Rangitīkei District Council

Asset Management Plan

3 Waters – 2017-2018

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Document Approval

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Revision History

Revision Number	Author	Description	Signed	Date
0	See above	Update for 2017-2018		

Review Schedule

Action	Last Completed	Frequency	Next Scheduled	Responsibility
Review		Every 3 years		Asset Engineer
External Review		Every 3 years		General Manager - Infrastructure

Contents

Abbreviations

AC	Asbestos Cement
AM	Asset Management
AMP	Asset Management Plan
BOD	Biochemical Oxygen Demand
BOD_5	5-day Biochemical Oxygen Demand
$cBOD_5$	Carbonaceous 5-day Biochemical Oxygen Demand
CRA	Catchment Risk Assessment
CBD	Central Business District
CDEM	Civil Defence Emergency Management
CDEMG	Civil Defence Emergency Management Group
COD	Chemical Oxygen Demand
DO	Dissolved Oxygen
DIA	Department of Internal Affairs
DRP	Dissolved Reactive Phosphorus
DWF	Dry Weather Flow
DWSNZ	Drinking Water Standards for New Zealand
FENZ	Fire and Emergency New Zealand
I&I	Inflow and Infiltration
IQP	Independent Qualified Person
LAPP	Local Authority Protection Programme
LGA	Local Government Act
LIM	Land Information Memorandum
LOS	Level(s) of Service
LTP	Long Term Plan
MDC	Manawatū District Council

MfE	Ministry for the Environment
MOH	Ministry of Health
NAMS	New Zealand Asset Management Support
NES	National Environmental Standard
NPS	National Policy Statement
NRV	Non-Return Valve
O&M	Operations & Maintenance
P&ID	Piping & Instrumentation Diagram
PE	Polyethylene
PLC	Programmable Logic Controller
PRV	Pressure-Reducing Valve
PSV	Pressure-Sustaining Valve
PVC	Polyvinyl Chloride
mPVC	Modified Polyvinyl Chloride
oPVC	Orientated Polyvinyl Chloride
uPVC	Unmodified Polyvinyl Chloride
RDC	Rangitīkei District Council
RMA	Resource Management Act
RRPM	Raised Reinforced Pavement Marker
SCADA	Supervisory Control And Data Acquisition
SUIP	Separately Used Inhabited Portion
TN	Total Nitrogen
TSS	Total Suspended Solids
WSP	Water Safety Plan
WSPS	Water Supply Pump Station
WTP	Water Treatment Plant

WWF	Wet Weather Flow
WWPS	Wastewater Pump Station
WWTP	Wastewater Treatment Plant

1 Introduction

Asset Management is important to the Council for a number of reasons. First, many of the services delivered by the Council rely on assets to support their delivery. Secondly, assets represent a significant investment by the Community that needs to be protected. Thirdly, asset failure can have both social and economic effects on the community.

In light of the above, Council has been undertaking Asset Management Planning for over decade. The objective of Asset Management is:

"To meet a required level of service in the most cost effective way (through the creation, operation, maintenance, renewal and disposal of assets) to provide for existing and future customers".

The Asset Management Plan is the tool for combining management, financial, engineering and technical practices to ensure that the level of service required by customers is provided at the lowest long-term cost to the community. The plan is intended to demonstrate that Council is managing the assets responsibly and that customers will be regularly consulted over the price/quality trade-offs resulting from alternative levels of service.

1.1 Background

The objectives of the Asset Management Plan are:

- To ensure strategic and operational decisions regarding the activity will be based on "best for asset" principles. Levels of service will be cascaded down through all levels of operational practices to enhance the network performance and ratepayer satisfaction. The management of the assets will be carried out within budget constraints.
- To provide clear linkages to the Annual Plan, Long Term Plan, and all other key planning processes and documents.
- To comply with the Local Government Act 2002 (LGA), specifically in relation to our activities, services and assets.

The purpose of this plan is to improve the stewardship of assets by Council on behalf of its customers and stakeholders and achieve compliance with statutory obligations. This plan specifically does that by:

- Demonstrating responsible stewardship of the assets.
- Identifying minimum lifecycle costs to provide an agreed level of service.
- Improving understanding of service level standards and options.
- Assisting with an integrated approach to Asset Management throughout the organisation.

- Improving customer satisfaction and organisational image.
- Managing the risk of failure to deliver the required level of service.
- Supporting long-term financial planning by the Council.
- Clearly justifying forward works programmes.
- Improving decision-making based on costs and benefits of alternatives.

This Asset Management Plan is intended to set out how Council manages assets in a way that is appropriate for a readership which includes executive management and elected members of the Council, interest groups, stakeholders, and other interested members of general community.

Asset Management Plans are tactical plans for achieving strategies resulting from the organisation's strategic planning process.

Asset Management Plans are a key component of the Council planning process, linking with the following plans and documents:

- **Long Term Plan (LTP)**. A plan required by the Local Government Act 2002 and Amendment Act 2010 to cover a period of at least 10 years. This plan contains key information about the Council's activities, assets, levels of service, and cost of providing services. It sets out the Council's funding and financial policies and also a financial forecast for the years covered by the plan. The LTP is now required to include a 30-year Infrastructure Strategy that includes the water, wastewater and stormwater activities.
- **District Plan**. Incorporates policies and objectives for land use and road infrastructure. It may include designations for future works that should be reflected in the Asset Management Plan.
- **Strategic plans**. Strategic plans set out broad strategic direction for the next 20 years. Asset Management Plans are prepared to reflect the strategies outlined in those documents and confirm tactics to achieve strategic goals.

The Asset Management Plan provides the data required to enable future planning for the management of assets, for example asset age, condition and replacement cost. This data is used for forward planning in the LTP.

- **Annual Plan**. Complements the LTP in the years between updates by reporting on variances. A detailed action plan on Council's projects and finances for each particular year.
- **Funding policies**. These policies state how future expenditure needs will be funded. Key policies are summarised in the LTP.

- **Business/activity plans**. The service level policies, processes and budgets defined in Asset Management Plans are incorporated into business plans as activity budgets, management strategies and performance measures.

- **Contracts**. The service levels, strategies and information requirements contained in Asset Management Plans are translated into contract specifications and reporting requirements.

- **Legislation**. The Asset Management Plan must comply with all relevant legislation and provide the means of meeting legislative requirements.

- **Bylaws, standards and policies**. These tools for asset creation and subsequent management are needed to support Asset Management practices.

- **Other documentation**. There are a number of other documents used on a day-to-day basis for management of activities. Such documents are referenced in the Asset Management Plan.

This Plan recognises the following key stakeholders:

Table 1: Key Stakeholders

External	Rangitīkei District community
	Users of services (residents and visitors)
Internal	Councillors
	Utilities Manager and Asset Management staff
	Finance managers
	Information technology managers
	Policy and planning managers

1.2 Goals and Objectives

The objectives of the Asset Management Plan are:

- To describe how Council will implement the expectations that the community has about the management of its water, wastewater and stormwater assets through setting and delivering service levels within budget constraints.

- To provide clear linkages to the Annual Plan, Long Term Plan, and all other key planning processes and documents.

- To comply with the Local Government Act (LGA), specifically in relation to our activities, services and assets.

- To identify potential opportunities for reductions in asset lifecycle costs.

The purpose of this Plan is to improve the stewardship of assets by Council on behalf of its customers and stakeholders, and achieve compliance with statutory obligations.

The rationale for Council's involvement in each of the 3 Waters activities, and an overall description of them, are described in Section 1.5.

1.3 Plan Framework

Rangitīkei District Council (the Council) is the main provider for water, wastewater and stormwater services in the District. To deliver these activities, Council establishes contracts to obtain these services via established procurement strategies.

Rangitīkei District adjoins areas administered by Whanganui, Ruapehu, Napier, Tararua and Manawatū District Councils. Rangitīkei District is within the area administered by Horizons Regional Council.

The strategic objective of Asset Management is to maintain the assets to a high standard. Major maintenance and construction programmes are also to be completed to improve efficiencies and safety across the District.

Maintenance intervention strategies will be based around creating efficiencies within the operational activities. Improving the timing of maintenance activities will reduce the cost per repair and increase of quantity of repairs, while retaining a high quality.

A collaborative environment will be fostered by a management group comprising the relevant Utilities Manager, Project Managers and contractors. Intervention strategies will be developed as the collaborative environment develops. These strategies will be linked to the maintenance intervention strategies.

The assumptions used in Council planning that relate to Asset Management are described in Table 2. These are the assumptions adopted by Council for the Long Term Plan.

Table 2: Asset Management Assumptions

Forecasting Assumption	Risk	Level of Uncertainty	Reasons and Financial Effect of Uncertainty
Activities: Council will not exit any of the activities covered by this plan during the term of the Asset Management Plan	Council may choose to exit activities due to constrained finances	Low	Council has listed the assets covered by this plan as strategic assets, demonstrating its intention to continue with them

Forecasting Assumption	Risk	Level of Uncertainty	Reasons and Financial Effect of Uncertainty
Lives of assets: predictions contained in the Asset Management Plans are realistic	Asset lives are over stated and assets fail to deliver levels of service earlier than forecast	Low	Asset lives are reviewed regularly as part of condition assessment process
Levels of service: predictions of demand trends form a sound basis for the upgrading of assets	Council may renew or build new assets which do not meet user needs	Low	Council keeps abreast of National and International transportation trends

1.4 Core and Advanced

This Asset Management Plan has been prepared with the criteria of NAMS (New Zealand Asset Management Support) in mind. The NAMS International Infrastructure Management Manual (IIMM) is held up internationally as an example of best practice. This was reflected in the creation of the recent ISO 55000 standard for Asset Management, which specifically mentions the NAMS IIMM.

Asset Management maturity is defined by the International Infrastructure Management Manual (IIMM) produced by NAMS at four levels:

- Minimum.
- Core.
- Intermediate.
- Advanced.

Minimum is considered as the absolute lowest level essential for owning and maintaining a significant quantity of assets. Core represents a basic but sound level of Asset Management practices. “Intermediate” moves towards best practice, and “Advanced” is the highest level of Asset Management maturity.

This hierarchy applies to all aspects of Asset Management practice. There is a cost in moving from the more basic levels of Asset Management to the higher levels in terms of time, expense and effort. It is common practice for organisation to target specific areas where they wish to invest in achieving “Intermediate” or “Advanced”, where this is justified by the criticality, risk or asset value concerned.

Rangitīkei District Council has determined that all its Asset Management practices should be at Core level.

1.5 Rangitīkei District

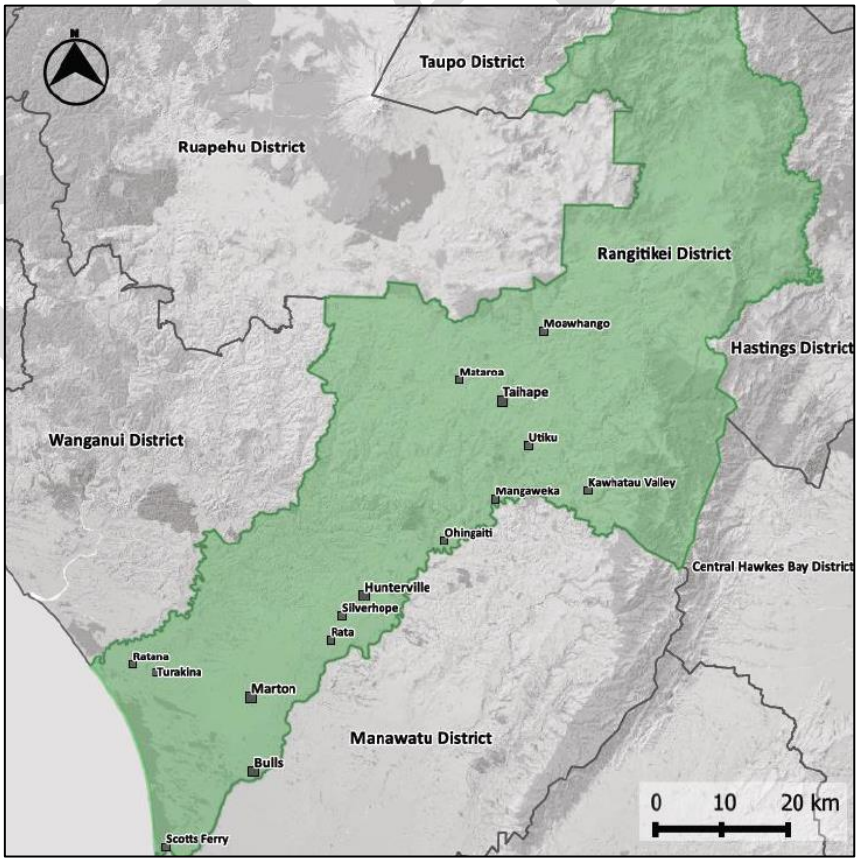
The Rangitīkei was one of the first Counties constituted under the Counties Act 1876 when the provincial system of Government gave place to the county system. The first meeting of Rangitīkei County Council was held in 1877.

Located 2 hours north of Wellington, the Rangitīkei District encompasses a trapezium-shaped block of mainly lush, rural land that covers an area of 4,479 km^2 and includes the towns of Taihape, Bulls, Marton, Hunterville, Mangaweka and a number of smaller settlements. Of particular note is the settlement of Rātana – the home of the Rātana movement, a religion and pan-iwi political movement, founded by Tahupōtiki Wiremu Rātana in the early 20th century.

The District takes its name from the Rangitīkei River, one of New Zealand's longest rivers, which flows from the Central Plateau south to the South Taranaki Bight at Scotts Ferry. It forms the eastern boundary of the District with the Whangaehu River broadly forming the western boundary, the northern section reaching beyond the town of Taihape and extending eastwards towards Napier.

Known as a marvellous place to farm, the growing climate and soil lends itself to many different operations. Rangitīkei boasts anything from game bird production to cut flowers, vineyards, asparagus, nuts, culinary and medicinal herbs, as well as meat productions and grain growing.

Figure 1: Rangitīkei District



Rangitīkei's climate is temperate and has few extremes compared to many parts of New Zealand. Summers are warm with average temperatures in the low 20s. The most settled weather occurs in summer and early autumn. Winters are mild near the coast and on the plains; it is colder inland and in the hill country, but often frosty, clear and calm. Snowfall occasionally settles in areas 400 m above sea level, such as Taihape. Annual amounts of bright sunshine can average over 2,000 hours.

2 Strategic Environment

2.1 Guiding Documents

A number of strategies, policies and legislation overarch the 3 Waters activities. These are discussed in brief in this section.

2.1.1 Legislation

The key legislation relating to the management of our water, wastewater and stormwater assets are listed below.

Table 3: Relevant Legislation

Legislation	Key Points
Building Act 2004	Rules around building compliant structures.
Civil Defence Emergency Management Act 2002	Requirement to continue service provision even in an emergency, and to be prepared for emergencies. Structure of emergency management.
Hazardous Substances and New Organisms Act 1996	Regulation of hazardous substances. Impacts on transportation of hazardous substances along the Roading network.
Health Act 1956	Requires local authorities to provide sanitary works. Requires Water Safety Plans for water supplies.
Health and Safety at Work Act 2015	Health & Safety obligations and liability.
Land Drainage Act 1908	Regulates drains and watercourses.
Local Government Act 2002	Purpose of local government. Structure, governance, planning, decision-making. Regulatory powers.
Local Government (Rating) Act 2002	Provides powers to collect set, assess and rates to fund activities.
Public Works Act 1981	Enables acquisition of land for public works.
Resource Management Act 1991	Responsibility to manage natural resources in a sustainable manner, and engage with tangata whenua. Provides certain regulatory powers.
Utilities Access Act 2010	Requires Utility operators to comply with Code of Practice.

2.1.2 National Infrastructure Plan

The National Infrastructure Plan (NIP) details the Government's view of the challenges and priorities for infrastructure. The 2015 NIP describes the view to 2045.

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

The aim is that New Zealand has a modern, integrated, and efficient infrastructure system which underpins a prosperous and inclusive society with high-quality state services and a healthy and sustainable natural environment. Economic performance is strong with infrastructure that supports international connectedness, increased productivity, movement up the global value chain, and more exports and growth. It helps enable all New Zealanders to reach their full potential and play a meaningful role in the economy and society.

- National decision-making is integrated with regional and local planning and considers the interdependencies between sectors.
- Separate national, regional, and local entities work together to create an efficient and effective infrastructure network.
- Our infrastructure investments provide clear overall social, environmental, and fiscal benefits that increase economic prosperity and living standards for all New Zealanders.
- New Zealand has stable and predictable regulatory settings, with industries clear on the expectations and requirements of them.
- We have mature asset management practices which provide a good understanding of intended levels of service and whole-of-life costs of investment, and these are effectively communicated.
- There is widespread use of shared infrastructure data standards so that our infrastructure networks can be benchmarked and network interdependencies can be better understood.
- Infrastructure providers consider both demand and supply-side solutions to infrastructure problems.
- Where supply-side solutions are necessary, appropriate funding options are always considered and advanced procurement tools are being used across the country.
- Our infrastructure is resilient.

2.1.3 National Policy Statements

The National Policy Statement (NPS) for Freshwater Management sets out the objectives and policies for freshwater management under the Resource Management Act 1991. This NPS

directs Regional Councils to establish objectives and set limits for freshwater in their regional plans. In the Manawatū-Whanganui region, this is achieved through the Horizons One Plan.

2.1.4 National Environmental Standards

The Ministry for the Environment (MfE) has produced National Environmental Standards (NESs) to protect the New Zealand environment, and work towards a consistent approach to environmental management across the country. These are regulations issued under Sections 43 and 44 of the Resource Management Act 1991 (RMA).

The following NESs are currently in force:

- Air quality.
- Sources of human drinking water.
- Telecommunications facility.
- Electricity transmission.
- Assessing and managing contaminants in soil to protect human health.

The proposed NES for the measurement of water takes is now instead a set of regulations within the RMA. The proposed NES for on-site wastewater treatment systems has been withdrawn.

The NESs most applicable to Rangitīkei District Council are those on sources of human drinking water and contaminated soil. The regulations are generally applied by Regional Councils in their planning. Horizons Regional Council remains the first point of contact regarding environmental issues in the District. The only NES that Rangitīkei District Council has direct involvement with implementing is that for contaminated soil. Council keeps track of contaminated sites within the District, as this information has implications for Planning and Building consents.

2.1.5 Horizons One Plan

The One Plan is the plan for resource management in the Manawatū-Whanganui Region. It focuses on the big four issues facing resource management in the Region:

- Water quality.
- Increasing water demand.
- Hill country erosion.
- Declining biodiversity.

The following aspects are also covered:

- Infrastructure, energy and waste.

- Te Ao Māori.
- Air quality.
- Natural hazards.
- Landscapes and historic heritage.
- Coastal activities.

This document, and the rules contained within, has a major impact on the water, wastewater and stormwater services that Rangitīkei District Council provides. Horizons determines the quantity of water we can abstract from bores or streams in the Region. They also determine the quality and quantity of wastewater or stormwater that we can discharge to the environment.

2.1.6 Manawatū-Whanganui Civil Defence Emergency Management Group Plan

The CDEM Group Plan defines the riskscape of the region with respect to natural hazards. It also discusses the 4 Rs of Civil Defence: Reduction, Readiness, Response and Recovery. Asset Management Planning plays a vital role in Reduction – reducing the exposure of our assets and the community to risks from natural hazards. Water Supply and Wastewater are considered lifeline utilities, and stormwater networks can prevent flooding, so all three are vital to the successful implementation of the Group Plan.

2.1.7 Internal Documents

A number of key documents underpin Council activities, including 3 Waters. The following table gives a summary of key points within these documents.

Table 4: Key Internal Documents

Document	Key Points
Policy Manual	Identifies 5 key policy intents for Council.
Significance and Engagement Policy	Indicates criteria for determining significance work, and engagement level.
Infrastructure Strategy	Discusses overall trends Council needs to be aware of in planning for sustainable infrastructure in the District.
Operational Guidelines	Explain the operational direction for each activity, and inform levels of service.
Rural Water Supply Policy	Contains specific guidelines for management of Rural Water Supplies.

Document	Key Points
Subdivision and Land Development	Council uses NZS4404:2010 as its minimum design standard for work related to land development and subdivision. In addition, there is an addendum that outlines any changes specific to Rangitīkei District.
District Plan	Sets out rules for the use of land within the District, including permitted activities and activities for which resource consent must first be obtained.
Council Bylaws	Contain legislative mechanisms and guidelines for management of the 3 Waters, and other, activities.

2.2 Stakeholders

Customer drivers and community expectations are the needs, expectations and satisfaction of customers (whether residents or not), which are primary factors in defining levels of service and reviewing performance.

The identified customers who use the services provided by 3 Waters assets include:

- **Residents**. These people live in the District.
- **Ratepayers**. This includes people who own properties in the District but may or may not reside in the District.
- **Local users**. They are the users of the services provided by this activity on an occasional or regular basis.
- **Visitors**. These people do not live within the District, but visit the District to carry out business or undertake other activities.
- **Businesses**. Individuals or organisations that carry out their business in the District.
- **Other stakeholders**. Individuals or organisations that have interest in or are affected by the services undertaken by the Council. They include neighbouring local authorities, Horizons Regional Council, Community Boards and Committees, local iwi and public service providers.

Council assesses its complaints/service request records to obtain information on the delivery of levels of service to customers. This research identifies areas that are performing well, as well as those that require improvement or intervention. Also of significant value to Council are regular meetings with various Community Committees and Boards throughout the District which provide wide-ranging information and highlight issues to be addressed. This

information complements the regular inspections of assets undertaken by Council and their agents.

The Council database has the facility to record information pertaining to a particular item, request services, and provide Council with a monitoring facility for response times to requests from Customers. The tracking of a type of activity can be monitored against contractor performance or whether a significant issue has occurred within the District.

2.3 Community Outcomes

The Local Government Act 2002 required local authorities to identify Community Outcomes for their Districts. For Rangitīkei District, these were a picture of the type of District people want to live in over the next 10-15 years. The whole community owned these outcomes. The Community Outcomes developed for Rangitīkei District are given in the following table. Those which the 3 Waters activities directly contribute to are indicated in **bold**.

Table 5: Community Outcomes

Number	Outcome	Description
1	Good access to health services	Achieving access to health services, whether it be the GP or the hospital is key.
2	A safe and caring community	Through effective partnership with local Police, rescue services, neighbourhood support and local initiatives.
3	Life-long educational opportunities	That meet the lifelong needs of all members of the community.
4	A buoyant District economy	With effective infrastructure and attractive towns that entice growth.
5	A treasured natural environment	With a focus on sustainable use of our land and waterways.
6	Enjoying life in the Rangitīkei	

3 Levels of Service

Rangitīkei District Council aims to provide sustainable levels of service to the community in all areas. The term 'levels of service' refers to the standard to which a service is delivered to the customer. This may include targets for availability, quality, quantity, responsiveness and customer satisfaction. The Council ensures that levels of service are customer-focused, technically meaningful, and address the issues that are important to the community. Levels of service for this activity are agreed and established through community consultation.

The process for development and monitoring of levels of service can be summarised as:

- Identify the customers of the service and other parties with an interest (stakeholders).
- Define the current levels of service the organisation delivers.
- Design and carry out consultation to define the desired service level.
- Establish service targets and service achieved over a long period.
- Measure and report to community on level of service achieved.
- Review levels of service with stakeholders at regular intervals to check desirability and affordability of level of service provided.

The Asset Management Plan aims to document each of these steps for the activity, identify any issues such as adequacy of consultation, suitability of standards, or service gaps, and describe plans to address or improve them.

It is common for customers to demand a continual improvement in service, and while the Council will strive to deliver improvements, the level of service is constrained by cost considerations. It is therefore important that when Council consults with the community over levels of service, cost information is provided in order for the price/quality trade-off to be established. The main mechanism for consultation on levels of service is via the Long Term Plan.

The Rangitīkei District Council aims to provide a potable water supply to meet domestic, commercial and firefighting requirements via a public reticulation through the urban communities of the Rangitīkei comprising Marton, Taihape, Bulls, Mangaweka, Hunterville and Rātana. It also administers Rural Water Supplies on behalf of the appropriate committees in Erewhon, Hunterville, Omatane and Putorino at a level of service sustainable and appropriate to the community.

Erewhon Rural Water and Hunterville Rural Water are constant flow systems and rely on correct operation of each consumer's restrictor. Service levels for Omatane Rural Water and Putorino are determined by the scheme management committee.

Wastewater services are provided by Rangitīkei District Council to protect public health and the environment. The Council owns and maintains reticulated wastewater systems in Marton, Taihape, Bulls, Mangaweka, Hunterville, Rātana and Koitiata. These systems consist of a network of pipes that convey wastewater from residential and commercial properties to the town's wastewater treatment plant. Council holds resource consents for discharges of treated wastewater to either land or water from these plants.

Council provides a collection and disposal system for surface and, in some instances, sub-surface water across the District. This links both private and public reticulation through the urban communities of Marton, Taihape, Bulls, Mangaweka, Hunterville and Rātana. There are also stormwater assets on a lesser scale in Utiku, Koitiata, Rakautaua and Scotts Ferry.

The key drivers of the levels of service for stormwater are community outcomes. The activity contributes equally to the treasured natural environment, buoyant economy and enjoying life in the Rangitīkei.

In line with Council's strategic priorities, the provision of this activity provides the basic infrastructure which enables the District to attract and retain people and businesses. Recent rainfall patterns have called into question historic design parameters and may mean that the capacity and capability of the existing system to provide protection to the levels normally expected by a community is exceeded. It is likely that stormwater management methods will be required to meet increasingly higher standards.

3.1 Customer Satisfaction

Customer drivers and community expectations are the needs, expectations and satisfaction of customers (whether residents or not), which are primary factors in defining levels of service and reviewing performance.

The Council undertakes both customer surveys and assessments of the complaints/service request records to obtain information on the delivery of levels of service to customers. This research identifies areas that are performing well, as well as those that require improvement or intervention. Also of significant value to Council are regular meetings with various Community Committees and Boards throughout the District which provide wide-ranging information and highlight issues to be addressed. This information complements the regular inspections of assets undertaken by Council and their agents.

3.1.1 Council Complaints/Service Request Database

The Council database has the facility to record information pertaining to a particular item, a facility to request services, and it provides Council with a monitoring facility for response times to requests from Customers.

3.1.2 Residents Survey

Each year, Rangitīkei District Council conducts a survey to get feedback on performance from the public. In 2017, questions were included on Water Supply, Wastewater and Stormwater for respondees who make use of these services. Results are shown in the following charts.

Figure 2: Satisfaction - Water Supply, 2017

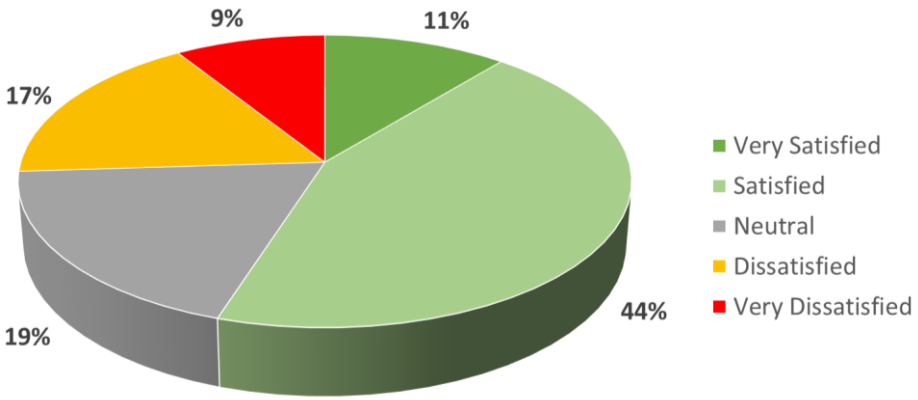


Figure 3: Satisfaction – Wastewater, 2017

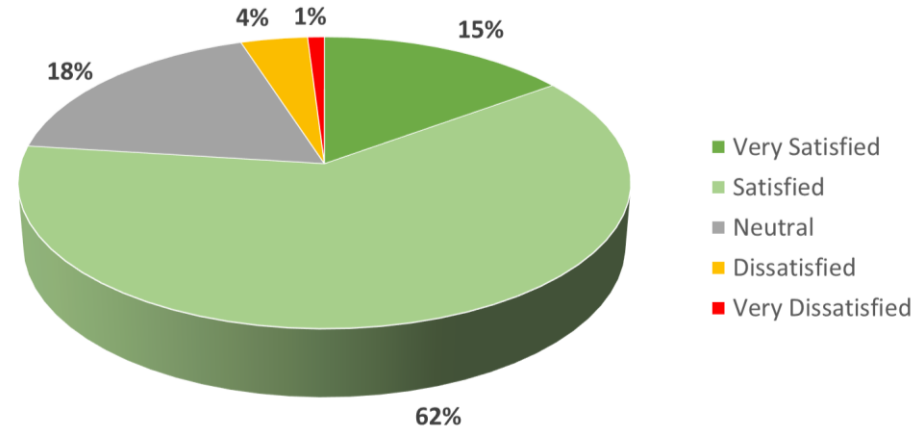
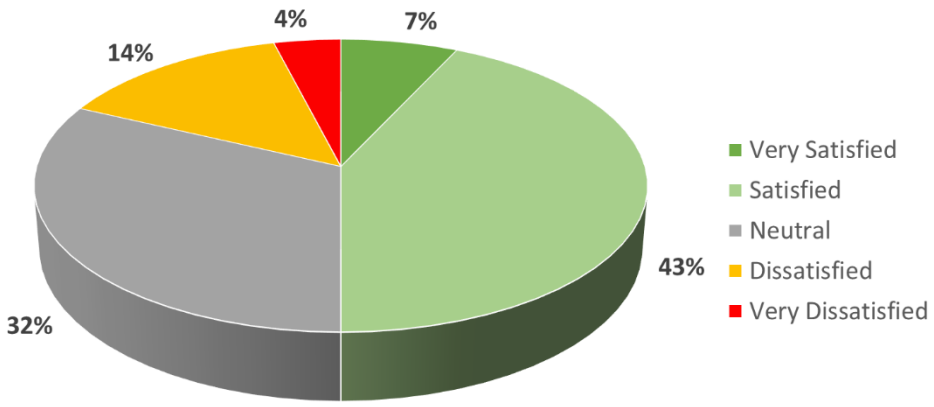


Figure 4: Satisfaction – Stormwater, 2017



On the whole, residents surveyed were satisfied with Water Supply, Wastewater and Stormwater services. The highest level of dissatisfaction was with Water Supply, with 26% either Dissatisfied or Very Dissatisfied (compared with 18% for Stormwater and only 5% for Wastewater).

When asked what Council could do to improve service, several of the comments were around the taste of water, specifically following rainfall events. Ongoing capital expenditure to deal with high turbidity raw water from such events should help to alleviate this.

3.2 Performance Measures

The Local Government Amendment Act 2010 provides that the Secretary of Local Government will introduce standard performance measures that are applicable to local authorities so that the public may compare the levels of service provided in relation to a group of activities by different local authorities. The measures apply to the mandatory groups of activities as specified in the Act, namely:

- Water supply.
- Sewerage and the treatment and disposal of sewage.
- Stormwater drainage.
- Flood protection and control works.
- The provision of roads and footpaths.

Section 4 of Schedule 10 of the Amendment Act 2010, specifies the information to be provided in the Long Term Plan as part of the statement of service provision. As well as performance measures for the mandatory Groups of Activities, the Act also requires that each local authority provides information on:

- The performance measures that the Local Authority considers will enable the public to assess the levels of service for major aspects of groups of activities for which performance measures have not been specified as mandatory measures.
- The performance targets set by the local authority for each performance measure.

Performance measures for each 3 Waters activity are given on the following pages, under the relevant level of service.

Figure 5: Performance Measures – Urban Water Supplies (2016-2017)

Measure	Target	Actual
Provide a safe and compliant supply of drinking water		
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 (b) part 5 of the drinking-water standards (protozoal compliance criteria).	**No incidents of non-compliance**	**(a) Not achieved** Technical non-compliances for sampling regime. One apparent *E. coli* transgression, at Calico Line bore in Marton, which is not in use. Three follow-up samples were clear. **(b) Not achieved** Technical non-compliances around demonstrating compliance for UV systems. Monitoring regime reviewed and changes made for 2017-2018 compliance year.
Compliance with resource consents	**≤ 1 non-compliance**	**Achieved** Backwash water and sludge discharge from Marton WTP exceeded consent limits. New consent application filed in August 2016. All other supplies assessed as compliant.
Provide reliable and efficient urban water supplies		
Continuity of supply Number of unplanned water supply disruptions affecting multiple properties	Fewer unplanned water supply disruptions affecting multiple properties than in the previous year	**Achieved** There were no unplanned water interruptions during the reporting period.

Measure	Target	Actual
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).	**< 40%**	**Achieved** Bulls: 4.9% Hunterville Urban: 32.3% Mangaweka: 37.0% Marton: 24.6% Rātana: 15.8% Taihape: 46.2%
Demand management The average consumption of drinking water per day per resident within the territorial authority district.	**600 L/person/day**	**Achieved** 542 L/person/day
Be responsive to faults and complaints		
Fault response times Where the local authority attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times measured: (a) attendance for urgent call-outs: from the time that the local authority receives notification to the time that service personnel reach the site, (b) resolution of urgent call-outs: from the time that the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption, (c) attendance for non-urgent call-outs: from the time that the local authority receives notification to the time that service personnel reach the site, and (d) resolution of non-urgent call-outs: from the time that the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption.	**Less than previous year** **(a) Benchmark (2015-2016):** 21 minutes **(b) Benchmark (2015-2016):** 1 hour 5 minutes **(c) Benchmark (2015-2016):** 2 hours 11 minutes **(d) Benchmark (2015-2016):** 16 hours 28 minutes	**Achieved** **(a) Achieved** 10 minutes **(b) Achieved** 1 hour 17 minutes **(c) Achieved** 19 minutes **(d) Achieved** 1 hour 7 minutes

Measure	Target	Actual
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 pressure or flow (d) continuity of supply, and (e) the local authority's response to any of these issues expressed per 1000 connections to the local authority's networked reticulation system	**< 45/1000**	**Achieved** **13/1000** (a) 6.79/1000 (b) 3.50/1000 (c) 1.66/1000 (d) 0.94/1000 (e) none
Maintain compliant, reliable and efficient rural water supplies (non-potable)		
Compliance with resource consents	**No non-compliances**	**Achieved** Hunterville Rural, Erewhon Rural and Omatane Rural all complied.
Fault response times For Hunterville Rural Water Supply, where the local authority attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times measured: (a) attendance for urgent call-outs: from the time that the local authority receives notification to the time that service personnel reach the site, (b) resolution of urgent call-outs: from the time that the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption.	**Less than previous year** **(a) Benchmark (2015-2016):** 32 minutes **(b) Benchmark (2015-2016):** 2 hours 49 minutes	**Partly achieved** **(a) Not achieved** 22 hours, 23 minutes **(b) Not achieved** 4 hours, 8 minutes Although the median times are higher than those reported last year, the response times were within the specified standard.

Measure	Target	Actual
Ensure firefighting capacity in urban areas		
Firefighting water supply Ensure firefighting capacity in urban areas through random flow checks at the different supplies	**99% of checked fire hydrant installations are in compliance**	**Partly achieved** 96.6%. During the year, five hydrants were found to need maintenance. Two of these were in the year's sample; three were service requests from the public for other hydrants that were not in the sample.

Figure 6: Performance Measures – Wastewater (2015-2016)

Measure	Target	Actual
Provide a reliable reticulated disposal system that does not cause harm or create pollution within existing urban areas		
Discharge compliance Compliance with the Council's resource consents for discharge from its sewerage system measured by the number of: (a) abatement notices (b) infringement notices (c) enforcement orders, and (d) convictions received by the Council in relation to those resource consents.	**None**	**Achieved**
Routine compliance monitoring of discharge consents	**6/7 systems compliant**	**Not achieved** Significant non-compliance at four WWTPs. **Taihape**: daily volume exceeded; discussions for variation underway. **Hunterville**: daily volume exceeded. Discussions for variation underway. Spikes in ammonia and *E. coli* from Jan-May 2017. **Bulls**: daily volume exceeded. **Rātana**: daily volume exceeded. Preparation for consent renewal underway. Non-compliance at three WWTPs.

Measure	Target	Actual
		Marton: $cBOD_5$ exceedances. Consent renewal in progress. **Mangaweka**: annual report not provided. **Koitiata**: vegetation survey report not provided.
Overflows Number of overflows from each network (response/resolution time).	**No single network to experience more than 3 overflows during a 12-month period**	**Not achieved** 2 dry-weather overflows, in Taihape and Marton. 6 wet-weather overflows, all in Marton.
System adequacy The number of dry weather sewerage overflows from the Council's sewerage system, expressed per 1000 sewerage connections to that sewerage system.	**≤ 1/1,000** There are 4,226 sewerage connections in the District.	**Achieved** 0.4/1000
Be responsive to reported faults and complaints		
Fault response time Where the Council attends to sewerage overflows resulting from a blockage or other fault in the Council's sewerage system, the following median times are measured: (a) attendance time: from the time that the Council receives notification to the time that service personnel reach the site, and (b) resolution time: from the time that the Council receives notification to the time that service personnel confirm resolution of the fault of interruption.	**Less than previous year** **(a) Benchmark (2015-2016):** 18 minutes **(b) Benchmark (2015-2016):** 2 hours 44 minutes	**Partly achieved** **(a) Not achieved** 22 minutes **(b) Achieved** 2 hours 34 minutes

Measure	Target	Actual
Customer satisfaction The total number of complaints received by the Council about any of the following: (a) sewage odour, (b) sewerage system faults, (c) sewerage system blockages, and (d) the Council's response to issues with its sewerage systems, expressed per 1,000 connections to the Council's sewerage system.	**< 18/1000**	**Achieved** 4.49/1000 (a) 0.47/1000 (b) 1.89/1000 (c) 2.13/1000 (d) none

Figure 7: Performance Measures – Stormwater (2015-2016)

What are they:	Targets	Progress to date
Provide a reliable collection and disposal system to each property during normal rainfall		
System adequacy a) The number of flooding events that occurred in the District. b) For each flooding event, the number of habitable floors affected (expressed per 1,000 properties connected to the Council's stormwater system). This is a District-wide assessment. The rules for the DIA mandatory measures define a 'flooding event' as an overflow from a territorial authority's stormwater system that enters a habitable floor.	**< 1/1000**	**Not applicable** No such event occurred during the reporting period.

What are they:	Targets	Progress to date
Discharge compliance Compliance with the Council's resource consents for discharge from its stormwater system measured by the number of: (a) abatement notices (b) infringement notices (c) enforcement orders, and (d) convictions received by the Council in relation to those resource consents	**Not applicable** Council currently has no resource consents for stormwater discharges Horizons Regional Council has indicated that resource consents may be required in the future, but the timeline for this has yet to be confirmed. When this occurs the anticipated benchmark will be no abatement or infringement notices, no enforcement orders and no convictions.	**Not applicable** The Council has not been required to have resource consents for any of its stormwater discharges.
Be responsive to reported faults and complaints		
Customer satisfaction The number of complaints received by the Council about the performance of its stormwater system, expressed per 1,000 properties connected to the Council's stormwater system.	**< 15/1000**	**Achieved** 4.12/1000
Response time The median response time to attend a flooding event, measured from the time that the Council receives notification to the time that service personnel reach the site.	**≤ 1 hour**	**Not applicable** There were no flooding events during the reporting period within the scope of the measure.

3.3 Gap Analysis

This section analyses the results given above against performance measures, to determine where gaps exist and what can be done to close those gaps.

3.3.1 Water Supply

3.3.1.1 Safety of Drinking Water

Water quality, and compliance with the Drinking Water Standards, is a top priority for Council. The two key parts to the Standards are bacteriological compliance and protozoal compliance. Bacteriological compliance assesses the ability of a water supply to protect against harmful bacteria. Protozoal compliance assesses the ability of a water supply to ensure that protozoa, which are multi-cellular organisms that can include *Giardia* and *Cryptosporidium* species, are absent from drinking water.

During the 2016-2017 year, technical non-compliances occurred for bacteriological compliance. A review of sampling schedules, and enhanced use of our Water Outlook compliance software, will help to ensure that sufficient numbers of samples are taken for all supplies, at the required intervals in the future.

Protozoal compliance is more difficult to achieve. Council has invested significant amounts of money in recent years to upgrade its water supplies to enable them to achieve compliance. In general, this has involved the installation and commissioning of UV disinfection units. These use ultraviolet light to destroy harmful pathogens, including protozoa. The monitoring required to demonstrate that UV units are operating effectively are strict, but Council is focused on reaching compliance through sound operation of its plants and regular analysis of Water Outlook reports.

Several projects are underway to improve drinking water quality in various areas. Further details are available on these projects in Section 7 of this Asset Management Plan.

3.3.1.2 Compliance with Resource Consents

The only two water supplies in the Rangitīkei District that go over their allocated consent limits are Mangaweka and Taihape. Mangaweka, being a small supply, can often have issues as even one or two significant leaks can cause the consent limit to be exceeded. Taihape on occasion can go over its consent limit. The fact that Taihape is a relatively old town and has aging water reticulation is a strong contributor to this.

Council's programme of water reticulation renewals is focused on Mangaweka and Taihape. See Section 7.2.1 for further details.

As mentioned earlier, an application has been lodged for a renewal of the Marton Water Treatment Plant discharge consent. This consent, for the discharge of treated backwash water and aluminium sludge, is the only Water Supply consent which was non-compliant in 2016-2017. If the application is successful, it should result in a consent for which compliance can be consistently achieved.

3.3.1.3 Water Losses

This measure was assessed as "achieved" over the District as a whole, but losses in Taihape were calculated as 46.2%, higher than the target of 40.0%.

Water reticulation renewals in Taihape, as well as helping with consent compliance, will also ensure that Council meets its target for water losses.

3.3.1.4 Demand Management

Council achieved its target, with the actual "consumption" being 542 L/person/day compared with a target of 600 L/person/day. It should be noted that, in line with DIA requirements, this is a coarse measure calculated by the total water into supply divided by the total population. This means that a town such as Marton, with low population but several wet industries, is to an extent penalised because per capita consumption can seem high. For this reason, it's worth paying attention to performance against this measure even though it was within target in 2016-2017. Our programme of water reticulation renewals will help to ensure that demand across the District is kept within manageable levels.

3.3.1.5 Firefighting Water Supply

A regular programme of hydrant inspections is being developed, which will ensure that each hydrant in the District is tested every five years. This will contribute to fully achieving against this measure.

3.3.2 Wastewater

3.3.2.1 Routine Compliance Monitoring of Discharge Consents

Significant issues with discharge flows were experienced in Bulls, Hunterville and Taihape. In each of these networks, work is underway in the reticulation to address areas of inflow and infiltration, and on the treatment side to ensure that compliance can be achieved against future resource consents. Upgrades to treatment plants that include partial or complete irrigation to land is seen as one method by which consent compliance can be achieved going forward. For each consent renewal, background work is also done on quantifying reasonable flows, and applying for consent limits that are achievable, while also minimising environmental impact.

The discharge consent for Rātana will expire on 31 Jul 2018. Plans to upgrade the plant and renew the consent are underway. The end result of this should be a plant that complies with its new consent, and has a significantly reduced impact on the environment as well as cultural values.

3.3.2.2 System Adequacy

In the 2016-2017 compliance year, there were 2 dry weather overflows throughout the District, and 6 wet-weather overflows.

In general, there are no areas where there are consistent problems with dry weather overflows. These can occur when there is a blockage, either on the Council network or on a connection, and it is not cleared before wastewater overflows.

All 6 wet-weather overflows occurred in Marton. There are known areas where inflow and infiltration (I&I) are an issue; most notably near the railway underpass on Wellington Rd. A solution has been proposed for this area. This will be implemented, along with a proactive programme of identifying I&I issues and either remedying them or instructing property owners to do so.

4 Growth & Demand

4.1 Demand Drivers

4.1.1 Population

The total population of the Rangitīkei District is 14,019 from the 2013 Census. This is a decrease of 693 people or 4.7 % since the 2006 Census. However, recent population estimates indicate that the population is seeing a small increase for the first time in more than 25 years.

Figure 8: Population – Rangitīkei District (Statistics NZ)

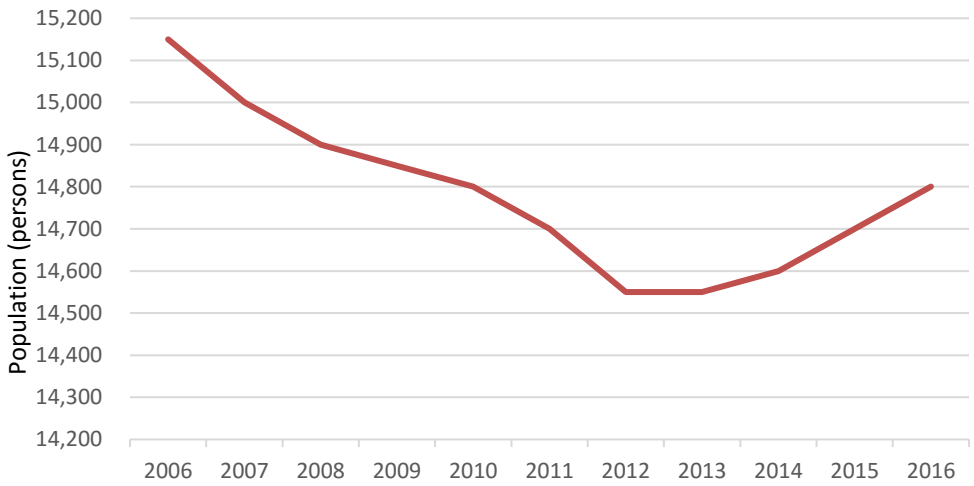
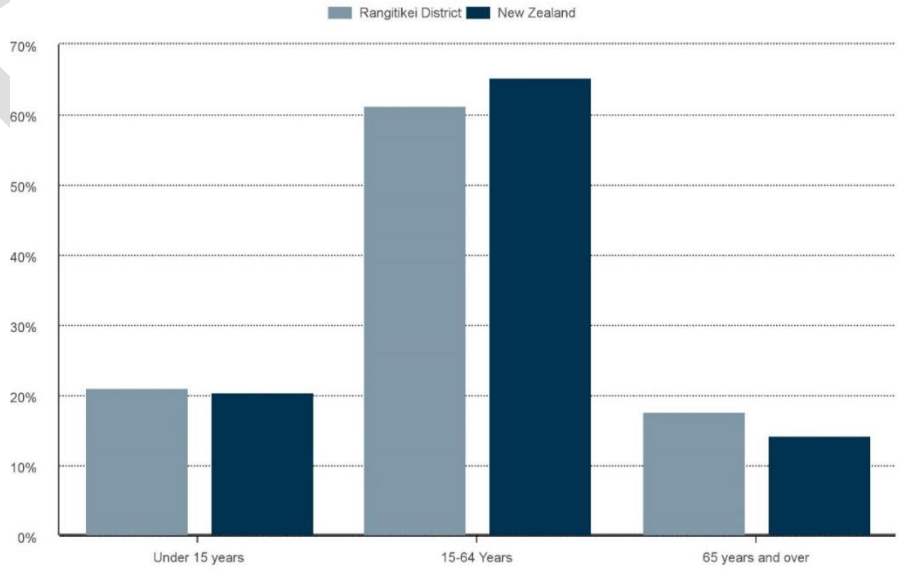


Figure 9: Age Distribution (Statistics NZ)



The District is predicted to become increasingly diverse; this increase is largely responsible for the slowing down/reversal of population decline. To maintain this growth it is important that the District supports the successful settlement of new communities.

Figure 10: Ethnicity – Median Projections (Statistics NZ)

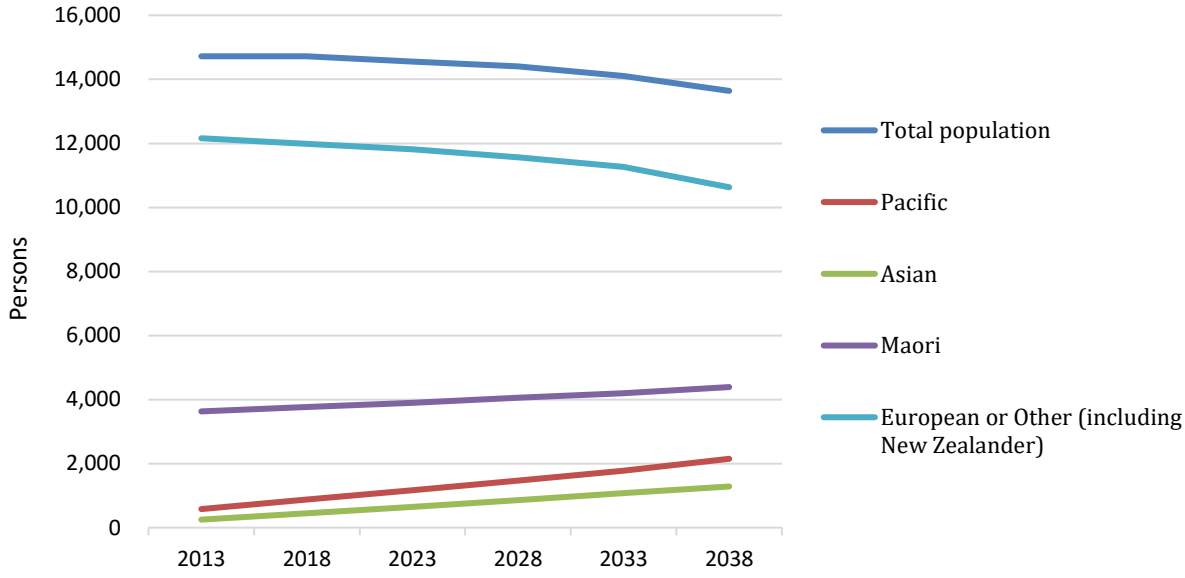
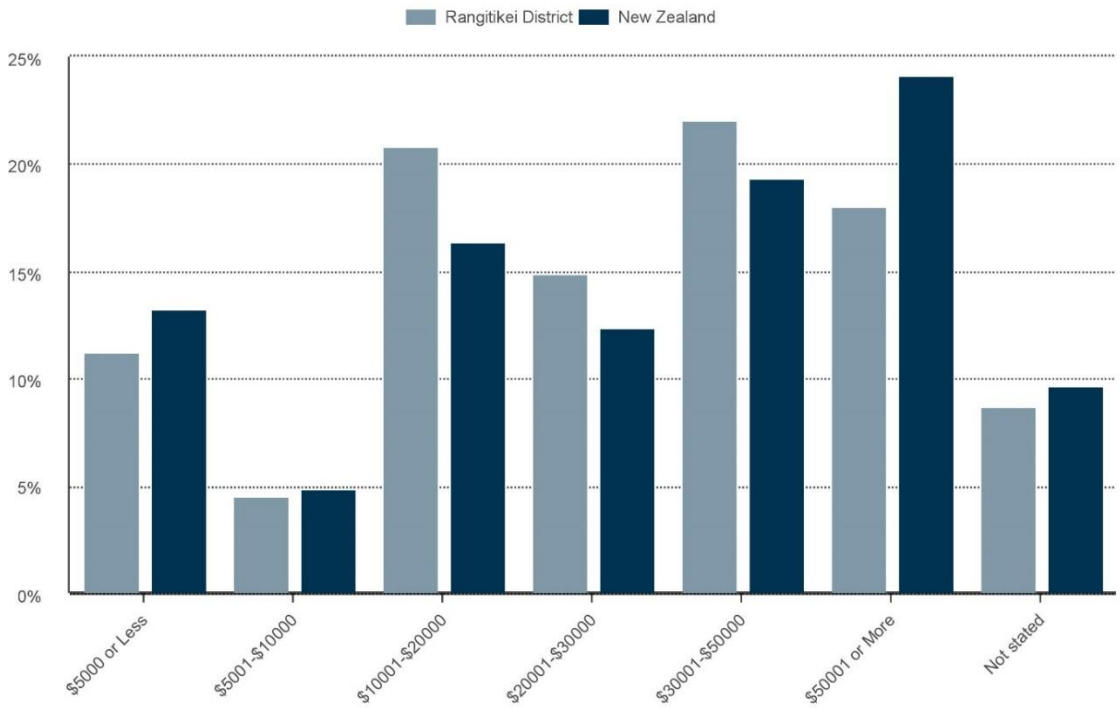
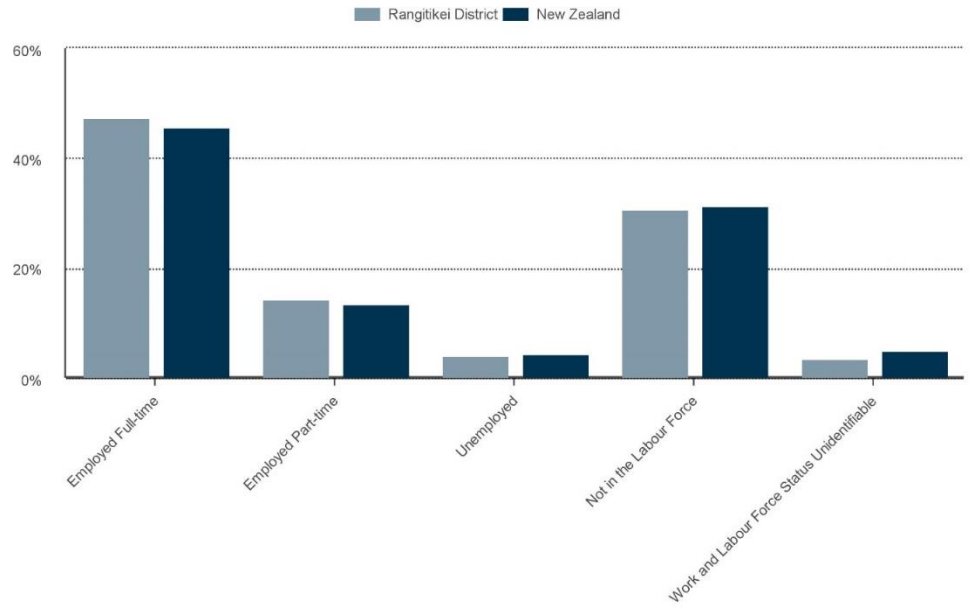


Figure 11: Total Personal Income (Statistics NZ)



The 2013 Census suggests that the income for 50% of the population is less than $30,000 per annum.

Figure 12: Labour Force Participation (Statistics NZ)



Historically the labour force participation rate in the District has been slightly higher than the national average.

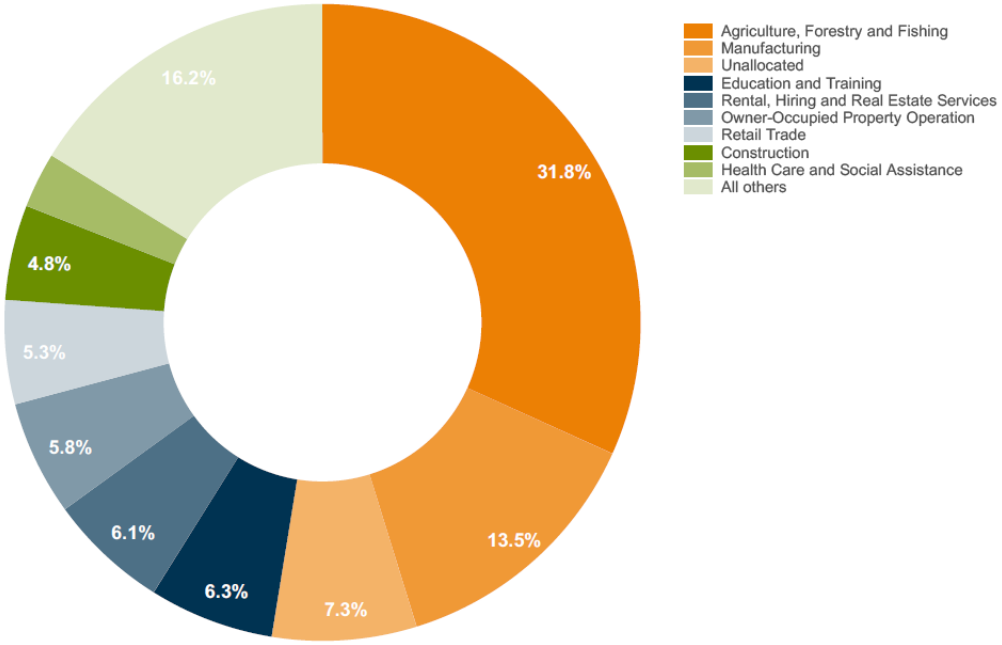
4.1.2 Regional Economy

Agriculture (including: horticulture and fruit growing; sheep, beef and livestock farming; dairy farming; other farming services to agriculture; and hunting and trapping) are the Manawatū-Whanganui (Horizons) Region's most important enterprise. Agriculture, forestry and fishing contribute almost 32% to the District GDP compared to just over 6% nationally. Approximately two thirds of this is sheep and beef cattle farming.

Councils in the Horizons region are collaborating to facilitate economic growth and prosperity. This collaboration has seen central Government invest in a Regional Growth Study for the Horizons Region. This study identified key opportunities for growing our regional economy. Government has highlighted the importance of Councils collaborating with each other, with industry and with iwi to facilitate growth.

Accelerate 25, the action plan associated with the Regional Growth Study, is investigating ways to increase the Horizon region's agribusiness exports from $1.9 billion to $3.8 billion by 2025. The Region comprises around 80% of fertile grassland including 18% of all Class 1 soils and 14% of all Class 2 soils in New Zealand. These are considered to be the most versatile soils for agriculture and horticulture, and there is potential for further growth around the use of these soils.

Figure 13: Proportion of GDP – Rangitīkei District (2015)



4.1.3 Sustainable Development

The most widely quoted definition of sustainability and sustainable development, is that of the Brundtland Commission of the United Nations on 20 March 1987:

"sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

At the 2005 World Summit it was noted that this requires the reconciliation of environmental, social and economic demands - the "three pillars" of sustainability. In New Zealand the Local Government Act 2002 also recognizes a fourth pillar, that of cultural wellbeing. The four pillars of sustainability are not mutually exclusive, and can be mutually reinforcing.

Asset Management provides for the delivery of agreed levels of service in the most cost-effective manner for present and future generations. Taking a sustainable approach is therefore an underlying principle of Asset Management, rather than a factor only considered when significant decisions are made. The development and implementation of this Asset Management Plan demonstrates the commitment made by Council to the sustainable management of assets.

4.2 Demand Forecasts

This section contains information on projected demand for each of the 3 Waters activities. Demand projections have been made based on the generic demand drivers above, as well as factors that are specific to water, wastewater or stormwater.

The major impacts of demand on our water assets, as alluded to above, will be the need to maintain them with less and less funding available, while also catering for any future growth and development that occurs. Increasingly, Council may be forced to set a lower level of service in order to reduce the financial burden on ratepayers. This could mean that in some locations, services become more decentralised, and some infrastructure (e.g. rainwater tanks) is privately owned. This is the case for water, wastewater and stormwater services. Certainly, the trend in stormwater is for decentralising, hydrological neutrality, and the favouring of natural systems such as wetlands and riparian planting over centralised, reticulated systems.

Like other rural Councils, we face significant cost barriers in providing services to meet demand. Larger metropolitan authorities tend to have centralised systems with a large rating base, and the economies of scale that arise from this. Rangitīkei, on the other hand, has a number of small networks, geographically separated, that duplicate services across each of our communities. Per capita, this is a more expensive system to own and operate, but with a large District and small population, there is no practical alternative.

Town redevelopments in Marton, Taihape, Bulls and Hunterville could impact on requirements for water, wastewater and stormwater infrastructure in the CBDs of these towns.

4.2.1 Water Supply

As indicated earlier, the greatest challenge for providing sustainable infrastructure in the Rangitīkei District is the declining population and subsequent reduction in the rating base. Across the District, our water supplies will be affected by this demographic change.

The main potential growth area for water supply is the Marton township, particularly from an industrial point of view. Council's water infrastructure needs to support any major industry wishing to locate to the town.

Having said this, there are developments occurring around the District, such as the potential 60-lot subdivision at Rātana Pa. In this case, the needs of the new subdivision are being considered in the current upgrade work in progress for the town's water supply.

The availability of water is closely associated with development. Industrial, agricultural, business and residential development all depend on the availability, quantity and quality of water. Development in one sector ultimately has a flow on effect onto the other sectors.

Therefore, the Rangitīkei District's future development will rely heavily on the availability of water and the responsible management, distribution and protection of water sources.

Climate change has a major impact on water demand. There is an increasing acceptance within the community that a higher frequency of droughts is the reality now, and will continue to be so in the future. The challenges of dealing with these events during summer (and with an increasing frequency of floods in the winter) are a major factor in dealing with demand for water.

It is feasible that the population of Marton could exceed 5,000 within the 30-year planning horizon of this Asset Management Plan. If this occurred, there would be additional monitoring requirements under the Drinking Water Standards, including:

- Sampling for *E. coli* twice a week rather than once.
- Maximum of 5 days between samples rather than 13.
- Minimum 6 days of the week used rather than 5.
- Continuous monitoring of turbidity entering the UV unit.
- Measuring UVT twice a week rather than once.

These changes could be accommodated within existing operational budgets.

4.2.2 Wastewater

Similarly to the comments on water above, wastewater services in Rangitīkei are in general faced with declining populations to serve. This means that wastewater flows will mostly remain the same or decrease.

Trends in occupancy, however, mean that there are now proportionally more houses for the same number of people. This means that our wastewater systems need to be able to accommodate new connections, even if the total wastewater flows are not increasing significantly.

The ability to cater for new industry in areas such as Marton is a consideration for wastewater as well as water. New industrial developments could require additional investment in reticulation as well as treatment, depending on their nature, and this must be included in future planning. The second anaerobic pond currently being installed at Marton WWTP will go some way to future-proofing that plant against such developments.

Similarly, the proposed 60-lot subdivision at Rātana will have the effect of increasing wastewater flows. The current treatment plant for Rātana was sized for the existing township. The increases in wastewater flows that would come about from such a substantial development mean that investigation will be required into the ability of the current system to cope. The most likely scenario is that some of our wastewater mains would need upsizing, and that the treatment process would need to be enhanced or expanded upon. As investigation work proceeds, funding will be budgeted in future years to deal with these additional requirements.

4.2.3 Stormwater

The impacts of climate change will be felt strongly by the stormwater activity. In general, predictions from NIWA for New Zealand are that the intensity of storm events will increase, as will the frequency of large events. In other words, an event that may have occurred every 20 years in the past would be expected to occur more often than that under future scenarios.

In addition, community expectations around stormwater management have increased. There is little tolerance for surface flooding, and our stormwater systems need to be adequate to deal with flows without inconveniencing the public or allowing damages to occur.

However, stormwater is just as prone to the effects of a diminishing rating base as our other activities. For this reason, there will be a need to perform cost-benefit analysis on stormwater projects, on a case-by-case basis. In a world where there is less than unlimited funding to tackle all stormwater issues, the highest priority would be given to those that can achieve the most impact with the least spending.

There is also an increasing trend, again on a case-by-case basis, for Council to require private property owners or developers to deal with stormwater on-site. In previous decades, the philosophy behind stormwater management was to concentrate flows and discharge them to waterways. This is becoming increasingly less acceptable, largely for environmental reasons. Now, if stormwater from a development is unable to be collected and dealt with effectively by the existing Council network, we may require developers to install features such as soakholes or wetlands within property boundaries. This is known as the principle of hydrological neutrality; in other words, dealing with water that falls on a property within that property.

The proposed 60-lot subdivision at Rātana is a prime example where the developer is being asked to deal with stormwater within the boundaries of the subdivision, to avoid placing extra strain and expense on the town's stormwater system.

5 Asset Description

This section of the Asset Management Plan contains detailed information on existing Water Supply, Wastewater and Stormwater assets. The information is current as of the last valuation year i.e. 30 June 2016. Information specific to each network is given in specific sections later on in this Asset Management Plan.

5.1 Condition

The assessment of asset condition is an essential part of Asset Management Planning. The condition rating system used follows NAMS guidelines, and in general terms can be described according to the following table.

Table 6: Condition Rating System

Condition Rating		Description
1	Excellent	Excellent condition. Only normal maintenance required.
2	Good	Minor defects only. Minor maintenance required.
3	Average	Significant maintenance required.
4	Poor	Significant renewal/upgrade required.
5	Very Poor	More than 50% of asset requires replacement.

Asset condition for Water Supply, Wastewater and Stormwater is discussed in the relevant section(s) below.

5.2 Criticality

Each 3 Waters asset has been assigned a criticality rating from 1 to 5. This is recorded against the relevant asset in the asset register. This information is used when programming renewal or upgrade work. An asset in poor condition with high criticality will be given priority over an asset with low criticality.

5.3 Capacity/Performance

Capacity and performance are two separate, but related, aspects of the assets we own.

The capacity of an asset is its ability to meet demand now and in the future. For example, the capacity of a sewer main is its ability to convey the amount of wastewater it is currently

required to, as well as its potential ability to convey additional amounts in the future. The capacity of a Water Treatment Plant as a whole is the quantity of water it can treat to the desired standard, usually expressed in cubic metres per day. Utilisation is a related term, and can be expressed as the proportion of an asset that is utilised. For example, if a Water Treatment Plant was capable of treating 10,000 m^3/day but was on average treating only 7,500 m^3/day, its utilisation would be 75%.

The performance of our assets is their ability to perform the function expected of them. A newly installed water main will most likely have excellent performance. The performance of a main that is 50 years old and known to be leaking will be lower. Our Asset Register contains a field for each asset where we indicate its performance. This information is largely collected from experience by our operators in the field. The performance grading system used is:

1. Excellent.
2. Good.
3. Average.
4. Poor.
5. Very Poor.

Performance is displayed on a per-asset basis in the sections below. Capacity is not graded in the same way as performance. The sections below discuss the overall capacity of each network, rather than assessing it on a per-asset basis.

Council has had network models created for several water and wastewater networks. These models are calibrated against real data in the field. They allow us to see the overall capacity of a network, and to test the impacts of making changes to it such as adding in new reticulation, or changing the existing reticulation.

Water network models have been created in InfoWorks Water Supply (IWWS) for these water supplies:

- Bulls
- Hunterville
- Hunterville Rural (only southern portion calibrated)
- Mangaweka (not updated or calibrated)
- Marton
- Rātana
- Taihape (not updated or calibrated)

In the case of Hunterville Rural, updating the network model would assist with investigations on our ability to transfer unallocated water units to different locations within the network. There could potentially be spare capacity on this, and other, water supplies. This potentially creates opportunities for growth, whether domestic, agricultural or industrial. Capacity is discussed per supply later in this section of the Asset Management Plan. Future work will involve more accurate forecasting of future demand to gain a better understanding of where spare capacity exists.

The following wastewater networks have been modelled in InfoWorks Collection Systems (IWCS):

- Marton
- Taihape

Although these models exist, Council does not hold a license to run the IWCS software in-house, and any work done with these models is performed externally.

As well as modelling capacity, our water and wastewater models can help us to assess the performance of our reticulation, and check on efficiency measures such as water loss or pressure.

IWCS is capable of running stormwater models, but none have been created for Rangitīkei as yet.

5.4 Data Confidence

Council owns assets that in some cases are more than 100 years old. This is obviously a lot further back than the experience of current staff reaches. Rangitīkei District Council as it now stands was formed from the Rangitīkei County, Marton Borough and Taihape Borough Councils; historic asset information has come from a variety of sources.

Many of our water, wastewater and stormwater assets are buried, meaning they cannot be easily inspected or, in some cases, even found. Historic records are held, and modern asset information systems ensure we are constantly improving the data we have. But there are still gaps in information for certain areas or assets. There still remain cabinets of historic, hard copy plans that have not been digitised to date.

In general, confidence of data on reticulation assets is good. Treatment plant asset information requires some work, particularly with componentising assets. This is more the case for Water Treatment Plants than Wastewater Treatment Plants.

Data held for Hunterville, Erewhon and Omatane Rural Water Supplies is good with respect to historic assets installed decades ago. Where minor changes have been made to networks in recent years, some of this information has been harder to come by and may not be up to date.

For Mangaweka, the assets with data confidence ranging from “Good” through “Average” to “Poor” are in certain areas of Mangaweka where information is uncertain. These areas of uncertainty have come about as the town has decreased in size and old assets have been left in place without being decommissioned. Road work done for the Mangaweka deviation has left some assets buried. In some cases, they could now be buried up to 5 m deep, making it difficult to obtain reliable information on them.

Some asset information for the Putorino scheme has been collected over the past 5 years. However, in general data for the scheme is not very complete.

For Taihape wastewater, there are some areas of uncertainty, for example underneath the railway lines. There are data gaps involving the piping of wastewater from the western side of town to the eastern. Some laterals are not shown. However, CCTV investigations of the most critical areas has improved the information we hold.

The main area of concern with respect to data confidence is condition information. This is explained further under the relevant sections on Asset Condition. Lack of condition information is more an issue with Water Supply than with Wastewater or Stormwater. Condition information is most complete for Wastewater, due to the number of CCTV inspections carried out in recent years.

Information on Council’s stormwater assets in Bulls is reasonably complete. There is, however, an extensive network of open drains on private property for which information is not known. These drains are not owned or maintained by Council, but they do have an impact on our reticulated system. The knowledge of stormwater reticulation in Bulls is good. In-house surveys, GPS surveys and field inspections have been incorporated into the GIS database. Reticulation pipes are generally of concrete construction. Lead-ins and sumps from kerbside channels to manholes are documented, and confidence of the pipe sizes, materials and condition has improved.

The knowledge of the stormwater layout in Hunterville is poor. In-house surveys have incorporated GPS and aerial surveys, but field surveys and inspections are needed to improve asset confidence in the GIS. Reticulation pipes are predominately Asbestos Cement, with PVC lead-ins. Invert levels are undocumented and a comprehensive survey is required to give more value to the asset register.

The knowledge of the stormwater layout in Mangaweka is average. In-house surveys have incorporated employee knowledge, GPS and aerial surveys, and field inspections into the GIS. Reticulation pipes are predominately concrete, with small lengths of asbestos, PVC and earthenware. Lead-ins and sumps from kerbside channels to manholes need better documentation, and invert levels and gradients are not recorded. There is only a small number of stormwater assets in Mangaweka. Most of these are open drains adjacent to roads. The majority of stormwater pipes on the Council system are culverts crossing roads

In general, the knowledge of the stormwater layout in Marton is good. In-house surveys have incorporated employee knowledge and field inspections into GIS. Some previously unknown stormwater pipe has been discovered by staff in the streets around Wilson Park. Some of this pipe may only be 20 years old, and may have been constructed by road contractors during area wide pavement rehabilitation work.

In general the knowledge of the stormwater layout in Taihape is good. In-house surveys have incorporated employee knowledge and field inspections into GIS. Some of the older areas of the town, and some renewals work carried out before Council amalgamation are of variable accuracy. Where the age of an asset is in question, a note has been included in the database declaring this to be an estimate only. Research of archived drawings has improved the detail of the electronic database, with discovery of previously unknown pipes. More than 25 manholes have been discovered either through use of archives or CCTV inspections. Because of the age of the town, there is a significant quantity of older assets that we do not hold current information on. As these assets are renewed, the overall quality of information held is improving.

5.5 Water Supply

The total assets for water supply are given in the following table, along with replacement cost and written down value.

Table 7: Asset Summary – Water Supply

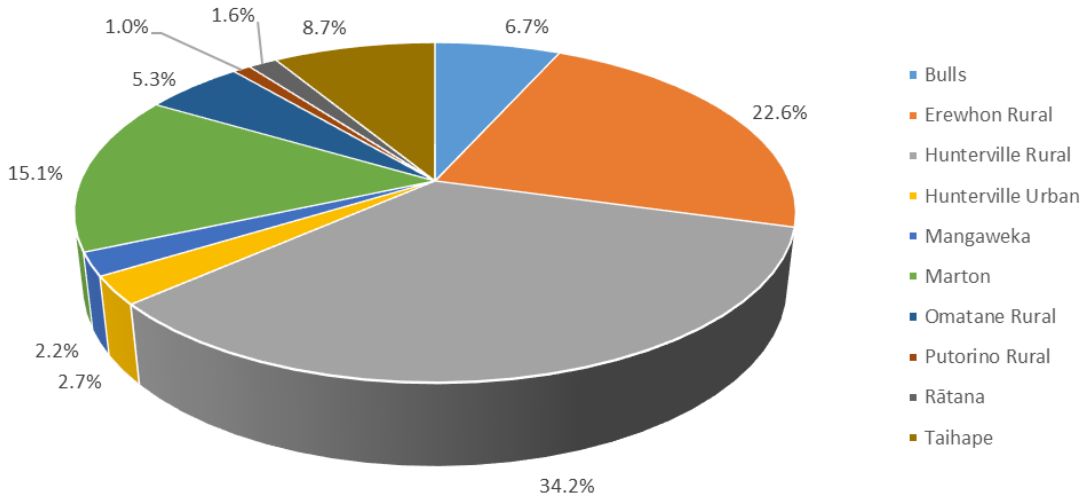
Asset Group	Assets	Replacement Cost ($)	Depreciated Value ($)	Annual Depreciation ($/yr)
Plant				
Reservoirs	36	3,778,978	1,120,522	26,047
Treatment Plant	331	21,724,489	15,328,361	392,063
Bores	12	721,437	502,328	8,747
Lines				
Mains	407.0 km	51,865,991	27,031,143	703,528
Service Lines	23.2 km	8,439,365	5,114,814	98,125
Points				
Valves	1,165	2,398,316	1,082,776	45,370
Fire Hydrants	751	1,872,059	713,570	33,484
Bulk Meters	27	61,740	10,395	621
Meters	1,417	378,564	204,919	13,173
Tobies	3,357	1,070,341	615,862	19,318
Other	1,590	391,486	331,654	5,817
TOTAL		**92,702,766**	**52,056,344**	**1,346,293**

The length of water mains in each supply is indicated below, as an indication of the extent of each supply (Table 8 and Figure 14).

Table 8: Water Main Lengths

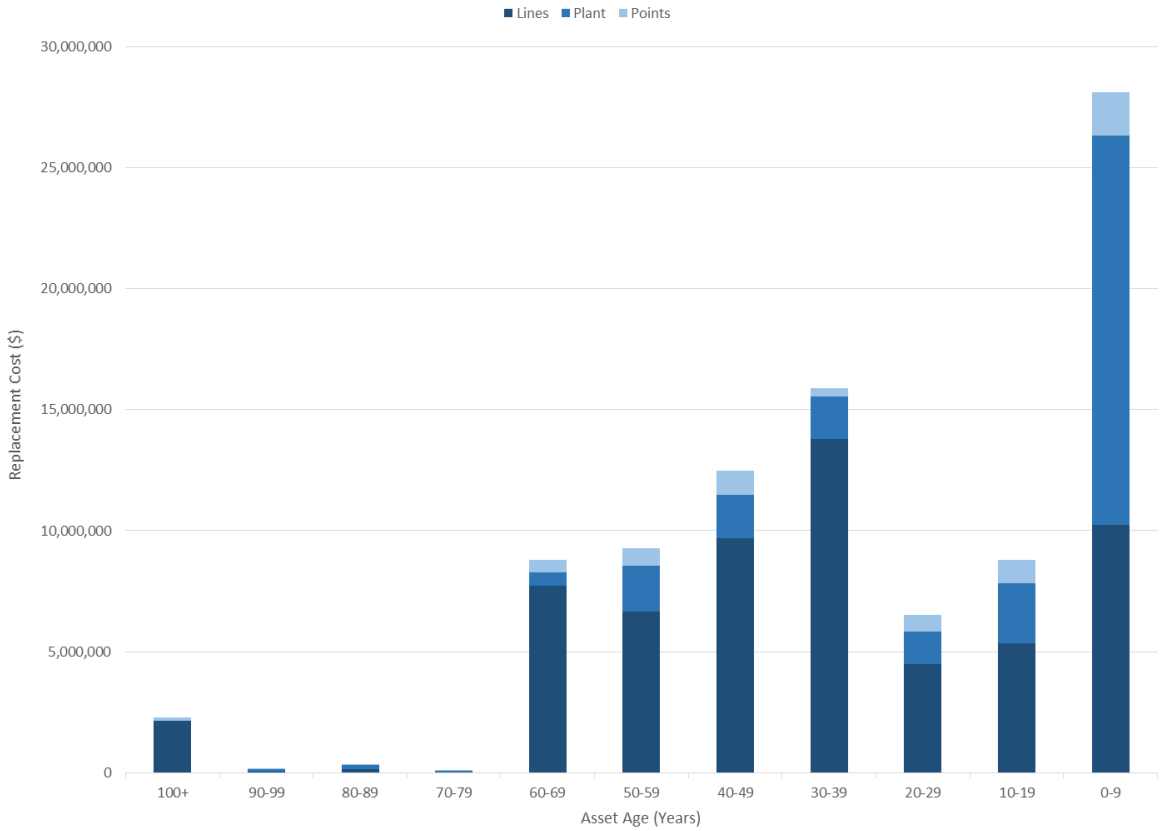
Water Supply	Length of Mains (km)
Bulls	27.4
Erewhon Rural	92.0
Hunterville Rural	139.2
Hunterville Urban	10.9
Mangaweka	9.0
Marton	61.4
Omatane Rural	21.6
Putorino Rural	3.9
Rātana	6.3
Taihape	35.4
TOTAL	**407.0**

Figure 14: Water Main Location by Length



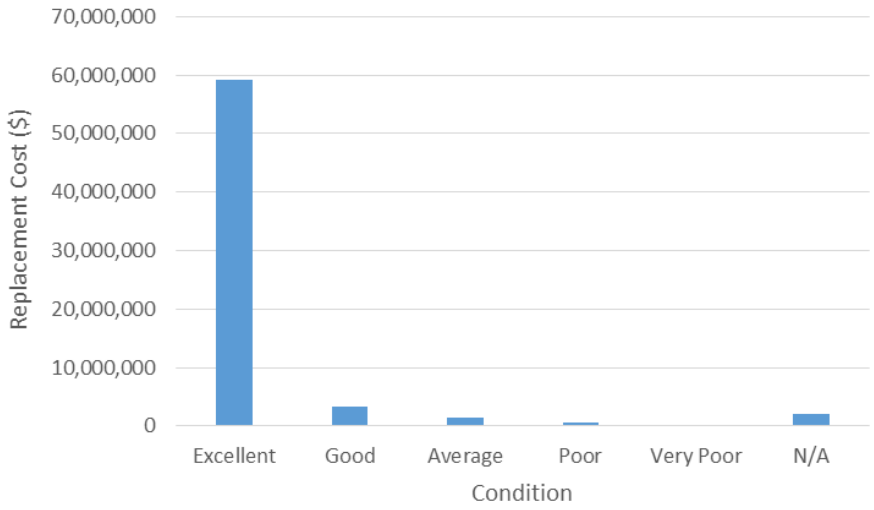
The age profile of Water Supply assets in the Rangitīkei is shown in Figure 15 below:

Figure 15: Asset Age – Water Supply



Condition information on Water Supply assets needs improvement. The default Condition rating is “Excellent”, and there is a high proportion of assets given this score. See below.

Figure 16: Asset Condition – Water Supply



Improvement of condition information will be programmed as an Improvement Plan item. Following collection of better data, asset condition can be shown per scheme.

5.5.1 Bulls

Bulls is located beside the Rangitīkei River on two old river flats. Water is abstracted from several shallow bores. From there it is treated before being pumped to two water reservoirs at Tricker's Hill on the north-western side of Bulls in the farmland adjacent to Tricker's Hill Road. These two reservoirs have a total capacity of 540 m^3. A trunk main from these reservoirs supplies the entire town of Bulls. A 227 m^3 water tower located in Taumaihi Street previously supplied the RNZAF zone. This zone has now been combined with the town.

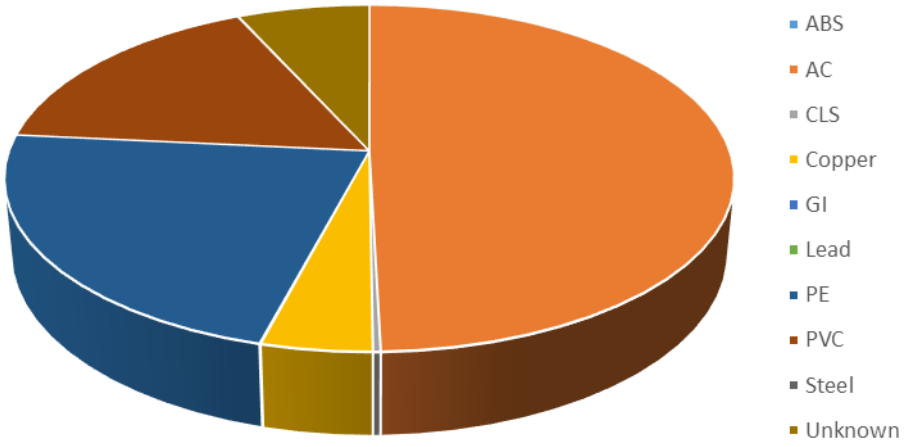
The Bulls water network is depicted in Figure 17.

Figure 17: Bulls Water Supply

The Bulls water network comprises pressure mains ranging up to 200 mm diameter. Approximately two-thirds of all the pipes are Asbestos Cement pipes laid in the late 1960s and 1970s. This material was superseded in the late 1970s by MDPE and PVC, which now account for 30% of the network. There is a small portion of the network built from copper which is known to be in poor condition.

The various pipe materials used for water supply in Bulls are described in Figure 18. Predominantly, the pipes are made from Asbestos Cement. There is a significant amount of plastic pipe within the network as well.

Figure 18: Pipe Material – Bulls Water



5.5.1.1 Condition

The pipe work is in average to good condition. The rising main from the pump station to Tricker's Hill is a critical asset, and will be periodically inspected for its condition.

Most service connections were installed with the original contract and this has been taken as the age of all connections for this plan. Many of the copper services have been replaced due to the aggressive nature of the water.

A high proportion of service lines in Bulls are copper or galvanised iron. These materials have deteriorated and contribute to leakage.

5.5.1.2 Capacity

The plant copes with present demand; however the addition of the meat processing plant in Ferry Road highlighted the need for further water storage capacity. This requirement has been deferred by the installation of a direct supply main to the meat processing plant and utilisation of their on-site storage facilities. The meat processing plant utilises up to half of the entire town's demand at peak times. The installation of Bore 5 alleviated this risk, with consent to abstract an additional 1,125 m^3/day.

Data on capacity for the Bulls water supply are given in Table 9.

Table 9: Asset Capacity – Bulls Water

Parameter	Comments	Data
Population connected	Prior to 2013 Census	1,800 persons
Consent Limit	Bore 5 (32 m depth)	1,125 m^3/day
	Bore 1 (10 m depth) Bore 2 (15 m depth)	1,700 m^3/day (combined)

Parameter	Comments	Data
	Bore 3 (14 m depth) Bore 4 (11 m depth)	
	Total	2,825 m^3/day
Consumption (2016-2017)	Average daily demand	930 m^3/day
	Peak daily demand	1,572 m^3/day
Treatment Plant	Maximum production	2,400 m^3/day
Storage	Taumaihi St "Mushroom" reservoir	227 m^3
	Tricker's Hill reservoirs (one concrete and one timber)	540 m^3
	Total storage	767 m^3

There are no capacity issues in Bulls when considering the total consented amount of water available. However, there are quality issues with Bore 5 as it is high in iron and manganese. By preference, Bores 1, 2, 3 and 4 are used instead. From time to time, however, demand is higher than the consented limit for these sources, and Bore 5 must be run. This could be considered a capacity issue or a performance issue. See below.

5.5.1.3 Performance

The following treatment process are in place at Bulls:

Table 10: Treatment Processes – Bulls Water

Treatment Type	Processes
Iron and manganese removal	Aeration
Secondary	Filtration
Tertiary	Chlorination UV disinfection

The slight acidity of the water is causing some problems with corrosion of metal fittings. Consumers across the District are advised annually about plumbosolvency – the advice to flush taps before consuming water. Doing so should alleviate any taste or health concerns arising from this.

As mentioned earlier, there are issues with iron and manganese in Bore 5. Bores 1, 2, 3 and 4 contain iron and manganese, but Bore 5 is deeper and the concentrations from it are higher.

Bore 5 is plumbed to run through the Maxwell filter, whereas all others go through Filters 1 and 2. A potential solution to the issue with Bore 5 is to alter the pipework so that Bore 5 water is treated by Filters 1 and 2. There is already chemical dosing to deal with iron and manganese prior to these filters; the additional treatment requirement of including Bore 5 would be slightly higher chemical costs.

5.5.2 Hunterville Urban

The Hunterville Urban water supply purchases water from the Hunterville Rural Water Supply. The water is already chlorinated by the Hunterville Rural Water Supply and receives further treatment at the water treatment plant.

There is no all-weather road to the treatment plant so access for maintenance purposes is a problem. The absence of lights is also a safety issue.

As well as this, the land on which the plant is located is not by Council, and there is no formal easement or agreement in place. The site is, however, designated for water supply purposes in the District Plan.

Figure 19 shows the extent of the Hunterville Urban water supply.

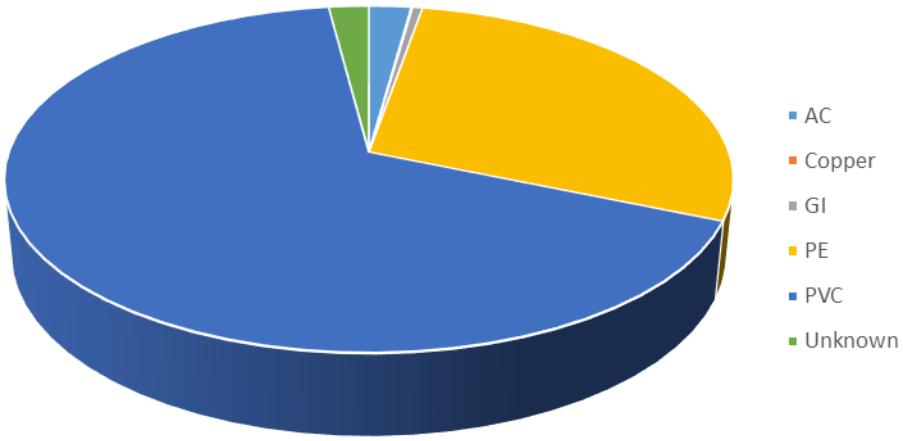
Figure 19: Hunterville Urban Water Supply

The Hunterville Water Network comprises pressure mains ranging up to 150 mm diameter. The network is relatively new, with no pipes listed as being older than 30 years, and 30% being less than 10 years old.

All known connections are currently metered, although it is suspected there may still be a handful of unmetered connections on the border of the community.

Pipe materials in use for Hunterville Urban water are shown in Figure 20. The predominant materials are plastic (PVC or PE), which corresponds to the fact that most pipes were installed in the last 30 years as shown above.

Figure 20: Pipe Material - Hunterville Urban Water



5.5.2.1 Condition

There are still a number of early LDPE pipes that cause problems, owing to the poor methods adopted when installing them, and the age of the material.

Little is known about the service connections. The service connections and meters are not critical to the operation of the reticulation, are of low value and will be replaced on an operational maintenance basis.

5.5.2.2 Capacity

Water from the Rural Water Supply is restricted to a maximum of 370 m^3/day. Analysis of domestic consumption meters shows an average of 130 m^3/day. Information on the capacity of the network is given in the following table.

Table 11: Asset Capacity - Hunterville Urban Water

Parameter	Comments	Data
Population connected	Prior to 2013 Census	400 persons
Water availability	This is the volume paid for from HRWS	370 m^3/day
Consumption (2016-2017)	Average daily demand	139 m^3/day
	Peak daily demand	325 m^3/day
Treatment Plant	Maximum production	432 m^3/day
Storage	2 timber reservoirs	150 m^3 each (300 m^3 total)

5.5.2.3 Performance

The processes in place at the Hunterville Urban Water Treatment Plant are listed below.

Table 12: Treatment Processes – Hunterville Urban Water

Treatment Type	Processes
Primary	Pressure media filtration Cartridge filtration
Tertiary	UV disinfection Chlorination

5.5.3 Mangaweka

Mangaweka is situated on an elevated river flat approximately 60 m above the Rangitīkei River. Water for the town is abstracted from a shallow well alongside the river and then lifted vertically 100 m to the treatment plant. Filtration and chlorination occurs and the water is stored in a large roofed reservoir. Gravity feeds from the reservoir service two distinct sections of the community. The primary feed services the town itself to the south, while a smaller feed services an area of pastoral farms and the camping ground to the east.

The intake for the Mangaweka water supply consists of a concrete chamber containing a 150 mm riparian bore surrounded with a 600 mm steel casing. Water is pumped from the bore to a holding tank located at the intake. This feeds the water treatment plant by way of a rising main with a 100 m lift. Treated water is stored in one of two unreinforced concrete reservoirs operated in parallel but connected via a pipe, with total storage capacity of 630 m^3.

The two reservoirs are partly buried. Usually the intake flow is matched to the outflow from the holding tank on site. The riparian bore level can go down in a very dry summer. In this case, the rate of take can be reduced below the holding tank outflow. Telemetry from the intake is via a radio link bounced off the cliff opposite, to the Mangaweka WWTP, and then from here to the Mangaweka WTP (where the reservoirs are located).

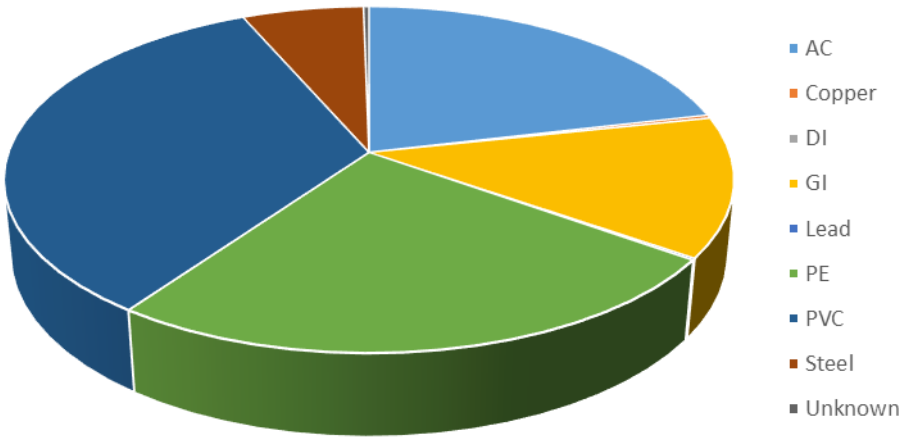
The layout of the Mangaweka water supply is shown in Figure 21.

Figure 21: Mangaweka Water Supply

The Mangaweka water network comprises pressure mains ranging up to 200 mm diameter. Approximately half of the network was replaced during the 1990s and many service connections renewed as part of the consumption meters installed in the 2000s. Asbestos pipes from the 1960s and original steel pipes from the 1910s make up the remainder of the network.

Water pipe materials used in Mangaweka are shown in Figure 22. As can be seen, most of the pipes in use are plastic (either PVC or PE). Asbestos Cement pipes are the next most common.

Figure 22: Pipe Material – Mangaweka Water



5.5.3.1 Condition

The original rising main has now been replaced except for 55 m remaining in 125 mm steel pipe. The only other concern in this main is the existence of galvanised iron where the pipe passes through the railway corridor. It would be desirable to replace this with a more acceptable material.

The reservoir building is old. The replacement of the roof has extended the useful life until 2033, and the main structure is expected to last until 2020.

5.5.3.2 Capacity

Capacity information for the Mangaweka water supply is given in Table 13.

Table 13: Asset Capacity – Mangaweka Water

Parameter	Comments	Data
Population connected	Prior to 2013 Census	180 persons
Consent Limit	Infiltration gallery at Mangaweka Campground.	170 m^3/day
Consumption (2016-2017)	Average daily demand	119 m^3/day
	Peak daily demand	231 m^3/day
Treatment Plant	Maximum production	432 m^3/day
Storage	Concrete reservoir	630 m^3

5.5.3.3 Performance

Treatment processes in use at Mangaweka water follow:

Table 14: Treatment Processes – Mangaweka Water

Treatment Type	Processes
Primary	Pressure media filtration Cartridge filtration
Tertiary	UV disinfection Chlorination

5.5.4 Marton

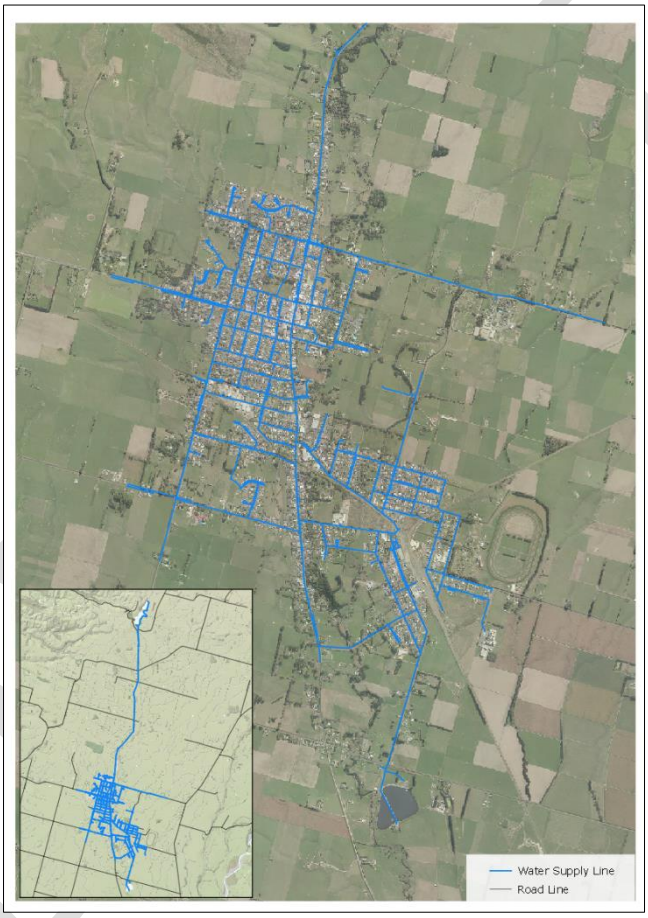
Marton is situated on mildly rolling terrain, which gradually slopes away from the source water, impoundment dams, treatment plant and urban area. The primary water source is a

14.5 km^2 catchment area that includes pastoral farmland runoff, feeding two impoundment dams. This water is treated before entering a 5.3 km bulk main to the town boundary.

Currently supply augmentation is provided by bore water from a site at Calico Line. This is pumped into the system to supplement flows during peak demand. Treatment at the source is restricted to disinfection by chlorine. Adverse water chemicals and hardness are not treated. There is also a bore on Tutaenui Rd, which is piped to the Tutaenui Dams for blending. This bore is currently not required to augment supply.

The extent of the water supply is shown in the following diagram.

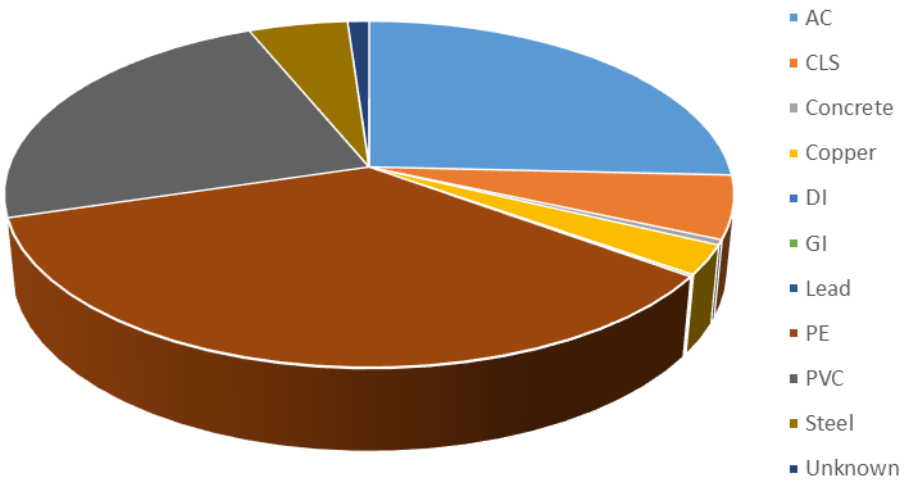
Figure 23: Marton Water Supply



The Marton water network comprises pressure mains ranging up to 375 mm diameter. Approximately a third of all the pipes are Asbestos Cement pipes laid in the late 1960s and 1970s. This was superseded in the late 1970s by MDPE and PVC which account for 40% of the network. There are no records of any substantial quantities of pipes older than 60 years in the Marton reticulation.

Figure 24 shows the pipe materials used for water supply in Marton. There is a fairly even distribution of materials, with the largest proportion being Asbestos Cement. The next largest proportion of pipes are plastic (PVC or PE).

Figure 24: Pipe Material – Marton Water



5.5.4.1 Condition

C Dam is a relatively modern structure built in the 1950s, with the intake system having been modified in 2009 to optimize the level at which water is drawn from and provide for easy maintenance and water quality sampling. This asset is performing well with no significant defects. The trunk main from the junction of B and C Dam supply lines to the treatment plant is operating well. The only recorded problems with this main are with movement of the lead joints and compression of the natural rubber joining rings. These problems would appear to be a result of age. Both joint types are being repaired as they fail, but due to the high criticality of this pipe, it will be inspected annually and possibly replaced by 2020.

The treatment plant was initially constructed in the early 1920s. All that remains of this original plant in use today are one of the old reservoirs (now used as a contact tank) and a portion of the building.

A large portion of the reticulation is Asbestos Cement. This material was first used in the early 1950s. As the age of these pipes is now approaching their life expectancy we would expect the failure rate to increase. Replacement of pipes is based on repair history where available.

5.5.4.2 Capacity

Data on capacity in the Marton system is given below.

Table 15: Asset Capacity – Marton Water

Parameter	Comments	Data
Population connected	Prior to 2013 Census	3,750 persons
Consent Limit	Tutaenui Dams	6,500 m^3/day
	Calico Line Bore (240 m depth)	2,200 m^3/day

Parameter	Comments	Data
	Tutaenui Rd Bore	3,500 m^3/day
	Discharge	140 m^3/day
Consumption (2015-2016)	Average daily demand	2,452 m^3/day
	Peak daily demand	4,054 m^3/day
Treatment Plant	Maximum production – current	4,080 m^3/day
	Maximum production – future, after upsizing clarifier inlet pipes	6,000 m^3/day
Storage	Newer concrete reservoir	6,000 m^3
	Older reservoir	750 m^3

5.5.4.3 Performance

Details of the treatment processes in use on the Marton Water Supply are given in the table below.

Table 16: Treatment Processes – Marton Water

Treatment Type	Processes
Marton WTP	
Primary	Coagulation Clarification
Secondary	Filtration
Tertiary	UV disinfection Chlorination
Calico Line Bore	
Tertiary	Chlorination

Marton Dam experiences issues with algae from time to time. A potential permanent solution to this issue would be to alter pipework from the Tutaenui Bore to divert water directly to the treatment plant. Processes could then be put in place to treat the iron, manganese and other undesirable constituents present, and this would become the primary

source for the town. This is dependent on a current investigation into a potential new rural water supply for the area around Marton, which could make use of this bore.

Calico Line bore water in the area is moderately hard with iron and manganese at reasonably high levels. Hence, this source is used as a backup only.

5.5.5 Rātana

Rātana is situated on mildly rolling terrain, which gradually slopes away from the treated water storage tanks, resulting in a fairly static head throughout the village. Source water is abstracted from shallow (80 m) bores and treated before being lifted a further 20 m to a tank farm. The tanks then release on demand down to the village reticulation.

When the system was installed it was not intended for human consumption, except as a supplementary supply to the individual household rainwater systems. In 1972 an upgrade was carried out with chlorination equipment, a large pump, new reservoirs, bore relining, and a fire main being installed. This upgrade was carried out with the intention of providing a fire fighting supply in the town. It is still considered a supplementary supply with only six residents and the school totally relying on the supply for drinking water.

The treatment plant is beyond its useful life and does not meet the current Drinking Water Standards. A major upgrade to the Rātana Water Treatment Plant is underway. Funding has been obtained from the Ministry of Health through the CAP programme to assist with this work. As well as improving the quality of water for Rātana, this upgrade will provide enough water for the town, as well as the proposed 60-lot Waipu Trust subdivision. The treatment plant will be designed in such a way that it can expanded should the Waipu Trust subdivision eventually reach its maximum of 120 lots. The water supply should cater for both normal demand periods, and increased demand during the annual Rātana festival.

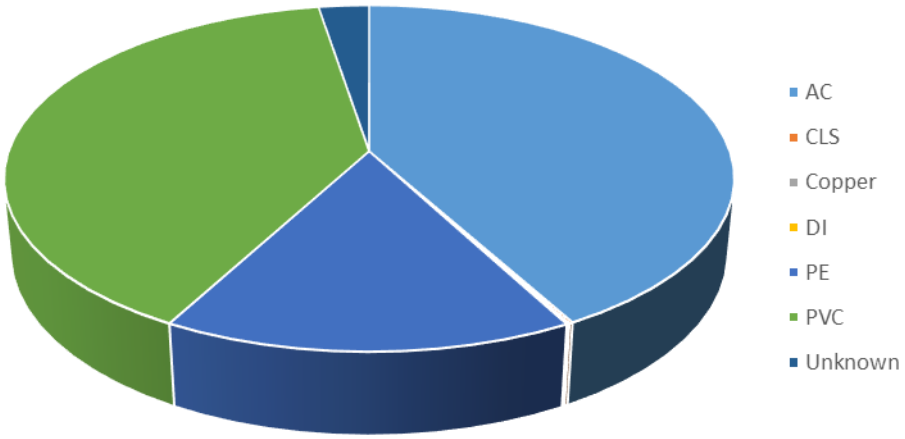
The Rātana water supply is shown in Figure 25.

Figure 25: Rātana Water Supply

The Rātana water network comprises pressure mains ranging up to 150 mm diameter. More than half of all the pipes are Asbestos Cement pipes laid in the late 1970s. The network was progressively extended in the 1980s-1990s with MDPE and PVC, accounting for 43% of the network.

Much of the water reticulation in Rātana consists of Asbestos Cement pipes, as shown in Figure 26. There is also a substantial amount of plastic pipe, whether it is PVC or PE.

Figure 26: Pipe Material - Rātana Water



5.5.5.1 Condition

The existing treatment plant is old and beyond its useful life. Most items of plant need replacing. The storage facilities are in poor to average condition and inadequate in capacity. The pipe work is generally in good condition.

5.5.5.2 Capacity

The system struggles to meet daily demands and cannot cope with the additional demand created during the annual Rātana festival. This places a strain on the treatment plant.

The capacity of the Rātana water system is shown in Table 17.

Table 17: Asset Capacity - Rātana Water

Parameter	Comments		Data
Population connected	Prior to 2013 Census		450 persons
Consent Limit	Existing bore (80 m depth)	Outside Festival	130 m^3/day
		During Festival	300 m^3/day
	New bore (180 m depth)	Outside Festival	307 m^3/day
		During Festival	613 m^3/day
Consumption (2015-2016)	Average daily demand		157 m^3/day
	Peak daily demand		256 m^3/day
Treatment Plant	Maximum production		260 m^3/day
Storage	9 concrete reservoirs		18-25 m^3 each (total 225 m^3)

5.5.5.3 Performance

The current Rātana Water Treatment Plant uses the water treatment processes described below.

Table 18: Treatment Processes – Rātana Water

Treatment Type	Processes
Iron and manganese removal	Aeration
Secondary	Sand filtration
Tertiary	Chlorination

The water is very difficult to treat owing to high quantities of manganese, iron and hardness. The iron and manganese is not fully removed during the treatment process and this is still settling out during the storage period. The reservoirs act as a sedimentation stage, which is acceptable, provided regular cleaning is carried out. This process also continues to a lesser

degree in the reticulation and regular scouring is essential to maintain an acceptable standard.

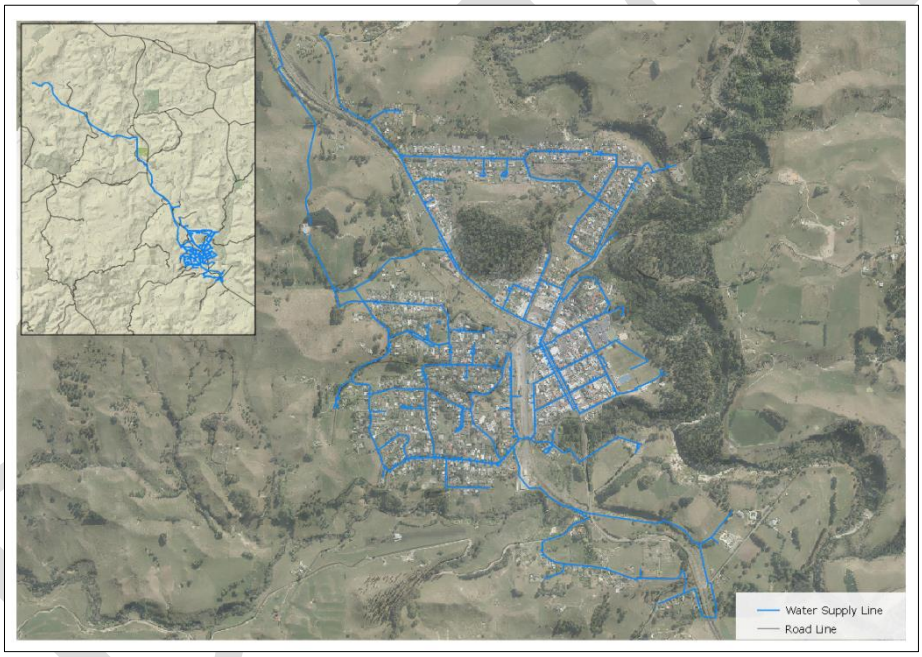
5.5.6 Taihape

Taihape is nestled on the slopes of the District's hill country, straddling State Highway 1 and the North Island Main Trunk railway. Water is sourced 11.5 km away from the Hautapu River. From there it is piped to the treatment station under gravity. Post-treatment it is delivered to two main zones located on alternate sides of the highway.

Due to the terrain there are pressure control valves to moderate the high pressures that can occur in some parts of the reticulation. The pressure ranges are significant and additional pressure management is required to minimise the loss of water from storage and associated property damage should a mains break occur.

The extent of the system for Taihape water is shown in Figure 27.

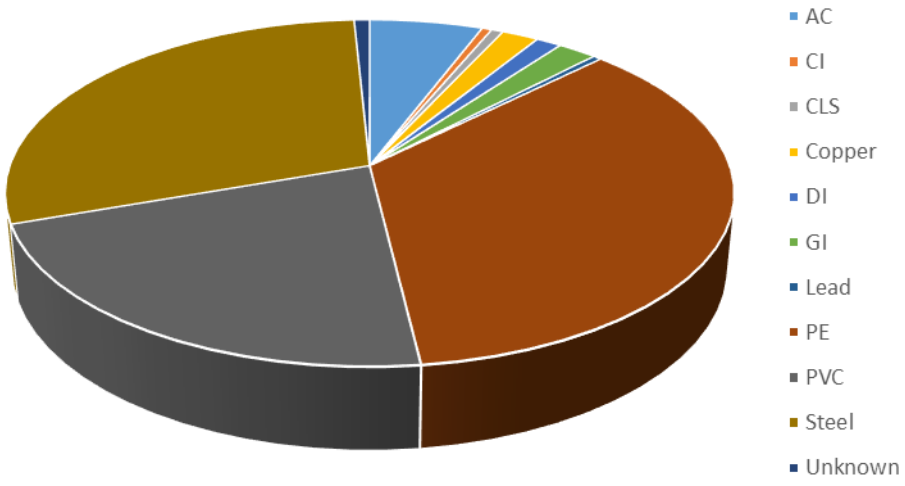
Figure 27: Taihape Water Supply



The Taihape water network comprises 21.9 km of pressure mains ranging up to 375 mm diameter. Approximately half of all pipes are the original steel mains laid from 1910 to 1960.

Figure 28 shows the distribution of pipe materials in the Taihape water network. A large amount of the pipes are constructed from steel, which is consistent with the age profile.

Figure 28: Pipe Material – Taihape Water



5.5.6.1 Condition

A large portion of the town reticulation is aged steel nearing the end of its economic life. This is starting to show with the incidence of failures increasing in recent years resulting in an increased maintenance budget. Some of the original pipe work (which dates back to 1911) is still in place. This pipe work is in very poor condition and difficult to repair. Replacements of sections are more economic to undertake than spot repairs.

The range of reticulation pressures is excessive varying from nearly atmospheric to in excess of 100 m head. This is a contributing factor in mains failures. Currently the reticulation has two pressure zones (west and east of the railway line respectively). The reticulation would benefit from the implementation of pressure management.

5.5.6.2 Capacity

The raw water supply pipeline is laid in an area that possess significant hydraulic challenges. This pipeline is designed as a constant flow line with any surplus water not required by the treatment plant being bypassed to the adjacent valley and returned to the Hautapu River via the urban stormwater system. Ground contours along the line affect the pressures in the pipe. These range from atmospheric on the high points to greater than 120 m head in low points. Should the supply valve be closed at the treatment plant, 2.5 km of pipeline would be subject to pressure in excess of 160 m head. The intake pipeline is a high risk component of the supply and regular inspections and proactive renewals are required to minimize this.

In general the Taihape supply has high pressures associated with the steep elevation in the supply area.

The reservoir has capacity for more than 3 days storage. See Table 19 for more information.

Table 19: Asset Capacity – Taihape Water

Parameter	Comments	Data
Population connected	Prior to 2013 Census	2,200 persons
Consent Limit	When Hautapu River flow at Alabasters > 0.69 m^3/s	2,900 m^3/day
	When Hautapu River flow at Alabasters ≤ 0.69 m^3/s	2,225 m^3/day
Consumption (2015-2016)	Average daily demand	1,084 m^3/day
	Peak daily demand	1,374 m^3/day
Treatment Plant	Maximum production	2,160 m^3/day
Storage	Reinforced concrete reservoir	4,500 m^3

There are currently issues with over-abstraction at the Taihape intake, owing to the hydraulic grade line of the raw water main. To alleviate this, in agreement with Horizons Regional Council, a bypass has been installed which delivers untreated water back into the Hautapu River. This is metered, to ensure that overall abstraction is within consent limits.

5.5.6.3 Performance

Treatment at the Taihape plant consists of:

Table 20: Treatment Processes – Taihape Water

Treatment Type	Processes
Primary	Coagulation Clarification
Secondary	Filtration
Tertiary	UV disinfection Chlorination

Raw water quality is consistent with abstraction from a natural river source. However there is the potential of contamination from road spills from State Highway 1 in the Hihitahi Bluffs area. Potential mitigation for this could be installing instrumentation at the plant on the incoming raw water. There are systems available that could shut down inflows to treatment if contamination was detected. Water could be purged until contamination cleared.

5.5.7 Erewhon Rural

Oversight of this Rural Water Supply is by a Sub-Committee of Council, with representatives from the farmers on the scheme. Erewhon was established in 1980. The financial and strategic planning oversight is handled by Council staff at the committee's direction. All aspects of the scheme from revenue setting, maintenance and renewal expenditure are directed by the committee.

The Rural Water Supply is designed to deliver supply to each property at a constant flow rate 24 hours a day. To achieve this, the supply is delivered through a Marrick restrictor, which is sized to maintain the required constant flow over a range of water pressures.

Erewhon is a gravity system. Working pressures in sections of pipe network are high (up to 600 m head) due to changes in elevation. This necessitates the use of a significant quantity of steel pipe where the working pressures are typically in the range of 200-300 m. Pipes and fittings need to be appropriately rated for pressure, and maintained in good condition, for reliable operation. The scheme traverses steep variable terrain.

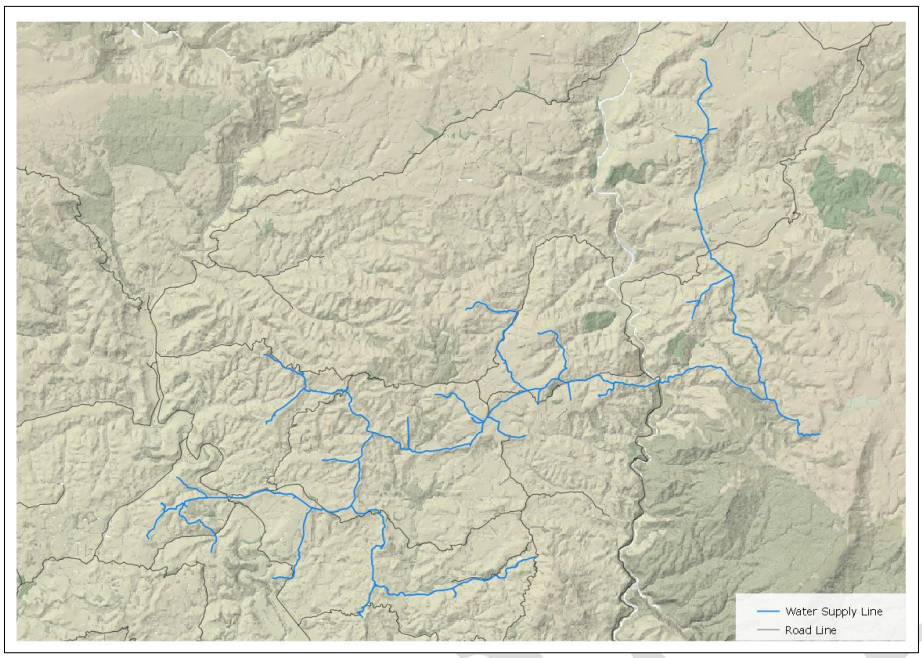
Most of the reticulation is laid in rural farm land, although sections do run alongside rail or road corridors. Renewals in these corridors should be programmed in conjunction with other works to reduce costs.

The Erewhon rural water network and treatment facilities are managed day to day by contractors based in Taihape. Contractors perform routine maintenance and monitoring, attending to customer requests for service. Major repairs or capital work is undertaken by the contractors.

Maintenance on the Erewhon Rural Water Supply is contracted privately. The tank service connections are checked regularly to ensure correct operation and condition.

The extent of the scheme is shown in Figure 29.

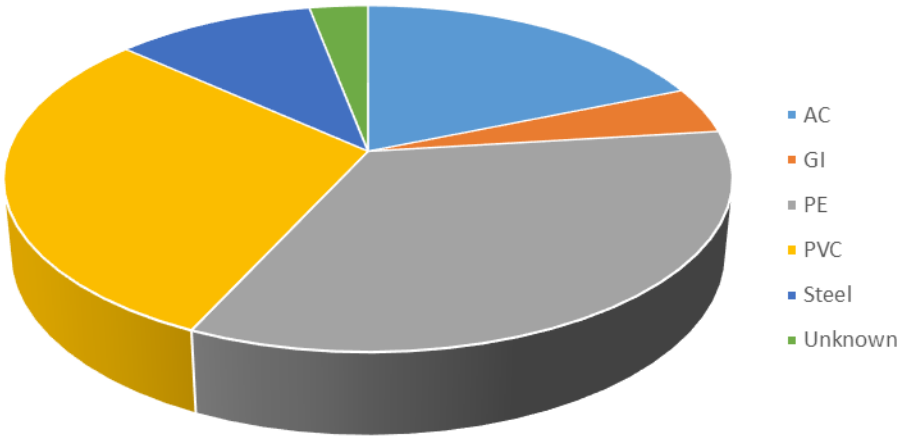
Figure 29: Erewhon Rural Water Supply



The Erewhon rural water network comprises constant flow pressure mains ranging up to 200 mm diameter. It was originally constructed with Asbestos Cement and steel pipes, with PVC used in the smaller diameters in the 1980s. The original steel pipe has shown over the years that it is susceptible to corrosion. An investment to replace this material with suitable pressure rated plastic alternatives means there is only 16% steel remaining.

Most of the water pipes on the Erewhon scheme are made from plastic (PVC or PE), as seen in Figure 30. There are a number of Asbestos Cement pipes and steel pipes as well.

Figure 30: Pipe Material – Erewhon Rural Water



5.5.7.1 Condition

Headworks are generally in good condition, but need to be regularly inspected and cleaned, as they are open to the elements and accessible by a track.

Mangaohane A Tank is in very good structural condition, however the inlet, outlet and overflow pipes and overflow channels need to be modified to reduce exposure to damage. Mangaohane B Tank is in good structural condition at present.

High maintenance costs are being incurred for the repair of leaks mainly within the lengths of buried steel pipe. The proactive renewal programme is addressing these issues.

There are ongoing maintenance needs associated with protecting pipelines from cattle damage and erosion at a number of locations. There is a planned renewal programme in place.

The stream crossings are currently in a satisfactory condition but require regular monitoring.

The pipe bridge crossing the Rangitīkei River Gorge is generally in sound structural condition with paintwork in good condition.

5.5.7.2 Capacity

The capacity of the Erewhon Rural Water Supply is described in Table 21.

Table 21: Asset Capacity - Erewhon Rural Water

Parameter	Comments	Data
Population connected	Population not yet confirmed	54 supply tanks 28 farms
Consent Limit	Reporoa Bog	1,800 m^3/day
Consumption (2015-2016)	Average daily demand	1,176 m^3/day
	Peak daily demand	1,323 m^3/day
Storage	A Reservoir –concrete	23 m^3
	B Dam - concrete	28 m^3
	Total	51 m^3

5.5.7.3 Performance

Water supplied is not suitable for domestic supply without the installation of treatment and filtration processes. The capital and operating costs of doing this are beyond the scheme's ability to fund and there is no intention to upgrade to provide a domestic supply.

Although the Reporoa Stream generally runs clear, in periods of heavy rainfall the water can be discoloured due to a fine sediment loam. The entry of fine sediments into the pipe reticulation affects water quality, as does the entry of organic matter that grows in the streambed.

There are the following issues with reliability:

- The flow meters and restrictor valves regularly become blocked or jammed with organic material, which needs to be cleared.
- The weir is in a very remote location and difficult to access. Any problems that may arise would be difficult to fix immediately.

5.5.8 Hunterville Rural

The Hunterville Rural Water Supply (HRWS) was built in the 1980s to provide farms in the region with a reliable stock water system. The biggest consumer on the scheme is the township of Hunterville, which takes about 14% of the demand. There are more than 160 farms connected as well as supply to Rata, Otairi and Ohingaiti.

Water is abstracted from the Rangitīkei River and pumped a height of 330 m in three lifts to the main reservoir.

The water is chlorinated as it is intended as a stock water supply. Consumers are regularly reminded that this is considered a non-potable supply and additional treatment is required for residential consumers.

This scheme is administered by Council for the scheme committee. All aspects of the scheme from revenue setting, maintenance and renewal expenditure are directed by the committee.

Rangitīkei District Council staff perform maintenance on the Hunterville Rural Water Supply. This is charged back to the scheme on a cost-recovery basis.

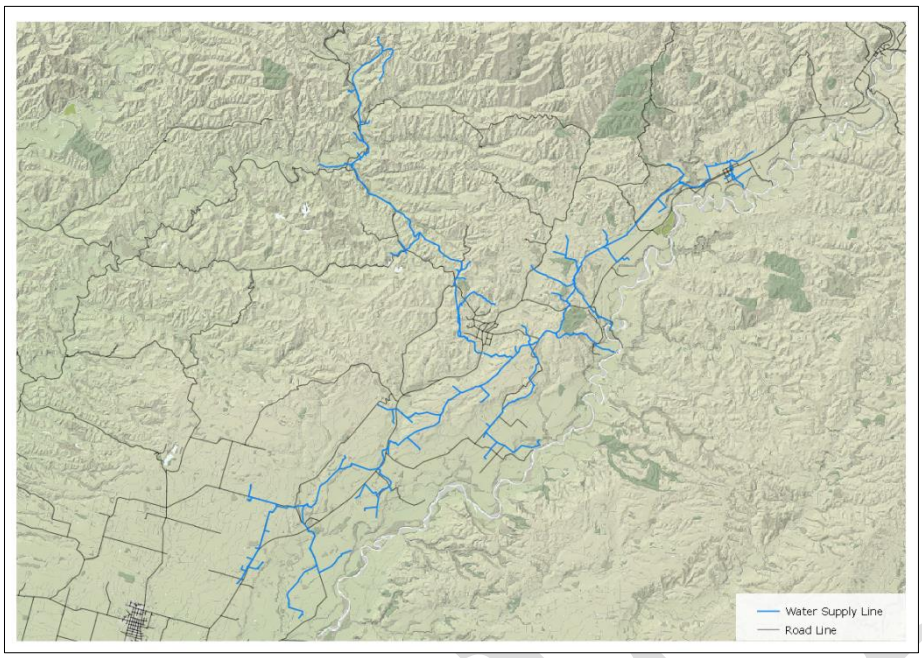
The responsibility of Council ends at the Marrick valve (flow restrictor) on each connection, after which it is the responsibility of the property owner to maintain.

There is a requirement for each user on the scheme to provide 24 hours storage on-site.

The scheme administration includes responsibility for the pipework up to and including ball cocks in farm tanks. These are replaced as needed.

The extent of the Hunterville Rural Water Supply is shown by Figure 31.

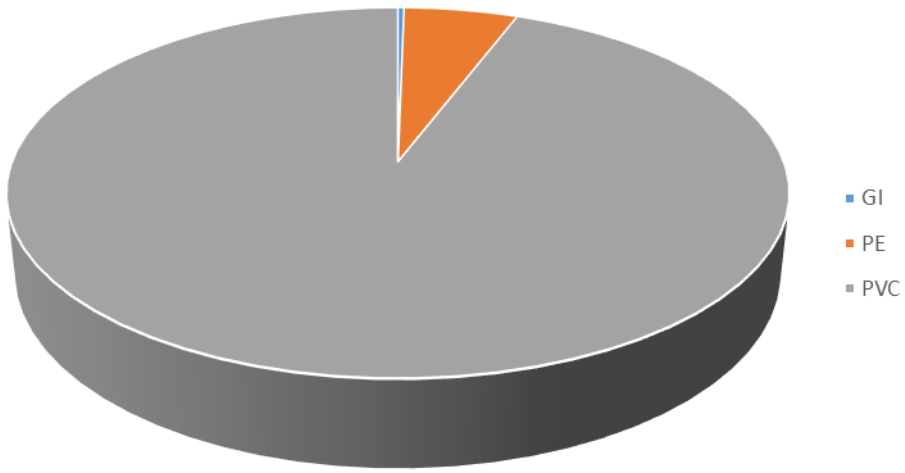
Figure 31: Hunterville Rural Water Supply



The water network comprises pressure mains ranging up to 150 mm diameter. Nearly the entire scheme was constructed in 1985 from PVC pressure pipe. Some growth of the system occurred in early 2000. Replacement of pipelines has been initiated by mains breaks or land slippage. Extent of replacement has been minimized to only that required to resolve the issue.

Pipes on the Hunterville Rural Water Supply are almost entirely PVC, as shown in Figure 32.

Figure 32: Pipe Material - Hunterville Rural Water



5.5.8.1 Condition

Some Asbestos Cement pipe was used in the construction, and lengths in slip-prone areas have failed. These lengths have been replaced with more flexible HDPE materials.

5.5.8.2 Capacity

The infiltration gallery has been the cause of problems over several years. The course of the river naturally bypasses the gallery and may change course with each fresh. The channel needs to be reopened frequently to restore the water supply. The alarm systems in place ensure a rapid response in case of problems. The lack of storage capacity of the main reservoir means water shortage risks are medium-high however this is mitigated by the requirement of consumers to maintain 48 hours on-site storage.

During periods most summers, auxiliary pumping is required as the intake cannot cope with demand.

Information on the capacity of the Hunterville Rural Water Supply is given in Table 22.

Table 22: Asset Capacity - Hunterville Rural Water

Parameter	Comments	Data
Population connected	Population not yet confirmed	160 connections
Consent Limit	Riparian take (infiltration gallery)	2,500 m^3/day
Consumption (2015-2016)	Average daily demand	1,382 m^3/day
	Peak daily demand	1,556 m^3/day
Treatment Plant	Maximum production	2,100 m^3/day
Storage	Main Reservoir (Top Reservoir)	360 m^3
	Middle Pump Station	150 m^3
	Top Pump Station	150 m^3

5.5.8.3 Performance

Only basic treatment is provided for this stock water supply, as indicated below:

Table 23: Treatment Processes – Hunterville Rural Water

Treatment Type	Processes
Tertiary	Chlorination

Rangitīkei District Council and the Ministry for Primary Industries jointly funded a strategic water assessment for the District. This assessment included the Hunterville Scheme Review with the purpose of:

- Identifying opportunities to improve the effectiveness and efficiency of the scheme.

- Assessing what potential exists to increase the area serviced by the scheme, and/or to utilise the scheme for irrigation purposes.

The review found that in general the scheme is realising its purpose. However, the review also confirmed the following weaknesses:

- The intake structure in the Rangitīkei River.
- Costs associated with lifting water from the Rangitīkei River to the scheme's high point.
- A considerable operating deficit, and the costs of future programmed new and replacement capital works.
- Other issues - the rural/Hunterville pricing differential, infrastructure replacement, landowner awareness of assets, unit allocation.

Recommendations were made to address these. Investigations are currently underway into the opportunities that could be presented by decentralising the scheme by introducing additional water sources.

Key issues for the Hunterville Rural Water Supply are:

- The water collection needs augmentation from surface pumping during summer and periods of low-river flow. This augmentation increases silt and algae loadings and a stilling and separation tank has been installed prior to the wet well.
- Power costs are a significant part of the budget. Reliability of power supply is also a concern with frequent interruptions resulting in callouts and higher than normal maintenance costs.
- More proactive maintenance is needed on flow restrictors, valves and storage tanks.
- The water is stock water only and consumers are now required to have a minimum of 48 hour storage capacity on site.
- Faulty or tampering of flow restrictors to individual consumers are increasing the system demand and restricting flow to downstream consumers. This is more evident during dry periods.

5.5.9 Omatane Rural

Omatane is a Rural Water Supply in remote rural hill country. The scheme is limited to a set number of water units, and as such does not allow for growth. It gathers water from a tributary of the Makino River by means of a weir and flow diversion pipe. This scheme was constructed in the 1980s. The water is intended for stock consumption and is not treated in any way. It supplies a small rural community of six farms by way of pipes of undetermined sized and length.

Omatane is a private supply. As such, Council has nothing to do with the maintenance of the water assets within the scheme.

The extent of the Omatane scheme is shown in Figure 33.

Figure 33: Omatane Rural Water

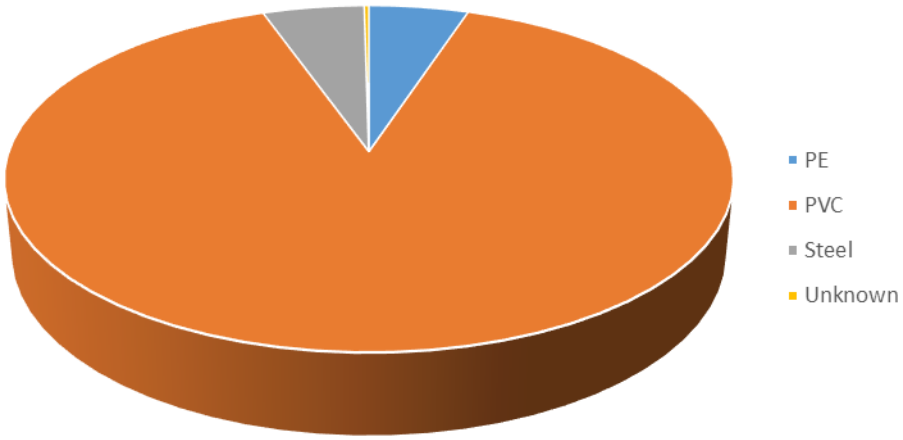
The Omatane water network is managed by the farm owners it supplies. Council staff provide a management role only; this includes performing monitoring compliance for resource consents, and advising the farmers as required.

Water charges on the Omatane scheme are related to the area of each property, which differs from the water unit system used on the Hunterville Rural Water Supply.

The Omatane water network comprises pressure mains ranging up to 80 mm diameter. Construction of the scheme was in the 1980s and consisted entirely of PVC, with some service connections being made of steel.

Pipe material used on the Omatane scheme is 95% PVC, as seen in Figure 34. The remainder is either steel or PE.

Figure 34: Pipe Material - Omatane Rural Water



5.5.9.1 Capacity

Information on capacity for Omatane is given below.

Table 24: Asset Capacity - Omatane Rural Water

Parameter	Comments	Data
Population connected	Population not yet confirmed	11 properties
Consent Limit	Unnamed tributary of Makino Stream at Makino Rd	300 m^3/day
Consumption (2015-2016)	Average daily demand	Unavailable
	Peak daily demand	Unavailable
Storage	Concrete reservoir at intake	20 m^3

5.5.10 Putorino Rural

The Putorino Rural Water Supply gathers water from a tributary of the Rangitīkei River by means of a weir and flow diversion pipe. This scheme was constructed in the 1910s. The water is gravity fed to the dam about 1,100 m away. The water is intended for stock consumption and is not treated in any way. It supplies a small rural community of six farms by way of pipes of undetermined sized and length.

The scheme is managed by the Putorino Farm Settlement Water Supply Committee, which is not a Sub-committee of Council like the other Rural Water Supply Committees. Council has no involvement with this scheme, other than assistance with rating of properties.

There are currently no plans for the Putorino scheme held at the council offices, and the data contained herein is based on staff knowledge only. It is expected that more information can be obtained from the farm managers and this should be a priority for this scheme.

The scheme is now more than 90 years old, but is working adequately.

The water is diverted at the headworks by a weir from a small stream, which eventually joins the Rangitīkei River south of Putorino.

The primary dam is estimated to hold 5,600 m^3 (from aerial photo measurements).

The falling main is 100 mm Asbestos Cement. All other reticulation is of unknown material and size.

Six farms are connected to this scheme, of which three are believed to also hold connections to the Hunterville Rural Water Supply.

The scheme was established in the 1910s and is managed by the farm owners. There is a small maintenance fund for breakages and repairs. There is no depreciation charged on the system, and there are no plans to renew it in the future. All farms using the scheme can connect to the Hunterville Rural Water Supply, or in some cases have already done so.

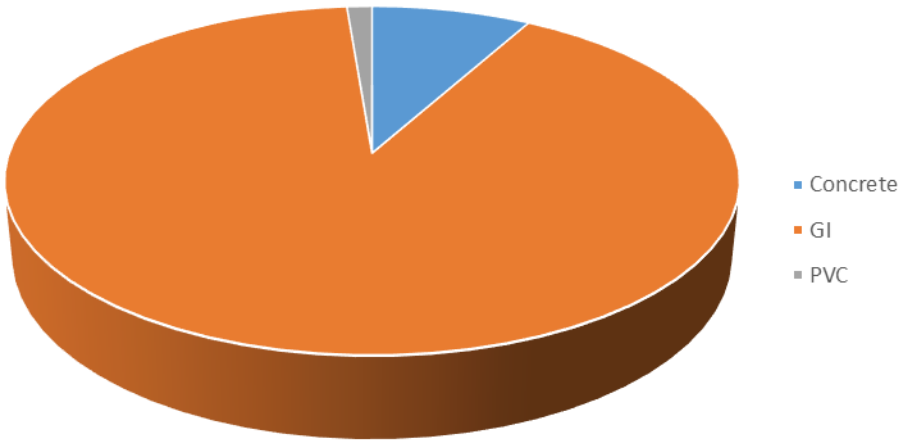
Putorino, like Omatane, is a private scheme which Council is not involved in maintaining.

The location of the Putorino scheme can be seen in the following map.

Figure 35: Putorino Rural Water

Pipe material in Putorino is mostly galvanised iron, since the mains are of small diameter (see Table 25). This is distinct from all other water supplies mentioned, in which the mains are larger and constructed from different materials.

Table 25: Pipe Material – Putorino Water



Information on the consent held by the Putorino Farm Settlement Water Supply Committee for this supply is given in the following table.

Table 26: Asset Capacity - Putorino Rural Water

Parameter	Comments	Data
Consent Limit	Unnamed tributary of Rangitīkei River off Rangatira Rd. Consent held by Putorino Farm Settlement Water Supply Committee.	80 m^3/day

5.6 Wastewater

A summary of Council's wastewater assets is given in the following table:

Table 27: Asset Summary - Wastewater

Asset Group	Assets	Replacement Cost ($)	Depreciated Value ($)	Annual Depreciation ($/yr)
Plant				
Treatment Plant	339	13,149,058	9,537,857	278,449
Pump Stations				
Pump Stations	63	791,766	387,828	29,375
Lines				
Sewer Mains	99.0 km	21,040,058	11,150,513	267,184

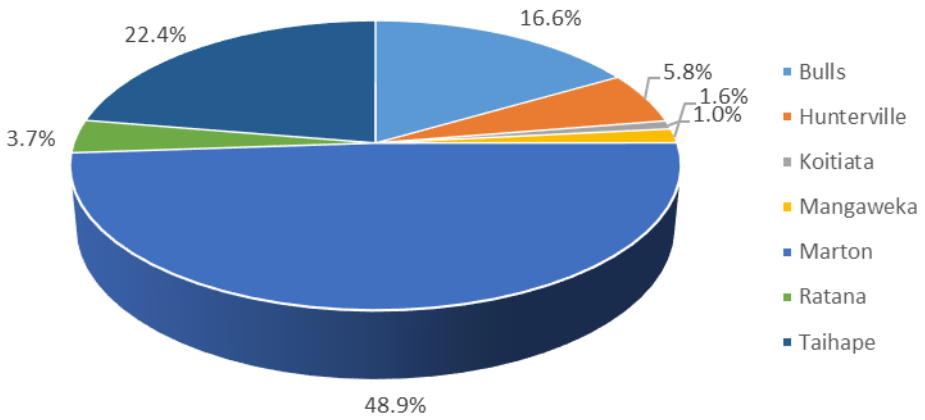
Asset Group	Assets	Replacement Cost ($)	Depreciated Value ($)	Annual Depreciation ($/yr)
Service Lines	33.2 km	4,934,109	3,251,054	50,322
Points				
Manholes	1,385	7,494,177	3,633,335	65,826
Other	204	74,563	54,055	752
TOTAL		**47,483,731**	**28,014,642**	**691,908**

A breakdown of wastewater mains by network is given in the following table and chart.

Table 28: Wastewater Main Lengths

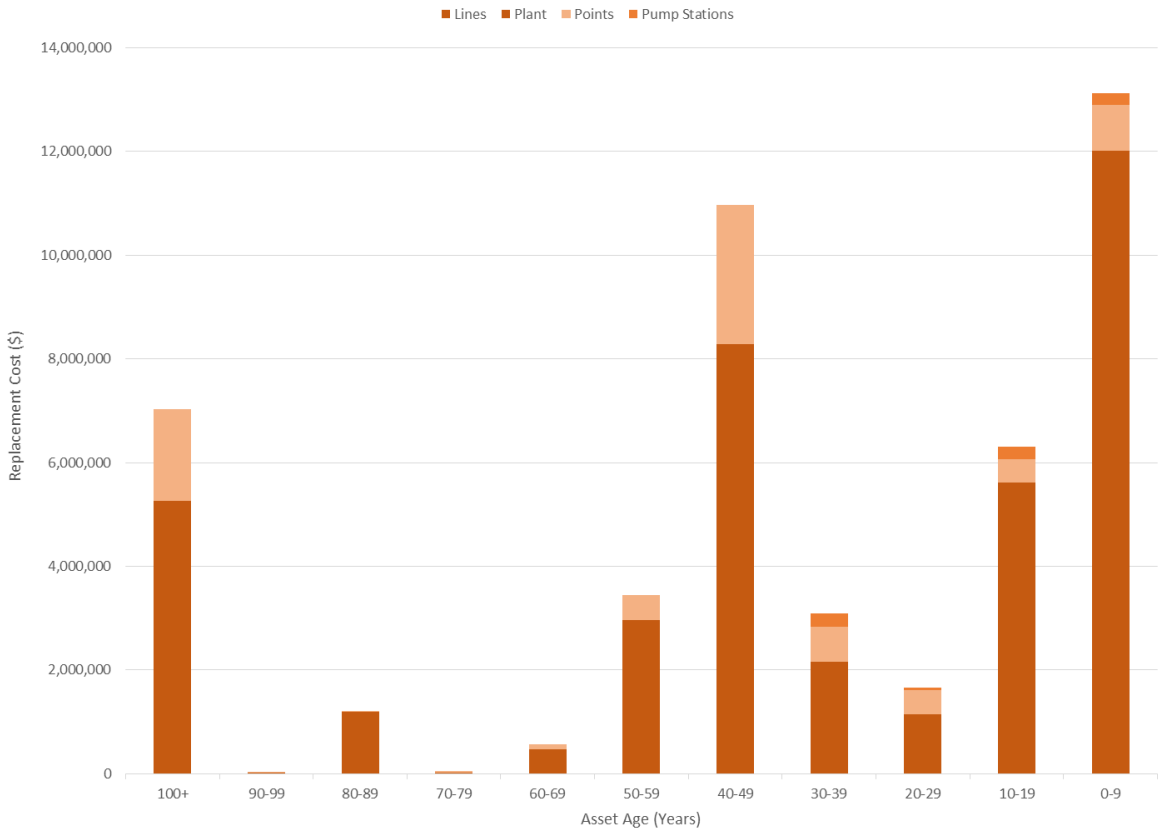
Network	Length of Mains (km)
Bulls	16.5
Hunterville	5.7
Koitiata	0.9
Mangaweka	1.6
Marton	48.4
Rātana	3.7
Taihape	22.1
TOTAL	**99.0**

Figure 36: Wastewater Main Location by Length



The age profile for Wastewater assets in the District is given below.

Figure 37: Asset Age - Wastewater



The Bulls wastewater network was mostly constructed in the 1970s when the town moved from individual septic tanks on private properties to a reticulated wastewater system. When this network was created, property owners had to connect their septic tanks to the

reticulation. Records were sent to the Council by plumbers showing the locations of these connections, and dimensions. These have since been scanned, and the information contained within them uploaded to our asset register.

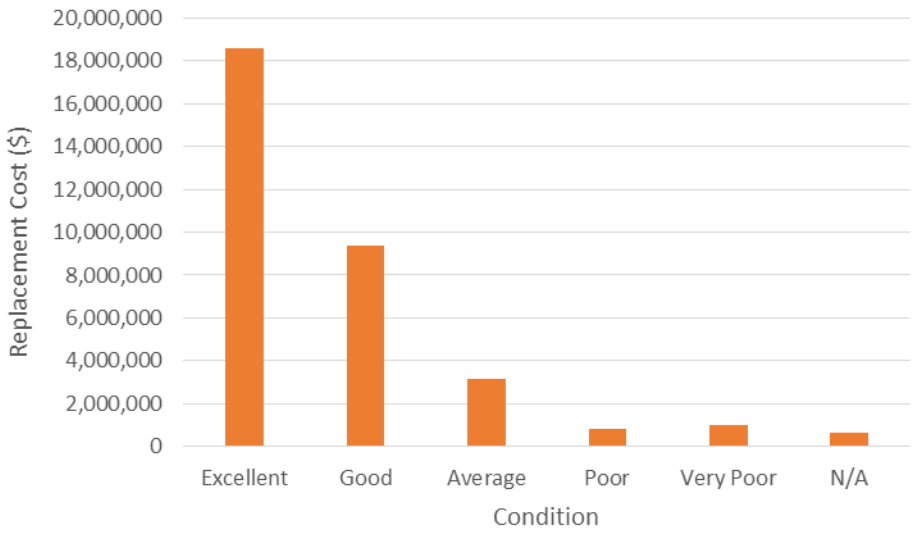
The Mangaweka network in general is very old, much of it dating from the 1890s. Relatively speaking, there have been few maintenance issues with the system. For this reason, the assets have not been inspected as frequently as assets on our other wastewater networks, and information is lacking. The system has, however, had CCTV work done on its entirety, and these records have been captured.

Much of the wastewater reticulation in Marton was installed in the 1970s when the new treatment plant was constructed, so data is fairly reliable. There are extensive hard copy plans for Marton, and Council has had access to field books containing invert levels. Where the installation years of older pipes have been in doubt, they have been assigned a nominal installation year of 1910. This is the reason why a large proportion of Marton's wastewater assets are recorded as being more than 100 years old.

The wastewater network in Rātana was installed fairly recently, and there are few issues with lack of asset information. The reticulation is predominantly PVC and was laid in the 1980s.

Condition information for Wastewater presented in the following sections is for lines and points (mains, manholes, etc.). Insufficient data is held on condition for treatment plant or pump station assets to display. Improvement of data will be undertaken. The graph below shows condition information for the District as a whole.

Figure 38: Asset Condition - Wastewater



5.6.1 Bulls

The Bulls wastewater network was installed in three stages from 1974 to overcome concerns about groundwater pollution caused by septic tank discharges. The Council has also inherited sewer drains installed by the Ministry of Defence for an Air Force housing block.

The network operates primarily by gravity with one small lift pump station required on a lower river terrace.

The entire community is serviced including a small industrial area including food processing. The town's abattoir runs and maintains its own oxidation pond system.

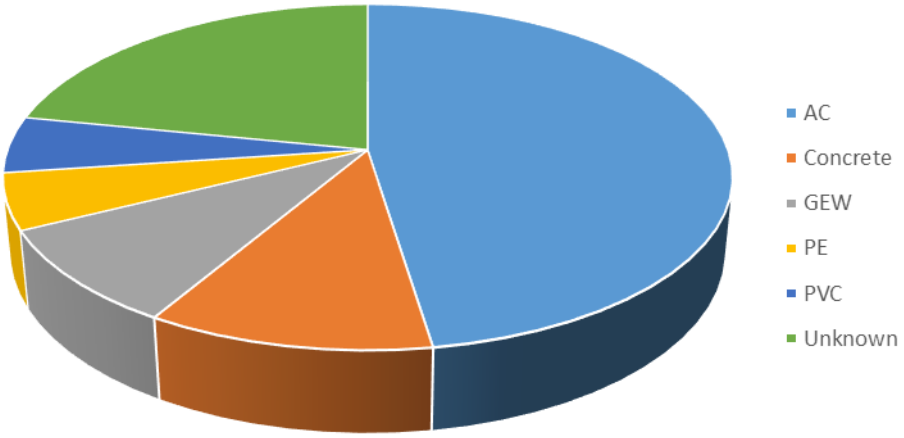
The extent of the Bulls network can be seen in Figure 39.

Figure 39: Bulls Wastewater

The Bulls wastewater network comprises pipelines ranging from 100 to 375 mm in diameter. The network is relatively young with an age of less than 40 years. The majority pipe material is Asbestos Cement, which has exhibited accelerated deterioration in other communities. However, there is very little industrial waste in the township and the expected remaining life for this material is expected to be longer than elsewhere.

The predominant wastewater pipe material in use in Bulls is Asbestos Cement. There is, however, around a quarter of pipes for which the material is unrecorded (Figure 40).

Figure 40: Pipe Material – Bulls Wastewater



The large amount of "unknown" pipe material can be shown to be the lateral connections from private property to the main. It is assumed these would be GEW pipes if they are part of the original construction.

5.6.1.1 Condition

The embankment around the wastewater ponds has been damaged by the failure of the concrete waveband in several locations. The quality of the original concrete waveband is poor and in places the slope of the embankment is such that concrete has moved allowing subsequent erosion of the material behind the band. Some areas have been repaired by filling the voids behind the concrete band with mass concrete. In some of these locations the repair work has not been particularly successful with continuing damage occurring. These observations indicate that the deterioration of the waveband and embankment will continue and in the long term failure of part of the embankment could occur.

The mechanical screen is well maintained and in good condition.

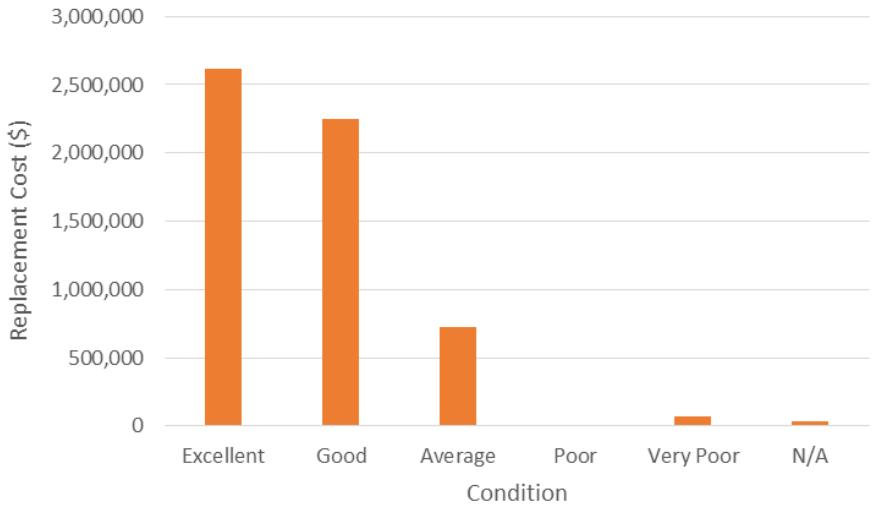
The pump structure is in reasonable condition. The power/control cabinet has been renewed recently to alleviate heat build-up and reliability issues. Telemetry systems have a redundant system which can be switched on when the older system fails.

The reticulation is generally in good condition. The only known problem is the build-up of fats in the Air Force housing area. The surface condition of some larger concrete pipes near the treatment plant shows exposed aggregate material suggesting chemical attack.

The bulk of the reticulation was installed in the 1970s. The condition profile is good with less than 5% of the network being in poor or very poor condition.

Asset condition information for Bulls wastewater is shown in Figure 41. Most assets are in either "Excellent" or "Good" condition.

Figure 41: Asset Condition – Bulls Wastewater



5.6.1.2 Capacity

The ponds are considered to be oversized for the community and this provides an extra level of security for any possible growth or infiltration.

Council has identified the need to control the quantity of infiltration and inflows to reticulated systems, including Bulls. This is extremely important in terms of the capacity of the sewerage system. Heavy rainfall flows, far in excess of the normal flows, have been and will be experienced in the sewerage networks from time to time. While the sewerage system has been designed to carry some extra water during storm flow conditions, flows far in excess to non-peak flow will lead to low lying access chambers and gully traps in some areas of the sewerage network to overflow. Smoke testing has been found to be more effective that visual inspections alone. I&I investigations have been carried out, and findings will be used to improve network performance.

The performance grading for the pipe network is largely determined by the occurrence of infiltration of ground water, tree roots or other sources of restricted flow. Approximately 4% of the network is considered to have poor or very poor performance. Despite much of the reticulation being laid in private property, tree roots are not a major issue.

Capacity information relating to Bulls Wastewater is given in the table below. The Riverlands plant has its own wastewater system, and is not included in these figures.

Table 29: Asset Capacity – Bulls Wastewater

Parameter	Comments	Data
Population connected	Prior to 2013 Census	1,800 persons
Pump Stations	Domain Road Water Treatment Plant	2

Parameter	Comments	Data
Consent Limit	Discharge from Bulls oxidation pond to Rangitīkei River	515 m^3/day
Discharge (2015-2016)	Average daily	520 m^3/day
	Peak daily	2,359 m^3/day
Treatment Efficiency	Maximum throughput	1,000 m^3/day

5.6.1.3 Performance

The treatment processes in use at the plant are indicated below:

Table 30: Treatment Processes – Bulls Wastewater

Treatment Type	Processes
Primary	Mechanical screen
Secondary	Primary pond (1.978 ha) - aerated Secondary pond (1.648 ha)

The form of upgrading of the Bulls oxidation ponds likely to be required needs to be able to reduce the suspended solids concentration, bacteria concentration, ammonia concentration, phosphorus concentration and preferably the soluble inorganic nitrogen (SIN) concentration.

Key issues include:

- The ponds are oversized for the current population. There is an opportunity for a trade waste agreement with Riverlands Meat Processors to accept pre-treated effluent from their adjacent oxidation ponds.
- Large portions of the network are laid across private property causing issues around maintenance access and property subdivision development.

The Bulls ponds experience significant algae growth over certain summer months.

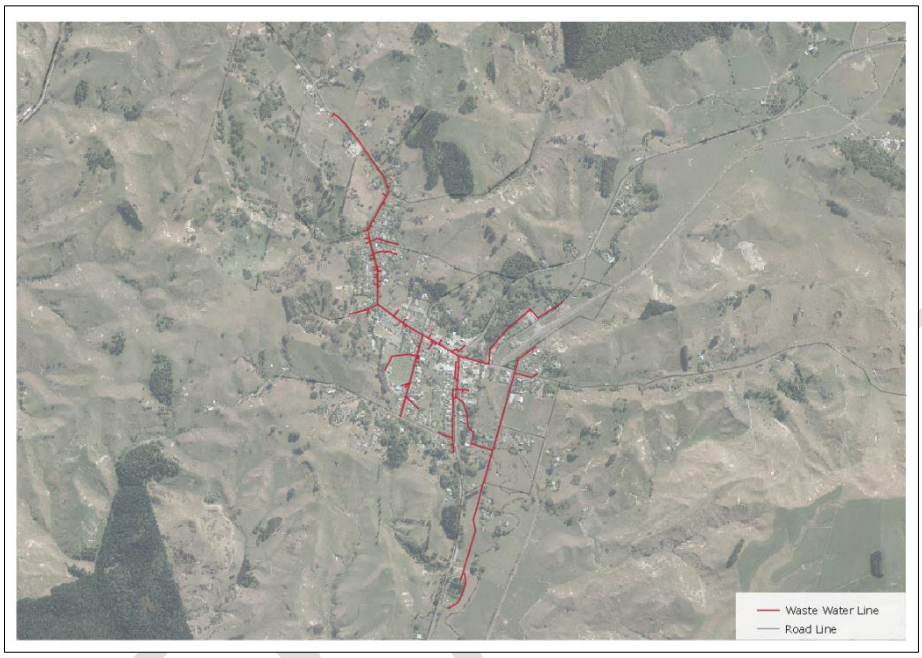
5.6.2 Hunterville

Hunterville is a small town in the Rangitīkei District and located on State Highway 1 about 40 kilometres north of Bulls. The town has a population of approximately 450 people and is mainly a support town for the rural community in the area. The wastewater network comprises largely earthenware pipes that were installed around 1910. The reticulation operates exclusively by gravity flow.

Wastewater from Hunterville is treated in primary and secondary oxidation ponds that are located between State Highway 1 and the Porewa Stream, approximately 500 m south of Hunterville. Treated effluent is discharged via an open drain to the Porewa Stream under conditions set by resource consent.

The extent of the area served by the Hunterville wastewater network can be seen in Figure 42.

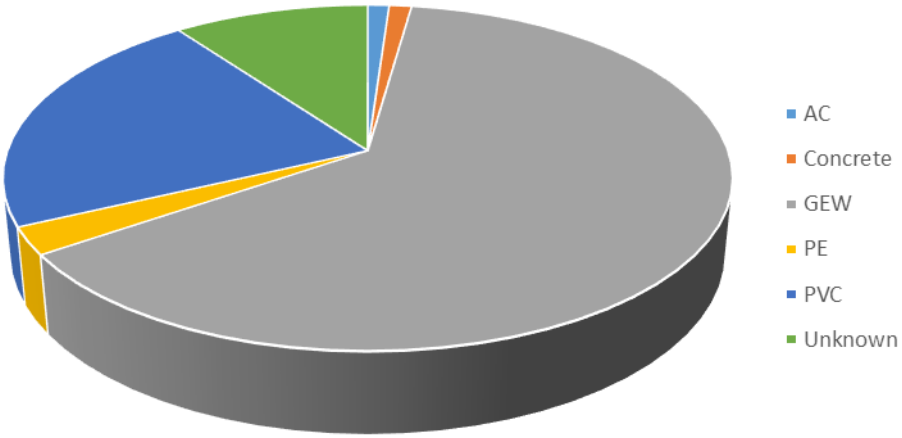
Figure 42: Hunterville Wastewater



Graphs of pipe age and material for the wastewater system in Hunterville follow. 50% of the reticulation was installed in the 1910s, and is now around 100 years old.

Because of the age of the infrastructure, most pipes on the Hunterville wastewater network are constructed from glazed earthenware. There is a substantial amount of newer, plastic pipe however (as seen in Figure 43).

Figure 43: Pipe Material – Hunterville Wastewater



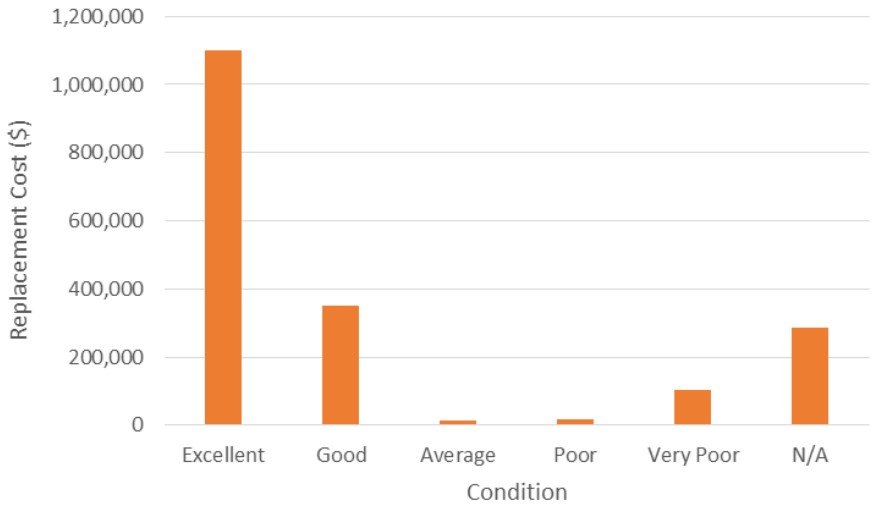
5.6.2.1 Condition

The system consists of two primary treatment ponds, with an outflow to the Porewa Stream.

A large proportion of the network is still the original earthenware pipe laid in the 1910-1930 period and is generally in very poor condition. It is nearing the end of its service life. There is a considerable infiltration problem due to the poor condition of the older pipes in the system.

The condition of our wastewater assets in Hunterville is mostly “Excellent”, with a number rated “Good” and few assets rated lower than this.

Figure 44: Asset Condition – Hunterville Wastewater



5.6.2.2 Capacity

Much of the original pipework from 1910-1930 is subject to infiltration. During wet weather this overwhelms the ability of the oxidation ponds to provide proper treatment. Heavy rainfall flows, far in excess of the normal flows, have been and will be experienced in the

sewerage networks from time to time. While the sewerage system has been designed to carry some extra water during storm flow conditions, flows far in excess to non-peak flow will lead to low lying access chambers and gully traps in some areas of the sewerage network to overflow. Council has identified the need to control the quantity of infiltration and inflows (I&I) to reticulated systems, including Hunterville. This is extremely important in terms of the capacity of the sewerage system. These I&I issues can lead to emergency discharges of wastewater occurring from the treatment plant during winter. Upgrade work to the plant is planned to prevent this occurring, and ongoing I&I investigations will contribute to solving this problem.

Information on capacity is given below.

Table 31: Asset Capacity – Hunterville Wastewater

Parameter	Comments	Data
Population connected	Prior to 2013 Census	444 persons
Pump Stations	None	0
Consent Limit	Discharge to land that enters Porewa Stream	250 m^3/day
Discharge (2015-2016)	Average daily	191 m^3/day
	Peak daily	804 m^3/day
Treatment Efficiency	Maximum throughput	1,152 m^3/day

5.6.2.3 Performance

Hunterville's Wastewater Treatment Plant utilises the processes below:

Table 32: Treatment Processes – Hunterville Wastewater

Treatment Type	Processes
Primary	Bar screen
Secondary	Primary pond - aerated Secondary pond (total area 0.853 ha) Wetlands
Phosphorus removal	Alum dosing

Treatment Type	Processes
Primary	Clarifier
Tertiary	UV disinfection

5.6.3 Koitiata

Koitiata is a small beachside community with a mainly seasonal population. The wastewater network is small and usually operates well below design capacity. The Koitiata sewer network serves a limited population with 17 connections. The community has a total seasonal population of between 100 and 250 people.

The Koitiata wastewater network was installed in 1986 when the Council built a new subdivision. The network serves only this subdivision and the camping grounds ablution block. The wastewater drains by gravity to a pump station outside the camping grounds and is then pumped to the oxidation pond. Effluent from the pond is discharged to land within the surrounding natural wetland in a disposal area consisting of six rows of 200 mm slotted pipe into the sand.

Figure 45 shows the extent of the Koitiata wastewater network.

Figure 45: Koitiata Wastewater

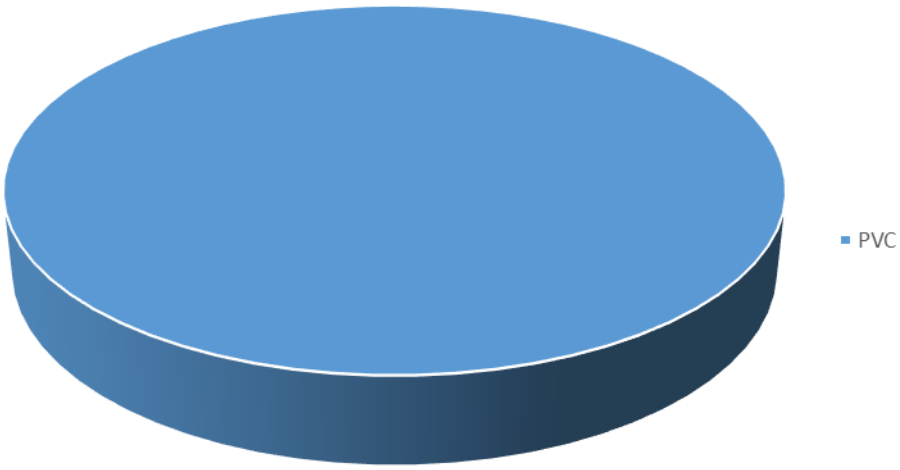
A key issue is the compliance issues of the majority of the septic tanks in Koitiata. Regardless of the material of construction, a septic tank must be watertight and structurally sound to protect the environment and function properly. A survey of septic tank systems, and sampling of groundwater, has been carried out by Council. This has revealed that there is no contamination of groundwater by septic tank effluent. The results have been communicated to Horizons Regional Council, which is the governing authority for septic tank discharges.

As part of its Long Term Planning process, Council will investigate the provision of a reticulated wastewater system at Koitiata, in consultation with the community.

The Koitiata wastewater network is only 25 years old. No CCTV has been conducted at Koitiata as there have been no faults reported, and the system is relatively new.

Being relatively new reticulation, all Koitiata wastewater pipes are constructed from uPVC (see Figure 46).

Figure 46: Pipe Material – Koitiata Wastewater



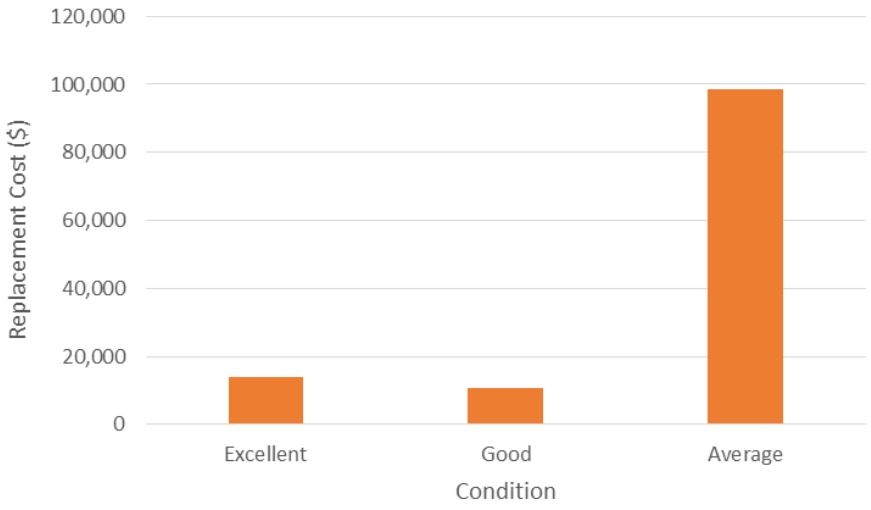
5.6.3.1 Condition

The pond is in good condition and shows no condition-related problems. The butenyl liner, however, is deteriorating and in need of replacement within the next 5 years. The intention is to replace it with a similar liner of modern material (most likely PE). Plans will need to be developed as to how this is carried out while leaving the system operational. The pump station operates some three times each day, providing inflows to the plant. The solution may be to install a bypass or a holding tank. The pond will be desludged prior to liner replacement. One potential option will be to carry out liner replacement in summer, and to tanker out effluent during the period in which the pond is not operational.

There are no problems experienced with the pipe network or the rising main, as could be expected of a system of this age and materials. No CCTV surveys have been carried out in this area due to the low probability of such a recent network needing work.

The overall condition of wastewater assets here is shown in Figure 47. Most of the assets are in only “Average” condition, but none are recorded as having “Poor” or “Very Poor” condition.

Figure 47: Asset Condition – Koitiata Wastewater



The pumping line is buried in sand country, and may be exposed to vehicular damage as it is laid adjacent to a forestry track.

5.6.3.2 Capacity

Capacity data for Koitiata are given below.

Table 33: Asset Capacity – Koitiata Wastewater

Parameter	Comments	Data
Population connected	Prior to 2013 Census	58 persons
Pump Stations	Prior to WWTP	1
Consent Limit	Discharge from oxidation pond to land	16.2 m^3/day (based on inflow)
Discharge[1] (2015-2016)	Average daily	3.1 m^3/day
	Peak daily	7.0 m^3/day
Treatment Efficiency	Maximum throughput[2]	25.9 m^3/day

The plant is designed to only cope with the original 17 properties in the subdivision. Maximum loading for the pond is 58 persons. The census data indicates a usually resident population of 93 and a total of 125 properties. This would rise seasonally to well over 250 people. There is pressure from other residents to connect to the system to satisfy infill

[1] Based on inflow records from 12/4/2016 to 30/6/2016.
[2] Based on WWPS outflow of 0.0003 m^3/s, running for 24 hours.

housing or new subdivisions. It is suspected that some non-approved connections have been installed by local residents.

5.6.3.3 Performance

Treatment at Koitiata is briefly described below.

Table 34: Treatment Processes – Koitiata Wastewater

Treatment Type	Processes
Primary	Septic tanks at individual properties (except campground)
Secondary	Primary pond (625 m^2)

The pond has a butenyl liner, but as mentioned above its condition is deteriorating and it is in need of replacement.

5.6.4 Mangaweka

The Mangaweka wastewater network was established in 1910 as reticulated pipe network directing effluent to a community septic tank. The effluent from this tank discharged directly into the Rangitīkei River. In 2006 a new treatment plant was commissioned for the community after public consultation. This provides a much higher quality effluent to meet the new resource consent conditions.

The reticulation does not service all properties within the town: properties on Raumaewa Road, Cage Road, Weka Street and the south end of Mangawhahariki Road (SH1) are not serviced. A separate waste disposal system operates at the Mangaweka Campground, but is not evaluated in this Asset Management Plan.

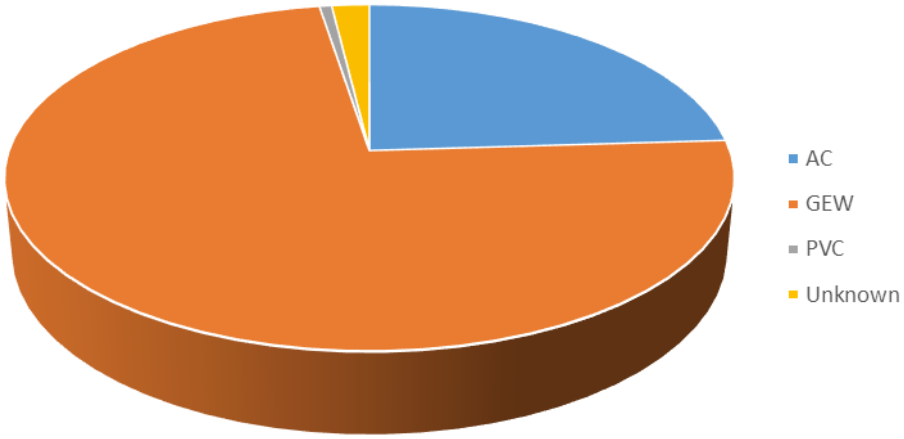
Following treatment, disposal of effluent is via a rock bed and a discharge over the adjacent cliff to the Rangitīkei River below.

The extent of the Mangaweka wastewater system is shown in Figure 48.

Figure 48: Mangaweka Wastewater

There are mostly two materials found in wastewater pipe assets in Mangaweka: glazed earthenware and Asbestos Cement (Figure 49).

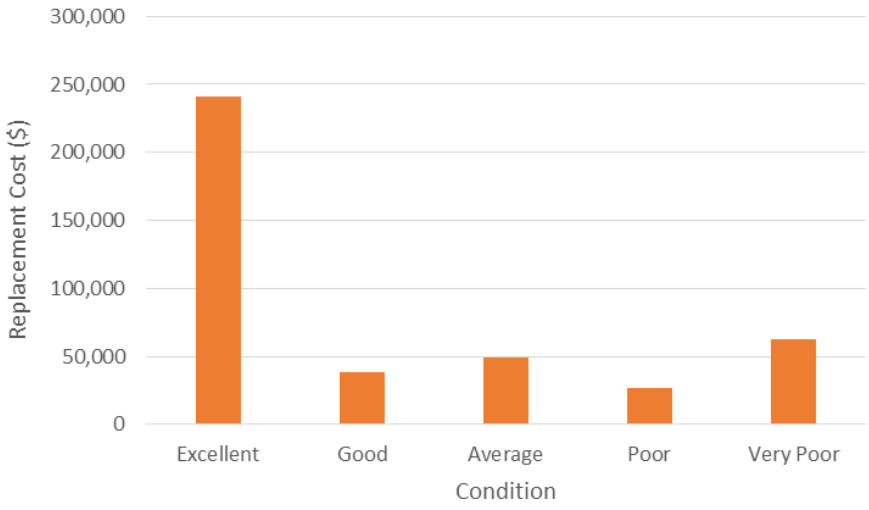
Figure 49: Pipe Material – Mangaweka Wastewater



5.6.4.1 Condition

The condition of Mangaweka wastewater assets is mostly rated as “Excellent” (see Figure 50).

Figure 50: Asset Condition – Mangaweka Wastewater



5.6.4.2 Capacity

Information on population connected and plant capacity are given in the following table.

Table 35: Asset Capacity – Mangaweka Wastewater

Parameter	Comments	Data
Population connected	Prior to 2013 Census	Approx. 60% of resident population of 250
Pump Stations	None	0
Consent Limit	Discharge to Mangatera Stream	90 m^3/day
Discharge (2015-2016)	Average daily	Unavailable
	Peak daily	Unavailable
Treatment Efficiency	Maximum throughput	360 m^3/day

There are I&I issues in Mangaweka which have yet to be addressed. The focus on I&I in the District in recent times has been on Bulls, Hunterville and Taihape; and historically on Marton.

5.6.4.3 Performance

The Mangaweka wastewater treatment system is described in the following table.

Table 36: Treatment Processes – Mangaweka Wastewater

Treatment Type	Processes
Primary	Septic tanks at individual properties 2 x 70 m^3 community septic tanks in series
Secondary	Fixed film biofilters
Nutrient removal	Recirculating biofilter
Tertiary	UV disinfection

5.6.5 Marton

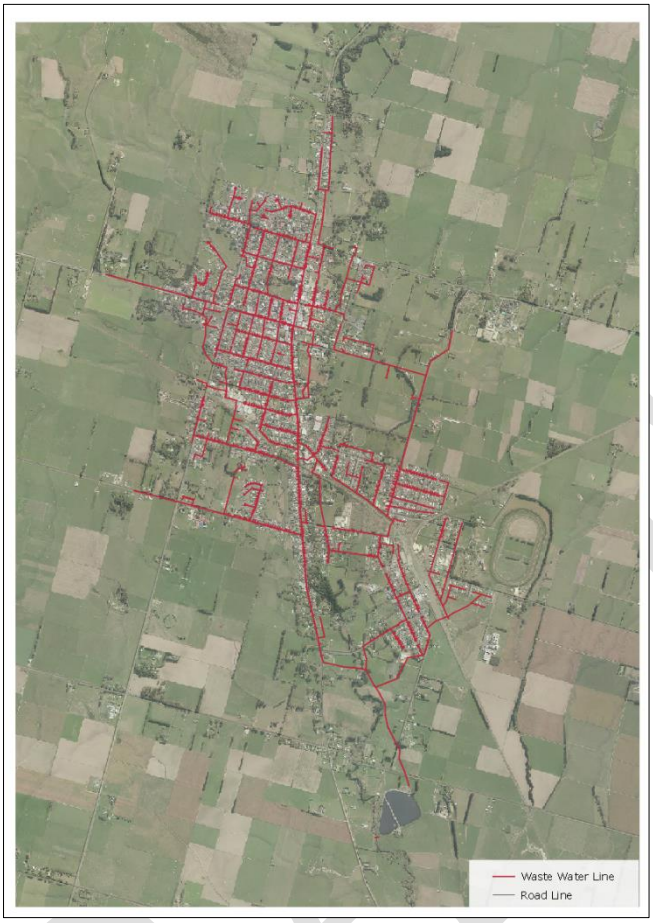
Marton is situated on mildly rolling terrain, which gradually slopes to the oxidation ponds at the south of the town. The reticulation relies entirely on gravity flow to service the properties connected.

As well as residential and commercial sewer connections, there are a handful of food processing industries. Two major inputs to the Marton WWTP are Speirs Foods and Malteurop. Both industries contribute to create imbalanced waste as sulphur, hydrogen and COD levels are higher than municipal waste, therefore the inherent odours that are produced are going to be an ongoing issue. The most significant industrial discharge, however, is Bonny Glen landfill. In recent years, leachate from the landfill has been trucked to the Marton WWTP for disposal. Negotiations are underway as to the most sustainable solution in the future. Bonny Glen have already installed some pre-treatment as a requirement of Council to help address compliance issues arising from high ammonia concentrations in the leachate.

Septage from tanker trucks is received at the King St dump station, where it is fed directly into the reticulation. The dump station in King Street (which serves both septage tanker trucks and caravans) is maintained by Council wastewater staff.

The extent of the Marton wastewater network can be seen in Figure 51.

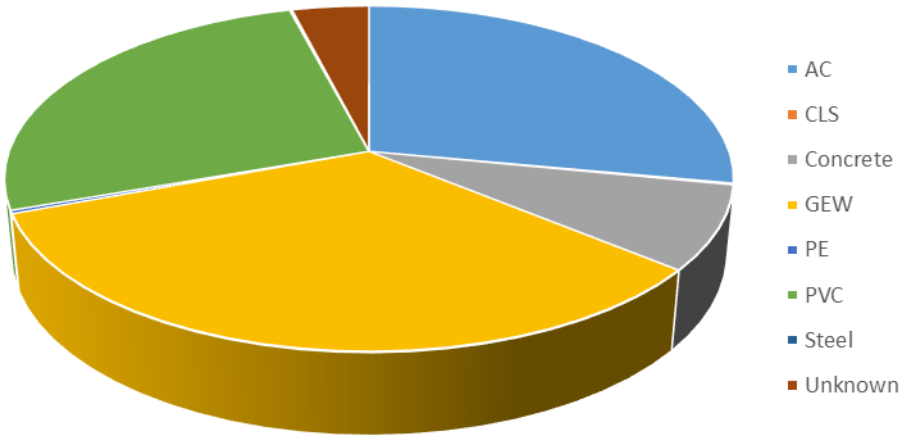
Figure 51: Marton Wastewater



The Marton wastewater network comprises pipelines ranging from 100 to 500 mm in diameter.

The most common wastewater pipe materials for Marton are Asbestos Cement, PVC and glazed earthenware. See Figure 52 for more details.

Figure 52: Pipe Material – Marton Wastewater



5.6.5.1 Condition

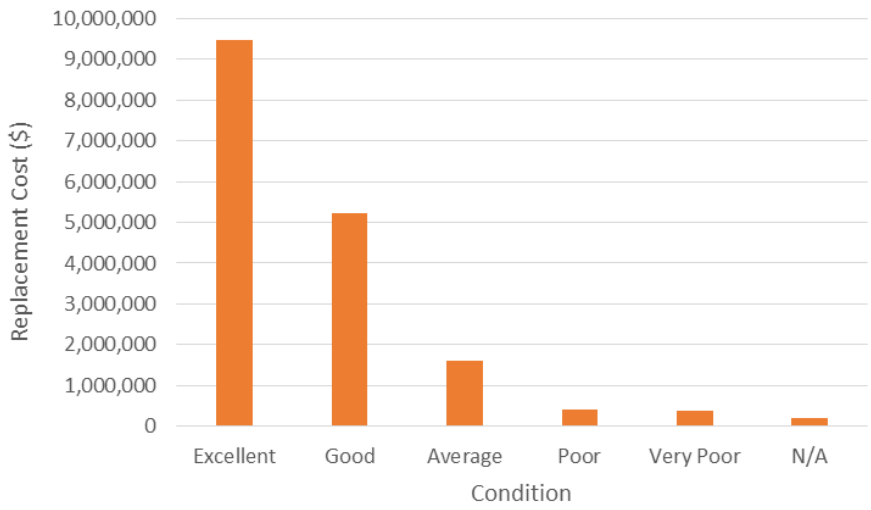
The initial two-stage oxidation ponds were built in the 1970s with the demolition of the original septic tanks, and have been progressively developed to improve the quality of effluent discharge. An aeration pond was added shortly afterward. This pond has since been upgraded to an anaerobic pond to overcome significant load and flow variations. This pond will provide a buffer and preliminary treatment for slugs of strong organic waste. Its objective is to partially stabilize the incoming wastewater. Another objective is to considerably reduce the organic loading to the secondary treatment units i.e. the secondary and tertiary oxidation ponds, before passing through to the filtration plant and UV disinfection system. The recirculation sand filter plant was built in 1997 and is in good condition.

The original sewer reticulation dates back to 1910, built from glazed earthenware. Development work in the 1970s saw the addition of asbestos concrete or concrete pipes, replacing 40% of the reticulation. The original earthenware pipes are generally in poor condition and are now causing infiltration and overflow problems due to root intrusion, collapsed pipes, offset joints and poor quality laying. Recent renewals of critical areas of the network especially in Wellington Road and Grey Street have alleviated the surcharging and overflows of recent years.

Asset condition confidence is generally good for these older pipes, and condition monitoring will target these areas with updated information added to the asset register on a regular programmed basis. Areas with overflow problems are recorded and will be assessed in prioritising-planned renewals.

Figure 53 summarises the condition data held on Marton Wastewater assets, most of which are in “Excellent” or “Good” condition.

Figure 53: Asset Condition – Marton Wastewater



Approximately 12% of the network is in poor or very poor (condition 4 & 5). The age of these pipes are between 60 and 100 years old. The Asbestos Cement pipes laid in the 1970s are on average in worse condition than other pipe materials of similar age. Asbestos Cement pipe

has suffered in some areas of town due to the aggressive acidic attack by industrial wastes suggesting poor material choices in the past. Overall most pipes in the network are in good condition.

5.6.5.2 Capacity

Under the conditions of the current resource consent, the change in water quality of the Tutaenui Stream must lie within required levels rather than a specified quality of effluent. Therefore, the plant has the ability to bypass the filter when there is high stream flow. Since the installation of the tertiary treatment filters, the effluent has met resource conditions except for ammonia levels.

The static population growth in Marton indicates little requirement for future reticulation development. Periodic flow monitoring at the ponds indicates a high level of infiltration/inflow corresponding with winter rainfalls. This poses a risk to the quality and quantity conditions of the resource consent as the biological treatment processes are slowed down with cooler temperatures, and the extra flow reduces detention time. Private water consumption and therefore sewage production is expected to rise slightly despite the static growth rate.

Significant wet weather volume infiltration is over represented in the older catchment areas and deeper sewers. Although the oxidation ponds are currently designed to cope with current inflow, it places unnecessary loading on the treatment facilities and increases the potential for overflows in the network. Sewer systems tend to failure progressively and undetected over time through infiltration, joint displacements and build-up of debris. Occasional blockages are generally cleared within the stated level of service. A couple of areas have sluggish flow and would benefit from an annual jetting operation to remove deposits. These lines are either on a shallow gradient and unable to self-clean, or receive discharges from properties without grease traps.

The following table gives an indication of the capacity at Marton WWTP.

Table 37: Asset Capacity – Marton Wastewater

Parameter	Comments	Data
Population connected	Population not yet determined	2,200 properties connected
Pump Stations	None	0
Consent Limit	Discharge to Tutaenui Stream	No volume limit; only pollutant concentration/loading limits
Inflow (2015-2016)	Average daily	2,191 m^3/day
	Peak daily	5,263 m^3/day
Treatment Efficiency	Maximum throughput	3,000 m^3/day

In some areas of the network, the system capacity is exceeded especially during wet weather. Some areas have experienced overflows from manholes. A hydraulic model of the network has identified these areas requiring larger capacity pipes and these upgrades will be undertaken subject to the renewal plans.

Capacity is not an issue at the plant itself. The issues at Marton WWTP are around performance and compliance (below).

5.6.5.3 Performance

The treatment plant at Marton uses the following processes:

Table 38: Treatment Processes – Marton Wastewater

Treatment Type	Processes
Primary	Grit trap Mechanical screen (auger)
Secondary	Anaerobic pond Primary pond (5.421 ha) - aerated Secondary pond (2.670 ha) Continuous moving bed filtration system
Tertiary	UV disinfection (not in use)
Sludge handling	Holding tanks Recirculation to plant inflow Sludge disposal system

As mentioned earlier, the acceptance of leachate from Bonny Glen leachate has caused major compliance issues at the plant, with respect to ammonia in particular. Bonny Glen have now installed pre-treatment in an attempt to mitigate some of the issue and comply with Council requirements. Further work is required in order to make the plant consistently compliant with consent conditions. One possibility now under consideration is whether to pipe wastewater to Bulls for treatment and discharge. This would relieve pressure on the Tutaenui Stream, which at some times of the year has no natural flow.

The sludge holding tanks at the plant are in need of emptying, as one has around 1 m depth of sludge. This is planned to be carried out in 2017-2018 under maintenance budgets (at an estimated cost of some $2,500).

Periodically, algae is an issue at the treatment plant.

5.6.6 Rātana

The Rātana wastewater network was installed in 1979. The Rātana oxidation ponds (a two-pond system) are located off Rangatahi Road, to the west of Rātana Township. They provide treatment for effluent from Rātana's reticulated sewerage system. The final effluent is discharged into an unnamed tributary of Lake Waipu. The network operates entirely by gravity. The pipelines are laid predominantly on private property.

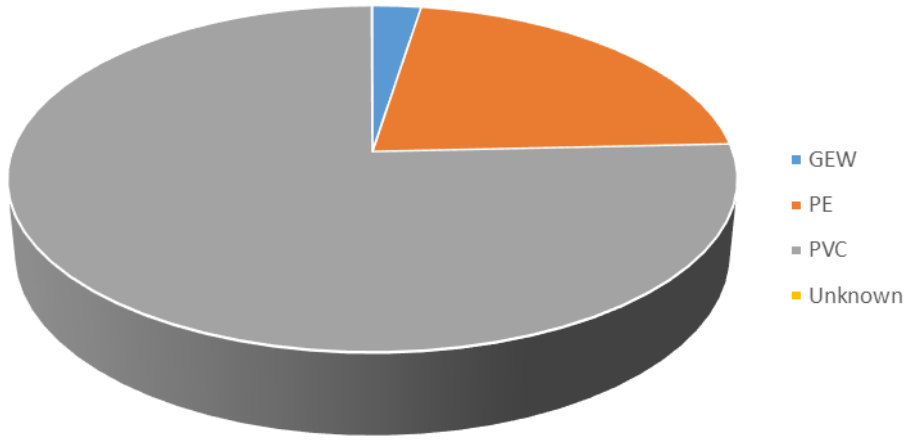
The extent of the Rātana network is shown in Figure 54.

Figure 54: Rātana Wastewater

Charts showing the age and material of the sewer pipes in Rātana follow. Pipes make up the bulk of the value of a wastewater system, so it is important to know this crucial data.

Wastewater pipes in Rātana, due to their fairly recent installation, are entirely PVC plastic. This is shown in Figure 55.

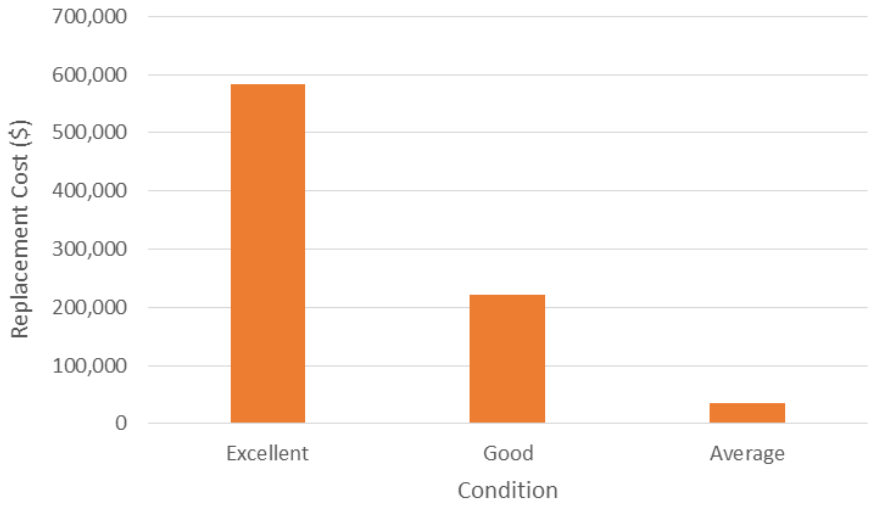
Figure 55: Pipe Material – Rātana Wastewater



5.6.6.1 Condition

A summary of condition information for all Rātana assets is given in Figure 56. Most of the assets are in "Excellent" condition, with a significant amount "Good" and a small number "Average".

Figure 56: Asset Condition – Rātana Wastewater



5.6.6.2 Capacity

While the treatment plant can meet current consent conditions, there are occasions on which it is non-compliant, particularly with respect to nitrogen. This is a concern because of the nature of the ultimate receiving environment (Lake Waipu), particularly given its significance to the people of Rātana. As part of an application for a new discharge consent, consideration will be given to the treatment process used and also the receiving environment, in order to facilitate the construction of an upgraded plant that will meet the aspirations of the community as well as any consent conditions.

The performance of the wastewater reticulation system is adequate for all current needs, although it is at full capacity during the annual Rātana festival. The only problems encountered with the reticulation involve fat deposits. These are cleared promptly and the cause is investigated and rectified where possible. As mentioned in Section 4.2.2, the proposed 60-lot subdivision at Rātana will have the effect of increasing wastewater flows. The current treatment plant for Rātana was sized for the existing township. The increases in wastewater flows that would come about from such a substantial development mean that investigation will be required into the ability of the current system to cope. The most likely scenario is that some of our wastewater mains would need upsizing, and that the treatment process would need to be enhanced or expanded upon. As investigation work proceeds, funding will be budgeted in future years to deal with these additional requirements. The ultimate size of this subdivision is currently projected to be 120 lots, with the second group of 60 lots coming on line in 5-10 years' time.

There have been no significant failures of the network or treatment plant.

Indications are given below of the capacity of the Rātana wastewater system.

Table 39: Asset Capacity – Rātana Wastewater

Parameter	Comments	Data
Population connected	Prior to 2013 Census	366 persons
Pump Stations	None	0
Consent Limit	Discharge to unnamed tributary of Waipu Stream	136 m^3/day
Discharge (2015-2016)	Average daily	Unavailable
	Peak daily	Unavailable
Treatment Efficiency	Maximum throughput	240 m^3/day

Analysis of flow data has revealed that I&I issues exist at Rātana. Investigation and resolution of these will be programmed. Reference to this work will be made in the application for a new discharge consent.

5.6.6.3 Performance

Treatment processes currently used at Rātana Wastewater Treatment Plant are described below. These will change to some extent through discharge consent renewal.

Table 40: Treatment Processes – Rātana Wastewater

Treatment Type	Processes
Primary	Auger
Secondary	Primary pond - aerated Secondary pond (total area 0.853 ha)
Solids removal	Rock filter
Tertiary	UV disinfection (not in use)
Nutrient removal	Recirculating biofilter

Performance issues at Rātana are generally related to ammonia levels in the discharge, and are only periodic. As part of applying for a renewal of the discharge consent, a process will be selected that will future-proof the plant in terms of effluent quality as well as capacity. One strong possibility will be discharge of treated effluent to productive land, in which case high levels of nutrients would be an advantage rather than a concern.

5.6.7 Taihape

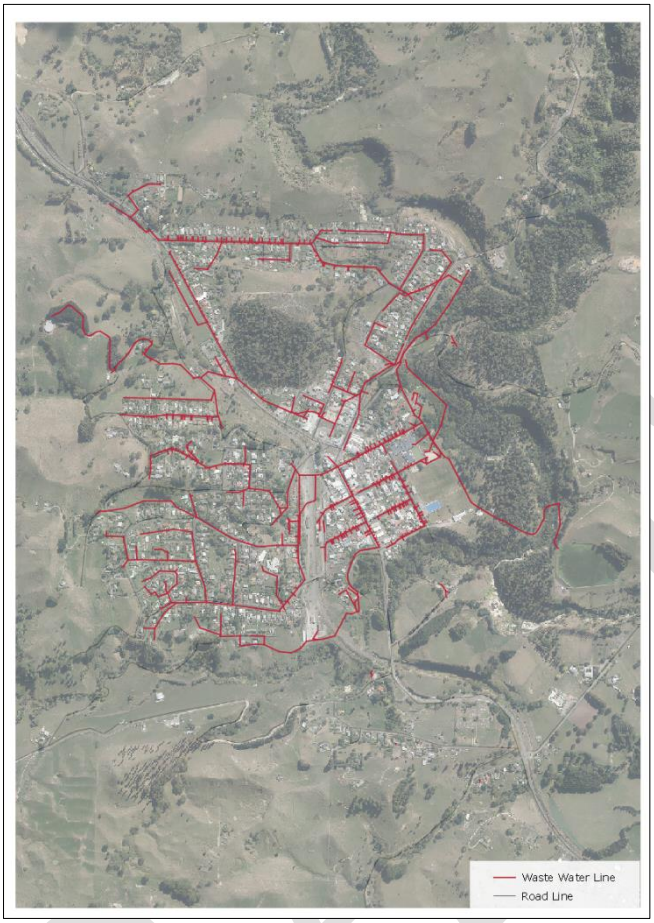
Taihape is situated on moderately steep hill country and is bounded on the east side by the Hautapu River. The system has three pump stations to forward flows onto the oxidation pond situated on the east side of the Hautapu River. The Taihape sewer network excludes the satellite catchments of Dixon Way and Mangaone Valley.

The system is very old and originally was built as a combined stormwater/effluent system until the 1940s when a stormwater network was constructed.

The oxidation pond was constructed well over 25 years ago. It was initially designed to provide for the treatment of sewage (for a population of 6,000), stormwater and other wastewater from the community of Taihape.

Figure 57 shows the extent of the Taihape wastewater network.

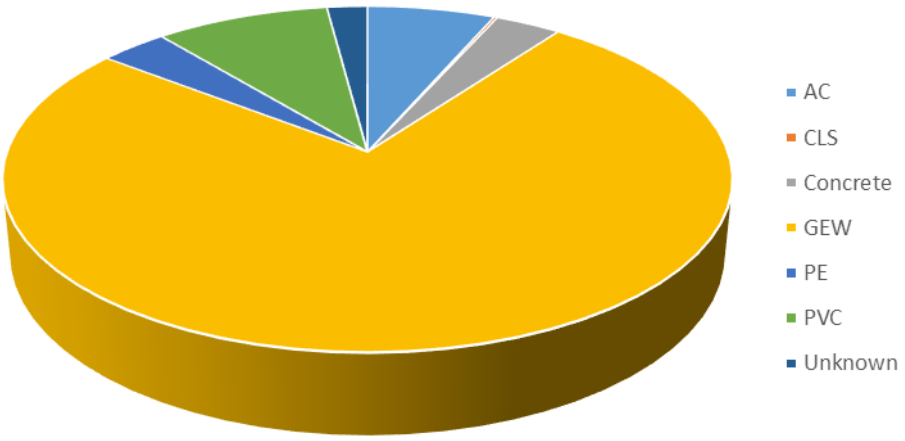
Figure 57: Taihape Wastewater



The Taihape wastewater network comprises pipelines ranging from 100 to 375 mm in diameter. Approximately 70% of the network is thought to be glazed earthenware pipes over 90 years old.

Due to the age of the reticulation (see above), most of the wastewater pipes are found to be glazed earthenware. The remaining pipes are made up of a range of material types (Figure 58).

Figure 58: Pipe Material – Taihape Wastewater



5.6.7.1 Condition

The oxidation pond is generally in good condition. There is minor seepage occurring through the pond embankment, but this is not significant enough to warrant repair. All the structures controlling the pond flow are in good condition. The pond is unlined, but does include a waveband.

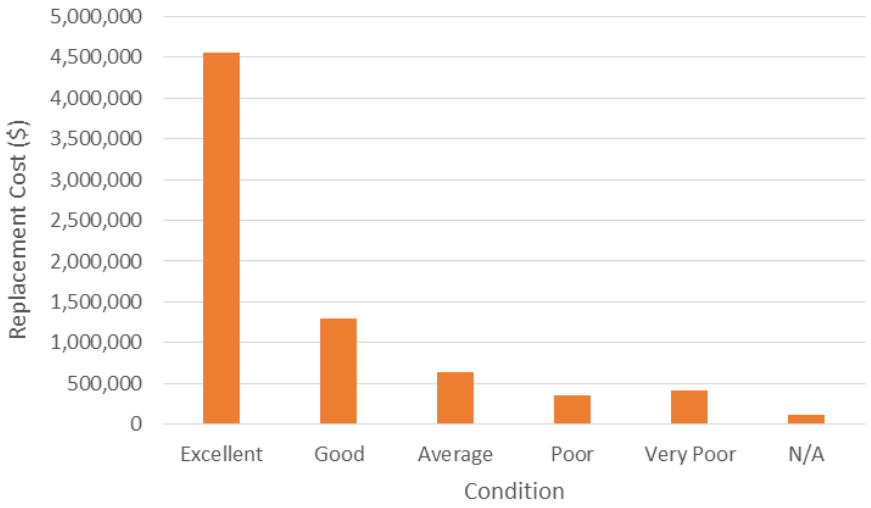
The bulk of the reticulation was installed between 1910 and 1920. This age data is considered accurate and from this we have estimated that 70% of today's reticulation was constructed during this period from 150 mm diameter glazed earthenware pipe.

Approximately 22% of the network is in poor or very poor condition. Much of the network (70%) is recorded as being glazed earthenware pipe. Poor grading scores are caused by joint displacements. This is supported both from CCTV and the infiltration studies showing high groundwater inflow.

An assessment of the capacity of the reticulation network a (modelling of the network) has now been undertaken to be able to undertake upgrade the capacity of the network to prevent overflows.

A summary of the asset condition data for Taihape wastewater is given in Figure 59.

Figure 59: Asset Condition – Taihape Wastewater



5.6.7.2 Capacity

Capacity information for Taihape is given in Table 41.

Table 41: Asset Capacity – Taihape Wastewater

Parameter	Comments	Data
Population connected	Prior to 2013 Census	2,200 persons
Pump Stations	Huia St	3
	Papakai Rd	
	Achilles Drive	
Consent Limit	Discharge onto land that enters Hautapu River when flow > 2.8 m^3/s at Alabasters.	1,200 m^3/day
	Discharge onto land that enters Hautapu River when flow ≤ 2.8 m^3/s at Alabasters.	500 m^3/day
Discharge (2015-2016)	Average daily	1,355 m^3/day
	Peak daily	3,013 m^3/day
Treatment Efficiency	Maximum throughput	3,000 m^3/day

The pond is actually over-sized for the current community, having been designed at construction for a population of 6,000 persons.

There is currently no reticulated wastewater system for Dixon Way in Taihape. The provision of wastewater services to this area in some form will be investigated by Council, to determine the best approach.

Taihape was originally built with a combined stormwater/wastewater network, which is gradually being separated. Sewer systems tend to failure progressively and undetected over time through infiltration, joint displacements and build-up of debris. Occasional blockages are generally cleared within the stated level of service. A couple of areas through private property have sluggish flow and would benefit from an annual jetting operation to remove deposits.

It is believed that there are a high number of reticulation failures that continue unobserved underground due to the terrain of the network. These failures are likely to be the cause of a majority of the infiltration problems of the network and will be identified with the condition-rating programme.

5.6.7.3 Performance

The performance grading for the pipe network is largely determined by the occurrence of infiltration of ground water, tree roots or other sources of restricted flow. Approximately 10% of the network is considered to have poor or very poor performance. Root intrusion does not seem to be as prevalent as in other communities, but there is evidence of substantial infiltration.

Treatment in use at Taihape WWTP is shown below. All wastewater for Taihape passes through the Huia St WWPS, where it is screened and then pumped across the river to the treatment plant.

Table 42: Treatment Processes – Taihape Wastewater

Treatment Type	Processes
Huia St WWPS	
Primary	Auger
Taihape WWTP	
Secondary	Primary pond (3.438 ha) - aerated
Primary	Clarifier Membrane filtration
Phosphorus removal	Alum dosing

The key performance, and compliance, issue at Taihape WWTP is flow. While the plant is capable of treating wastewater to the required quality, the amount of I&I in the system means that it periodically breaches consent limits for discharge flow. Work underway in the

reticulation on renewal of mains, and resolution of I&I issues, will alleviate these issues. See "Capacity" above.

Another issue that is problematic from time to time is the growth of algae on the pond.

5.7 Stormwater

The stormwater assets owned by Council are described in the table below.

Table 43: Asset Summary - Stormwater

Asset Group	Assets	Replacement Cost ($)	Depreciated Value ($)	Annual Depreciation ($/yr)
Lines				
Gravity Mains	45.6 km	20,161,664	12,376,778	228,017
Open Drains	7.2 km	97,197	64,818	1,402
Sump Leads	3.7 km	1,193,639	828,556	13,335
Service Connections	0.5 km	58,576	45,561	852
Subsoil	0.2 km	31,505	30,831	413
Points				
Manholes	898	3,397,938	2,116,795	33,922
Sumps	108	118,369	100,253	1,184
Wingwalls	44	185,846	127,740	1,858
Other	307	40,800	17,440	408
TOTAL		**25,285,534**	**15,708,772**	**281,391**

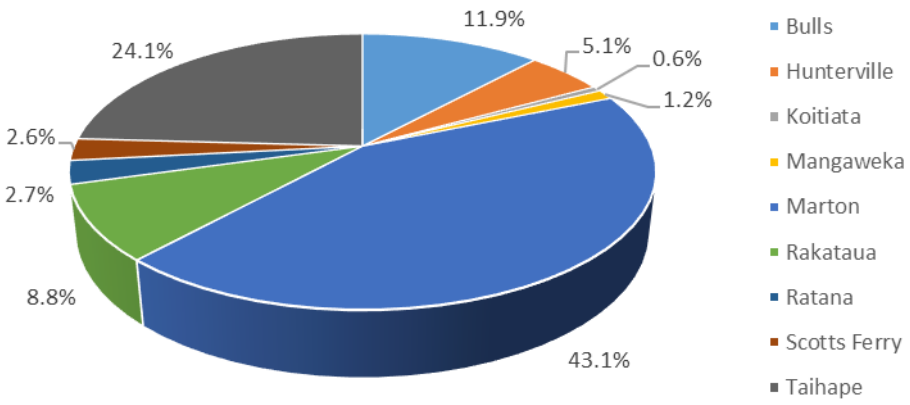
Council's stormwater networks are described, in terms of network length, in Table 44 and Figure 60 below.

Table 44: Stormwater Main Lengths

Network	Length of Mains (km)
Bulls	6.3
Hunterville	2.7
Koitiata	0.3

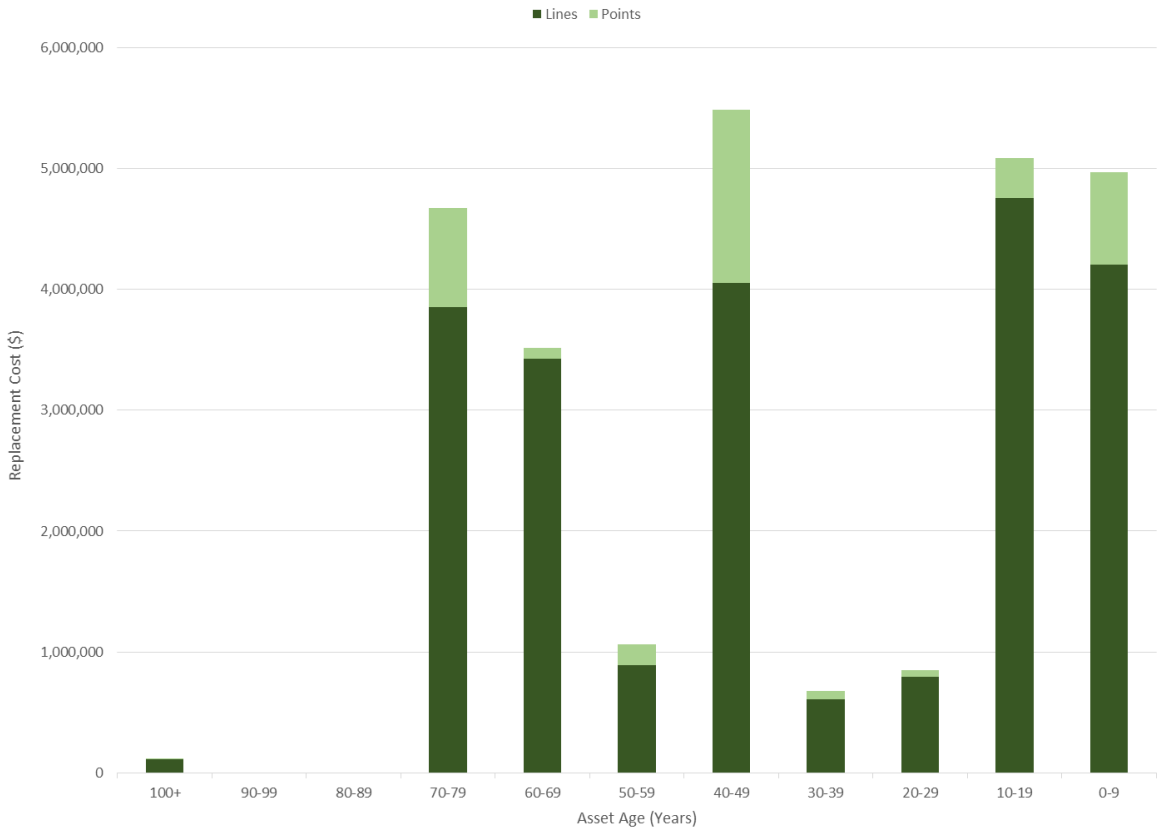
Network	Length of Mains (km)
Mangaweka	0.6
Marton	22.8
Rakataua	4.7
Rātana	1.4
Scotts Ferry	1.4
Taihape	12.8
TOTAL	**53.0**

Figure 60: Stormwater Main Location by Length



The age distribution of stormwater varies across the District. Age profile by total replacement cost of assets is given in Figure 61.

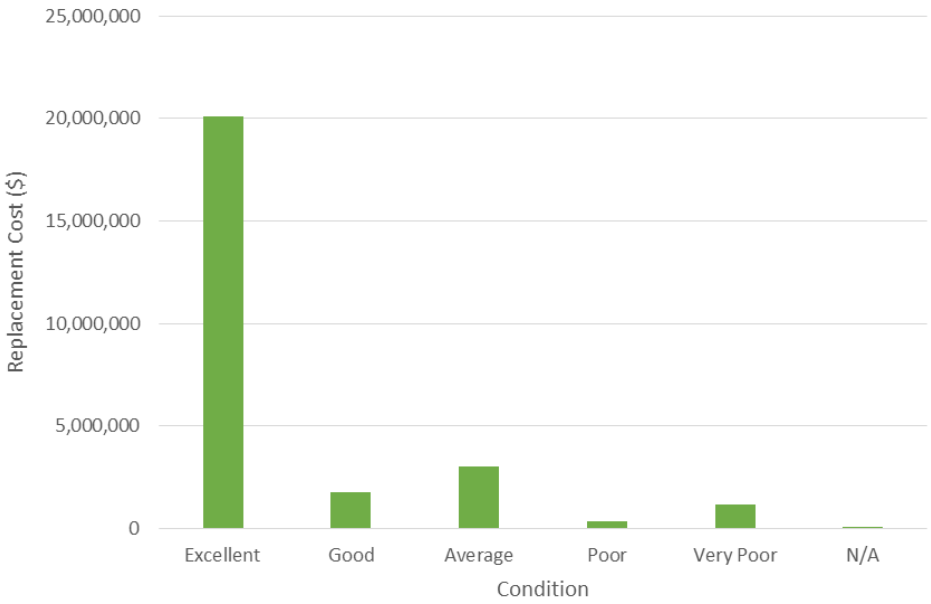
Figure 61: Asset Age - Stormwater



As well as holding information on our own stormwater assets, Council also keeps some information on stormwater systems located on private property, as well as assets owned by Horizons Regional Council. This is partly because these privately or regionally owned systems can impact on our own stormwater network, and partly to keep track of ownership in case this is not clear. The Asset Management Plan does not contain details on those assets which are outside Council ownership.

Condition information for stormwater is reasonably complete, but a large number of assets are only listed as “Excellent” since that is the default value. Condition of assets will be confirmed by inspections, and data updated where necessary. Data for the District as a whole is currently as shown below. The graphs include both stormwater lines (e.g. mains) and points (e.g. manholes).

Figure 62: Asset Condition - Stormwater



5.7.1 Bulls

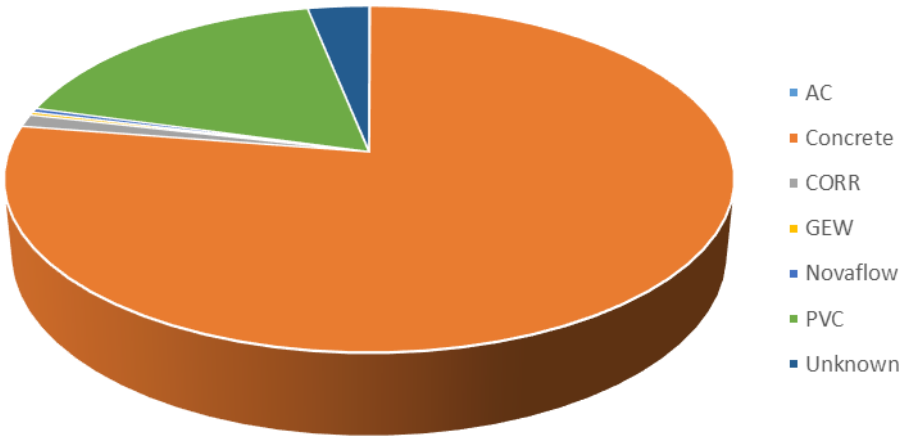
The Bulls urban stormwater network is characterised by a flat river plain on two distinct levels, serviced by public and private drains feeding into key catchments serviced by open unlined drains. These drains feed into the Rangitīkei River and the Tutaenui Stream. The Bulls stormwater network is a mixture of mainly open drains with some short sections of piped reticulation.

The extent of the stormwater system for Bulls is shown in Figure 63.

Figure 63: Bulls Stormwater

A breakdown of pipe materials used for Bulls stormwater is given in Figure 64. Predominantly, the pipes are made of concrete. But at least 17% of the pipe network is plastic. Material is unknown for approximately 3% of stormwater pipes in Bulls.

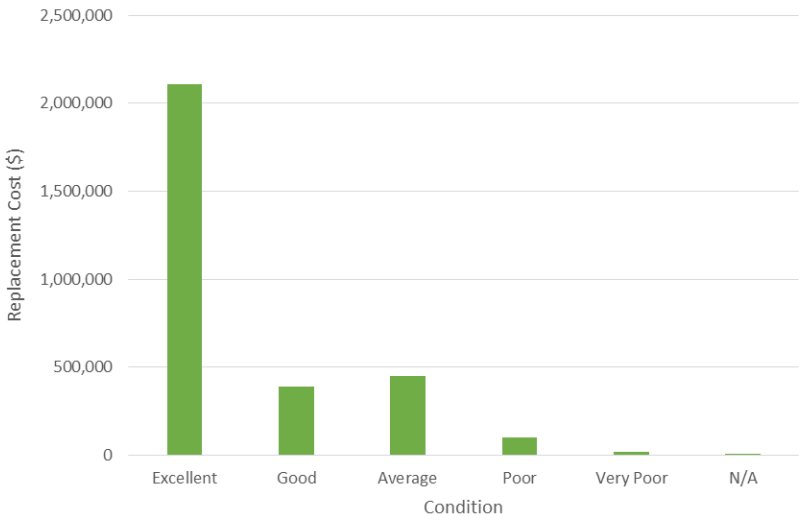
Figure 64: Pipe Material - Bulls Stormwater



5.7.1.1 Condition

The condition of Bulls stormwater assets is summarised in Figure 65. Most of the assets are still in "Excellent" condition, according to the information in our Asset Register. However, not all pipes have been visually inspected, and values may be interpolated based on pipes of similar location, age, material and diameter. Condition grading following CCTV inspections and more accurate dates of installation will allow the Council to smooth out these spikes. Some reprioritisation is expected following this work.

Figure 65: Asset Condition – Bulls Stormwater



5.7.1.2 Capacity/Performance

Background data for Bulls stormwater are given in Table 45.

Table 45: Background Data – Bulls Stormwater

Parameter	Data
Population served	1,649
Total urban catchment area	1.52 km^2
Number of catchments	4

5.7.2 Hunterville

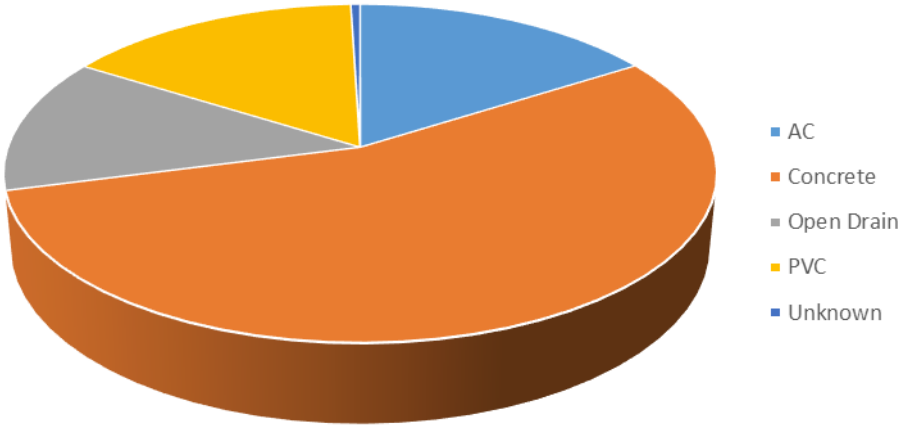
Hunterville is situated at the confluence of several valleys. The natural grades are steep and significant runoff can occur quickly. The natural grade through–out the township varies, but is generally rolling to steep. The Hunterville urban stormwater network receives stormwater runoff from the surrounding rural area, conveys it through the town collecting runoff from the urban environment on the way and discharges to the Porewa Stream catchment.

The area served by the Hunterville stormwater network is displayed in Figure 66.

Figure 66: Hunterville Stormwater

Most stormwater pipes in Hunterville are concrete, as indicated in Figure 67. There is a reasonable amount of Asbestos Cement pipe on the network as well.

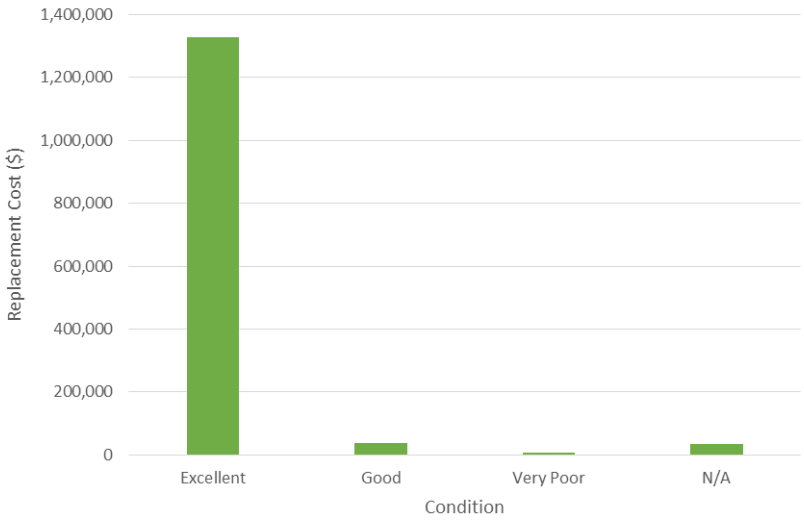
Figure 67: Pipe Material - Hunterville Stormwater



5.7.2.1 Condition

The condition of stormwater assets in Hunterville has generally been assessed as "Excellent", as seen in Figure 68. There are some gaps in information for this network, however. Condition grading following CCTV inspections and more accurate dates of installation will allow the Council to improve our asset information.

Figure 68: Asset Condition - Hunterville Stormwater



5.7.2.2 Capacity/Performance

General information on the network is shown in Table 46.

Table 46: Background Data - Hunterville Stormwater

Parameter	Data
Population served	438

Parameter	Data
Total urban catchment area	0.69 km^2
Number of catchments	11

5.7.3 Mangaweka

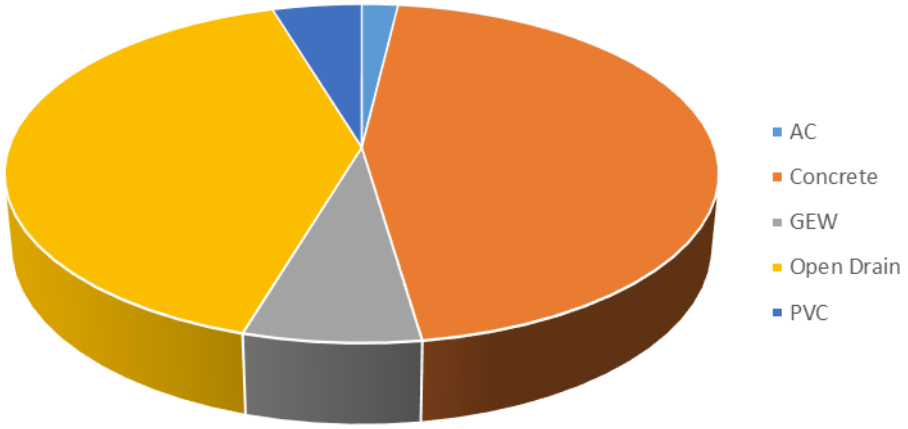
Mangaweka's urban drainage is predominately made of concrete culvert pipes laid around about 1945 connecting roadside drains. It is considered a relatively simple network. The town is situated on a river terrace and the three main drains on Bank St, Kawakawa St and Raumaewa St all drain towards the Rangitīkei River. All three drains run underneath the State Highway. There are other culverts outside the town boundary which are maintained as road assets either by the local authority or by NZTA.

The extent of the stormwater network for Mangaweka is shown by Figure 69.

Figure 69: Mangaweka Stormwater

Figure 70 shows the breakdown of pipe materials used in Mangaweka stormwater. The pipes themselves are mostly concrete, but a significant amount of the assets are open drains.

Figure 70: Pipe Material – Mangaweka Stormwater

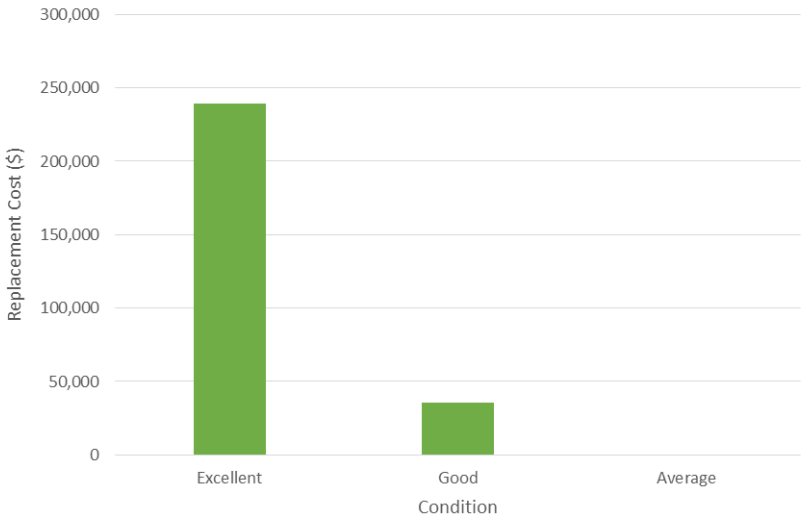


5.7.3.1 Condition

Reticulation condition data is poor with no assessments being undertaken in the last ten years. Data confidence will be improved upon with planned CCTV inspections throughout the District in the next five years. Similarly condition data for the manholes, sumps and headworks can also be verified at this time.

Information on the condition of the Mangaweka stormwater assets can be found in Figure 71. About 20% of the network has not been assessed for condition or given an interpolated score. However, these tend to be the newer pipes which it is assumed are still in very good condition.

Figure 71: Asset Condition – Mangaweka Stormwater



5.7.3.2 Capacity/Performance

A summary of background data for the Mangaweka network is given in Table 47.

Table 47: Background Data – Mangaweka Stormwater

Parameter	Data
Population served	168
Total urban catchment area	2.545 km^2
Number of catchments	3

5.7.4 Marton

The Marton urban stormwater network receives stormwater runoff from the surrounding rural area, conveys it through the town collecting runoff from the urban environment on the way and discharges to the Tutaenui Stream catchments. Marton is situated on mildly rolling terrain, which gradually slopes toward the Tutaenui Stream. The natural grade varies, but is generally mild.

The Marton stormwater system catchment is shown in Figure 72.

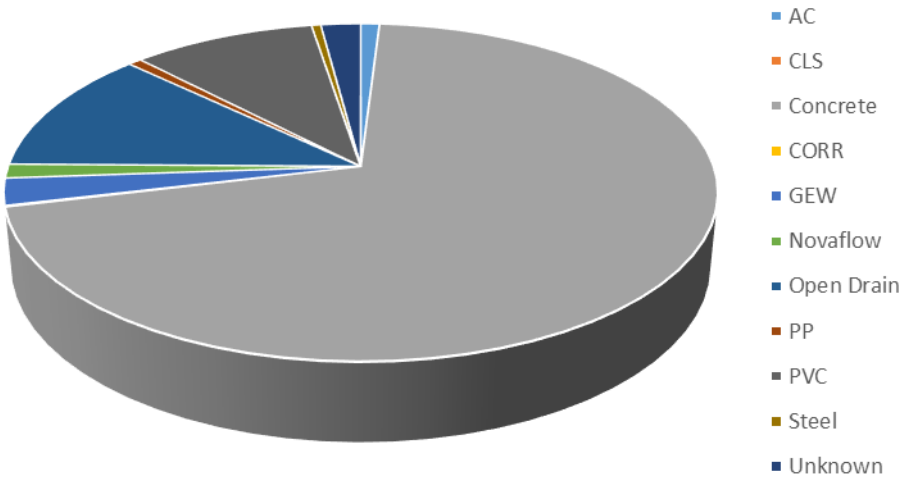
Figure 72: Marton Stormwater

The potential need for a stormwater discharge consent is being worked through with Horizons. This involves the collection of baseline data to determine the significance of any effects on the natural environment. Following a successful application for such a consent to

cover Marton, other urban areas would be looked at with the same intent (particularly Bulls and Hunterville).

The construction materials for Marton stormwater pipes are shown in the following chart. Predominantly, the material used has been concrete.

Figure 73: Pipe Material – Marton Stormwater

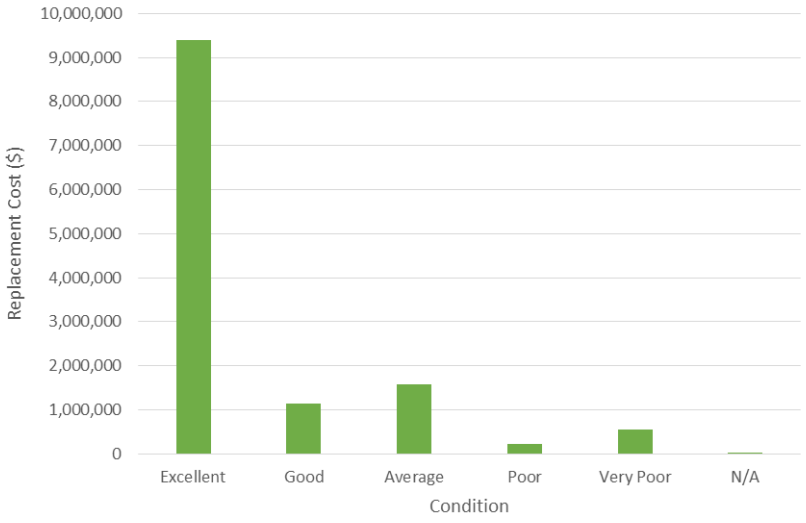


5.7.4.1 Condition

Reticulation pipes are generally of concrete construction (150 mm diameter and up). The majority of lead-ins and sumps from kerbside channels to manholes are documented, with pipe diameter and materials. Private connections are shown where observation of the entry point to the manhole is known.

The current assessment of condition information for stormwater in Marton is given in Figure 74.

Figure 74: Asset Condition – Marton Stormwater



5.7.4.2 Capacity/Performance

Background data for the Marton stormwater network are given in Table 48.

Table 48: Background Data – Marton Stormwater

Parameter	Data
Population served	4,637
Total urban catchment area	5.754 km^2
Number of catchments	19

5.7.5 Rātana

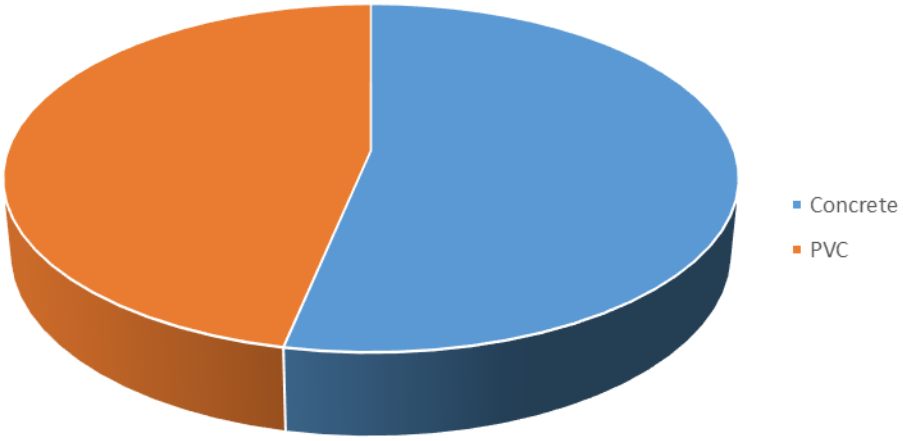
The Rātana urban stormwater network collects stormwater runoff primarily from the urban area with only a small rural catchment, conveys it through the town and discharges to the Waipu Stream. Rātana is situated on mildly rolling terrain, which gradually slopes toward the Waipu Stream.

The Rātana stormwater system is shown in Figure 75.

Figure 75: Rātana Stormwater

Stormwater pipes in Rātana are either concrete or uPVC. See below.

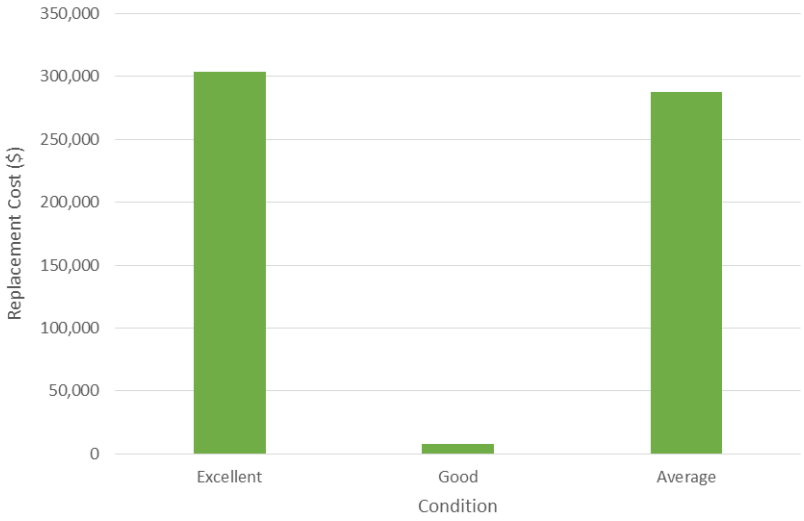
Figure 76: Pipe Material - Rātana Stormwater



5.7.5.1 Condition

Current condition information for Rātana stormwater assets is shown in Figure 77. Most are in "Excellent" condition, but a large proportion are only "Average".

Figure 77: Asset Condition - Rātana Stormwater



5.7.5.2 Capacity/Performance

Key data for the network is given in Table 49.

Table 49: Background Data - Rātana Stormwater

Parameter	Data
Population served	347

Parameter	Data
Total urban catchment area	2.2 km^2
Number of catchments	3

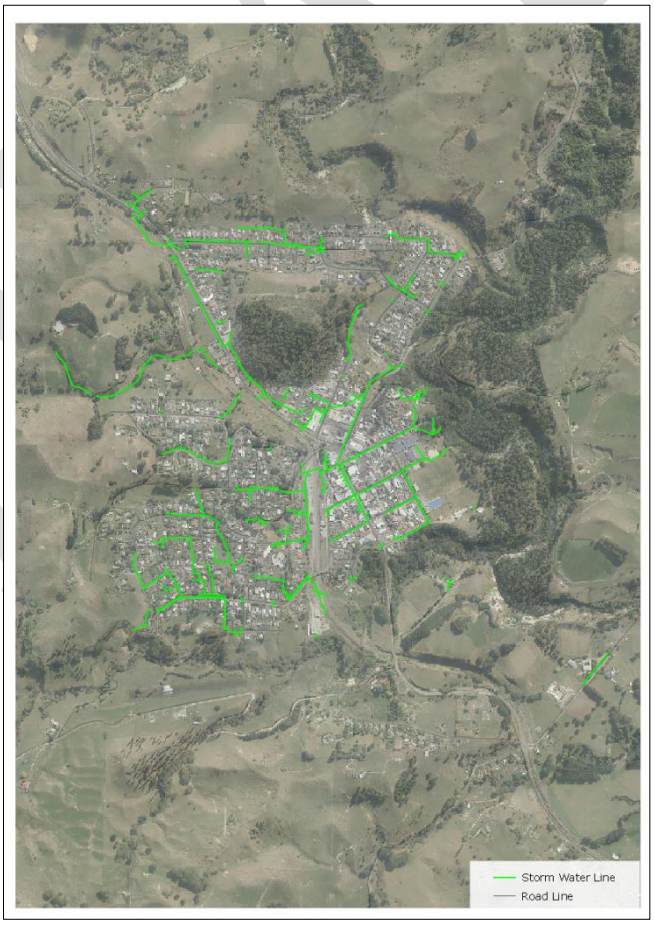
The proposed 60-lot subdivision at Rātana is a prime example where the developer is being asked to deal with stormwater within the boundaries of the subdivision, to avoid placing extra strain and expense on the town's stormwater system. This is in line with the principle of hydrological neutrality discussed in Section 4.2.3.

5.7.6 Taihape

The Taihape urban stormwater network receives stormwater runoff from a relatively small surrounding rural area, conveys it through the town collecting runoff from the urban environment on the way and discharges to the Hautapu River and its tributary catchments. The topography is steep with pipe and drain gradients having significant slopes and high flow velocities. As a result, Taihape has a greater density of reticulated stormwater pipes.

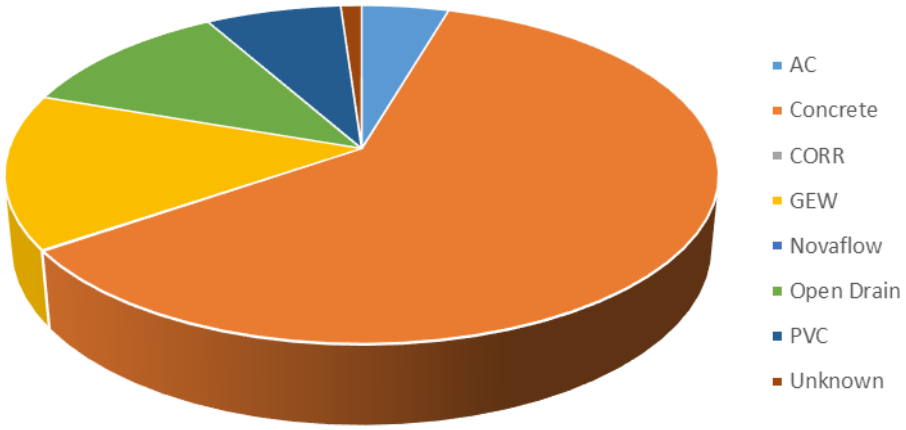
The extent of the network is shown in Figure 78.

Figure 78: Taihape Stormwater



The most commonly found stormwater pipe material in Taihape is concrete (see Figure 79). There are also significant amounts of glazed earthenware and uPVC.

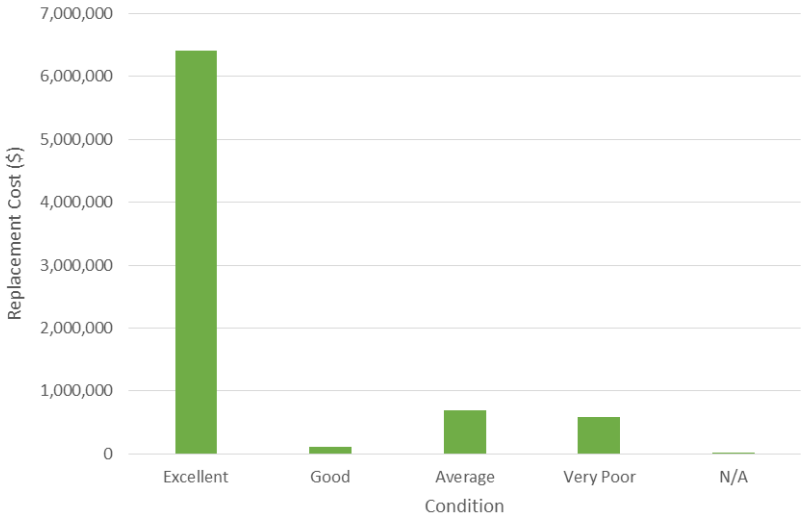
Figure 79: Pipe Material – Taihape Stormwater



5.7.6.1 Condition

The condition of our stormwater assets in Taihape is shown in Figure 80. Mostly, the condition of the assets has been assessed as "Excellent".

Figure 80: Asset Condition – Taihape Stormwater



5.7.6.2 Capacity/Performance

Background data on the network are given in Table 50.

Table 50: Background Data – Taihape Stormwater

Parameter	Data
Population served	1,759

Parameter	Data
Total urban catchment area	0.5 km^2
Number of catchments	3

The Taihape West zone, although showing fewer signs of land movement is an area which requires more regular and intensive inspections and prompt follow up of reticulation faults, either condition or performance.

5.7.7 Rural Stormwater

There is a budget for rural stormwater systems, which includes small systems in areas such as Utiku, Koitiata, Rakautaua and Scotts Ferry. These are not considered to be fully reticulated systems, but there are Council stormwater assets in these locations that need to be maintained, and have associated records kept.

Scotts Ferry has a network of 1.3 km of gravity mains, while Koitiata has some 300 metres of piped stormwater collection, and Rakautaua has 4.6 km of open drains downstream from Whangaehu. However, the extent of these systems, and the level of expenditure on them, does not warrant their being considered as separate networks to the extent that systems in larger towns are.

Maps of some of these networks are shown below.

Figure 81: Koitiata Stormwater

Figure 82: Scotts Ferry Stormwater

An investigation is required into stormwater levels of service for Scotts Ferry. Due to its location it is prone to flooding from the Rangitīkei River, and ponding of stormwater can contribute to issues for the community. The scope and cost of potential improvements will be investigated. If necessary, Council may decide to apply rating for stormwater to Scotts Ferry so that funds are available to improve infrastructure at this locality.

Dudding's Lake is another locality where there is a small stormwater system. The infrastructure here, which includes a wastewater system as well, is managed by a community trust. Currently, Rangitīkei District Council has no involvement with the infrastructure in this locality.

5.8 Land

Water Supply and Wastewater sites for treatment, storage, pumping, etc. all have Designations in the District Plan. This means that they have planning status that enable Water Supply or Wastewater activities to take place without needing a planning consent for every upgrade or renewal.

5.9 Resource Consents

Council holds a large number of resource consents for its water supply and wastewater activities. There is a cost to obtain consents, and they must be renewed periodically, so they are recorded as assets in our Asset Register.

Key information for critical consents is given below.

Table 51: Resource Consents – Water Supply

Water Supply	Consent	Consent Number	Expiry Date	Comments
Bulls	Abstraction – Bore	103868	16 Jan 2022	Bore 5, adjacent to Bulls WTP.
	Abstraction – Bore	6903	16 Jan 2022	Four bores adjacent to Rangitīkei River (Bores 1, 2, 3 and 4).
Mangaweka	Abstraction – Rangitīkei River	103081	18 Dec 2017	Infiltration gallery at Mangaweka Campground.
Marton	Abstraction - Calico Line Bore	106300	1 Jul 2027	Supplementary supply for Marton.
	Abstraction – Tutaenui Stream	6929	11 Jul 2032	From C Dam and B Dam.
	Abstraction – Well 303029 (Tutaenui Bore)	106125	1 Jul 2027	Located within road reserve on Tutaenui Rd.
	Discharge	6853	14 Nov 2016	Discharge alum sludge and filter backwash to B Dam. Renewal in progress.
Rātana	Abstraction – Bore (Existing Supply)	6350	6 Dec 2020	Two bores at Kiatere St.
	Abstraction – Bore (New Supply)	APP-2014200014.00	1 Jul 2034	Bore on Rātana Rd.
Taihape	Abstraction – Hautapu River	101722	31 May 2020	Limits dependent on flow in Hautapu Stream.
Erewhon Rural	Abstraction – Reporoa Stream	103986	1 Jul 2027	East of Matawhero Rd
	Abstraction - Dam	103987		Consent to dam stream using weir
Hunterville Rural	Abstraction – Rangitīkei River	103989	1 Jul 2037	Riparian take (infiltration gallery)
	Dam	RTK800737	6 Jan 2026	Consent to dam unnamed tributary of Porewa Stream
	Disturb and Divert	106903, 106904	1 Jul 2037	Disturb bed and divert water for maintenance of infiltration gallery

Water Supply	Consent	Consent Number	Expiry Date	Comments
Omatane Rural	Abstraction	103988	1 Jul 2027	Unnamed tributary of Makino Stream at Makino Rd
Putorino Rural	Abstraction	105370	1 Jul 2027	Unnamed tributary of Rangitīkei River off Rangatira Rd. Consent held by Putorino Farm Settlement Water Supply Committee.

Table 52: Resource Consents - Wastewater

Network	Consent	Consent Number	Expiry Date	Comments
Bulls	Discharge	6406	7 Oct 2006	Discharge from Bulls oxidation pond to Rangitīkei River. Renewal in progress.
Hunterville	Discharge to Water	105833	1 Jul 2037	Discharge to land that enters Porewa Stream. Application for variation underway.
	Discharge to Land	105834	1 Jul 2037	Discharge to land via pond seepage.
	Land Use	105835	1 Jul 2037	Construction of rock outfall within Porewa Stream bed; no instream works between 1 May and 31 December of any year.
Koitiata	Discharge to Land	105079	1 Jul 2024	Discharge from oxidation pond to land.
	Land Use	106028	1 Jul 2024	Construction of land disposal area.
Mangaweka	Discharge to Water	101726	19 Mar 2024	Discharge to Mangatera Stream.
Marton	Discharge to Water	7312	31 Mar 2019	Shall not give rise to negative effects on receiving environment as detailed in consent.
	Discharge to Air	7313	31 Mar 2019	
Rātana	Discharge to Water	7400	31 Jul 2018	Discharge to unnamed tributary of Waipu Stream. Preparation for renewal underway.
Taihape	Discharge	105518	1 Jul 2027	Discharge onto land that enters Hautapu River.

6 Risk Management

6.1 Framework

The Council faces a range of business risks inherent in the functions of being a local authority. The Council's objective is to integrate risk management practices and procedures that are targeted to (and appropriate for) Council's strategic and operational goals, and also appropriate for Council's business functions. The Council evaluates risk at the corporate and at an activity level. Once the risk cost is known, the organisation can then evaluate the risk reduction opportunities available. Risk treatments are the management practices and processes to eliminate the probability and/or lessen the consequences of the risk event.

Council adopts risk treatments on the basis of cost/benefit, where a reduction in risk exposure is seen as an organisational benefit. In some cases Council may choose to accept the risk, whereas in other cases it will choose to do all it can to reduce the risk cost.

Council is committed to the identification, evaluation, prioritisation and management of these risks, in order to:

- Reduce, mitigate, transfer or eliminate threats.
- Allow for the most effective use of resources.
- Protect Council's corporate image and reputation as a responsible and ethical organisation.
- Capitalise on opportunities.

The risk management process is designed to ensure that:

- All significant operational and organisational risks are understood and identified.
- The highest risks that should be addressed in the short to medium term are identified.
- Risk reduction treatments that best meet business needs are applied.
- Responsibilities for managing risk are allocated to specific staff.

This section looks at the risk management framework set up by the Council for assessing and managing risk.

The framework for successfully identifying, analysing, evaluating and managing risk was established based on the joint Australian Standard AS 4360. This standard has since been replaced by the Joint Australian New Zealand International Standard – Risk management – Principles and guidelines (AS/NZS ISO 31000-2009)

The overall process framework for records management is unchanged:

- Establish the context (i.e. the external and internal parameters to be taken into account when managing risk);
- Assess the risk – identification, analysis (in terms of consequence and likelihood) and evaluation; and
- Treat the risk.

These are in the context of ensuring communication and consultation and undertaking monitoring and review.

The new standard offers a list of attributes of enhanced risk management to assist organisations measure their own progress. These derive from 11 principles, most of which are general management principles – creates and protects value, an integral part of all organisational processes, part of decision-making, systematic, structured and timely, based on the best available information, transparent and inclusive etc. This is intended to embed risk management as part of an organisation's management. The unique principle is that risk management explicitly addresses uncertainty, the nature of that uncertainty, and how it can be addressed.

The major elements of the risk management process are:

- Risk management context: establishes criteria against which risk can be evaluated.
- Risk identification: identifies the risks the Council may encounter and helps explain the impact of those risks on the business.
- Risk assessment: establishes a risk rating for all assets or asset groups, and describes which assets represent the greatest risk to the business.
- Risk treatment: identifies what actions are available to reduce risk at asset or asset group level to an acceptable level, and identifies the most cost effective treatment option.
- Monitor and review: the ongoing process to ensure risk levels remain acceptable even if risks change.

6.1.1 Risk Types

There are a number of different risk types considered in determining overall risks. These risk types represent the major groups of risks that could be present and must be considered in our risk management practices. Council has used the following risk types:

- Compliance (including legal).
- Operational.
- Environmental.

- Financial.
- Health & Safety.
- Reputation.

6.1.2 Risk Score

For each risk event identified, the consequence of failure and the likelihood of failure is assessed using the tables below. The risk cost is evaluated for each risk event identified using the following formula:

Risk cost = probability of event occurring x consequence of event

The likelihood of a given risk occurring is assessed using the following ratings:

Table 53: Likelihood Ratings

Likelihood	Rating	Description	Frequency
Rare	1	May occur in exceptional circumstances	1 in 100 years
Unlikely	2	Could occur very occasionally	1 in 10 years
Moderate	3	Might occur from time to time	1 in 5 years
Likely	4	Will probably occur often	1 in 2 years
Almost Certain	5	Is expected to occur in almost all circumstances	Every year

The consequences of a given risk, assessed against each of the risk types from Section 6.1.1, are given in the table below:

Table 54: Consequence Ratings

Factor	Insignificant	Minor	Moderate	Major	Catastrophic
	1	2	3	4	5
Compliance	Minor exceedance, not recorded as non-compliance	Non-compliance occurs, without abatement notice	Abatement notice issued to Council	Council fined	Council or individual convicted
Operational	No loss of operational capability or negative disruption to service levels	Loss of operational capability in some areas and some disruption to service levels	Serious loss of operational capability for over 1 week and disruption to service levels	Serious loss of operational capability for over 2 weeks and major disruption to service levels	Serious loss of operational capability for over 4 weeks and serious disruption to service levels

Factor	Insignificant	Minor	Moderate	Major	Catastrophic
	1	2	3	4	5
Environmental	Localised short term reversible damage to aquatic and/or terrestrial ecosystems. No noticeable species reduction	Localised minor reversible damage to aquatic and/ or terrestrial ecosystems. Temporary reduction in one species	Localised, medium term reversible damage to aquatic and/ or terrestrial ecosystems. Moderate reduction in one or more species	Widespread, long-term reversible damage to aquatic and/ or terrestrial ecosystems. Significant reduction in one or more species	Widespread, irreversible damage to aquatic and/ or terrestrial ecosystems. Permanent loss of one or more species
Financial	Total loss less than $20,000	Total loss between $20,000 to $250,000	Total loss between $250,000 and $1 million	Total loss between $1 million and $10 million	Total loss of $10 million or greater
Health & Safety	Near miss	Injury not requiring treatment	Injury requiring treatment	Loss of life or permanent disability	Multiple loss of life
Reputation	Negative feedback from individuals or small groups in the community Negative regional multi-media coverage for up to 2 days	Loss of confidence among sections of the community Negative multi-media nation-wide coverage for 2 days	Manageable loss in community confidence Negative multi-media nation-wide coverage for several days	Large loss in community confidence that will take significant time to remedy Negative multi-media nation-wide coverage for up to 2 weeks	Insurmountable loss in community confidence Negative multi-media nation-wide coverage for 2 weeks +

The matrix below is used to assess the level of risk, depending on both the likelihood of that risk occurring and its consequences.

Table 55: Risk Matrix

Likelihood	Consequence				
	1	2	3	4	5
1	L	L	L	M	M
2	L	L	M	M	H
3	L	M	M	H	H
4	M	M	H	H	E
5	M	H	H	E	E

The risk levels indicated are defined below:

Table 56: Risk Levels

Abbreviation	Risk Level	Description
L	Low Risk	Manage by routine procedures
M	Moderate Risk	Management responsibility must be specified
H	High Risk	Risk and management strategy identified in AM Plan Failure management plans available
E	Extreme Risk	Risk and management strategy identified in AM Plan Failure management plans specifically addressing event in place

6.2 Risk Register

The following risk registers contain a detailed breakdown of risks identified for each activity, as well as existing or proposed mitigations.

6.2.1 Water Supply

A summary of risks assessed for each water supply is given in the following table.

Table 57: Risk Register – Water Supply

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
District	Loss of water supply for more than 8 hours to multiple properties	• Operational • Financial • Health & Safety • Reputation	3	5	H	• Maintain register of key consumers e.g. dialysis patients, major industries, schools, medical, dental, rest homes, relevant commercial premises • Minimum 1 day storage in reservoirs • Council and contractors hold spares of key components • Rural water supplies require consumers have on-site storage	2	3	M
	Poor water quality	• Compliance • Operational • Financial • Health & Safety • Reputation	4	3	H	• Maintain register of key consumers e.g. dialysis patients, major industries, schools, medical, dental, rest homes, relevant commercial premises	4	1	M
	Consent conditions not met	• Compliance • Environmental • Financial • Reputation	5	5	E	• Monitoring of performance; maintenance; capital works	3	2	M
	Leaks in roads	• Operational • Financial • Reputation • Compliance	2	5	H	• Proactive leak detection; prioritisation of renewals in roads	2	4	M

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
	Lack of easements causing access issues	• Operational	3	3	M	• Proactively ensure key easements in place • Use Public Works Act if necessary	3	2	M
	Failure of AC mains	• Operational • Compliance	2	5	H	• Pressure management • Renewals programme	2	4	M
	Failure to deliver renewals programme • Insufficient funds • Insufficient resources	• Operational • Financial • Compliance • Health & Safety	4	5	E	• Ensure qualified and experienced staff are hired; maintain sufficient staffing levels; propose realistic programme	4	3	H
	Failure to deliver upgrade programme • Insufficient funds • Insufficient resources	• Operational • Financial • Compliance • Health & Safety	4	5	E	• Ensure qualified and experienced staff are hired; maintain sufficient staffing levels; propose realistic programme	4	3	H
	Volcanic ashfall. Increased turbidity, acidity and toxicity of raw water could affect water quality. Potential damage to intakes, pipelines, pumps, plant equipment and vehicles could lead to loss of supply.	• Compliance • Operational • Environmental • Financial • Health & Safety • Reputational	4	1	M	• Ensure all water surfaces covered • Shield sensitive equipment • Shut down exposed equipment in event of ashfall	2	1	L
Bulls	Damage to bores • Seismic event • Flooding • Liquefaction	• Operational • Financial	5	2	H	• Ensure casings meet specifications; ensure any bore can be used for supply	4	1	M
	Filter failure • Seismic event	• Compliance • Operational • Financial	5	2	H	• Perform seismic assessments as necessary and programme necessary upgrade work	4	1	M

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
	Loss of electricity supply	• Operational	3	4	H	• Use existing 60 kVA generator and triage assets to run • Source 100 kVA generator that will run entire plant plus all other plants	2	4	M
	Failure of rising mains • State Highway • AC and steel	• Operational • Financial • Compliance • Reputation	5	2	H	• Proactive leak detection and asset renewals	5	1	M
	Tricker's Hill reservoir failure • Seismic event	• Operational • Financial	5	2	H	• Feed reticulation directly • Assess seismic strength	4	1	M
	Mushroom reservoir failure • Seismic event	• Operational • Financial	5	2	H	• Run supply off Tricker's Hill reservoir • Assess seismic strength	4	1	M
	Tricker's Hill trunk main failure • Burst • Flood damage	• Operational • Compliance • Financial	5	2	H	• Proactive leak detection and asset renewals	5	1	M
	Tutaenui River crossing failure	• Operational • Compliance • Financial	4	2	M	• Crossing is above flood level	5	1	M
	Flooding causing loss of access to Tricker's Hill reservoir	• Operational • Health & Safety	2	2	L	• Provide all weather access to site • Relocate reservoir site	1	2	L
Hunterville Urban	Loss of dam for backwash water • Private farmer's dam	• Compliance • Operational • Environmental	3	2	M	• Send to sewer • Formalise agreement	2	2	L

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
	Plant failure • Landslide	• Compliance • Operational • Financial • Health & Safety	5	1	M	• Observe potential for landslides affecting plant and mitigate as required	5	1	M
	Supply from Hunterville Rural Water Supply affected • Physical damage • Break down in relationship between Council and HRWS Committee	• Operational • Financial	5	5	E	• Set up pump from tanker in town • Mitigations on Hunterville Rural Water Supply	4	4	H
	Loss of plant access	• Operational • Health & Safety	5	2	H	• Use alternate track suitable for quad bikes	4	2	M
	Rising main failure	• Operational • Compliance • Financial	5	2	H	• Proactive leak detection and asset renewals	5	1	M
	Trunk main failure	• Operational • Compliance • Financial	5	2	H	• Proactive leak detection and asset renewals	5	1	M
	Failure of mains under State Highway 1	• Compliance • Operational • Financial • Health & Safety • Reputation	3	2	M	• Proactive condition assessment and asset renewal • Relocate assets off highway where feasible • Work with NZTA to minimise risk of breakage	3	1	L
Mangaweka	Intake damaged • Flooding • Liquefaction	• Operational • Financial	5	2	H	• Inspect regularly and communicate with Horizons about condition of river, particularly aggradation	5	1	M

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
	Rising main failure	• Operational • Compliance • Financial	5	2	H	• Proactive leak detection and asset renewals	5	1	M
	Trunk main failure	• Operational • Compliance • Financial	5	2	H	• Proactive leak detection and asset renewals	5	1	M
	Mains failure under railway line	• Operational • Compliance • Financial	3	2	M	• Use directional drilling	2	1	L
	Scheme becomes uneconomic to operate • Decline in demand	• Financial • Health & Safety • Reputation	5	1	M	• Manage costs • Harmonise rates across District	5	1	M
	Poor water quality at dead ends in reticulation	• Compliance • Operational • Health & Safety • Reputation	4	4	H	• Flushing programme • Loop mains • Backflow prevention	3	3	M
Marton	Dam burst • Seismic event • Structural failure	• Operational • Financial • Health & Safety	5	1	M	• Dam has been assessed • For continuity of supply, Calico Line bore would be used and flow from Tutaenui Rd bore would be re-directed to WTP • Repeat inspections by engineer every 3 years	3	1	L

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
	Raw water main failure • Catastrophic burst	• Operational • Compliance • Financial	5	2	H	• Hold key spares • Source other spares in 2-3 days • Renewals programme • Use of Calico Line and Tutaenui Rd bores	5	1	M
	Loss of electricity supply	• Operational	3	4	H	• Use on-site standby generator	2	4	M
	Mains failure under railway line	• Operational • Compliance • Financial	3	2	M	• Use directional drilling	2	1	L
	Flood damage. Damage to or destruction of plants, pumps, pipelines and reservoirs could lead to loss of supply	• Compliance • Operational • Environmental • Financial • Health & Safety • Reputation	5	2	H	• Provide enhanced flood protection of key assets • Ensure alternative options available, located out of flood zone	2	2	L
Rātana	Poor water quality	• Compliance • Operational • Health & Safety • Reputation	4	5	E	• Construct new water supply	4	2	M
	Health risks from rainwater tanks	• Health & Safety	4	5	E	• Construct new water supply	4	2	M
	Demand exceeds supply • Annual Rātana religious festival	• Operational • Financial • Reputation	5	3	H	• Tanker water in • Construct new water supply	3	2	M
	Poor quality electricity supply	• Operational	4	4	H	• Provide standby generator for new WTP	2	4	M

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
Taihape	Intake failure	• Operational • Financial	5	2	H	• Run WTP to deal with higher raw water turbidities	5	1	M
	Falling main failure • Seismic event • Over-pressure	• Operational	5	2	H	• 1-2 days storage available	5	1	M
	Clarifier failure • Seismic event • Structural failure	• Compliance • Operational • Financial • Health & Safety	5	2	H	• Get clarifier inspected • Programme renewal • Install spare lamella plate separator if required	4	1	M
	Reservoir failure • Seismic event • Structural failure	• Operational • Financial • Health & Safety	5	2	H	• Perform seismic assessments as necessary and programme upgrade works as required	4	1	M
	Steel pipe bursts • Fittings unavailable	• Operational • Financial • Compliance	3	3	M	• Renewal programme	3	2	M
	PRV failure • High pressure	• Operational • Financial • Health & Safety	4	4	H	• Ensure relief valves operational	4	2	M
	High industrial demand • Hautapu Pine • Hospital • Rest home • Cafés and other businesses	• Compliance • Operational • Reputation	4	4	H	• Encourage on-site storage	3	3	M
	Slips • Slip zone in west of town	• Operational • Financial • Health & Safety	4	3	H	• Proactive leak detection and renewal of water mains • Proactive	4	2	M

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
	Loss of electricity supply	• Operational	3	4	H	• Use on-site standby generator	2	4	M
	Mains failure under railway line	• Operational • Financial • Compliance	3	2	M	• Use directional drilling • Proactive leak detection and renewals	2	1	L
Erewhon Rural	Landslides	• Operational • Financial • Compliance	5	2	H	• Land management practices to reduce likelihood and impact	4	2	M
	Loss of electricity supply	• Operational	3	4	H	• Investigate potential of using diesel or other generation	2	3	M
	Intake failure	• Operational • Reputation	5	2	H	• Inspect regularly and maintain as necessary	5	1	M
	Break down in relationship between Council and Committee	• Operational • Compliance • Reputation	5	3	H	• Regular attendance at meetings, good customer service and prompt resolution of issues	4	2	M
	Reticulation failure • High pressure	• Operational • Financial • Compliance	3	5	H	• Proactive leak detection and asset renewals	2	4	M
Hunterville Rural	Landslides	• Operational • Financial • Compliance	5	2	H	• Land management practices to reduce likelihood and impact	4	2	M
	Loss of electricity supply	• Operational	3	4	H	• Investigate potential of using diesel or other generation	2	3	M
	Intake failure	• Operational • Reputation	5	2	H	• Inspect regularly and communicate with Horizons about condition of river, particularly aggradation	5	1	M

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
	Break down in relationship between Council and Committee	• Operational • Compliance • Reputation	5	3	H	• Regular attendance at meetings, good customer service and prompt resolution of issues	4	2	M
	Reticulation failure • High pressure	• Operational • Financial • Compliance	3	5	H	• Proactive leak detection and asset renewals	2	4	M
	Loss of water supply on farm	• Operational • Reputation	2	5	H	• Ensure all consumers have required amount of on-site storage	2	4	M
Omatane Rural	Landslides	• Operational • Financial • Compliance	5	2	H	• Land management practices to reduce likelihood and impact	4	2	M
	Loss of electricity supply	• Operational	3	4	H	• Investigate potential of using diesel or other generation	2	3	M
	Intake failure	• Operational • Reputation	5	2	H	• Inspect regularly and communicate with Horizons about condition of river, particularly aggradation	5	1	M
	Break down in relationship between Council and Committee	• Operational • Compliance • Reputation	5	3	H	• Regular attendance at meetings, good customer service and prompt resolution of issues	4	2	M
	Reticulation failure • High pressure	• Operational • Financial • Compliance	3	5	H	• Proactive leak detection and asset renewals	2	4	M
Putorino Rural	Landslides	• Operational • Financial • Compliance	5	2	H	• Land management practices to reduce likelihood and impact	4	2	M

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
	Loss of electricity supply	• Operational	3	4	H	• Investigate potential of using diesel or other generation	2	3	M
	Intake failure	• Operational • Reputation	5	2	H	• Inspect regularly and communicate with Horizons about condition of river, particularly aggradation	5	1	M
	Break down in relationship between Council and Committee	• Operational • Compliance • Reputation	2	3	M	• Supply managed by committee; ensure good service with respect to financial management	2	1	L
	Reticulation failure • High pressure	• Operational • Financial • Compliance	3	5	H	• Proactive leak detection and asset renewals	2	4	M

The Building Act 2004 (Sub Part 7 Sections 133 to 162) places numerous obligations on dam owners in relation to dam safety. Rangitīkei District Council has conducted a Comprehensive Safety Review of the earth dams that form part of the Marton water supply. This Review classified the two dams as a High Potential Impact Category (PIC). PIC is a function of the Population at Risk (PAR), as well as the impact upon residential houses, critical or major infrastructure, the natural environment and the community recovery time. Due to the dam locations in relation to the centre of Marton, the consequences of a potential dam break is significant. The PIC defines the necessary standards to be adopted for the dam investigation studies, design, construction, commissioning and operational phases. In accordance with Section 139 of the Building Act 2004 the dam classification requires review every 5 years.

6.2.2 Wastewater

The current risk register for Wastewater is given below.

Table 58: Risk Register - Wastewater

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
District	Consent conditions not met	• Compliance • Environmental • Financial • Reputation	5	5	E	• Monitoring of performance; maintenance; capital works	3	2	M
	Lack of easements causing access issues	• Operational	3	3	M	• Proactively ensure key easements in place • Use Public Works Act if necessary	3	2	M
	Failure to deliver renewals programme • Insufficient funds • Insufficient resources	• Operational • Financial • Compliance • Health & Safety	4	5	E	• Ensure qualified and experienced staff are hired; maintain sufficient staffing levels; propose realistic programme	4	3	H
	Failure to deliver upgrade programme • Insufficient funds • Insufficient resources	• Operational • Financial • Compliance • Health & Safety	4	5	E	• Ensure qualified and experienced staff are hired; maintain sufficient staffing levels; propose realistic programme	4	3	H
	Volcanic ashfall. Potential damage to intakes, pipelines, pumps, plant equipment and vehicles could lead to loss of service. Potential impacts on treatment, especially microbiological.	• Compliance • Operational • Environmental • Financial • Health & Safety • Reputation	4	1	M	• Ensure all water surfaces covered • Shield sensitive equipment • Shut down exposed equipment in event of ashfall	2	1	L

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
	Failure of mains on private property	• Compliance • Operational • Environmental • Financial • Health & Safety • Reputation	3	2	M	• Proactive condition assessment and asset renewal • Relocate assets off private property where feasible • Enforce building and bylaw controls	3	1	L
Bulls	Pump station overflows • Domain	• Compliance • Operational • Environmental • Financial • Health & Safety • Reputation	2	3	M	• Reduce I&I • Maintain and replace assets as required • Monitor flows	2	2	L
	Failure of mains under State Highway 1	• Compliance • Operational • Financial • Health & Safety • Reputation	3	2	M	• Proactive condition assessment and asset renewal • Relocate assets off highway where feasible • Work with NZTA to minimise risk of breakage	3	1	L
	Liquefaction from seismic event	• Compliance • Operational • Environmental • Financial • Health & Safety • Reputation	4	1	M	• Locate assets out of high-risk areas where possible • Ensure adequate foundations for structures in high-risk areas	4	1	M
	Damage caused by flooding from Rangitīkei River	• Compliance • Operational • Environmental • Financial • Health & Safety • Reputation	4	2	M	• Build resilience into assets to reduce likelihood of damage being caused	4	1	M

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
Hunterville	Failure of trunk main river crossing	• Compliance • Operational • Environmental • Financial • Health & Safety • Reputation	3	2	M	• Proactive assessment, maintenance and renewal • Liaison with Horizons and landowners to keep debris clear	3	1	L
	Failure of mains under State Highway 1	• Compliance • Operational • Financial • Health & Safety • Reputation	3	2	M	• Proactive condition assessment and asset renewal • Relocate assets off highway where feasible • Work with NZTA to minimise risk of breakage	3	1	L
Koitiata	Liquefaction from seismic event	• Compliance • Operational • Environmental • Financial • Health & Safety • Reputation	4	1	M	• Locate assets out of high-risk areas where possible • Ensure adequate foundations for structures in high-risk areas	4	1	M
	Damage/destruction from tsunami	• Compliance • Operational • Environmental • Financial • Health & Safety • Reputation	4	1	M	• Build resilience into assets to reduce likelihood of damage being caused • Ensure warnings are followed and personnel evacuate	3	1	L
	Damage caused by flooding from Turakina River	• Compliance • Operational • Environmental • Financial • Health & Safety • Reputation	4	2	M	• Build resilience into assets to reduce likelihood of damage being caused • Ensure warnings are followed and personnel evacuate	3	2	M

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
Mangaweka	Erosion of cliff face caused by outfall	• Environmental • Financial • Health & Safety • Reputation	2	1	L	• Build scour protection into outfall	2	1	L
Marton	Damage caused by flooding from Tutaenui Stream	• Compliance • Operational • Environmental • Financial • Health & Safety • Reputation	5	2	H	• Provide enhanced flood protection of key assets • Ensure alternative options available, located out of flood zone	2	2	L
	Odour issues detected outside site boundary	• Reputation	4	2	M	• Manage trade wastes • Install and maintain appropriate treatment, or find alternative	4	1	M
Rātana	Environmental degradation of Lake Waipu	• Compliance • Environmental • Reputation	4	5	E	• Renew existing system with one having additional treatment or discharge to land	2	2	L
Taihape	Slips causing mains failures • Slip zone in west of town	• Operational • Financial • Health & Safety	4	3	H	• Proactive condition assessments	4	2	M
	Loss of electricity supply	• Operational	3	4	H	• Use on-site standby generator	2	4	M
	Mains failure under railway line	• Operational • Financial • Compliance	3	2	M	• Use directional drilling • Proactive leak detection and renewals	2	1	L
	Break down in relationship between Council and Committee	• Operational • Compliance • Reputation	5	3	H	• Regular attendance at meetings, good customer service and prompt resolution of issues	4	2	M

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
	Pump station overflows • Papakai Rd • Huia St • Railway	• Compliance • Operational • Environmental • Financial • Health & Safety • Reputation	2	3	M	• Reduce I&I • Maintain and replace assets as required • Monitor flows	2	2	L
	Failure of rising main over Hautapu Stream	• Compliance • Operational • Environmental • Financial • Health & Safety • Reputation	3	2	M	• Proactive assessment, maintenance and renewal	3	1	L

6.2.3 Stormwater

The risk register for Stormwater is detailed in the following table.

Table 59: Risk Register - Stormwater

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
District	Damage to roads from mains failures	• Operational • Financial • Reputation • Compliance	2	5	H	• Proactive condition assessment; prioritisation of renewals in roads	2	4	M
	Lack of easements causing access issues	• Operational	3	3	M	• Proactively ensure key easements in place • Use Public Works Act if necessary	3	2	M
	Failure to deliver renewals programme • Insufficient funds • Insufficient resources	• Operational • Financial • Compliance • Health & Safety	4	5	E	• Ensure qualified and experienced staff are hired; maintain sufficient staffing levels; propose realistic programme	4	3	H
	Failure to deliver upgrade programme • Insufficient funds • Insufficient resources	• Operational • Financial • Compliance • Health & Safety	4	5	E	• Ensure qualified and experienced staff are hired; maintain sufficient staffing levels; propose realistic programme	4	3	H
	Volcanic ashfall. Potential loss of capacity and flow.	• Compliance • Operational • Environmental • Financial • Health & Safety • Reputational	3	1	L	• Cover key inlets • Educate community on proper ash removal	3	1	L

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
	Failure of mains on private property	• Compliance • Operational • Environmental • Financial • Health & Safety • Reputation	3	2	M	• Proactive condition assessment and asset renewal • Relocate assets off private property where feasible • Enforce building and bylaw controls	3	1	L
Bulls	Failure of mains under State Highway 1	• Compliance • Operational • Financial • Health & Safety • Reputation	3	2	M	• Proactive condition assessment and asset renewal • Relocate assets off highway where feasible • Work with NZTA to minimise risk of breakage	3	1	L
Hunterville	Failure of mains under State Highway 1	• Compliance • Operational • Financial • Health & Safety • Reputation	3	2	M	• Proactive condition assessment and asset renewal • Relocate assets off highway where feasible • Work with NZTA to minimise risk of breakage	3	1	L
Mangaweka	Failure of mains under State Highway 1	• Compliance • Operational • Financial • Health & Safety • Reputation	3	2	M	• Proactive condition assessment and asset renewal • Relocate assets off highway where feasible • Work with NZTA to minimise risk of breakage	3	1	L
Marton	Mains failure under railway line	• Operational • Compliance • Financial	3	2	M	• Use directional drilling • Relocate where possible	2	1	L

Location	Risk	Risk Types	Gross Risk			Management	Net Risk		
			Consequence	Likelihood	Risk Level		Consequence	Likelihood	Risk Level
Taihape	Slips • Slip zone in west of town	• Operational • Financial • Health & Safety	4	3	H	• Proactive leak detection and renewal of water mains • Proactive	4	2	M
	Mains failure under railway line	• Operational • Financial • Compliance	3	2	M	• Use directional drilling • Relocate where possible	2	1	L

6.3 Lifelines Vulnerability Study

In 2016, the Manawatū-Whanganui CDEMG Lifelines Advisory Group completed an updated study on the vulnerability of lifeline utilities in the region.

This project incorporated asset information from all participating agencies, with updated hazard maps overlaid. Critical assets were identified as those being either locally, regionally or nationally significant. Where these assets were exposed to risk from the assessed natural hazards, mitigation actions were recorded.

The lifeline utilities included were:

- Electricity.
- Fuel.
- Gas.
- Telecommunications and broadcasting.
- Transport.
- Water supply.
- Wastewater.
- Flood management (not including stormwater networks).

The natural hazards covered in this study were:

- Seismic hazards.
    - Faults.
    - Peak Ground Acceleration.
    - Liquefaction.
    - Landslides.
- Tsunami.
- Volcanic hazards.
    - Ashfall.
- Severe weather.
    - Flooding.

Interdependencies between utilities were also covered, so that for example the electricity distribution companies were made aware of critical customers they had in terms of significant water or wastewater treatment plants.

Findings from this study have been incorporated into the risk register above, and asset management planning for the Water Supply and Wastewater activities. Aside from this, findings of the study including the hazardscape are not repeated here as they are covered in the report. It is intended that the report will be a living document, and be updated on an ongoing basis by the Lifelines Advisory Group.

Specific commitments from Rangitīkei District Council as a result of this study, to improve the resilience of lifeline utilities, include:

1 Seismic assessments on key assets at Water Treatment Plants, followed by upgrading or renewals.

2 Ongoing renewals programme for water supply and wastewater reticulation and treatment assets. This includes key assets such as reservoirs and raw water intakes.

3 Investigations into additional backup electricity generation at Water Treatment Plants and Wastewater Treatment Plants.

4 Continuing focus on risk management through asset management planning, including prioritisation of work programmes based on criticality and risk exposure.

5 Appropriate materials to be used in high-risk areas e.g. PE pipe for water supply and wastewater in Taihape slip zone.

6 Continuation of upgrades to Water Treatment Plants to achieve compliance with Drinking Water Standards for bacteria and protozoa.

7 Condition assessments on key assets.

7 Programme Business Case

This section of the Asset Management Plan proposes a programme of works to deliver 3 Waters services and meet performances measures discussed in previous sections.

The high-level issues facing 3 Waters infrastructure in the District are given below, with the key issues in **bold**:

- **Ageing infrastructure.**
- The need to maintain an ongoing renewals programme to avoid a "bow wave" of renewals in the future.
- **Compliance with the Drinking Water Standards, resource consent conditions, and our internal targets for DIA mandatory performance measures.**
- The need to renew, and in some cases upsize, infrastructure to comply with the above.
- Future upgrades to comply with the above and future requirements.
- Dealing with risk exposure arising from providing non-potable water for rural water supplies.
- **Increased severity and frequency of storm events, with increased risk exposure from flooding.**
- Increased frequency of droughts, with impacts on security of water supply.
- **Providing a consistent level of service across the District, particularly considering small communities such as Scotts Ferry and Koitiata.**
- **Allowing for sustainable growth in communities where relevant, for example Bulls and Marton.**
- Dealing with the effects of declining populations in certain other centres.

7.1 Operations and Maintenance

This section sets out the operational strategies that will be used to maintain and enhance 3 Waters services, in the context of the levels of service that need to be delivered. This includes both planned and unplanned maintenance.

7.1.1 Water Outlook

Operational checks and maintenance tasks for treatment plants are contained within Water Outlook. Water Outlook is our compliance monitoring software. It also has the ability to create and record tasks, as well as schedule alerts and reminders. Having this information in

a central repository means that it can be easily accessed, and included in compliance reports as necessary.

Work is also underway to bring in the same functionality for reticulation.

7.1.2 Response Times

Our performance measures around response times were given in Section 3.1, and any gaps discussed in Section 3.3. The intention is to resource appropriately to be able to deliver on these KPIs.

7.1.3 Water Supply

7.1.3.1 Backflow Prevention

Backflow preventers are installed at connections where there is a reasonable risk of contaminated water flowing back into the water supply and affecting other consumers.

Currently, a programme of work is underway to assess backflow prevention across the District. Arising from this, installation of additional or improved backflow preventers may be required.

Backflow preventers are tested annually for compliance by an IQP.

7.1.3.2 Firefighting

Each fire hydrant must be tested at least five-yearly in order to comply with the Firefighting Water Supplies Code of Practice. In the Rangitīkei District, this will be done in a concerted effort with FENZ.

In addition to hydrant testing, checks will be performed on the condition of hydrants, and reactive requests for maintenance are followed up on.

The above should help to achieve against the performance measure which Council has set for firefighting water supply (see Section 3.1).

Flow and pressure testing will also be carried out. This should identify areas where improvements would need to be made to the reticulation to meet the Code of Practice.

Road markings for hydrants (yellow lid, yellow triangle and blue RRPM) are maintained so that they are visible both day and night. This occurs either proactively, or reactively when advised that attention is required.

Council indicated through Asset Management Plan workshops that reticulation found to be deficient in providing fire flow or pressure should be upgraded as required. Full compliance with the Code of Practice would, at this stage, only be endorsed if the Code became mandatory.

7.1.3.3 Valve Testing

There is a programme of valve testing, which ensures that valves are in good condition and are operable if required.

7.1.3.4 Demand Management

We manage water demand and reduce losses with:

- Monitoring demand through Daily and Weekly Water Outlook reports.
- Calculating losses through annual Benchloss calculations.
- Proactive renewal of water mains in poor condition or at increased risk of bursts.
- Reactive renewal of leaking assets.
- Monitoring of water meter readings to detect unusually high consumption.
- Following up with property owners when we become aware of leaks on private property.

Further information on the demand management techniques that can be, or are being, used by Council for the water activity is contained in Table 60:

Table 60: Demand Management - Water

Demand Component	Method	Example
Operation	Pressure demand management	Where very high pressures exist within a network, pressure management devices are installed to return pressures to an acceptable range. For instance, three Pressure-Reducing Valves (PRVs) have been installed in Marton. These will be commissioned in the near future, following determination of the optimal settings to be used. Pressure zones can also be monitored to assess leakage within these smaller areas, rather than simply town-wide. This allows areas of concern to be identified, and issues found more easily.
	Water restrictions	Water restrictions have been used as a measure to manage summer drought times when garden and lawn watering increases demand beyond the capacity of either the reticulation or the water source. These apply to urban supplies only, as rural supplies are already on trickle-feed supply.
Regulation	Council bylaws	Council bylaws provide for the implementation of policies to enforce efficiencies of water use.

Demand Component	Method	Example
Incentives	Water metering and pricing	Council policy is to meter commercial users of water and extraordinary users that are either outside of the water rateable area or have land areas of a large size. Water rates and water meter charge rates are calculated for each water supply to recover the actual cost of operating and managing that system. Universal water metering was historically in place in areas such as Bulls. This has been discontinued in recent years.
Education	Water conservation and public education	Council has a responsibility to promote water conservation and the efficient use of water. It is proposed to implement a public awareness campaign about the importance of saving water.
Demand substitution	Water leakage control detection and repairs	Proactive, acoustic leak detection will be carried out across the District. Work will be done to quantify water losses across each supply. As time goes on, this data will be improved and estimates will become more accurate.

As mentioned in Section 3.3.1.2, there is the most need for effective demand management on the Mangaweka and Taihape supplies.

At Mangaweka, there is a flow restrictor in place on the intake flow. During normal operations, this limits the total amount of water abstracted to 165 m^3/day to ensure that the consent limit of 170 m^3/day is not breached. This total resets at midnight each night. If the reservoir drops below 40% during peak demand periods, and the flow restrictor must be turned off, Horizons are notified prior to this action being taken. It usually takes 5-7 days of sustained high demand for this to occur, and it takes around 1 day for reservoir levels to recover.

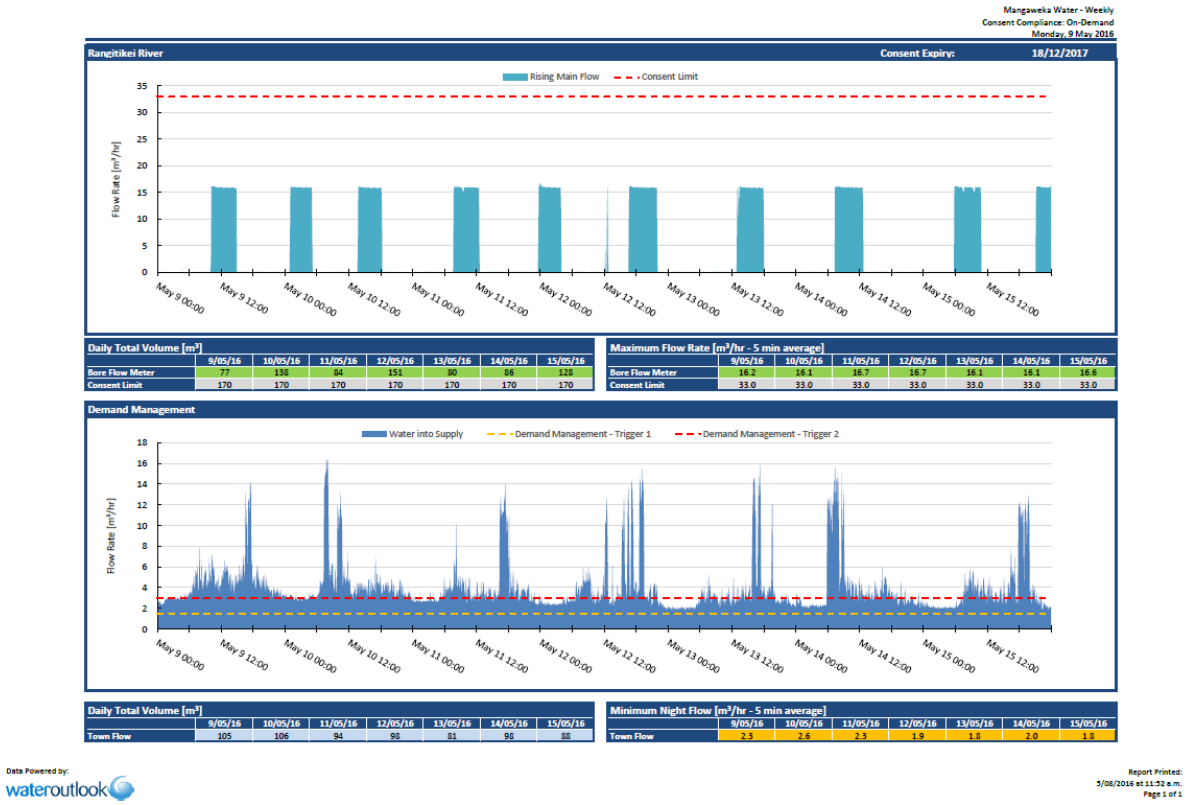
Meters have been installed on all properties in Mangaweka. On meter reading rounds (Feb, June, October) all meters are read, not only those for which users are charged a metered rate as extraordinary users. Data are analysed for average daily use, and average daily use per area. The most critically high consumers are followed up with. Staff also respond reactively to reports of water leaks, or follow up themselves when detected. Acoustic leak detection was last performed in Mangaweka in February 2015. No leaks were detected.

On occasion, staff have found and repaired leaks at troughs on private property to ensure demand is managed. Preferentially, however, Council contacts private property owners and stresses on them the need to find and repair leaks.

All properties in Mangaweka are metered. Meters are read regularly for billing purposes. Information used from the billing process is also used to manage demand. The system used generates alerts if consumption through a given meter increases significantly over the historic average. This enables follow-up with the consumer to advise them to locate and fix leaks, advise them on how best to do so, and save them money as well as helping to manage demand on the network.

Demand in Mangaweka, and abstraction consent compliance, is managed partly through weekly Water Outlook reports (example below).

Figure 83: Example Water Outlook Report: Mangaweka Water - Weekly



Two intervention levels are set on the flowrate of water into supply (shown by the orange and red dashed lines on the example above). When these intervention levels are exceeded, demand management actions are initiated. These may include, but are not limited to:

- Reactive reading of all water meters to identify excessive consumption.
- Checking for treatment losses.
- Walking the raw water main and checking for leaks.
- Engaging a leak detection contractor.
- Communication with the public to ask them to conserve water.
- Visits to high water users to ask them to conserve.

Treatment and reticulation staff both have roles to play in managing demand, as well as Assets staff who monitor and report on compliance.

The Pukepapa Rd PRV in Marton needs work to enable it to be used for pressure management. Installation of the PRV has helped reduce the extent of AC water main

breakages, but a control system will allow even more to be done here to manage demand. This is expected to cost in the order of $40,000.

7.1.3.5 Lateral Replacements

There are a number of connections throughout the District made from outdated materials such as galvanised iron and copper. These can cause large amounts of leakage when considered all together, and cause service issues. Bulls is of note, as there is a significant number of copper laterals.

When service requests are raised to deal with issues on galvanised iron or copper laterals, the laterals are being replaced rather than repaired, for efficiencies. This is done through maintenance budgets, as it is reactive work.

7.1.3.6 Source Protection

Removal of overgrown and inappropriate vegetation from the banks of both dams combined with selective removal of the mature plantation trees is enhancing the water quality. This is an ongoing project and combined with suitable riparian replanting will continue to raise the quality of the water as well as the immediate environment.

Currently, an investigation is taking place into opening up public access to the Marton Dam. If this proceeds, measures will need to be taken at the dam and surrounds to protect public health.

Algae has been an issue at the dam from time to time, causing taste and odour complaints. There is a cyanobacteria protocol in place, which is used in such events.

The dams have been inspected, and a report is expected soon on their condition and compliance. The report will recommend follow up actions that should be taken.

Work is needed on the decommissioned Bulls well, to make it secure and prevent contamination entering the aquifer. Decommissioning and disposal will be allowed for. Decommissioning will involve filling the well with concrete and capping it, or similar.

In addition to this, extra work is required to protect Bores 1-4 at Bulls from floodwater intrusion. The boreheads are located within the 1 in 200 year (0.5% AEP) flood zone. These precautions will mitigate against contaminants entering the bores in flood events of this magnitude or greater. $15,000 has been allocated for this work, in Year 1 of the 2018-2048 Long Term Plan.

The intake for the Mangaweka WTP also needs to be made secure, to prevent ingress of contaminants.

7.1.3.7 Hunterville WTP Access

There is no all-weather road to the treatment plant so access for maintenance purposes is a problem. The absence of lights is also a safety issue.

As well as this, the land on which the plant is located is not by Council, and there is no formal easement or agreement in place. The site is, however, designated for water supply purposes in the District Plan.

$40,000 is being sought to advance this work, in Year 3 of the 2018-2048 Long Term Plan.

7.1.3.8 Tutaenui Rd Falling Main

There is anecdotal evidence to suggest that there are connections directly off the Tutaenui Rd falling main coming in to Marton from the WTP. These connections were apparently granted when this main was first installed, and properties were granted free water.

These connections should be located and identified, particularly given that the Tutaenui Rd trunk main is programmed for renewal.

7.1.3.9 Taihape Raw Water Main

There are known connections off the Taihape raw water main. This is a potential health risk, if the raw water is being consumed. It can also cause operational difficulties, particularly with consent compliance if large amounts of water are being abstracted.

Work should be carried out to locate and quantify these connections.

7.1.3.10 Bulls Bore 5 Pipework Reconfiguration

This operational project is to allow Bore 5 water to be treated by Filters 1 and 2, alleviating iron and manganese issues and improving capacity. Once complete, there would be a small increase in operational costs for chemicals. An allowance of $15,000 has been made in 2018-2019 for this work.

7.1.3.11 Hunterville Urban WTP UPS

Hunterville WTP is susceptible to power outages. The current UPS (Uninterruptible Power Supply) is sufficient to keep computer systems running, but not to power the entire plant.

Installation of a new UPS will provide a greater security of supply. $5,000 has been allocated for this as an operational project in Year 1 of the 2018-2048 Long Term Plan.

7.1.3.12 Hunterville Urban WTP Outflow Meter

Currently, there is no outflow meter to measure flows from the Water Treatment Plant into town. This makes it harder to quantify losses and manage demand (which is a DIA requirement).

Installation of an outflow meter will enable Council to better manage this water supply, and report on water consumption as required by central government. $10,000 has been allowed for this project in Year 1 of the 2018-2048 Long Term Plan.

7.1.3.13 DWS Compliance for Rural Water Supplies

There will be increasing pressure from the Ministry of Health for rural water supplies to comply with the Drinking Water Standards. This could be achieved under the Rural Agricultural Guidelines 2015, with the production of Water Safety Plans and the implementation of monitoring.

This will need to be given serious consideration by both Council and the relevant Committees.

7.1.4 Wastewater

7.1.4.1 Dry Weather Overflows

In Section 3.3.2.2 the number of dry weather overflows in the District was discussed. This was not considered to be excessive. It is not felt that there is an additional programme of work needed to address dry weather overflows on top of existing operational and maintenance activities.

7.1.4.2 Demand Management

There are fewer options available to reduce the demand for wastewater services than there are for water. Some of this demand is linked to demand for water, as most water supplied to consumers subsequently enters the wastewater system. Currently identified demand management options for wastewater are given in the following table.

Table 61: Demand Management - Wastewater

Demand Component	Method	Example
I&I	Investigation	CCTV and smoke testing to determine where inflow (of stormwater) and infiltration (of groundwater) to the wastewater system is occurring. Remedial works to address this can then be programmed.

During workshops on the Asset Management Plan, Council indicated that they would like an education programme to be implemented. This would include education on disposal of items such as wet wipes, and work in tandem with work on water conservation education to reduce inflows to sewer networks.

A budget for I&I reduction has been requested, comprising $40,000/year across the District for the first five years of the 2018-2048 Long Term Plan. This will allow for the investigation of I&I problems, including work on private property as well as on our networks. Physical works for renewal of wastewater infrastructure where necessary is funded under each network for the towns most affected.

7.1.4.3 Trade Waste

There is a need to work with commercial premises in the District that discharge to our wastewater systems. Regulation in this area could improve. The benefits would be reduced impacts on Wastewater Treatment Plants, better results for consent compliance, and a more equitable distribution of the costs involved in treating waste from these premises.

7.1.5 Stormwater

7.1.5.1 Stormwater Bylaw

When the Water-Related Services Bylaw 2013 was formally adopted by Council, the section on stormwater was not. More than 100 submissions were received on stormwater issues, in relation to the maps which Council distributed showing which assets were considered public and which private. Although many of the submissions were regarding flooding issues, some were regarding the accuracy of the maps, or disputing the ownership of assets.

Council has determined to follow up on each submission and prepare responses before adopting this section of the bylaw. There is work involved to investigate, collecting background information and conducting site visits, before this work can be finalised.

Currently there is an extensive network of open drains which are recorded as being in private ownership. Council has asked for an investigation into the cost of taking over maintenance of these assets. This has been estimated as $15,000/year. This will be included in proposed budgets for the Long Term Plan 2018-2028.

7.1.5.2 Capacity/Performance

Work is required to determine the capacity and performance of our stormwater networks. Following this, recommendations can be made for where assets may need to be upsized or added.

Council indicated through Asset Management Plan workshops that work should be done to identify areas of concern for stormwater, and cost options. It was suggested that an annual budget be allocated for District Stormwater, from which the highest priority work could be funded on an annual basis.

7.1.5.3 Unfunded Networks

Council is considering the inclusion of currently unfunded networks such as Scotts Ferry and Koitiata. Rating for stormwater in these locations would allow maintenance and improvement works to be carried out.

7.1.5.4 Demand Management

The current demand management techniques used by Council for the stormwater assets are outlined in the following table.

Table 62: Demand Management - Stormwater

Demand Component	Method	Example
Private property runoff	Hydrological neutrality	On a case-by-case basis, Council limits the amount of stormwater entering its system by requiring property owners or developers to contain stormwater from their properties on site.
System failures	Proactive inspections and maintenance	These will be carried out regularly to be aware of any issues with the stormwater system, allowing repair and minimisation of issues during extreme storm events.

7.2 Asset Renewals

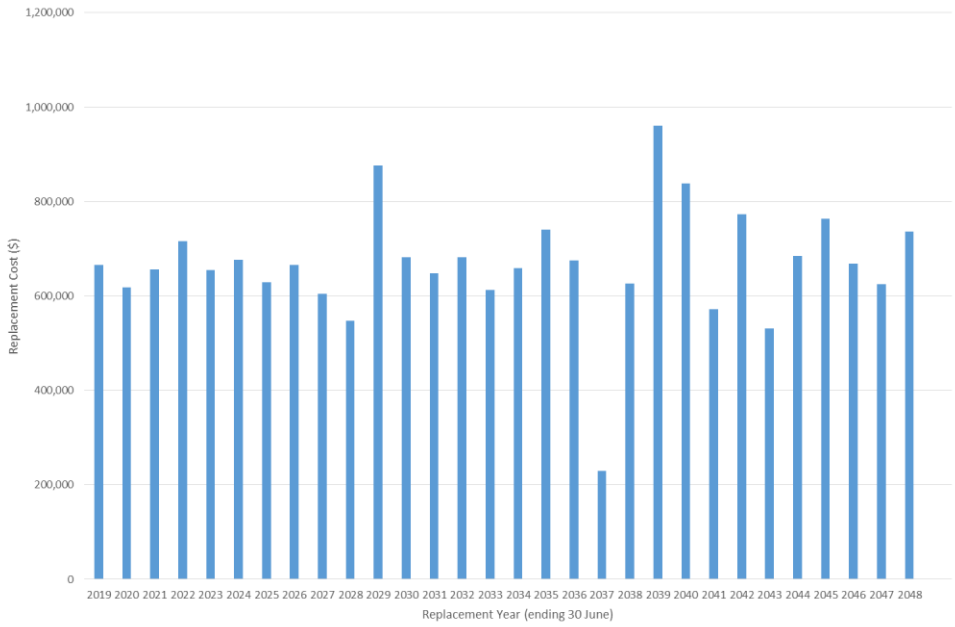
7.2.1 Water Supply

7.2.1.1 Mains Renewals

AssetFinda is used to generate a draft renewals programme, based on age and condition. Prior to renewal, mains are inspected to confirm that they are in need of replacement. If leaving a particular main in place is not going to significantly impair the performance of the network, renewal is deferred.

The 30-year programme generated by AssetFinda for the next 30 years is given below. This does not include the points (valves, hydrants, etc.) that would be replaced as part of these water main renewals.

Figure 84: Renewals Profile – Water Supply Lines



This high-level projection will be used to set budgets. Individual renewals will be assessed on the basis of Indicative Business Cases, which are a level of detail not contained in this Asset Management Plan.

Mains renewals in Mangaweka and Taihape should be prioritised, to help abstraction stay within consent limits.

Replacement of AC mains should also be prioritised. These are generally failing well before the end of their expected useful lives, particularly where exposed to cyclic pressures.

One key renewal required for Erewhon RWS is the replacement of 1.2 km of mains from Mangaohane Station to the Rangitīkei River. This could end up being done in three stages. The recommendation to the Committee will be to install a track as soon as possible, let it bed down, then install the main along the same alignment. $900,000 has been allowed for Erewhon RWS for renewal of the Rangitīkei River Crossing at Gilbert's, in Years 4 and 5.

Renewal of the Bulls State Highway 1 mains is a critical project for which $474,150 is being requested in Year 1 of the 2018-2048 Long Term Plan. The rising main from the Water Treatment Plant to Trickers Hill reservoir is a critical asset that needs to be relocated away from the State Highway. The service main on the eastern side of the road is AC, and also needs replacing. The timing of these replacements is being advanced ahead of major work by NZTA on the highway between High St and Holland Cres.

7.2.1.2 Seismic Assessments

Preliminary seismic assessments have been carried out on key Water Supply assets. The following assets have been identified as earthquake-prone. This means they will need to be either strengthened or demolished, to reduce the risk of injury, fatality, or interruption to critical services.

Table 63: Initial Seismic Assessment Results

Network	Location	Asset	Strengthening Recommended	Cost of Strengthening
Bulls	Tricker's Hill	Concrete Reservoir	No	N/A
	Taumaihi St	Concrete Tower	Yes	$300,000 - $400,000
	WTP	Concrete Building and Filter	Yes	$100,000 - $200,000
Marton	WTP	Concrete Clarifier	Yes	$200,000 - $300,000
Mangaweka	WTP	Concrete Reservoir	Yes	$200,000 - $300,000
Taihape	WTP	Concrete Reservoir	Yes	$200,000 - $300,000

7.2.1.3 Consent Renewals

Within the 30-year planning horizon of this Asset Management Plan, abstraction consents for most of our water supplies come up for renewal.

The most immediate of these are shown in the table following.

Table 64: Consent Renewals – Water Supply (Years 1-3)

Consent(s)	Expiry Date	Budget	
		$	Year
Bulls Bores 1-5	16/1/2022	50,000	2020-2021
Rātana Bore (Old)	6/12/2020	75,000	2018-2019
Taihape, Hautapu River	31/5/2020	50,000	2018-2019

7.2.2 Wastewater

7.2.2.1 Funding

During workshops on the Asset Management plan, the cost of providing wastewater services across seven networks was noted by Council. There is commitment to retaining these services in all towns currently served. But the direction given was to investigate potential external funding sources, and to look at options that may provide the same level of service in a more cost-effective manner (for example, potentially diverting Marton wastewater to Bulls for treatment).

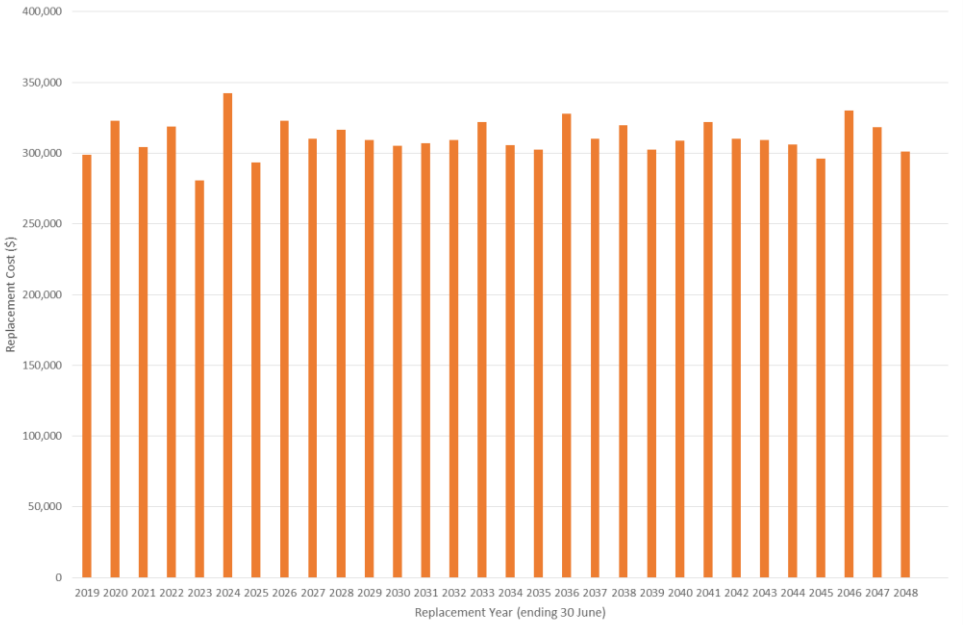
7.2.2.2 Mains Renewals

Renewals for wastewater mains can include complete replacement, or refurbishment by methods such as re-lining. Re-lining is a useful and cost-effective technique in certain situations, particularly if an asset is located underneath roads or buildings.

The renewals profile generated by AssetFinda for the next 30 years is shown below. This draft programme will be refined by inspection records, supported by knowledge of criticality, performance and condition.

Note that the profile shown is for wastewater mains, and does not include the point assets such as manholes that may be renewed at the same time.

Figure 85: Renewals Profile – Wastewater Lines



The information above will be used for budgeting purposes. The extent of individual renewals to be carried out will be on a case by case basis.

7.2.2.3 I&I

The following towns have I&I issues that need to be investigated and resolved:

1. Hunterville.
2. Taihape.
3. Bulls.
4. Marton.
5. Mangaweka.

This will be programmed as part of the Long Term Plan. There may be a need for ongoing operational budgets to deal with minor issues. This could include working alongside Building Control on issues within private premises.

In Marton, manholes along Wellington Rd, between the railway overpass and the WWTP, surcharge in heavy rain.

In Taihape, the Papakai Rd WWPS is in need of an upgrade. The following work is required there:

- Wet well chamber replacement and upgrade for capacity.
- Generator set installation to mitigate against overflows during power outages.

- Retaining wall repair.
- Pump replacements.

Design and construction will be allowed for 2018-2019, although there is scope to proceed with some of the design work in 2017-2018.

All other I&I issues are general issues across the networks mentioned.

7.2.2.4 Bulls

The major renewal projects for Bulls wastewater are the upgrade of the WWTP and the renewal of the associated resource consent. A consent application has been lodged with Horizons but is currently on hold. An investigation is underway into the option of piping wastewater from Marton to Bulls for treatment, relieving pressure on the Tutaenui Stream. Funding was sought from the Ministry for the Environment for this work, but our application to the contested Freshwater Improvement Fund was not successful.

Until this is resolved, work cannot proceed on the Bulls plant. Major works, and also minor works such as waveband repair, have been deferred pending the outcome of this investigation.

The amount allocated for Bulls is $900,000 per year for the first five years of the 2018-2048 Long Term Plan.

7.2.2.5 Marton

The receiving environment for discharge from the Marton WWTP is the Tutaenui Stream. This is a small, ephemeral stream with very little capacity to deal with treated wastewater. In the recent past, there have been compliance issues at Marton, most notably due to high ammonia. This has been due to the acceptance of leachate from Bonny Glen landfill to the plant without pre-treatment.

Bonny Glen is expected to advise Council by the end of 2017 whether it can successfully pre-treat this waste on site, reducing the impact on Marton WWTP and the Tutaenui Stream. However, even if this issue was dealt with, there are still concerns about the present discharge.

An investigation is taking place into piping wastewater from Marton to Bulls, and upgrading the Bulls WWTP to deal with this, with a land-based solution being part of the treatment process. Funding is being sought for this work in the Long Term Plan.

The amount allocated for Marton is $900,000 per year for the first five years of the 2018-2048 Long Term Plan.

7.2.2.6 Koitiata

The pond is in good condition and shows no condition-related problems. The butenyl liner, however, is deteriorating and in need of replacement within the next 5 years. The intention

is to replace it with a similar liner of modern material (most likely PE). Plans will need to be developed as to how this is carried out while leaving the system operational. The pump station operates some three times each day, providing inflows to the plant. The solution may be to install a bypass or a holding tank. The pond will be desludged prior to liner replacement. One potential option will be to carry out liner replacement in summer, and to tanker out effluent during the period in which the pond is not operational.

The Most Likely Scenario for Koitiata indicated by Council as part of Asset Management Plan workshops was for the status quo to continue.

7.2.2.7 Consent Renewals

Within the 10-year term of the 2018-2048 Long Term Plan, discharge consents for the following plants are up for renewal:

Table 65: Consent Renewals – Wastewater (Years 1-10)

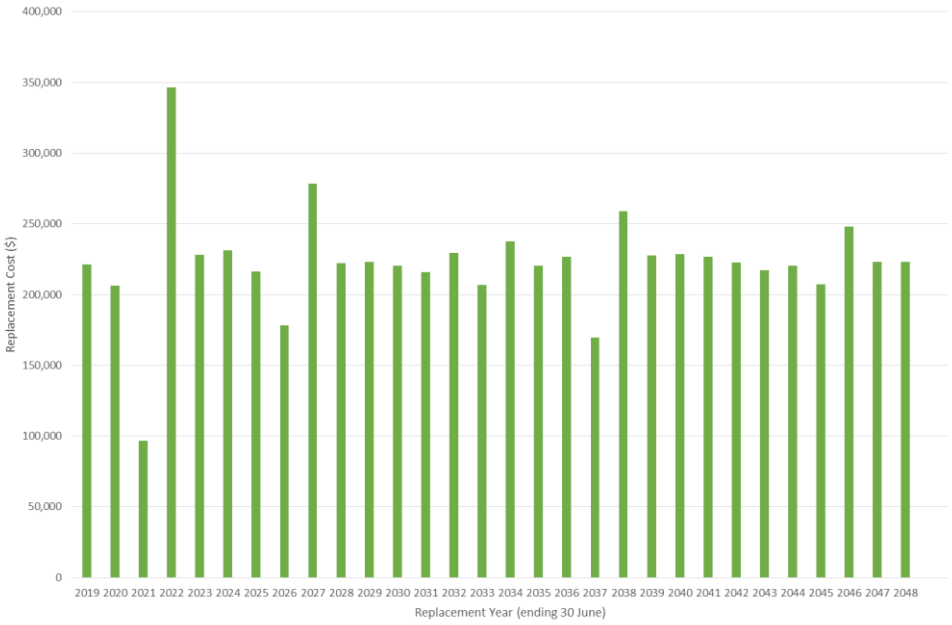
Consent(s)	Expiry Date	Budget	
		$	Year(s)
Koitiata	1/7/2024	250,000	2021-2022
		250,000	2022-2023
Mangaweka	19/3/2024	250,000	2021-2022
		250,000	2022-2023

7.2.3 Stormwater

7.2.3.1 Mains Renewals

The chart below shows the renewals profile generated by AssetFinda for the next 30 years. This is based on replacement costs for mains only, and does not include the cost of replacing point assets such as manholes or outlets at the same time.

Figure 86: Renewals Profile – Stormwater Lines



This draft programme will be used to set budgets. Drilling into detail, the assets selected will be examined to confirm whether renewal is required or can be deferred. Following this, Indicative Business Cases will be made for individual projects.

The highest proportion of stormwater renewals are required in Taihape, due to the age of infrastructure.

7.3 Asset Creation

7.3.1 Water Supply

7.3.1.1 Water Quality

The following projects are planned to improve drinking water quality:

- **Taihape Spill Detection**. The Taihape intake is exposed to a risk from spills of hydrocarbon or other chemical as a result of the major road and rail routes nearby. This could be mitigated against by installing monitoring equipment at the plant inflow, configured to shut the plant down in case of emergency until the raw water is safe.

- **Hunterville WTP Treatment Improvements**. Additional process to deal with high turbidity in source water. $15,000 in Year 1 of the 2018-2048 Long Term Plan.

- **Mangaweka WTP Treatment Improvements**. Additional process to deal with high turbidity in source water. $15,000 in Year 1 of the 2018-2048 Long Term Plan.

- **Calico Line UV Installation**. A provisional sum of $200,000 has been allowed for in Year 3 of the 2018-2048 Long Term Plan. This will be required in order to achieve

protozoal compliance for this source, if the Havelock North inquiry results in secure bore status being removed from the Drinking Water Standards.

- **Rātana UV Installation**. A provisional sum of $200,000 has been allowed for in Year 3 of the 2018-2048 Long Term Plan. This will be required in order to achieve protozoal compliance for this source, if the Havelock North inquiry results in secure bore status being removed from the Drinking Water Standards. The new plant has been built without UV disinfection, but with the ability for this to be retrofitted if needed.

The "treatment improvements" projects identified should help with taste issues for these areas, such as those mentioned in the 2017 Residents Survey (Section 7.3.1.1).

7.3.1.2 Hunterville Water Supply Upgrade

Funding has been received from the Ministry of Health to upgrade the Hunterville Urban water supply, with a dedicated source. Currently the town relies on supply from the Hunterville Rural Water Supply, which is susceptible to power outages. An allowance of $500,000 has been made in Year 1 of the 2018-2048 Long Term Plan for Council's share of this subsidised project. The amount of the MOH subsidy is $393,511.

7.3.1.3 Rural Water Supplies

During workshops on the Asset Management Plan, Council indicated that it was comfortable with continuing to provide non-potable water to Rural Water Supply customers. However, it was indicated that every effort should be made to inform property owners that the water is delivered on this basis. This could include requiring signage on properties, to ensure that tenants are as aware of the risks as owners.

7.3.1.4 Bulls and Marton Growth

In recent years, several approaches have been made to Council by owners of property on the outskirts of Bulls and Marton wishing to connect to the water supply. During Asset Management Plan workshops, Council endorsed the extension of these networks where it makes sense to do so. The preference indicated was for areas of land already zoned as Rural Lifestyle (rather than Rural). The desire is for controlled, quality growth of networks.

7.3.1.5 Broadway, Marton Trunk Main

An allowance has been made in Year 1 of the 2018-2048 Long Term Plan to continue the extension of the 300 mm water main along Broadway, completing the section between Signal St and 146 Broadway.

7.3.2 Wastewater

7.3.2.1 Koitiata

The investigation into the extension of the Koitiata wastewater network to serve the entire community continues. Support in the community for this to occur is currently divided. The

Most Likely Scenario for Koitiata indicated by Council as part of Asset Management Plan workshops was for the status quo to continue.

7.3.2.2 Rātana

The Wastewater Treatment Plant in Rātana will receive a major upgrade so that it can treat nitrogen and phosphorus in the wastewater.

Funding has been received from the Ministry for the Environment Freshwater Improvement Fund. $875,000 has been granted, towards a total estimated project cost of $1.9 million for improving the quality of Lake Waipu. $75,000 of this is for science and monitoring, with Horizons Regional Council providing another $75,000 and managing that side of the work. $800,000 was granted for Rangitīkei District Council to upgrade the wastewater treatment plant.

The plant upgrade will be designed to cater for additional wastewater flows from the proposed 60-lot subdivision for Rātana. There may also be a need to increase the capacity of certain sewer mains in town for the same reason. This will be investigated, and work programmed.

7.3.2.3 Hunterville

An allowance has been made for a future upgrade of the Hunterville WWTP, in Years 17 and 18 of the 2018-2048 Long Term Plan. This is to coincide with discharge consent renewal ahead of expiry in 2037. The allowance is for a $1.5 million upgrade (and $500,000 consent renewal), split over the two years.

7.3.3 Stormwater

7.3.3.1 Scotts Ferry

An investigation is needed into stormwater provisions at Scotts Ferry. It is proposed to carry out this investigation as part of the 2018-2028 Long Term Plan. Depending on the outcome of this, there may be a need to install new stormwater assets at this location.

In overall terms, for towns which are not considered “stormwater connected”, Council indicated through Asset Management Plan workshops that it would like to see a cost analysis of work required.

The estimated cost of ongoing annual work is $5,000/year. This can be accommodated within the operational budgets requested for Stormwater in the 2018-2028 Long Term Plan, should Council decide to extend this level of service.

7.4 Asset Disposal

7.4.1 Water Supply

7.4.1.1 Seismic Assessments

Preliminary seismic assessments have been carried out on key Water Supply assets. The following assets have been identified as earthquake-prone. This means they will need to be either strengthened or demolished, to reduce the risk of injury, fatality, or interruption to critical services.

Table 66: Initial Seismic Assessment Results

Network	Location	Asset	Strengthening Recommended	Cost of Strengthening
Bulls	Tricker's Hill	Concrete Reservoir	No	N/A
	Taumaihi St	Concrete Tower	Yes	$300,000 - $400,000
	WTP	Concrete Building and Filter	Yes	$100,000 - $200,000
Marton	WTP	Concrete Clarifier	Yes	$200,000 - $300,000
Mangaweka	WTP	Concrete Reservoir	Yes	$200,000 - $300,000
Taihape	WTP	Concrete Reservoir	Yes	$200,000 - $300,000

7.4.1.2 Bulls

The now-defunct Bulls well needs to be properly decommissioned, and disposed of.

7.4.1.3 Rātana

Once the new supply for Rātana is operational, it is likely that there will be disposals required for old plant equipment.

7.4.2 Wastewater

7.4.2.1 Bulls and Marton

If centralisation of Marton and Bulls wastewater occurs, it is likely that some assets at existing plants would need to be disposed.

8 Financial Summary

8.1 Financial Statements and Projections

10-year projections for each utility are given in the following tables. Note that figures are in "today's dollars" (i.e. without inflation).

8.1.1 Water Supply

The summary financial statements for water for the next ten years is given in the following tables, broken down by cost centre.

8.1.1.1 District Water Supply

Table 67: Financial Summary – District Water Supply

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Revenue										
Metered Supply Charges	532,821	532,821	532,821	532,821	532,821	532,821	532,821	532,821	532,821	532,821
Water User Charges	-	-	-	-	-	-	-	-	-	-
Sundry Sales	-	-	-	-	-	-	-	-	-	-
Subsidy Capital Improvements	-	-	-	-	-	-	-	-	-	-

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Expenses										
Advertising	1,076	1,076	1,076	1,076	1,076	1,076	1,076	1,076	1,076	1,076
Treatment Costs - External Contractors	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Consultants	16,146	16,146	16,146	16,146	16,146	16,146	16,146	16,146	16,146	16,146
Insurance	46,114	46,114	46,114	46,114	46,114	46,114	46,114	46,114	46,114	46,114
Telephone Costs	12,917	12,917	12,917	12,917	12,917	12,917	12,917	12,917	12,917	12,917
Reticulation Costs - External Contractors	118,405	118,405	118,405	118,405	118,405	118,405	118,405	118,405	118,405	118,405
Chemicals & Consumables	264,461	264,461	264,461	264,461	264,461	264,461	264,461	264,461	264,461	264,461
Materials	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
Professional Services - MDC	538,203	538,203	538,203	538,203	538,203	538,203	538,203	538,203	538,203	538,203
Rates	23,450	23,450	23,450	23,450	23,450	23,450	23,450	23,450	23,450	23,450
Rates - Utility	46,901	46,901	46,901	46,901	46,901	46,901	46,901	46,901	46,901	46,901

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Resource Consents	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
Special Projects Water	-	-	-	-	-	-	-	-	-	-
Electricity	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Operational Projects										
Water Treatment O&M	90,000	10,000	50,000	10,000	10,000	10,000	10,000	60,000	10,000	10,000
Renewals										
Water Reticulation Renewals	3,512,682	2,311,905	1,621,565	999,875	1,060,124	1,521,119	1,579,640	1,190,769	900,000	900,000
Water Treatment Renewals	185,000	60,000	110,000	60,000	60,000	60,000	60,000	110,000	60,000	60,000
Capital										
Water Reticulation New Works	43,750	256,250	30,000	-	-	-	-	-	-	-

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Water Treatment New Works	45,000	300,000	775,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000

8.1.1.2 Hunterville Urban Water

Table 68: Financial Summary – Hunterville Urban Water Supply

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Revenue										
Metered Supply Charges	90,070	90,070	90,070	90,070	90,070	90,070	90,070	90,070	90,070	90,070
Water User Charges	-	-	-	-	-	-	-	-	-	-
Sundry Sales	-	-	-	-	-	-	-	-	-	-
Subsidy Capital Improvements	-	-	-	-	-	-	-	-	-	-
Water Supply Upgrade - MOH Subsidy	393,511	-	-	-	-	-	-	-	-	-
Expenses										

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Insurance	2,745	2,745	2,745	2,745	2,745	2,745	2,745	2,745	2,745	2,745
Telephone Costs	2,335	2,335	2,335	2,335	2,335	2,335	2,335	2,335	2,335	2,335
Reticulation Costs - External Contractors	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC
Chemicals & Consumables	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Materials	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Professional Services - MDC	10,764	10,764	10,764	10,764	10,764	10,764	10,764	10,764	10,764	10,764
Extraordinary Water	95,184	95,184	95,184	95,184	95,184	95,184	95,184	95,184	95,184	95,184
Rates - Utility	5,274	5,274	5,274	5,274	5,274	5,274	5,274	5,274	5,274	5,274
Resource Consents	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Electricity	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Operational Projects										

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Water Treatment O&M	15,000	-	50,000	-	-	-	-	10,000	-	-
Renewals										
Water Reticulation Renewals	-	-	-	-	-	-	-	-	-	34,948
Water Treatment Renewals	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Capital										
Water Treatment New Works	908,511	-	-	-	-	-	-	-	-	-

8.1.1.3 Erewhon Rural Water Supply

Table 69: Financial Summary – Erewhon Rural Water Supply

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Revenue										

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Metered Supply Charges	200,910	200,910	200,910	200,910	200,910	200,910	200,910	200,910	200,910	200,910
Expenses										
Insurance	4,090	4,090	4,090	4,090	4,090	4,090	4,090	4,090	4,090	4,090
Telephone Costs	1,076	1,076	1,076	1,076	1,076	1,076	1,076	1,076	1,076	1,076
Erewhon W/Board Lease	3,229	3,229	3,229	3,229	3,229	3,229	3,229	3,229	3,229	3,229
Operational Costs - External Contractors	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000
Materials	1,076	1,076	1,076	1,076	1,076	1,076	1,076	1,076	1,076	1,076
Professional Services - MDC	5,382	5,382	5,382	5,382	5,382	5,382	5,382	5,382	5,382	5,382
Rates - Utility	11,087	11,087	11,087	11,087	11,087	11,087	11,087	11,087	11,087	11,087
Resource Consents	2,153	2,153	2,153	2,153	2,153	2,153	2,153	2,153	2,153	2,153
Renewals										

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Water Reticulation Renewals	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000	120,000
Water Treatment Renewals	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000

8.1.1.4 Hunterville Rural Water Supply

Table 70: Hunterville Rural Water Supply

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Revenue										
Metered Supply Charges	436,773	436,773	436,773	436,773	436,773	436,773	436,773	436,773	436,773	436,773
User Charges and Contributions	-	-	-	-	-	-	-	-	-	-
Penalty	-	-	-	-	-	-	-	-	-	-
Expenses										

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
External Contractors	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000
Member Remuneration	-	-	-	-	-	-	-	-	-	-
Insurance	10,549	10,549	10,549	10,549	10,549	10,549	10,549	10,549	10,549	10,549
Telephone Costs	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Chemicals & Consumables	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Materials	5,382	5,382	5,382	5,382	5,382	5,382	5,382	5,382	5,382	5,382
Professional Services - MDC	43,056	43,056	43,056	43,056	43,056	43,056	43,056	43,056	43,056	43,056
Rates - Utility	18,444	18,444	18,444	18,444	18,444	18,444	18,444	18,444	18,444	18,444
Resource Consents	2,153	2,153	2,153	2,153	2,153	2,153	2,153	2,153	2,153	2,153
Electricity	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000
Renewals										
Water Reticulation Renewals	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Water Treatment Renewals	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000

8.1.1.5 Omatane Rural Water Supply

Table 71: Financial Summary – Omatane Rural Water Supply

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Revenue										
Metered Supply Charges	5,803	5,803	5,803	5,803	5,803	5,803	5,803	5,803	5,803	5,803
Expenses										
Insurance	753	753	753	753	753	753	753	753	753	753
Materials	-	-	-	-	-	-	-	-	-	-
Professional Services - MDC	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Rates	1,566	1,566	1,566	1,566	1,566	1,566	1,566	1,566	1,566	1,566
Resource Consents	2,153	2,153	2,153	2,153	2,153	2,153	2,153	2,153	2,153	2,153

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Renewals										
Water Reticulation Renewals	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000

8.1.2 Wastewater

Table 72 gives a summary of the finances for wastewater over the next 10 years.

Table 72: Financial Summary - Wastewater

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Revenue										
Rate Remissions	-	-	-	-	-	-	-	-	-	-
User Charges & Contributions	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Rātana - WWTP Upgrade - Te Mana o te Wai	800,000	-	-	-	-	-	-	-	-	-
Expenses										
Advertising	483	483	483	483	483	483	483	483	483	483
Treatment Costs - External Contractors	118,405	118,405	118,405	118,405	118,405	118,405	118,405	118,405	118,405	118,405
External Consultants	5,188	5,188	5,188	5,188	5,188	5,188	5,188	5,188	5,188	5,188
Insurance	56,026	56,026	56,026	56,026	56,026	56,026	56,026	56,026	56,026	56,026

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Telephone Costs	2,180	2,180	2,180	2,180	2,180	2,180	2,180	2,180	2,180	2,180
Reticulation Costs - External Contractors	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Chemicals & Consumables	130,000	130,000	130,000	130,000	130,000	130,000	130,000	130,000	130,000	130,000
Materials	7,781	7,781	7,781	7,781	7,781	7,781	7,781	7,781	7,781	7,781
Professional Services - MDC	224,947	224,947	224,947	224,947	224,947	224,947	224,947	224,947	224,947	224,947
Rates	7,373	7,373	7,373	7,373	7,373	7,373	7,373	7,373	7,373	7,373
Extraordinary Water	16,905	16,905	16,905	16,905	16,905	16,905	16,905	16,905	16,905	16,905
Rates - Utilities	51,869	51,869	51,869	51,869	51,869	51,869	51,869	51,869	51,869	51,869
Resource Consents	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Electricity	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000
Operational Projects										

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Wastewater Reticulation - O&M	40,000	40,000	40,000	40,000	40,000	-	-	-	-	-
Renewals										
Wastewater Reticulation - Renewals	1,263,652	1,281,752	1,118,621	1,148,981	1,110,828	967,588	923,478	952,871	920,346	877,064
Wastewater Treatment - Renewals	1,970,000	3,769,750	2,570,000	3,970,000	1,395,000	195,000	70,000	70,000	70,000	70,000
Capital										
Wastewater Reticulation - New Works	75,000	-	-	-	-	-	-	-	-	-
Wastewater Treatment - New Works	800,000	-	-	-	-	500,000	1,250,000	250,000	-	-

8.1.3 Stormwater

Forecast expenditure, and a financial summary, for stormwater are given in the tables/figures on the following pages.

Table 73: Financial Summary - Stormwater

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Revenue										
Sundry Income	2,362	2,362	2,362	2,362	2,362	2,362	2,362	2,362	2,362	2,362
Newly Found/Vested Assets	-	-	-	-	-	-	-	-	-	-
Expenses										
External Contractor	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Insurance	15,885	15,885	15,885	15,885	15,885	15,885	15,885	15,885	15,885	15,885
Materials	5,382	5,382	5,382	5,382	5,382	5,382	5,382	5,382	5,382	5,382
Professional Services - MDC	120,692	120,692	120,692	120,692	120,692	120,692	120,692	120,692	120,692	120,692
Rates - Utilities	42,787	42,787	42,787	42,787	42,787	42,787	42,787	42,787	42,787	42,787
Renewals										

Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Stormwater Reticulation - Renewals	507,977	448,520	346,567	596,516	478,331	481,466	440,700	391,181	528,356	472,394
Capital										
Stormwater Reticulation - New Works	750,000	750,000	750,000	750,000	750,000	800,000	750,000	750,000	750,000	750,000

8.2 Funding Strategy

8.2.1 Operating Expenditure

Council funds operating expenditure from the following sources:

- General rates.
- Targeted rates.
- Fees and charges.
- Interest and dividends from investments.
- Grants and subsidies towards operating expenses (grants and subsidies towards capital expenditure are applied to the related capital expenditure only).
- Other operating revenue.

Council may choose not to fund fully the operating expenditure in any particular year, if the deficit can be funded from operating surpluses in the immediately preceding or subsequent years. An operating deficit will only be budgeted when beneficial to avoid significant fluctuations in rates, fees or charges.

Council may choose to fund from the above sources more than is necessary to meet the operating expenditure in any particular year. Council will only budget for such an operating surplus if necessary to fund an operating deficit in the immediately preceding or following years, or to repay debt. Council will have regard to forecast future debt levels when ascertaining whether it is prudent to budget for an operating surplus for debt repayment.

Rangitīkei District Council does not collect Development Contributions.

8.2.2 Funding of Capital Expenditure

Council funds capital expenditure from borrowing and then spreads the repayment of that borrowing over several years. This enables Council to match best the charges placed on the community against the period of benefits from capital expenditure. Borrowing is managed within the framework specified in the Liability Management Policy.

8.2.3 Water Supply

For potable water supplies, the current funding mechanism is a combination of a targeted rate and user charges.

25% of the total cost of the activity is charged to all separately used or inhabited rateable properties (whether connected or unconnected), funded 33% through the general rate with the balance funded through a fixed charge. This is the 'public good' component, to reflect the community-wide benefit. Varying this percentage has a consequential impact on the other components of the funding mechanism.

65-70% of the cost of this activity (excluding Hunterville Urban supply) is charged to all connected properties, other than those metered in Hunterville or as extraordinary users. It is a fixed charge (i.e. same for all properties). This is effectively a consumption charge. This is based on the SUIP, meaning one property may have two rates applied, if it contains more than one SUIP. An example is a property with 2 houses on it, as the rate is more applicable to dwellings than to the land itself.

5-10% of the cost of this activity (excluding Hunterville Urban supply) is recovered from charges to extraordinary users and bulk supplies.

75% of the cost of the Hunterville Urban supply is recovered through meter charges.

The operational expenses of the Rural Water Supplies are funded by charges on each subscriber. Overhead costs are, however, funded through the general rate. Depreciation costs for each network are currently not funded. This means any renewals or capital expenditure must be loan funded, which could mean significant fluctuations in the funding requirements.

8.2.4 Wastewater

The current funding mechanism for wastewater is a combination of a targeted rate and user charges.

25% of the total cost of the activity is charged to all separately used or inhabited rateable properties (whether connected or unconnected), funded 33% through the general rate with the balance funded through a fixed charge. This is the 'public good' component, to reflect the community-wide benefit.

65-70% of the cost of this activity is charged to all connected properties, except for properties subject to an agreement under the Trade Waste Bylaw. This is based on the SUIP, meaning one property may have two rates applied, if it contains more than one SUIP. An example is a property with 2 houses on it, as the rate is more applicable to dwellings than to the land itself.

5-10% of the cost of this activity is recovered from charges levied under the Trade Waste Bylaw and septage disposal (on the basis of the rate set in the Council's annual Schedule of Fees and Charges or as separately agreed).

8.2.5 Stormwater

The current funding mechanism for the stormwater activity is a combination of a targeted rate and user charges.

25% of the total cost of the activity is charged to all separately used or inhabited rateable properties (whether connected or unconnected), funded 33% through the general rate with the balance funded through a fixed charge. This is the 'public good' component, to reflect the community-wide benefit. Varying this percentage has a consequential impact on the other components of the funding mechanism.

75% of the total cost is funded through a targeted rate on all rating units. Unlike wastewater and water supply, which are rated based on an SUIP, by law only one stormwater rate may be applied to each rating unit.

Previously, stormwater was funded by a targeted rate specific to each of the town-based stormwater networks. It is now harmonised, so (for example) a property connected to the Marton stormwater network pays the same as one connected to the Taihape network.

8.3 Asset Valuation

Each year, a valuation of our 3 Waters assets is completed internally. These valuations are peer-reviewed and certified. The latest valuation is as of 1 July 2016, and asset values within the Asset Management Plan are based on this.

The valuation is based on PBE IPSAS 17 Property, Plant and Equipment, and is completed in accordance with the New Zealand Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2.0 (2006).

Key assumptions made in preparing the valuation are that:

- Depreciation follows a straight line.
- The replacement cost for pipes has been assumed to be a function of diameter and the use of a modern equivalent material where appropriate.
- All water pipes and fittings are PN12 rated unless otherwise stated.
- As at 1 July 2016 MDC has not experienced any major natural events, nor operational damage, (malicious or accidental) that would cause asset impairment to any part of the assets covered.

Unit rates are set by the following procedure:

- Where this information is available, historic contract rates are inflation-adjusted for each of the previous three years and then averaged together. This 3-year average is then combined with the previous year's unit rate to define a new rate.
- Where there is an absence of recent contract data the previous unit rate is simply adjusted for inflation.
- Where plant assets such as civil structures, electrical and piping assets are not amenable to a standard unit rate (i.e. they are a unique design or have an unspecified quantity) the purchase cost of the original asset is adjusted for inflation and recorded in the individual asset's 'optional unit rate' field. This optional unit rate overrides any standard unit rate on an asset by asset basis.
- For Plant assets, the 3-year contract average is extended to 10 years to increase the number of data points available in the calculation. Plant renewals are not as

common as reticulation and there may be long periods between suitable contract data.

Expected Useful Lives used are indicated below.

Table 74: Expected Useful Lives – Water Supply

Asset Category		Useful Lives
Pipes	Plastic	80 – 90 years
	Concrete	80 years
	Steel	30 – 90 years
	Fibre Cement	38 – 75 years
	Other	20 - 100 years
Fittings	Backflow Devices	20 – 35 years
	Hydrants	50 years
	Valves	20 – 100 years
	Tobies/Meters	20 – 50 years
Plant	Civil	20 – 200 years
	Mechanical	10 – 50 years
	Electrical	10 – 65 years
	Valves	10 – 50 years
	Building	10 – 50 years

Table 75: Expected Useful Lives - Wastewater

Asset Category		Useful Lives
Pipes	Plastics	50 – 90 years
	Ceramics/Concretes	80 – 100 years
	Fibre Cement	60 years
	Re-lined Pipe	50 years[3]
Fittings	Manholes	90 years

[3] From manufacturer's guarantee.

Asset Category		Useful Lives
	Valves	50 – 100 years
Plant	Reservoirs/Tanks	50 - 100 years
	Civil	50 – 100 years
	Mechanical	10 – 20 years
	Electrical	5 – 25 years

Asset Category		Useful Lives
Pipes/Culverts	Plastic	65 years
	Ceramic	50 – 80 years
	Fibre Cement	60 years
	Concrete	90 – 100 years
	Earth Swales, Drains	indefinite
Fittings	Manholes	100 years
	Sumps and Catchpits	100 years
Plant	Reservoirs/Tanks	50 - 100 years
	Civil	50 – 100 years
	Mechanical	10 – 20 years
	Electrical	5 – 25 years

For more information, refer to the Infrastructural Assets Valuation Report 2016.

8.4 Insurance

Rangitīkei District Council is a member of LAPP (the Local Authority Protection Programme), which is a cash accumulation mutual pool that members use to assist with the cost of infrastructure repairs resulting from natural disasters. LAPP covers underground assets, but not aboveground assets such as Water Treatment Plants, reservoirs, or open drains.

Losses on assets covered by LAPP are recovered through a split of 40% LAPP and 60% central government, with a deductible of $260,000. From a membership of 40 Councils, LAPP now consists of only 26. Wellington City Council is one of the authorities that have left. There is now less risk of LAPP funds being drained by a major disaster, as happened in the aftermath of the Canterbury quake.

Council carries insurance policies itself for our aboveground assets, through brokers AON.

8.5 Key Assumptions

The Council has made a number of corporate assumptions, which underpin the development of this Asset Management Plan and the Long Term Plan. A full list of these assumptions is included within the Long Term Plan.

8.6 Forecast Reliability

Both capital and operational forecasts are built up from zero-based budgets where possible. This means starting from first principles and calculating costs, for example calculating chemical usage from dose rates and expected flows, then determining costs based on contract rates for those chemicals.

Operational budgets are checked against historic expenditure over a period of several years to ensure that they are comparable and realistic.

9 Asset Management Practices

9.1 Introduction

This section of the Asset Management Plan describes how the Council manages the activity on a day-to-day basis. It covers the strategies employed by Council to ensure that levels of service are delivered to the agreed level in a sustainable and cost effective manner.

9.2 Organisational Structure and Asset Responsibilities

The Manawatū District Council and Rangitīkei District Council are responsible for providing services to their respective communities through the operation and sustainable management of infrastructural activities.

In November 2007 the two Councils signed a Memorandum of Understanding that outlined the framework for a shared services arrangement. The shared services arrangement recognises that there are advantages to both Councils in working together to provide asset and contract management services.

The activities covered by the shared services arrangement are:

- Roads.
- 3 Waters.
- Solid waste.

As part of the implementation, the Manawatū District Council established an Assets Group, with responsibility for the provision of services to each Council. In 2011 the Group was retitled the Infrastructure Group. Property, parks and cemeteries remain under the direct management control of the Rangitīkei District Council. Asset Management practices for these activities are closely aligned to those observed in the shared services arrangement.

The functions provided by the Infrastructure Group are:

- Asset Management (all activities).
- Project management (all activities).
- Contract management (all activities).
- Technical expertise and skills (all activities).
- Operation and maintenance of the water and wastewater treatment plants (water and wastewater activities only).

- Operation and maintenance of the water, wastewater and stormwater reticulation networks (water, wastewater and stormwater activities only).

These functions are undertaken to ensure that:

- Each Council's statutory obligations are met and not compromised; and
- Each Council's commitments with their respective communities are delivered, as outlined in the Long Term Plans, Asset Management Plans and other relevant plans.

9.3 Infrastructure Group Structure

The 3 Waters activities are managed under a shared services agreement by the Infrastructure Group of the Manawatū District Council. Rangitīkei District Council maintains relationships with Infrastructure Group staff of other Councils to facilitate the exchange of information and management practices.

The Group structure was developed with the shared services objectives in mind. The team structure recognises that the delivery approach for each activity will be influenced by:

- Differences in the management structures of each organisation.
- The nature of the various activities.
- The current level of performance with respect to each activity.
- The level of skills required to meet community expectations.

9.4 Procurement of External Services

The physical implementation of Asset Management strategies is largely implemented via the purchase of external goods and services. RDC staff follow a procurement policy, which is available through SharePoint. This policy sets out a framework for the procurement of goods and services that aligns with the strategic outcomes and objectives of Rangitīkei District Council.

The policy recognises that Council has a responsibly to its community to manage its resources effectively and efficiently and to procure goods and services in a transparent and legally compliant manner.

The policy is a Council tool that delivers 'value for money' rather than a prescriptive document which dictates a single procurement process for all goods and services. The policy covers the full range of products and services procured by Council and it is intended that implementation of the policy will provide consistency in maximising value for money, in supporting the local market and in providing fair competition.

Staff have delegated authority for expenditure depending on their role within Council. For details, refer to the Delegations Manual.

9.5 Asset Management Information

To help identify the Asset Management information needs it is helpful to break down business practice into three key Asset Management inputs:

- **Processes**. The necessary processes and the analysis and evaluation techniques needed for lifecycle management.
- **Data**. Data available for manipulation by information systems to produce the required outputs.
- **Information systems**. The information support systems used to store and manipulate the data.

9.6 Data Management and Information Systems

9.6.1 Asset Data

Council maintains its core Wastewater Treatment asset data within the AssetFinda System. The software allows for the data to be viewed in a variety of forms. It has extensive and advanced searching functions, as well as tabular and graphical reporting of search results.

This allows the manager to view records by location, commission date, overall condition, design life, critical (remaining) life, or any other parameter. AssetFinda is also capable of carrying out cost-based valuation calculations using straight-line depreciation.

Data management processes to ensure data accuracy and completeness are under continual review and are at present reasonably documented, although the opportunity exists to improve the identification linkages between systems.

Most asset attribute is contained in databases to a high degree of accuracy and completeness.

- **Land Identification:** Property land ID numbers are currently used with Council's GIS system.
- **Plans and Records:** Most design plans and some as-built plans are kept in hard copy form in the Professional Services Unit plan room. There is a move towards digitising these and linking them to a property land ID number.
- **Customer Requests:** All customer requests are received and logged by Council. The customer service officers then either escalate the call to the contractor (routine matters) or the officer responsible for the activity.

- There is no direct link between AssetFinda and the customer request system. AssetFinda has a distinct customer request module, but this is not the system used by Council to track requests.

- **Financial Data:** The financial system used is NCS. The system is entirely separate from the network database. The manager signs off all expenses and all costs (operation, maintenance, capex) are recorded against appropriate cost codes in the financial system. The actual costs of renewals are entered against the appropriate asset component within AssetFinda. A valuation is carried out every year by an external valuer, using the AssetFinda data.

- **Asset Accounting/Costing:** The asset accounting and costing practices are detailed below.

9.6.2 SCADA Data

Our water and wastewater networks are monitored or controlled using local SCADA systems. Due to the topography and geography of the District, there is no centralised collection point for our SCADA information. However, our operators can dial in to most of our plants remotely.

Each day, certain SCADA sites send a batch file of information to a report server, from where it is distributed to operational staff. This information is also sent daily by .csv file via an FTP site to our online Water Outlook software, which stores it separately by tag. Water Outlook gives our staff greater ability to query this data and run reports on the performance of our plants.

9.7 Asset Categorisation/Hierarchy

Asset description classifications and standards are well documented for all significant assets and components.

Asset data is stored in various locations around the Council and maintained by various staff depending on ownership and usage of the data. A more centralised and consistent approach to collecting, storing and managing the data would be desirable and more efficient.

Several information management software systems are used by Council to store and manipulate Asset Management data but they are currently used to a limited extent only. The Geographic Information System (GIS) used is MapInfo. AssetFinda links to MapInfo to present asset data spatially.

The Asset Management Plan is a living document, which is relevant and integral to daily Asset Management activity. To ensure the plan remains useful and relevant the following on-going process of Asset Management Plan monitoring and review activity will be undertaken:

Formal adoption of the plan by Council:

- Review and formally adopt levels of service:

- Revise Asset Management Plan annually to incorporate and document changes to works programmes, outcome of service level reviews and new knowledge resulting from the Asset Management improvement programme.
- Quality assurance audits of Asset Management information to ensure the integrity and cost effectiveness of data collected.
- Peer review.

10 Improvement Plan

The development of this plan is based on existing levels of service, the best available current information and the knowledge of Council staff. It is merely a snap shot in time of the underlying planning processes of Council. The Asset Management Plan will be the subject of on-going monitoring, review and updating to improve the quality of Asset Management Planning and accuracy of the financial projections.

This process involves using improved knowledge of customer expectations and enhanced Asset Management systems and data to optimise decision-making and activities, review outputs, develop strategies, introduce risk management and extend the planning horizon.

The Asset Management improvement process involves:

- The cycle of Asset Management Plan monitoring, review, revision and audit to improve the effectiveness of Asset Management Plan outputs and compliance with audit criteria, legal requirements and good practice.
- The definition of service standards reflecting community desires through public consultation (service level review). The Asset Management Plan is used to identify service standard options and costs, and the delivery of the service standards adopted is a key objective of Asset Management Planning.
- The corporate Asset Management co-ordination role by the Asset Planning Group, which guides and audits the development of Asset Management Plans within the framework of Council's strategic direction.

The purpose of the Improvement Plan is to:

- Identify and develop implementation of Asset Management Planning processes.
- Identify and prioritise ways to cost-effectively improve the quality of the Asset Management Plan.
- Identify indicative time-scales, priorities, and human and financial resources required to achieve Asset Management Planning objectives.

The Asset Management Plan is a living document, which is relevant and integral to daily Asset Management activity. To ensure the plan remains useful and relevant the following on-going process of Asset Management Plan monitoring and review activity will be undertaken:

- Formal adoption of the plan by Council.
- Review and formally adopt levels of service.

- Revise Asset Management Plan annually to incorporate and document changes to works programmes, outcome of service level reviews and new knowledge resulting from the Asset Management improvement programme.

- Quality assurance audits of Asset Management information to ensure the integrity and cost effectiveness of data collected.

- Peer review.

These processes will be undertaken as required throughout the three year Asset Management updating cycle.

Responsibilities have been allocated for each of the Improvement Plan actions listed below. Buy-in from each of the relevant parties will be sought, and completion dates for tasks agreed upon. These actions will be tracked, with milestones and progress. As each future Asset Management Plan is produced, the updated status of each improvement item will be included. In these ways, accountability for improving Asset Management practices will be demonstrated.

The improvement action plan is given in Table 76.

Table 76: Improvement Actions

Improvement	Location	Target Completion	Resources	Current status
Overall				
Develop strategy and processes for planned maintenance	District	Jun 2018	Reticulation Supervisor, Treatment Supervisor	
Develop mobile solution for capture of asset data from the field	District	Dec 2018	Asset Management Officer	Working on rollout of iPads or Surface tablets, similar to MDC. Firewall issues in process of being resolved. Need $8,000-10,000.
Complete digitisation of all hard copy plans	District	Jun 2018	Asset Management Officer	Section 5.4.
Bring O&M tasks for reticulation into Water Outlook.	District	Jun 2018	Asset Information Officer, Reticulation Supervisor, Asset Engineer	
Water				
Produce O&M manual for WTP	Hunterville	Jun 2019	Operations Manager	
	Rātana	Jun 2019	Operations Manager	
Produce O&M manual for B/C Dam	Marton	Jun 2019	Operations Manager	
Produce P&ID for WTP	Hunterville	Dec 2017	Operations Manager	
	Rātana	Dec 2017	Operations Manager	Pending completion of new supply.
Secure formal access agreements for assets on private land	District	Jun 2020	Development Manager	Including Bulls bores 1-4, Hunterville WTP.

Improvement	Location	Target Completion	Resources	Current status
Implement condition assessment programme	District	Jun 2018	Asset Team	For reticulation and treatment assets.
Forecast demand based on historic trends and future predictions	District	Jun 2020	Asset Engineer	Historic records available are limited, impacting on ability to forecast based on trends.
Develop emergency response plans	District	Jun 2018	Operations Manager, Health & Safety Officer	In progress; spill response plans, chemical containment, etc.
Componentise WTPs	District	Jun 2018	Asset Engineer, Asset Management Officer, Treatment Team Leader	From P&IDs. Decide level of componentisation. Valuation by MWH underway, which will help to address this.
Ensure adequate backflow prevention is in place	District	Jun 2019	Reticulation Supervisor	Programme underway since 2017 to inspect entire District.
Have B and C Dams inspected	Marton	Jun 2018	Operations Manager, Asset Engineer	Site visit complete, report in progress.
Consider pressure management for Taihape	Taihape	Jun 2019	Operations Manager, Asset Engineer	Would help with water losses. Two PRVs already existent.
Assess generation capacity across WTPs and other key assets	District	Dec 2017	Asset Engineer, Operations Manager	Resilience. Budget for generator installation where appropriate.
Finish seismic assessments on key assets.	District	Jun 2018	Project Team Leader	Initial inspections done; detailed assessments outstanding.
Investigate connections from raw water main	Taihape, Marton	Jun 2019	Asset Engineer, Project Engineer, Senior Reticulation Operator	
Write Functional Descriptions for water supplies	District	Jun 2018	Operations Manager, SCADA Contractor	Will include asset register.

Improvement	Location	Target Completion	Resources	Current status
Complete dam break study for Marton B/C Dams	Marton	Jun 2018	Asset Engineer, Operations Manager, Treatment Supervisor	Top recommendation from Comprehensive Dam Safety Review.
Review sanitary procedures protocol	District	Dec 2017	Utilities Manager, Operations Manager	
Undertake residence time testing on Calico Line bore	Marton	Sep 2017	Utilities Manager, Operations Manager	
Ensure Calico Line borehead is sanitary	Marton	Sep 2017	Utilities Manager, Operations Manager	
Wastewater				
Produce O&M manual for WWTP	Marton	TBC	Operations Manager	On hold pending centralisation discussion.
	Taihape	Jun 2019	Operations Manager	
	Bulls	TBC	Operations Manager	On hold pending centralisation discussion.
	Rātana	TBC	Operations Manager	On hold pending consent renewal.
	Koitiata	Jun 2018	Operations Manager	Partially completed; O&M manual written for distribution field. Complete for WWPS. Not required for pond.
Carry out I&I investigation	District	Jun 2019	Asset Engineer, Special Project Engineer, Reticulation Supervisor	Completed for Bulls, Hunterville, Taihape. Marton done historically, but needs to be re-done. Include Rātana and Mangaweka.
Forecast demand based on historic trends and future predictions	District	Jun 2020	Asset Engineer	

Improvement	Location	Target Completion	Resources	Current status
Develop emergency response plans	District	Jun 2018	Operations Manager, Health & Safety Officer	In progress; spill response plans, chemical containment, etc.
Componentise WWTPs	District	Jun 2018	Asset Engineer, Asset Management Officer, Treatment Team Leader	Use P&IDs. Valuation by MWH underway, which will help to address this.
Address gaps in wastewater reticulation data near railway line in Taihape	Taihape	Jun 2018	Asset Management Officer	
Assess generation capacity across WWTPs and key pump stations	District	Dec 2017	Asset Engineer, Operations Manager	Resilience. Budget for generator installation where appropriate.
Finish seismic assessments on key assets.	District	Jun 2018	Project Team Leader	Initial inspections done; detailed assessments outstanding.
Stormwater				
Forecast demand based on historic trends and future predictions	District	Jun 2020	Asset Engineer	
Confirm responsibilities for stormwater across District	District	Dec 2018	Council	Report delivered to Council suggesting ownership framework. Submissions on bylaw review analysed.
Respond to submissions on stormwater bylaw	District	Dec 2018	Asset Engineer, Asset Management Officer	List compiled of issues resolved. Some issues remain to be resolved before feedback provided.
Confirm condition information for pipes in “Excellent” condition	District	Jun 2018	Asset Engineer, Asset Management Officer	
Improve information on stormwater network in Hunterville	Hunterville	Jun 2018	Asset Engineer, Asset Management Officer	

Improvement	Location	Target Completion	Resources	Current status
Provide detailed information on capacity and performance issues	District	Jun 2018	Asset Engineer, Asset Management Officer, Reticulation Supervisor	

11 References

AS/NZS ISO 31000:2009 Risk Management – Principles and Guidelines

Brundtland Commission 1987

Building Act 2004

Census 2013, Statistics New Zealand

Civil Defence Emergency Management Act 2002

Climate Change Response Act 2002

Drinking Water Standards for New Zealand 2005 (Revised 2008)

Hazard Risk Assessment for the Manawatū-Whanganui Region, 2009

Health & Safety in Employment Act 1992

Health Act 1956

Health (Drinking Water) Amendment Act 2007

Horizons Regional Council One Plan 2013

Hunterville Rural Water Supply Scheme: A Review, The Catalyst Group, 2014

Infrastructure Asset Valuation and Depreciation Guidelines 2006

Landowner Barriers to Irrigation, The Catalyst Group, 2014

Land Drainage Act 1908

Local Government Act 2002

Local Government Amendment Act 2010

NAMS International Infrastructure Management Manual 2011

New Zealand Coastal Policy Statement 2010

Non-Financial Performance Measures Rules 2013

NRB Communitrak Survey – Rangitīkei District, 2010

NZ IAS 16 Property, Plant and Equipment 2004

NZS 4404:2010 Land Development and Subdivision Infrastructure

Rangitīkei Catchment: Groundwater Use and Availability, The Catalyst Group, 2014

References

Rangitīkei District Council Annual Plan 2013-2014

Rangitīkei District Council Long Term Plan 2012-2022

Rangitīkei District Council Operational Guidelines – Stormwater

Rangitīkei District Council Operational Guidelines – Wastewater

Rangitīkei District Council Operational Guidelines – Water Supply

Rangitīkei District Council Operative District Plan 2013

Rangitīkei District Council Policy Manual 2013

Rating Powers Act, 1988

Reserves Act 1977

Resource Management Act 1991

SNZ PAS 4509: 2008 NZFS Firefighting Water Supplies Code of Practice

Soil Conservation and Rivers Act 1941

Appendices

Appendix I - Improvement Programme History

The history of previous Asset Management Plan Improvement Programmes is included in this Appendix for completeness and to demonstrate progress that has been made. Items that have not been completed have been carried forward into the current improvement programme.

Improvement Action	Location	Completion Date	Resources	Comments
Overall				
Develop SOP for verifying depreciation calculations	District	Apr 2015	Asset Management Officer	Developed for Audit NZ.
Ensure AMP aligns with District Plan	District	Apr 2015	Asset Engineer, Policy Analyst/Planner	Include information on growth areas e.g. Bulls.
Improve coordination in the works planning and budget development processes	District	Dec 2014	Asset Team, Project Team, Roading	Forward works programme developed between Assets, Operations, Projects and Roading teams.
Improve the linkage and integrated planning with other activity areas	District	Dec 2014	LTP Project Team	Ongoing
AM Appropriate Practice Review	District	July 2013	Waugh Infrastructure Management	
AMP Compliance Review	District	July 2013	Waugh Infrastructure Management	
Water				

Improvement Action	Location	Completion Date	Resources	Comments
Ensure that land designations related to water assets are correctly recorded in the District Plan	District	Jun 2017	Asset Engineer, Policy Analyst/Planner, GIS Officer	All checked. Hunterville WTP and key Hunterville RWS stations included. Tutaenui Bore not included – located in road reserve.
Approach DHB about moving to Criterion 1 for all current Criterion 2A supplies	Bulls, Hunterville, Marton, Taihape	Jan 2017	Compliance Monitoring Officer	Completed. Reverted back to Criterion 1 from 1/1/2017.
Finalise programme for fire hydrant inspection and testing	District	Jan 2017	Asset Management Officer, Reticulation Supervisor	Programme completed and inspections/testing underway.
Review and improve risk management processes and practices	District	Feb 2017	Asset Engineer, Asset Management Officer, Operations Manager	Risk matrix updated. Water Safety Plans updated. Regional Lifeline Vulnerability Study completed.
Quantify water losses	District	Aug 2016	Asset Engineer	Done as part of performance measure reporting for 2015-2016.
Develop flushing programme	Marton	Jun 2015	Reticulation Supervisor	Reticulation Supervisor
	Bulls	Jun 2015	Reticulation Supervisor	Reticulation Supervisor
	Rātana	Jun 2015	Reticulation Supervisor	Reticulation Supervisor
	Taihape	Jun 2015	Reticulation Supervisor	Reticulation Supervisor
Review Levels of Service and performance measures	District	Dec 2014	LTP Project Team	Adopted as part of Long Term Plan process.

Improvement Action	Location	Completion Date	Resources	Comments
Improve coordination in the works planning and budget development processes	District	Dec 2014	Asset Team, Project Team, Roading	
Complete P&ID for WTP	Bulls	Mar 2016	Operations Manager	
	Marton	Aug 2015	Operations Manager	
	Mangaweka	May 2015	Operations Manager	
	Taihape	Apr 2015	Operations Manager	
Develop inspection programme for critical valves	District	Jun 2014	Reticulation Supervisor	Programme in place for all valves.
Develop A1 size poster to display summary valuation and production statistics of the network	District	2008	Asset Systems Engineer	Commitment (and Organisational Integration).
Wastewater				
Review and improve risk management processes and practices	District	Oct 2017	Asset Engineer	
Confirm all required designations are in place	District	Jun 2017	Asset Engineer, Policy Analyst/Planner, GIS Officer	All checked, and all designated.
Implement condition assessment programme	District	Apr 2017	Asset Management Officer	Programme completed. To be handed over to Reticulation Supervisor for delivery.

Improvement Action	Location	Completion Date	Resources	Comments
Produce P&ID for WWTP	Hunterville	Feb 2016	Operations Manager	
	Mangaweka	Sep 2015	Operations Manager	
Produce O&M manual for WWTP	Hunterville	Apr 2015	Operations Manager	
	Mangaweka	Jun 2015	Operations Manager	
Review Levels of Service and performance measures	District	Dec 2014	LTP Project Team	Adopted as part of Long Term Plan process.
Improve coordination in the works planning and budget development processes	District	Dec 2014	Asset Team, Project Team, Roading	
Stormwater				
Review and improve risk management processes and practices	District	Oct 2017	Asset Engineer	
Implement condition assessment programme	District	Apr 2017	Asset Management Officer	Programme completed. To be handed over to Reticulation Supervisor for delivery.
Review Levels of Service and performance measures	District	Dec 2014	LTP Project Team	Adopted as part of Long Term Plan process.

Improvement Action	Location	Completion Date	Resources	Comments
Review and document condition assessment programme (to support risk and predictive modelling)	District	2010	Asset Management Officer	Output is a programme of work, by priority, tailored to suit budget.