



CARTERTON
DISTRICT COUNCIL

WASTEWATER ASSET MANAGEMENT PLAN

Te Mahere Wai Taonga Whakahaere

PART B

REVIEWED 2021

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Revision history

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1 Executive summary

What we do

The Council's wastewater treatment service collects treat's and disposes of approximately 3000m³ per day of domestic and industrial wastewater from urban areas of Carterton and provides disposal facilities for liquid effluent from domestic and industrial septic tanks from throughout the district. The pipe network has around 40.9km of mostly gravity reticulation mains, augmented by pumps and pump stations. Aside from the pumped wastewater, flows gravitate into the Dalefield Road wastewater treatment plant, and treated wastewater effluent is discharged to both land and water.

Why we do it?

A poorly maintained wastewater system can have detrimental effects on the health and well-being of the community, it can be economically damaging and be harmful to the environment. Our work programme is driven by community expectations about the quality of our environment and the need for sustainability by reducing our overall impact on the environment, both now and in the future.

Carterton District Council is moving into a new phase of a long-term plan to improve the treatment of urban waste water in a sustainable way. Its vision is to improve fresh water quality by removing treated effluent from streams.

Levels of service

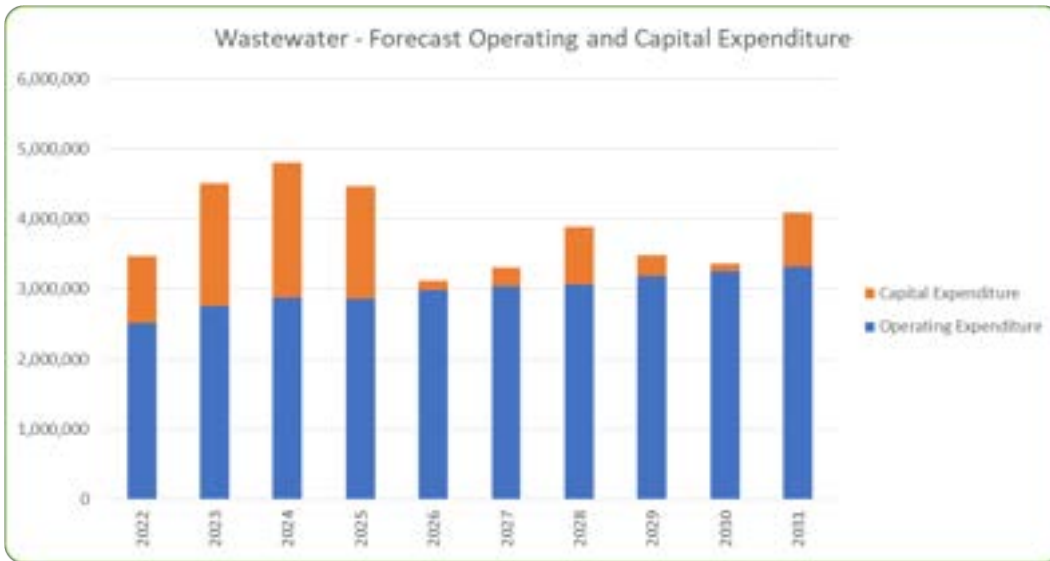
The level of service for wastewater is defined on nationally accepted standards, current appropriate practice, and any relevant legislative compliance requirements. How the customer regards the level of service provided by CDC is gathered from surveys, meetings, trend analysis, annual plan submissions, service request analysis and general customer responses.

From this evidence we have established that the community is generally satisfied with what we are doing and how we are delivering the service.

What does it cost?

The estimated replacement cost (i.e. value) of CDC's wastewater assets is approximately \$23.7 million. based on the 2019 Opus asset valuation. Maintenance and upgrading of those assets to provide the current levels of service to the community is forecast at around 1.9 million per year in the next ten-year period with the split between operational expenditure and capital expenditure graphically displayed below in Figure 1

Figure 1: Projected Operational Expenditure and Capital Expenditure for wastewater



Growth and demand

Data for the AMP’s is based around the Wairarapa Population Projections – June 2020 report from Infometrics Limited.

Population growth in Carterton District has been strong over the past decade, aided by significant net migration flows in the past five years. Carterton District’s current estimated population is 9,690. In Carterton District, growth is more evenly distributed across urban and rural areas, reflecting the historic propensity for rural lifestyle developments in the district and by 2051 the projected population will be approximately 13,098. Growth is expected to slow however in the next term with international net migration falling away due to COVID-19.

Council has however prepared a draft urban growth strategy that would increase the designated urban area with associated wastewater reticulation loading.

Based on current population projections, Council is well placed with the ability to cope with wastewater facilities for the foreseeable future.

Identified Issues

Urban development

A draft urban growth strategy is currently being finalised and if adopted may require an increase in capital expenditure for new wastewater pipe work on the eastern side of Carterton CBD. Before any detailed costing work is completed, the draft plan needs to be adopted and approximate costings can be supplied prior to acceptance as policy.

Condition rating knowledge

Wastewater assets (pipes, pumps, valves etc.) have been condition graded based on age, material and anecdotal local knowledge.

However, age alone does not necessarily portray an accurate assessment of assets. A good knowledge of the assets condition flows into consistent delivery of the aimed for levels of service as well as increased accuracy for long term financial planning.

Council records asset condition assessed from maintenance works and undertakes inspection procedures to be able to gain better a knowledge of asset condition.

Seismic Risk

Earthquake engineers are always learning. The Christchurch 2011 sequence of earthquake events have provided a wealth of information and data and emphasised that the current state of knowledge of regional seismicity has far outweighed the design and construction knowledge at the time of building many of Council's critical facilities such as pump stations, reticulation and treatment plant.

Pipeline networks include extensive use of non-ductile (inflexible) materials, such as earthenware and asbestos-cement (AC) pipe, which tend to fail during strong ground motion. Pipelines are especially vulnerable to failure from permanent ground deformation (resulting from liquefaction), because the deformation causes push-on pipe joints to separate.

Resilience planning of our infrastructure is to be incorporated into this plan.

Three Waters Reform

The New Zealand Government has initiated a wide-ranging reform of the three waters sector which will be ongoing from 2021 and is intended for implementation 1 July 2024.

This is a three-year programme of reform of local government water service delivery arrangements, and includes support for the establishment of Taumata Arowai, the new Waters Services Regulator. A report by Water Industry Commission of Scotland estimated that New Zealand would need to invest between \$120 billion to \$185 billion in our three waters infrastructure over the next 30 years to meet drinking water and environmental standards to provide for future population growth. It is thought though that the Water Industry Commission of Scotland modelling may well underestimate the necessary investment costs and could give overly optimistic timeframes for implementation.

Once Taumata Arowai is fully functional, it will oversee and administer an expanded and strengthened drinking water regulatory system, new drinking water standards and oversee the environmental performance of wastewater and stormwater networks. This is expected to improve the sector's performance, and to put greater focus on infrastructure performance.

Carterton would belong to 'Entity C' of the Water Service Entities (WSE), along with 22 other Councils. The boundaries have been set with consideration of rohe/takiwā, water catchments, population, economic benefits and the needs and interests of local communities.

WICS has estimated efficiencies of 45% over a 30-year period, roughly 2% per annum achieved through improved and aggregated capability, procurement, governance, scale and economic regulation, ultimately delivering lower costs for communities.

An indicative amount of \$6,797,415 has been allocated from this "better off" funding should Carterton Council continue to be involved in the three waters reform programme.

The future investment risk is real and manifesting in the legislative changes such as the drinking water Regulator (Taumata Arowai), the Water Services Bill, the changes to the Drinking water standards and Environmental Regulation (Proposed Natural Resources Plan, National Policy Statement on Fresh Water Management, and the Natural and Built environment Act).

2 Introduction

The *purpose* of this Plan is to provide Carterton District Council with a range of tools to assist with the management of its assets. The Asset Management Plans combine management, financial, engineering and technical practices and is intended to:

- Ensure that an agreed level of service is provided to defined standards at optimum cost.
- Be sustainable in the long term.
- Comply with regulatory requirements.
- Help the Council to achieve the outcomes the community has defined.

The Wastewater Asset Management Plan has been in use since 1992 and has been reviewed regularly, becoming handbooks for management and planning for the Council's assets. The last review was carried out in 2019 and included a substantial increase in the forecasting of forward works from 10 years to 30 years in line with the statutory requirement to prepare an Infrastructure Strategy in support of CDC's Long term plan.

2.1 Linkages

The plan is an integral input into the Council's Long term plan (LTP) and contributes to meeting the identified community outcomes and desires for its expected levels of service.

Table 1 provides an overview of the Plan which is a live document. Through its life it will be modified to include information and policies that improve or enhance the Council's ability to effectively manage assets on behalf of the community.

Table 1: Plan framework

| Sections | Detail |
|-------------------------|--|
| Introduction | Provides an overview of the AMP structure linkages with CDC strategic planning process |
| Description of activity | Description of assets, goals, frameworks, responsibilities, the asset management systems, and the service. Translates higher level aspirations into meaningful service level items. |
| Levels of Service | Linkage between agreed community outcomes and specified Levels of Service. |
| Demand Management | Forecasting future demand based on influencing factors such as population demographics, |

| | |
|---------------------------------|--|
| | customer expectations, legislative requirements, and Councils strategic planning. |
| Risks and Resilience | <p>Identifying opportunities or avoiding loss.</p> <p>The assessment and mitigation against failure to deliver levels of service, with mitigation measures provided.</p> <p>Funding and associated justification. Clearly presented funding requirements, linked directly to delivering levels of service.</p> |
| Assets and Lifecycle management | Prudent acquisition, operation, maintenance, renewal and disposal of assets which optimise asset use in delivering a service to the community throughout its lifecycle |
| Financial Projections | Existing data is used to estimate the financial implications of the asset management |
| Improvement Plan and monitoring | <p>Improvement in data collection and application, clear lines of responsibility, and creation of a practical working document.</p> <p>To enable asset management plans to be reviewed and then improved upon.</p> |

3 Description of Activity

3.1 What is involved?

The wastewater activity applies to all wastewater systems owned and managed by Council. This includes wastewater the treatment plant, pump stations and the reticulation network.

Wastewater primarily flows by gravity to the wastewater treatment plant at the southern end of Carterton (Dalefield Road). Small pump stations discharge into the gravity lines at points where there is insufficient natural fall. The wastewater treatment plant has been located at the present site since approximately 1960, with historic discharge to an unnamed drain connecting to the Mangatāre Stream.

In 2014, when soil moisture conditions are suitable for irrigation, the final effluent is further treated with Ultraviolet light (UV) irradiation, from where it is irrigated on approximately 20Ha of CDC owned land. Discharge via an outlet weir into the unnamed drain above the Mangatāre Stream in accordance with a discharge regime specified in the discharge permit occurs during winter months when stream conditions allow.

Although the District is approximately equally split in population size between urban and rural it is not practical to provide a reticulated wastewater service to the rural community because of the non-viability of recovering the cost of the infrastructure required (pipes, pumps etc.) from an insufficient number of properties. The wastewater catchment area is therefore limited to the Carterton residential zone, and a small industrial zone at Waingawa. The latter is pumped to the Masterton wastewater treatment plant.

Reticulated wastewater systems may be provided when the land use in the residential zone is developed for urban housing. The point of service for wastewater collection is generally the property boundary. The Council owns and maintains all wastewater pipelines up to and including the point of service. All wastewater drains and plumbing upstream of the point of service are owned by, and are the responsibility of, the property owner.

3.2 Summary of Wastewater Assets

The wastewater network consists of 66.1km of pipe reticulation and a wastewater treatment plant. The wastewater network is summarised in Table 2

Table 2: Carterton District Council Wastewater Assets

| Asset type | Unit | Quantity | Comments |
|-----------------------------|------|----------|--|
| Pipes | Km | 66.1 | Diameter from 50 – 380mm (various materials) |
| Manholes | No. | 603 | |
| Pump Stations | No. | 17 | |
| Lateral Connections | No. | 2666 | (Rated wastewater connections) |
| Treatment Plant | No | 1 | Comprises 1 ^o , 2 ^o , and 3 ^o treatment processes |
| Irrigation and storage area | Ha | 65.7 | Gross usable land area |

3.3 Why does CDC provide this Activity?

The purpose of the Wastewater activity is to provide for the safe and reliable collection, treatment and disposal of wastewater (sewage) from residential, industrial and commercial properties. Our sewage treatment plant, pumping stations and reticulation systems contribute by controlling the quality of effluent and minimising the risk of sewage overflows and spills.

Our work programme is driven by community expectations about the quality of our environment and the need for sustainability by reducing our overall impact on the environment, both now and in the future.

The sewerage function is one of the core activities of Council as confirmed by statute in the Local Government Act (LGA) 2002. Generally, the LGA requires the continued operation of any sewerage system that Council operated at the time the LGA was passed and the continued operation of any new system that Council constructs after that date.

3.4 Management of Activity

The Wastewater activity comprises of the collection of wastewater from properties the conveyance of the wastewater to a central treatment facility, either by gravity or if necessary by pumping, and then treatment of the wastewater to remove harmful pollutants and pathogens before discharge to a receiving environment.

3.4.1 Operations and maintenance

Day-to-day operations and maintenance are covered by in-house delivery. Operations covers day to day service delivery required to deliver the agreed level of services. Maintenance covers the actions necessary for retaining the assets at as near as practicable to its original condition, but excludes rehabilitation or renewal.

3.4.2 Renewals

Renewals cover the progressive replacement of existing assets as they reach the end of their useful life. The rate of asset renewal is intended to maintain the overall condition of the asset system at a standard that ensures the community's investment is maintained. If existing assets are not replaced with assets of similar standard the ability of the service to deliver the required level of service is reduced.

Identification of renewal needs are through staff knowledge of individual assets and associated analysis maintenance records (asset failure and expenditure history), service requests records, and observations.

3.4.3 Service Improvement – Levels of service driven

Service driven improvements provide for infrastructure development to enable Council's drive to achieve its predetermined levels of service (see section 4). The need for these capital works

can result from changes in the operating environment, changes to mandatory or council prescribed levels of service, compliance issues and/or changes in existing demand.

3.4.4 Service Improvement – Growth Driven

Growth related projects relate to the development that occurs as a consequence of population, commercial or industrial growth. Growth can result in changes in demand for infrastructure, and changes in the pattern of demand.

Carterton is currently experiencing relatively high population growth and will require investment into the wastewater infrastructure to enable further industrial and residential re-zoning to occur. Capital works identified as being driven by growth are funded retrospectively through development contributions.

3.5 Significant negative effects and how they are mitigated

There is growing recognition of the potential negative effects that wastewater can have on the environmental, social, and economic well-being of the community.

3.5.1 Environmental Effects

The effects of a growing wastewater treatment and disposal systems on the environment are considered in planning and developing the Plan. The potential negative effects of the activity include:

- Discharge of treated wastewater effluent from the WWTP to the Mangatārere Stream adversely affecting water quality.
- Odours from wastewater infrastructure such as pumping stations, treatment facilities and pipeline vents adversely affecting local residents.
- Overloading of the wastewater system during rainfall due to the entry of storm water runoff (infiltration and inflow).
- Structural failure of pipelines.
- Blockages of wastewater pipelines; and
- Malfunction of utility installations such as pumping stations or treatment plants.

Council is able to mitigate these potential negative effects through robust asset management processes including daily operating and maintenance activities, careful monitoring of treatment plant loading and performance, renewal and development work, demand management initiatives and the incorporation of sustainable wastewater treatment processes that are sympathetic to amenity values and safeguard the environment.

3.5.2 Social Effects

Odours from the wastewater system could be objectionable to neighbouring properties. Careful management of the oxygen levels in the settling ponds can minimise odours.

3.5.3 Economic Effects

A wastewater system that is working well and meeting its levels of service, will increase property values and ensure our towns are good places for people to 'live, work, learn and play'. Conversely, inadequate wastewater systems can severely impact the economic activity and vibrancy of the District.

The cost of maintaining the wastewater assets or long term (deferred) costs if assets are not maintained to a good service condition have direct economic effects.

While restricted capacity can result in constraints on potential development and business capacity significant compliance costs are passed onto developers, businesses and individual households.

3.6 Significant changes to activity.

During the term of this plan the three waters reforms may have significant implications on this activity.

As well the Council plans to complete works at the wastewater treatment plant to support the consents granted in 2017

3.7 Strategic and Corporate Goals

The Local Government Act 2002 (schedule 10) states that a purpose of local government is to promote the social, cultural, economic, and environmental well-being of its communities, now and for the future. This statement captures, and is consistent with, concepts of sustainable resource management and sustainable development.

'Community outcomes' are defined as the outcomes, or results, that a local authority aims to achieve in order to promote the social, economic, environmental, and cultural well-being of its district or region, in the present and for the future.

Carterton District Council understands, and is committed to, its role as a guardian of community assets. Council's decision-making processes are structured to ensure a sustainable approach to asset and resource management. Council realises the importance of considering our community's needs right now, as well as the longer-term benefits, impacts and costs of any decisions made. The Council aims to maintain the quality of life, environment, and community that exist today. Where affordable improvements can be achieved, short or long term, for current and/or future generations, these will be pursued.

Each group of activities carried out by the Council contributes in some way to one or more of the community outcomes and the Long term plan outlines specifically how the Council intends to contribute to these outcomes over that period.

The vision for Carterton District is “a welcoming and vibrant community, where we all enjoy living”.

The community outcomes are a:

- a strong community
- a prosperous economy
- a healthy natural and built environment,
- quality, fit-for-purpose infrastructure
- a strong and effective Council.

The Council expects that infill and other development as regulated by finalised draft Urban Growth structure plans and the Combined District Plan will generally result in expansion over the timeframe of the LTP.

3.8 Statutory obligations

Key legislation relating to the management of wastewater assets is listed below:

3.8.1 Local decision making

Local Government Act 2002. This act defines the purpose of local authorities as enabling local decision making by and on behalf of the community and allows local authorities the power of general competence. To assist exercising this power of general competence, the Act requires that significant consultation takes place with the community including:

- Council must carry out a process to identify community outcomes for its district
- Council is required to consult with the community through the adoption of its Long term plan on a range of specific issues including proposals to alter significantly the intended level of service provision for any significant activity, including a decisions to commence or cease any such activity and transfer of ownership or control of strategic assets to or from Carterton District Council.

Resource Management Act 1991 requires Council to:

- Sustain the potential of natural and physical resources to meet the reasonable foreseeable needs of the next generation
- Comply with the Combined District and Regional Plans
- To avoid, remedy or mitigate any adverse effect on the environment
- Comply with resource consents issued by Greater Wellington Regional Council for wastewater quality, and discharges e.g., wastewater discharges to stream from the wastewater treatment plant.
- Take into account the principles of the Treaty of Waitangi in exercising functions and powers under the act relating to the use, development and protection of natural and physical resources

The **Health Act 1956** places an obligation on Council to improve, promote and protect public health within the District. The provision of wastewater services conserves public health and helps to protect land and waterways from contamination.

The **Health and Safety at Work Act 2015** requires that every employer shall take all practicable steps to ensure the safety of employees while at work by providing a safe working environment and safe work facilities. The employer must ensure all plant used by employees is safe to use and employees are not exposed to hazards at work. Council must ensure the safety of the public and all workers (including contractors) when undertaking the activity.

The **Civil Defence Emergency Management (CDEM) Act 2002** requires Local Authorities to coordinate plans, programmes, and activities related to CDEM across the areas of Risk Reduction, Readiness, Response, and Recovery. It also encourages cooperation and joint action within regional groups. The Act compels Councils to function at the fullest possible extent during and after an emergency and to have plans for such functioning.

The District Plan provides the regulatory process for implementing policies prepared under the LTP, the asset management plans, and the Resource Management Act. The policies in the District Plan are to ensure sustainable management of the natural and cultural environment, and appropriate use of the Council's infrastructure.

The Carterton, Masterton, and South Wairarapa District Councils have chosen to prepare a combined District Plan so that consistent policies and methods will be used to address significant resource management and cross-boundary issues.

3.8.2 Long term plan

CDC's asset management plans are used to inform preparation of its Infrastructure Strategy, and hence, its Long term plan. The LTP is required to be reviewed every three years, with the next review being currently undertaken.

The purpose of a long-term plan is to.

- describe the activities of the local authority; and
- describe the community outcomes of the local authority's district or region; and
- provide integrated decision-making and co-ordination of the resources of the local authority; and
- provide a long-term focus (ten years) for the decisions and activities of the local authority; and
- provide a basis for accountability of the local authority to the community

3.8.3 Council Strategic Planning and Other Documents Affecting this Activity

- Long term plan
- Wairarapa Combined District Plan
- Carterton District Council Bylaws and Policies
- Urban Growth Strategy
- Infrastructure Strategy

- Regional Waste Management and Minimisation Strategy

3.8.4 Other

- Building Act 2004
- Health and Safety at Work Act 2015
- Construction Contracts Act 2002
- The Local Government Official Information and Meetings Act 1987
- The Climate Change Response Act
- The Civil Defence Emergency Management Act 2002 (Lifelines)
- Health (Drinking Water Amendment) Act 1956
- The Resource Management Act 1991
- Water Supply Protection Regulations 1961
- Public Works Act 1981.

3.9 Goals and Objectives of Asset Ownership

The Carterton Wastewater activities aim is to provide an effective collection and disposal of treated sewage that contributes to community health and minimises public health risk. Effective wastewater reticulation supports a vigorous residential and commercial community. Reticulation and wastewater treatment infrastructure capable of meeting resource consent requirements minimises adverse impacts on the environment.

Council has statutory obligations under the Local Government Act 2002 to continue to provide wastewater services and a general authority to construct public drains and undertake land drainage, recognising the requirement to take a sustainable development approach that takes into account:

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

3.10 Community Outcomes

Council’s levels of service contribute to achieving community outcomes.

As part of the development of the Consultation Document for the LTP, the Council reviewed its existing vision and community outcomes to confirm whether they were still relevant to the community. They were satisfied that the vision and community outcomes were generally still relevant and refined the vision and outcome priorities as set out in Table 3 below.

Table 3: How Council activities relate to the Community Outcomes

| | | | | | |
|---|---------------------------|-----------------------------|--|---|---------------------------------------|
| Community outcome, Council group of activities | A strong community | A prosperous economy | A healthy natural and built environment | Quality fit-for-purpose infrastructure | A strong and effective Council |
|---|---------------------------|-----------------------------|--|---|---------------------------------------|

| | | | | | |
|---|---|---|---|---|---|
| Governance | ✓ | | | | ✓ |
| Community services | ✓ | ✓ | ✓ | | ✓ |
| Regulatory and planning | | ✓ | ✓ | ✓ | ✓ |
| Roads and footpaths | | ✓ | ✓ | ✓ | |
| Rural water races | | ✓ | ✓ | ✓ | |
| Sewerage and the treatment and disposal of sewage | | | ✓ | ✓ | |
| Stormwater drainage | | | ✓ | ✓ | |
| Waste management | | | ✓ | ✓ | |
| Water supply | | | ✓ | ✓ | |

3.11 Local Context

3.11.1 Assessment of water and sanitary services

Under the Local Government Act 2002 councils must, from time to time, assess the provision of water supply, wastewater services, and sanitary services in its district.

CDC last completed its water and sanitary services assessment in 2016. The assessment informed the development and ongoing review of the related asset management plans and is consequently reflected in CDC's Long term plan.

3.11.2 Financial Strategy

Section 101A of the Local Government Act 2002 requires all local authorities to prepare and adopt a financial strategy for each of the 10 consecutive financial years covered by its long-term plan. The purpose of the financial strategy is to:

- facilitate prudent financial management by the local authority by providing a guide for the local authority to consider proposals against funding and expenditure and
- provide a context for consultation on the local authority's proposals for funding and expenditure by making transparent the overall effects of those proposals on the local authority's services, rates, debt, and investments

3.12 Regional Context

3.12.1 Greater Wellington Regional Council (GWRC) - Natural Resources Plan (NRP)

GWRC has reviewed the existing regional plans for the Wellington Region. It has identified the effects of human activity on the region's natural and physical resources and has worked closely with communities and individuals to develop rules that "*protect the right things, in the right places*". As a result of this review, the NRP for the Wellington Region was developed. The NRP was approved by GWRC for public notification on 31 July 2015. It combines coastal and regional plans, as well as incorporating regulatory and non-regulatory methods. The Proposed Plan identifies five distinct catchment areas (Whaitua) within the region. The Whaitua process provides a decentralised approach to establishing priorities and programmes within each Whaitua through catchment groups called Whaitua committees. These committees work collaboratively and use an integrated approach to resource management. GWRC is currently working through the hearing process on issues that may be resolved or require clarity.

3.12.2 Regional Council Policies and Plans Affecting This Activity

- Regional Policy Statement for the Wellington Region
- Regional Fresh Water Plan
- Proposed Natural Resources Plan

3.12.3 Infrastructure strategy

Closely linked to this Asset Management Plan is the Infrastructure Strategy which accounts for over half of the Carterton District Council's (CDC) annual operating expenditure and approximately 80% of Council's capital expenditure. Section 101B of the Local Government Act 2002 requires all local authorities to prepare and adopt an Infrastructure strategy for at least its network (three waters and roading/footpath) assets, covering a period of 30 consecutive years. The purpose of the infrastructure strategy is to identify significant infrastructure issues for the local authority over the period covered by the strategy and to identify the principal options for managing those issues and the implications of those options. Council's first infrastructure strategy was adopted in 2015 for the period 2015–2045.

3.13 Strategic Direction – Future demand and Sustainability

Statutory requirements set the framework for the minimum standards of service, which the assets have to meet, and are generally non-negotiable. The key legislation relating to the management of wastewater services are listed below.

3.13.1 Statutory and regulatory environment affecting this Activity

- Building Act 2004
- Health Act 1956
- Health and Safety at Work Act 2015
- Local Government Acts 1974 and 2002
- Local Government Official Information and Meetings Act 1987

- Public Works Act 1981
- Public Bodies Contracts Act 1981
- Construction Contracts Act 2002
- Civil Defence and Emergency Management Act 2002
- Utilities Access Act 2010
- Resource Management Act 1991
- The Climate Change Response Act 2002
- The Local Government (Rating) Act 2002
- Public Bodies Contracts Act 1959
- NZS4404: 2010 Land Development and Subdivision Engineering (standard)

3.13.2 National Policy/Strategy Framework

- National Policy Statement for Freshwater Management
- National Policy Statement on Urban Development Capacity
- National Environmental Standard for Sources of Human Drinking Water
- National Environmental Standards for Air Quality
- National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health
- The New Zealand Biodiversity Strategy
- The New Zealand Waste Strategy: Reducing harm, improving efficiency
- New Zealand Coastal Policy Statement
- Government Policy Statement on Land Transport 2015/16 – 2024/25
- National Land Transport Programme
- New Zealand Positive Ageing Strategy
- Public Libraries of New Zealand: A Strategic Framework (2006 to 2016)
- New Zealand Urban Design Protocol

3.13.3 Other Organisations and Bodies which Council works with Relating to this Activity

- Central Government
- Greater Wellington Regional Council
- Rangitāne o Wairarapa
- Ngāti Kahungunu ki Wairarapa
- The Department of Conservation
- Wairarapa Public Health

4 Levels of Service

4.1 Introduction

This Plan intends to match the level of service the assets provide with the customers' expectations given financial, technical, and legislative constraints. Asset management plans can be readily co-ordinated with strategic financial planning. Allied to which, adoption of formalised asset management systems and practices will provide Council with key benefits which, though acknowledged as understood in broad terms, are repeated here in detail:

- Improved understanding of service level options and requirements.
- Minimum life cycle (long term) costs for an agreed level of service.
- Better understanding and forecasting of asset related management options and costs.
- Managed risk of asset failure.
- Improved decision making based on costs and benefits of alternatives.
- Clear justification for forward works programmes and funding requirements.
- Improved accountability over the use of public resources.
- Improved customer satisfaction and organisation image.

The pursuit of formal asset management planning will enable Council as owner of a comprehensive range of assets to demonstrate to their customers and other stakeholders that services required to be provided are in fact being delivered in the most effective manner.

4.2 Service statement

The provision of physical infrastructure provides an important foundation for the role Council performs in achieving community well-being. Council is therefore committed to its role as manager of the range of valuable and essential assets that ensure the well-being of our community. These services include the provision of safe and efficient Water supply systems, considered by Council to be strategic assets.

Council delivers wastewater services because:

- There are legislative mandates requiring the provision of these services
- In-house delivery reduces the risk to Council of failing to meet legislative requirements
- Council has an interest in ensuring the health, well-being and safety of our community, and these functions contribute to this
- Council currently owns the assets relating to this activity

4.3 Customers and Stakeholders

Council's wastewater service customers include:

- Ratepayers
- Residents
- Local industries and businesses
- Health and Educational institutions
- Emergency services

Council's wastewater service stakeholders include:

- Greater Wellington Regional Council.
- Rangitāne o Wairarapa Inc
- Kahungunu ki Wairarapa
- The Department of Conservation
- Wairarapa Public Health
- Ministry for the Environment
- Ministry of Health
- Ministry for Primary Industries

4.4 Defining levels of service

The adopted levels of service for wastewater reflect current industry standards and are based on:

- **Customer Research and Expectations.** Information gained from the community on expected quality and services.
- **Legislative Requirements.** Environmental standards, regulations and acts that impact on the way assets are managed (i.e. resource consents, building regulations, health and safety legislation, Local Government Act).
- **Strategic and Corporate Goals.** These provide guidelines for the scope of current and future services offered the manner of service delivery and define specific levels of service that the organisation wishes to achieve.

4.5 Customer Research and Expectations

Council's knowledge of customer expectations is based on:

- Annual Residents Survey conducted by 'Key Research'
- Public meetings on specific projects
- Consultation via the Annual Plan/ Long term plan process
- Feedback from the elected members and community boards
- Analysis of customer service requests and complaints

4.5.1 Annual residents survey

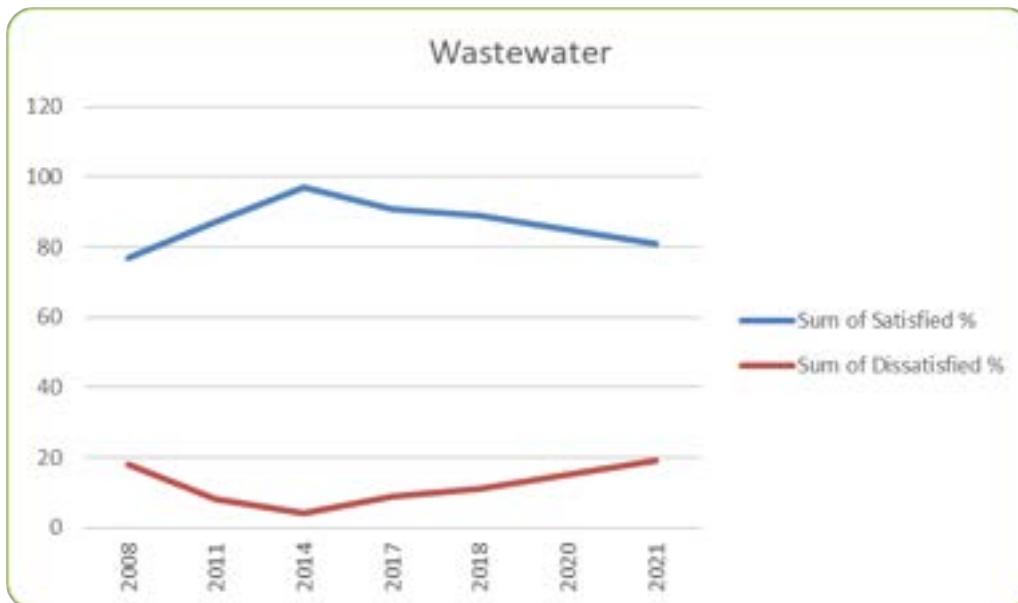
Council undertakes regular resident's satisfaction surveys to gain feedback on the communities' perceptions of Carterton District Council's delivery of services. Market research consultants are engaged to poll and measure the Council's effectiveness at providing services for their residents and customers. The survey results provide comparisons for Council to measure the services performance and to be able to make adjustments to those levels of service when indicated.

Previous survey results are tracked for comparison purposes.

The town's wastewater system is currently servicing about 60% of the Districts population. The survey shows a high satisfaction, although perceptions of the reliability of the system have progressively declined in relation to previous surveys.

Figure 3 below shows the proportions of satisfied and unsatisfied respondents for all who took part in the previous Residents Survey.

Figure 2: Results of the 2008–2021 Resident's survey for town's wastewater network



4.5.2 Public Meetings on Specific Projects

Council's current policy is to ensure public consultation when undertaking any major projects. As an example, the application for consent for the wastewater treatment plant has undergone significant public consultation.

4.5.3 Consultation via Annual Plan Process and Long-Term Planning

The draft Annual Plan and Long-Term Plan (3 yearly) are released for public submissions and consultation as a part of the plan reviews. Council then finalises Plans by reviewing and utilising submissions.

4.5.4 Feedback from Elected Members and Community Boards

Feedback from the Councillors is taken into account in order to provide a better levels of service.

4.5.5 Analysis of Customer Service Requests and Complaints

Customer service requests and complaints coming through Councils call centre, letters and direct phone calls are considered and appropriate actions are undertaken for improving the service level.

4.6 Service Levels and Performance Measures

Monitoring of performance standards is an integral part of service management. Regulatory changes to performance standards require an alignment of Councils monitoring and reporting in order to meet regulatory requirements.

Council developed the current wastewater asset levels of service, performance measures and targets from the Long-Term Plan shown in Table 4, to reflect:

- Industry standards
- Customer research and expectations
- Legislative and other requirements
- Strategic and corporate goals

Table 4: Levels of Service, used for performance measures and targets (2021 LTP)

| The service broken down into measurable components | Performance measure | Target for year ending June | | | | | How it will be measured |
|---|---|-----------------------------|-----------|-----------|-----------|--------------|-------------------------|
| | | 2020 Actual | 2022 | 2023 | 2024 | 2025 to 2031 | |
| System and adequacy | Number of dry weather sewerage overflows per 1000 connections | 0 | ≤5 | ≤5 | ≤5 | ≤5 | Operational records |
| Management of environmental impacts (compliance with resource consent conditions) | Number of abatement notices | 0 | ≤ 1 | ≤ 1 | ≤ 1 | ≤ 1 | Operational records |
| | Number of infringement notices | 0 | 0 | 0 | 0 | 0 | Operational records |
| | Number of enforcement orders | 0 | 0 | 0 | 0 | 0 | Operational records |
| | Number of convictions | 0 | 0 | 0 | 0 | 0 | Operational records |
| Response to sewerage system faults ¹ | Median attendance time ² | 0.5 hours | ≤ 1 hour | ≤ 1 hour | ≤ 1 hour | ≤ 1 hour | Operational records |
| | Median resolution time ³ | 3.25 hours | ≤ 4 hours | ≤ 4 hours | ≤ 4 hours | ≤ 4 hours | Operational records |

| | | | | | | | |
|-----------------------|---|-----|-----------------|-----------------|-----------------|-----------------|----------------------------|
| Customer satisfaction | Total number of complaints received per 1000 connections ⁴ | 7 | ≤20 | ≤20 | ≤20 | ≤20 | Operational records |
| | Residents' satisfaction with the town's sewerage system | 80% | ≥ 75% rate 7–10 | ≥ 75% rate 7–10 | ≥ 75% rate 7–10 | ≥ 75% rate 7–10 | Annual survey of residents |

1 sewerage overflows resulting from a blockage or other fault in the territorial authority's sewerage system

2 from the time that the Council receives notification to the time that service personnel reach the site.

3 from the time that the territorial authority receives notification to the time that service personnel confirm resolution

4 total number of complaints received about: sewage odour; sewerage system faults; sewerage system blockages; and the Council's response to issues with its sewerage system, expressed per 1000 connections to the territorial authority's sewerage system.

4.7 Potential changes in Levels of Service

The Government is reviewing how to improve the regulation and supply arrangements of drinking water, wastewater and stormwater (three waters) to better support New Zealand's prosperity, health, safety and environment.

The Review team, including representatives from the Ministry of Health, the Ministry for the Environment and the Department of Internal Affairs, will be undertaking engagement on those related emerging high-level proposals.

Ongoing increases in the cost of infrastructure materials and labour are likely to be higher than CPI. This is due to a number of factors including:

- a shortage of engineering and trade skills
- the impact of increased environmental considerations when selecting materials and methodologies
- increased requirements around contractor health and safety.

Supporting environmental and public health outcomes (air, water, land, biodiversity) are likely to change levels of service and conflict with affordability. Maintaining debt levels within required tolerances could also become an issue if capital work costs increase and/ or levels or growth slow or decline. This could mean a more aggressive approach to prioritising infrastructure work to stay within limits.

4.8 Levels of Service Improvements

To maintain current levels of service, with specific, minor variations by exception, and to formally review levels of service at least every three years. Engagement with the community on their satisfaction with the levels of service provided and improvements desired will be undertaken periodically.

Consultation on options will be undertaken for specific, significant projects. The level of service review will inform the levels of service adopted by the Council.

| Improvement Action | Responsible person | Budgeted \$ | Proposed completion date | Notes |
|--------------------|--------------------|-------------|--------------------------|---|
| Monitoring tools | Operations Manager | 20,000 | 2021/2022 | Data logging of wastewater flows to be undertaken in the reticulation network |

5 Demand Management

5.1 Climate change

Wastewater services will very likely be affected by the patterns of the predicted cyclical effects of climate changes, in that the discharging of wastewater can be dominated by changing meteorological conditions, and hence will be particularly susceptible to possibly more intense weather patterns that are associated with the climate change predictions.

Climate change projections¹ for Wairarapa are there will be significant impacts to the Wellington Region by 2090 if global emissions are not significantly reduced. They include:

- warmer temperatures (+3⁰ C)
- significant increase in the number of hot days (>25⁰ C) from 24 days now to 94 days
- frosts in the high elevations of the Tararua Ranges are likely to disappear
- spring rainfall will reduce by up to 10% on eastern areas
- the risk of drought will increase in Wairarapa
- more extreme rainfall events.

Climate change assumptions suggest that there is a likelihood of increase in the number of extreme rainfall events. This will have a direct effect on the wastewater system, as there is a need for consistent discharge once storage capacities are reached for the network to function.

More frequent, high intensity rainfall will challenge the existing capacity of the wastewater network, increased inflow and infiltration to the sewerage network is likely to be a consequence of higher rainfall events.

Extreme rainfall periods may impact on the Councils ability to discharge treated effluent to land and the Mangatārere Stream, making for greater reliance on the planned holding reservoirs for Daleton Farm.

The Council's overall approach in response to climate change effects is to manage through mitigation of causes and adaptation to effects. Policies and responses will need to be robust to a range of possible futures, rather than relying on a single "forecast".

¹ Greater Wellington Regional Council's Climate Change Report (June 2017)

5.2 Demand for improvement in the Level of Service

This can result from:

- Advances in available technology
- Improving standards of living
- A greater understanding of customers' perceptions and expectations
- Changing legislative requirements, including resource consent conditions
- Change in the strategic management of assets by the Council
- Change in community demographic driving different service levels

The demand for improvement in the service level can be determined by:

- Reviewing the current level of service through public consultation
- Monitoring customer feedback through surveys e.g. Key Research
- Analysing submissions to annual plans

Feedback from customers and consultation processes suggest that, in general, the community is happy with the current level of service provided by Council. However, Council will continue to monitor community feedback and incorporate this into its planning processes.

5.3 Current Consenting issues

The resource consents to allow the treatment and disposal of treated sewage over the next 35 years have been obtained. These consents will impose greater environmental standards for Council and associated increases in monitoring and reporting. The objective is to put in place a regime that minimises the discharge of effluent to Mangatārere Stream, and achieves swimmable water flows downstream of the discharge point. Council has a development plan that involves:

- A three chamber 200,000m³ reservoir to provide storage of treated sewage to be built
- Reshaping 22ha of land including re-aligning an ephemeral water course before installing a second centre-pivot
- Continued development of the treatment plant to improve capacity and capability

5.4 Changes to Customer Expectations

Customer expectations may influence service levels. Changes that are likely to impact on services include increasing emphasis on the sustainability of the treatment plant and greater demand for responsible environmental discharges. There is the potential that wastewater standards may be made stricter or that the community expectations for the quality of the treatment may increase. In those cases, Council will need to respond accordingly at that time to those changes in service standards.

Opportunities may be identified via the strategic infrastructure and levels of service reviews.

Changes in customer expectations can be determined through community consultation (e.g. Key Research survey) and feedback processes. Customer expectations will be monitored and assessed. Trends will be monitored, and these plans will be updated accordingly.

5.5 Demand forecast and Response Strategy

Overall demand drivers are expected to have a moderate impact on future demand for wastewater services. The impact of demand drivers on future wastewater services are summarised in Table 5.

Table 5: Expected impacts of Demand Changes for wastewater Services

| Demand Driver | Future Impact | Future Demand (for the next 10 years) |
|------------------------------------|---------------|---|
| Consent limits | Moderate | Consent conditions will need to be factored into budget forecasting over the next 35 years |
| Population | Moderate | Increases in population growth beyond the current growth rate predictions is possible but unknown |
| Climate changes | Moderate | Specifics are not identified but there will likely be increased inflow and infiltration to the sewerage network as a consequence of higher rainfall events. |
| Demand for improvement in services | Low/moderate | Outcomes from public consultation and annual plan submissions will be considered |
| Changes in customer expectations | Low/moderate | Outcomes from public consultation will be considered |

5.6 Cost of responding to Growth and Demand changes

As noted, no specific work has been identified at this time. It is possible that climate change impacts will require future work to mitigate and/or adapt. At this stage the extent and impact of climate change is unknown however, investigative work on potential changes will be covered by existing budgets.

Table 6: Wastewater planned to meet Growth & Demand

| Action/Work | Driver for Action | Estimated Cost | Scheduled For | How this will be funded |
|----------------|---|--------------------------------------|---------------|---|
| Climate Change | It is possible that climate change impacts will require future work to mitigate and/or adapt. At this stage the extent and impact of climate change is unknown. | Potential project costs are unknown. | On going | Investigative work around network capacity will be covered by existing budgets. |

| | | | | |
|------------------------------|---|--------------------------------------|----------|---|
| Urban growth strategy | Planning for growth in the eastern area, whether our infrastructure has capacity. | Potential project costs are unknown. | On going | Investigative work will be covered by existing budgets. |
|------------------------------|---|--------------------------------------|----------|---|

5.7 Growth and Demand improvement summary

The existing wastewater supply, at optimal flows, has sufficient capacity to accommodate moderate changes in demand as discussed in this section. Trends and potential impacts will continue to be monitored and this Plan will be updated accordingly.

Further research is recommended to assess:

- Council will develop strategies for the various possible projections as to the likely risks of climate changes.
- Strategies required having the asset capacity to accommodate the projected growth forecast by the Urban Growth Strategy for prediction modelling.

6 Risks and Resilience

6.1 Introduction

Risk management is the term applied to a logical and systematic method of establishing the context, identifying, analysing, evaluating, treating, monitoring and communicating risks associated with any activity, function or process in a way that will enable organisations to minimise losses and maximise opportunities. It is as much about identifying opportunities as avoiding or mitigating losses.

6.2 Risk management procedure

The process followed for this Plan involved a Strategic Level Risk Assessment:

- Initiation of the Waugh Risk Management Project (reviewed on 04/11/2021) to support Council's asset management planning processes and the long-term plan
- Introduction of Council staff to concepts of risk management via training workshops in March 2017
- Production of a report: Carterton District Council Asset Management Processes Risk Management (Waugh Consultants, 2017)

6.3 Summary of trends in Risk Assessment

6.3.1 Asset information and Staff Opinions

The risk results presented in the Waugh Report (2017) were a combination of opinions of individual staff and the current extent of 'hard' asset data that is held.

Specific asset risk parameters such as systematically assessed failure probabilities and impacts (including risk costs) are not available to justify risk scores. Staff have undertaken targeted investigations and condition assessments as resources allow, and therefore have more certainty about their assessments where such work has been completed.

The results of the report are reviewed as necessary within the wider corporate context and whenever additional asset information is obtained. Improvement items identify the need to undertake criticality and risk assessments.

6.3.2 GWRC Natural Resources Plan

The Greater Wellington Regional Council is in the process of preparing a Natural Resources Plan (to replace the Regional Plan) that sets targets and rules for all activities in the Wellington Region that have the potential to affect the natural environment, biodiversity and landscape values.

The plan has potentially significant impact on Council's infrastructure requirements, especially on the potable water, rural water (water races), and the wastewater treatment plant. In preparing the asset management plans and infrastructure strategy we have allowed for what we believe to be the most likely requirements when the Natural Resources Plan is in place.

6.3.3 Seismic Risk

Many critical facilities, such as the pump stations, reticulation and treatment plants, were designed and constructed before the adoption of seismic design standards that reflect the current state of knowledge of regional seismicity.

Pipeline networks include the use of non-ductile (inflexible) materials, such as earthenware and A/C pipe, which tend to fail during strong ground motion. Pipelines are especially vulnerable to failure from permanent ground deformation (resulting from liquefaction), because the deformation causes push-on pipe joints to separate.

6.4 Critical assets

Council has identified the critical wastewater supply assets as being.

- The Dalefield Road Wastewater Treatment Plant.
- The trunk mains to the treatment plant.
- The 17 wastewater pump stations

6.5 Conclusion

The Waugh Report showed that there were a number of risk themes that were common to many activities. These themes are outlined in the Waugh Report and are identified in Table 7 below.

Table 7: Carterton Risk Improvement Plan – District-Wide Risks

| Item | Description |
|---|--|
| Changes in Demographics not effectively managed by District Plan. | Population and demand changes forecast at least 30 years forward, for individual communities served. District Plan needs to recognise effects of contraction as well as growth, directing infrastructure decisions. |
| ‘Physical-Risk-Readiness’ | Responsibilities under the CDEM Act: Plans exist for emergency response, recovery, and continuity. Exercises are held regularly to rehearse and check viability. |
| Incorrect Information | Where information is not ‘defensible’ or data confidence is low, it is not revealed. Executive support for information gathering and management, including asset information. All information held is locatable. |
| Council Property (Buildings/Facilities) | Corporate Facilities and Offices are managed as part of infrastructure (Building compliance, internal Levels of service agreements, demand management, maintenance, renewal, additions, disposals etc.) and covered by AMP. |
| Current, changing or new Legislation, National or Regional policy changes Regional Development Strategies and Studies Industry structure and governance arrangements, Shared Services | Monitor developments across NZ and Region: When Strategy developed by GW, assess impacts on Council planning, demand management and asset acquisition/renewal. Shared services model has been implemented already for Rooding. Opportunities for any shared services to be explored as and when these become available |
| Land Use Changes / Rural Technology changes | Monitor and assess effect of changes in crop types (dairy, viticulture, forestry) and lifestyle blocks on asset requirements and usage patterns. |
| Community Group Viability | Policy is desirable regarding accepting or declining of proposals from community groups, based on risk and mitigation of current/future sustainability by the proposer. |
| Climate Change | CDC proposes to adopt Wellington Regional Council policy and investigates climate change impacts. |
| Covid response | COVID 19 outbreak through Council Staff, affecting staff or their families or a pandemic response preventing staff from being at their workplace |

The utilities risk assessment covered the water, wastewater and stormwater utilities that are managed by Carterton District Council. It is generally assumed that the risks involved in utilities assets are manageable. However, some of the risks involved in this asset have been identified and assessed on the basis of existing conditions. The utilities risk improvement plan is shown below in Table 8.

Table 8: Risk Improvement Plan

| Item | Description |
|---|---|
| Succession plan | Ensure systems, data, records are of good quality. |
| Risk register and asset risk plan | Review regularly the risk control and criticality schedule for Utilities |
| Corporate Risk Policy | Actively promote utilities risk assessments, mitigation measures and processes corporately to assist with a Corporate Policy development. |
| Council policy document | The council has a corporate policy manual that records all policies. Staff know of the manual's existence and it is being actively used. More policies are required in the Utilities / Waters chapter. |
| Staff Resources | Staffing levels are low and considered appropriate due to level of plant automation. Intermittent high project/consent/reporting workload is handled economically with consultants. |
| Financial assistance (external sources) being taken advantage of. | Council to actively seek Government Assistance |
| Optimisations- Renewals | Optimisation approach is currently least cost. Complete data attribute update for risk-based optimisation. |
| Operations Manuals | Maintenance and operation manuals updated when equipment changes and reviewed at 5-year intervals. Risk higher since no succession plans to be made. Licensed operator is essential. Private property access agreements in place where required |
| Legislative compliance | All legislative requirements that impact on Utilities Waters services being complied with. |
| Climate Change | Climate change is predicted to bring more intense wet periods and stormwater infrastructure will need to be able to cope with greater short-term influxes. New wastewater and replacement wastewater infrastructure needs to cater for these changes. |
| Natural Events (severe storms, seismic activity, bush fires, coastal or river erosion. | CDC has an approach for managing damage; assessing the risks (Lifelines), and exercises have been held in the past. Earthquake & Emergency Response Plans held, also SARS operator quarantine plan. The Lifelines planning/assessments are now old. Review; prepare additional ERP's. |
| Damage by others (excavations, accidents, illegal discharges to system, vandalism etc.) | Reactive response when events detected. |

| Item | Description |
|--|--|
| Growth | 3 yearly projections are provided corporately, and the impacts allowed for in AMPs. 30-year projections are made and provided for in District Plan and AMP. |
| Seismic Assessment of Structures | Policy on Assessment Priority and programme urgency. Then AMP/LTP to show budget for works. |
| Inflow/Infiltration | Management Plan developed. Programme to be implemented |
| Asset vulnerability to natural hazards | Flood, fire, high wind, earthquake, lightning, liquefaction, and landslide can all negatively impact infrastructural assets. Whilst relatively low probability, asset failure due to natural hazards is potentially catastrophic, with potential loss of supply. |

6.6 Areas for improvement

Review of the Wairarapa Engineering Lifelines Associations publication (2003) is underway.

Undertake an audit/review of the capability of the wastewater infrastructure for adverse weather events identifying possible areas of vulnerability in the asset components for improvements.

Table 9: Areas for improvement

| Improvement Action | Responsible person | Budgeted \$ | Proposed completion date | Notes |
|--|--------------------|--|-------------------------------|---|
| Wairarapa engineering lifelines review | Asset Engineer | 30,000 | 2021/22 | Review the engineering lifelines hazards and responses |
| Urban Growth Strategy - Option B | Not assigned | 691,681.00 691,681.00 691,681.00 | 2024/25 2027/28 2030/31 | Estimated utility costs are dependent on modelling for the loading capacities within the system |
| Effects of the Growth Strategy planning on the eastern supply area | Asset Engineer | 50,000 | 2021/22 | Wastewater loading/modelling |
| | | 20,000 | 2021/22 | Monitoring equipment |

7 Assets and Lifecycle management

7.1 Introduction

The Carterton's wastewater assets encompass an urban network for Carterton Township, and a reticulation network for the Waingawa Industrial area.

The urban township asset group contains a treatment plant, irrigation area, pump stations, a network of pipes, manholes, and service laterals that have been established over a period of time to provide a network servicing the urban area of the Carterton District. The urban wastewater network relies on the reticulation network to receive wastewater from service laterals to convey wastewater to the Dalefield Road treatment plant site, for the processing of the town's wastewater prior to its discharge to land or stream.

It is Council's role is to ensure that the wastewater reticulation and treatment continues to operate in a manner that meets the standards and consents for the urban residents, and to comply with any bylaws or codes of practice that are relevant.

This AMP covers the wastewater assets in the Carterton urban area that Council owns and maintains. This includes the:

- Treatment plant
- Irrigation area
- Pipe network
- Manholes
- Pump Stations
- Service connections

7.2 Asset descriptions

7.2.1 Treatment Plant

The existing wastewater treatment plant is a three-stage tertiary treatment plant featuring the following treatment steps:

- Inlet fine screen and grit removal.
- Flow measurement flume.
- Pumping chamber (which transfers the wastewater to the following treatment stages).
- Primary clarifier.
- Sludge removal from clarifier to heated digester followed by drying beds.
- Secondary oxidation ponds.
- Tertiary oxidation pond.
- Constructed surface flow wetlands.
- Screen filtering and UV treatment (prior to land irrigation or stream discharge).
- Irrigation to land via centre pivot irrigator and driplines within Daleton Farm (when soil and wind speed conditions allow) or
- Discharge via an outlet weir into an unnamed drain connecting to the lower reach of Mangatāre Stream in accordance with a discharge regime specified in the discharge permit.

In 2012, the Council purchased the 65.7-hectare Daleton Farm next to the treatment plant explicitly for the purpose of undertaking land irrigation of treated wastewater effluent. The irrigator was designed, implemented, and commissioned in late 2014, and subsequently a dripline was installed for irrigating a native shelter belt on the eastern boundary (SH2).

Council manages the irrigation and farm operation through a land irrigation management plan in accordance with the requirements of the current land discharge permit.

Land irrigation has been implemented over summer periods, all treated wastewater is either held within the wastewater treatment plant ponds or discharged to land. For the first two summer periods, there was insufficient wastewater to promote significant crop growth within the irrigated area. The experience suggests that summertime wastewater inflows can be managed by a combination of land irrigation and storage.

The existing sedimentation ponds are identified as being at risk of contamination through accidental or deliberate discharges of inorganic material into the town's wastewater reticulation network.

A significant event was experienced in June 2021 when an unknown substance (probably a solvent based product) was discharged into the wastewater reticulation seriously contaminating the primary pond killing off the pond's bacteria. The ponds health deteriorated significantly and required intervention to restore the bacterial balance to the pond. An emergency discharge reservoir for the diversion of suspected contaminant's, and additional aerators in the sedimentation ponds are planned for the 2021/2022 financial year to minimise the effect of contamination.

The sedimentation ponds have been surveyed for sediment loading and planning for the desludging of this material is being considered.

In addition to the recent installation of the UV treatment and land irrigation facilities, CDC has also invested in upgrading the treatment plant and site. Upgrading has included:

- design and installation of supplementary mechanical aeration in Ponds 1 and 3
- covering the anaerobic digester and collection and diversion of digester gases to a soil filter
- the planting of shelter belts of native plants and pine trees to filter any spray drift from land irrigation
- excavation of an amenity wetland area and initial planting with wetland species in partnership with the Mangatāre Restoration Society and GWRC
- installation of monitoring bores, anemometers, leaf sensors, soil moisture probes, and rain gauges.

In addition, the trade wastes from the Premier Beehive food processing factory are now being partially treated at source before reticulation to the WWTP so as to reduce contaminant concentrations (predominantly phosphorus) at the WWTP. Previously, concentrations of dissolved reactive phosphorus in the treated effluent had been non-compliant and outside the limits specified in conditions.

With the Premier Beehive discharges being pre-treated, DRP levels have been reduced to compliant levels and these are expected to improve.

The discharge consent numbers are.

WAR090120 – Discharge permit to discharge treated wastewater to Mangatāre Stream, (expires 14 October 2017) authorises.

- Discharge tertiary treated wastewater to the Mangatāre Stream.
- Discharge of tertiary treated wastewater to land via the existing sub-surface drip-line irrigation system
- Discharge of partially treated wastewater to land and groundwater via seepage from the existing oxidation ponds and the existing wetland treatment system

WAR150068 – Discharge to land and air, (expires 14 October 2017) and is to.

- To discharge treated effluent to land from a municipal wastewater treatment plant and to discharge odour to air associated with the discharge of treated effluent to land.

WAR090120 - Discharge permit to discharge odours from the oxidation ponds and other operational activities, (expires 14 October 2017) and is to.

- Discharge permit to discharge odours from the oxidation ponds and other operational activities to air.
- Discharge of odours to air from the operation of the oxidation ponds and other operational activities related to the wastewater treatment plant.

WAR170107 - To construct and maintain seven bores, (monitoring - no expiry) and is to;

- Construct and maintain seven bores for groundwater level and quality monitoring purposes.

7.2.2 Upgrade to Treatment Plant

The Council is undertaking the following works to support the consents that have been granted:

- Construction of three sequential batch reservoirs which will provide a further treatment step, and which will have a combined storage of 200,000 cubic m³
- Earthworks to level the farm topography and render it more suitable for irrigation.
- Irrigation of approximately 20 additional hectares of the Daleton Farm with the potential for irrigation of an additional 10 hectares using non-pivot irrigation equipment (approximately 50 hectares total).
- Re-location of the existing discharge outfall to a point downstream on the true left bank of the mainstream Mangatāre Stream and construction there of a gabion rock diffuser structure set at a height to allow pumped discharge during elevated stream flows.
- Lining the inflow and outflow channels to and from the existing constructed (treatment) wetland with impervious material to prevent leakage to ground.
- Installation of pipelines to supply treated effluent to and from the sequential batch reservoirs to the expanded land irrigation area and to the re-located stream outfall.

- Further development and planting of amenity wetlands located at the south-eastern corner of Daleton Farm and riparian planting, in partnership with the Mangatārere Restoration Society and GWRC, including the development of walking tracks suitable for use by the public.
- UV treatment at the point of discharge.

Construction of the Sequential Batch Reservoirs are planned to provide additional storage to be used in conjunction with the existing land irrigation area. Construction of the re-located discharge outfall and pipeline ready for use for high-flow discharge.

Consideration of a second centre pivot land irrigator to expand the area of land irrigation, bearing in mind that the hydraulic capacity of the existing irrigation area will allow irrigation of a greater volume than actually experienced to date and this will be supplied from the sequential batch reservoirs.

Land irrigation may be achieved by other methods that have yet to be investigated and approved.

The above benefits of the proposed land irrigation and high-flow discharge regime at the earliest practicable opportunity and is affordable alongside the community's other significant capital investment demands. However, aspects of the current discharge regime will be required to continue for a short period until all of the components are in place.

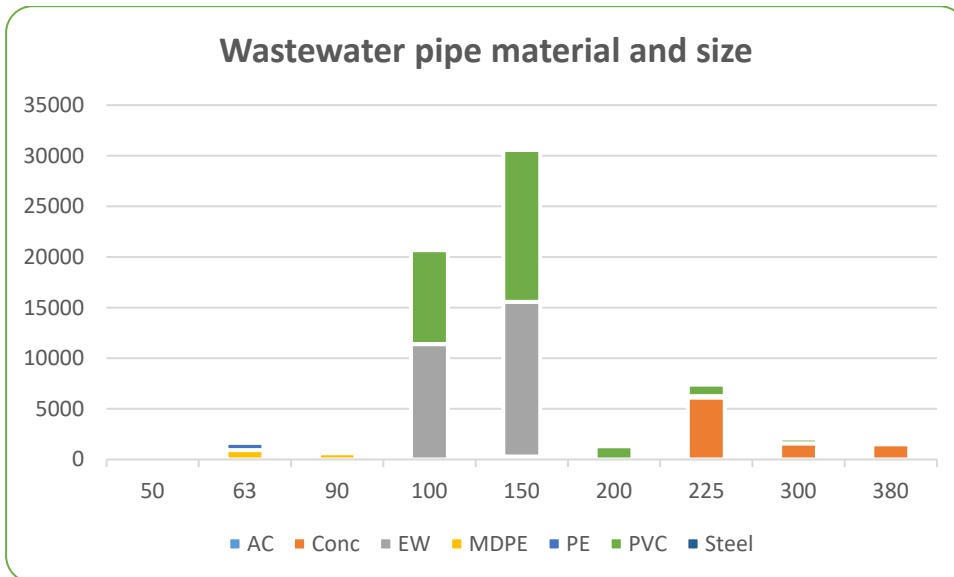
7.2.3 Pipework

The Carterton wastewater reticulation network comprises approximately 66.1km of wastewater pipe ranging in size from 50mm to 380mm diameter (see Table 11 for detail). Approximately half of the pipe material is either asbestos cement or earthenware which tends to be a brittle material when disturbed. Some pipes are approaching the end of their useful lives and CDC has established an annual survey and replacement programme to address deterioration of its older sewerage network. Approximately 5.3km of wastewater pipelines have been installed or renewed since the last AMP was reviewed in 2019 (for example the 1130m of 300m diameter trunk main replaced in Lincoln Road).

Table 10: Length of pipework by size and material (includes wastewater laterals)

| Diameter | AC | Conc | EW | MDPE | PE | PVC | Steel | Grand Total |
|----------|------------|------|---------------|------------|------------|---------------|-----------|-------------|
| 50 | | | | 168.8 4 | 158.2 6 | | | 327.1 |
| 63 | | | | 932.3 4 | 706.2 3 | | | 1,638.57 |
| 90 | | | | 608.2 2 | | | | 608.22 |
| 100 | | | 11,397.5 7 | | 16.78 | 9,254.91 | | 20,669.26 |
| 150 | 299.9 8 | | 15,266.4 3 | | | 15,028.8 8 | 16.7 8 | 30,612.07 |
| 200 | | | | | | 1,306.81 | | 1,306.81 |

| | | | | | | | | |
|---------------|--------------------|----------------------|-----------------|---------------------|--------------------|---------------|-------------------|------------------|
| 225 | | 6,137.3 9 | 116.6 | | | 1,138.6 | | 7,392.59 |
| 300 | | 1587.8 | | | | 471.8 | | 2,059.6 |
| 380 | | 1,498.3 6 | | | | | | 1,498.36 |
| Totals | 299.9 8 | 9,223.5 5 | 26,780.6 | 1,709. 4 | 881.2 7 | 27,201 | 16.7 8 | 66,112.58 |



In addition to the pipe reticulation, the network includes 17 pump stations (as well as 2 pump stations at the treatment plant) servicing various sub catchments within the reticulated area. Wastewater is mostly gravity-fed (with supplementary pumping in some zones) via the wastewater network to the Dalefield Road treatment plant.

The oldest pipes were laid in 1940 and the most recent in 2021.

7.3 Asset Management Systems

Council retains plans and records for the assets servicing the Carterton area, information from these documents has been summarised into an asset inventory.

Council’s operational services monitors the maintenance of works recording alterations, removals and asset details required for a complete asset management system.

Council uses asset AssetFinda as its chosen management system. AssetFinda is capable of storing asset data in a format that can be consumed by financial, forward planning, and condition performance scaling.

The asset management system inventory contains information such as:

- Asset type
- Age
- Specification
- Condition grading
- Service life

- Valuation
- Associated documentation

Council developed in conjunction with neighbouring Councils an Engineering Lifelines Plan, which identifies vulnerable components of the water supply network and ways of mitigating the degree of disruption likely to be incurred in a civil emergency. A review of this document (WELA) along with current mitigating work identified in the plan is an improvement project.

Council utilises the following electronic information systems to store and analyse asset data for these services:

- An asset management system called “AssetFinda” which is a central strategic register and asset management system for all asset classes. It includes in-built reporting, works tracking and life-cycle costing. It will be integrated with prediction model for a complete Strategic Asset Management planning and operational system capable of holding all Water asset information.
- Inventory, including replacement cost, depreciated replacement cost, annual depreciation, and condition assessment based on age (i.e., date installed/built).
- Progress claims from the maintenance Contractor.
- ArcMap 10.8 Geographical Information System (GIS).
- Councils GIS shows the location of the water reticulation, with some information on the assets (e.g., diameters, year of installation, etc.). It is subject to development involving digitisation of existing plans plus utilisation of aerial photography to identify services.
- It will be linked to the AssetFinda asset management software package.

The demand for data is expected to increase significantly in the future, especially for resource consent compliance and to contribute to improving decision-making processes.

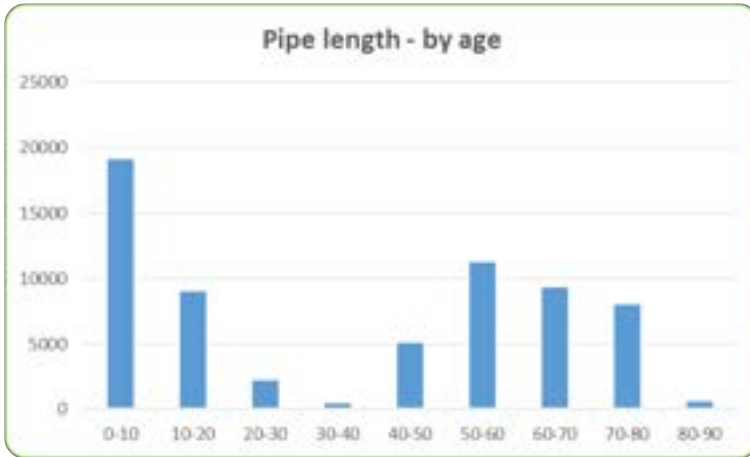
7.3.1.1 Pipe work asset condition

In Figure 4 below it can be seen that when grouped by total pipe lengths, a majority of 57.2km of the pipes are 0-69 years old and 8.8km are 70-90 years old slightly older than the generally expected lifespan of 70 years. The older pipes are capable of performing satisfactorily and planned renewal will depend upon any loss in the levels of service.

Renewal that is based solely on the assets age would not be a viable use of funding when the performance of these pipes has not shown signs of diminished capacity or performance. Continued condition assessments and monitoring by Council of these pipelines in the network will assist decision making for future renewal / replacement programs.

It would prove uneconomic to base the renewal or replacement decisions for these pipelines based solely on an expiry date when the performance of these pipes has not diminished. Continued assessments and monitoring by Council Staff of these pipelines will assist with the renewal replacement programme considerations. Figure 4 below shows pipe length grouped by asset age.

Figure 3: Total merged pipe lengths by average age (includes laterals)



The reticulated network is displayed below in Figures 5 and Figure 6 below.

Figure 4: Wastewater - Network (Carterton)



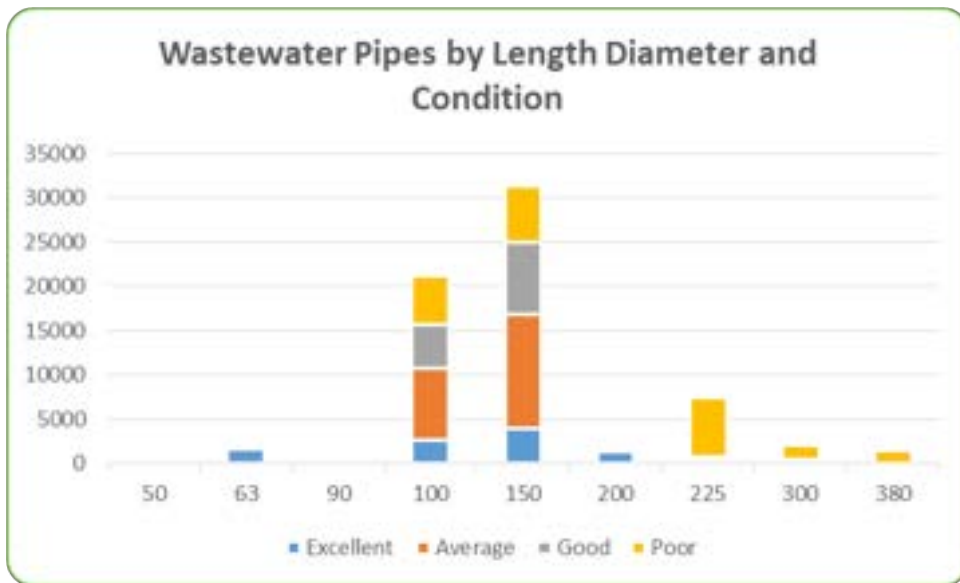
Figure 5: Wastewater - Network (Waingawa)



7.3.1.2 Condition assessment

In Figure 7 below, the condition grading of wastewater pipes in the network has been recorded, from excellent to poor. The assessment was made using age and material type to accrue an initial grading.

Figure 6: Current wastewater pipe condition (includes laterals)



The wastewater asset class indicates a predominant spread of condition ratings in the 1-5 categories (very poor to excellent). An assessment was completed, and all assets were graded according to age and material types based on the NZ Pipe Inspection Manual (2006). Ongoing condition surveys are undertaken to gauge whether the initial assessment is a true reflection of the asset stock.

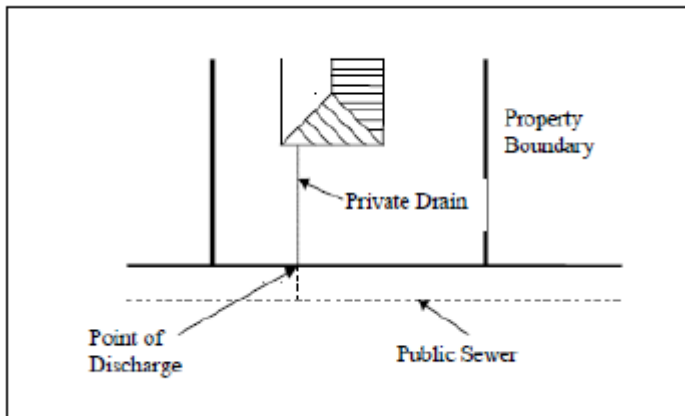
It is normal practice to grade any pipework while being maintained or altered by Operational Staff and this information is incorporated into the asset management system.

7.3.2 Wastewater lateral connections

Wastewater lateral connections to the wastewater mains were privately owned until the adoption by the three Wairarapa District Councils of the Wairarapa Consolidated Wastewater Bylaw in 2019. Wastewater lateral connections were valued following the change from private ownership and wastewater lateral pipes along with their inspection points were valued at a replacement cost of \$3,428,320.93 (2019).

The moving of the point of discharge to the property boundary has meant that wastewater lateral connections to the public sewer are the responsibility of the Council. Ownership of these lengths of lateral pipe has been included in the asset management system and these assets will now be maintained along with other wastewater pipework assets. Figure 8 shows the average configuration of a wastewater lateral, with the point of discharge.

Figure 7: Point of discharge location example



Wairarapa Consolidated Wastewater Bylaw (2019). –

8.1. The point of discharge from a customer shall be the point on the public sewer which marks the boundary of responsibility between the customer and Council, irrespective of property boundaries.

7.3.3 Manholes

Manhole inspections and condition rating along with other structure information was collected by WSP Opus for Council late in 2019, this information included accurate lid and invert levels. Photography of the lid and interior of the manholes was also captured.

The project data collected has been saved against the individual manhole assets in the asset management system.

As the NZPIM grading system does not include manholes, an equivalent system was formulated. This system is considered to comply with the requirements of the International Infrastructure Management Manual (2015).

Routine manhole condition inspections are carried out by the Councils operational staff during maintenance. Of particular interest is the amount of inflow and infiltration entering the reticulation network through the manhole structures. When manhole structure faults are identified by staff waterproofing of leaks, root invasion, or invert haunching failures are programmed for repair.

7.3.4 Wastewater Pump stations

There are 18 Council owned wastewater pump stations within the wastewater reticulation network. The purpose of the pump stations is to lift wastewater from the lower laying areas through pressurised rising mains to points in the network that restore the gravity abilities of the network. So, although the majority of the network is gravity driven some areas require supplementary pumping to support the network directing wastewater to the Dalefield Road treatment plant.

There are privately owned pump stations that also contribute to the network, but they are not considered in the information provided for this plan.

Recon Geotechnical Services Ltd was commissioned in 2010 by Carterton District Council to collect data on the wastewater pumping stations in the Carterton and Waingawa areas. The result of the project was to provide information to CDC operational staff a determination of volume and flow at each of the pumping stations on Carterton's wastewater network.

Tabular data and point-data set from that 2010 report was included in CDC's geo-database with: well diameter, well span (depth), stop float position, 1st start float position, 2nd start float position, and high-level float position.

All pump stations are connected via telemetry, with data transmitted to the Operations Depot via the "Abbey" (swamp fox) monitoring network. All pump stations are capable of onsite connection to portable backup power generation should localised or general power outages occur. Standby mobile generation is maintained and stored at the Operations Depot.

Pump station maintenance is carried out on a weekly cyclical basis that undertakes cleaning, programmed checks, and pump inspections.

7.4 Wastewater Assets Maintenance

Maintenance of the Carterton wastewater network is carried out by an 'in-house' operations unit and includes the following items:

- Treatment, and discharge of, wastewater
- Wastewater pipe maintenance, manhole, and pump station maintenance
- Wastewater discharge monitoring
- Wastewater consent and standards compliance

Council's operations unit carries out maintenance on an 'as required' basis, for the treatment and reticulation including any other wastewater asset inspections and assessments.

It is recommended however that more documented condition grading is to be carried out on the wastewater network assets whenever maintenance is undertaken.

7.5 Renewals / Capital Expenditure Plan

Renewal expenditure is work that does not increase an asset's design capacity but restores, rehabilitates, or renews an existing asset to its original capacity.

Capital works are those works that create new assets or works that upgrade or improve an existing assets capacity. They may result from growth, social or environmental needs.

Capital works in this group of activities in the next year are as presented in table 11 below

Table 11: Wastewater, capital plan costs as Identified in the LTP 2021 (Year 1)

| Capex type | Action | Estimate |
|-------------------|--|-----------------|
| Renewals | Victoria Street - Replace 80m of wastewater mains (completed 2021) | 109,167.80 |
| Renewals | Nobel Street - renew services | 72,000.00 |
| Renewals | Memorial Square - renew services (74m) | 84,000.00 |
| Renewals | Rexwood to Costley - renew services | 218,000.00 |
| Renewals | Belvedere to Faraday - renew services | 253,711.50 |
| Renewals | Broadway - renew services | 386,000.00 |
| Renewals | Costley St extend wastewater | 99,500.00 |
| Renewals | Renew services – Dalefield renew services (underway with stimulus funding) | 858,180.71 |
| Renewals | Plimsoll St - renew services | 119,000.00 |
| Increased demand | Taverner St – renew services | 471,900.00 |
| New | WWTP - Wetland’s refurbishment | 6,000.00 |
| New | WWTP - treatment facility (DO meter) | 20,000.00 |
| Renewals | Wastewater (modelling) | 50,000.00 |
| Renewals | Wastewater (portable monitoring equip) | 20,000.00 |
| Renewals | Treatment plant - telemetry and instruments | 16,000.00 |
| Renewals | Wastewater manhole rehab (annual) | 6,000.00 |
| Renewals | Wastewater – temp traffic signage (annual) | 6,000.00 |
| Renewals | Holiday Park - wastewater mains renewal | 132,000.00 |
| Renewals | Wastewater pump station pumps (annual) | 30,000.00 |

7.5.1 Decision making

All project work priorities regarding timing of renewal or replacements are based on the optimised renewal decision-making (ORDM) framework.

The ORDM process is a risk-based methodology which assesses the probability of each failure mode (including structural, hydraulic capacity, performance, and operational) against the consequence (or damages) of the failures.

A scoring system of 0 to 5 is employed to quantitatively assess the risk components. This is derived from a system that is scaled to the International Infrastructure Management Manual (IIMM) 2015.

For example, structurally failed sections of pipework will attract a failure mode probability of 5. The risks of failure (for each failure mode) of each section are assessed and calculated by quantifying the product of their probability and consequence of failure.

Sections with a high risk of failure are then ranked and the top group is included in the priority 0 list.

However, it must be noted that the on-going programme of collecting further asset information and the variation of market prices for renewal/replacement, as well new technology advances in the industry, mean that the priority list is provisional and will be subject to change with new information.

Currently the ORDM for Water reticulation failure probability assessment include the following factors:

- Structural Failure: CCTV records, age profiles, material profiles, and soil type profiles.
- Hydraulic/Capacity Failure: Catchment (current/future) flow monitoring, low flow/pressure records.
- Performance Failure: System performance, high flow, inflow & infiltration volumes.
- Operations and Maintenance Failure: Repair records, maintenance records and costs

The above probability rating is then multiplied by the consequence of failure rating to obtain the overall risk score.

The utility service department maintains and updates a database on the reticulation network.

7.5.2 Data confidence

The data confidence levels for this asset are shown in Table 12 where.

- A = Highly Reliable
- B = Reliable
- C = Uncertain
- D = Very uncertain

Note that some assets have variable confidence levels spread across the asset description and therefore appear across the attribute range.

Table 12: Wastewater data confidence levels

| Attribute | Very uncertain | Uncertain | Reliable | Highly reliable |
|-------------------------|----------------|-----------|----------|-----------------|
| Physical Parameters | | | X | |
| Asset Capacity | | X | | |
| Asset Condition | | | X | |
| Valuations | | | X | |
| Historical Expenditures | | | | X |
| Design Standards | | | X | |

7.5.3 Asset modelling

AssetFinda has two different modelling options for the Council’s Wastewater network, there is an optimized budget model using the long-term plan renewal amounts and there is an asset driven model.

The ‘optimized budget renewal’ can predict the renewal schedule based on a combination of factors such as budgeted annual expenditure, condition, age, risk, and performance. These scenario options show assets due for renewal over the next 30 year period and will assist Council Staff in accurately identifying assets likely to require attention in the Council’s Works Program.

The ‘calculate predictive model’ is not constrained by budget and uses the assets end of life to determine the renewal scenario.

An assumption has been made that the associated ancillary point asset items such as the pipeline fittings and terminations can be included within the long term budgets for line assets. The Councils long term plan identifies ten years of predicted budget for the upgrade of existing assets, but to aid with a utility forecast out to thirty years, these figures have been entered into the Infrastructure Strategy.

Optimize Budget Renewal - This model provides a replacement program, firstly by taking budget into account then the replacement requirements. The model identifies if there is enough budget to maintain a desired level of service (condition). The model provides a ‘before’ condition graph and ‘after’ program condition graph as a reference.

Predictive Model - This model displays a basic budget for assets that are due for replacement over the next 30-year time-frame. It is based on the estimated replacement date of the asset.

Wastewater hydrology modelling will be undertaken once the water network modelling has been completed as an improvement to enhance the process of optimised decision making in the future.

7.6 Design Standards

All wastewater network infrastructure installed in areas of new development must meet the requirements outlined in NZS4404 Land Development and Subdivision Engineering.

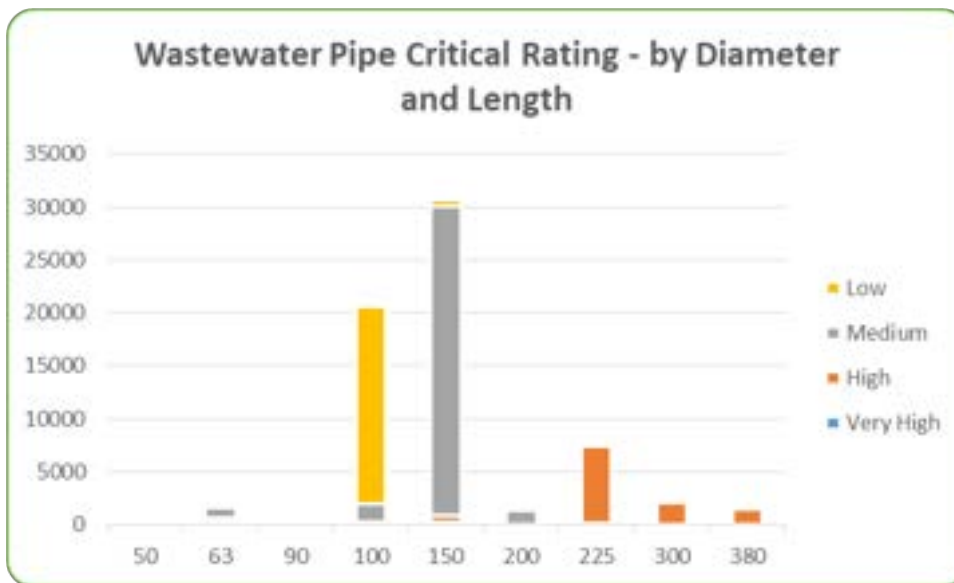
The policy for reticulation network design endeavours to achieve gravity reticulation within the network as the first option when assessing designs. Pump stations with the initial costs and ongoing maintenance are accepted in the network only when the 'gravity' options are unavoidable.

The current policy for renewals and maintenance on service laterals is to install gravity boundary kits on connections to the wastewater network enabling convenient inspection points that are accessible to operational staff.

7.7 Critical Assets

Within the asset management system Council has identified criticality for all Water assets. A very high rating was applied to two rising mains are key delivery mains or have higher service delivery requirements.

Figure 8: Criticality rating for water pipes



7.8 Disposal plan

Council does not have a disposal plan for its wastewater assets, and it is not considered currently necessary given the nature and usage of the assets involved.

7.9 Improvement Plan

Below is a list of actions for CDC to take to improve knowledge of the water assets

- Continued condition sampling of assets.

- Wastewater hydrology and distribution predictive modelling.

| Improvement Action | Responsible person | Budgeted \$ | Proposed completion date | Notes |
|---|--------------------|----------------------------|--------------------------|--|
| Condition assessments of assets | Operations Manger | Within operational budgets | Immediate | As maintenance is undertaken condition assessments will be recorded with 'as built' data and stored in the AssetFinda system against the asset assessed. |
| Effects of the Growth Strategy planning on the eastern area | Asset Engineer | 50,000 | 2021/22 | Water demand/modelling |
| | | 20,000 | 2021/22 | Monitoring equipment |

8 Financial Projections

This section sets out financial statements, funding strategy, depreciation forecast and charges for the Wastewater asset activity for Carterton District Council.

All forecasts are presented as the amounts for inclusion in the Long term plan, which include forecast inflation as required by the Local Government Act 2002

8.1 Financial Strategy

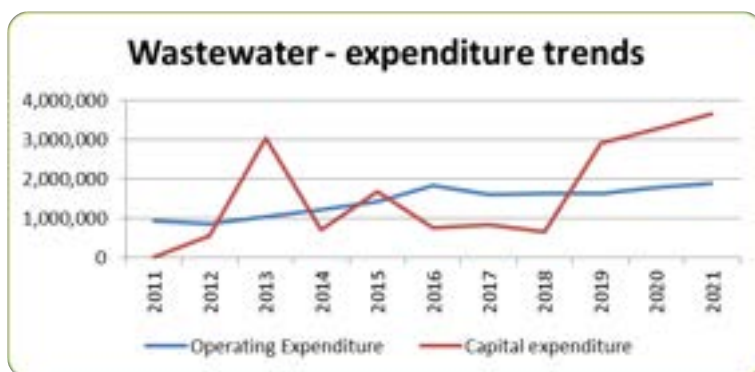
This plan provides the substantiation for budget forecasts put forward in the Long term plan for the Wastewater assets. CDC will:

- Implement an improvement approach to asset management planning. An improvement plan will be developed and included in each asset management plan. Improvement projects will be monitored as a part of Council's performance reporting system
- Prepare, maintain, and periodically review an AMP outlining sustainable long-term asset management strategies. Annual amendments or updates may be undertaken if significant asset management changes occur
- Report variations in the adopted annual plan budgets against the original asset management plan forecasts and explain the level of service implications of budget variations

8.2 Past Expenditure

Council's Annual Reports provide the following summarised information on the historical operating and maintenance costs of the Wastewater network. Figure 9 below demonstrates the previous 11 years operating and capital costs.

Figure 9: Historical costs (sourced from Council's Annual Reports)



8.2.1 Wastewater Assets Valuation

Councils' wastewater assets were last valued as at 30 June 2019 by Opus International Consultants Ltd. The components valued are shown in Table 16 below shows a summary of the 2019 valuation results for Carterton District Council's water assets. Of the three asset types valued in the Opus (2019) report, water comprises 35% of the total overall optimised replacement cost for the three waters at the time of valuation (\$54,146,564.00).

The 2019 valuation was a 21% increase (optimized replacement cost) on the 2016 valuation and that is partially attributable to increased data confidence and the contributions over three years of urban developments. Opus assessed the valuation to have an overall confidence rating of B (i.e. $\pm 10\%$ - 15%) for the 2019 values.

Next valuation is due in 2022.

Table 13: 2019 Wastewater Assets Valuation Summary

| Asset Type | Optimized replacement cost | Optimized depreciated replacement cost | Annual depreciation |
|---------------------|----------------------------|--|---------------------|
| Reticulation | 10,677,021.00 | 4,429,884.00 | 132,614.00 |
| Wastewater Fittings | 2,986,348.00 | 1,212,924.00 | 54,020.00 |
| Pump Stations | 678,953.00 | 386,256.00 | 19,710.00 |
| Wastewater Plant | 3,433,988.00 | 1,390,724.00 | 82,436.00 |

| | | | |
|---------------------------|----------------------|---------------------|-------------------|
| Wastewater System Upgrade | 1,154,763.00 | 429,977.00 | 48,319.00 |
| Totals | 18,931,073.00 | 7,849,765.00 | 337,099.00 |

8.3 Depreciation

Depreciation is an annual expense to reflect the reduced economic potential of an asset. Because revenue (cash) covers this expense (non-cash) a cash reserve builds up over an asset's life to help fund the asset's replacement at the end of its life. This depreciation reserve is the principal funding mechanism for asset renewals.

Depreciated replacement cost is determined using a number of significant assumptions.

Significant assumptions include:

- The replacement asset is based on the replacement cost of the specific assets as at the date of valuation less an allowance for any physical and economic obsolescence to date and for any over-design
- The replacement cost is derived from recent construction contracts of similar assets, reference to publications such as the Rawlinson's Construction Handbook, recent costing obtained from construction details and Property Institute of New Zealand cost information
- The remaining useful life of assets is an estimated figure using the expected life of an asset, asset maintenance frequencies, and known condition rating
- Straight-line depreciation has been applied in determining the depreciated replacement cost value of assets.

Wastewater infrastructural assets are valued using the depreciated replacement cost method.

There are a number of estimates and assumptions exercised when valuing infrastructural assets using the depreciated replacement cost method. These include:

- Estimating any obsolescence or surplus capacity of the asset
- Estimating the replacement cost of the asset. The replacement cost is derived from recent construction contracts in the region for similar assets
- Estimates of the remaining useful life over which the asset will be depreciated. These estimates can be affected by the local conditions. For example, weather patterns and traffic growth. If useful lives do not reflect the actual consumption of the benefits of the asset, then the Council could be over-or under-estimating the annual depreciation charge recognised as an expense in the statement of comprehensive revenue and expense. To minimise this risk, infrastructural asset useful lives have been determined with reference to the NZ Infrastructural Asset Valuation and Depreciation Guidelines published by the National Asset Management Steering Group, and have been adjusted for local conditions based on past experience. Asset inspections, deterioration, and condition-modelling are also carried out regularly as part of asset management planning activities, which provides further assurance over useful life estimates.

8.4 Insurance coverage

The Council is a member of the Local Authority Protection Programme (LAPP). The LAPP is a mutual insurance fund which provides for disaster insurance cover over Council's underground and generally uninsurable assets, to the extent of 40% of their value. The Government's Disaster Recovery Fund is expected to cover 60% of the replacement cost of assets in the event of a declared civil defence emergency arising from an adverse weather or seismic event. Value and costs coverage under the LAPP is set out below in Table 15

2021 LAPP replacement costs are on average 30% greater than those of 2019.

Table 14: Infrastructure assets covered by the LAPP fund (2021)

| Description | Covered by LAPP | 2021 Value (ORC) | 2021 Value (ODRC) |
|---------------|-----------------|------------------|-------------------|
| Reticulation | LAPP | \$17,788,537 | \$7,346,453 |
| Pump stations | No | \$883,938 | \$502,872 |
| Treatment | No | \$4,588,751.21 | \$2,370,397 |

8.5 Forecast finances

The Council has an Infrastructure Strategy to help the Council to make informed decisions to deal with the major decisions and investment opportunities that will occur over the next 30 years and to comply with section 101B of the Local Government Act 2002.

8.5.1 Forecast loan repayment and loan interest costs

The level of debt related to the wastewater infrastructure is relatively. Much of the capital renewals are expected to be funded from loan funds.

The Council has set limits on the level of borrowing. These are set out in its liability management policy. All three of the following conditions must be met:

- Total debt as a percentage of total assets will not exceed 15 percent
- In any financial year, gross interest paid on term debt will not exceed 12 percent of gross operating revenue
- In any financial year, gross interest expense will not exceed 50 percent net cash inflow from operating activities.

8.5.2 Forecast operational revenue

Operational revenue (other than Rates) is not a significant financial item for the Wastewater activity as there is little opportunity to generate user pays income. Trade Waste charges are levied on those premises where the waste characteristics meet the Trade Waste Bylaw criteria and septic tank discharges to sewer are charged.

8.5.3 Forecast expenditure required

The forecasted capital expenditure for the wastewater services over the next thirty years. The key items are:

- Wastewater reticulation maintenance
- Operation of the Daleton WWTP
- WWTP consent compliance
- Interest and loan repayments on the debt incurred to fund capital upgrades to date
- On-going sewer investigations and condition assessments

8.5.4 Wastewater asset renewals forecast

Renewal expenditure is work that does not increase an asset's design capacity but restores, rehabilitates, or renews an existing asset to its original capacity. These estimates are based on incorporated asset condition assessment work to be done for the AMS and the asset management plan.

Council has made a strategic decision to maintain the current levels of service for this activity. Maintenance and renewal work to enable maintenance of current Levels of Service is outlined in table 5 of section 4 of this plan.

8.5.5 Capital Expenditure plan

Renewal expenditure is work that does not increase an asset's design capacity but restores, rehabilitates or renews an existing asset to its original capacity. Capital works are those that create new assets or works that upgrade or improve an existing capacity. They may result from growth, social, or environmental needs.

Capital expenditure in this group of activities in the next ten years are shown in table x below.

8.6 Changes in service potential

Council maintains the assets so as to retain their condition and overall value at nationally accepted levels. A programme of routine maintenance and the renewal of identified underperforming components where and when required is used to achieve this.

8.7 Assumptions and confidence levels

8.7.1 Basis of preparation

The financial information in this plan has been prepared following the provisions of Public Benefit Entity (PBE) Standard - Financial Reporting Standard 42 'Prospective Financial Statements' (PBE FRS 42).

8.7.2 Basis of assumptions

Prospective information is based on a number of assumptions. Risks and uncertainties surround these assumptions. The basis of the assumptions surrounding the information is found in Planning Assumptions in the LTP. The information should therefore be used carefully, with this best endeavours purpose in mind. The Local Government Act 2002 Schedule 10 (1)(e) requires that information relating to levels of service, estimated expenses and revenue be provided in detail for three financial years, and indicative for the subsequent seven financial years. Over time, information becomes increasingly indicative from the time it was first prepared.

The approach taken to budget development has been that of preparing 'forecasts' on a best estimate basis. In this case, a forecast refers to financial information based on assumptions on future events the Council expects to occur and on the basis of Council's expected response to these events.

The Council has not taken an approach where hypothetical "what-if" projections are used.

The major limitation of the forecasting approach, as with any approach, is that events may change over time and undermine the accuracy of assumptions made. The actual financial results achieved for the period are likely to vary from the information presented and the variations may be material.

The review of assumptions underlying the financial information was undertaken in preparation of the Long term plan (LTP). However, the assumptions themselves were adopted by Council resolution to approve the Draft LTP for public consultation in 2021.

8.7.3 Assumptions and Risk Assessments

A number of assumptions were made in preparing the LTP. These assumptions are necessary as the planning term is for ten years and the stating of assumptions ensures that all estimates and forecasts are made on the same basis. There are four categories of planning assumptions in this document:

- Demand Assumptions
 - Resident population
 - District growth
- Political Environment
 - Policies
 - Governance
- Operating Environment
 - Resource consents
 - Natural disasters
 - External factors
- Financial Assumptions

(Please see the full LTP document for the assumptions detail.)

8.8 Funding summary (including rates requirements)

Operating costs are to be funded by rates and user charges as per the Council's Revenue and Financing Policy. Capital renewals should be funded from depreciation reserves (to the extent that the reserve funds can sustain the renewals programme). Upgrade projects should be loan funded to ensure intergenerational equity i.e. those receiving the benefits should pay.

Urban sewerage rate

The Council proposes to set a differential targeted rate for the Council's urban sewerage and treatment and disposal of sewage services of a fixed amount per separately used or inhabited part of a rating unit in relation to all land in the district to which the Council's sewerage service is provided or available.

The rate applied is as follows:

- a charge per separately used or inhabited part of a rating unit connected
- a charge per water closet or urinal within the separately used or inhabited part of a rating unit after the first one
- a charge per separately used or inhabited part of a rating unit that is able to be connected.

For the purposes of this rate:

- 'connected' means the rating unit is connected to the Council's urban sewerage service
- 'able to be connected' means the rating unit is not connected to the Council's urban sewerage drain but is within 30 metres of such a drain
- a rating unit used primarily as a residence for one household is treated as not having more than one water closet.

Waingawa sewerage rate

The Council proposes to charge a targeted rate of a fixed amount on every separately used or inhabited part of a rating unit that is connected to the Waingawa sewerage service.

Additionally, the Council proposes to set a Waingawa sewerage rate based on capital value on all properties connected or able to be connected to the Waingawa sewerage service.

For the purposes of this rate:

- 'connected' means a rating unit that is connected to the reticulated sewerage service
- 'Able to be connected' means a rating unit that can be connected to the sewerage service, but is not, and is a property situated within 30 metres of such a drain.

The purpose of this rate is to fund the operation and maintenance of the Waingawa sewerage service.

Operating costs are to be funded by rates and user charges as per the Council's Revenue & Financing Policy. Capital renewals should be funded from depreciation reserves (to the extent that the reserve funds can sustain the renewals programme). Upgrade projects should be loan funded to ensure intergenerational equity i.e. those receiving the benefits should pay.

Table 15: Forecast revenue and expenditure included in LTP

| | Annual Plan 30 June 2021 | LTP 30 June 2022 | LTP 30 June 2023 | LTP 30 June 2024 | LTP 30 June 2025 | LTP 30 June 2026 | LTP 30 June 2027 | LTP 30 June 2028 | LTP 30 June 2029 | LTP 30 June 2030 | LTP 30 June 2031 |
|--|-----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | \$ | \$ | \$ | \$ | \$ | \$ | \$ | \$ | \$ | \$ | \$ |
| Sources of Operating Funding | | | | | | | | | | | |
| General rates, UAGC, rates penalties | 227,185 | 253,753 | 290,203 | 305,236 | 330,290 | 344,736 | 349,375 | 359,318 | 364,494 | 373,830 | 390,893 |
| Targeted rates | 2,044,664 | 2,283,775 | 2,611,828 | 2,747,124 | 2,972,607 | 3,102,622 | 3,144,378 | 3,233,860 | 3,280,448 | 3,364,466 | 3,518,039 |
| Subsidies and grants for operational purposes | - | - | - | - | - | - | - | - | - | - | - |
| Fees and charges | 427,852 | 450,000 | 459,000 | 471,848 | 484,254 | 496,216 | 508,622 | 521,027 | 534,319 | 548,496 | 563,560 |
| Internal charges and overheads recovered | - | - | - | - | - | - | - | - | - | - | - |
| Local authorities fuel tax, fines, infringement fees and other | - | 12,151 | 12,505 | 13,015 | 13,834 | 14,663 | 15,519 | 16,365 | 17,252 | 18,129 | 19,009 |
| Total operating funding | 2,699,701 | 2,999,678 | 3,373,536 | 3,537,224 | 3,800,984 | 3,958,237 | 4,017,895 | 4,130,570 | 4,196,513 | 4,304,921 | 4,491,501 |
| Applications of Operating Funding | | | | | | | | | | | |
| Payments to staff and suppliers | 886,578 | 906,827 | 924,964 | 949,969 | 972,652 | 995,058 | 1,018,559 | 1,042,674 | 1,068,774 | 1,096,655 | 1,126,316 |
| Finance costs | 406,399 | 127,795 | 193,967 | 189,319 | 190,350 | 191,518 | 187,009 | 188,421 | 189,836 | 185,296 | 187,334 |
| Internal charges and overheads applied | 551,988 | 771,699 | 807,886 | 842,888 | 859,792 | 885,136 | 920,979 | 929,031 | 951,167 | 983,226 | 994,191 |
| Other operating funding applications | - | - | - | - | - | - | - | - | - | - | - |
| Total applications of operating funding | 1,844,965 | 1,806,321 | 1,926,817 | 1,982,175 | 2,022,794 | 2,071,711 | 2,126,548 | 2,160,126 | 2,209,777 | 2,265,176 | 2,307,841 |
| Surplus/(deficit) of operating funding | 854,736 | 1,193,357 | 1,446,719 | 1,555,049 | 1,778,190 | 1,886,525 | 1,891,347 | 1,970,444 | 1,986,736 | 2,039,744 | 2,183,660 |
| Sources of Capital Funding | | | | | | | | | | | |
| Subsidies and grants for capital expenditure | - | - | - | - | - | - | - | - | - | - | - |
| Development and financial contributions | 66,026 | 95,600 | 96,900 | 98,200 | 225,722 | 232,041 | 238,141 | 244,024 | 250,125 | 256,225 | 262,762 |
| Increase/(decrease) in debt | 2,152,424 | 8,660,480 | (782,760) | (782,887) | (63,852) | (804,248) | (822,114) | (55,925) | (862,787) | (851,246) | (30,935) |
| Gross proceeds from sale of assets | - | - | - | - | - | - | - | - | - | - | - |
| Lump sum contributions | - | 256,250 | - | - | - | - | - | - | - | - | - |
| Other dedicated capital funding | - | - | - | - | - | - | - | - | - | - | - |
| Total sources of capital funding | 2,218,450 | 9,012,330 | (685,860) | (684,687) | 161,870 | (572,207) | (583,973) | 188,099 | (612,662) | (595,021) | 231,827 |
| Applications of Capital Funding | | | | | | | | | | | |
| Capital expenditure - meet additional demand | - | - | - | - | 746,257 | - | - | 806,691 | - | - | 876,631 |
| Capital expenditure - improve level of service | 1,849,625 | 1,770,000 | 6,120 | 6,308 | 17,262 | 24,341 | 6,815 | 6,998 | 7,186 | 19,713 | 7,604 |
| Capital expenditure - replace existing assets | 375,232 | 1,359,652 | 1,773,069 | 2,017,638 | 966,278 | 127,235 | 302,702 | 156,312 | 343,591 | 113,349 | 78,578 |
| Increase/(decrease) in reserves | 848,329 | 7,076,035 | (1,018,331) | (1,153,585) | 210,263 | 1,162,743 | 997,857 | 1,188,542 | 1,023,297 | 1,311,662 | 1,452,673 |
| Increase/(decrease) of investments | - | - | - | - | - | - | - | - | - | - | - |
| Total application of capital funding | 3,073,186 | 10,205,688 | 760,859 | 870,362 | 1,940,060 | 1,314,318 | 1,307,374 | 2,158,543 | 1,374,074 | 1,444,724 | 2,415,487 |
| Surplus/(deficit) of capital funding | (854,736) | (1,193,357) | (1,446,719) | (1,555,049) | (1,778,190) | (1,886,525) | (1,891,347) | (1,970,444) | (1,986,736) | (2,039,744) | (2,183,660) |
| Funding balance | - | - | - | - | - | - | - | - | - | - | - |

Table 16: Capital expenditure included in LTP

| Item | Carry Forward 30 June 2021 \$ | LTP 30 June 2022 \$ | LTP 30 June 2023 \$ | LTP 30 June 2024 \$ | LTP 30 June 2025 \$ | LTP 30 June 2026 \$ | LTP 30 June 2027 \$ | LTP 30 June 2028 \$ | LTP 30 June 2029 \$ | LTP 30 June 2030 \$ | LTP 30 June 2031 \$ |
|----------------------------|-------------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Reticulation network | 730,000 | 539,652 | 1,651,689 | 2,001,867 | 879,966 | 46,468 | 245,910 | 132,987 | 283,706 | 101,028 | 53,230 |
| Urban Growth Strategy | | - | - | - | 746,257 | - | - | 806,691 | - | - | 876,631 |
| Treatment Plant | 1,448,000 | 406,000 | 121,380 | 15,771 | 86,312 | 98,469 | 56,792 | 23,326 | 59,885 | 24,641 | 25,348 |
| Treatment Plant - wetlands | | 6,000 | 6,120 | 6,308 | 17,262 | 6,638 | 6,815 | 6,998 | 7,186 | 7,392 | 7,604 |

Carry Forward reflects the potential underspend on approved projects that will be transferred to 2021/22 for completion

9 Improvement plan and monitoring

9.1 Improvement plan

In preparing this Plan there remains a number of areas where improvements to the level of detail have been identified. These improvements will be phased over the next three years reflecting a process of continuous enhancement of the management confidence provided by the Plan. This further work will have the effect of:

- Enhancing analysis for planning purposes
- Enhanced predictive modelling for renewals and financial forecasting
- Improving operational efficiency

The following table (Table 18) are recommendations for refining Asset Management Plan data and budget forecasting.

Table 17: Improvement recommendations

| Action | AMP Section | Responsibility | Completion Date |
|--|-------------|--|-----------------|
| Develop a critical asset register, and investigations undertaken to report on the condition, possible risk mitigation measures, and alternative service/redundancy strategies in case of damage from significant natural events. | 6 | Asset manager / Corporate services manager | 2023 |
| Further work on identification of climate change risks specific to the area should be undertaken using data sourced through existing government research and applied to the Carterton District. | 6 | Project team | 2023 |
| The draft urban growth strategy may require an increase in capital expenditure for new wastewater pipe work on the eastern side of Carterton. Costings for this need to be completed | 6 | Project team | 2022 |
| Wastewater hydrology and distribution predictive modelling | 7 | Asset Manager | 2023 |
| Review actual performance measures against reported measures, and re-assess accuracy. | 4 | Asset Manager | 2022 |

9.2 Monitoring and review

The above 'Improvement Plan' should be monitored and reviewed at least once every 12 months. Appropriate actions then can be taken for further improvement.

10 References

Table 19 sets out the wastewater issues identified in the assessment (2006) along with a summary of Council's role.

Table 18: Assessment of Water and Sanitary Services (2006)

| Issue | Role for CDC |
|--|---|
| Education of relevant issues to communities. | Action on behalf of communities to resolve specific issues. |
| Monitoring of relevant public health issues. | Monitoring of public health issues under the Health Act Meet monitoring requirements of current legislation. |
| Funding of asset management, investigations, design, physical works and maintenance. | Manage funding for capital work requirements in line with levels of service. |
| Wastewater scheme levels of service. | Levels of service to be established with community. |
| Resource consents. | Ensure district discharge consents are in place and adhered to. |
| Development in the district. | Council to monitor/respond to growth in line with levels of service. |

Figure 10: Planned 30year Wastewater Mains Renewals

