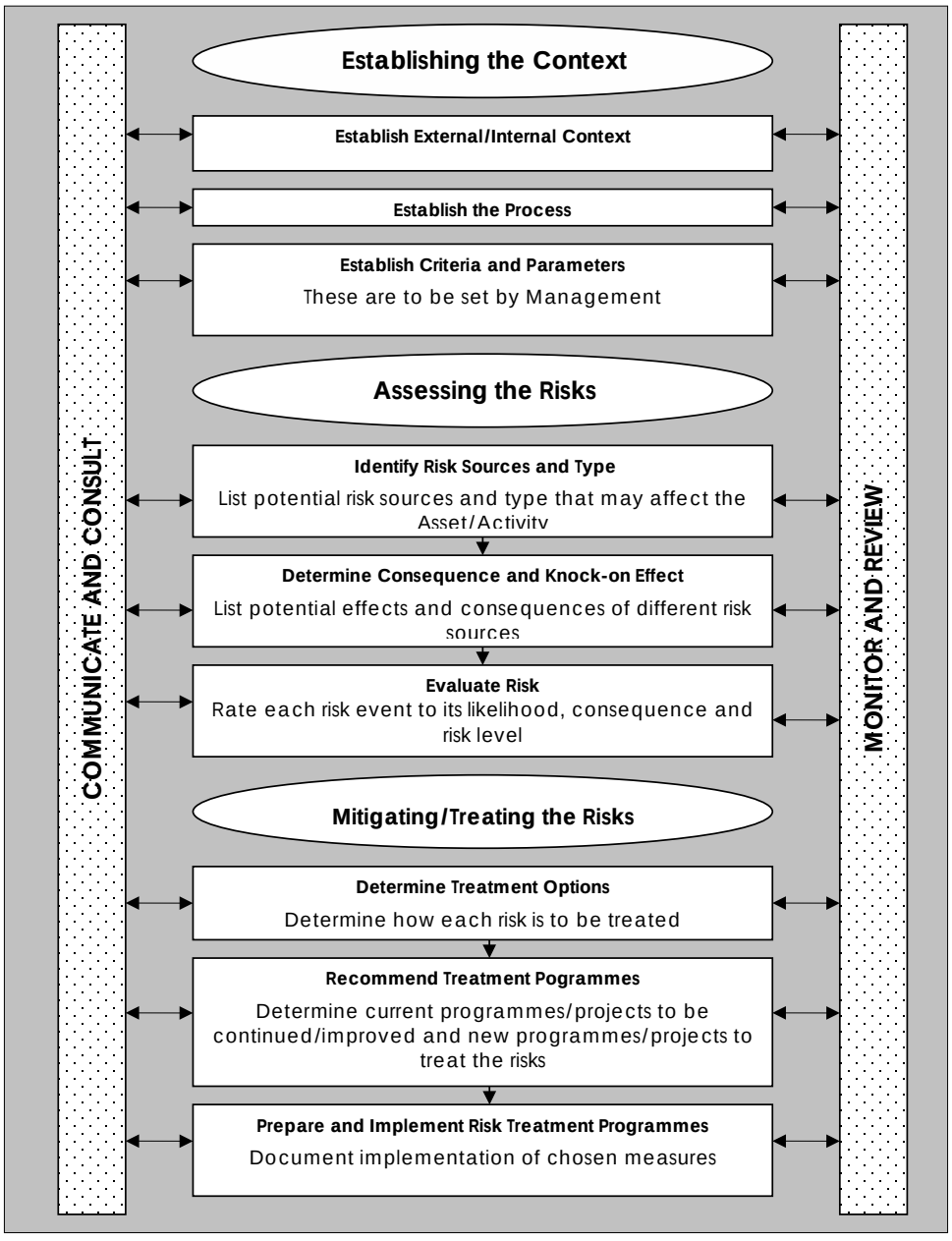
IIMM INDICATOR	MINIMUM	CORE	INTERMEDIATE	ADVANCED
4.4 **Service Delivery Mechanism**	Service delivery roles clearly allocated (internal and external), generally following historic approaches.	Contracts in place for external service provision. Core functions defined.	Internal service level agreements in place with internal service providers. (2025=80%) Contracting approaches reviewed to identify best delivery mechanism. Tendering/contracting policy in place. Competitive tendering practices. (2014=70%)	All potential service delivery mechanisms reviewed and formal analysis carried out. Risks, benefits and costs of various outsourcing options are considered.
4.5 **Quality Management**	Simple process documentation in place for service-critical activities.	Defined quality policy and basic Quality Management System. All critical activity processes documented. (2014=40%)	Process documentation implemented in accordance with the Quality System Management Plan. All processes documented to appropriate level of details. (2025=65%)	ISO 9001 certification achieved and surveillance audit demonstrates the satisfactory operation of the Quality Management System
4.6 **Improvement Planning**	Improvement actions identified and allocated to appropriate staff.	Current and future AM performance assessed and gaps used to drive the improvement actions. Improvement plans identify objectives, timeframes, deliverables, resource requirement and responsibilities. (2014=50%)	Formal monitoring and reporting on the improvement programme to Executive Team. Project briefs developed for all key improvement actions. (2025=70%)	Improvement plans specified key performance indicators (KPIs) for monitoring AM improvement and these are routinely reported.



Appendix 5: TDC Drainage and Water Unit Organizational Chart



Appendix 6: Pipe Renewal Decision Flowchart



Appendix 7: Risk Management Process

Appendix 8: Approved Water Safety Plans as at 2014

Scheme	Subsection	Status	Document number	Review due
Geraldine		Approved	839444	October 2018
Peel Forest		Approved	847903	2013
Pleasant Point		Approved	846002	November 2018
Temuka		Approved	821708	July2018
Timaru	Timaru urban	Approved	556590	July 2017
	Pareora Pipeline	Not Yet developed		June 2015
Winchester		Not yet developed		June 2015
Beautiful Valley		Not required		
Downlands	Pareora	Approved	835437	2018
	Rural	Approved	787287	July 2019
	Hadlow	Approved	872129	April 2019
	Springbrook	Not yet developed		June 2015
Orari		Refer Temuka		
Rangitata Orari		Not required		
Seadown		Approved	858144	February 2019
Te Moana		Approved	866698	April 2019

Appendix 9: Water Supply Services Planning Assumptions

Assumption:	Confidence Level			Risk/Uncertainty	Risk Level			Consequence of variation to assumption	Mitigation
	High	Med	Low		High	Med	Low		
Council will remain involved in this activity and continue to own and operate all assets.	✓			Council will devolve ownership and/or operation of some assets.			✓	May adversely affect TDC's ability to recover capital costs.	Cost-benefit analysis of service delivery options.
Water availability is unchanged and not significantly adversely affected by climate change or other factors.		✓		Effects of climate change or other factors are more severe than expected.		✓		May create additional costs to improve protection of/repair damage to critical infrastructure.	Monitoring of sources and water availability.
Source water quality does not decrease due to climate change or change in land use.		✓		Climate change and land use change effects are more severe than expected.		✓		May create additional costs to meet DWSNZ.	Monitoring of sources.
Actual demand will be within projected levels.		✓		Demographic changes are higher or lower than expected.			✓	Significant and consistent variation from projected levels may adversely affect TDC's ability to meet levels of service at an affordable cost.	Monitoring of demographic changes.
Cost estimates do not escalate significantly. Projections are based on current year dollar value.		✓		Costs are higher than anticipated.		✓		May adversely affect TDC's ability to provide the service at an affordable cost to the community.	Annual review of budget.
Levels of service will not change.	✓			Communities demand or legislations impose increased levels of service.		✓		Increased or improved levels of service may require additional resources for TDC to provide them.	Community engagement.
Asset information is reliable and reflects the condition and performance of the assets.		✓		Asset information is not reliable.			✓	Renewals program is inaccurate and may have significant financial repercussions.	Regular asset condition and performance monitoring.
Fire-fighting Code of Practice (COP) SNZ PAS 4509: 2008 remains voluntary.		✓		COP becomes mandatory resulting in significant reticulation upgrades.		✓		Increased infrastructure costs.	Consideration of progressive upgrades to meet COP requirements when renewals are programmed. Monitoring of legislative changes.

PART B – ACTIVITY MANAGEMENT BY WATER SCHEME

B1. Urban Water Schemes

- B1.1 Geraldine
- B1.2 Peel Forest
- B1.3 Pleasant Point
- B1.4 Temuka
- B1.5 Timaru
- B1.6 Winchester

B2. Rural Water Schemes

- B2.1 Downlands
- B2.2 Orari
- B2.3 Seadown
- B2.4 Te Moana

B3. Stockwater Races

- B3.1 Beautiful Valley
- B3.2 Rangitata-Orari

B1 - URBAN WATER SUPPLY SCHEMES

This Section provides summary information on the urban water schemes.

The urban water schemes consist of the Geraldine, Peel Forest, Pleasant Point, Temuka, Timaru and Winchester water supplies. They are operated as individual water supplies but funded as a single scheme. This Section provides the detailed 10-year capital work programme and budget which includes renewal works as well as works to address levels of service improvements and growth in demand.

Detailed description of assets in each scheme, their condition and performance, associated risks, demand, and priority issues are covered in the succeeding sections.

ASSET SUMMARY – ALL URBAN SCHEMES

Plant Asset Information is summarised in Table 9.

Summary information on reticulation assets are in the following graphs:

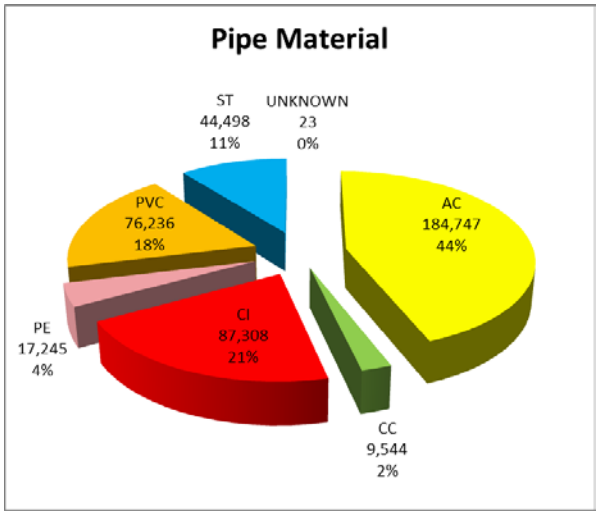


Figure 4: Urban Schemes, Length of Mains (km) by Material and % Distribution

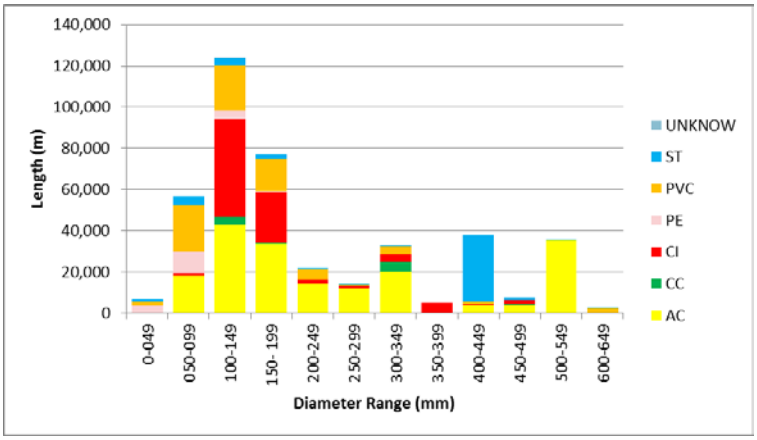


Figure 5: **Urban Schemes, Diameter Range of Water Mains by Material and Length**

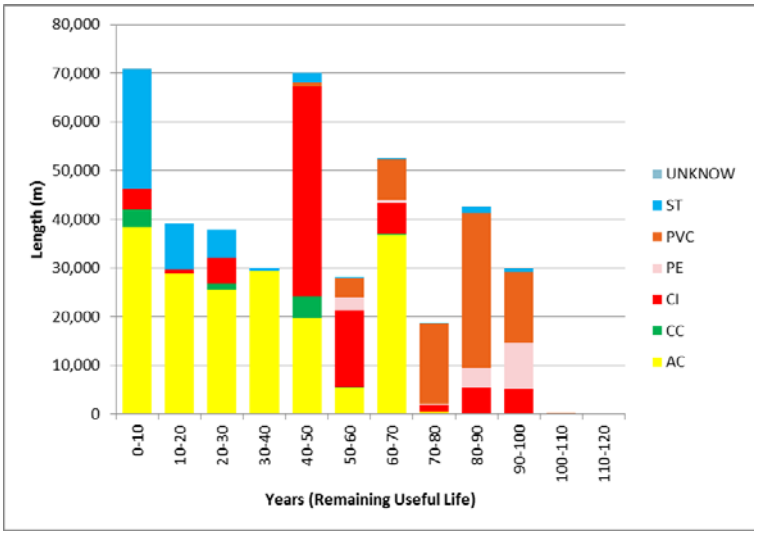


Figure 6: **Urban Schemes Remaining Useful Life of Mains by Length and Material Type**

Table 9: Urban Scheme Facilities and Land Assets

SCHEME	FACILITY	INTAKE	TREATMENT	PUMP	STORAGE (m^3)	TELEMETRY	LAND STATUS*
Geraldine	Geraldine	Bores	UV and filters	√	x	√	DW
	Geraldine Reservoir	x	x	x	2,275	√	DOC
	Tripp St Pump	x	x	√	x	x	R
Peel Forest	Intake	Spring	x	x	x	x	P
	Treatment Plant	x	Chlorine	√	30	x	P
Pleasant Point	Pleasant Point	Bores	UV	√	136	√	DW
	Pleasant Point Emergency Source	Timaru (Opihi)	x	x	x	x	R
Temuka	Spring Intake	Infiltration gallery	x	x	x	x	P
	Temuka Reservoir and Treatment Plant	Bores	UV and Chlorine	√	1,600	√	DW
	Orari Pump Station	Bore	x	√	x	x	DW
Timaru	Pareora Intake	River	x	x	x	√	Rs
	Opihi Intake	Infiltration gallery	x	√	x	√	DW
	Claremont Reservoir	x	Ozone, Chlorine and pH Correction	√	220,000	√	DW
	Rosewill Pump Station	x	x	√	x	√	DW
	Gleniti Reservoir	x	Chlorine	√	7,000	√	DW
	Gleniti Pump	x	x	√	X	X	R
	Washdyke Meter	x	x	x	x	√	R
Winchester	Winchester	Bore	Chlorine	√	158	√	DW

* DW= TDC owned and administered by D&W Unit; P=Private; C=Crown (usually riverbed); R= Road Reserve; DOC= Department of Conservation; Rs= Reserve; TDC= TDC owned and administered by Property Unit.

CAPITAL WORKS PROGRAMME AND BUDGET

To be added when LTP budget is finalised.

PLANNED MAINTENANCE PROGRAMME AND BUDGET

Details of the Maintenance Programme are found in TRIM Document # 859216.

Maintenance Budget to be added when LTP budget is finalised.

B1.1 GERALDINE WATER SUPPLY

SCHEME OVERVIEW

The Geraldine Water Supply was installed in the 1930s. It is an urban water scheme with firefighting capacity. Its water comes from four 12m deep wells/bores near the Orari River. Water goes through an ultraviolet (UV) light chamber before being pumped into a reservoir located above ground within the Talbot Forest Reserve. The UV treatment kills giardia and cryptosporidium and has been designed to meet the Drinking Water Standards for New Zealand.

From the reservoir, water is supplied to consumers using gravity only which means that the water pressure is mostly dependent on the height difference between the reservoir and the supplied property. Around 2,433 reticulated populations in the township of Geraldine are served.

The take of water for Geraldine Water Supply from the Orari River is permitted under CRC064043. This consent was renewed in 2007 for further 20 years. The renewal allowed an increase in volume of water take to feed the Te Moana Water Supply from this source.

The scheme also supplies stock and domestic water to a portion of the Te Moana Water Supply for some or all of the year.

ASSET SUMMARY

A schematic diagram of the Geraldine Water supply is shown in Figure 7. The asset components of the scheme consist of a bore field with a treatment plant and a reservoir. The treatment plant and reservoir are equipped with telemetry device.

There are approximately 24.82 km of water mains within the reticulation. The trunk main which runs from the treatment plant to the reservoir within the Talbot Forest is approximately 3.2 km long, made up of a single 250 mm diameter AC. A further 0.15 km of 200 mm diameter AC pipe was installed in 1977.

Figure 8 below shows the percentage distribution of pipes by material type and length. Figure 9 shows pipe diameter by length and material type.

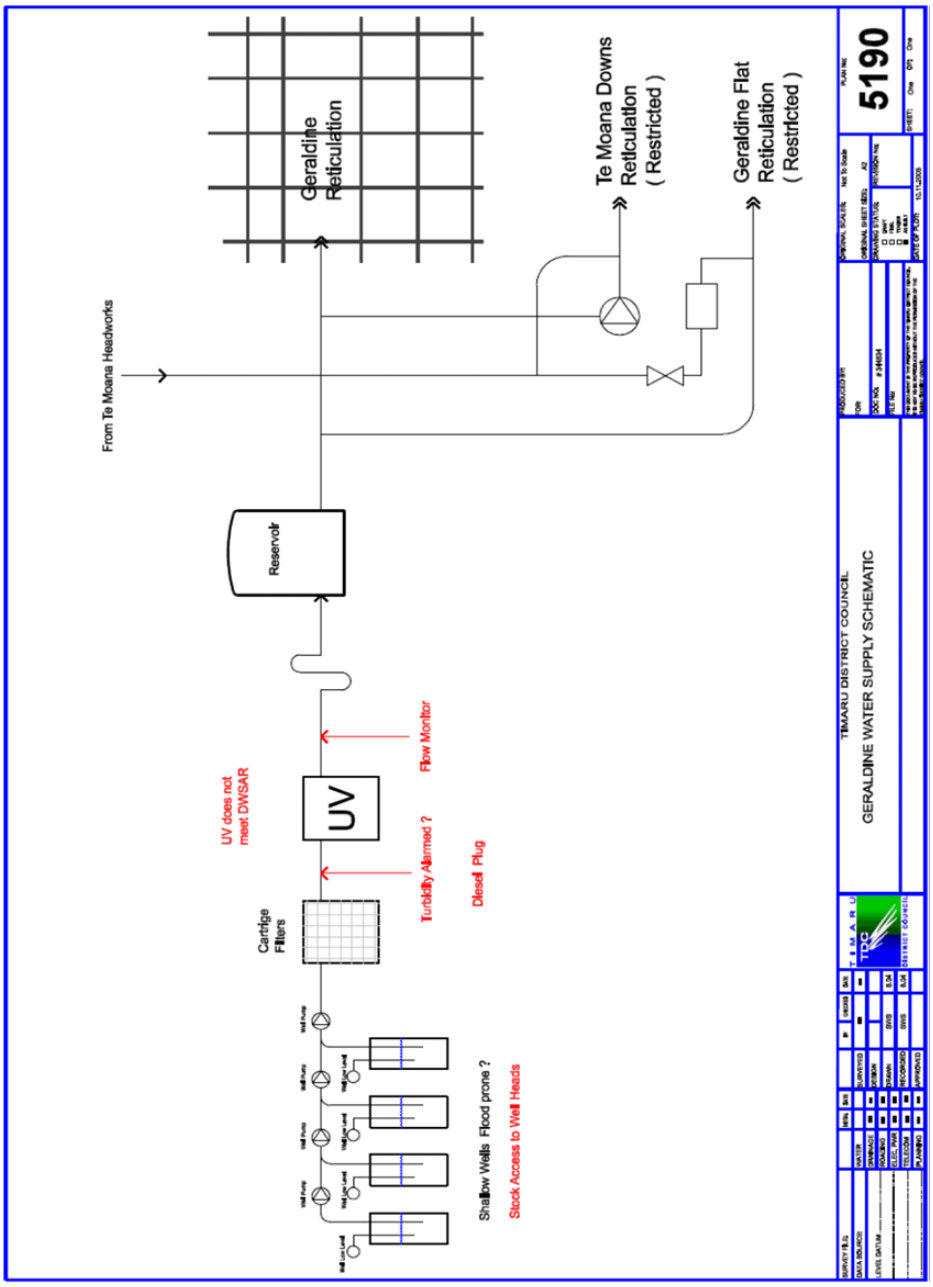


Figure 7: **Geraldine Water Supply Schematic**

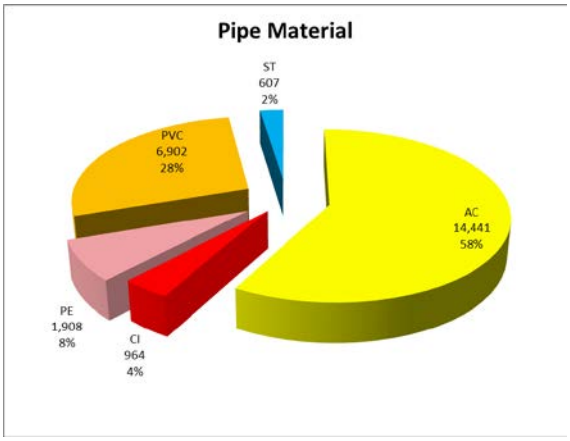


Figure 8: **Geraldine Water Mains Material Type, by Length (meter) and % Distribution**

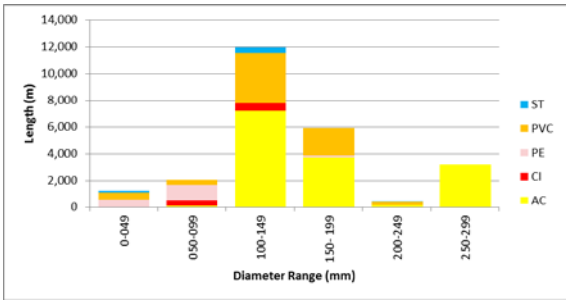


Figure 9: **Geraldine Water Mains Diameter Range, by Pipe Length and Material**

ASSET CONDITION AND CRITICALITY

The bores, treatment plant and reservoir are in good condition (From 2013 report, TRIM document #829869). The plant is visually inspected on a regular basis. Its operation is telemetered and any faults would be detected immediately. This mitigates risk of asset failure.

The treatment plant and reservoir are highly critical assets (details of criticality assessment in TRIM document #829869). As they are in good condition, the overall risk of asset failure and loss of LOS are considered low. Regular inspection and maintenance mitigates the risk of asset failure.

Part A Section 5.3 of this AMP describes the criteria used in estimating the remaining useful life of pipes, and the cyclic renewal strategies for the reticulation network that incorporates risk and criticality factors. Critical reticulation assets in Geraldine are identified in TRIM document# 551581.

The condition of the reticulation is based on condition sampling of the pipes from the 2008 and 2014 Pipe Condition Assessment by Opus. The results show a big portion of AC pipes will be renewed within the next 10 years (see Figure 10 below).

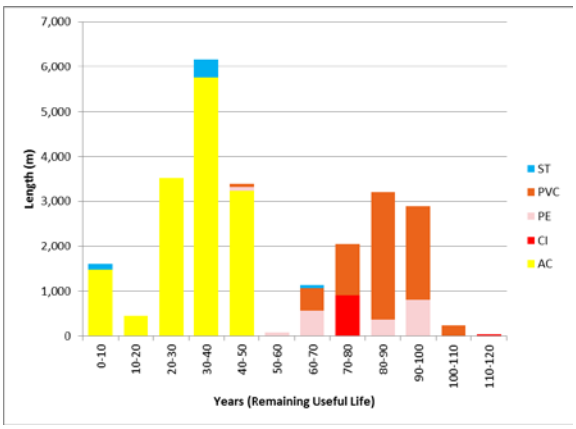


Figure 10: Geraldine Water Mains Remaining Useful Life, by Length and Material Type

ASSET CAPACITY/PERFORMANCE

The resource consent conditions allow 80 litres per second abstraction rate with a maximum take of 49,408 m^3 in any period of seven consecutive days. For the combined Geraldine and Te Moana takes, Te Moana has a maximum take of 7,408 m^3/7days. The system capacity is currently unable to take 80 L/s with a peak capacity of 60 L/s. The consent has adequate volume for a significant growth.

The design capacity for the treatment plant is 60 L/s. Storage is a fully enclosed concrete reservoir that holds 2,275 m^3 or approximately 12 hours storage at high demand times. This capacity is adequate for current demand. But storage capacity will be an issue with any significant growth in demand. Geraldine is likely to be supplying more or the entire Te Moana scheme within the 10 year timeframe. This is likely to increase annual demand from the source, trunk main and reservoir by up to 60% per annum (2012/13) or 25% on a high demand day.

Pressure reduction occurs when the draw off from the reservoir is very high and exceeds the pump capacity. When the reservoir drops below approximately 70% full, several houses near the reservoir level have water shortages. This minimises the benefits of the storage.

Current network capacity is sufficient to meet the required Levels of Service in this AMP. Of note, however, is that the Raukapuka catchment is currently fed by 150 mm diameter AC watermain which is close to demand network capacity to the catchment.

Assessment of Fire Fighting Capacity

Currently the gazetted fire district covers the approximate urban boundaries. There are no major discrepancies between the Fire District boundaries and the area covered by hydrants. Some individual streets on the outskirts of the reticulated area are without hydrant coverage as the sections are not developed to date. Hydrants will be installed as and when required by development.

All fire hydrants and flows meet 25 L/s minimum Fire Fighting Standards and there are no known maintenance issues.

LEVELS OF SERVICE

The Geraldine Scheme is a drinking water supply. Customers are predominantly domestic or related to a domestic and farming population such as schools, rest homes, restaurants and food outlets, mall businesses, and some farms in the urban fringe. Te Moana Water Supply is the largest consumer taking 6-26% of the water each year.

There are no LOS issues with Geraldine water supply. Performance status in 2013-2014 is summarized in Table 10 below. Council plans to consult with the community on LOS options and their costs to improve management of the scheme.

Table 10: Geraldine Water Supply LOS Performance Status

Levels of Service	Customer Core Value	2013/14 Status
Deliver water services according to required environmental standards	Environmental Safety	Resource consents compliant
Provide Safe Drinking Water	Quality	DWSNZ compliant (chemical, bacteria, protozoa)
Provide demand management of water supply services	Responsiveness	Water use monitored. No major changes in volume. Hosing restriction not required in 2013/14.
Deliver affordable water supply services	Affordability	Highly satisfied users and public – in district wide survey
Maintain excellent customer service	Efficiency	No major complaints (service requests, water odour/taste/appearance)
Maintain excellent water supply network services	Quality	No unplanned outage > 8 hours Water pressure ≥200 kPa

RISK

Risks to the Geraldine Water Supply were identified and assessed during the development of the scheme's Water Safety Plan (formerly Public Health Risk Management Plan). (TRIM Document # 839444)

There are no high or extreme risks to health of consumers served by the Geraldine scheme. There are moderate and low risks, a number of which can be readily addressed or monitored for little staff time or additional cost. The potential causes are:

- Agricultural contamination
- Excessive demand or leakage
- Backflow
- Poor maintenance practices
- Dead end mains
- Pressure Reduction
- Air in reticulation following maintenance
- Staff unfamiliar with event

The Improvements Schedule in the Water Safety Plan gives priority to these risks most of which are items of moderate to major capital works expenditure that need further investigation and evaluation.

A *Business Continuity Plan* will be developed to mitigate risk from levels of service failure due to unforeseen significant events.

DEMAND

The average annual demand for water within Geraldine in the last 7 years was around 516,000 m^3. The average supply to Te Moana Water Supply was 89,000 m^3. The scheme has 1,288 connections. These were all within the projected demand levels and the capacity of the assets.

Geraldine Water Supply currently serves approximately 2,433 reticulated populations (excluding Te Moana). The scheme currently serves 1,438 connections.

Changes in Demand

- Council's LTP medium-growth scenario estimates an uptrend in population and number of households in the Timaru District in the next 10 years. The significance of these projections for Geraldine will be monitored and any potential impact will be assessed through the hydraulic model of the scheme.
- There may be a significant increase in demand if Te Moana Scheme is supplied entirely from Geraldine Scheme. Expansion in asset capacity will be required (Cross reference with B2.4 Te Moana Water Supply).

- Any actual change in demand is assumed to be within the projected levels. Design capacity of Geraldine's plant assets and reticulation are sufficient to meet projected medium growth scenario.
- Scheme boundary changes in the periphery may be requested.

Managing Demand

Occasional water shortages due to dry weather are managed through the council's stepped hosing restriction policy that is imposed to reduce demand to the required level. In the last 10 years only level 1 restrictions, a ban on watering lawns, have been implemented.

Other demand factors, such as land use change and economic development trends, will continue to be monitored and assessed, and water use will continue to be trended and analysed in the development of the Annual Plan to mitigate risk of level of service failure from any major changes in water use.

Continual changes in the scheme's demand drivers are accounted for through a managed *Model Calibration Programme* that is reviewed and recalibrated every three years. The next calibration is scheduled for 2015.

A district-wide *Water Conservation Education Programme* will be developed within this AMP period. Implementation will take into account identified water use issues within the scheme.

A *Leak Detection and Reduction Programme* is currently being developed, and once this has been implemented, total water demand from the scheme is expected to decrease.

SUMMARY OF ISSUES

The following issues are considered as areas for priority attention within the next ten years:

1 Geraldine is likely to be supplying more or the entire Te Moana scheme within the 10 year timeframe. This is likely to increase annual demand from the source, trunk main and reservoir by up to 60% per annum (2012/13) or 25% on a high demand day.
2 Raukapuka catchment is currently fed by 150 mm diameter AC watermain which is close to demand network capacity to the catchment.
3 Ageing reticulation infrastructure with 60% (14.8 km) of AC pipe reaching the end of its useful life.

FUTURE WORKS

Refer to Section B1 – Urban Water Schemes Capital Work Programme and Budget

Planned works in the Geraldine Scheme in the next 10 years will address asset renewal requirements, sustaining levels of service and growth in demand. These include:

- Implementation of the Geraldine Area Wide Water Supply Strategy
- Renewals at the reservoir
- Renewals at the pump station
- Tripp Street pump renewal
- Reticulation renewals
- Pipe condition assessment
- Leak detection and reduction
- Network analysis and metering

B1.2 PEEL FOREST WATER SUPPLY

SCHEME OVERVIEW

The Peel Forest township is located approximately 50 km north of Timaru. Peel Forest Water Supply is a small scheme supplying drinking water in the residential area of the township. The scheme does not supply the picnic area, campground or all of the properties at Peel Forest.

The Peel Forest water supply consists of a small site storage scheme. The scheme was established prior to 1950 and various modifications since 1950 have included the renewal of reticulation with polythene pipe in 1966.

The water is piped from a spring through a small treatment plant, where it is chlorinated, and pumped into a storage tank. It is then gravity fed down the main road and into Dennistoun Road. A treatment upgrade to UV and cartridge filters is programmed for 2015.

ASSET SUMMARY

A schematic diagram of the water supply is shown in Figure 11 below.

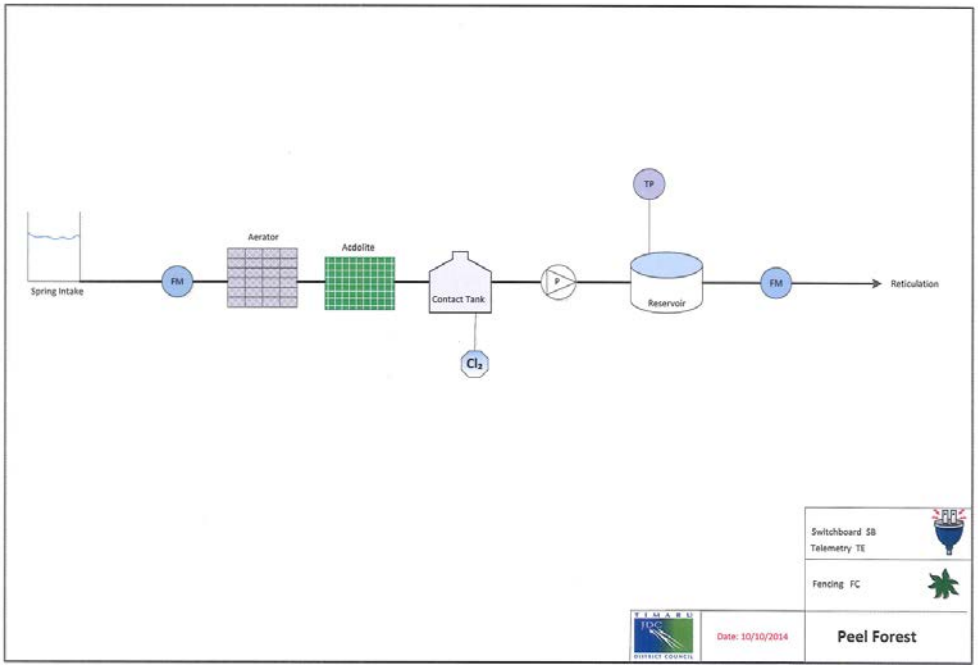


Figure 11: Peel Forest Water Supply Schematic

The asset components of the scheme consist of a spring intake, a pump, a treatment plant, telemetry and a storage tank. Length of reticulation is approximately 1.47 kilometres. Figure 12 below shows the percentage distribution of pipes by material type and length. Figure 13 shows length of pipes by diameter range.

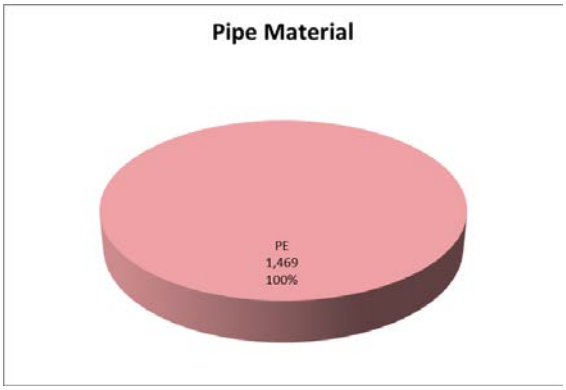


Figure 12: Peel Forest Water Mains by Pipe Material and Length

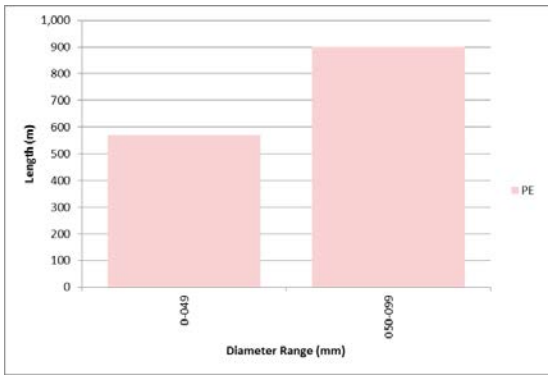


Figure 13: Peel Forest Water Mains Diameter Range by Length and Type of Material

ASSET CONDITION AND CRITICALITY

The facilities are in good condition (Report in TRIM document # 829869). The intake and treatment plant requires minor maintenance only. The plant is above ground, visited on a regular basis and equipment is readily accessible. Any malfunctioning or deterioration is readily detected and rectified. The plant is telemetered and faults are detected immediately. All facilities hold C grade criticality rating in Hansen. Risk of asset failure is deemed low.

Part A Section 5.3 of this AMP describes the criteria used in estimating the remaining useful life of pipes, and the cyclic renewal strategies for the reticulation network.

The pipes have 50 or more years remaining useful life (see Figure 14 below). Renewals are not anticipated in this scheme within the next 30 years.

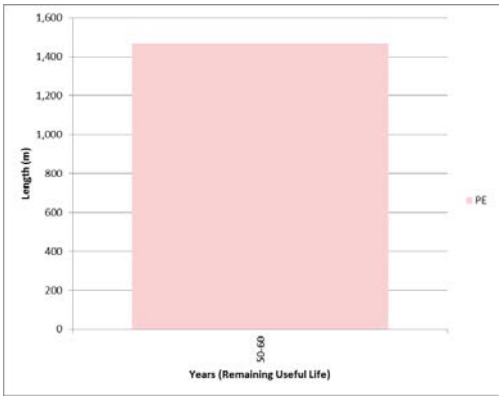


Figure 14: Peel Forest Water Mains Remaining Useful Life

ASSET CAPACITY/PERFORMANCE

The storage tank holds 20 hours supply at maximum daily demand. The storage reduces the impact of short-term outages for maintenance works of the treatment.

The resource consent permits a maximum rate at 1.5 L/s, with a volume not exceeding 907 m^3 per week. The consent expires in 2046.

The capacity of the source and pipe to the treatment plant is 0.5 L/s. The maximum daily flow in the last 2 years was approximately 40 m^3/day.

Residents are required to provide site storage tanks of 900 litres minimum size to ensure that each household has sufficient storage for two days, thus preventing supply shortages during peak demands or when TDC shuts off the supply to carry out maintenance work.

During extreme dry season when spring supply drops to a very low level, water restrictions are applied to reduce demand. Previous gaugings recorded a minimum spring flow of 1.06 L/s and the flow during the dry season can reduce to approximately half of this.

The capacity of this scheme is sufficient to supply existing consumers for the majority of the time.

Current network capacity is sufficient to meet the required Levels of Service in this AMP.

The scheme has no fire fighting capacity and it is anticipated to remain this way in the future.

LEVELS OF SERVICE

The scheme supplies 35 connections. The supply is for drinking purposes only.

Although Peel Forest is within the urban water schemes, some of the urban LOS are not achievable.

There are no LOS issues with Peel Forest water supply. Performance status for 2013/14 is summarized in Table 11 below. Council plans to consult with the community on LOS options and their costs to improve management of the scheme.

Table 11: Peel Forest LOS Performance Status

Levels of Service	Customer Core Value	2013/14 Status
Deliver water services according to required environmental standards	Safety	Resource consents compliant
Provide Safe Drinking Water	Quality	Compliant with DWSNZ chemical and bacteria only.
Provide demand management of water supply services	Responsiveness	Water use monitored. No major changes in volume. Hosing restriction policy if required. No restrictions required during 2013/14.
Deliver affordable water supply services	Affordability	Highly satisfied users and public in district wide survey
Maintain excellent customer service	Efficiency	No major complaints (service requests, water odour/taste/appearance)
Maintain excellent water supply network services	Quality	No unplanned outage > 8 hours Water pressure ≥200 kPa at point of supply was not achieved

RISK

Risks to the Peel Forest water supply were identified and assessed during the development of the scheme's Water Safety Plan, formerly Public Health Risk Management Plan, (TRIM Document #847903).

The risks that stand out as high priority are as follows:

- No treatment process for protozoa. DWSNZ required treatment and assumes protozoa in water.
- backflow

- Illegal connection to water supply especially where backflow of contaminated water possible.
- The Improvements Schedule gives high priority to these risks most of which are items of moderate to major capital works expenditure that need further investigation and evaluation.

There are moderate and low risks, a number of which are already or can be readily addressed or monitored for little staff time or additional cost. The potential causes are:

- Agricultural contamination
- Meter failure
- pH adjustment fails
- power failure

Emergency Response and Business Continuity Plan will be developed to mitigate service failure from unforeseen significant events.

DEMAND

Peel Forest Water Supply currently serves approximately 63 reticulated populations although this will increase significantly during holiday periods. Average annual demand for water in the last 3 years was 6,828 m^3 (data from Annual Performance Report).

Changes in Demand

- No significant change in demand is expected based on the last 10 year performance of the scheme.
- Any actual change in demand is assumed to stay within projected levels.

Managing Demand

Dry weather conditions may result in short supply because of low spring flows and excessive use by consumers. When this happens hosing restrictions are put in place to help keep the demand for water down. Restrictions are advertised in the newspaper and on TDC's website.

Other demand factors, such as land use change and economic development trends, will continue to be monitored and assessed, and water use will continue to be trended and analysed in the development of the Annual Plan to mitigate risk of level of service failure from any major changes in water use.

A district-wide *Water Conservation Education Programme* will be developed within this AMP period. Implementation will take into account identified water use issues within the scheme.

ISSUES AND FUTURE WORKS

Treatment process upgrade is required to improve quality and maintain safety of water supply. Expansion of the treatment facility is underway.

The scheme has no capacity for new connections. There are no other identified significant issues in the Scheme at the time of writing of this AMP.

Treatment renewal is planned within the period of this AMP.

Refer to Section B1 – Urban Water Schemes Capital Work Programme and Budget for details.

B1.3 PLEASANT POINT WATER SUPPLY

SCHEME OVERVIEW

Pleasant Point is a rural town with a resident population of 1,278 (from 2013 Census, TRIM document # 888167). The town is located approximately 20 km northwest of Timaru. The Pleasant Point water supply was initially reticulated during the late 1930s as part of the Downlands Water Scheme. Water is now sourced from two bores and an infiltration gallery. The area owned by the Council (adjacent to Halstead Road) where one bore (1998), the infiltration gallery (2009), the treatment plant and the reservoir (1964) are located is approximately 1,500 m^2. The second bore, established in 1997, is located on Stratheona Road Reserve. The water is firstly aerated and then passes into a 136 m^3 concrete reservoir. From this, water then passes through a booster pump, an ultraviolet irradiation disinfection unit (installed mid-2003 and then is supplied via the reticulated system to consumers.

The resource consent conditions allow 50 L/s abstraction rate with a maximum take of 1,850 m^3 per day. This consent expires in 2034.

ASSET SUMMARY

A schematic diagram of the Pleasant Point Water Supply is shown in Figure 15. The asset components of the scheme consist of:

- 1 infiltration gallery
- 2 bores
- a pump station
- a treatment plant
- a reservoir
- telemetry

There are approximately 15.40 km of pipe within the reticulation. Figure 16 below shows the percentage distribution of pipes by material type and length. Figure 17 shows pipe diameter by length and material type

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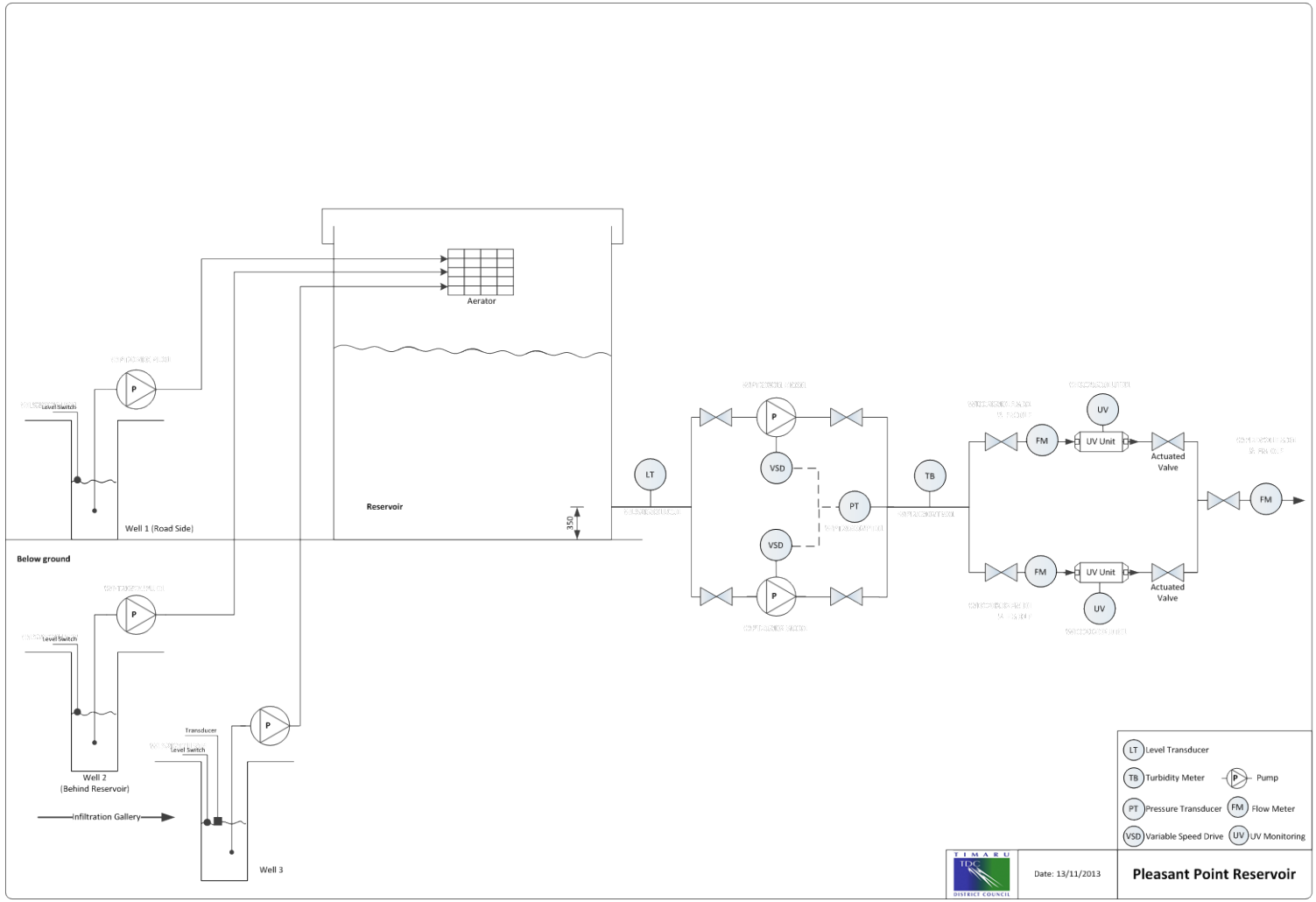

Figure 15: Pleasant Point Water Supply Schematic

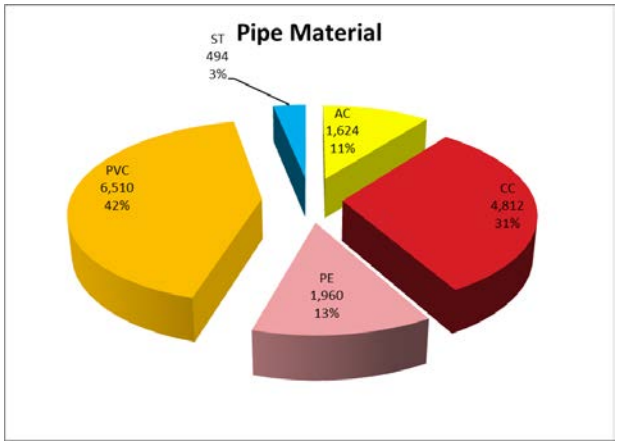

Figure 16: **Pleasant Point Water Mains Material Type, by Length (m) and % Distribution**

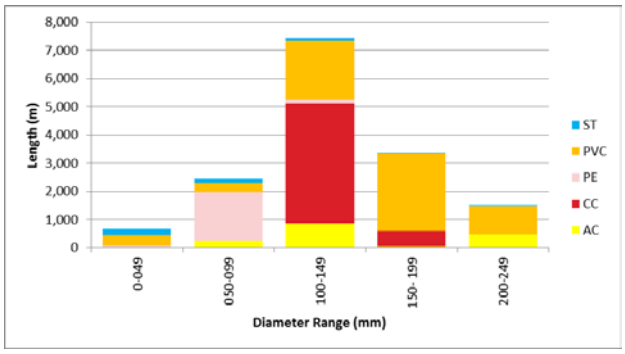

Figure 17: **Pleasant Point Water Mains Diameter Range, by Pipe Length**

ASSET CONDITION AND CRITICALITY

The bores and treatment plant are in good condition, the reservoir has deterioration issues (From 2013 report, TRIM document # 829869). These facilities are visually inspected on a regular basis. Operation is telemetered and any faults would be detected immediately.

The treatment plant and reservoir are critical assets (details of criticality assessment in Document #829869). Failure risk is low on the treatment plant that is in good condition but high on the reservoir due to significant deterioration issues. Regular inspection and maintenance mitigates the risk of asset failure.

Part A Section 5.3 of this AMP describes the criteria used in estimating the remaining useful life of pipes, and the cyclic renewal strategies for the reticulation network that incorporates risk and criticality factors. Critical reticulation assets are identified in TRIM document# 551581.

As shown in Figure 18 below, Pleasant Point has a significant amount of CC pipes installed, 31% (4.8km). Water leak detection studies have shown joints in CC pipes are prone to leakage and thus requiring monitoring. Priority of reducing leakage will be the renewal of the CC water main.

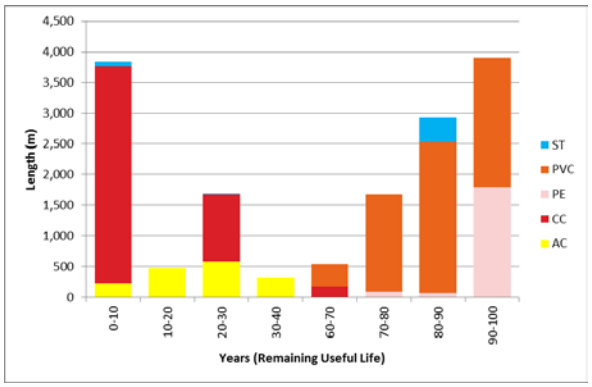

Figure 18: Pleasant Point Water Mains Remaining Useful Life, by Length and Material

ASSET CAPACITY/PERFORMANCE

The Pleasant Point Water Supply is a combination of an on-site storage and on-demand system for domestic and industrial water. Properties are required to have an on-site storage tank but are allowed a single high-pressure tap prior to the storage tank for a hose connection. Dispensation is given to consumers on request and storage will not be a requirement following the new reservoir installation in 2015/16.

The design of the headworks is based on supplying a fire fighting supply of 50 L/s to the school. Beyond this point a fire fighting supply of 25 L/s only is required (SNZ PAS 4509:2003: New Zealand Fire Service Fire Fighting Water Supplies Code of Practice).

The Pleasant Point township has a reservoir of 136 m^3 capacity. This equates to only approximately half an hour at design flow rates or 1.5 hours at current peak flow rates. Although the risk of water shortages is reduced by the existence of on-site storage and has been further minimised by the installation of a standby generator, water shortages do occur due to insufficient storage.

Compliance with treatment is compromised by the need to maintain fire fighting flows 24/7. The treatment process cannot be shut down remotely or within the 3 minute time frame required by DWSNZ. This will be resolved in 2015/16 when the storage capacity increases.

Low water table levels occur relatively regularly and the well pumps are subsequently throttled back to ensure continuous pumping at a reduced rate. Consumers are required to have adequate storage for demand needs. This on-site storage typically

consists of header tanks that contain about 2,000 litres, which is the equivalent of two days supply for a typical domestic dwelling.

Current network capacity is sufficient to meet the required Levels of Service in this AMP.

Assessment of Fire Fighting Capacity

Currently the gazetted fire district covers the approximate urban boundaries. There are no major discrepancies between the Fire District boundaries and the area covered by hydrants.

Some individual streets on the outskirts of the reticulated area are without hydrant coverage as the sections are not developed to date. Hydrants will be installed as and when required by development. All fire hydrants and flows meet 25 L/s minimum Fire Fighting Standards and there are no known maintenance issues.

LEVELS OF SERVICE

Customers of the Pleasant Point Scheme are predominantly domestic or related to a domestic and farming population such as schools, rest homes, restaurants and food outlets, small businesses, and some farms in the urban fringes. There are no large consumers of water on the scheme.

There is an issue with protozoal compliance. During extended wet weather water quality may not be sufficient for disinfection alone. Performance status in 2013-2014 is summarized in Table 12. Council plans to consult with the community on LOS options and their costs to improve management of the scheme.

Table 12: Pleasant Point LOS Performance Status

Levels of Service	Customer Core Value	2013/14 Status
Deliver water services according to required environmental standards	Safety	Resource consents compliant
Provide Safe Drinking Water	Quality	Chemical and bacteria compliant Non-compliant with protozoa Pleasant Point – Non compliant with turbidity >2NTU for 5hours in August following well pump changeover. Some water not treated for 22 hours after 1 UV unit shut down but flow continued through the unit.
Provide demand management of water supply services	Responsiveness	Water use monitored. No major changes in volume. Hosing restriction policy not required in 2013/2014.

Deliver affordable water supply services	Affordability	Highly satisfied users and public – in district wide survey
Maintain excellent customer service	Efficiency	No complaints
Maintain excellent water supply network services	Quality	No unplanned outage > 8 hours Water pressure ≥200 kPa

RISK

Risks to the Pleasant Point Water Supply were identified and assessed during the development of the scheme's Water Safety Plan (formerly Public Health Risk Management Plan). (TRIM Document #846002)

There are no high or extreme risks to health of consumers served by the scheme. There are moderate and low risks, a number of which can be readily addressed or monitored for little staff time or additional cost. The potential causes are:

- Agricultural contamination
- Excessive demand or leakage
- Backflow
- Poor maintenance practices
- Dead end mains
- Pressure Reduction
- Air in reticulation following maintenance
- Staff unfamiliar with event

The Water Safety Plan's Improvements Schedule gives priority to these risks most of which are items of moderate to major capital works expenditure that need further investigation and evaluation.

A *Business Continuity Plan* will be developed to mitigate risk from levels of service failure due to unforeseen significant events.

DEMAND

The average annual demand for water in the last 3 years was 292,000 m^3 (Data from Annual Reports). The scheme currently has 612 connections. These are all within the projected demand levels and the capacity of the assets.

The scheme currently serves approximately 1,282 reticulated populations.

Changes in Demand

- Council's LTP medium-growth scenario estimates an uptrend in population and number of households in the Timaru District in the next 10 years. The significance of these projections for Pleasant Point will be

monitored and any potential impact will be assessed through the hydraulic model of the scheme.

- The actual change in demand is assumed to be within the projected levels. Design capacity of the scheme's assets is sufficient to meet the projected medium growth scenarios.
- Scheme boundary changes in the periphery may be requested.

Managing Demand

The average annual demand for the past 3 years was 292,000 m^3. This volume varies significantly depending on leakage or weather condition and is well down on the 500,000 m^3 in 2007/08 prior to replacement of some concrete pipe. The CC main had been identified to have high leakage especially at the CC joints. If there is a significant increase in demand, leak detection is usually carried out and any major leaks will be repaired.

There is often a month delay between the demand increasing and leakage repairing, so water restrictions are more common for this supply.

Occasional water shortages due to dry weather are managed through the council's stepped hosing restriction policy that is imposed to reduce demand to the required level.

Other demand factors, such as land use change and economic development trends, will continue to be monitored and assessed, and water use will continue to be trended and analysed in the annual review of the AMP to mitigate risk of level of service failure from any major changes in water use.

Continual changes in the scheme's demand drivers are accounted for through a managed *Model Calibration Programme* that is reviewed and recalibrated every three years. The next calibration is scheduled for 2015.

A district-wide *Water Conservation Education Programme* will be developed within this AMP period. Implementation will take into account identified water use issues within the scheme.

A *Leak Detection and Reduction Programme* is currently being developed, and once this has been implemented, total water demand from the scheme is expected to decrease.

SUMMARY OF ISSUES

1 Compliance with treatment is compromised by the need to maintain fire fighting flows 24/7. The treatment process cannot be shut down remotely or within the 3 minute time frame required by DWSNZ
2 New reservoir location must cater for above. The method of reservoir fill needs to cater for minimum UV starts per day
3 Scheme changes with reservoir - properties will not require storage, increased pressure will be required to supply the high area of point
4 Leakage in the network
5 Water quality may not allow disinfection to meet DWSNZ (August 2012 5.4% > 1 NTU, only 5% allowed)

FUTURE WORKS

Refer to Section B1 – Urban Water Schemes Capital Work Programme and Budget

Planned works in the Pleasant Point Water Scheme in the next 10 years will address asset renewal requirements, sustaining levels of service and growth in demand. These include:

- Renewal/upgrade of the headworks, treatment and pumping
- Renewal/upgrade of the treated water storage
- Reticulation renewals
- Pipe condition assessment
- Leak detection and reduction
- Network analysis and metering

B1.4 TEMUKA WATER SUPPLY

SCHEME OVERVIEW

Temuka is a small rural town with a resident population of 4,210 from 2013 Census. It is located approximately 20 km north of Timaru City. Temuka water comes from a spring and four shallow wells at Orari and is piped to the Orari Reservoir where it is treated with ultraviolet (UV) light and chlorine to make it safe. UV is used to kill bacteria and protozoa (giardia and cryptosporidium) and chlorine to prevent the water getting re-contaminated in the reticulation network.

The resource consent to take water which includes the take for Winchester allows for a collective maximum take of 123 L/s, 59,293 m^3/7 days and 2,100,000 m^3 each year.

There are limits on each individual source. The consent expires in 2048.

ASSET SUMMARY

A schematic diagram of the Temuka Water Supply is shown in Figure 19. The asset components of the scheme consist of:

- Spring intake and 4 bores
- a pump station
- a treatment plant
- a reservoir
- telemetry

There are approximately 52.37 km of pipe within the reticulation. Figure 20 shows the percentage distribution of pipes by material type and length. Figure 21 shows diameter of pipes by length and material type.

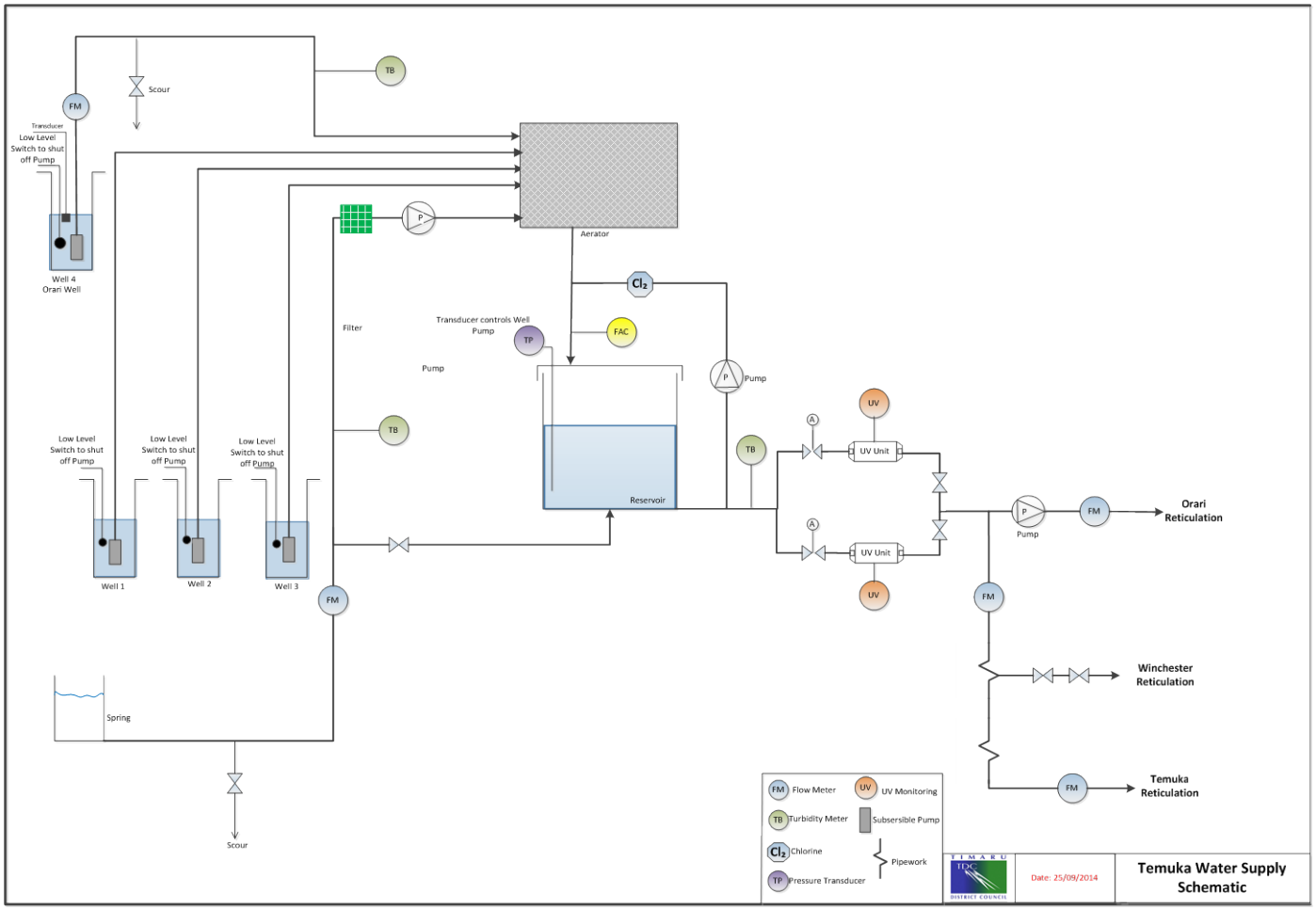

Figure 19: Temuka Water Supply Schematic

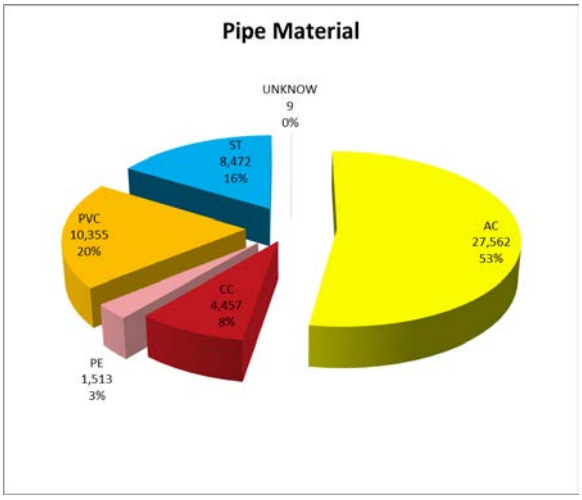

Figure 20: **Temuka Water Mains Material Type, by Length (m) and % Distribution**

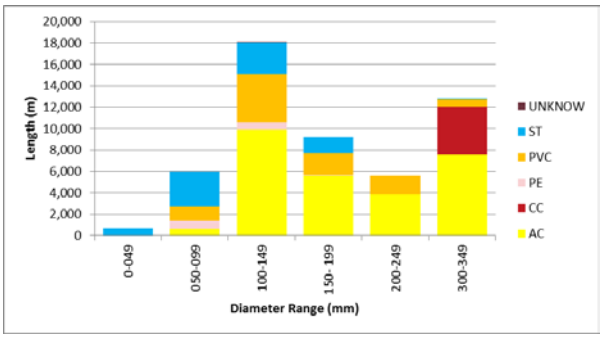

Figure 21: **Temuka Water Mains Diameter Range, by Pipe Length and Material Type**

ASSET CONDITION AND CRITICALITY

The Temuka bores, Temuka-Orari intake, treatment plant, and reservoir are in good condition. These are highly critical assets. As they are in good condition, risk of asset failure is deemed low. There are deterioration issues with the spring intake which is not currently in use (From 2013 report, TRIM document # 829869). This is addressed in the Water Safety Plan.

Part A Section 5.3 of this AMP describes the criteria used in estimating the remaining useful life of pipes, and the cyclic renewal strategies for the reticulation network that incorporates risk and criticality factors. Critical reticulation assets are identified in TRIM document# 551581.

As shown in Figure 22 below, Temuka has an ageing reticulation infrastructure with 53% (27.5km) of AC pipe reaching the end of its useful life. Strategic sampling is

currently being undertaken to enable prioritisation for renewal in the District. A significant portion of the AC pipe is due for renewal in the next 30 years.

Temuka's trunk main from the reservoir is a 4.4 km Cast Concrete and 9 km AC pipeline. Leakage is a major issue to this trunk main with leak detection reports showing pipe joints are prone to leakage and thus require monitoring. Any renewal of the trunk main will be assessed in conjunction with new bore and reservoir design options.

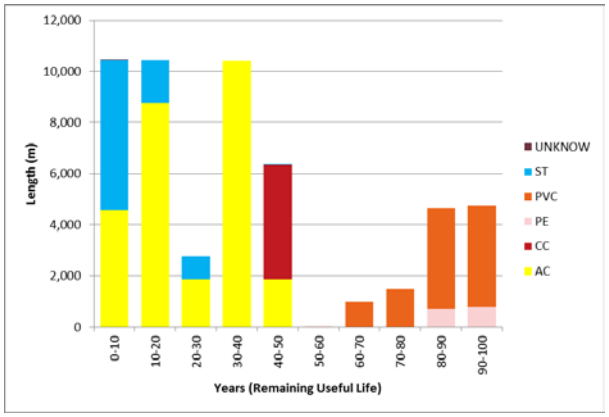

Figure 22: Temuka Water Mains Remaining Useful Life by Pipe Material and Length

ASSET CAPACITY/PERFORMANCE

Restrictions are imposed on the resource consent when the Temuka River is low and Dobies creek is flowing downstream of Orari Station Road. The restrictions are a reduction of 25 % or 50% of the volume. Analysis of restrictions and demand indicate the peak demands and the low river flows do not frequently coincide.

During extended drought periods the water table drops and is monitored closely to ensure the pumps can operate correctly.

In 2001 a new bore (the third bore) was drilled to a 23 m depth to ensure a continuous supply of water remained available. This well does not produce as much water as the two shallow wells and it has been necessary on occasions for the pump to be throttled.

The spring source is currently not in use as the concrete trunk main had significant leakage issues. It could be reinstated if necessary to sustain the total volume of water.

The Orari township bore was reinstated and a pipeline to the reservoir installed in 2011. Unfortunately the quality of the water deteriorated in 2013 and water has not been taken since December 2013. Pumping of the well is currently occurring to see if the issue was from the bore, not the ground water.

Therefore the current source of water (excluding Winchester) is from the 3 wells sited at the reservoir. These are unlikely to meet the requirement of peak demand for Temuka during dry periods unless the leakage on the trunk main is closely monitored and promptly repaired.

The reservoir capacity is barely adequate with regular low level alarms occurring in high demand periods. However the long trunk main effectively adds a further 1000 m^3 of storage ensuring the township does not run out of water. A new reservoir is programmed for 2016 but the location has not yet been determined.

Current network capacity is sufficient to meet the required Levels of Service in this AMP.

Assessment of Fire Fighting Capacity

Currently the gazetted fire district covers the approximate urban boundaries. There are no major discrepancies between the Fire District boundaries and the area covered by hydrants. The Council has provided the Fire Service with tanker filling point to cater for back sections and other small sections not covered by a hydrant. Some individual streets within the reticulated area are without hydrant coverage, as the sections are not developed to date. Hydrants will be installed as and when required by development.

All fire hydrants and flows meet 25 L/s minimum Fire Fighting Standards and there are no known maintenance issues.

LEVELS OF SERVICE

Customers of the Temuka water Scheme are predominantly domestic with few industries. The types of non-domestic contributors include schools, hospitals, restaurants and food outlets, and small businesses. Orari Water Supply is also supplied.

Performance status in 2013-2014 is summarized in Table 13 below. One event was recorded concerning an unplanned water supply interruption that went beyond 8 hours due to extended work. It involved one consumer and was not a common issue in the scheme. Council plans to consult with the community on LOS options and their costs to improve management of the scheme.

Table 13: Temuka Water Supply LOS Performance Status

Levels of Service	Customer Core Value	2013/14 Status
Deliver water services according to required environmental standards	Safety	Resource consents compliant
Provide Safe Drinking Water	Quality	Chemical, bacterial and protozoal compliant

Provide demand management of water supply services	Responsiveness	Water use monitored. No major changes in volume. No water restriction imposed
Deliver affordable water supply services	Affordability	Highly satisfied users and public in district wide survey
Maintain excellent customer service	Efficiency	2 complaints about bubbles in water. Resolved. Non-issue.
Maintain excellent water supply network services	Quality	1 non-compliance: water supply interruption >8 hours. The customer was provided a temporary supply installation. Water pressure ≥200 kPa

RISK

Risks to the Temuka Water Supply were identified and assessed during the development of the scheme's Water Safety Plan, formerly Public Health Risk Management Plan, (TRIM Document #821708).

No risks stand out as extreme risks.

There is one high risk, being the high turbidity from the spring intake. This intake has been out of use since June 2012. There are no plans to renew the spring trunk main and use this source within the LTP. Further use will follow a full assessment and redevelopment of the spring intake.

There are moderate and low risks, a number of which are already or can be readily addressed or monitored for little staff time or additional cost. The potential causes are:

- Agricultural contamination
- cyanobacteria
- Excessive demand or leakage
- Backflow
- Poor maintenance practices
- Dead end mains
- Pressure Reduction
- Air in reticulation following maintenance
- Staff unfamiliar with event

Emergency Response Plan and Business Continuity Plan will be developed.

The Improvements Schedule gives priority to these risks most of which are items of moderate to major capital works expenditure that need further investigation and evaluation.

DEMAND

The average annual demand for water in the last 7 years was 1,248,400 m^3 (Data from Annual Reports). The scheme has 2,101 connections.

In addition, an average of 27,600 m^3 is supplied from the Temuka Reservoir after treatment to Orari.

The scheme currently serves approximately 4,199 reticulated populations.

Changes in Demand

- The medium growth scenario estimates an uptrend in population and number of households in the Timaru District in the next 10 years. The significance of these projections for Temuka will be monitored and any potential impact will be assessed through the hydraulic model of the scheme.
- The actual change in demand is assumed to be within the projected levels. Design capacity of the scheme's plant assets and reticulation are sufficient to meet projected medium growth scenarios.
- Scheme boundary changes in the periphery may be requested.

Managing Demand

Occasional water shortages due to dry weather are managed through the council's stepped hosing restriction policy that is imposed to reduce demand to the required level.

Other demand factors, such as land use change and economic development trends, will continue to be monitored and assessed, and water use will continue to be trended and analysed in the annual review of the AMP to mitigate risk of level of service failure from any major changes in water use.

A district-wide *Water Conservation Education Programme* will be developed within this AMP period. Implementation will take into account identified water use issues within the scheme.

A *Leak Detection and Reduction Programme* is currently being developed, and once this has been implemented, total water demand from the scheme is expected to decrease.

SUMMARY OF ISSUES

1 Source quality - confirm the Orari bore quality is suitable (i.e. assess turbidity issue), or investigate other source options (i.e., another bore somewhere or the existing spring source with appropriate protection)
2 Trunk main leakage
3 Network leakage
4 Leakage within private property
5 Head loss due to age of pipe material - incoming residual pressure to Temuka water reticulation cannot meet 2 hydrants at 12.5 L/s each fire fighting requirement. At peak demand, residual pressure in the network is sufficient to bring the second hydrant online but not at full fire fighting capacity
6 Ageing reticulation
7 Location of new reservoir

FUTURE WORKS

Refer to Section B1 – Urban Water Schemes Capital Work Programme and Budget.

Planned works in the Temuka Scheme in the next 10 years will address asset renewal requirements, sustaining levels of service and growth in demand. These include:

- Headworks renewal
- Pump/electrical/treatment renewals
- Trunk main renewal
- Treated reservoir and pump renewal
- Source upgrade
- Reticulation renewals
- Network analysis and metering
- Pipe condition assessment
- Leak detection and reduction

B1.5 TIMARU WATER SUPPLY

SCHEME OVERVIEW

Timaru's public water supply has steadily evolved since initial installation with a water race from the Pareora River during the 1880s. The present supply is a direct surface intake, via a 7 metre high weir, from the upper Pareora River source as well as from an infiltration gallery within the Opihi River. There is no storage available at either source.

The abstraction of water from the Pareora River was relocated in 1939 to within the Pareora River Scenic Reserve. In 1967 the TDC was appointed to manage and control this reserve. The catchment area straddles the boundaries of the Waimate and Mackenzie District Councils. Within the Mackenzie District, the entire Pareora catchment is zoned rural and within the Waimate District, it is also zoned rural, but also in addition, it has a water supply protection zone overlaying it. The pipeline from the Pareora Intake to the Claremont Reservoir is 36.5 km long with 450 mm diameter then 400 mm diameter thereafter, with air valves and scour valves.

The current resource consent for the upper Pareora River source was granted in February 2003 and is for a maximum flow of 215 L/s. Another requirement on this consent is that a minimum flow of at least 30 L/s must be maintained in the Pareora River. This consent expires in November 2024.

The Opihi Intake is situated close to Pleasant Point on the north side of the Opihi River adjacent to the Waitohi Pleasant Point Road. The infiltration galley consists of 600 mm diameter pipes in two gravel trenches some 300 metres long, one at right angles to the river and the other parallel to the stop bank. The galleries are interconnected, supplying water to two wells with electric submersible pumps. The Opihi pump station was commissioned in 1977, after the installation of the pipeline and intake. The pipeline to the Claremont reservoir is 16.5 km long and consists mostly of 530 mm diameter asbestos-cement Class C pipe. There are 32 air valves and 6 scour points along the length of pipe.

The resource consent for the Opihi source is for a maximum flow of 329 L/s, unless any restrictions are imposed due to low flow levels of the Opihi River. This consent expires in September 2030.

Additionally, in 2010 TDC obtained a consent for 100L/s from either the Opihi Intake, Waitohi Intake (Downlands) or Seadown Intake, or a combination of these intakes. To date, approximately 10L/s has been utilized within the rural schemes. There is no infrastructure to take this water from Opihi. The water from the Pareora and Opihi sources is stored at the Claremont Reservoir, which consists of two 113,650 m^3 reservoirs with polypropylene floating covers. One reservoir receives relatively clean water from the above sources, some sedimentation is able to occur prior to treatment as the raw reservoir stores approximately four days demand. From the raw water reservoir, the water passes through ozone treatment, is dosed with chlorine and then pH corrected and pumped into the second reservoir. The treated water reservoir also stores approximately four days demand.

After leaving the Claremont Reservoir, part of the supply is pumped to Gleniti Reservoir to supply the area west of Morgans Road and east of the Gleniti Reservoir.

The reticulation has 2 pressure zones. Zone 1 West of Morgans Road is fed by Gleniti Reservoir and Zone 2 East of Morgans Road including CBD is fed by Claremont Reservoir.

The Downlands Water Supply purchases some of this water for a small area of the Downlands Water Supply reticulation.

Even though the Timaru urban water supply is the main source of drinking-water for the Timaru urban reticulated community, there are a number of private bores that supply domestic requirements. The exact number and contribution from these domestic bores is unknown but minimal. The collection, storage and use of roof rainwater by residents is believed to be uncommon.

Asset Summary

A schematic diagram of the Timaru Water Supply is shown in Figure 23. The asset components of the scheme consist of the following:

- Pareora Intake
- Opihi Intake
- Rosewill Pump Station
- Claremont Reservoir and Treatment Plant
- Gleniti Pump Station
- Gleniti Reservoir
- Telemetry

Length of reticulation is approximately 321.78 km. Figure 28 shows the percentage distribution of pipes in the reticulation network by material type and length. Figure 29 shows pipe diameter by length and material type.

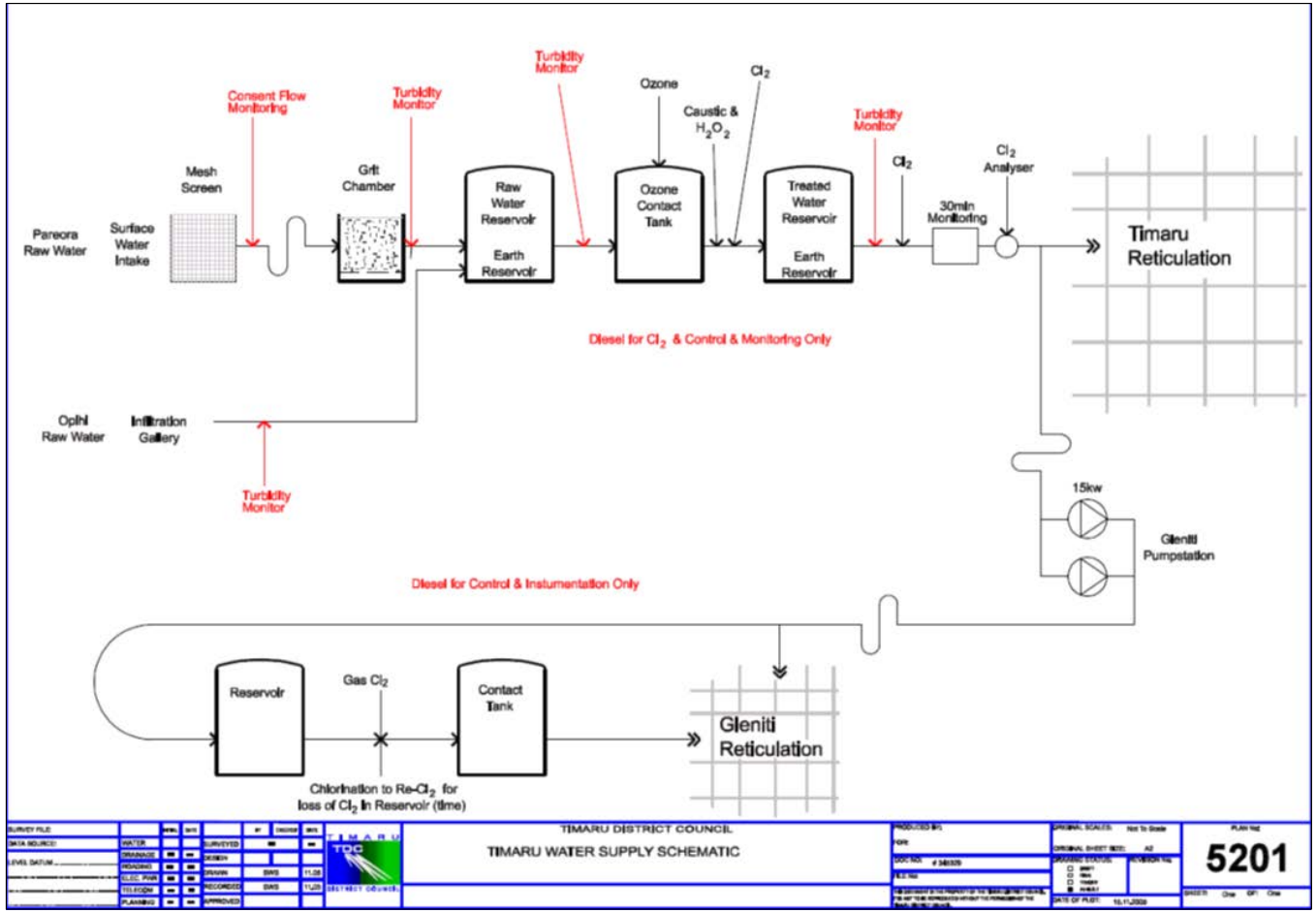

Figure 23: Timaru Water Supply Schematic

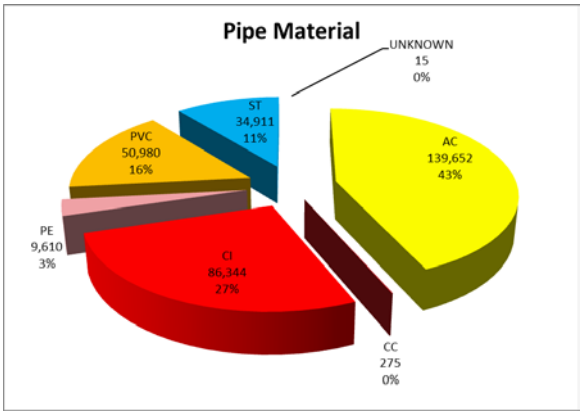

Figure 24: **Timaru Water Mains Material Type, by Length (m) and % Distribution**

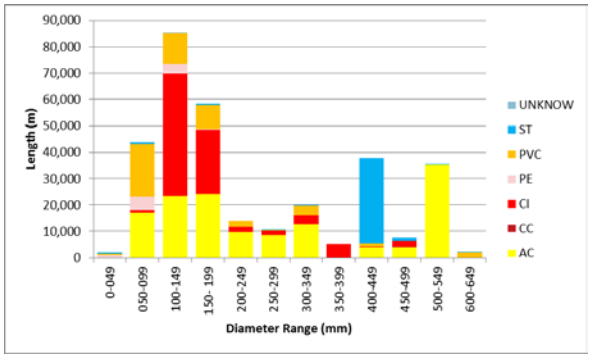

Figure 25: **Timaru Water Mains Diameter Range by Pipe Length**

ASSET CONDITION AND CRITICALITY

The Gleniti Reservoir and Pump Station, and the Claremont Treatment Plant are in good condition. There are significant deterioration and deficiency issues with the Pareora and Opihi intakes. The Claremont Reservoir covers need replacement due to age-related issues.

All these facilities are rated highly critical assets. Risks on the Pareora intakes and the Claremont Reservoir are high due to condition issues. This is addressed in the capital works programme for this AMP period.

Part A Section 5.3 of this AMP describes the criteria used in estimating the remaining useful life of pipes, and the cyclic renewal strategies for the reticulation network that

incorporates risk and criticality factors. Critical reticulation assets are identified in TRIM document# 551581.

As shown in Figure 26 below, Timaru has an ageing reticulation infrastructure with 43% (139.6 km) of AC pipe and 27% (86.3 km) Cast Iron Pipes reaching the end of its useful life. Strategic sampling is currently being undertaken to enable prioritisation for renewal in the District. Timaru has instigated a small AC mains replacement program in 2014 which will replace all small (100 mm diameter) AC pipes over the next 10 years. Studies have shown these are assets that could reduce associated maintenance costs when replacement has been completed. A significant portion of CI pipes will be due for renewal on the trunk mains in the next 20 years. Majority of these are in the North Street and a replacement program started in 2010.

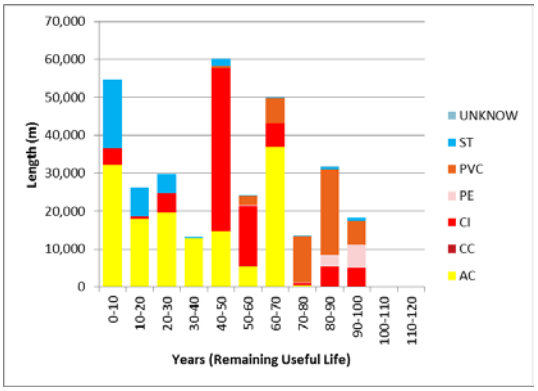

Figure 26: Timaru Water Mains Remaining Useful Life, by Pipe Material and Length

ASSET CAPACITY/PERFORMANCE

The resource consent conditions limit the daily total abstraction for both of the Timaru Urban public water supply sources.

The resource consent for the Pareora source limits the take to a maximum of 215 L/s (or 18,576 m^3/day). Although the records show that this consent has been exceeded for a total of 139 days since it was obtained the exceedance has not been more than 1.5%. This is less than the margin of error within the recording system.

During dry weather the river flows can be so low that the consent conditions significantly limit the volumes taken.

The Opihi resource consent limits the take to a maximum of 329 L/s (or 28,409 m^3/day).

The resource consent from the Opihi is limited under the rules within the ORRP to 21,307 m^3/day (75% of maximum take) and 14,204 m^3/day (50% of maximum take) when the Opuha Dam cannot maintain minimum flows within the Opihi River and the

water level behind the dam falls to certain trigger levels. The expectancy of reduction to 50% of the maximum take is one year in twenty.

When the Opihi take is limited to 75% or 50% of consented maximum it is expected approximately only 6,000 m^3/day would be available to take from the Pareora.

The capacity of the Opihi Intake is approximately 22,000 m^3/day.

Current network capacity is sufficient to meet the required Levels of Service in this AMP period.

Assessment of Fire Fighting Capacity

TDC will adopt Fire Fighting Code of Practice to supply minimum 25 L/s Fire Fighting Standard, and 50 L/s to critical areas such as schools and hospitals. Businesses that require the extra capabilities due to activities on the site are required to have their own fire fighting systems.

Currently the gazetted fire district covers the approximate urban boundaries. There are no major discrepancies between the Fire District boundaries and the area covered by hydrants.

The Council has provided the Fire Service with a Water Tanker to cater for back sections and other small sections not covered by a hydrant. Some individual streets within the reticulated area are without hydrant coverage, as the sections are not developed to date. Hydrants will be installed as and when required by development.

NZ Fire Service has a programme of regular testing of Fire Hydrants. TDC rectifies any maintenance issues. There are no issues outstanding.

LEVELS OF SERVICE

Customers in the Timaru water scheme are domestic and industrial users, with each accounting for approximately half of the total volume of water consumption. The types of Timaru industries that generate significant industrial consumption include meat slaughter and processing, food processing, fish processing, breweries, wool scours, rendering and hide processing. Other non-domestic contributors include schools, hospitals, restaurants and food outlets, and small businesses.

Performance status in 2013-2014 is summarized in Table 14 below. There was an issue with protozoal compliance. This is identified and addressed in the scheme's Water Safety Plan. There was also an issue with continuity of water supply. However, it is not a prevalent problem in the scheme. Council plans to consult with the community on LOS options and their costs to improve management of the scheme.

Table 14: Timaru Water Supply LOS Performance Status

Levels of Service	Customer Core Value	2013/14 Status
Deliver water services according to required environmental standards	Safety	Resource consents non-compliant for 10 days
Provide Safe Drinking Water	Quality	Chemical and bacterial compliant Protozoal non-compliant: there were a number of short term non compliance periods following start up and for longer periods when the water was very cold. The water requires a higher Ct (contact time) when cold, however the Ct does not account for the ozone in the water after it leaves the treatment plant which is significant in cold water.
Provide demand management of water supply services	Responsiveness	Water use monitored. No major changes in volume. No water restrictions imposed in 2013/14.
Deliver affordable water supply services	Affordability	Highly satisfied users and public in district wide survey
Maintain excellent customer service	Efficiency	12 complaints
Maintain excellent water supply network services	Quality	1 non-compliance: water supply interruption > 8 hours. The landowner was consulted who confirmed water was not needed for the duration of the outage. Water pressure ≥ 200 kPa

RISK

Risks to the Timaru water supply were identified and assessed during the development of the scheme's Water Safety Plan, formerly Public Health Risk Management Plan, (TRIM Document #556590).

The risks that stand out as high priority action in order from the intake to distribution system are as follows:

- Raw water turbid and unable to be treated
- Protozoa Increase and unable to treat
- Ozone Ct low
- Backflow

The Improvements Schedule gives high priority to these risks most of which are items of moderate to major capital works expenditure that need further investigation and evaluation.

There are moderate and low risks, a number of which are already or can be readily addressed or monitored for little staff time or additional cost. The potential causes are:

- Agricultural contamination
- Cyanobacteria risk from the Opihi
- Communication landline to Opihi
- Communication landline to Gleniti pumps and reservoir
- Power fail at Opihi
- Opihi Trunk main Fail
- Pressure reduction
- Unfamiliar event
- Unauthorised entry to Claremont
- Excessive Leakage
- Increased pipe velocity caused by burst main cause resuspension of material
- Low FAC in extremity of reticulation

Emergency Response and Business Continuity Plan will be developed to mitigate service failure from unforeseen significant events.

DEMAND

The average annual demand for water in the last 7 years was 7,238,800 m^3 (Data from Annual Reports). The scheme has 13,016 connections. These are all within the projected demand levels and the capacity of the assets.

The scheme currently serves approximately 26,019 reticulated populations.

Changes in Demand

- The medium growth scenario estimates an uptrend in population and number of households in the Timaru District in the next 10 years. The significance of these projections for the Timaru township will be monitored and any potential impact will be assessed through the hydraulic model of the scheme.
- The actual change in demand is assumed to be within the projected levels.
- Scheme boundary changes in the periphery may be requested.

Managing Demand

Occasional water shortages due to dry weather are managed through the TDC's stepped hosing restriction policy that is imposed to reduce demand to the required level.

Other demand factors, such as land use change and economic development trends, will continue to be monitored and assessed, and water use will continue to be trended and analysed in the annual review of the AMP to mitigate risk of level of service failure from any major changes in water use.

Continual changes in the scheme's demand drivers are accounted for through a managed *Model Calibration Programme* that is reviewed and recalibrated every three years. The next calibration is scheduled for 2015.

A district-wide *Water Conservation Education Programme* will be developed within this AMP period. Implementation will take into account identified water use issues within the scheme.

A *Leak Detection and Reduction Programme* is currently being developed, and once this has been implemented, total water demand from the scheme is expected to decrease.

SUMMARY OF ISSUES

1. Security of supply
    a. Pareora Source has availability and quality issues
    b. Need to identify alternative supply if not Pareora. Opihi? Buy water?
    c. Condition of Pareora pipeline - if the decision is to retain Pareora source then parts of the pipeline need to be renewed asap.
    d. Pareora Pipeline connections – a few domestic and rural connections are supplied off the Pareora Pipeline. All customers are advised to treat own water and disruptions occur when maintenance is carried out. TDC obligation to these consumers needs clarification. They do not pay for the water (agreement 10 cents/4,540 $m^{3)}$. The TDC also supplies the Downlands via Camerons pump station. These will need to be considered when the future of the Pareora Pipeline is considered.
    e. Didymo may in future block intakes
2. High pressure in the reticulation
3. Leakage in both mains and private networks
4. Claremont treatment process unable to treat > 1 NTU, 3 log removal not achieved.
    a. There is insufficient Contact time
    b. Insufficient storage capacity of the raw water reservoir
5. Significant amount of renewals

FUTURE WORKS

Refer to Section B1 – Urban Water Schemes Capital Work Programme and Budget

Planned works in the Timaru Scheme in the next 10 years will address asset renewal requirements, sustaining levels of service and growth in demand. These include:

- Plant renewals
    - Ozone and instrumentation
    - Telemetry
    - Electrical and control
    - Reservoir pipework
- Pumps renewal
    - Timaru
    - Opihi
    - Rosewill
- Intakes renewal
- Claremont plant renewals
- Gleniti pump station renewals
- Gleniti reservoir renewals
- Pareora pipeline renewal
- Timaru port renewals and upgrade for firefighting
- Renewal of reservoir covers
- Alternative Washdyke supply
- Reticulation renewals
- Pipe condition assessment
- Leak detection and reduction
- Network analysis and metering

B1.6 WINCHESTER WATER SUPPLY

SCHEME OVERVIEW

Winchester is a town with a resident population of 264, located approximately 20 km north of Timaru City.

The Winchester water supply is a small on-demand scheme supplying the Winchester township. The majority of the reticulation was installed in 1966-67 and the source, reservoirs and some reticulation extensions were completed in 1975. Initially, Winchester was supplied with water from the Temuka scheme until the completion of the current source in 1975.

The TDC owns and maintains the water supply network from the source through to the service connections that terminate at the toby tap adjacent to all serviced property boundaries, plus tobies and valves. There are 5 metered connections. TDC owns the water meter and the consumer pays for the actual water used.

The Winchester water supply takes water from a shallow bore (7.5 metres depth) located on land owned by TDC at the north end of Winchester adjacent to Dobies Creek. The bore is located in a small concrete block shed, which also houses the chlorinator and pump control equipment. Water is pumped from the bore by a submersible pump and delivered to an aerator mounted on one of the four storage tanks. The booster pump pumps from the storage to the township maintaining a constant pressure. The bore, reservoir, pump control/treatment building are all located on the same site. This water supply also has a connection to the trunk main of the Temuka water supply. This Temuka Water Supply is on the west side of Winchester at the intersection of Richard Street and McNair Road. The valve at this connection is closed but the connection is capable of supplying Winchester with variable pressure.

The scheme has a total storage of 120 m^3, which consists of four 30 m^3 tanks at ground level linked together.

ASSET SUMMARY

A schematic diagram of the Winchester Water Supply is shown in Figure 27. The asset components of the scheme consist of a treatment plant, pumps and storage tanks.

The scheme has approximately 3.75 km of reticulation network.

Figure 28 below shows the percentage distribution of pipes in the reticulation network by material type and length. Figure 29 shows pipe diameter by length and material type.

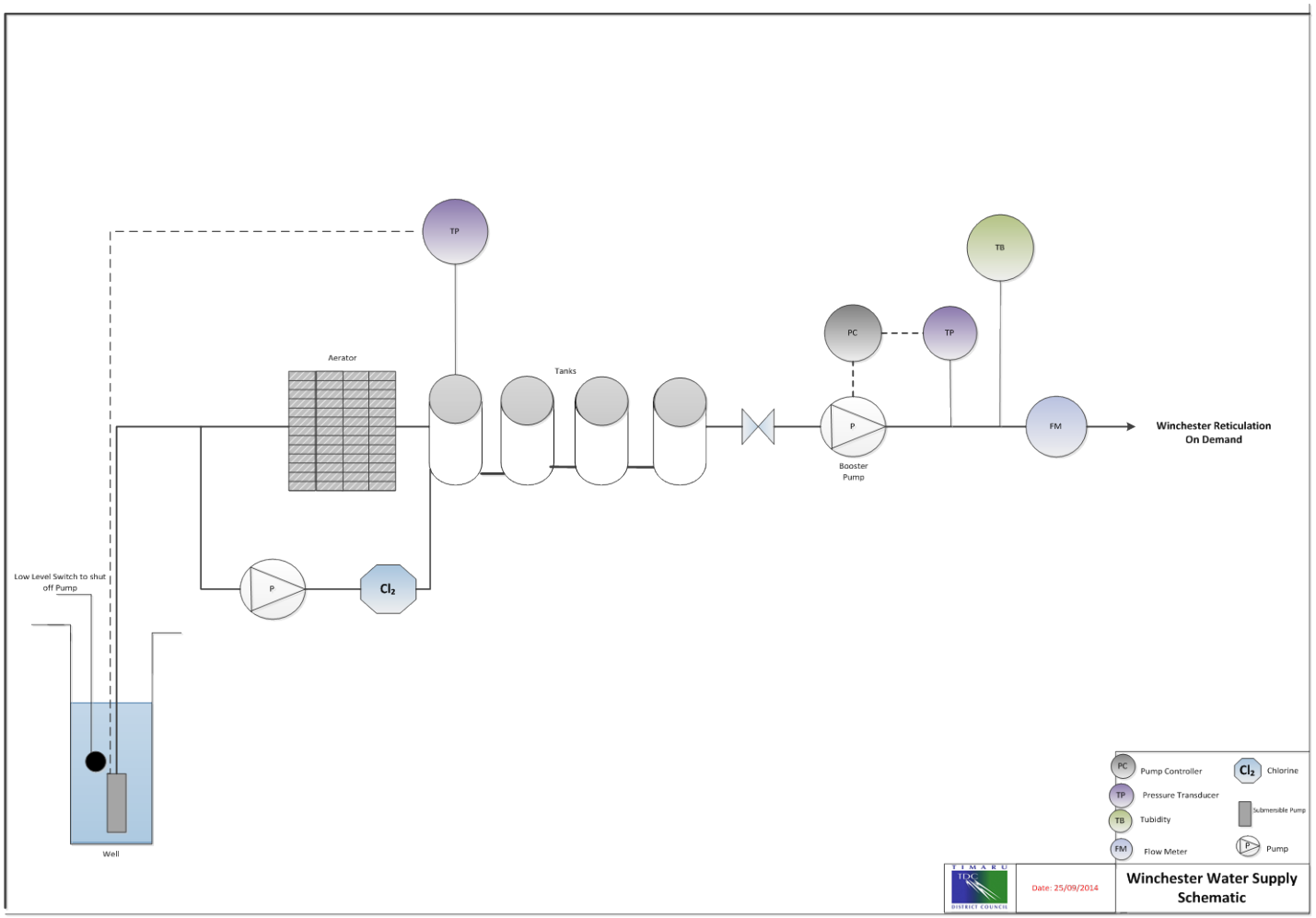

Figure **27:** Winchester **Water Supply Schematic**

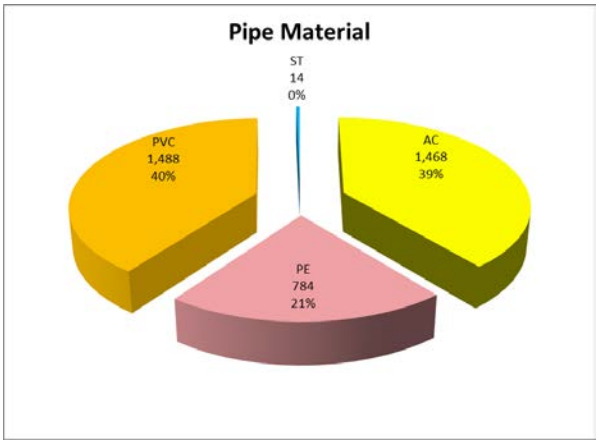

Figure 28: **Winchester Water Mains Material Type, by Length (m) and % Distribution**

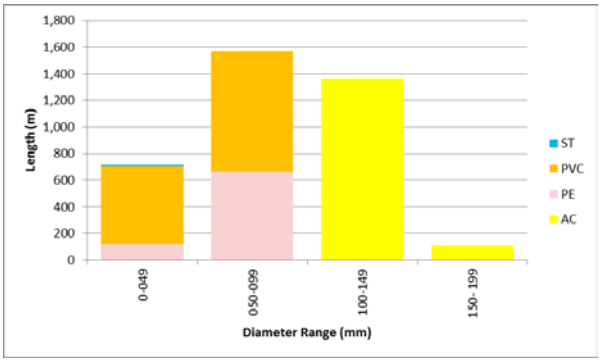

Figure 29: **Winchester Water Mains Diameter Range by Length and Material**

ASSET CONDITION AND CRITICALITY

The bores, treatment plant and reservoir are generally in good condition. These facilities are visually inspected on a regular basis. Operation is telemetered and any faults would be detected immediately.

The treatment plant and reservoir are highly critical assets. As they are in good condition, risk of asset failure is deemed low (Criticality Report in TRIM document #829869).

Part A Section 5.3 of this AMP describes the criteria used in estimating the remaining useful life of pipes, and the cyclic renewal strategies for the reticulation network.

As shown in Figure 30 Winchester has 1.5 km of AC pipes, 100-150 mm in diameter, due for replacement in the next 20 years. Currently, strategic sampling is being undertaken to ensure prioritisation for renewal in the District.

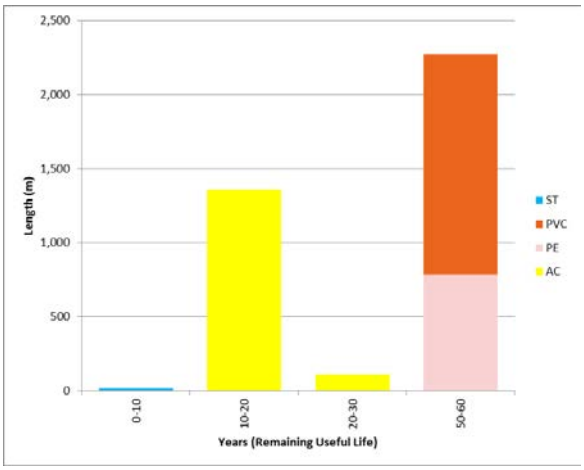

Figure 30: Winchester Water Mains Remaining Useful Life by Pipe Material and Length

ASSET CAPACITY/PERFORMANCE

The Winchester Water Supply is a demand system for domestic water.

The resource consent conditions limit the daily total abstraction for the Winchester public water supply to 11 L/s with maximum weekly take of 5,267 m^3. This can be taken from Winchester or Temuka.

The current treatment plant is scheduled to be upgraded to meet the DWSNZ this year. The proposal is a new connection from the Temuka trunk main to the Winchester storage, and retain the Booster Pump to maintain the current pressure. The Winchester bore and bore pump will be retained until the Temuka Water Supply source issues have been resolved but the use will be for backup source only. Storage is likely to be increased.

The reservoir has a storage capacity of 120 m^3.

The scheme does not meet the New Zealand Fire Fighting Code of Practice (COP) and there is no plan to meet the COP in future. The area is not a gazetted fire district.

Current network capacity is sufficient to meet the required Levels of Service in this AMP period.

LEVELS OF SERVICE

Customers of the Winchester Scheme are predominantly domestic or related to a domestic and farming population. It includes a school, rest homes, restaurants and food outlets, and small businesses. There are no large consumers of water on the scheme.

Performance status in 2013-2014 is summarized in Table 15 below. Council plans to consult with the community on LOS options and their costs to improve management of the scheme.

Table 15: Winchester Water Supply LOS Performance Status

Levels of Service	Customer Core Value	2013/14 Status
Deliver water services according to required environmental standards	Safety	Resource consents compliant
Provide Safe Drinking Water	Quality	Chemical, bacterial compliant and protozoal non-compliant
Provide demand management of water supply services	Responsiveness	Water use monitored. No major changes in volume.
Deliver affordable water supply services	Affordability	Highly satisfied users and public in district wide survey
Maintain excellent customer service	Efficiency	2 complaints resolved with flushing of mains
Maintain excellent water supply network services	Quality	No unplanned service interruption >8 hours Point of supply water pressure ≥200 kPa

RISK

The Water Safety Plan will be developed in the current year. With the new source for Temuka the risks identified will be similar to those in the Temuka Water Safety Plan.

A *Business Continuity Plan* will be developed to mitigate service failure from unforeseen significant event.

DEMAND

The average annual demand for water is about 103,500 m^3 (Data from Annual Reports). This has varied from 81,400 m^3 to 133,193 m^3. During high demand years a single leak was a significant contributor. The scheme has 154 connections.

Changes in Demand

- The medium growth scenario estimates an uptrend in population and number of households in the Timaru District in the next 10 years. The significance of these projections for Winchester will be monitored and any potential impact will be assessed through the hydraulic model of the scheme.
- Any actual change in demand is assumed to be within the projected levels and capacity of the assets.

Managing Demand

Occasional water shortages due to dry weather are managed through the council's stepped hosing restriction policy that is imposed to reduce demand to the required level.

Other demand factors, such as land use change and economic development trends, will continue to be monitored and assessed, and water use will continue to be trended and analysed in the annual review of the AMP to mitigate risk of level of service failure from any major changes in water use.

A district-wide *Water Conservation Education Programme* will be developed within this AMP period. Implementation will take into account identified water use issues within the scheme.

A *Leak Detection and Reduction Programme* is currently being developed, and once this has been implemented, total water demand from the scheme is expected to decrease.

SUMMARY OF ISSUES

1 Model recalibration
2 If supplied by Temuka will the water be available at all times (covered in Temuka issues)
3 If not supplied by Temuka, own treatment plant will be required

FUTURE WORKS

Water treatment and source will be renewed within the period of the AMP.

Refer to Section B1 – Urban Water Schemes Capital Work Programme and Budget.

B2 - Rural Water Supply Schemes

TDC has four rural water supplies. These are the Downlands, Orari, Seadown and Te Moana Downs schemes. Description of assets in each scheme, their condition and performance, associated risks, demand, and priority issues are covered in the succeeding sections.

Each scheme is funded separately. Details of planned works are provided by scheme in the next sections.

(Budget details to be added when the LTP is finalised.)

SUMMARY OF RURAL WATER ASSETS

Table 16: Rural Schemes Facilities and Land Assets

SCHEME	FACILITY	intake	treatment	pump	storage (m^3)	TELEMETRY	Land Status*
Downlands	Te Ngawai	Infiltration gallery	Chlorine	√	x	√	C
	Waitohi	Infiltration gallery	Chlorine	√	x	√	C
	Pareora	Bore	UV and Chlorine	√	120	√	R
	Springbrook	Bore and infiltration gallery	Chlorine	√	122	√	DW
	Camerons Pump	Water supplied from Timaru's Pareora Pipeline	Chlorine	√	25	√	DW
	Taiko Reservoir	x	Chlorine	√	5,700	√	DW
	Clelland Reservoir	x	Chlorine	x	1,800	√	DW
	Waitohi Reservoir	x	Chlorine	x	2,800	√	DW
	Sutherlands Reservoir	x	Chlorine	x	1,100	√	DW
	Camerons Reservoir	x	Chlorine	√	2,800	√	DW
	Cannington Pump	x	x	√	x	x	R
	Harts Tanks	x	x	x	67	√	P
	Davison Road Meter	x	x	x	x	√	R
Orari	Nil						-
Seadown	Seadown	Bore	UV and Chlorine	√	500	√	DW
Te Moana	Intake	River	Sand filter	x	x	x	DW
	Mees Road	x	Chlorine	x	x	√	R
	Gapes Valley Pump	x	x	√	x	x	R
	Pleasant Valley Pump	x	x	√	x	x	P
	Gleniti Pump	x	x	√	X	X	R
	Washdyke Meter	x	x	x	x	√	R

* DW= TDC owned and administered by D&W Unit; P=Private; C=Crown (usually riverbed); R= Road Reserve

B2.1 DOWNLANDS WATER SUPPLY

SCHEME OVERVIEW

The Downlands Water Supply Scheme was originally installed in the period 1938-1940, with the section south of the Pareora River installed after 1945 and a further extension from the Totara Valley Reservoir into Hazelburn in 1998. In the 1960s independent water sources were installed for the townships of Pareora, Pleasant Point and St Andrews. The Tengawai pump station was installed in 1966 after the failure of the original dam in the Tengawai. Pleasant Point is no longer part of the Downlands Water Supply.

In the 1970s the scheme was struggling to supply its existing consumers, and there were increasing requests to supply additional houses and troughs. Between 1982 and 1989 a comprehensive upgrade of the scheme was undertaken. The scheme was changed to on-farm storage and 426 km of pipe was installed. From 1990, the scheme was unable to sell additional water on several occasions. This resulted in the installation of another two sources – Hadlow pump station and Cameron's pump station, both taking water from Timaru.

At present, the Downlands Scheme supplies 78,000 hectares within the Timaru, Waimate and Mackenzie Districts and has 6 intakes with 4 separate reticulation systems:

1 Rural

1.1 Tengawai intake which supplies the majority of the Downlands Water Supply

1.2 Waitohi intake which supplies the area north of the Opihi and Tengawai during peak demand periods

1.3 Cameron's pump station which takes water from the Timaru Urban Supply pipeline at Pareora River during peak demand periods only and supplies the Waimate District section of the scheme

2 Hadlow – water is purchased from Timaru at the Gleniti Reservoir

3 Pareora – Pareora township intake which supplies the Pareora township only

4 Springbrook – Springbrook intake which supplies Springbrook and St Andrews, within Waimate District

Downlands is a restricted water supply which means that the daily allocation is supplied into the consumer's tank at a constant flow over a 24 hour period. Once the tank is full, the ballcock shuts off the flow.

Neither the Pareora township nor the St. Andrews township are restricted although1,800 litres storage tanks are still required.

There is a Downlands Joint Standing Committee made up of 5 representatives appointed by TDC and 3 members appointed by the Mackenzie and Waimate District Councils to oversee the governance of the scheme.

TDC is responsible for the management and operation of the water supply and uses contractors to carry out maintenance work.

ASSET SUMMARY

A schematic diagram of the Downlands Water Supply is shown in Figure 31.

Plant facilities consist of the following:

Rural –

- Tengawai intake, treatment plant and pump station
- Waitohi intake, treatment and pump station
- Camerons pump station and treatment
- Cannington pump station
- Davison Road flow meter
- Camerons reservoir
- Cleland reservoir (in ground)
- Sutherlands reservoir (in ground)
- Taiko reservoir (in ground)
- Waitohi reservoir (in ground)
- Hart's tanks
- Holmes Station tanks

Hadlow – no plant facilities

Pareora –

- Pareora bore, pump station, treatment and storage tanks

Springbrook –

- Springbrook bore, treatment and reservoir (above ground)

The reticulation network of the Downlands Scheme has approximately 987 km of water mains.

Figure 32 shows the percentage distribution of pipes in the reticulation network by material type and length. Figure 33 shows diameter range of pipes by length and material type.

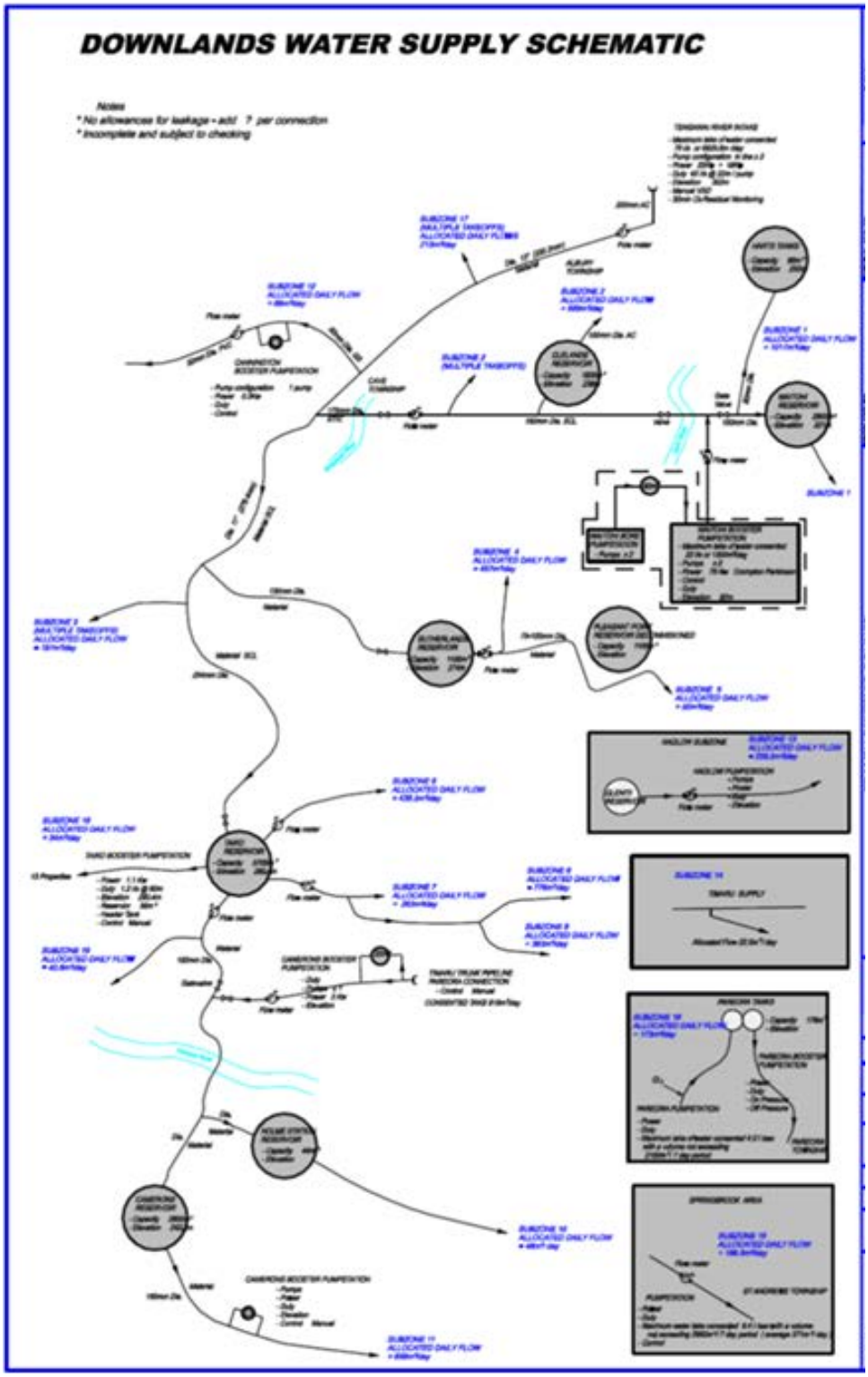

Figure 31: Downlands Water Supply Schematic

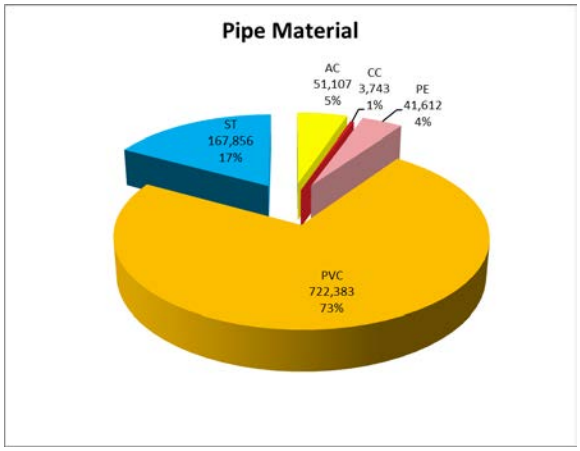

Figure 32: Downlands Water Mains Material Type, by Length (m) and % Distribution

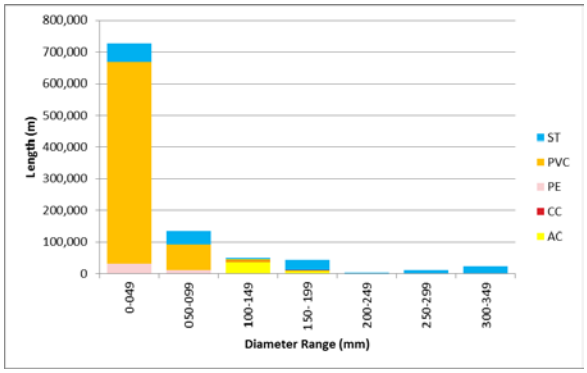

Figure 33: Downlands Water Mains Diameter Range by Length and Material

ASSET CONDITION AND CRITICALITY

Plant

The plant facilities are generally in good condition. There are significant deterioration and efficiency issues with the Springbrook reservoir which will be reroofed in 2015, and the Tengawai intake which will be redesigned in 2016. These are critical assets therefore risk of failure is estimated to be high. All facilities are visually inspected on a regular basis. Operation is telemetered and any faults would be detected immediately.

Reticulation

Part A Section 5.3 of this AMP describes the criteria used in estimating the remaining useful life of pipes, and the cyclic renewal strategies for the reticulation network that incorporates risk and criticality factors. Critical reticulation assets in the Downlands Scheme are identified in TRIM document# 551581.

Strategic sampling and condition analysis will be carried out in 2015 and 2016 to determine when asset renewal should be carried out. From Figure 34 there is approximately 51 km AC water main ranging from 100 to 150 mm diameter pipes due for renewal within the 10 year period of this AMP.

Downlands has $10 M of renewals over the next 10 years based on asset life. Tengawai trunk main and pipeline are due for renewal in 2017 with $10 M budgeted for this replacement.

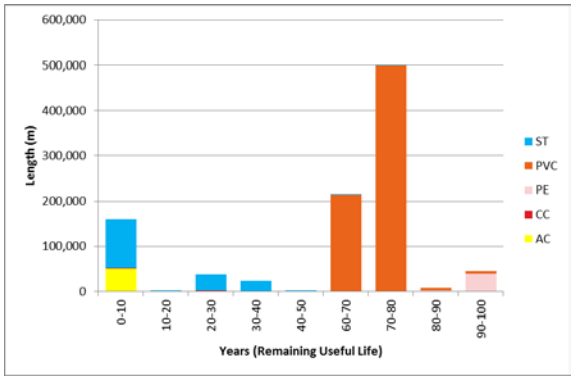

Figure 34: Downlands Water Mains Remaining Useful Life by Pipe Length and Material

Asset Capacity and Performance

The resource consent conditions that apply to each of the takes limit the daily total abstraction from all the Downlands public water supply sources. The consented maximum take is 8,125 m^3/day for Tengawai and Waitohi, and Cameron's supplementary sources which is from Timaru's Pareora Pipeline. It is not possible to fully utilise the consents with the existing infrastructure: 300 m^3/day for Pareora (expires 2035), maximum demand 183 m^3; 380 m^3/day for Springbrook (expires 2035), maximum demand 289 m^3.

Current network capacity is sufficient to meet the required Levels of Service in this AMP period although no new connections have been permitted in the rural sector.

Levels of Service

Customers of the Downlands Scheme are either residential or farm properties. Water is supplied for domestic and stock water use.

There is no treatment process within the rural section of the scheme or Springbrook, for protozoal removal. Chlorination occurs at all sources, usually at a sufficient dosage to kill bacteria although it is not uncommon to have e-coli detected in a sample. In

2013/14 an e-coli was detected in the reticulation zone supplied by Tengawai, the zone supplied by Tengawai or Waitohi and the zone supplied by either Tengawai or Camerons. The first 2 zones complied the bacterial section of DWSNZ as over 80 samples were taken. The zone supplied by Tengawai or Camerons has a small population so is sampled less frequently and did not comply with the bacterial section.

In addition to inadequate treatment at Waitohi there is a taste and odour problem with water supplied from this source. In 2013/14 the water quality complaints do not reflect the problem as the consumers have accepted the difficulty to resolve the problem, and with higher river flows the odour may have been less. The Waitohi is no longer the secondary source for the rural sector with the source operating 9 days in September/October and 42 days in February/March.

Performance status in 2013-2014 is summarized in Table 17 below. There were 7 water quality complaints reported, 2 were private issues. All complaints were investigated and resolved. Council plans to consult with the community on LOS options and their costs to improve management of the scheme.

Table 17: Downlands Water Supply LOS Performance Status

<table>
<tr><th>Levels of Service</th><th>Customer Core Value</th><th>2013/14 Status</th></tr>
<tr><td>Deliver water services according to required environmental standards</td><td>Safety</td><td>Resource consents compliant</td></tr>
<tr><td>Provide Safe Drinking Water</td><td>Quality</td><td>
<table>
<tr><td></td><td>Chemical</td><td>Bacterial</td><td>Protozoal</td></tr>
<tr><td>Rural</td><td>✓</td><td>most</td><td>X</td></tr>
<tr><td>Hadlow</td><td>✓</td><td>✓</td><td>X</td></tr>
<tr><td>Pareora</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Springbrook</td><td>✓</td><td>✓</td><td>X</td></tr>
</table>
</td></tr>
<tr><td>Provide demand management of water supply services</td><td>Responsiveness</td><td>Water use monitored. No major changes in volume.</td></tr>
<tr><td>Deliver affordable water supply services</td><td>Affordability</td><td>Highly satisfied users and public in district wide survey</td></tr>
<tr><td>Maintain excellent customer service</td><td>Efficiency</td><td>7 complaints:
2 private issues
3 resolved with flushing of mains
1 sampled for e-coli and clear
1 resolved on visit to property</td></tr>
<tr><td>Maintain excellent water supply network services</td><td>Quality</td><td>No unplanned service interruption >8 hours

Point of supply water pressure ≥200 kPa</td></tr>
</table>

RISK

The risks that stand out as high or extreme risks in order from the intake to distribution system are as follows:

Rural –

- Raw water quality poor
- Contaminated water at source (Waitohi)
- E-coli present after treatment
- Protozoa present after treatment
- Water turbid after treatment
- High chlorine demand resulting in taste and odour complaints

Hadlow – no high or extreme risks

Pareora – no high or extreme risks

The Improvements Schedule gives high priority to these risks most of which are items of moderate to major capital works expenditure that need further investigation and evaluation.

There are moderate and low risks, a number of which are already or can be readily addressed or monitored for little staff time or additional cost. The potential causes are:

- Agricultural contamination
- Cyanobacteria
- Excessive demand or leakage
- Backflow
- Poor maintenance practices
- Low FAC in reticulation extremity
- Dead end mains
- Staff unable to promptly reinstate scheme

Hadlow –

- Excessive demand or leakage
- Backflow
- Poor maintenance practices
- Telemetry system failure
- Plumbosolvency

Pareora –

- high turbidity events

The Springbrook WSP has not yet been written but risks are likely to be similar to Rural which has no treatment process. Raw water quality will however be better than directly from a river source.

A Business Continuity Plan will be developed to mitigate service failure from unforeseen significant events.

DEMAND

The Downlands Scheme provides both stock and drinking water requirements. It is a restricted supply which requires on-site storage. The allocation to consumers is based on a supply of 56 L/ha/day, plus 900 L/dwelling/day where this allocation has been approved. The volume is then rounded to the appropriate unit.

Water is sold by the unit. Each unit allows for a supply of 1,000 L/day, provided there is storage capacity available. Over recent years the subdivision of land has resulted in some reallocation of units. This would reflect the changes to the District Plan allowing lifestyle blocks.

The actual demand for stock water is uncertain. A 2011 report prepared by Aqualinc for TDC assessed the demand for stock water in the Downlands scheme to be in the range of 80-150 L/ha/day by 2030, compared to the scheme design of 56 L/ha/day. The estimate was based on scenarios of conversion/intensification in livestock farming. This indicator will be monitored within the AMP period for any significant impact on actual demand for stockwater. Currently, the Downlands scheme does not have sufficient capacity over and above the existing scheme design allocations to provide for any additional demand which could be a result of increased agricultural demand. This is part of the Downlands Water Supply Additional Water Strategy (Doc# 724458).

There are currently 2,748 connections to the scheme. Water use trend is as follows:

Table 18: Downlands Water Use Trend

	Water Use in 2013/14 (m^3)	Average from 2007/08 (m^3)
Rural	1,498,000	1,555,440
Hadlow	62,533	Not available
Pareora	37,723	40,953 (from 2009/10)
Springbrook	47,928	49,104

The medium growth scenario estimates an uptrend in population and number of households in the Timaru District in the next 10 years. The significance of these projections for Downlands will be monitored and any potential impact will be assessed through the hydraulic model of the scheme.

Managing Demand

The primary method of managing demand over the last 10 years is of not approving any additional sale of water in the rural area.

Occasional water shortages due to dry weather or high demand are managed through TDC's stepped hosing restriction policy that is imposed to reduce demand to the required level.

At times the Tengawai Intake struggles to meet the leakage plus consumption demand. The flows through the Tengawai flow meter are closely monitored and when the difference is higher than the consumption sold between the meters leak detection occurs. Repairs reduce the demand by up to 10 L/s. This occurs approximately 4 times each year.

Other demand factors, such as land use change and economic development trends, will continue to be monitored and assessed, and water use will continue to be trended and analysed in the annual review of the AMP to mitigate risk of level of service failure from any major changes in water use.

Changes in the scheme's demand drivers are accounted for through a managed *Model Calibration Programme* that is reviewed and recalibrated every three years. The next calibration is scheduled for 2015.

A district-wide *Water Conservation Education Programme* will be developed within this AMP period. Implementation will take into account identified water use issues within the scheme.

A *Leak Detection and Reduction Programme* is currently being developed, and once this has been implemented, total water demand from the scheme is expected to decrease.

New houses have utilized rain water unless there has been an alternative private system, usually a bore to supplement the stock water. In these cases a stock allocation is often transferred to a domestic allocation.

Summary of Issues

Tengawai

- Infiltration gallery – for upgrade to address low river flows and poor quality water
- Pump station needs renewal
- Treatment plant and process upgrade – to deal with DWSNZ
- Storage – to deal with operational outages when carrying out maintenance/repair works
- Trunk main and pipeline need upgrading to fully utilize resource consent and allow new connections
- Ageing reticulation – renewals required
- Didymo may block the intake
- Leakage

Waitohi

- Intake, treatment – to be used as an alternative source in future once Tengawai upgrade is completed and the additional allocation available utilized

Camerons

- Camerons pump station – dependent on retention of Pareora source for Timaru

Springbrook

- Treatment upgrade needed and reservoir re-roofing

Reservoir re-covering, lining, and pipe work renewal

- Waitohi reservoir
- Camerons reservoir
- Cleland reservoir
- Sutherlands reservoir
- Taiko reservoir

Reticulation

- Tengawai trunk main renewal required within the next 10 years

General issue

- Unsure of actual stock demand

FUTURE WORKS

Planned works in the Downlands Scheme in the next 10 years will address asset renewal requirements, sustaining levels of service and growth in demand. These include:

- Renewal of infiltration gallery and low lift pumps
- Renewal of pumps, jets, telemetry
- Treatment renewal
- Storage renewal (treated water and raw water)
- Renewal of switchboard and solar panels
- Springbrook treatment renewal
- Renewal of reservoir cover
- Tengawai trunk main renewal
- Reticulation renewals
- Opihi River crossing pipeline renewal
- Network analysis and metering
- Pipe condition assessment
- Leak detection and reduction

B2.2 ORARI WATER SUPPLY

SCHEME OVERVIEW

Orari's water is fed from the Temuka Water Treatment plant at Orari. Temuka water comes from a spring and four shallow wells at Orari and is piped to the Orari Reservoir where it is treated with ultraviolet light and chlorine to make it safe. The ultraviolet treatment meets the Drinking Water Standards for New Zealand.

The Orari water supply is restricted for domestic and stock water use. The daily allocation is supplied into a tank at a constant rate over a 24 hour period. If the tank is full, the ballcock shuts off the flow.

ASSET SUMMARY

There are no separate plant facilities held for Orari Water Supply. Treated water is supplied from the Temuka Water Supply. There are about 7.95 km of pipes in the Orari reticulation network.

Figure 35 below shows the percentage distribution of pipes in the reticulation network by material type and length.

shows pipe diameter range.

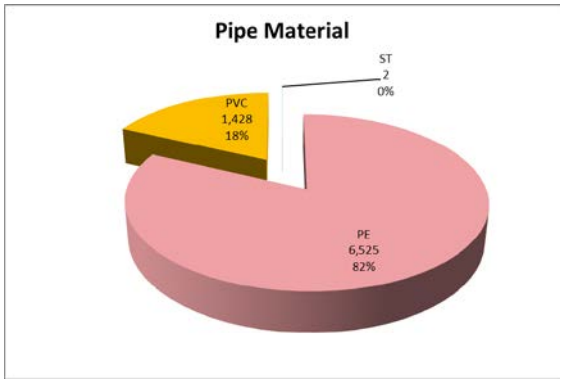

Figure 35: Orari Water Mains Pipe Material, by Length (m) and % Distribution

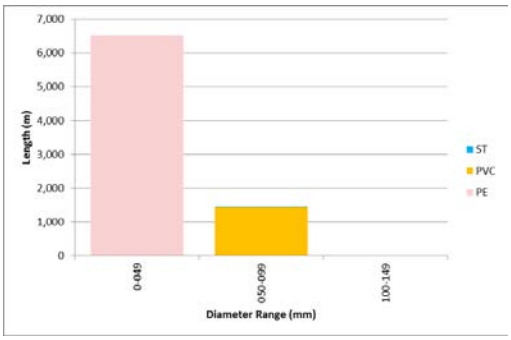

Figure 36: Orari Water Mains Diameter Range

ASSET CONDITION

The scheme does not have its own plant assets. Reticulation is in good condition. No renewals are identified in the next 30 years. The water mains currently have 60 or more years remaining useful life as shown below.

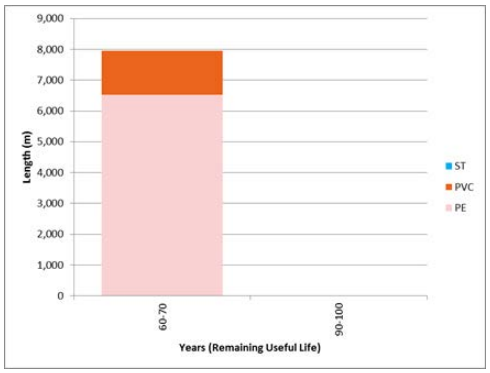

Figure 37: Orari Water Mains Remaining Useful Life

LEVELS OF SERVICE

Customers of the Orari Scheme are predominantly domestic or lifestyle property owners. There are no large consumers of water on the scheme.

Performance status in 2013-2014 is summarized in Table 19 below. There were no LOS issues within the scheme. Council plans to consult with the community on LOS options and their costs to improve management of the scheme.

Table 19: Orari Water Supply LOS Performance Status

Levels of Service	Customer Core Value	2013/14 Status
Deliver water services according to required environmental standards	Safety	NA (no resource consents)
Provide Safe Drinking Water	Quality	Full compliance with DWSNZ
Provide demand management of water supply services	Responsiveness	Water use monitored. No major changes in volume.
Deliver affordable water supply services	Affordability	Highly satisfied users and public in district wide survey
Maintain excellent customer service	Efficiency	No reported complaints
Maintain excellent water supply network services	Quality	No unplanned service interruption >8 hours Point of supply water pressure ≥150 kPa

RISK

As Orari purchases the water from Temuka its risks were addressed in the Temuka WSP. These risks are discussed in Section B1.4.

A *Business Continuity Plan* will be developed to mitigate service failure from unforeseen significant events.

DEMAND

Water use in 2013/2014 was 27,660 m^3 compared to 27,609 m^3 annual average from 2007/2008.

There are currently 134 units rated within the scheme.

Supply of water is restricted. Water is sold by the point with each point allowing for a supply of 1,800 L/day.

The medium growth scenario estimates an uptrend in population and number of households in the Timaru District in the next 10 years. The significance of these projections for Orari will be monitored and any potential impact will be assessed through the hydraulic model of the scheme.

The Orari water supply has minimal stock water demand. The Temuka Scheme which supplies Orari has sufficient capacity to meet potential increased stock water demands on the Orari scheme should they occur.

Managing Demand

Occasional water shortages due to dry weather are managed through the TDC's stepped hosing restriction policy that is imposed to reduce demand to the required level.

Other demand factors, such as land use change and economic development trends, will continue to be monitored and assessed, and water use will continue to be trended and analysed in the annual review of the AMP to mitigate risk of level of service failure from any major changes in water use.

A district-wide *Water Conservation Education Programme* will be developed within this AMP period. Implementation will take into account identified water use issues within the scheme.

A *Leak Detection and Reduction Programme* is currently being developed, and once this has been implemented, total water demand from the scheme is expected to decrease.

Summary of Issues

No significant issues. Demand has remained unchanged. The split between domestic and stock water demand is unknown.

No asset renewals identified in the next 30 years.

Future Works

The scheme does not have its own plant assets as water is supplied from the Temuka Scheme.

Reticulation is in good condition. No renewals are identified for the next 30 years.

B2.3 SEADOWN WATER SUPPLY

SCHEME OVERVIEW

The Seadown Water Supply was constructed in the mid-1970s and replaced the old stock water race scheme. It supplies both stock and drinking water.

This scheme takes water from a shallow bore located on Mill Road just east of Pleasant Point. Water is pumped from the well to an aerator above the reservoir, through which it gravitates into the reservoir. At the source a concrete block building houses the booster pumps, controls and water treatment and is attached to the concrete reservoir. A galvanized iron roof covers the reservoir and the associated building. The 500 m^3 concrete reservoir was constructed in 1974-75 and is located at the headworks site.

ASSET SUMMARY

A schematic diagram of the Seadown Water Supply is shown in Figure 38.

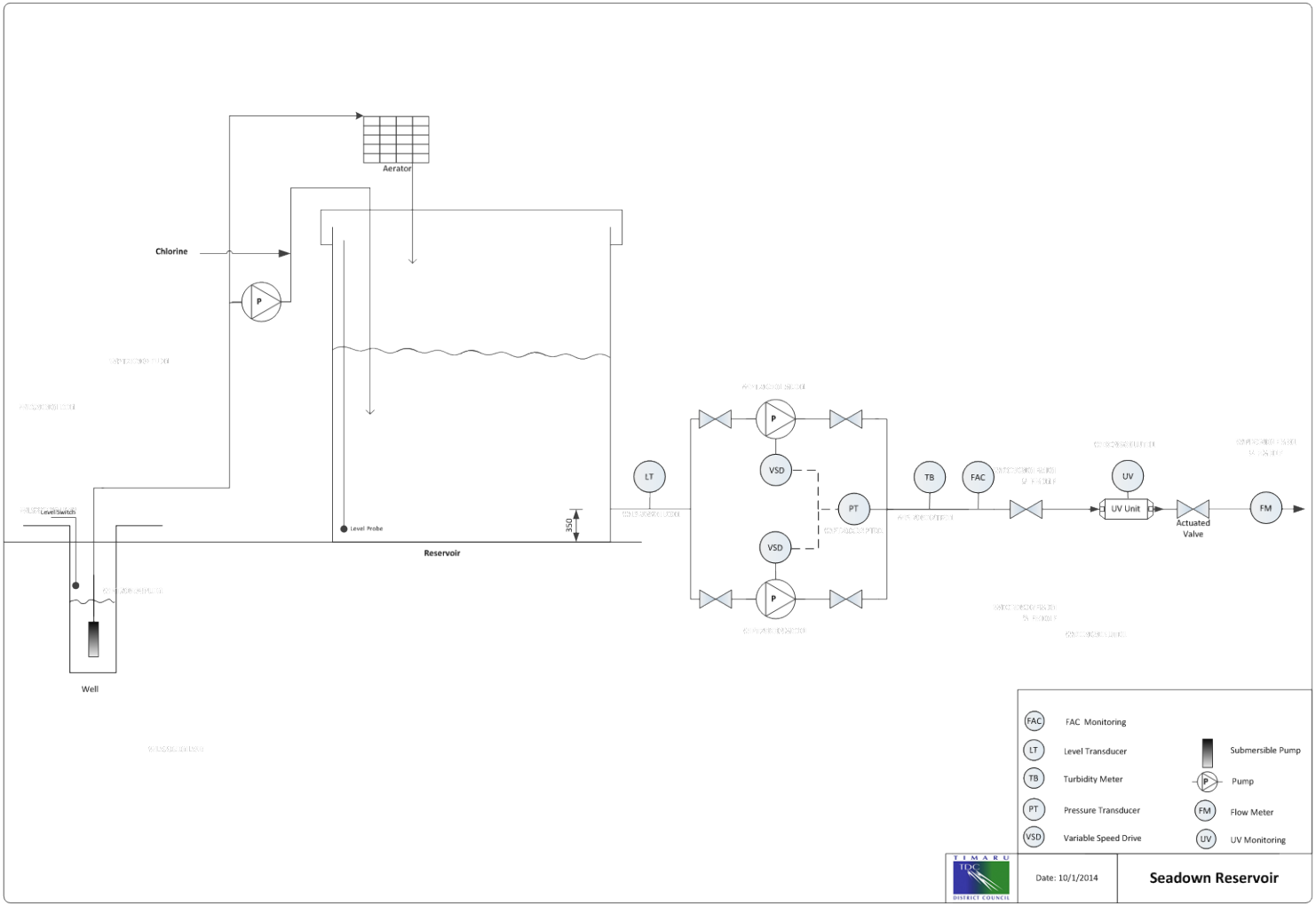

Figure 38: Seadown Water Supply Schematic

The plant facility consists of a bore, pumps, treatment plant and a reservoir.

The scheme has approximately 172 km of water mains.

Figure 39 shows the percentage distribution of pipes in the reticulation network by material type and length. Figure 40 shows length of pipes by diameter range.

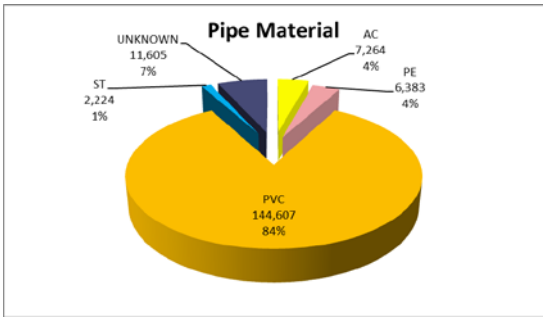

Figure 39: Seadown Water Mains Material Type by Length (m) and % Distribution

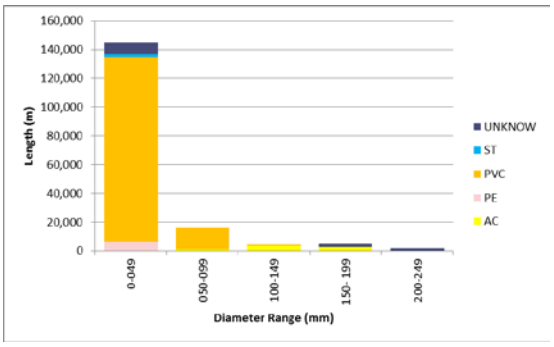

Figure 40: Seadown Water Mains Diameter Range by Pipe Length and Material

Asset Condition and Criticality

The bore, pumps, treatment plant and reservoir are in good condition.

The reservoir is a critical asset but with low risk of failure due to its good condition.

All facilities are visually inspected on a regular basis. Operation is telemetered and any faults would be detected immediately.

Figure 41 shows the remaining useful life of the water mains in the Seadown Scheme. For the next 10 year period, Seadown has approximately $1.5 M of renewals based on remaining life.

Seadown has issues with supply to farm properties with connections directly to troughs instead of reticulated tanks. This gives issues with water conservation and quantity. Maintenance calls associated with this arrangement is an issue.

TDC will be assessing whether to keep the current set-up of the scheme or to convert to a restricted supply. Renewals will be based on what the decision will be as pipe requirements may change significantly (e.g., pipe size, etc). Network renewals are deferred until final strategy for the scheme is in place. This is anticipated to be completed within the first 3 years of this AMP.

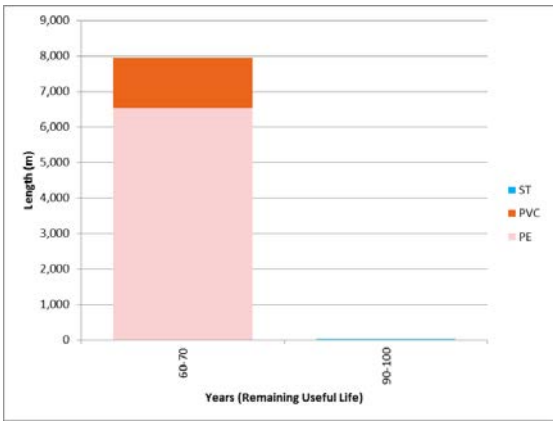

Figure 41: Seadown Water Mains Remaining Useful Life by Pipe Length and Material

ASSET CAPACITY/PERFORMANCE

The Seadown water supply is predominantly a demand system although on-site storage is required for domestic use.

The Council supplies water into most troughs and every tank.

Since 1991 domestic tanks have a restricted connection into the tank with the water flowing in at a constant rate unless the tank is full, once that happens the ballcock shuts off the flow.

The resource consent conditions limit the daily total abstraction for both of the Seadown public water supply sources to a rate not exceeding 21 L/s, with a volume not exceeding 149,743 m^3 in any period of 122 consecutive days.

If the level in Lake Opuha drops and is unable to supplement the Opihi River the consented volume drops to 892 m^3/day. When the Opuha Dam was designed, this was calculated to occur one year in twenty years. Although demand does drop below these levels for a significant period each year it will be difficult to reduce demands to these levels in the prevailing drought conditions.

Additional water is available from a consent to take on additional 100 L/s at 3 sources including at Mill Road. This water is not available when Lake Opuha is low.

The capacity of the concrete reservoir is 500 m^3.

Current network capacity is sufficient to meet the required Levels of Service in this AMP period provided farm conversions do not occur.

LEVELS OF SERVICE

Customers of the Seadown Scheme are predominantly domestic or farmers.

Performance status in 2013-2014 is summarized in Table 20. The scheme was non-compliant for protozoa for 8 days in April 2014 after heavy rain caused UVT to drop. This however is not a common issue with the scheme. Council plans to consult with the community on LOS options and their costs to improve management of the scheme.

Table 20: Seadown Water Supply LOS Performance Status

Levels of Service	Customer Core Value	2013/14 Status
Deliver water services according to required environmental standards	Safety	Resource consents compliant
Provide Safe Drinking Water	Quality	The scheme is chemical and bacterial compliant. Treatment plant was not protozoal compliant for 8 days after a heavy rain.
Provide demand management of water supply services	Responsiveness	Water use monitored. No major changes in volume.
Deliver affordable water supply services	Affordability	Highly satisfied users and public in district wide survey
Maintain excellent customer service	Efficiency	No reported complaints
Maintain excellent water supply network services	Quality	No unplanned service interruption > 8 hours Point of supply water pressure ≥ 200 kPa

RISK

Risks to the Seadown Water Supply were identified and assessed during the development of the scheme's Water Safety Plan, formerly Public Health Risk Management Plan, (TRIM Document #858144).

No risks stand out as extreme or high risks

There are moderate and low risks, a number of which are already or can be readily addressed or monitored for little staff time or additional cost. The potential causes are:

- Agricultural contamination
- Well pump Failure
- Power failure at treatment plant > 8 hours
- Booster pump failure
- Backflow
- Poor maintenance practices
- Dead end mains
- Pressure Reduction
- Air in reticulation following maintenance
- Staff unfamiliar with event
- Telemetry system failure
- Plumbosolvency

The Improvements Schedule gives priority to these risks most of which are items of moderate to major capital works expenditure that need further investigation and evaluation.

A *Business Continuity Plan* will be developed to mitigate service failure from unforeseen significant events.

DEMAND

The demand for water in 2013/2014 was 325,880 m^3 compared to 343,041 m^3 average annual demand from 2007/2008. There are currently 671 units rated within the scheme. Reticulated population is currently around 896. These are all within the capacity of the assets.

The medium growth scenario estimates an uptrend in population and number of households in the Timaru District in the next 10 years. The significance of these projections for Seadown will be monitored and any potential impact will be assessed through the hydraulic model of the scheme.

Managing Demand

Actual changes in demand will be monitored closely. The expansion of dairying could result in major supply issues as there is no control over the volume supplied, only the number of troughs. From the 2011 Aqualinc Study done for TDC, The Seadown scheme does not have any additional capacity to increase stock water delivery in the current manner over the existing levels. Any additional stock troughs must now be

supplied through a restricted tank system. The delivery mechanism to this scheme will need to be reviewed to ensure that the current demand is able to be met as well as any future demands.

Occasional water shortages due to dry weather are managed through the TDC's stepped hosing restriction policy that is imposed to reduce demand to the required level.

Other demand factors, such as land use change and economic development trends, will continue to be monitored and assessed, and water use will continue to be trended and analysed in the annual review of the AMP to mitigate risk of level of service failure from any major changes in water use.

A district-wide *Water Conservation Education Programme* will be developed within this AMP period. Implementation will take into account identified water use issues within the scheme.

A *Leak Detection and Reduction Programme* is currently being developed, and once this has been implemented, total water demand from the scheme is expected to decrease.

SUMMARY OF ISSUES

1 Scheme delivery mechanism
   - The demand is very high per hectare
   - Customers could change land use (e.g., dairying) and take additional water with no knowledge to TDC creating issues to other consumers
   - Need to assess tank versus troughs as a strategy

2 Treatment process upgrade to modern UV – may address possible raw water quality deterioration but required as a renewal
3 Reducing the volume of take when the Opihi River restrictions are imposed

FUTURE WORKS

Reticulation renewals are deferred until final strategy for the scheme is in place. This is anticipated to be completed within the first 3 years of this AMP.

Planned works in the next 10 years will address asset renewal requirements and sustaining levels of service. These include:

- Source renewal
- Pump and VSD renewal
- Treatment upgrade
- Storage renewal
- Controls renewal
- Instrumentation and electrical renewals
- Pipe condition assessment
- Leak detection and reduction
- Network analysis and metering

B2.4 TE MOANA DOWNS WATER SUPPLY

SCHEME OVERVIEW

The Te Moana Downs public water supply replaced the 1926 Downs-Raukapuka piped (demand) scheme, the Woodbury and Kakahu-Te Moana stock water race schemes and, in addition, covered a large area not previously served by a public water supply. The whole scheme was completed in 1973.

The river intake is approximately 3 km up the north branch of the Hae Hae Te Moana River from Wooding Road, and the catchment area for the headworks is approximately 18 km^2 and consists of 15% bush cover, with the rest being grazed farmland. The intake consists of a shallow concrete weir with an infiltration galley pipe (9m length of slotted screen) which has the facility for backwashing. A surface collection box is available at the intake for periods when the infiltration gallery is non-operational.

The rapid sand filter removes majority of the sediment within the water. The water is then chlorinated to kill bacteria and by maintaining a chlorine residual in the system minimises the risk of contamination in the consumer's water tank.

The resource consent for the water take at the Hae Hae Te Moana River headworks is for a maximum volume of 7,408 m^3 per any 7-day consecutive period.

The Te Moana Water Supply Advisory Committee meets annually and recommends policy for the water supply scheme. The TDC approves all policy matters.

Currently no new connections or units of water are being approved; these will be resumed once the Te Moana scheme review has been completed.

ASSET SUMMARY

A schematic diagram of the Te Moana Water Supply is shown in Figure 42:

Plant facilities consist of the following:

- Te Moana intake and filter
- Mees Road treatment and pump station
- Gapes Valley pump station
- Pleasant Valley pump station

The scheme has approximately 214 km of water mains.

Figure 43 below shows the percentage distribution of pipes in the reticulation network by material type and length. Figure 44 shows length of pipes by diameter range.

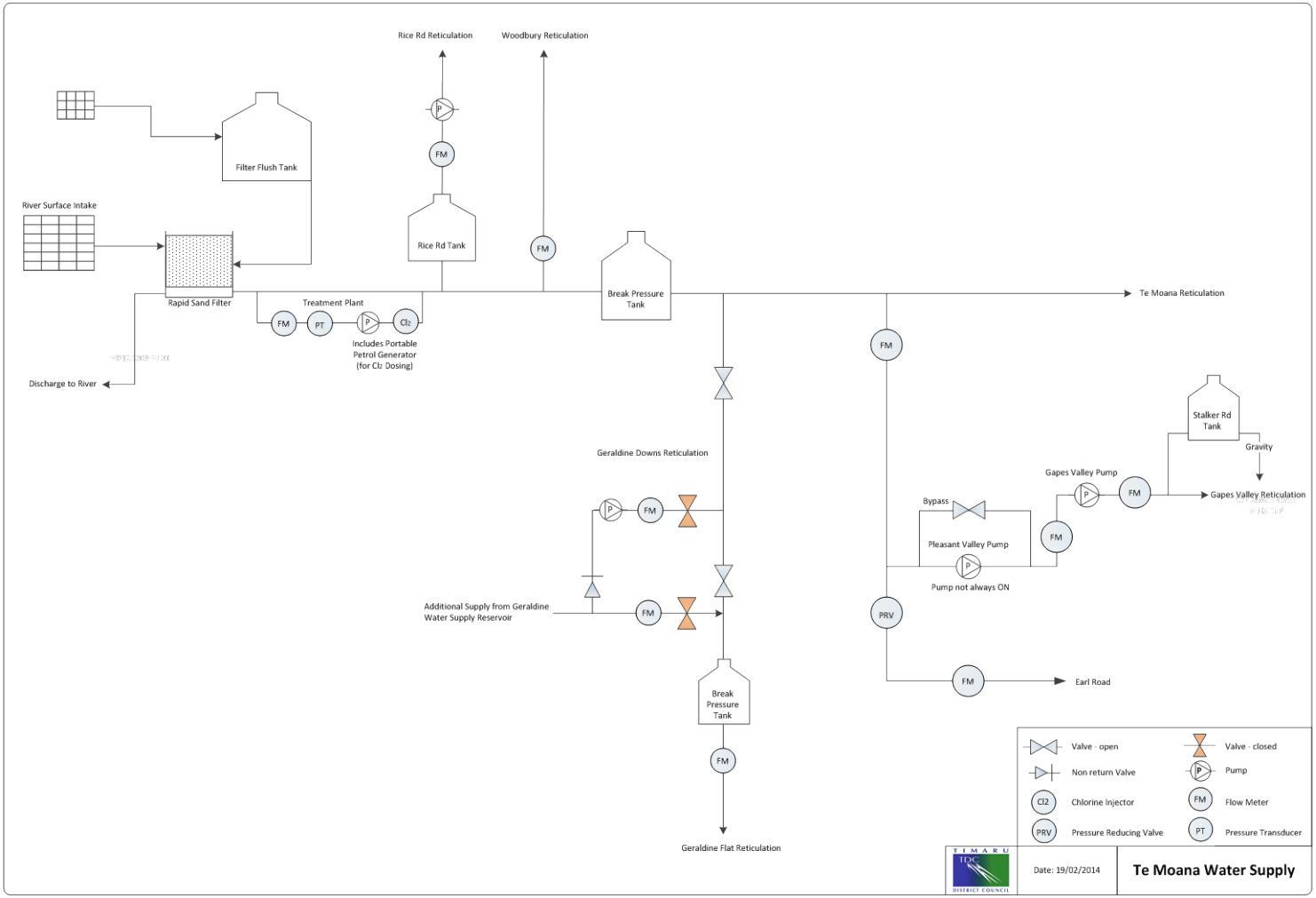

Figure 42: Te Moana Water Supply Schematic

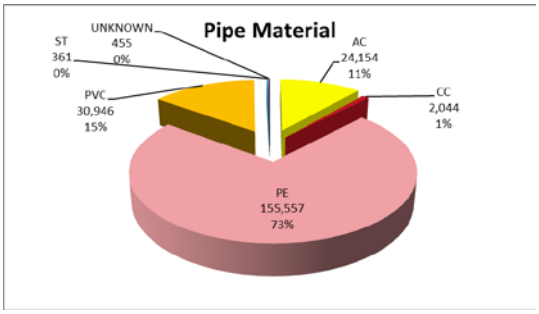

Figure 43: Te Moana Water Mains Material Type, by Length (m) and % Distribution

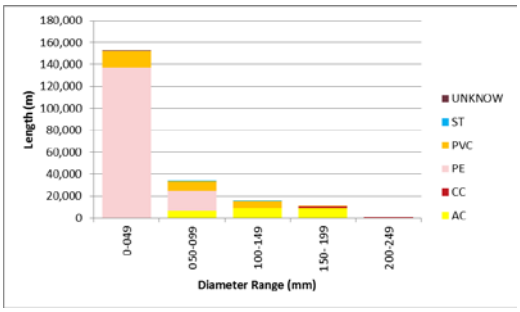

Figure 44: Te Moana Water Mains Diameter Range by Pipe Length and Material

ASSET CONDITION AND CRITICALITY

The plant assets are in good condition. The intake is a critical asset.

All facilities are visually inspected on a regular basis. Operation is telemetered and any faults would be detected immediately.

Leakage from small (< 80 mm diameter) PE pipes has been an issue in this scheme. TDC has carried out a renewal program based on these leakage results. PE pipes have been replaced prematurely due to leakage and depth of pipe causing significant maintenance.

Te Moana and Geraldine are being investigated so water can be supplied to Te Moana from Geraldine. Renewals are currently on hold for 80-150 mm diameter pipes as it is anticipated that some pipe upgrades may be needed. There are 24 km of AC pipes due for renewal that will be sampled and condition assessed in 2015/16 to enable decisions on where to best spend the money, whether on renewal of 100 and 150 mm diameter pipes or on small PE pipe upgrades. Remaining useful life of water mains is summarized in Figure 45 below.

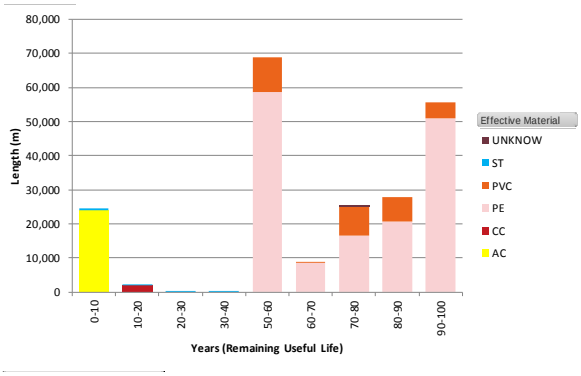

Figure 45: Te Moana Water Mains Remaining Useful Life by Pipe Length and Material

ASSET CAPACITY/PERFORMANCE

The design area of the scheme is 18,500 hectares. The supply is a restricted supply and the allocation is now based on 56 L/ha plus 900 L/dwelling/day. Many larger properties have less than this while smaller properties connected before 1998 may have an allocation of 1,800 L/day for domestic purposes.

The resource consent conditions limit the daily total abstraction for both of the Te Moana Downs public water supply sources.

All properties require storage. Current requirements are three days although when the scheme was installed a 1800L tank was sufficient for all allocations.

The volume of water sold is 1,228 m^3/day or units. The volume of water available for the Te Moana scheme is 7,408 m^3/week, an average of 1,058 m^3/day. The Te Moana source is only able to supply all the water for approximately 200 days in a year. The balance of the water is supplied from Geraldine. This can be supplied either immediately upstream of the Tripp Street BPT and when operating supplies 15% of the consumers; or immediately after the Tripp Street pump in addition to the Tripp Street BPT. This supplies 45% of the consumers leaving 55% (650 m^3/day) of the water supplied from the Te Moana source.

The Tripp Street pump is required between 360 and 65 days each year averaging 234 days.

There has been one occasion when the source has not been able to supply the consumers requiring the 650 m^3/day within the consent volume (average 1,058 m^3/day) for 6 days continuously. A total hosing ban was implemented and a significant leak found and repaired.

Demand is required to be monitored when high leakage detection occurs.

This scheme does not cover a gazetted fire district.

Current network capacity is sufficient to meet the required Levels of Service in this AMP period provided leakage is managed.

LEVELS OF SERVICE

Customers of the Te Moana Scheme are predominantly domestic or farming. There are no large consumers of water on the scheme.

The Te Moana Intake has no treatment process for protozoal removal. The current preferred option is to purchase all water from Geraldine. The overview design for this is near completion.

Performance status in 2013-2014 is summarized in Table 21 below. There are no other assessed gaps but there will be a review of the LOS to identify options and their costs as part of improving the management of the scheme.

Table 21: Te Moana Water Supply LOS Performance Status

Levels of Service	Customer Core Value	Status
Deliver water services according to required environmental standards	Safety	Resource consents compliant
Provide Safe Drinking Water	Quality	The reticulation was bacterial non-compliant at the zone feed from the Tripp St Break Pressure Tank No protozoal treatment.
Provide demand management of water supply services	Responsiveness	Water use monitored. No major changes in volume.
Deliver affordable water supply services	Affordability	Highly satisfied users and public in district wide survey
Maintain excellent customer service	Efficiency	No complaints reported
Maintain excellent water supply network services	Quality	No unplanned service interruption > 8 hours Point of supply water pressure ≥ 150 kPa (rural)

RISK

Risks to the Te Moana Water Supply were identified and assessed during the development of the scheme's Water Safety Plan, formerly Public Health Risk Management Plan, (TRIM Document #866698).

No risks stand out as extreme risks.

High Risk events are:

- Contaminated source water
- Raw water quality poor
- E-coli present after treatment
- Protozoa present after treatment
- Water turbid after treatment

There are moderate and low risks, a number of which are already or can be readily addressed or monitored for little staff time or additional cost. The potential causes are:

- Agricultural contamination
- Excessive demand or leakage
- Backflow
- Poor maintenance practices
- Dead end mains
- Staff unfamiliar with event
- Telemetry system failure
- Plumbosolvency

The Water Safety Plan Improvements Schedule gives priority to these risks most of which are items of moderate to major capital works expenditure that need further investigation and evaluation.

A *Business Continuity Plan* will be developed to mitigate service failure from unforeseen significant events.

DEMAND

The volume of demand was 352,881 m^3 in 2013/2014, compared to an annual average of 403,963 m^3 from 2007/2008.

The Te Moana supply is a restricted water supply. This means the daily allocation is supplied into a tank at a constant rate over a 24 hour period. If the tank is full the ballcock shuts off the flow.

The Te Moana Downs has reached its original capacity. There are currently 958 supply connections. Additional water is being purchased from Geraldine to supplement the main intake. That water supply is treated by ultraviolet light which kills bacteria and

protozoa, but is not chlorinated; therefore re-contamination within the water mains and tanks is possible.

Pipeline upgrades are being carried out to allow additional consumers to connect to the scheme.

From the Aqualinc 2011 study conducted for TDC, the Te Moana scheme currently has limited ability to meet increased stock water demands. Additional water for increased demand is part of the Geraldine Area Wide Water Supply Strategy (Doc# 734515).

Summary of Issues

1 Finalise source of water
2 Treatment requirement dependent on source
3 Trunk main distribution network
4 Reticulation renewals
5 Uncertain with future stock demand

Future Works

Planned works in the Te Moana Water Scheme in the next 10 years will address asset renewal requirements and sustaining levels of service. These include:

- Reticulation renewals
- Pump renewals
- Jet renewals
- Treatment renewals
- Tank renewals
- Network capacity upgrade
- Leak detection and reduction
- Network analysis and metering

B3 – STOCK WATER ONLY SCHEMES

B3.1 BEAUTIFUL VALLEY

SCHEME OVERVIEW

The Beautiful Valley Stockwater Scheme is located approximately 30 km northwest of Timaru. The Scheme is a piped stockwater that supplies 22 properties.

The Beautiful Valley stockwater supply is a constant flow, gravity fed scheme. It was designed by the former Ministry of Agriculture and Fisheries in 1981 based on 17.5 stock units/ha at 4 L/stock unit/day (or 70 L/ha/day) which also caters for garden and shed use but not domestic use. Installation and commissioning of the scheme as a public water supply was completed in 1983.

TDC owns and maintains the water supply network from the source through to and including the restrictor units at the consumers' site storage tanks.

The headworks is a short slotted infiltration pipe attached to a small weir on Stoney Creek, a tributary of the Kakahu River. Supply is by gravity direct into the reticulation. The first break pressure tank is a 22.5 m^3 concrete tank that acts as a settling tank for sediment in times of high creek flow.

ASSET SUMMARY

A schematic diagram of the Beautiful Valley Stock Water Supply is shown below.

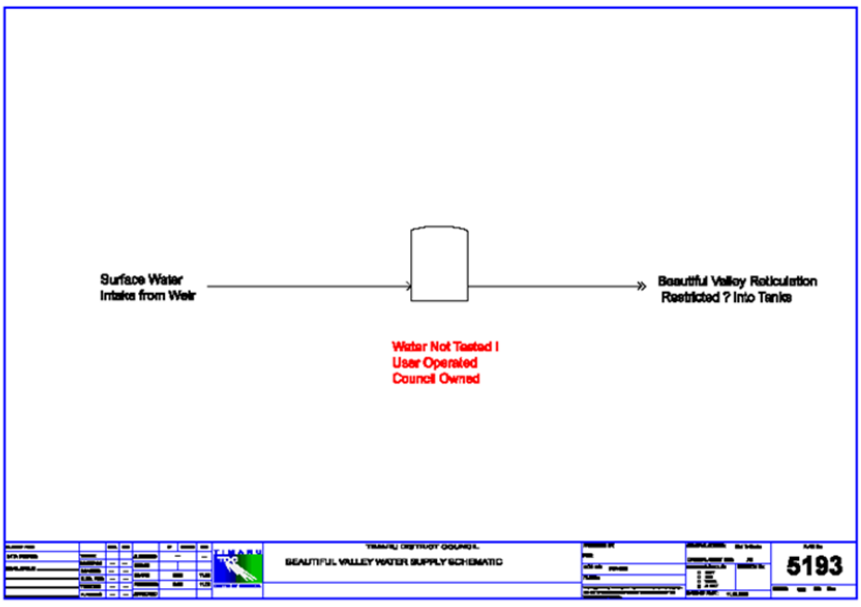

Figure 46: Beautiful Valley Stockwater Schematic

The main asset components of the scheme consist of an intake, storage tanks and around 18.7 km pipeline. A short slotted infiltration pipe is attached to a weir at the water source on Stoney Creek. Three break pressure tanks give 5 hours storage.

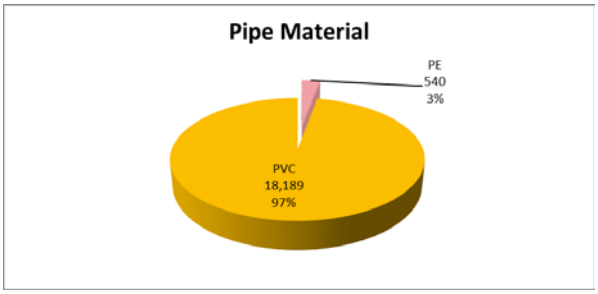

Figure 47 shows the percentage distribution of pipes in the reticulation network by material type and length. Figure 48 shows length of pipes by diameter range.

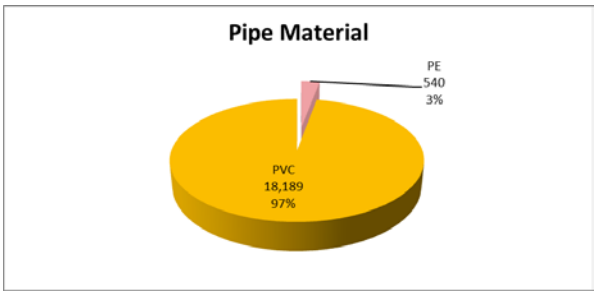

Figure 47: Beautiful Valley Network Pipe Material by Length (m) and % Distribution

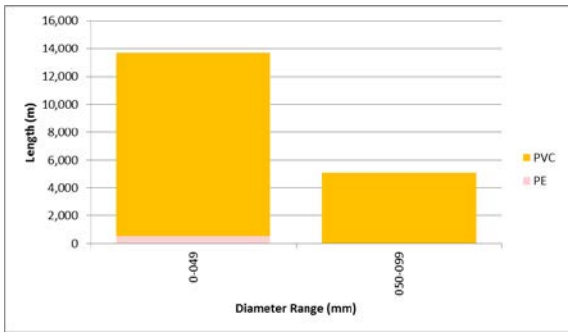

Figure 48: Beautiful Valley Network Pipe Diameter Range by Length and Material

ASSET CONDITION

The assets are in good condition. They are low criticality and low risk assets. Pipes have 60 or more remaining useful life as shown in Figure 49.

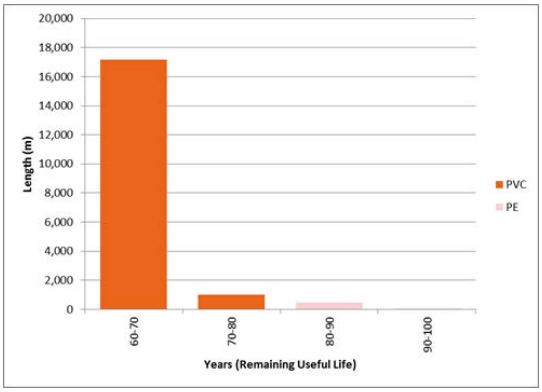

Figure 49: Beautiful Valley Network Pipe Remaining Useful Life by Length and Material

ASSET CAPACITY/PERFORMANCE

Three break pressure tanks along the main line have approximately five hours storage which acts as a buffer for minor maintenance. This is the only scheme storage. Every farm is required to have 1.5 days storage.

The existing resource consent to take water (CRC992621) allows a maximum take of 2.8 L/s, with a volume not exceeding 900 m^3 in any period of seven consecutive days.

The capacity of this scheme is sufficient to supply existing customers.

There is no capacity to expand the scheme as the consent is fully utilised by the stockwater allocation. If any house uses the water for domestic purposes it is from the stock water allocation. The existing source could not supply any additional water during low flow periods.

Levels of Service

Customers of the Beautiful Valley Scheme are predominantly farm related stock troughs and other stock water facilities.

There are no Levels of Service issues in this scheme.

To improve management of the scheme, Council plans to consult with the community on LOS options and their costs.

Risk

There are no extreme or high risk events identified in the scheme.

As the supply is a stock-water supply only, there are no health risks to the local or the general public.

Demand

The scheme covers around 1,800 hectares. There are currently 41 units rated within the scheme.

Water is charged by the hectare within the scheme. It is based on 70 L/ha/day. A restrictor unit is used with a jet which controls the volume of water to be supplied to a property's storage tank.

The assessed stock water demand for Beautiful Valley was estimated at 95-170 L/ha/day. Beautiful Valley is a very small scheme and no additional water is available at the source. There are no plans to cater for additional demand at present.

Summary of Issues

There are no significant issues identified. The scheme has no expansion capacity and demand has remained unchanged and is expected to remain unchanged within the AMP period. The three break pressure tanks are likely to be renewed in the next 30 years.

Future Works

Intake renewal is programmed in Year 10 of this AMP.

B3.2 RANGITATA-ORARI

SCHEME OVERVIEW

The Rangitata-Orari (RO) water race is a stock water supply only. The water flows from the Orari River and is fed into a network of open water races. The water quality is dependant upon river conditions and possible contamination from stock upstream of each property.

The RO stockwater scheme has been in existence for many years, drawing water from the Orari River and delivering stockwater via an extensive network of open races eastwards to the coast. The total area of the RO stockwater scheme is around 16,700 hectares. The reliability of the scheme, particularly at the eastern extent of the scheme, has at times been poor, and some property owners have installed private water supply systems. There have also been significant changes in land use in the area.

Some significant modifications to the water race network have occurred as a result of the establishment of the Rangitata South Irrigation Scheme in the area which is upgrading then utilizing parts of the races for conveying irrigation water.

ASSET SUMMARY

The headworks are located below the Orari Gorge. Water is fed into a network of open races, some 230 km long. There are ongoing modifications in the RO scheme under agreement with Rangitata South Irrigation Limited to utilize some of the existing water races for transport irrigation water.

There are about 115 km race to close once the irrigation scheme is completed. There will be 70km new race combined with irrigation. Around 13 km of race will be relocated. Of the original water race, 104 km race will remain. The final scope of the Scheme is required to be completed as part of the efficiency audit in 2014. A new consent is required to be submitted by end November 2016 to allow continued use.

ASSET CAPACITY AND PERFORMANCE

Water races are an inefficient use of water. The consent is for 526 L/s (Timaru Urban 544 L/s, or Downlands Rural 94 L/s consented or 82 L/s capacity).

If water is taken at the consented rate then the demand is 2,800 L/ha/day, 50 times that of the Downlands Water Supply.

The full consented take is rarely taken, however data analysis shows 90% of the take is taken on 10% of the days.

In 2013/14 the volume taken was much lower with a maximum take at 340 L/s or 35% of the volume. However, takes were reduced to allow race construction for irrigation and there were extended periods when water was not available in all races.

LEVELS OF SERVICE

The RO Scheme is compliant with current resource consent requirements.

An LOS review will be carried out within this AMP period to consider impacts of the on-going modifications to the Scheme, land use changes, and the requirements of the new resource consent.

RISK

As the supply is a stock-water supply only, there are no health risks to the local or the general public.

Being an open water race, the Scheme is susceptible to weather conditions. The Scheme can fill with debris when windy, blocking culverts, freeze in extreme winter conditions, or cease to flow in hot conditions when weed growth is lush and evaporation high. TDC endeavours to maintain a flow at all times although in the extremity of the Scheme, water can cease flowing and take several days to recover. This situation however is not common.

There is a risk that increased efficiencies will be required and the operation of the scheme will not be achievable with the current consent renewal requirement. This has been reduced by the involvement of the TDC in the development of Chapter 14 of the LWRP:

> "14.4.3 Over-allocation of fresh water in the Orari catchment is addressed by Timaru District Council surrendering CRC011982 or its replacement in 2013 and increased efficiency with any renewal of CRC011991 in 2017. However, for security of supply a total flow rate of 235 L/s in 2025 of surface water will continue to be reserved for Timaru District Council community drinking and stock water, in addition to the volumes in Table 15, as part of the flow and allocation regime for Orari River."

The existing consent obtained in 2007 has a requirement to have all cattle and deer being fenced from races. This has not occurred to date and could create issues with the renewal. However, discharges will be modified with the operation of the irrigation scheme.

DEMAND

With the establishment of the Rangitata South Irrigation (RSI) scheme, the water races have been upgraded, under agreement, to be able to be used for the transport of irrigation water as well as stockwater. This will provide a greater reliability in the delivery of stockwater.

A large number of RO ratepayers are also shareholders in the RSI. There are also a number of RO ratepayers who are not irrigation shareholders and who wish to remain on the RO stockwater scheme, and a number of ratepayers who wish to permanently withdraw from the scheme. A number of surveys have been conducted with ratepayers by the irrigation developer and Council and an area of approximately 1,810 hectares has been identified as potentially withdrawing from the stockwater scheme.

There are about 540 units in the scheme rated in 2014.

SUMMARY OF ISSUES

1. Finalize scope of the scheme. Determine properties who:
    a. Do not want stock water but want irrigation water
    b. Do not want stock or irrigation water
2. Efficiency audit
3. Consent renewal in 2017
4. Water take – volume is allocated within LWRP Chapter 14
5. Discharge compliance is an issue, i.e. animal access - quality
6. water abstraction issues – quantity for stock drinking
7. Management of the scheme – balancing irrigation/stock water
8. Intake – fish screen limits the flow of water
9. Intake vulnerable to floods
10. Didymo may block the intake

FUTURE WORKS

Renewal of the races and the intake/fish screen are programmed within the period of this AMP.