Asset Management Plan

Wastewater

PAPAIOEA
PALMERSTON
NORTH
CITY

Our Asset Management Plans for water were created prior to the October 2023 Government election. We will follow government guidance as it is released

Asset Management Plan
Executive Summary

Wastewater

Manaaki whenua, manaaki tangata, haere whakamua. Tihei mauri ora!

No reira, e te haukainga Rangitāne, nei rā te mihi nui ki a koutou e pupuri nei i te mauri o te whenua me ngā wai e rere atu e rere mai.

Tēnā koutou, tēnā koutou, tēnā tātou katoa.

We provide wastewater collection, treatment and disposal services for Palmerston North, Ashhurst, Bunnythorpe and Longburn. Linton also has some wastewater pipes, which drain via the Linton Army Camp network, to our treatment plant.

As a member of the Manawatū River Leaders' Accord, we recognise we have a role in improving the mauri and health of the Manawatū River. Presently, all the wastewater is treated at our treatment plant in Awapuni and discharged to the Manawatū River. As our population grows, environmental legislation increases, and residents' value of the natural environment strengthens – the way we manage wastewater in the future is undergoing significant change.

Taumata Arowai became New Zealand's dedicated regulator of drinking water, when the Water Services Act came into effect on 15 November 2021. In 2024, it will assume oversight for wastewater and stormwater networks, becoming the three waters regulator for Aotearoa.

The Government is progressing three waters reforms so that three waters services will be provided by ten publicly-owned water service entities by July 2026. These reforms will improve public health and wellbeing, environmental outcomes, economic growth and job creation, housing and urban development, adaptation to the impacts of climate change, building resilience to natural hazards, and upholding iwi/Māori rights and interests relating to water services.

Under the National Policy Statement for Freshwater Management 2020, we must give effect to the hierarchy of obligations and six principles of Te Mana o te Wai.

Rangitāne O Manawatū expresses this in their Te Mana o te Wai statement and objectives. The Te Mana o te Wai statement is:

The most significant quality that flows through wai is mauri. The mauri is generated throughout the catchment and is carried through the connected tributaries, groundwater, wetlands and lagoons. It is the most crucial element that binds the physical, traditional and spiritual elements of all things together, generating, nurturing and upholding all life, including that of Rangitāne o Manawatū. The health and well-being of Rangitāne is inseparable from the health and well-being of wai. The Manawatū Awa, its catchment, tributaries and connections, wetlands and lagoons are taonga and valued for the traditional abundance of mahinga kai and natural resources.

Nature Calls is a key project for us

The Nature Calls project is taking a fresh look at how we treat and dispose of our wastewater for the coming decades. We're proposing a hybrid discharge to river and land, and the highest standard of treatment currently available. We're also looking at ways to reduce the amount of treated wastewater entering our river. In 2023 our consent application was accepted by Horizons Regional Council for processing.

This Asset Management Plan outlines how we intend to manage and invest in our wastewater assets for the next 30 years

Scope of this plan

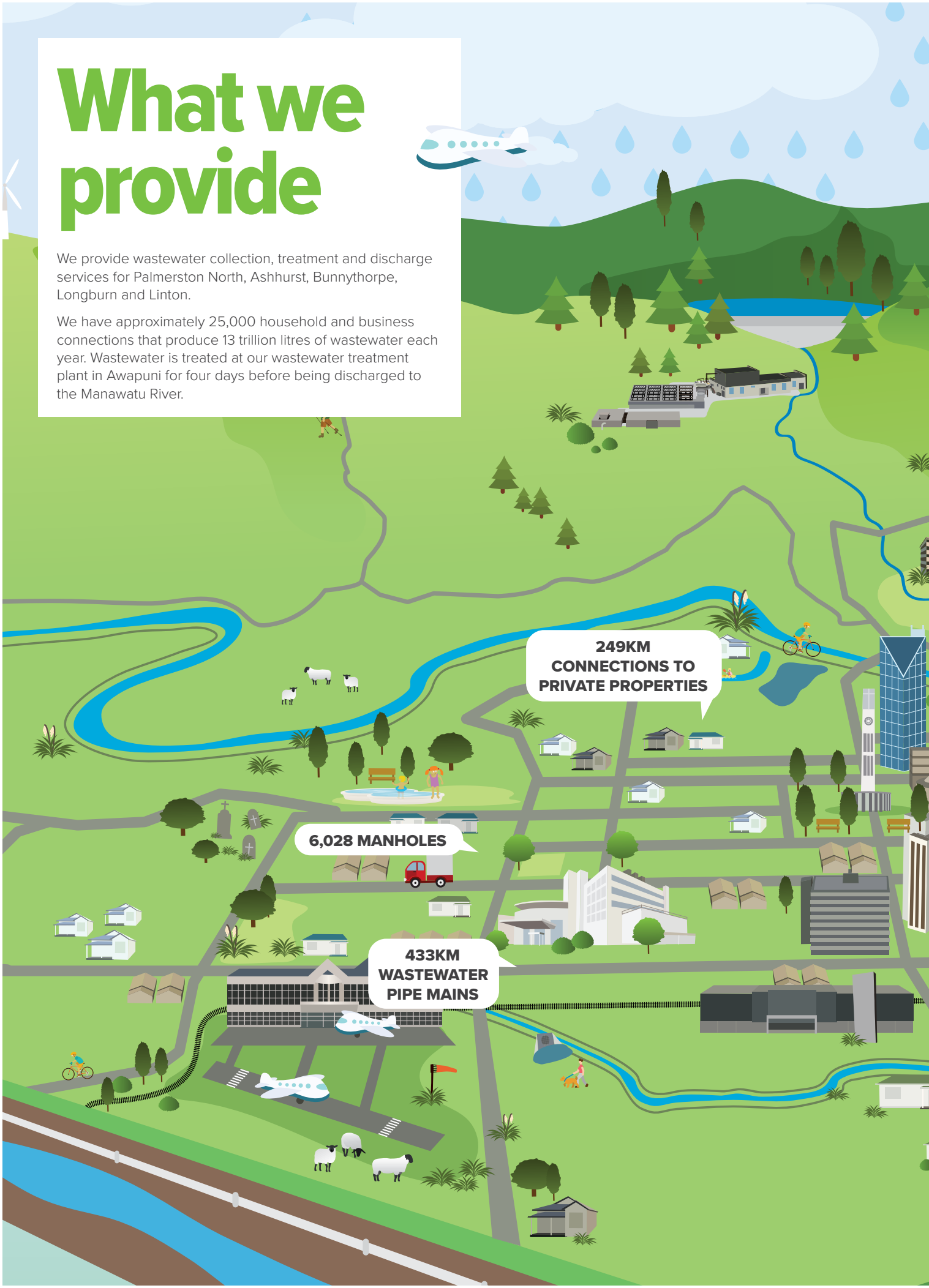
This Plan informs our 10 Year Plan, Financial Strategy and 30 Year Infrastructure Strategy. It supports the pro-active management of our wastewater assets to:

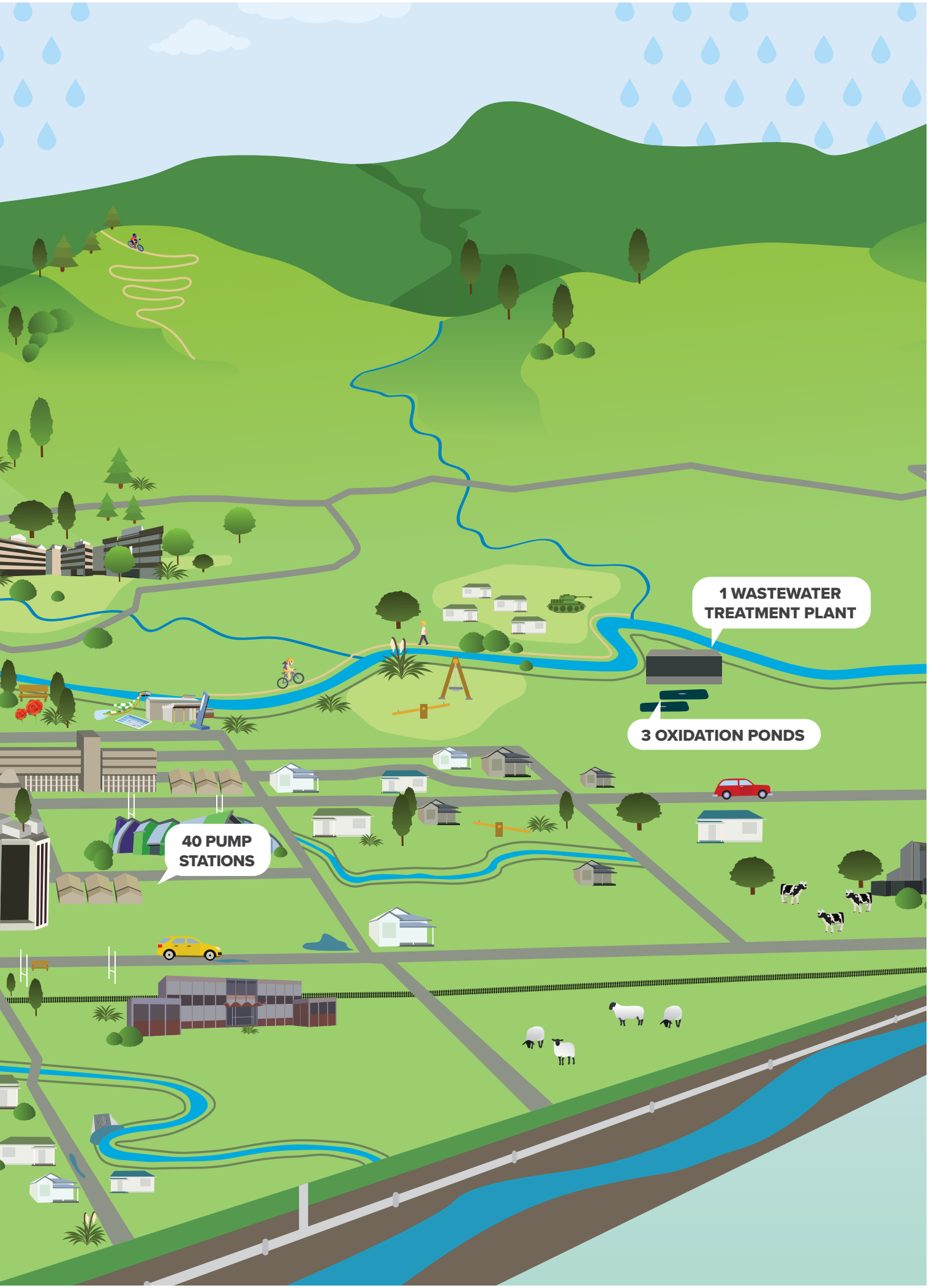
- Achieve our strategic outcomes as set by Goal 4: A sustainable and resilient city
- Meet the agreed levels of service,
- Plan for growth and key drivers such as consenting and legislative requirements,
- Improve asset knowledge and monitor and manage performance,
- Plan programmes and operations, and
- Mitigate and minimise risk, including for climate change.

What we provide

We provide wastewater collection, treatment and discharge services for Palmerston North, Ashhurst, Bunnythorpe, Longburn and Linton.

We have approximately 25,000 household and business connections that produce 13 trillion litres of wastewater each year. Wastewater is treated at our wastewater treatment plant in Awapuni for four days before being discharged to the Manawatu River.




1 WASTEWATER TREATMENT PLANT
3 OXIDATION PONDS
40 PUMP STATIONS

Everyone is a customer

Residential

Visitors

Industrial

Rural

Education sector

Fire and Emergency New Zealand

Healthcare

Council

Developers

Commercial

We service a population of approximately 90,000 people through the provision of wastewater services for the City of Palmerston North, including Ashhurst, Longburn and Bunnythorpe.

Businesses that produce trade waste are consented as their wastewater can contain substances which may be detrimental to our wastewater system, treatment plant processes, the environment, and to the health and safety of people working at wastewater plants.

About 500 businesses are required to have a treatment device to prevent fat, grease and oil from damaging the wastewater network. A smaller number of industries pay additional fees, mainly to cover treatment and sampling costs.

There are no restrictions on our other customers, but we do remind them to dispose of wipes to landfill, rather than flushing them, in order to reduce blockages. The majority of residents were satisfied with the wastewater activity in 2022. People expect reliable service, and the number of blockages and faults are decreasing. We are meeting our customer performance measures.

We have a strong partnership with Rangitāne o Manawatū. Our stakeholders include, regulators, river leadership, adjoining councils and communities, other iwi and hapu and central government.

We have some challenges + risks

Our treatment plant is aging

As our consent is now being reviewed for processing by Horizons Regional Council, it is unlikely that any upgrade to the existing treatment plant will occur in the next few years. The existing treatment plant was opened in 1968 and it has been maintained to a high standard but is now showing its age. Some of the equipment has been in service for more than 40 years and some of the technology is outdated. As a result, breakdowns are becoming more frequent, requiring higher levels of maintenance which leads to an increase in operating costs. The treatment plant must remain fully operational until any upgrades occur, so we have been busy replacing critical components. The focus is on moving towards a more preventative maintenance programme.

Our pipe infrastructure is aging

Currently we have 24km of highly critical pipes. These pipes typically service a large number of customers or critical providers such as hospitals and schools. Some assets are old and potentially due for replacement. The condition of these pipes needs to be better understood in order to confirm the risk of failure, and the priority for repair or replacement.

We need to stop stormwater entering our wastewater network

Stormwater and groundwater can get into our wastewater pipes in a variety of ways, including from roof downpipes, gully traps and leaking pipes. This is known as inflow and infiltration and it may increase as pipes and manholes age and deteriorate. This can lead to increased overflows during heavy or prolonged rainfall and puts a higher demand on treatment and disposal facilities.

Risk and Resilience

We have a good understanding of the risks to our wastewater network due to natural hazards such as earthquakes and floods.

Around 80% of our pipes are made of brittle material like concrete or earthenware that could fracture or be damaged in a major earthquake. Some buildings and structures at the treatment plant have unacceptable seismic risk. Our asset management planning is key to managing risks that we cannot “build” our way out of.

Pandemic risks, technological risks, security risks, and economic risks have been assessed for the Wastewater Activity. A criticality framework has been developed to help inform operations and renewal planning. The criticality of collection and treatment assets are yet to be integrated into the criticality framework.

Growth is continuing

A key focus is supporting growth and demand increase. This work includes constructing new assets for land that is rezoned for residential and industrial growth, as well as implementing capacity upgrades of existing pipelines and pump stations.

Climate change

Climate change is also expected to increase rainfall in winter. As there are many connections and entry points this is a challenging issue to effectively address. The catchments with the highest assessed inflow and infiltration (where rain is entering wastewater pipes) have been the focus of our upgrades over the past few years, and modelling is underway to determine an appropriate programmed approach.

What's our plan?

Reduce risk of service failure

We will consolidate the upgrading of critical pipes into a single work programme in order to prioritise projects as better condition data is obtained.

An investigation has found that the network is vulnerable in locations such as in gullies and around other services. We plan to relocate or protect these services to reduce the risk of failure and wastewater overflows.

There are a number of large diameter mains that are no longer in service but have not been fully decommissioned. To prevent collapses in these old pipes we plan to fully decommission these assets to prevent property damage and keep the public safe.

Sustainability

Sustainable energy usage can be achieved through improvements to Biogas Electricity Generation and operational efficiency at the Tōtara Road Wastewater Treatment Plant and our pump stations. We are undertaking a study to address future management of sludge from ponds and bio reactors. Implementation of food waste and organic waste to energy initiatives could lead to improvements. We'd do this by using surplus digester capacity to treat organic waste to generate biogas which is then burned in the gas energy to generate electricity to run the wastewater treatment plant site. The gas cogeneration system will receive upgrades and improvements to optimise the capture and conversion to energy of the biogas.

Implement Nature Calls project

We have confirmed the 'best practicable option' for managing, treating and discharging the city's wastewater for the next 30 to 50 years. The selected option will see treated wastewater discharged to both land and river. Three quarters of the time the treated wastewater will be discharged to the Manawatū River. During the remainder, the discharge of wastewater reduces to the river by 75% and this highly treated wastewater supplied will be to land by irrigation.

We will also look at diverting a higher proportion from the river over the lifespan of the consent. The wastewater is planned to have the highest treatment currently available in New Zealand.

The treatment plant will be upgraded under the Nature Calls Project, but the front end of the plant is unlikely to change. Therefore, we plan to carry out seismic strengthening on the sedimentation tanks, inlet works and main building in the short to medium term.

Collect more condition data to inform renewals

We are working hard to improve our pipe condition data, as this information is key to informing our risk failure profile. Understanding condition is also key to prioritising investment to ensure better outcomes. More plant condition data will ensure fewer reactive maintenance issues and improve planning.

Improve network and treatment performance

We will be investigating capacity constraints and design solutions to help mitigate the risk of overflows occurring during wet weather periods.

As well as collecting condition assessment data, we need to identify sources of inflow and infiltration. We are establishing a flow monitoring programme to collect data to use in calibrating our hydraulic model and update our network system performance that will inform the capital renewal and upgrade programmes. During calibration the selected rainfall data will consider climate change, taking these effects into consideration.

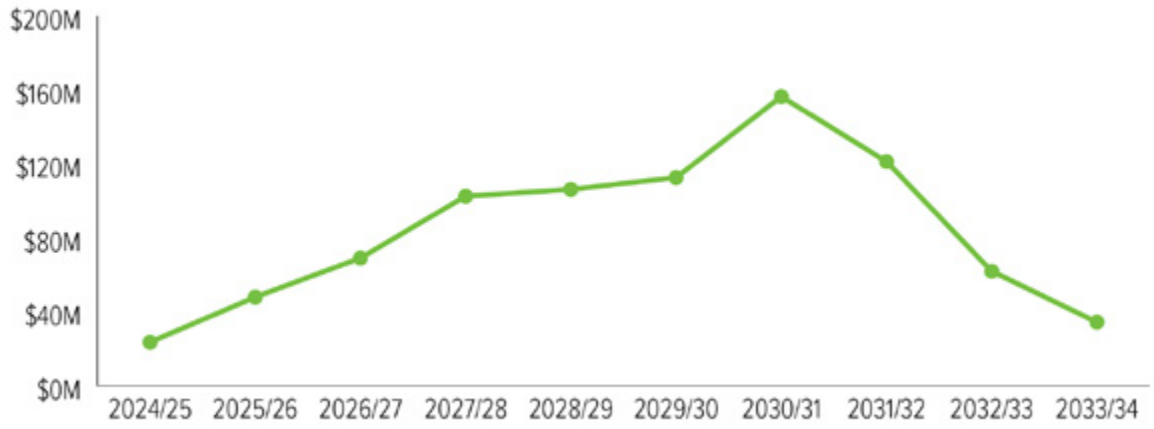
Maintain existing levels of services

We plan to keep operating the existing services at the same or better levels and continue to look for ways to improve operational efficiency. This includes responding to growth in a way that enables new customers to receive the agreed level of service, at an optimum cost.

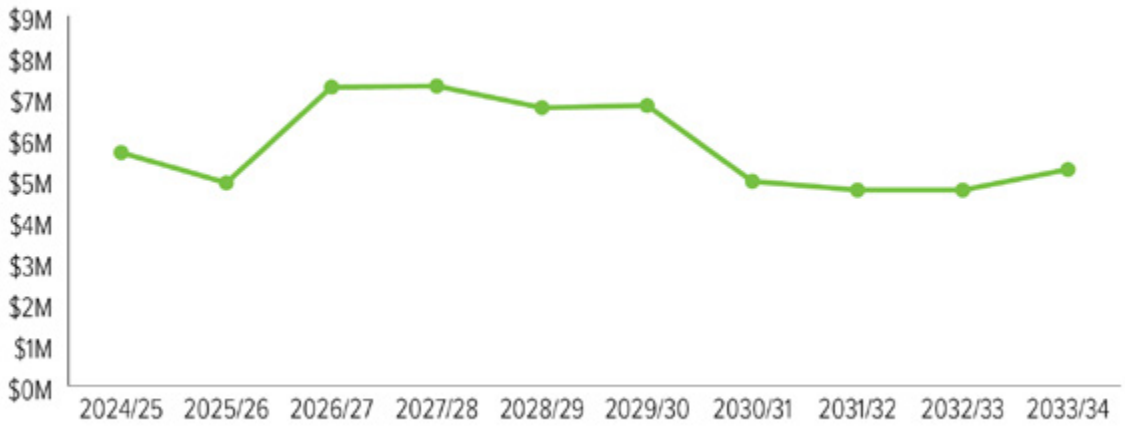
How much will it cost?

Operations and Maintenance

The largest proportion of operational expenditure is spent operating and maintaining our existing assets. Our consequential operational expenditure (from the creation of new assets) will increase steadily from year 7 once the new treatment and discharge with our future wastewater (Nature Calls) comes into effect , and new assets associated with growth areas begin to require maintenance.



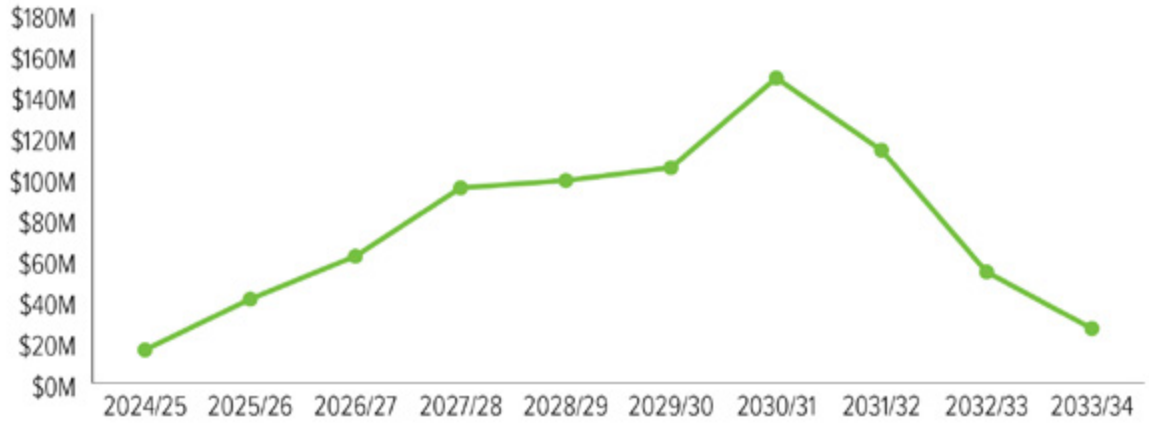
Renewals



Investment will continue to be required to implement the Nature Calls project, renew critical assets and provide infrastructure for new growth areas.

The majority of proposed future spend is for renewing wastewater pipes throughout the city, and particularly, critical wastewater trunk mains. Further work will be required to fully develop our renewals programme.

Capital new



Nature Calls takes up the majority of our capital new budget over the next 10 years. In addition to this we need to upgrade parts of the pipe network and increase network storage capacity to reduce the probability of overflow during rainfall events, as these events are predicted to be more frequent and more intense in the future.

There is also a need to realign at risk pipelines (those under stream beds and buildings) and ensure that we can extend our wastewater network to future growth areas. To do this work, we expect to be investing at least $7 to $11 million per year over the next 10 years.

Status: Final

This document was prepared by:

Palmerston North City Council | Infrastructure | Asset and Planning Division.

Version No.	Reason for Amendment	Date
0	DRAFT TO SUPPORT 10 YEAR PLAN CONSULTATION	9 Apr 2021
1	FINAL	23 Jul 2021
1.1	2022 Draft Update	6 Jul 2022
1.2	2023 Draft Update	August 2023
1.3	2023 Final Update	November 2023
1.4	2024 Addendum Update	June 2024

	Name
Asset Management Plan Coordinator:	Claire Scrimgeour, Beca Angela Murray, Beca
Reviewed by:	Priyani de Silva-Currie, Kristina Hermens, Claire Scrimgeour, Beca Leicester Drake Helen Churton
Approved for Issue by:	Mike Monaghan

OASIS Document No. 17187674

Contents

List of Figures

List of Tables

1 Introduction

1.1 He Mihi

Manaaki whenua, manaaki tāngata, haere whakamua. Tihei mauri ora!

No reira, e te haukainga Rangitāne, nei rā te mihi nui ki a koutou e pupuri nei i te mauri o te whenua me ngā wai e rere atu e rere mai.

Tēnā koutou, tēnā koutou, tēnā tātou katoa.

Our matawhānui Papaioea, vision for Palmerston North, is “he iti rā, he iti pounamu | small city benefits, big city ambition”, where our community enjoys the benefits of living in a small city yet has the advantages of a big city.

The city is fortunate to have a range of quality assets that are managed in a way that supports this vision and provides our community with essential services, including the Wastewater Activity.

1.2 Our Partnership with Rangitāne o Manawatū

In our commitment to fostering and strengthening our partnership with Rangitāne o Manawatū, we aim to ensure:

- Rangitānenuiarawa[1] is reflected in the city’s approach to wastewater systems; and
- Rangitāne o Manawatū have opportunities for early involvement in all wastewater systems projects and initiatives.

1.3 Activity Successes and Challenges

Our successes in the last three years and ongoing key challenges are outlined below.

1.3.1 Key Successes

Key successes for the Wastewater Activity in the last three years have been:

- **Nature Calls** – we carried out extensive engagement on how we treat and discharge the wastewater we create, for the next 30 to 50 years under the Nature Calls project. In 2021, we confirmed the 'best practicable option,' which will see treated wastewater discharged to both land and river. A consent application was lodged in late 2022, and we have continued to work with Horizons and stakeholders since this time.
- **Totara Road Wastewater Treatment Plant upgrades** – the following infrastructure improvements have been made or are underway: biogas upgrade to improve health and safety and efficiency, odour control improvements, capacity/resilience upgrades to inlet works, ongoing seismic strengthening, and power distribution works.
- **Resilience** - we have improved our service resilience by upgrading the backup power supply to our treatment plants and pump stations.
- **Flow monitoring** – we have installed flow monitoring across our wastewater network to better understand network performance

[1] Rangitānenuiarawa is the Rangitāne expression of kaitiakitanga, or customary authority and guardianship, and affirms their customary leadership in ensuring the health and regeneration of their tribal rohe.

1.3.2 Key Challenges

The table below contains a description of the major challenges and their impact on the Service.

Table 1: Service Delivery Challenges

Challenge	Implications	Mitigation
Nature Calls project may change treatment and disposal of wastewater	Large financial cost Uncertainty in activity and asset management	The Nature calls project has identified that the 'best practicable option' would be to discharge wastewater to both land and sea. A consent application was lodged in late 2022. Review renewals programme to focus on critical assets and assets not impacted by the Nature Calls project.
Aging infrastructure and the backlog of renewals which needs to be addressed to meet levels of service	Reduction in performance Increase in operational risk Timing of Financial cost	Prioritising critical assets with high consequence of failure to reduce impact of failure and give most effective renewals
High levels of stormwater inflow and infiltration into the wastewater system resulting in potential system overflows and costs of treating those flows at the treatment plant	Reduced capacity and increased demand on assets High cost for investigation and repair Difficult to reduce on private property There is uncertainty in cost and effectiveness in eliminating I&I	Separate inflow & infiltration investigation and renewal programme
Ensuring that processes are developed to capture extensive staff knowledge to ensure the knowledge stays within the organization	Issues and risks are forgotten Knowledge and process must be rebuilt or acquired at increased cost	Documentation and hand over of tasks prior to retirement or leaving
Historically asset renewals and improvement decisions were not recorded effectively or in one depository	Due to lack of supporting processes such as how to record asset data, our staff are unable to update or review processes when required which would lead to improved confidence in decision making when planning for renewals and documenting key data to support those decisions.	New documented processes and increased focus on asset management procedures
Poor level of maintenance data, criticality, and condition assessment data	Lack of information to inform asset decision making. Lack of awareness about risks and failure likelihood	Implementation of Mechanical and Electrical Maintenance Contract with heavy emphasis on maintenance and condition data collection. Introduction of tablet access to asset databases and training of field staff. Operationalisation of newly prepared Criticality Framework and Condition and Performance Policy.

1.4 Our Asset Management Framework

We have adopted an Asset Management Framework, as shown in Figure 1, from the International Infrastructure Management Manual (IIMM) 2020 (which broadly aligns with the international asset management standard ISO550001), in order to standardise our approach to asset management and grow it as an organisational practice.

Asset management planning is not only an output of lifecycle planning processes but relies on having a clear understanding of our current and future requirements, and is enabled through leadership, continuous improvement and other asset management elements.

The Framework is based on best practice and therefore helps define both the scope of the Asset Management Plan and its structure.

This AMP documents the key outcomes of each step of our Asset Management process to provide better accountability, sustainability, risk management, service management and financial efficiency.

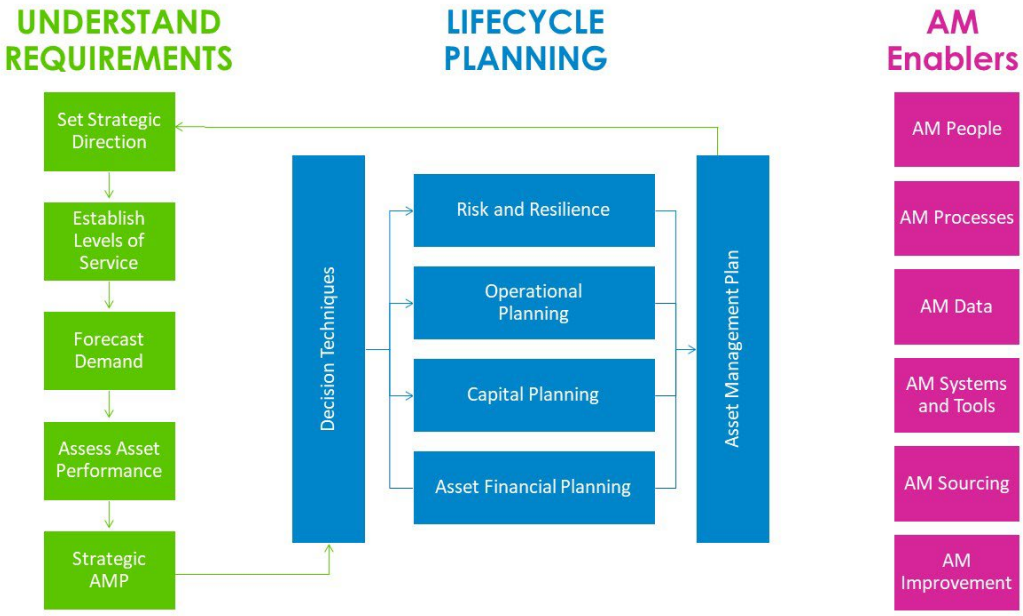


Figure 1: Asset Management Framework

1.5 Purpose and Scope of this Asset Management Plan

The purpose of this Asset Management Plan (AMP) is to document our intended programmes and budgets for the management of the Wastewater Activity based on our understanding of service level requirements, future demand, asset performance and risks.

This plan should be read in conjunction with the Strategic Asset Management Plan (SAMP).

The SAMP includes the overall strategic approach to managing our assets and overarching issues, practices and systems. The SAMP reflects our aspiration to lift the standard of asset management planning throughout the organisation and its purpose is threefold:

- To effectively define the Asset Management System (including giving effect to our Asset Management policy);
- To establish how Asset Management Objectives are linked to our organisational objectives; and
- To provide direction to our Asset Management Plans

This document, the Wastewater AMP provides detail on how our strategic asset management planning is applied to the Wastewater Activity. In this context, the objective of the AMP is to translate our Strategic Vision and Goals into Activity strategies and action plans in order to provide supporting evidence for the Long Term Plan and 30 Year Infrastructure Strategy[2]. The AMP achieves this by:

- Explaining how our strategic direction impacts on the management of our infrastructure assets specific to this Activity;
- Summarising our services and customers including agreed levels of service and performance;
- Forecasting future demand for our services and associated need for assets;
- Reporting on asset condition and performance;
- Highlighting the key risks (including sustainability, climate change and criticality considerations) and how they are incorporated into investment decisions that ensure our infrastructure is resilient;
- Summarising the basis of operational and maintenance programmes, including how interventions (inspections, assessments and renewals) help optimise planned and reactive maintenance in the operational planning;
- Justifying the business cases for capital new and renewal programmes including prioritisation of projects;
- Proposing long term financial forecasts that are used to inform the development of the draft Long Term Plan;
- Explain how asset management for this Activity is specifically enabled through people, processes, asset data and systems, and service delivery; and
- Demonstrate how the Activity is prioritising and improving its asset management maturity as part of its commitment to operational excellence.

[2] AMP demonstrates regulatory compliance with section 93(7) & 94(1) of the Local Government Act (LGA) 2002 which in summary requires the Long-Term Plan (LTP) to be supported by the information required by Part 1 of Schedule 10

1.6 Relationship with other plans

The figure below shows the relationships between our key planning documents.

This section outlines the relationships between the Wastewater AMP and other Council AMPs. These other plans are available on our website.

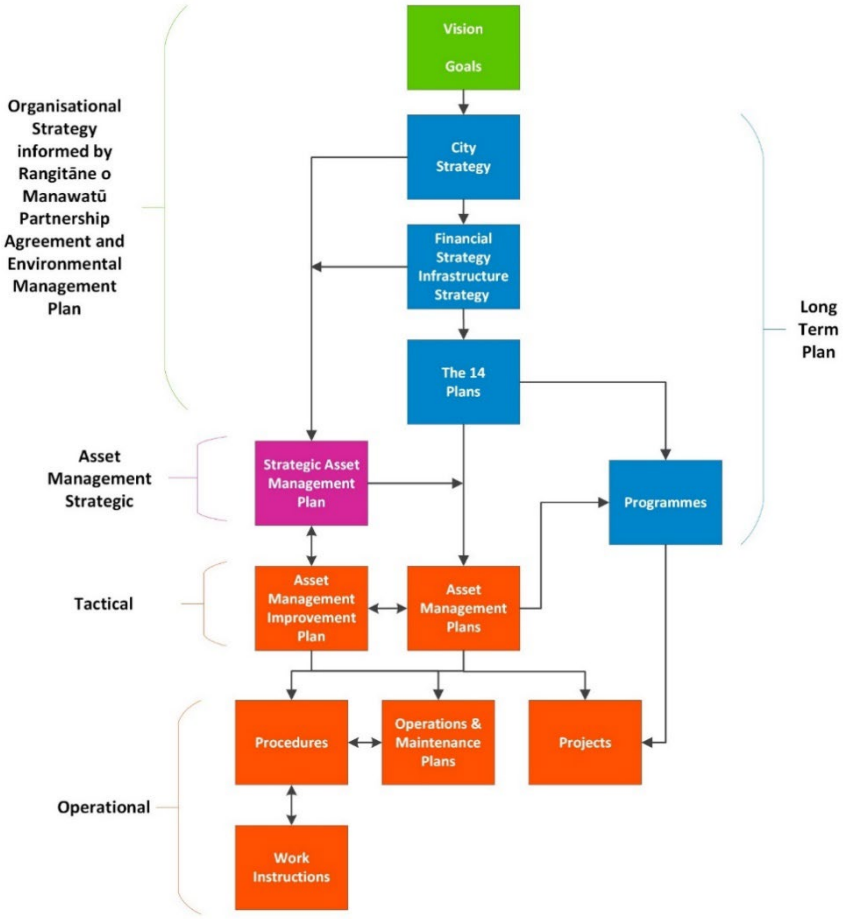


Figure 2: AMP and Key Documents in our Management Framework

1.6.1 Relationship to the Wastewater Management Plan

There is no current Wastewater management plan however we are in the process of developing the plan.

1.6.2 Relationship to Other Asset Management Plans

The following relationships between this AMP and other AMPs have been identified:

- **Resource Recovery AMP:** treatment plant sludge is composted and disposed of as closed landfill cover. Landfill gas is piped to the Co-Generation plant at the Tōtara Road Wastewater Treatment Plant. Wastewater also generates screenings and grit waste which is disposed of to landfill.
- **Water AMP:** In particular, water supplied to the Tōtara Road Wastewater Treatment Plant and pump stations.
- **Stormwater AMP:** In some areas, there is an interplay between I/I issues in the wastewater network issues and deficiencies or capacity issues in the stormwater network.
- **Property AMP:** The Property activity manages all the Wastewater buildings as a specialist support function. The Property AMP covers the strategies and work programmes needed to identify the required management and investment in property to support the Wastewater activities. The Property AMP covers the management of the Tōtara Road Wastewater Treatment Plant and major pump stations such as the Maxwell Line pump station.
- **Transport AMP:** Council works to coordinate the timing of wastewater works that are in the carriageway with reinstatement and renewal of pavements and other horizontal infrastructure.

1.7 Iwi, Key Partners and External Stakeholders

We play a central role in providing wastewater services. However, wastewater collection and disposal is a complex societal problem and hence there is very high engagement with us from both the community and government agencies.

1.7.1 Rangitāne o Manawatū

We work in partnership with Rangitāne o Manawatū to ensure Rangitānenuiarawa is reflected in the city's approach to water management, including the Water Activity.

The Rangitāne o Manawatū Claims Settlement Act 2016 places specific requirements on us to inform and consult Rangitāne o Manawatū on developments adjacent to the Manawatū River and its tributaries. Rangitāne o Manawatū are informing our understanding of the sensitive sites located along waterways to ensure development is undertaken in a culturally appropriate matter.

We are collaborating with Rangitāne o Manawatū on the Nature Calls project.

Rangitāne o Manawatū have opportunities for early involvement in all Wastewater projects and initiatives.

1.7.2 Iwi o te Awa

Iwi that associate with the Manawatū River that are engaged with us in the Nature Calls project include:

- Muaūpoko
- Ngāti Kauwhata
- Ngāti Whakatere
- Raukawa ki te Tonga
- Rangitāne o Tāmaki nui ā Rua

1.7.3 Stakeholders

Table 2 contains a summary of stakeholders that we regularly engage with on wastewater management issues. The level of engagement (whether we inform, consult, involve, co-operate with or empower) depends on how significant the issue is and who is responsible for resolving the issue.

Table 2: External Partners and Stakeholders

Name	Description
Ratepayers	People who own properties within the Palmerston North City Council boundaries but may or may not reside in the city
Trade Waste Customers	Trade waste is the liquid waste businesses discharge into the wastewater system. Trade waste can contain substances which are detrimental to the sewage system, treatment plant processes and the environment, and to the health and safety of people working in wastewater plants.
Residents	People who live within the Palmerston North City Council boundaries
Manawatū River Leaders' Accord Members	"In August 2010, iwi/hapū, local and central government, farming, and industry leaders along with Massey University and environmental groups formed the Manawatū River Leaders' Forum"
Visitors to Palmerston North	Palmerston North and the Manawatū District represent the 13th largest domestic visitor spend
Research Institutes	Massey University: conduct research at Tōtara Road Wastewater Treatment Plant
Wastewater Monitoring Groups	The following groups are members of the Wastewater Monitoring Group as set out by our discharge consent: Chamber of Commerce Fish and Game Forest and Bird Kiwi Canoe Polo Manawatū Estuary Trust NZ Jet Boat Association Palmerston North Canoe Club The Foxton Community Board The Opiki Community Group WECA
Businesses and NGOs	Individuals or organisations who carry out their business in the city, including educational facilities. Wastewater charges are based on a pan charge.
Manawatū-Whanganui Regional Council, trading as Horizons	The environmental, regulatory, and monitoring body under the Resource Management Act for the natural resources in the Manawatū-Whanganui region. We hold consents with Horizons for wastewater discharge and disposal of Sludge
Third parties operating on Council land/out of Council facilities	Community groups, management trusts, and businesses run their operations out of Council owned facilities or on Council land. Includes Council controlled and Council affiliated organisations
Media	Manawatu Standard
Contractors	Contractors and tradespeople who assist in the delivery of Council activities

Name	Description
Neighbouring local authorities	Manawatū, Horowhenua and Tararua districts adjoin Palmerston North City, and we are within the Horizons Region. Council maintains relationships with other Councils for the exchange of information and management practices
Government agencies	Ministry for the Environment: Government`s key advisor in New Zealand Ministry of Health: Overall responsibility in New Zealand for public health, including sanitation matters related to wastewater services Department of Internal Affairs (DIA):

1.8 Improvement Actions

There are no improvement actions for this section.

2 Strategic Context

2.1 Our Strategic Direction and Priorities

Our vision for Palmerston North is:

He iti rā, he iti pounamu - Small city benefits, big city ambition

The Oranga Papaioea City Strategy, and the series of plans that sit beneath it, describe the actions we will take to achieve our four goals:

- Goal 1: An innovative growing city
- Goal 2: A creative and exciting city
- Goal 3: A connected and safe community
- Goal 4: A sustainable and resilient city

To achieve our City's vision, we have aligned the Wastewater Asset Management Plan (AMP) with Goal 4 : A sustainable and resilient city, and notably the Waters Plan.

2.1.1 Goal 4: A sustainable and resilient city

Our goal is for Palmerston North to have healthy natural environment and resilient urban system that sustains everyone, now and in the future. We understand that Palmerston North has a responsibility to respond to climate change for the benefit of everyone. We want Palmerston North to reduce carbon emissions and our overall ecological footprint. We want to protect and enhance our natural and built environments, regenerate our native biodiversity, increase and support more resilient and sustainable lifestyles. We are committed to contributing to a thriving climate-resilient, low-emissions, low-waste city.

We understand the value of collaborating with our partners and communities to achieve a more sustainable and resilient future. We recognise the connection between our goal for a sustainable and resilient city and the Rangitāne o Manawatū Environmental Management Plan. We also recognise the interdependencies between environmental sustainability and the social, economic and cultural wellbeing of our citizens.

Objectives

We want our communities to have:

- a sustainable, low-emissions city;
- a resilient city and communities, prepared for the impacts of climate change;
- a circular economy with more resource recovery and less waste;
- a healthy, thriving ecosystem, including native biodiversity and food security;
- the Manawatū River and waterways restored to a healthy, respected and connected state;
- sustainable urban planning with a low-carbon built environment;
- a safe, affordable and resilient water supply;
- access to relevant information and education to support more sustainable choices; and
- opportunities to be involved and contribute to decision-making about environmental wellbeing.

Strategic Priorities - Waters Plan

Our Waters Plan outlines our strategic priorities for our three waters services and is guided by the following:

We want our city to have a safe and readily available water supply and to be safe from flooding. We want our wastewater to be safely collected, treated and disposed of.

- provide wastewater services for the safe collection, treatment and disposal of the city's wastewater;
- provide water services for the provision of safe and readily available water; and
- provide stormwater services to protect buildings from inundation from flooding in major events.

2.2 Relationship with Rangitāne o Manawatū

In recent years Council has made a series of considered decisions to uphold the mana of Te Tiriti o Waitangi. These include signing the Partnership Agreement with Rangitāne o Manawatū in 2019 and establishing a standing committee to consider matters of strategic significance to Māori.

Rangitāne O Manawatū have an operational Environmental Management Plan. This is equivalent to an Iwi management plan under the RMA and therefore provides insights into how we will:

- Work in partnership with Rangitāne o Manawatū on projects and initiatives of agreed priority (e.g. Te Motu o Poutoa)
- Encourage and enable Māori participation in Council decision-making and activities, and
- Support and embed a Whānau Ora approach in Council activities

The relationship with Rangitāne o Manawatū and our commitment to this partnership is reflected in our Waters Plan. Specific Rangitāne o Manawatū (RoM) outcomes relevant to our three waters activities are:

- RoM participate in 3 waters governance and technical decision-making processes.
- E. coli, nitrogen, phosphorous, sediment runoff and plastic pollution are reduced to levels that protect contact recreation, ecological communities and cultural health.
- Whānau can sustainably harvest mahingakai in sufficient quantities, and that kai is free from the risk of contracting gastric disease.*
- There is a formal cultural monitoring framework in place for freshwater monitoring that is properly resourced and enables a whānau and RoM-based response.
- All fish barriers are systematically removed, all new stream and river works require fish pass installation in consultation with RoM.
- RoM fish plan is recognised and provided for.
- Wetlands of scale need developing in partnership with RoM, in regionally strategic locations to protect urban and rural water quality and provide for biodiversity.
- Establish forest and wetland nodes within all urban suburbs to treat stormwater.
- Future-proofing water supply is seen as important.
- Climate change resilience is factored into water supply availability.
- Water use information should be publicly available.
- Water use is sustainable.
- Rainwater collection encouraged for urban development.

2.3 Te Mana o te Wai

Under the National Policy Statement for Freshwater Management 2020, we must give effect to the hierarchy of obligations and six principles of Te Mana o te Wai.

The hierarchy of obligations prioritises the following in order:

1. the health and well-being of water
2. the health needs of people (such as drinking water)
3. the ability of people and communities to provide for their social, economic and cultural well-being.

The National Policy Statement requires local authorities to take in an integrated approach to freshwater management and to actively involve tāngata whenua (to the extent they wish to be involved) in freshwater management (including decision-making processes). The RoM Environmental Management Plan gives effect to this with the following Te Mana o te Wai statement:

> *The most significant quality that flows through wai is mauri. The mauri is generated throughout the catchment and is carried through the connected tributaries, groundwater, wetlands and lagoons. It is the most crucial element that binds the physical, traditional and spiritual elements of all things together, generating, nurturing and upholding all life, including that of Rangitāne o Manawatū. The health and well-being of Rangitāne is inseparable from the health and well-being of wai. The Manawatū Awa, its catchment, tributaries and connections, wetlands and lagoons are taonga and valued for the traditional abundance of mahinga kai and natural resources.*

The objective the Te Mana o te Wai statement as stated in the Environmental Management Plan is:

1. Land and freshwater within the Manawatū will be managed in a way that gives effect to Te Mana o Te Wai by:
    1. Protecting and restoring the mauri of the Manawatū Awa and costal lagoons, their tributaries and connections so they can again physically, traditionally and spiritually sustain Rangitāne by ensuring:
        - the quality and quantity of water is sufficient to support all species that would be expected to be present in that place, including plants, birds, aquatic insects, mollusks, kōura and fish
        - rivers and streams have sufficient room on their flood plains to express their natural character, including changing course and connecting to wetlands
        - waterbodies have natural rhythm, geomorphology, hydrology and character
        - mahinga kai species and freshwater resources are healthy, resilient, abundant, and safe to harvest and eat.
    2. Recognising and providing for the relationship of Rangitāne o Manawatū with their waters by ensuring:
        - Rangitāne o Manawatū are enabled to undertake their kaitiakitanga duties, including decision-making, management, restoration and monitoring
        - Rangitāne o Manawatū can meaningfully exercise their mana whakahaere
        - Rangitāne o Manawatū cultural practices and tikanga tuku iho can be carried out, shared with the community and passed on to future generations, for example rāhui
        - the mātauranga of Rangitāne o Manawatū is recognised, its development and transmission is provided for.
    3. Recognising water as an interconnected whole by ensuring:
        - ephemeral and permanent waterways, from the smallest creeks, puna and wetlands to the largest lakes, groundwater bodies, rivers and coastal waters are provided for
        - when providing for social, economic and cultural well-being (2c), the way water is taken and disposed of is integrated.
2. To give effect to Te Mana o te Wai, all management of fresh water in the Manawatū FMU shall prioritise:
    1. firstly, the health and well-being of waterbodies and freshwater ecosystems, and the ability of mana whenua to uphold these
    2. secondly, the health and well-being of people interacting with water through ingestion (such as drinking water, water for essential washing and cleaning (but not its disposal) and consuming harvested resources) and immersive activities (such as harvesting resources and recreation)
    3. thirdly, the ability of people and communities to provide for their social, economic and cultural well-being, now and in the future.

Rangitāne o Manawatū are actively involved in the planning and delivery of infrastructure that will have an impact on water. This process is yet to be formalised and a timeframe is not available yet for reviewing the District Plan against the new Freshwater NPS. However, we will update infrastructure planning to give effect to any future freshwater management agreements or Plan Changes.

2.4 Three Waters Reform Programme

2.4.1 Overview

All New Zealanders need safe, reliable drinking water, wastewater and stormwater - the three waters services. We depend on these for the health and wellbeing of our communities and our environment. Local government is facing significant challenges in managing drinking water, stormwater and wastewater services. To address this, the Government is progressing reforms so that three waters services would be provided by ten publicly-owned water service entities by July 2026.

These reforms were to ensure public health and wellbeing, environmental outcomes, economic growth and job creation, housing and urban development, adaptation to the impacts of climate change, building resilience to natural hazards, and upholding iwi/Māori rights and interests relating to water services.

The change in government in October 2023 meant that these reforms were halted and associated legislation repealed. The new government intends to introduce new legislation by mid-2024 in line with its Local Water Done Well proposal.

2.4.2 Legislation Pre 2023 General Election

Three new Acts were passed in 2022 and 2023; they were;

1. The Water Services Entities Act 2022

   Established water services entities, including legal form, ownership structure, objectives, functions, operating principles and service area

2. Water Services Legislation Act 2023

   Established the powers, functions, and duties of the new water services entities, enabling them to deliver water services to communities, while also including provisions for the transfer of assets and liabilities from local government and making amendments to local government and water services legislation.

3. The Water Services Economic and Consumer Protection Act 2023

   Established an economic regulation and consumer protection regime as part of water services reform.

2.4.3 Post 2023 General Election

With the change in Government in October 2023 the legislation has been repealed via The Water Services Acts Repeals Act 2024. This passed all stages of parliament and received royal assent on 16 February 2024.

The Repeal Act essentially returned the provision of water services back to the arrangement which existed prior to the Water Services Entities Act 2022. The Government further announced that it would be bringing legislation to the house under its Local Water Done Well proposal in mid-2024. This intends to enable territorial local authorities to set up stand-alone water entities and has removed requirements around mandated iwi involvement within an entity.

2.4.4 Water Sector Regulators

Taumata Arowai was established as a Crown entity in March 2021 and became New Zealand's dedicated regulator of drinking water, when the Water Services Act came into effect on 15 November 2021. In 2024, it will assume responsibility for wastewater and stormwater networks, becoming the three waters regulator for Aotearoa.

Three waters activities and services provided by the new entities will be regulated via Taumata Arowai, Commerce Commission and regional councils.

Regional councils will continue to develop and implement regional policy statements and plans that guide land use, resource management, and environmental protection for three waters activities. They will continue to monitor and enforce regional rules and resource consent compliance.

2.5 Regulatory and Policy Context

Table 3 below contains a summary of legislation and policies that govern the Wastewater Activity.

Table 3: Legislation that Governs the Wastewater Activity

Legislation	Description	Implications
National Policy Statements	Relevant policy statements: • National Policy Statement on Freshwater Management 2020 • National Policy Statement on Urban Development 2020	Govern how we manage our services in relation to freshwater and also plan for urban development. Palmerston North is a tier 2 urban development centre.
National Environmental Standards	Current standards which may affect our water services are: • National Environmental Standards for Air Quality 2004 • National Environmental Standard for Sources of Drinking Water 2007 (update expected in 2023) • National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health 2011 • National Environmental Standards for Freshwater 2020	Regulations which prescribe technical standards, methods or requirement for specific activities which affect the environment.
Local Government Act 2002	The Local Government Act empowers councils to promote the well-being of communities. The purpose of local government is to: • enable democratic local decision-making and action by, and on behalf of, communities • promote the social, economic, environmental, and cultural well-being of communities in the present and for the future. The Act empowers Council to make bylaws to protect its assets and services.	The Wastewater Activity is identified as a core service to be considered by a local authority.
Health Act 1956	This gives the Council a general responsibility "to improve, promote and protect public health within its district." This involves identifying potential health risks and ensuring that these risks are managed to within acceptable levels.	This responsibility extends to wastewater services because of their important role in providing for public health.

Legislation	Description	Implications
Water Services Act 2021	This Act, which is regulated by Taumata Arowai, establishes drinking water standards and regulates all persons and organisations that supply drinking water. It also has other purposes related to wastewater and other water services: • to establish a framework to provide transparency about the performance of drinking water, wastewater, and stormwater networks and network operators • to provide mechanisms that build and maintain capability among drinking water suppliers and across the wider water services sector • to establish a framework for the continuous and progressive improvement of the quality of water services in New Zealand.	Regulation of wastewater services
Resource Management Act 1991	Requires us to: • Sustain the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations • Comply with the District and Regional Plan • To avoid, remedy, or mitigate any adverse effect on the environment • 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. • Consider the effects of natural hazards and climate change (including greenhouse gas emissions)	Affects how we manage and deliver the wastewater activity. The government is undertaking resource management reform with three new pieces to legislation proposed covering: • Natural and Built Environments • Strategic Planning • Climate Change Adaptation
Health and Safety at Work Act 2015	Provision of a framework to secure the health and safety of workers and work.	Sets out the principles, duties, and rights in relation to workplace health and safety.
Civil Defence and Emergency Management Act 2002	The Act aims to improve and promote sustainable hazard management for the well-being and safety of the public and property, facilitate emergency planning, response, and recovery, mandate coordination of Civil Defence Emergency Management (CDEM) among local authorities through regional groups, align local and national CDEM planning, and foster cooperation among various agencies	Responsibilities to plan for and act in case of civil emergency

Legislation	Description	Implications
	responsible for emergency prevention and management.	
Waste Minimisation Act 2008	The purpose of the act is to: Provide hygienic, efficient, and economic solid waste storage, collection, transportation and treatment or disposal of waste without polluting the atmosphere, soil or water system.	To impose a levy on waste disposed of in landfills to generate funding to help local government, communities and businesses minimise waste and future impacts to climate change.
Climate Change Response (Zero Carbon) Amendment Act 2019	The provides a framework for the development of climate change policies which contribute to the Paris Agreement (to limit the global average temperature increase to 1.5° Celsius above pre-industrial levels) and allow New Zealand to prepare for, and adapt to, the effects of climate change.	Council is required to align with emissions and carbon reduction targets
Building (Dam Safety) Regulations 2022	New dam safety regulations will take effect on May 13, 2024, requiring dam owners to assess their potential impacts and to submit a Dam Safety Assurance Programme to the regional authority. Medium and high-risk dams are required to submit a programme 12 months and 2 years after registration, respectively, while low-risk dams will be reassessed every 5 years.	Our wastewater assets will need to comply with these regulations
Manawatū-Whanganui Regional Plan (One Plan	Horizons (Manawatū-Whanganui Regional Council) has the One Plan which sets out requirements for environmental management within the region.	Our land use and discharge consents and related activities must comply with One Plan
Wastewater Bylaw and Administration Manual	Wastewater Bylaw 2019 and Administration Manual which includes technical and operation information to inform how the bylaw is applied. The manual may be reviewed and updated more frequently than the bylaw.	The Wastewater Bylaw protects our wastewater infrastructure from damage. It controls who can connect to the wastewater system and how they can connect to it.
Trade Waste Bylaw and Administration Manual	Trade Waste Bylaw 2022 and Administration Manual which includes technical and operation information to inform how the bylaw is applied. The manual may be reviewed and updated more frequently than the bylaw.	The Trade Waste Bylaw creates a system for issuing consent to discharge trade waste and imposes restrictions and controls on what can be discharged under those consents.
Manawatū-Whanganui Regional Plan (One Plan	Horizons (Manawatū-Whanganui Regional Council) has the One Plan which sets out requirements for environmental management within the region.	Our water takes and associated land use and discharge activities must comply with the requirements of the One Plan.

3 Description of The Wastewater Activity

3.1 Scope of our Services

We provide Wastewater services for the:

- Safe and reliable collection, treatment and disposal of wastewater (sewage) from residential and commercial properties.

We provide wastewater collection services directly to residents and businesses in:

- Palmerston North City (including Aokautere);
- Ashhurst;
- Bunnythorpe; and
- Longburn.

We also accept wastewater from:

- Massey University and Crown Research institutes on Tennant Drive;
- The Longburn Industrial Park; and
- New Zealand Defence Force, Manawatū Prison and New Zealand Pharmaceuticals.

We provide pressure sewer zones and systems to the following locations:

- Pacific Dr
- Kingsdale Dr
- Totara Rd Development
- Works Rd, Linton
- Centennial Park Stage 1.2 and 3
- Whiskey Creek Plan Change

Broadly, our services are arranged under two sub-activities:

- Wastewater collection; and
- Treatment and disposal.

3.2 Service Description

Table 4 contains a summary of what services our customers can access, how they are paid for, where they can access them and how often. The wastewater collection area is show in Figure 3 below. Currently we do not provide a stock truck disposal site or a facility for motor home vehicles outside of the Tōtara Road Wastewater Treatment Plant.

We manage trade waste discharges in order to:

- Protect the health and safety of all people working in the wastewater system;
- Protect our assets
- Protect waterways from harmful and toxic substances; and
- Encourage waste minimisation, water conservation and cleaner production.

We aim to contain wastewater within the pipes until it reaches the treatment plant. Treatment of the wastewater is required to remove harmful pollutants and pathogens before being discharged to a receiving environment. All wastewater collected is now treated at a single facility at Tōtara Road in Palmerston North and discharged to the Manawatū River.

Table 4: Summary of Wastewater Collection Services

Services	Customers	Revenue Source	Where	Frequency
Domestic wastewater	All (typically at the property boundary)	Target rates or pan charges	Wastewater collection area	Daily
Tankered waste	Liquid waste contractors	Charges	Tōtara Road Wastewater Treatment Plant	Adhoc
Trade waste	Trade customers, including: Food, chemical and industrial manufacturers Laundries and drycleaners Dentists Food premises GP surgeries, medical and veterinary centres, hospitals, nursing homes and rest homes Mechanical workshops	Charges	Wastewater collection area	Daily

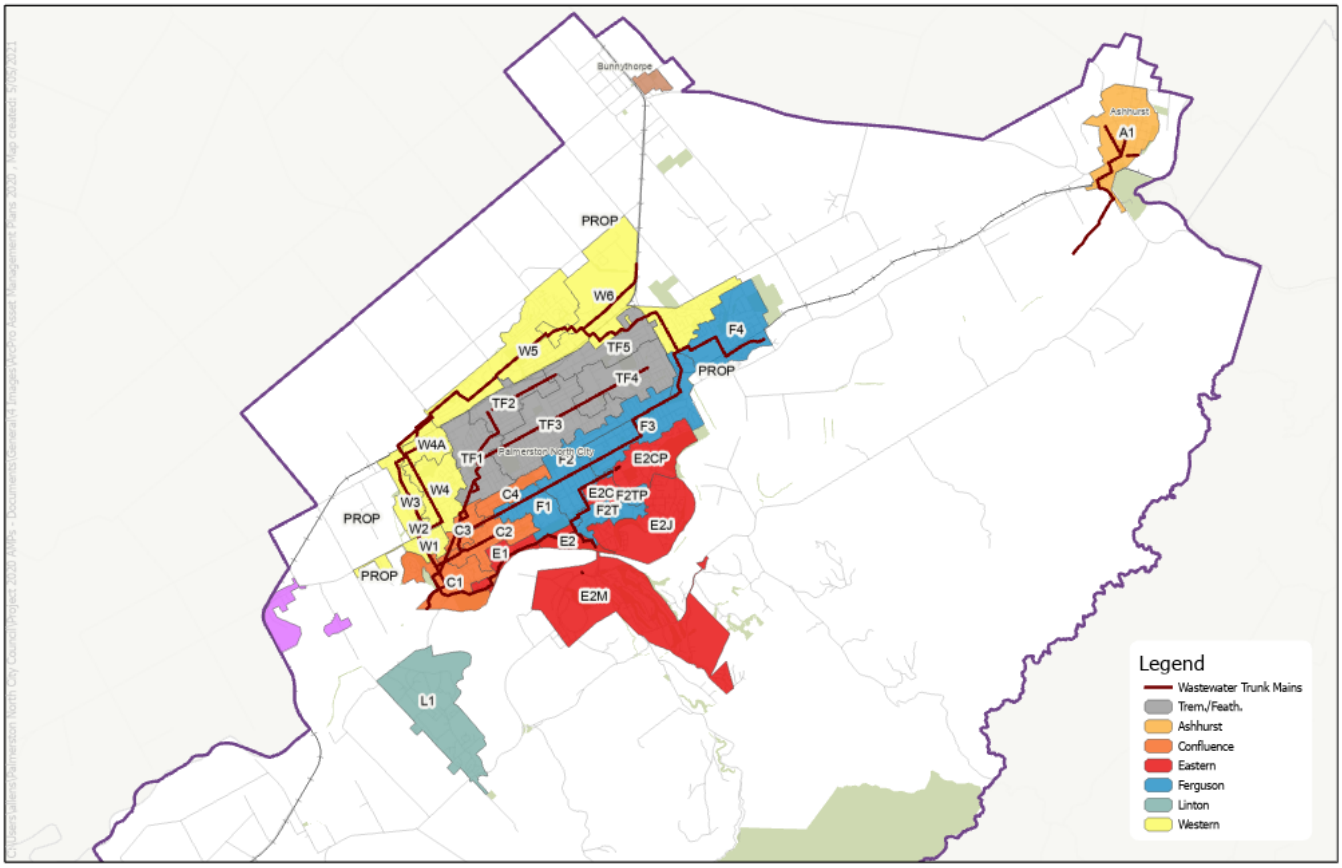


Figure 3: Wastewater Catchments and Trunk Mains

3.2.1 Wastewater Trends

Every year, up to 12.9 billion litres of wastewater is collected from 25,352 customer connections. We have 23 large wet industries with trade waste consents. While these customers contribute to only 8% of the daily volume, they contribute 35% of the organic strength and 8% of the phosphorous load that comes to the plant for treatment.[3]

Other sources of wastewater include septic tanks and caravan waste via a specially constructed receiving facility at the Tōtara Road Wastewater Treatment Plant. Volumes discharged are low and typically comprises 2-4 m^3/week.

3.2.2 Major Treatment and Disposal Challenges

Following high levels of periphyton (algae and slime) in the Manawatu River, Council committed to applying for a new discharge consent by 2022 rather than in 2028. This included undertaking a Best Practicable Options (BPO) assessment of treatment options before applying for the new discharge consent. Under "Nature Calls", the BPO considers all possible options for the treatment and disposal of wastewater in a holistic manner.

The BPO will likely be the Councils single largest capital investment in the next decade creating challenges for more immediate upgrades to the treatment plant.

The current treatment plant may have old and worn-out assets unsuitable for use in the BPO but will need to continue to meet the demands of the activity till the BPO is completed which is likely between 2026-2028;

The BPO will incorporate innovation, best practice, environmental and cultural considerations which may drive a step change in how we manage the activity particularly with respect to wet weather flows and reduced trade waste loads; and

The reticulation network is likely to largely remain the same, taking wastewater to the current treatment plant location.

It is uncertain when the project will come online but it will likely be between 2026-2028. The existing treatment plant needs to remain fully operational until then.

3.2.3 Major Network Challenges

A constant challenge is the aging of infrastructure resulting in an increased risk of service failure – primarily environmental spills. This can be caused by a reduction in capacity from more rain water and groundwater entering the pipes (see Figure 4 below), blockages caused by ragging and fat/grease or pipe and pump station failures.

Deciding if, and when to replace assets is a complex judgement between cost and risk. Section 5 & 9 both explore the age and condition of the assets and the processes for judging and carrying out renewal of assets. The trade-off of not renewing is increased maintenance costs versus increased risk of service failure and environmental non-compliance.

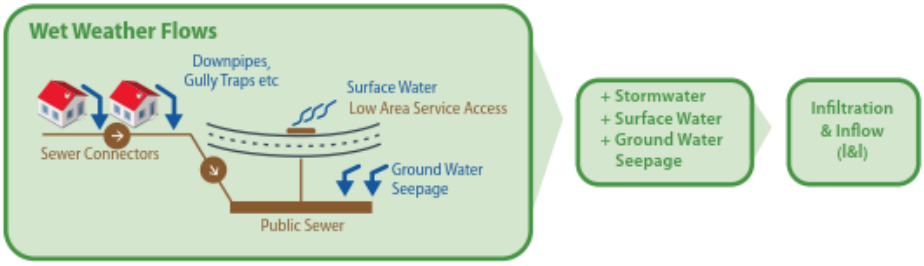


Figure 4: Sources of I&I

Out of Scope: Buildings owned by this activity are included in the financial expenditure and forecasts but are managed by our Property department. The scope of this AMP does not include wastewater services provided by others and assets not owned by Council.

[3] Nature Calls Fact Sheets

3.3 Rationale and Variation with Water and Sanitary Services Assessments

Council provides wastewater services for the safe collection, treatment and disposal of the city's wastewater

Within the PNCC catchment area there are private wastewater pipe connections linking to council networks such as NZ Pharmaceuticals.

3.4 Significant Negative Effects

Table 5 contains a summary of the significant negative effects for the Activity and how we mitigate them. All these potential negative effects are managed as part of the day-to-day operation of the Wastewater Activity.

Table 5: Mitigation of Significant Negative Effects of the Wastewater Activity

Significant Negative Effect	Description of Effect	Mitigation
Public health risk	Wastewater may contain harmful pathogens chemicals and heavy meals. When untreated or poorly treated wastewater comes into contact with humans, it can lead to spread of diseases like cholera, typhoid, and hepatitis. Exposure to pollutants in wastewater can also cause skin irritations, respiratory problems, and other health issues.	**Adequate Wastewater Treatment:** Make sure all the treatment processes are running well and work on improving to sustain the quality of the effluent. **Enhanced Monitoring and Testing:** Adding a pH prob at the outlet of WWTP in addition to regular testing. **Public Health Education and Awareness:** By collaborating with the comms team to add more educational material on PNCC website. **Protective Personal Equipment (PPE):** Including gas meters and updating safety procedures and hazards and risks. **Safety in design:** Investigating different construction methods, that do not require open trenching to avoid dealing with live sewage. **Regulatory Compliance and Enforcement:** Proactively address any health risk issue and enforce the waste and trade waste bylaws.
Environmental Impact	Odour and Aesthetic Issues: Improper handling or treatment of wastewater can generate foul odours and visually unappealing conditions. These issues can lead to public complaints, decreased tourism, and reduced quality of life for nearby communities.	**Odour Control Measures:** Installing an advanced odour control system is underway to improve the performance of the current odour control system. **Community Engagement and Communication:** Engaging with local community and maintaining open communication channels.

3.5 Improvement Actions

There are no improvement actions for this section.

4 Levels of Service

A key objective of this AMP is to ensure that assets support delivery of the agreed levels of service in the most cost-effective manner. This requires a clear understanding of levels of service, now and in the future.

The process for the development and monitoring of levels of service is outlined in the SAMP. This section of the AMP documents each of these steps for Water and identifies any issues or service gaps and the plans to address them.

The figure below outlines the three main inputs into the established levels of service for Water.

Figure 5: Level of Service Components

4.1 Performance Against Existing Levels of Service

Performance against the levels of service statements informs our investment, particularly where measures are not currently being met. The table below provides a summary of our performance against the levels of service for the previous three years.

Table 6: Performance Against Existing Levels of Service

Levels of Service Statements	Customer Performance Measures	Target	Performance 2020/21, 2021/22, 2022/23
Council provides wastewater services for the safe collection, treatment and disposal of the city's wastewater.	Number of dry weather wastewater overflows from Council's wastewater system.	No more than 1 per 1,000 connections per year.	
	Number of complaints about: • Wastewater odour; • Wastewater system faults; • Wastewater system blockages; • Response to issues with the wastewater system.	No more than 15 per 1,000 connections per year.	
	Median time for attending overflows resulting from blockages or other faults.	Attending < 1.5 hrs	

	Median time for resolution of overflows resulting from blockages or other faults.	Attending < 8 hrs	
	Compliance with resource consents for discharge from our wastewater system as measured by the number of: • abatement notices • infringement notices • enforcement notices • convictions received by us in relation to resource consents	100% compliance Zero abatement, infringement or enforcement notices or convictions	
We manage our wastewater assets in a financially sustainable way.*	A 30-year Asset Management is in place and major AMP projects approved in the 10 Year Plan are achieved	In Place.	
	Major services and projects are provided within budget.	Services provided within budget.	

Key:

Target met  **Target not met** 

* This measure was removed from the 2021 Long Term Plan and subsequently not reported in the last Annual Report

4.2 Customer Expectations and Feedback

4.2.1 Customer Expectations

The way our customers utilise our wastewater service varies significantly depending on what they are disposing of. Table 7 provides the user and stakeholder groups of each of the elements of the Wastewater Activity which will be used to target the levels of service and assess whether the performance measures are being met.

Table 7: Wastewater Customers, Partners and Stakeholders by Sub-Activity

Sub-Activity	Customers	Partners	Other Stakeholders
Collection and Reticulation	• Residents • Local businesses and commercial premises • Trade waste customers • Visitors • Linton Army Camp • Food waste suppliers • Septic waste / sludge	• Rangitāne o Manawatū	• Nga Iwi o te Awa Manawatū • Horizons Regional Council • Developers
Treatment and Disposal			• Nga Iwi o te Awa Manawatū • Horizons Regional Council • Manawatū River Leaders Accord • Ministry of Health • Department of Internal Affairs • Taumata Arowai • Developers • Wastewater Monitoring Group • Massey University (researchers)

What's important to our Customers?

Based upon customer feedback through customer surveys and Long Term Plan engagement, our customers want access to safe, clean and readily available wastewater services.

Our customers look for their wastewater to be collected and disposed of reliably, affordably, and responsibly.

Users want to be confident that their wastewater is being collected, treated and disposed of using methods to avoid damage to the environment and that cause minimal impact to people such as odour.

When a disaster occurs, our customers expect us to react in an efficient manor to ensure our wastewater services can be used without interruption. These user values and expectations have been formulated from Council staff and experience in the delivery of the wastewater supply activity. They reflect the feedback we receive from users, and from also being users of the activity themselves.

What's important to our stakeholders?

Stakeholders will often agree with users on many aspects of LoS, for example, regulatory requirements will be broadly supported by residential user expectations. There will be key differences and tension between some stakeholder groups in some areas (regulatory requirements versus developer costs, for example).

Rangitāne Manawatū: have an active interest in all aspects of cultural and environmental impacts and, as such, are expected to take a keen interest in council's progress towards minimising disposal of wastewater particularly to water bodies.

Developers: Engage through the RMA planning process in addition to the extension or upgrade of infrastructure to provide wastewater services for their development. Developers need a quick planning/consent process and clear guidance on minimum engineering standards.

Trade waste and septage customers: Engage through bylaw setting and review process and directly with Council when trade waste consents are applied for or renewed.

Regulators: Regulators have a legal responsibility to enforce government legislation through regulatory oversight. For the wastewater activity this is primarily enacted by the Ministry of Health relating to public health impacts and the Ministry for the Environment in regard to National Environmental Standards. Taumata Arowai have a monitoring role for wastewater system performance.

Horizons: The regional council is responsible for, among other things, managing discharges to the environment and water quality in the Manawatū catchment. Horizons influences the activity through setting regional policies, for example under the national policy statement on freshwater management, and through the granting and enforcement of relevant consents under the RMA. Horizons also have a role coordinating emergency planning and response and planning for lifeline utilities.

Manawatū River Leaders Accord: Are interested in the disposal of wastewater and the cultural and recreational effect on the Manawatū River. Key concerns are the location and quality of the effluent disposal particularly to Mana Whenua and River users.

Other: Wider groups not directly affecting the district, such as surrounding communities, rural businesses, etc. are also affected by our actions, especially those downstream of our district, and as such could be negatively affected by our actions even though they have no direct way of influencing our decisions. We're engaging with a number of these groups for the Nature Calls project given the region wide impact it could have.

Limitations to Meeting Expectations

We recognise that the expectations of our users cannot always be met and that there are often conflicting desires and values within the broader activity user group. In addition to this, there are regulatory and technical considerations that often will override user expectations. The following limitations and/or exceptions to LoS are acknowledged:

- The wastewater activity is required to meet certain objectives and standards of regulatory authorities, relevant laws, local government by-laws and central government. These are considered non-negotiable and set a base LoS independent of our users' expectations and values (although they often will align with these);
- It is unattainable for council to supply a service that always meets all events and possible circumstances this means avoidance of occasional discharges of untreated wastewater to the environment cannot be guaranteed;
- Due to the scale and buried nature of the pipe network it is not always possible to identify faults in advance and blockages may occur;
- There will inevitably be extreme rain events which will result in wet weather overflows, and uncontrolled discharges;
- Council does not maintain private lateral connections. For some customers, this can result in significant and unexpected costs due to lateral failure or discovery that their stormwater is connected to the wastewater system, which they would prefer Council to be responsible for;
- The views of various stakeholders and users are often in conflict making it difficult to find win-win solutions

4.2.2 Customer Feedback

Annual Residents' Survey

We carry out an annual survey of residents to get an independent understanding of how residents view the Council and its services. The key findings from the 2023 survey for Wastewater-related infrastructure were:

- Perception of Wastewater has been steadily decreasing since 2020
- Seven in ten residents (72%) are satisfied with their Wastewater services in Palmerston North.
- 4% of respondents commented on "Drinking water is poor water quality/ polluted waterways / water shortage" in their feedback on water-related infrastructure
- 5% of respondents commented on "Wastewater and sewage concerns / need water collection systems" in their feedback on water-related infrastructure

For the Wastewater Activity, residents are generally happy with all aspects. The Village/rural residents area were the least satisfied as shown in Figure 6 below. A summary of the past 5 years results is shown in Table 8.

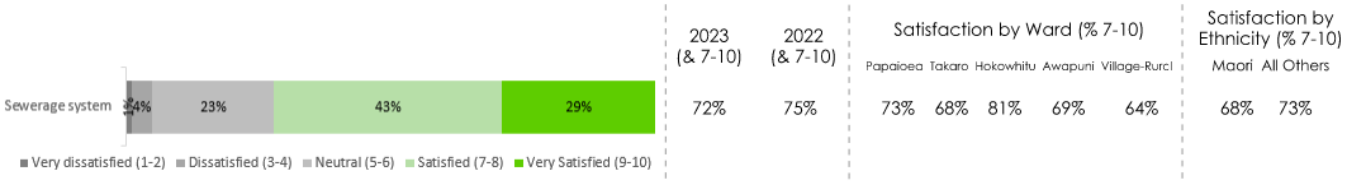


Figure 6: Customer Satisfaction Survey Results for Wastewater

Table 8: Resident Survey Overall results

Scores with % 7-10	% Point Change	Percentage of Respondents Satisfied or Very Satisfied				
	(2023-2022)	2023	2022	2021	2020	2019
Water-related Infrastructure	-4%	68%	72%	77%	72%	76%
Sewerage system	-3%	72%	75%	76%	80%	78%

He Aha Ra Nga Whainga Matua (What Really Matters)

https://www.pncc.govt.nz/files/assets/public/documents/council/research/what-really-matters-march-2023.pdf

Following the 2022 council election, sector lead organisations were asked about what really matters to them for our district's future, in preparation for the 2024 Long Term Plan. At the same time, students from Massey University were tasked with conducting two distinct research projects to gather the perspectives of young people in Palmerston North.

He Aha Ra Nga Whainga Matua (What Really Matters) captures the viewpoints of these contributors for Council to refer to and address during the Long-Term Plan process.

Feedback directly relevant to three waters is summarised below.

Table 9: He Aha Ra Nga Whainga Matua (What Really Matters) Three Waters Feedback

Contributor	Feedback
Environment Network Manawatū	• Increased programmes, education, infrastructure and investment in ensuring a significant reduction in plastic and litter entering local waterways • Recognition of the need for a dedicated staff member to monitor and manage the litter and plastic pollution in urban streams and waterways supported by PNCC • Increased artworks, signage depicting educational or historical information, accessibility and overall beatification of urban streams and waterways. • Increased collaboration in campaigns to showcase and promote sustainable practices in housing, gardening, energy efficiency, 3-waters efficiency, permaculture design, waste-free living, new technologies and environmental education. Tangible goals to achieve sustainability would be agreed for each campaign in consultation with Council.
Manawatū Business Chamber	• 3 Waters – what does this mean for PNCC, the City and our wider region? Does Council have a view on alternative funding models? It is a Public Private Partnership an option, and if so what might that look like?

4.3 Level of Service Gaps

4.3.1 Existing Levels of Service Gaps

In general, our wastewater systems were maintained and operated successfully throughout the year of 2021/22 to meet wastewater resource consent compliance.

In 2021/2022 there were 16 recorded incidents of a dry weather wastewater overflow, which is equivalent to 0.48 overflows per 1,000 connections.

About 80% of the major network renewal programmes of work were completed as planned, including relining of 1km of critical mains.

Key capital new and renewal programmes of work were only partly completed (55%) due to internal and external project and contract management resourcing gaps, long delays to procurement of materials and equipment particularly from overseas suppliers and significant project scope changes. Significant additional funding from DIA added to the work delivery pressures. These delays were a temporary impact of COVID-19 and from this impact we have learnt to build aspects such as 'materials lead times' into our Long term plans and for delay periods caused by COVID-19 and other external factors in consideration to Capital works.

4.3.2 Forecast Levels of Service Gaps

The most likely customer performance measure that is not going to be met in the future is provision of our services within budget. This is mainly due to existing budgets no longer being enough, as follows:

There is a medium risk that maintenance and renewal budgets previously set under the 10 Year Plan 2021-31 become inadequate as our assets age. This issue is dealt with in more detail in Section 9.

4.4 Improvement Actions

- Research and consider impacts of external delays such as COVID-19 and allow for longer procurement time frames when planning future capital works and maintenance.

5 Future Demand and Impact

The following drivers/significant issues are described in the SAMP and flow from the Infrastructure Strategy.

The key issues correlate to the significant issues highlighted within our Infrastructure Strategy which are:

1. Growth and changing expectations on levels of service – this links to affordability, liveability and a well-functioning urban environment.
2. Deterioration of Infrastructure Assets – there is a disconnect between agreed and expected levels of service funding. This also affects meeting an increasing cost of renewals (based on condition, age, performance).
3. Risks, resilience and compliance

The key issues which are described in the following subsections are:

- Our Strategic Direction
- City Growth – Population and Growing Urban Environment
- Sustainability and the effects of Climate Change, Natural Hazards, and Adverse Weather Events
- Technology Advances
- Customer Expectations
- Legislation Changes, Policy, and Guidelines
- Resilience
- Liveability (Demand Trends and Management)

5.1 Growth

Population projections for Palmerston North can be found in the SAMP.

Moderate residential, rural-residential and industrial development is proposed to occur within the district over both the short, medium and long term. New infrastructure will therefore need to be provided in development areas, some of which may need to be forward funded to enable the development to occur.

The current approach is to regularly maintain and update the wastewater network model to understand the effect of the projected growth and development scenarios.

5.1.1 Residential growth

The development scenario for residential growth is based on scenarios detailed in the SAMP that seek to meet the needs of a growing population. To provide wastewater systems to growing residential areas, there will be a need to expand the network and provide more capacity for wastewater treatment. It is assumed rural-residential subdivision will occur in locations which do not require us to fund substantial upgrades to the wastewater network in order to facilitate the subdivision.

Proposed Plan Change 1: Medium Density Residential Zone

We need more housing and have a responsibility under the requirements of the National Policy Statement - Urban Development Capacity to provide sufficient housing and business land development capacity to meet the demand for housing and residential sections.

Kākātangiata

Kikiwhenua is the first stage of the Kākātangiata urban growth area, which will enable about 220 new homes to be built in the western side of Palmerston North. We plan to connect to our existing network.

Whakarongo

Whakarongo is made up of 62 hectares surrounding James Line, Napier Road and Stoney Creek Road – between Palmerston North and Ashhurst. Development has begun in this area with 700 to 900 homes eventually planned. As this development progresses, extensions to the Palmerston North wastewater network will be needed to service new homes.

Ashhurst

Growth in Ashhurst is planned for the medium term (next 4-10 years). We have modelled this planned growth and capacity upgrade & replacement of the existing wastewater pipes in Oxford and Worcester streets of the proposed North Street Subdivision are required.

Aokautere

This is a proposed plan change to allow for up to 1,000 new homes in Aokautere in the medium term. Based on projected demand we have not allowed for any upgrades.

5.1.2 Industrial Growth

North East Industrial Zone

To mitigate downstream capacity constraints in the wastewater system the North East Industrial Zone (NEIZ) and the NEIZ Extension Area is specified as a pressure sewer area. The effect of this specification is to restrict the type of development that can occur to predominantly dry industries, such as warehousing and logistics. This will, in turn, impact the wastewater demand in this area. We will continue to monitor the type of industry going into the NEIZ.

Te Utanganui Central New Zealand Distribution Hub

Te Utanganui is a 2020 strategy administered by the Central Economic Development Agency and developed in collaboration with iwi, central and local government stakeholders. Its purpose is to create a primary distribution and transport hub for central New Zealand. There are several infrastructure projects which sit under Te Utanganui which are in various stages of development. The proposed KiwiRail Regional Freight Hub is an expansion of the NEIZ. We are currently planning the proposed infrastructure response to service this new hub.

Longburn Industrial Park

Longburn is viewed as a suitable location for wet industry. However, the services in the Longburn Industrial Park are private and do not meet our Engineering Standards for Land Development. This places a constraint on the range of industrial activities that can occur in the area. We are working with the landowner to resolve the issue. Further development will require the privately owned infrastructure to be upgraded to meet our Engineering Standards.

5.2 Resilience and Reliability

The SAMP describes common aspects of resilience and reliability affecting Council – which includes natural hazards and adverse weather events, biological hazards/pandemics, cyber security, security risks and economic risks.

There is a potential short-term cost implication for the activity in that a push for greater resilience will increase demand on the type of pipes and components selected when renewing or constructing new infrastructure assets. The need for increased redundancy in the network will also increase costs for both capital and operational expenditure. Spending on resilience, however, makes networks more reliable and in general can reduce lifecycle costs, particularly during recovery from damaging events.

Improving resilience and service reliability is incorporated into our capital and operational improvement programmes as part of our usual business practice. However, we also have some key ongoing programmes focussed on improving resilience:

- **Totara Road WWTP Resilience Programme** - this programme aims to ensure the WWTP undergoes strategic upgrades in processes/systems/equipment to ensure the plant can sustain expected future changes with regards to volume, costs, capacity, etc. and deliver a more reliable level of service.
- **Totara Road WWTP Earthquake Strengthening of Civil Structures** - this programme covers the investigation into the seismic resilience of the existing structures at the WWTP and the surrounding grounds.
- **Wastewater Pipeline Realignment of At-Risk Mains-** this programme looks at areas where the wastewater network is located below other services like stormwater gulleys and trees that may pose several risks to the network. It serves to relocate the wastewater network to isolate it, i.e. move mains, laterals.
- Decommissioning of Redundant Wastewater Mains
- Totara Road WWTP - Biogas System Improvements

5.3 Climate Change

5.3.1 Predicted Climate Change Effects

Climate change is predicted to increase the intensity of rainfall events and have longer dry/drought periods. For Wastewater systems, this will mainly affect the quality and quantity of supporting systems and also increased risk of erosion and flooding of infrastructure.

5.3.2 Climate Action Plan

The SAMP describes Council's participation in the regional Climate Action Joint Committee and its 2023 Joint Climate Action Plan which is about understanding how we will respond to climate change in the Manawatū-Whanganui region and working together to reduce potential harm.

Actions from the Plan which are specifically relevant to our three waters activities are:

- Prioritise nature-based solutions in response to flooding, storm water, and erosion.
- Review planning provisions to encourage on-site storm-water management.
- Assess and manage climate related risks to local services and critical infrastructure.
- Redouble efforts to address existing issues that will be exacerbated by climate change such as freshwater health, biodiversity loss, flooding and erosion.
- Measure and reduce emissions from council activities.
- Incorporate carbon emissions and a preference for nature-based solutions into council procurement policies.

5.3.3 Long Term Plan Climate Change Priorities

Our three climate change priorities as set out in the proposed draft 2024 Long Term Plan are:

- Reduce emissions as efficiently as possible
- Adapt to the known effects of climate change
- Comply with changing regulations
- We propose to implement these priorities through our design budgets and programmes as outlined below.

Investment to minimise greenhouse gas emissions as efficiently as possible over the whole life of an asset.

Council has committed to a 30% reduction by 2030 and net zero by 2050 (as reflected in the strategic direction of the 2024 Long Term Plan). Our understanding of how best to achieve this is continuing to evolve, especially as costs of many technologies fall, and new opportunities become available.

Plans should:

- Consider options to reduce carbon
- Analyse options in terms of their net present (whole of life) cost, their emissions impact, and the cost per tonne saved
- Allocate resources to projects/options that deliver emission reductions most efficiently

Investment to include consideration of the likely impact of climate change on weather patterns and operation of facilities.

Recent NIWA projections estimate an approximate 15% decrease in summer rainfall and an approximate 15% increase in winter rainfall by 2050. Recent experiences in Europe and North America indicate that extreme heat events in the summer are likely to pose a significant public health hazard as is winter flooding. This has impacts for utilities assets but also design of occupied or publicly accessible assets in terms of maintaining an operational temperature range and providing resilience.

Investment to include consideration of the likely impact of legislative and behavioural changes related to climate change.

Proposed government legislative programmes such as Building for Climate Change will affect legislative conditions around the Building Code, site waste management and where government subsidies are likely to be available. Forward planning should ensure future projects are viable this context.

Technological change including the adoption of electric vehicles, movement away from HCFC22 (R22) refrigerants, the increased use of pump variable speed drive (VSDs), microgeneration and microgrid effect on the electricity distribution system, the adoption of smart city principles and large scale data gathering will all result in changes to how assets are operated and planned.

5.3.4 Climate Change Aspects

While the predicted effects of climate change are a key consideration in our three waters planning, there are no specific projects to with regard to climate change or improvements proposed in terms of reducing capital or operational carbon emissions for renewals or new assets.

Proposed works programmes will need to incorporate the design budget and programme practices described above to align with Council's strategic priorities.

5.4 Sustainability

The potential impacts of sustainability drivers are related to management of wastewater overflows, energy use of the activity, and sustainable management of Totara WWTP discharges.

A greater upfront investment in new technologies and infrastructure (as discussed in Section 5.6) will impact the activity over the long term with greater energy efficiencies and support future environmental impacts.

Palmerston North City Council has confirmed the 'best practicable option' for managing, treating and discharging the city's wastewater for the next 30 to 50 years. The selected option will see treated wastewater discharged to both land and river. Three quarters of the time the treated wastewater will be discharged to the Manawatū River. During the remainder of the time, the discharge of wastewater reduces to the river by 75% and this highly treated wastewater is then used to irrigate crops. We will also look at diverting a higher proportion from the river over the lifespan of the consent. The wastewater would also have the best treatment currently available in New Zealand, just one treatment stage down from being drinkable.

Key sustainability issues for the Wastewater Activity are as follows:

- Minimising the impacts of the wastewater activity on the land and receiving water bodies.
- Embedding energy efficiency and sustainability into all aspects of the wastewater operations by utilising energy efficient motors when undertaking replacements or upgrades.
- Incorporating the concept of energy neutrality into future treatment plant upgrades.
- Increasing energy generation at the treatment plant through increased waste diversion to the digesters.
- Consider the impact of the process on the environment and communities:
- Use of more eco-friendly chemicals and materials.
- Reducing carbon generation.
- Developing a sustainable solution for the disposal of sludge.

Our approach to these sustainability considerations is to incorporate them into the AMP process through the following mechanisms:

- The Discharge Consent Permits for the Tōtara Road Wastewater Treatment Plant.
- Sustainable energy usage such as the Biogas Electricity Generation and operational efficiency at the Tōtara Road Wastewater Treatment Plant and pump stations. We are undertaking a study to address future management of sludge from ponds and bio reactors. Solutions include application of bio-solids to land through composting or other processes. Implementation of food waste and organic waste to energy initiatives by utilising surplus digester capacity to treat organic waste to generate biogas which is then burned in the gas energy to generate electricity to run the wastewater treatment plant site. The gas cogeneration system will receive upgrades, renewals and improvements to optimise the capture and conversion to energy of the biogas.

5.5 Legislative Changes

Broad proposed legislative changes affecting Council are outlined in the SAMP. Wastewater specific legislation is described in section 2 and in more detail below.

An important driver for the wastewater activity is the changes to the regional plan as a response to the NPS Freshwater Management and the effects on the level of treatment that will be required. In addition, the wider Three Waters reform will likely result in new ways of regional collaboration and a new three waters regulator.

5.5.1 National Policy Statement for Wastewater Management and Horizons Regional Council One Plan

The health of our freshwater is vital for the health of our people, environment, and economy. However freshwater quality is declining. It is being impacted by urban development, agriculture, horticulture, forestry and other activities. Current regulation has not been able to halt the decline in many of our catchments.

To address these issues, the Ministry for the Environment, under their Essential Freshwater Plan, is working towards these three objectives, all of which will have an impact on the Wastewater Activity:

- **Stopping further degradation and loss** – taking a series of actions now to stop the state of our freshwater resources, waterways and ecosystems getting worse (i.e. to stop adding to their degradation and loss), and to start making immediate improvements so that water quality is materially improving within five years.
- **Reversing past damage** – promoting restoration activity to bring our freshwater resources, waterways and ecosystems to a healthy state within a generation, including through a new National Policy Statement for Freshwater Management and other legal instruments.
- **Addressing wastewater allocation issues** – working to achieve efficient and fair allocation of wastewater and nutrient discharges, having regard to all interests including Māori, and existing and potential new users.

As part of this plan the New Zealand Government introduced a new National Policy Statement for wastewater Management (NPSFM) in 2020. It is expected that Horizons Regional Council (HRC) will amend the Regional Plan (The One Plan) in response to the NPSFM. It is anticipated that this will at least include:

- Heightened expectation that Council achieves meaningful improvements in discharge quality.

We also participate in discussions with Rangitāne o Manawatū. This occurs at all levels of the organisation and allows us to prepare, influence and adapt to pending changes before they are implemented.

We are also committed to implementing the monitoring of receiving environments to track how well treatment devices are operating, which will aid us in refining treatment options if some are found to have issues.

5.5.2 Building (Dam Safety) Regulations 2022

New dam safety regulations will take effect on May 13, 2024, requiring dam owners to assess their potential impacts and to submit a Dam Safety Assurance Programme to the regional authority. Medium and high-risk dams are required to submit a programme 12 months and 2 years after registration, respectively, while low-risk dams will be reassessed every 5 years. Wastewater assets will need to be reviewed to check if any e.g. ponds will need to comply with these requirements.

5.6 Technology Advances

The SAMP describes our Council's commitment to using digital transformation and smart new technology to bring about greater organisational proficiency.

We already utilise SCADA and telemetry systems to monitor the performance of our three waters activities. We also model our wastewater network to plan for network improvements and upgrades to reduce overflows. Smart metering can be used for trade waste customers to feed through information.

Pressure Sewer Systems are one example of new technology we are implementing. These systems have evolved and become a viable alternative for areas which are; low lying, suffer from high groundwater levels and are susceptible to liquefaction in seismic event. These are all factors which make conventional gravity sewer systems less viable. A key advantage of these systems is their provision of property level storage. This provides flow buffer resulting in significantly lower wastewater peaks and the options to hold back flows when the receiving network is at or over capacity.

Pressure Sewer Systems are also highly effective at restricting stormwater and ground water infiltration. Efficiencies come about as these systems limit wastewater to entering only the house or property gravity network rather than the wider wastewater network. In contrast to traditional gravity systems, Pressure Sewer Systems require additional pumping units to be install and maintained, often by the private landowner.

As part of work associated with considering alternatives for Nature Calls Project, a comprehensive review has been undertaken of all the wastewater treatment technologies which might be adopted to reduce or limit future wastewater flows and improve treated wastewater quality prior to discharge.

5.7 Demand Trends

Changes in user demands include:

- Increase or decrease the amount of flow. Reductions in user demand will introduce spare capacity and can offset demand from growth and issues with inflow and infiltration. Increases will have the opposite effect.
- Increase or decrease the amount of nutrients (load). Reductions in user demand will introduce spare treatment capacity and can offset demand from growth. Increases will have the opposite effect.
- Changes in timing of peak dry weather flows to create higher or lower peaks. A shift to more flexible work environments means there is potential that diurnal peaks may reduce as there is more working from home and less fixed workday start times.
- User trends include the type and amount of foreign material including wet wipes, sanitary products, oils, fats, cleaning product chemical compositions and residual pharmaceuticals.
- Grey and recycled water systems may harvest wastewater for non-potable water uses. This would lead to a disconnect in the assumed relationship between water supply and wastewater however adoption of these types of systems would need to be mandated to get significant uptake in an urban setting.

5.7.1 Wastewater Production

Wastewater production for all Council's supplies from the past seven years is shown below. This is as provided to the Water New Zealand National Performance Review. The data shows that over this period total wastewater production has remained relatively steady.

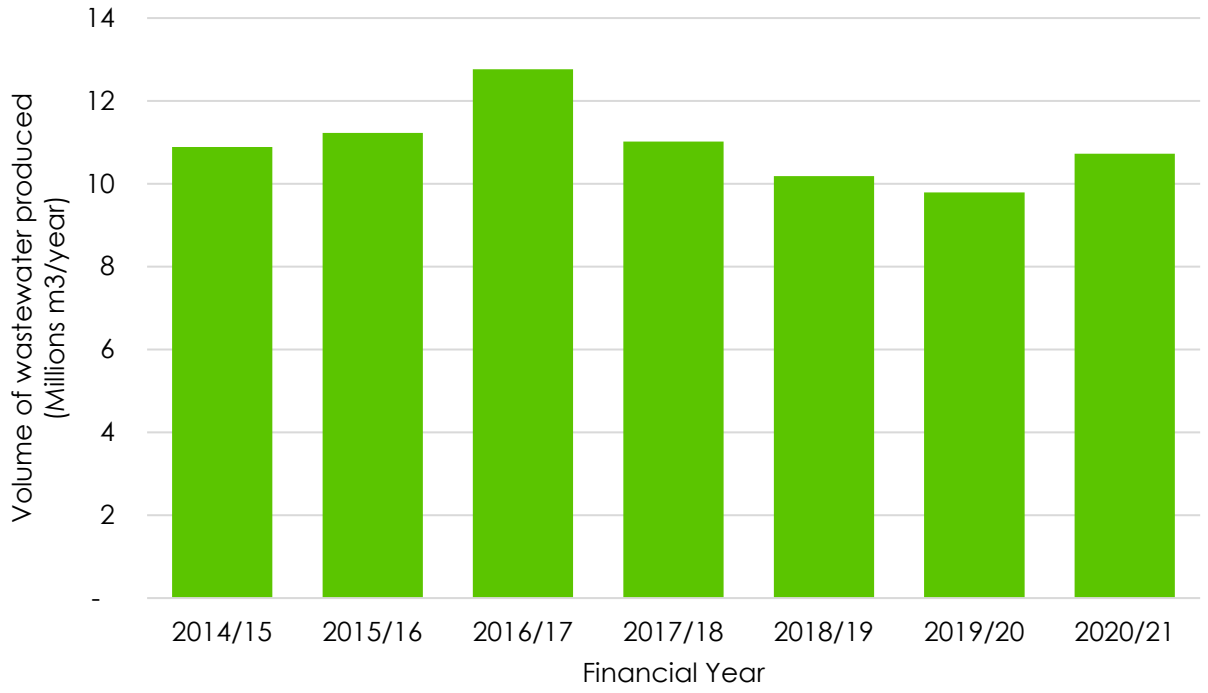


Figure 7: Historic wastewater production (Source: NPR 2022)

5.7.2 How do we Understand and Forecast the Impact of User Demand?

The most significant demand for wastewater collection services is dependent upon the volumes of wastewater produced and the extent of the collection service. Except for water used for irrigation and unaccounted for water, most water supplied by us is subsequently discharged into the wastewater reticulation.

In addition to tracking water consumption trends the following activities are also conducted by us:

- Discussions and trend analysis of monitoring and metering with industry and commercial users on changes in wastewater.
- Consultation with Linton, Massey University and other private networks.
- Treatment plant forecasts for other sources of wastewater including septage demand, trade waste and inflow and infiltration.
- Tracking international and national trends and research.
- Where a trend in user demand is determined then it can be incorporated into the growth modelling scenarios and turned into a change in network capacity.

5.7.3 Wastewater Network Model

The current model, developed by Mott MacDonald in 2019[4], includes updates to previous models of the network with additional surveyed works, including Bunnythorpe and Ashhurst added as point sources (network not included). The future scenarios are based on population projections for 2025, 2040 and 2055. The residential development, has been run assuming the following critical assumptions:

- 50% greenfield development, 38% urban residential infill, 12% rural (not connected) with the population distributed evenly over both existing and new catchment areas.
- Pressure sewer was assumed for the NEIZ Extension Area, Kākātangiata, and Napier Road urban growth areas.
- Inflow and infiltration is based on investigation work done in 2016[5] which identifies wastewater catchments for prioritising inflow and infiltration remediation.

Modelling uses historical long-term rainfall series to assess the system performance and does not account for the effects of climate change. The model outputs can be found in Mott MacDonald (2019) and forecast capacity issues and increased overflow locations for wet weather flows. From the model results a list of improvement areas has been compiled and solutions for each area are being investigated.

[4] Palmerston North Wastewater Network Strategy - System Performance Report. Mott MacDonald (19 December 2019)
[5] Wastewater Network Renewals Impact on the treatment plant. GHD (2016)

Figure 8: Long-term Growth and Development Implications on Network

The model results have been adopted as the high-level basis for growth driven upgrades of the network and are the best indication of impact and timing of the planned growth zones. The report divides the city into areas of concern showing the impact consequence and timing growth on capacity.

New infrastructure required to expand the network into the growth areas is generally provided by the developers with support from us. Developer contributions are collected, and we deliver the required capacity upgrades for infill and downstream implications of new development.

5.7.4 Wastewater Treatment Plant

The projected flows and loads for the Tōtara Road wastewater treatment plant as part of the Nature Calls project are summarised below.

Table 10: Total Projected Flow and Loads to Tōtara Road Wastewater Treatment Plant

Year	2020	2023	2033	2043	2053	2063	2073
Flows (m^3/day)	22,636	23,421	25,392	26,704	27,854	29,079	30,350
COD (kg/d)	15,887	16,709	18,033	18,892	19,638	20,436	21,267
BOD (kg/d)	7,455	8,102	8,741	9,155	9,514	9,899	10,299
TSS (kg/d)	7,657	8,008	8,657	9,084	9,455	9,852	10,264
TKN (kg/d)	1,314	1,357	1,466	1,536	1,596	1,661	1,729
NH_3 (kg/d)	813	858	927	971	1,010	1,051	1,093
TP (kg/d)	232	247	267	280	291	302	315
TN (kg/d)	1,395	1,441	1,556	1,630	1,695	1,764	1,836

5.7.5 Trade waste

The most significant impacts of industrial developments are the strength and composition of the wastewater.

- Food processing or pharmaceutical activities place a heavy demand on water and wastewater. Failure to remove the nutrients and medical residue can have adverse effects on the receiving environment.
- Overdesigning the treatment plant treatment infrastructure to account for all possible pollutants and full-strength wastewater can be inefficient while under sizing may mean the city could miss out on development opportunities.
- Chemical and biological treatment process within the treatment plant can be sensitive to the strength and uncontrolled contaminants can lead to failure or increased maintenance.
- Grease and fats from industry like restaurants can lead to build up and blockages, other waste products can reduce the life of the pipes, pumps, plant and fittings in the system.

Significant wet industries will also have a capacity impact on the wastewater system due to the volumes of trade waste that they produce.

We aim to have a good understanding of the type of industry that is likely to occur, and the industry it would like to attract, so it can appropriately plan for infrastructure. As part of the investigations for the Nature Calls project a report has been prepared about trade waste, its potential impact and options for its management. Potential and existing developers and industry groups provide us with opportunities to be proactive about industrial land developments. We will continue to use our Trade Waste Bylaw as it is the preferred mechanism for controlling flows and nutrient loads in the wastewater network. Where required, the bylaw will be used to control the volume and strength of trade waste discharges.

5.8 Demand Management

We are using the following measures to regulate wastewater demands:

- Continue to use social media and education to reduce foreign material disposed in the wastewater including grease/oils/fat, wipes and rags.
- Propose areas where pressure sewer systems must be used. Designation of specific growth areas within the city North East Industrial Area and Kākātangiata Residential Growth Area (formerly City West) as pressure sewer areas both to limit additional wastewater flows, enable cost effective service provision and provide greater resilience in liquefaction prone areas.
- Consultation with Linton, Massey University and other private networks
- Use of trade waste bylaw to regulate volumes and composition.
- An inflow and infiltration investigations programme to reduce this at source – which will be increased in scale in the future.
- In terms of service to rural residential subdivisions our District Plan seeks to prohibit the expansion of reticulated water and wastewater services into the rural and rural residential zones. It is not expected that there will be any further servicing developments of this type approved in the future

5.9 Impact of Demand and Drivers

Demand drivers and proposed improvements described above are proposed in the 2024/34 LTP are summarised below.

Table 11:Summary of Demand Drivers and Proposed Improvements for 2024-34 LTP

Demand Driver	Proposed Improvements
Growth	Infrastructure upgrades and extensions to meet residential and industrial growth projections
Resilience and reliability	Trunkmain upgrades particularly in the Palmerston North CBD to improve resilience and service reliability Improve and undertake seismic strengthening to main WWTP buildings and supporting structures.
Climate change	Recommendation that Council includes specific actions for three waters activities in the next update of its climate change action plan.
Sustainability	Improving and aligning with wastewater standards to achieve consent – PNCC Nature Calls project
Legislative changes	Participation in Three Waters Reform activities Upgrades and improvements to meet new wastewater standards and regulations
Technology advances	Pressure sewer system use where suitable Wastewater Treatment considered as part of Nature Calls project

5.10 Improvement Actions

- Council includes specific actions for three waters activities in the next update of its climate change action plan.

6 Our Assets, Condition & Performance

6.1 Asset Summary

We own $400 Million worth of assets in order to provide wastewater services to our customers.

The existing wastewater system has been developed and built up over many years as a public system to serve the needs of the community in the collection, treatment and disposal of wastewater.

Our services are arranged under two sub-activities:

- Wastewater collection
- Wastewater treatment

As shown below, most of the current investment is in the collection of wastewater. Nearly half ($58M) of the sewer service lines (laterals) servicing our customers have an assumed construction year of 1956. This is more than 10% of our total assets and is an area of improvement as it impacts on renewal budgeting. The next spike occurs in 1968 when the Tōtara Road Wastewater Treatment Plant primary and secondary treatment stages were upgraded, followed by the addition of tertiary treatment stages (UV in 2004 and the clarifier in 2008).

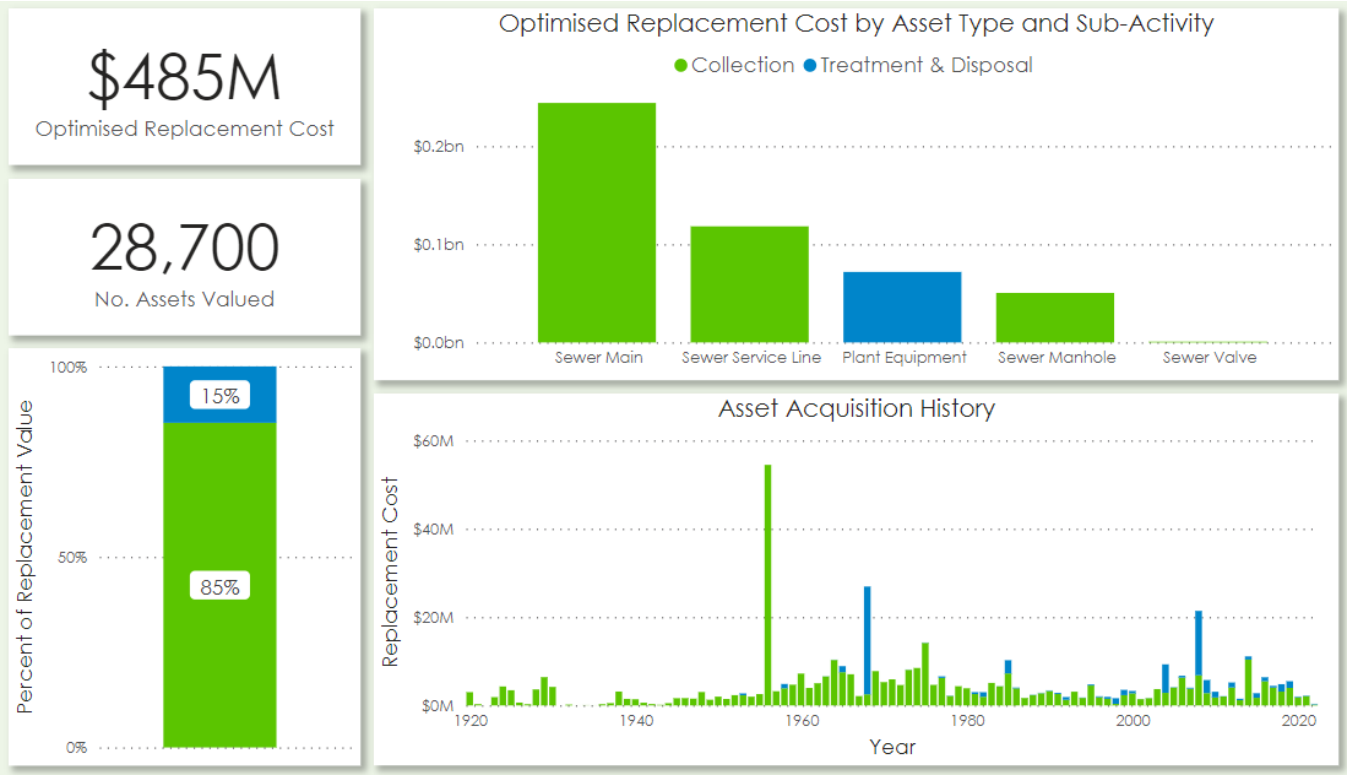


Figure 9: Optimised Replacement Cost (July 2023)

The table below contains some additional key statistics for each asset type.

Table 12: Key Wastewater Asset Statistics

Asset Type	Optimised Replacement Cost	Quantity
Manholes	$41,152,626	6028 no.
Mains	$275,652,015	433 km
Laterals	$105,802,292	249 km
Valves	$642,683	131
Pump Stations	$7,542,961	40
Oxidations Ponds	$1,898,061	3
Treatment Plant	$55,015,947	1
Total	**$487,706,585**	

As mentioned in Section 3.2 we currently operate a single, centralised wastewater network where wastewater is now treated at a single facility at Tōtara Road in Palmerston North and discharged to the Manawatū River. A schematic of our centralised wastewater scheme is provided below.

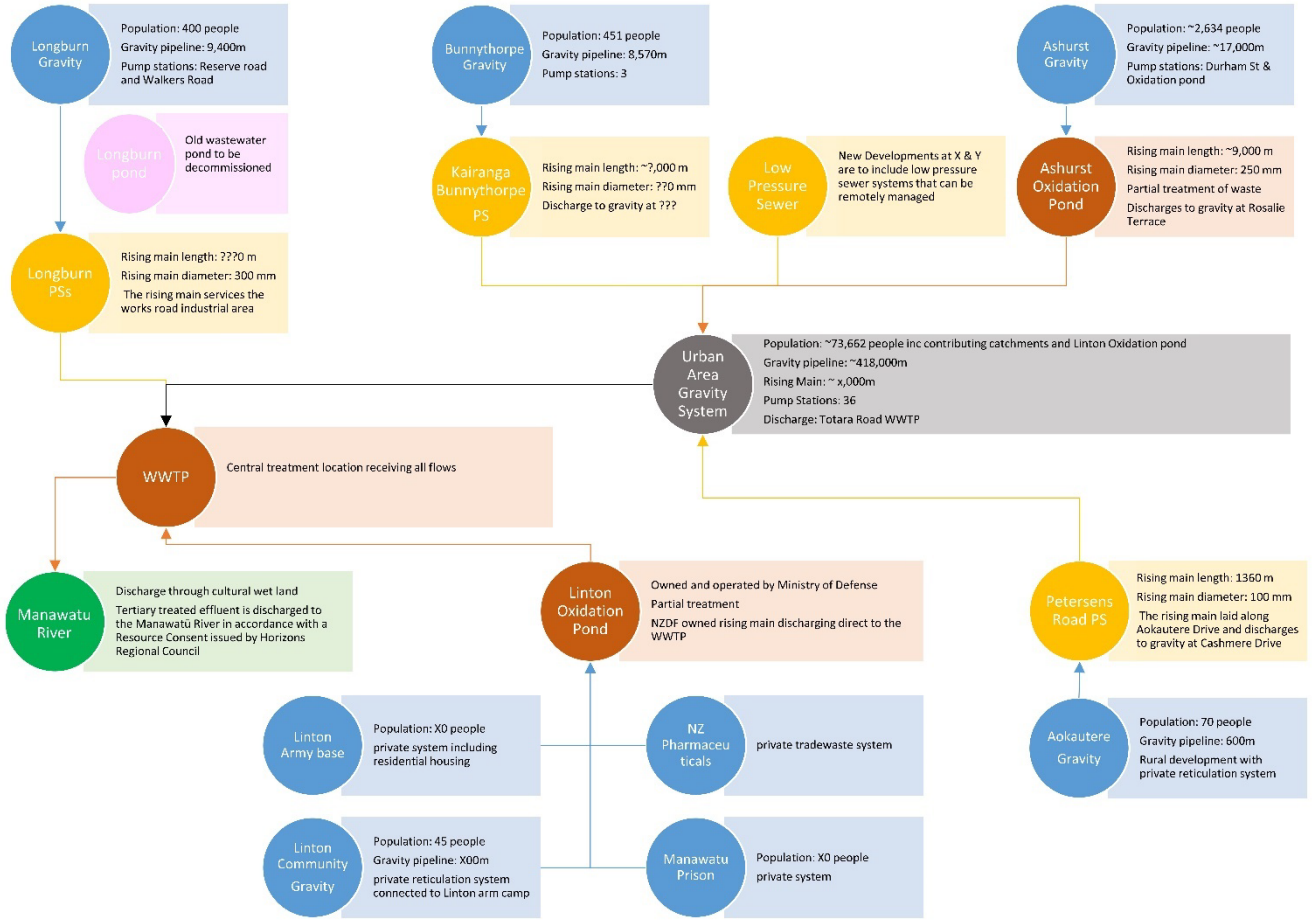


Figure 10: Network Diagram

6.2 Wastewater Collection Assets

Pump stations, although they are part of wastewater collection, function quite differently from the rest of the network and are therefore managed separately as a separate asset group.

6.2.1 Laterals

Laterals are pipes connecting properties to the sewer main from the point of connection. Data on laterals is incomplete, and the number of laterals is based on the number of properties rated for wastewater, excluding properties where the wastewater pipe is located on the property, and an estimated average lateral length of 9m and an assumed diameter of 100mm.

6.2.2 Pipes

The figure below shows an age profile of the wastewater pipelines. It indicates that, although the first pipes in the network were installed in 1890, most of the network is relatively young (installed less than 60 years ago). The network is predominantly constructed of reinforced concrete pipes (57%), with smaller lengths of earthenware (17%) and plastic (25%). Just over half the network has a diameter of 150mm.

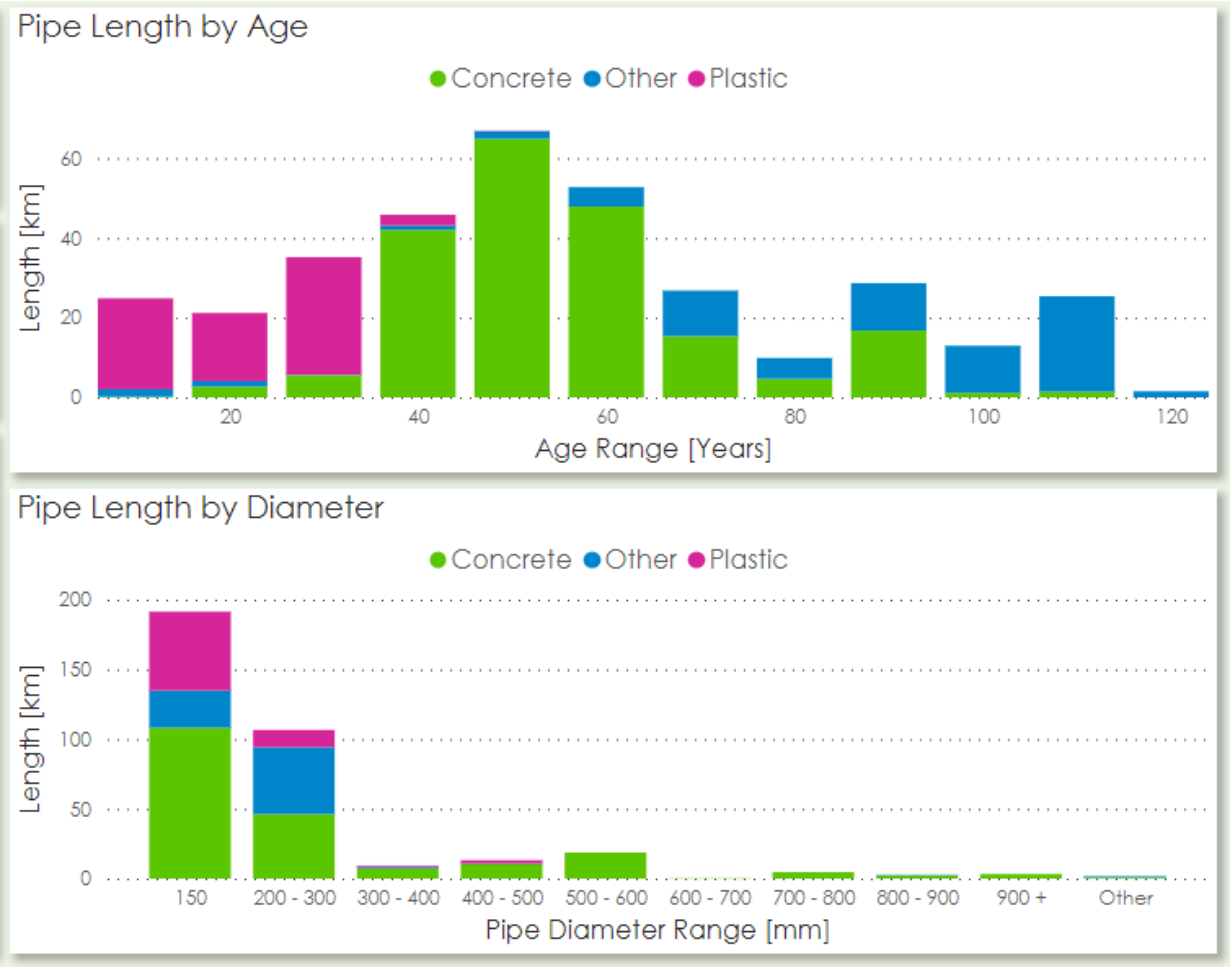


Figure 11: Wastewater pipe age

Manholes are installed as access points located at changes in direction or grade and pipe intersections.

- **Western Trunk Sewer Main Catchment:** The Western trunk sewer main, which was constructed over the period 1959 - 1975, drains the northern perimeter of the City, extending some 15 km from Kelvin Grove in the east to Maxwell's Line in the west. Recent developments have involved extending this to the intersection of Railway Road and Roberts Line to collect waste from the NEIZ area. Downstream of Tremaine Avenue, the system has been

duplicated, with both lines delivering flow to the Maxwell's Line Pumping Station. This pump station discharges through a rising main and gravity sewer along Maxwell's Line, joining the other trunk sewer mains between Otira Place and the treatment plant. The bulk of the pipework in this catchment is rubber ring jointed reinforced concrete pipe.

- **Featherston/Tremaine Trunk Catchment:** This trunk sewer main serves the northern part of the main City area, generally between the railway line and Grey Street in the east and extending as far south as Ferguson Street. It interconnects with the Ferguson Street trunk sewer main and the Western trunk sewer main between Rugby Street and the treatment plant.
- **Ferguson Street Trunk Catchment:** The Ferguson Street trunk sewer extends from the intersection of James Line and Rosalie Terrace, and receives flows from Ashhurst, the southern part of the City between the Featherston Street catchment to the north, and the Eastern trunk sewer main to the south. The original earthenware pipe was replaced after 1973 by a new 450-1200 mm concrete pipe, with the old pipeline left in some areas to act as a rider line interconnected with the new pipes.
- **Eastern Trunk Catchment:** The Eastern trunk sewer main sewer was completed in 1968 and was designed to handle flows from Aokautere and Massey, and also to relieve the Ferguson Street trunk by taking flows from the south east of the City through pumping stations at College Street and Jickell Street. The trunk is served primarily by these pump stations, with a connection to the Massey pump station by a pipeline across the Manawatū River bridge.
- **Confluence of Trunks:** In the south-western part of the City around Maxwell's Line, the sewer trunk mains converge on the Totara Road WWTP. The Western trunk sewer main flows are delivered along a rising main in Maxwell's Line, which gravitates past Racecourse Road and Otira Place, where the flows from the Tremaine/Featherston and Ferguson trunk sewer mains join the system. The College Street trunk and Eastern trunk sewer mains join the other trunks in Totara Road, from where wastewater is transported to the Treatment Plant through parallel 1350 mm and 900 mm pipelines.

6.3 Pump Stations

Pump stations lift wastewater from low lying areas into the gravity wastewater collection network. The figure below shows the location of these pump stations. The major pumping stations in Palmerston North are Maxwell's Line (pumping 25% of the total flow), Massey, College Street, Jickell Street and Ashhurst.

All pump stations are unmanned with automatic operation of the pumps being controlled by various level sensing devices and pump controllers. The installed pumps operate on an alternate cycle so that wear is equalised between the pumps. Pump operation is monitored using an Abbey Powerlink telemetry system.

To cater for major power outages, standby generators have been installed at three of the biggest pump stations: Maxwell's Line, Jickell Street, and Massey. Associated with pump stations are some 30km of rising mains.

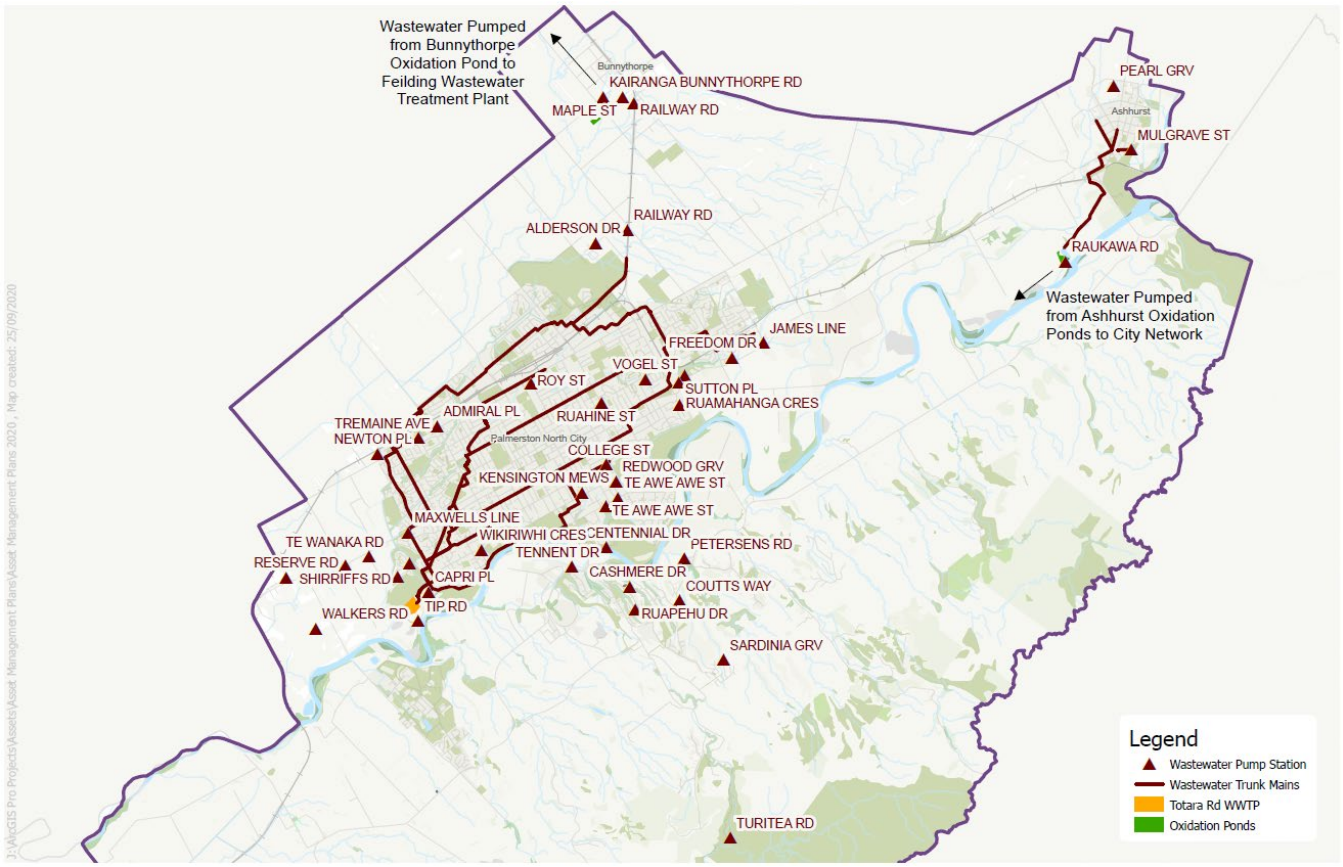


Figure 12: Location of wastewater pump stations

6.4 Minor Wastewater Ponds

The Ashhurst ponds were upgraded in 1997, with the addition of a 4kW aerator to minimise odour and meet resource consent requirements. Prior to 2013 the ponds discharged to the Manawatū River. Instead of renewing the discharge consent it was decided to connect Ashhurst to the Palmerston North network by building a pump station at the ponds. The ponds were kept in order to provide some treatment and buffer wet weather flows. The ponds are not lined with a plastic liner and are extensively monitored for leakage under a resource consent.

Three other village networks have been connected to Palmerston North including Aokautere, Bunnythorpe and Longburn. All systems had pond(s) that have been decommissioned. The ponds at Aokautere and Bunnythorpe have been disposed through remediation of the site under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health but the Longburn pond is yet to be disposed of.

The aerator is being rebuilt in 2023.

6.5 Current Wastewater Treatment Process

The Tōtara Road Wastewater Treatment Plant provides tertiary treatment through phosphorous removal and ultraviolet disinfection treatment to the wastewater before it is discharged to the Manawatū River. The plant removes most contaminants from the wastewater before it is passed through a wetland pond for further treatment in response to Māori cultural concerns.

During wet weather the aeration lagoons can be used to store excess wastewater, to meet consented discharge limits.

The figure below shows the current wastewater treatment process including the sludge digesters and biogas electricity generator.

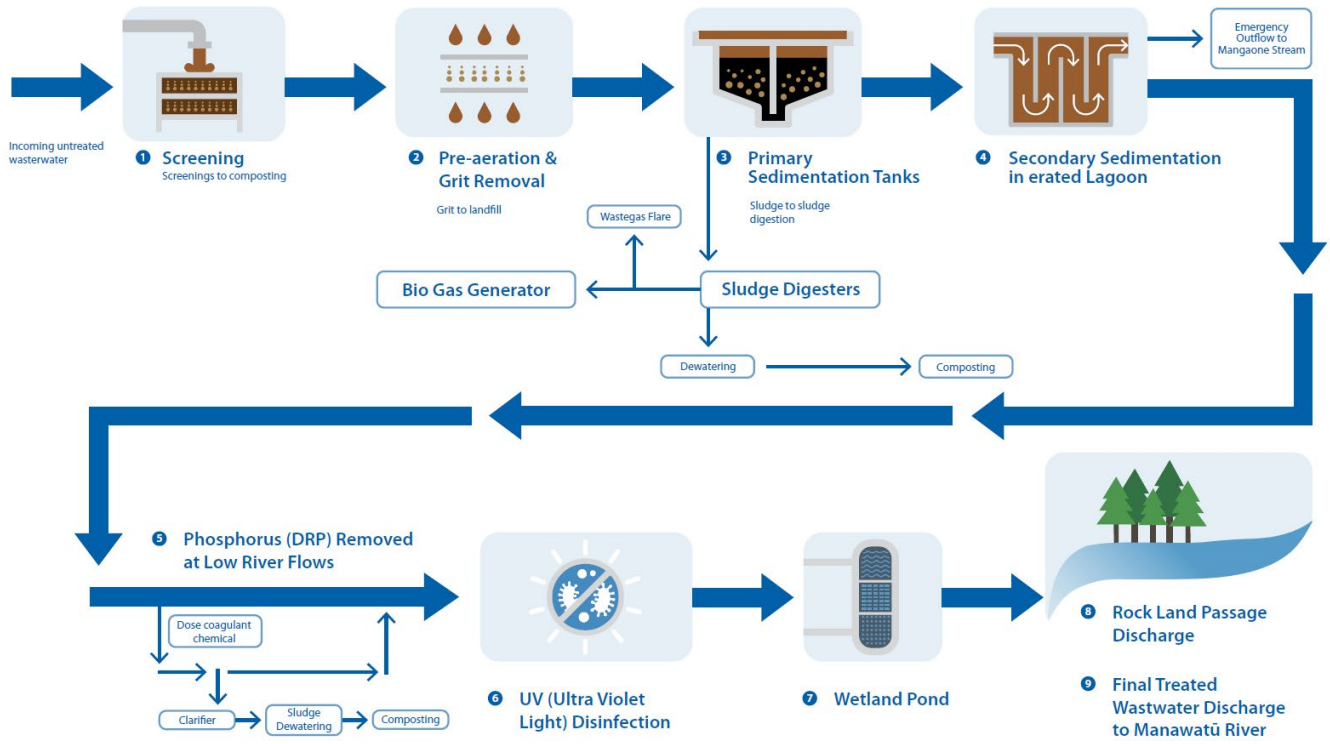


Figure 13: Schematic of the Current Treatment Process.

The figure below shows the layout of the treatment plant.

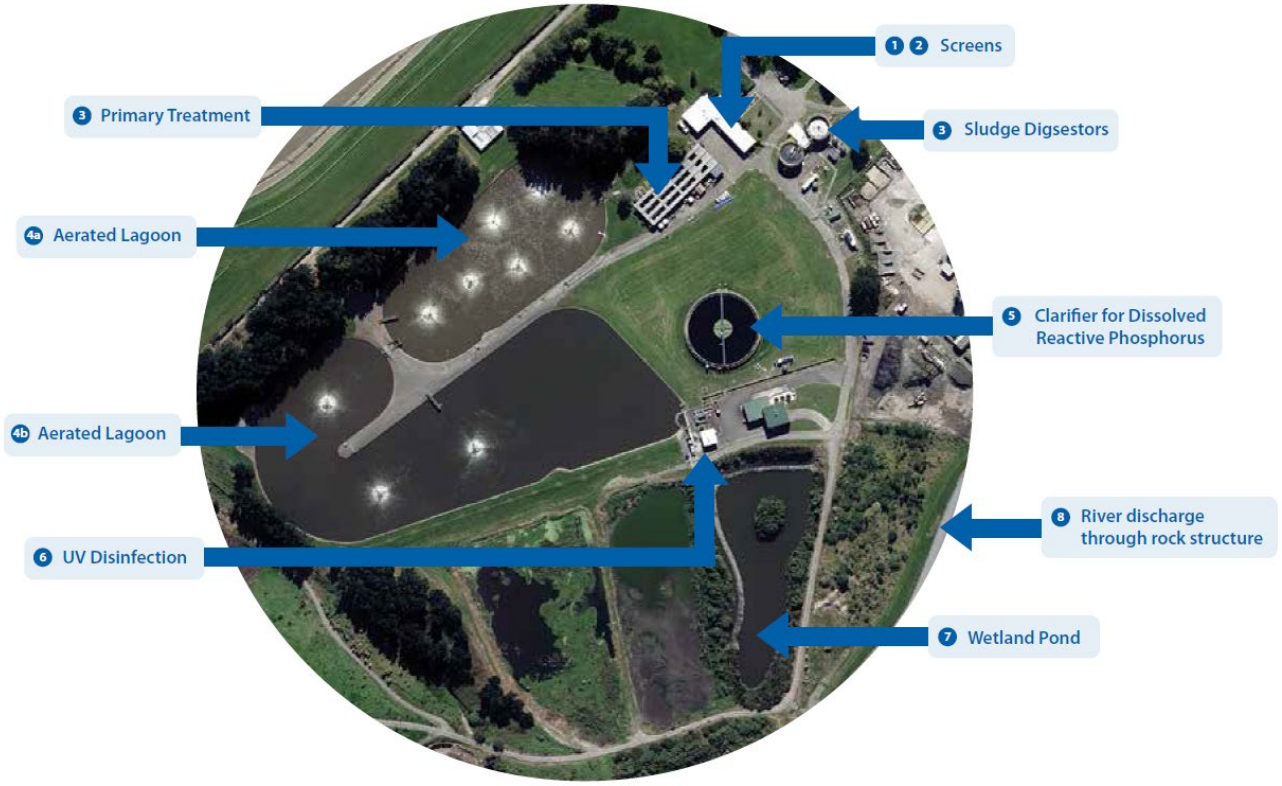


Figure 14: Components of the wastewater treatment plant at Totara Road

Currently sludge produced from the wastewater treatment process is dewatered and then composted at the neighbouring Awapuni Resource Recovery Park. The resulting biosolids are used as a cover to protect the clay cap on the closed landfill. The landfill will not be able to receive our sludge in 2 or 3 years. We are working on a new Biosolid strategy.

6.5.1 Overview of Treatment Plant Assets

The table below contains a description of the key assets at the Tōtara Road Wastewater Treatment Plant.

Table 13: Key Wastewater Treatment Asset Statistics

Component	Description & Purpose
Sluice Gate	A hydraulically operated penstock gate controls the incoming flow automatically so as to limit flow to that which can be handled by the plant.
Screening	Three 5mm band screens and two Nog Wash screen conveyors. Recycled wash water system to keep the screens clean.
Lift Pumps	Four 75KW AC variable speed driven pumps lift all the flow to a suitable level for gravity flow though the treatment processes.
Pre-aeration and Grit Removal Tank	This tank is for the deposition of grit before the flow passes to the sedimentation tanks.
Sedimentation Tanks	Three sedimentation tanks allow the solids to sink to the bottom for sludge removal and fat and grease to accumulate on the surface from where it is skimmed off.
Sludge Digesters	Two anaerobic sludge digesters stabilise the sludge for disposal to the sludge lagoons.
Sludge Lagoons	For storage of sludge produced during weekends. Three lagoons, 3.2 hectares total area.
Aerated Lagoons	Two lagoons covering a total area of 3.8 ha are connected in series provide for secondary treatment of the effluent.
Aerators	The first pond utilises four 30 kW floating aerators and two 45 kW floating aerators and the second pond three 30 kW aerators all fitted with variable speed drives to assist with the oxidation process.
Monitoring	SCADA via Wonderware Archestra and Abby Systems Powerlink telemetry.
Standby Generator(s)	A diesel powered standby 500 KVA generator commissioned in 2013 is installed to provide power for the main building including lift pumps in the event of power failure. A separate 300 KVA diesel powered generator has been installed to power the UV treatment plant and Phosphorus Removal Plant, the lagoon aerators are not supplied with standby power.
UV Plant	Installed and commissioned in 2003 consists of two banks of LP UV lamps 112 kW.
Phosphorus Reduction Plant	A single 48m diameter clarifier has been installed in association with a sludge dewatering plant in 2007.
Wetland Pond	Constructed in 2003 in conjunction with the UV plant by converting a sludge stabilisation pond.
Biogas Generator	Commissioned in 2010, 716 kW dual fuelled generator.
Digester Sludge Thickener	Andritz rotating drum sludge thickener commissioned in 2012 with associated automated poly batching plant and pumps.
Digested Sludge Thickener	Teknofaghi Mono Belt Thickener commissioned in 2016.
Clarifier Sludge Thickener	Westphaila Centrifuge.
Liquid Waste Reception facilities	Two 30,000L tanks and associated pumps for receiving additional liquid wastes before injection into the digesters commissioned in 2010.

6.6 Asset Condition and Performance

6.6.1 Draft Condition and Performance Policy

In July 2023, a draft staff policy was prepared to guide and develop condition and performance practice. Refer to **Appendix B** for the draft policy. This policy outlines current processes, acknowledges Council's desire to advance asset management practice and seeks to incorporate the new asset criticality framework into condition and performance programmes. The policy also includes detailed improvement actions to implement the policy.

6.6.2 Condition Overview

Condition ratings shown in Figure 15 are largely assumed based on age and expected life.

Wastewater pipes are the only assets where actual condition assessments have been carried out and recorded (17% of all assets by value). A maintenance programme is yet to be developed to rectify faults that have been identified through CCTV. Note that future candidates for CCTV inspection are to be prioritised based on their criticality.

All condition data for plant equipment in pump stations and the Tōtara Road Wastewater Treatment Plant is assumed but particularly at the treatment plant there is a significant amount ($7M) of assets that are nearing the end of their expected life.

Programmes for improving asset condition data for the Wastewater Activity is included in the Improvement Plan.

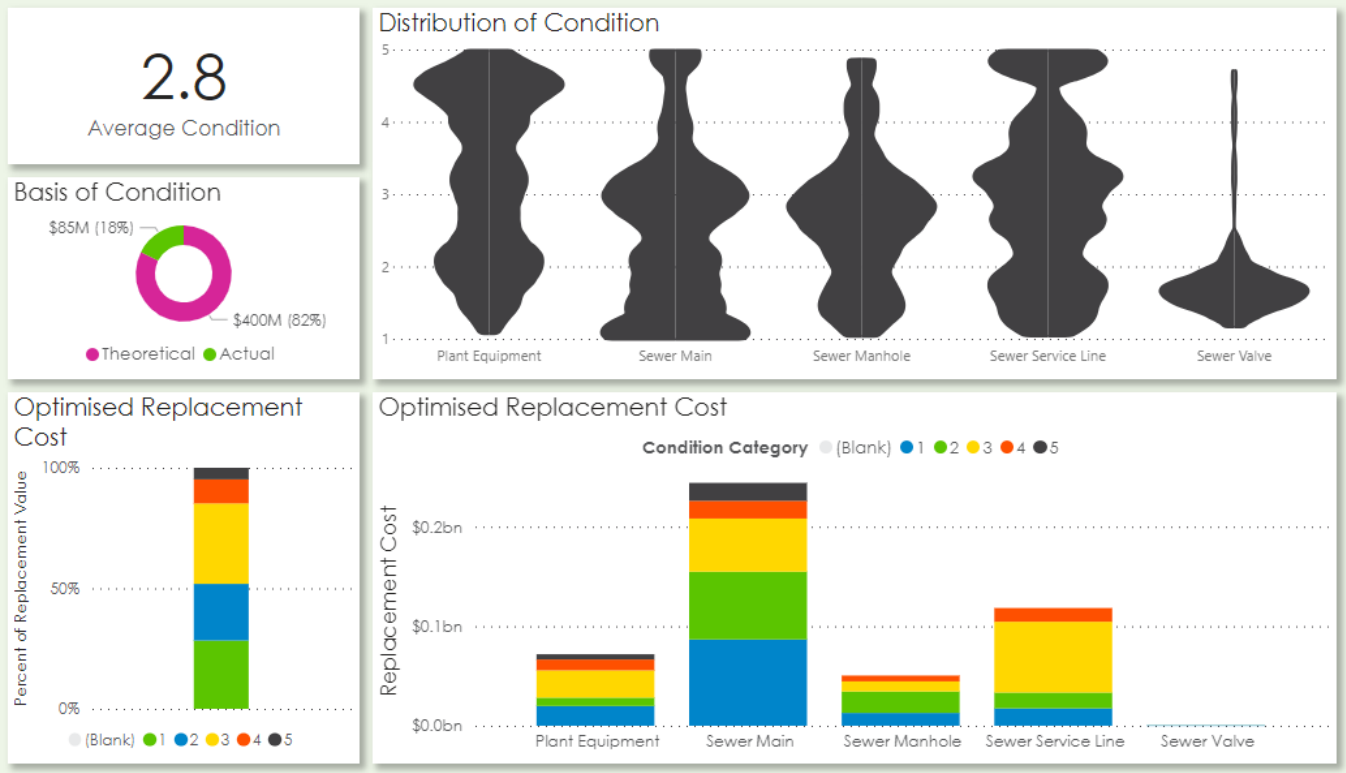


Figure 15: Wastewater Asset Condition

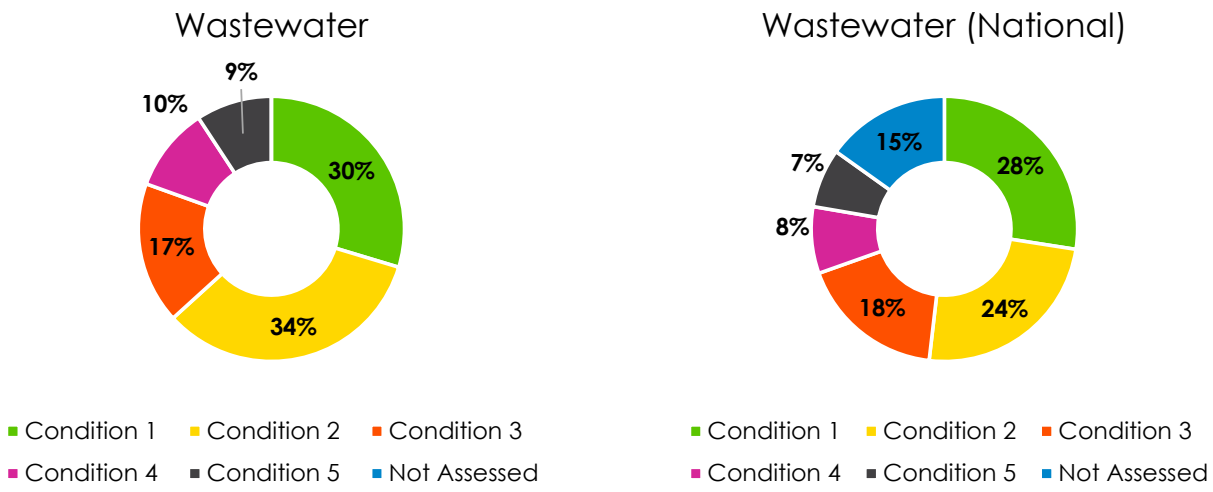


Figure 16: Palmerston North Wastewater Condition (PNCC Network: Left, National Average: Right) (NPR 2022 Data)

6.6.3 Wastewater Pipe Condition

Criticality has been used to prioritise assets that do not have any CCTV such that those with the biggest risks are inspected first and potentially on a more regular basis as they age. CCTV inspections have shown that age of pipe alone is not a good indicator of pipe condition. Other factors influencing condition include:

- Circumferential cracking in older earthenware pipes.
- Corrosion of concrete pipes particularly in the vicinity of major pump stations due to acid attack from hydrogen sulphide gas exacerbated by turbulent flow conditions. These pipes are to be more closely monitored to enable timely replacement or rehabilitation.
- Tree root intrusion – Several of the City's streets suffer significant blockage problems due to tree root entry of the sewer mains. This is also one of the main causes of sewer lateral failure within the road reserve. Many of the earthenware sewer mains laid by the Housing Corporation were located along the rear of the houses in private and these are particularly prone to tree roots intrusion in well planted sections.
- Poor pipeline grades – Areas of the City that were built on previous swampy land have settled unevenly so that there are sections with uneven or very flat grades. While this affects sewer laterals more than sewer mains, Council has a proactive main flushing programme in place to mitigate blockage risks in these sewers.

As shown in the figure below the number of breaks is very low. However, a couple of collapses on larger pipes have occurred (525mm and 600mm diameter), which tend to result in more publicity due to the disruption they cause both to the wastewater service and road carriage way.

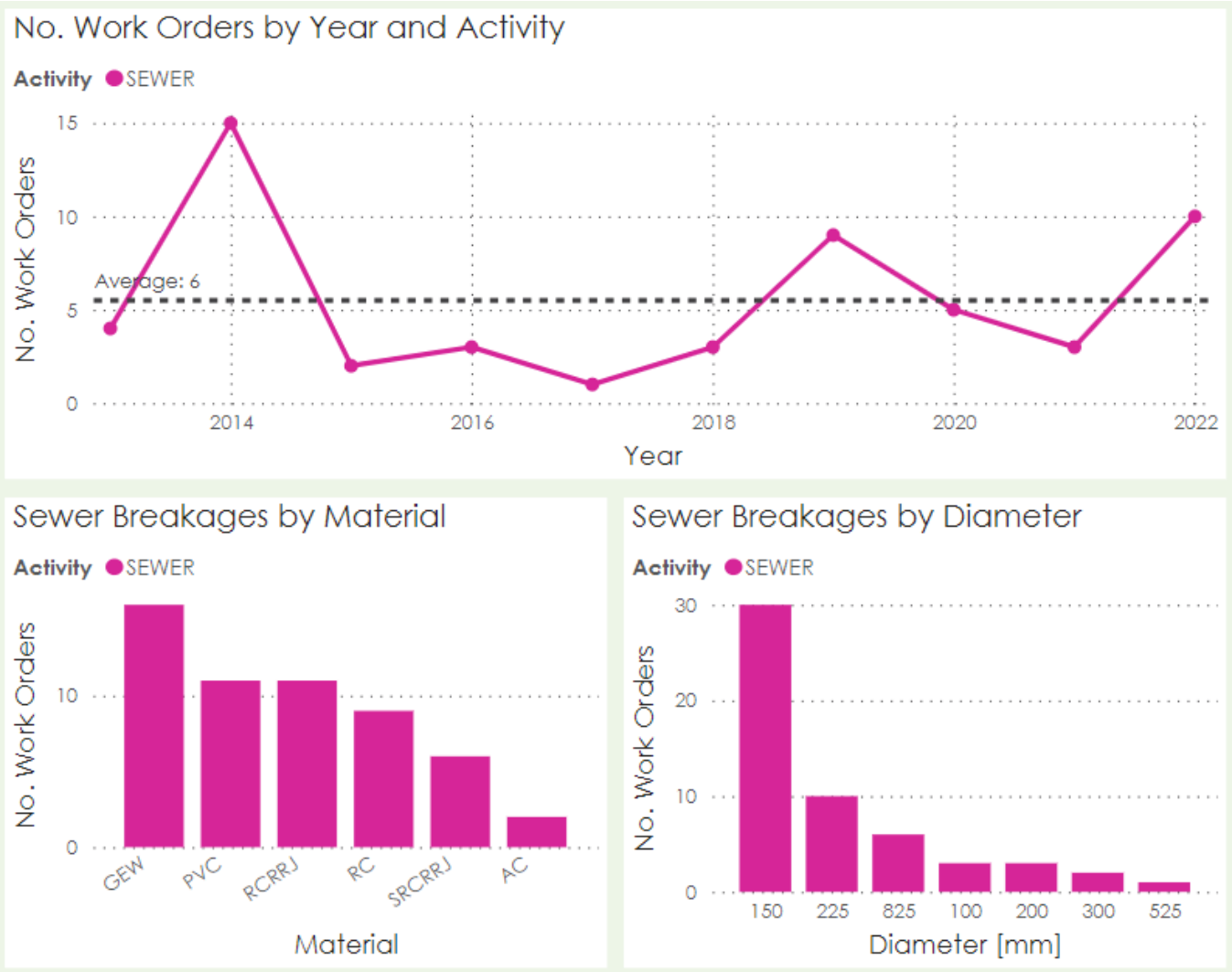


Figure 17: Wastewater Pipe Break Trends

Treatment Plant Asset Condition

The majority of maintenance for our plant assets is carried out reactively. The biggest risk of this approach is at our pump stations and treatment plants, where the most critical assets are located. For this reason an Electrical and Mechanical contract has commenced in 2023. The scope of this contract includes establishing routine inspections, condition assessments and preventative maintenance.

An improvement item is to include more condition assessment information about treatment plant assets in this AMP.

6.6.4 Asset Performance

Wastewater Pipe Blockages

As shown below blockage records show that there was an increasing trend until 2015 but has since remained relatively constant. The causes of blockages are from a mix of condition, environment factors and a result of improper use including:

- Condition causes:
    - Deterioration of pipe wall
    - Uneven grade
    - Offset pipes
    - Structural collapse
- Environmental causes:
    - Tree roots
    - Ground settlement
- Improper use:
    - Build-up of fat or gravel
    - Foreign object
    - Third party damage

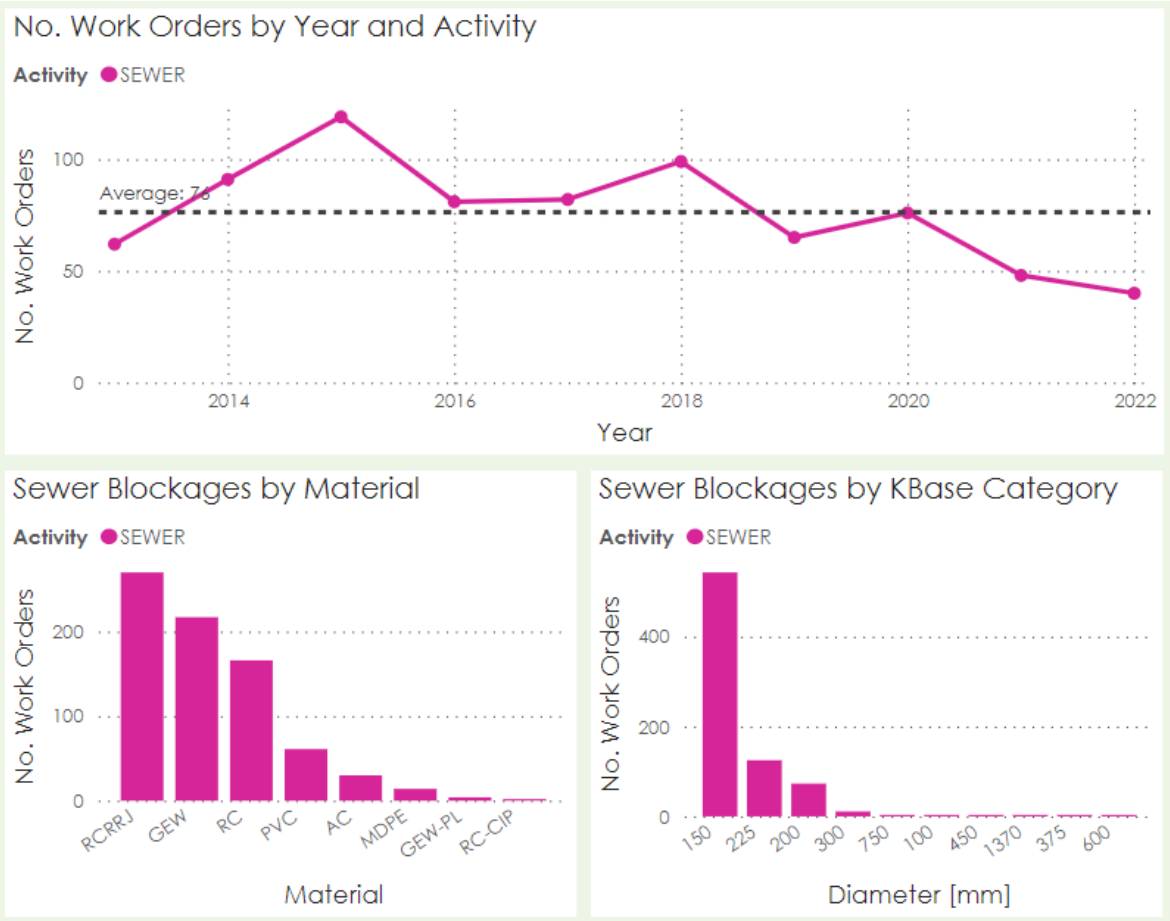


Figure 18: Wastewater Pipe Blockage Trends

Capacity of Wastewater Collection Assets

The overall performance of the wastewater collection network is satisfactory. Performance assessments have been based on:

- The number of sewer overflows.
- The volume of stormwater inflow and infiltration.

Figure 19 depicts the severity of inflow and infiltration in the wastewater catchments as assessed in 2013.

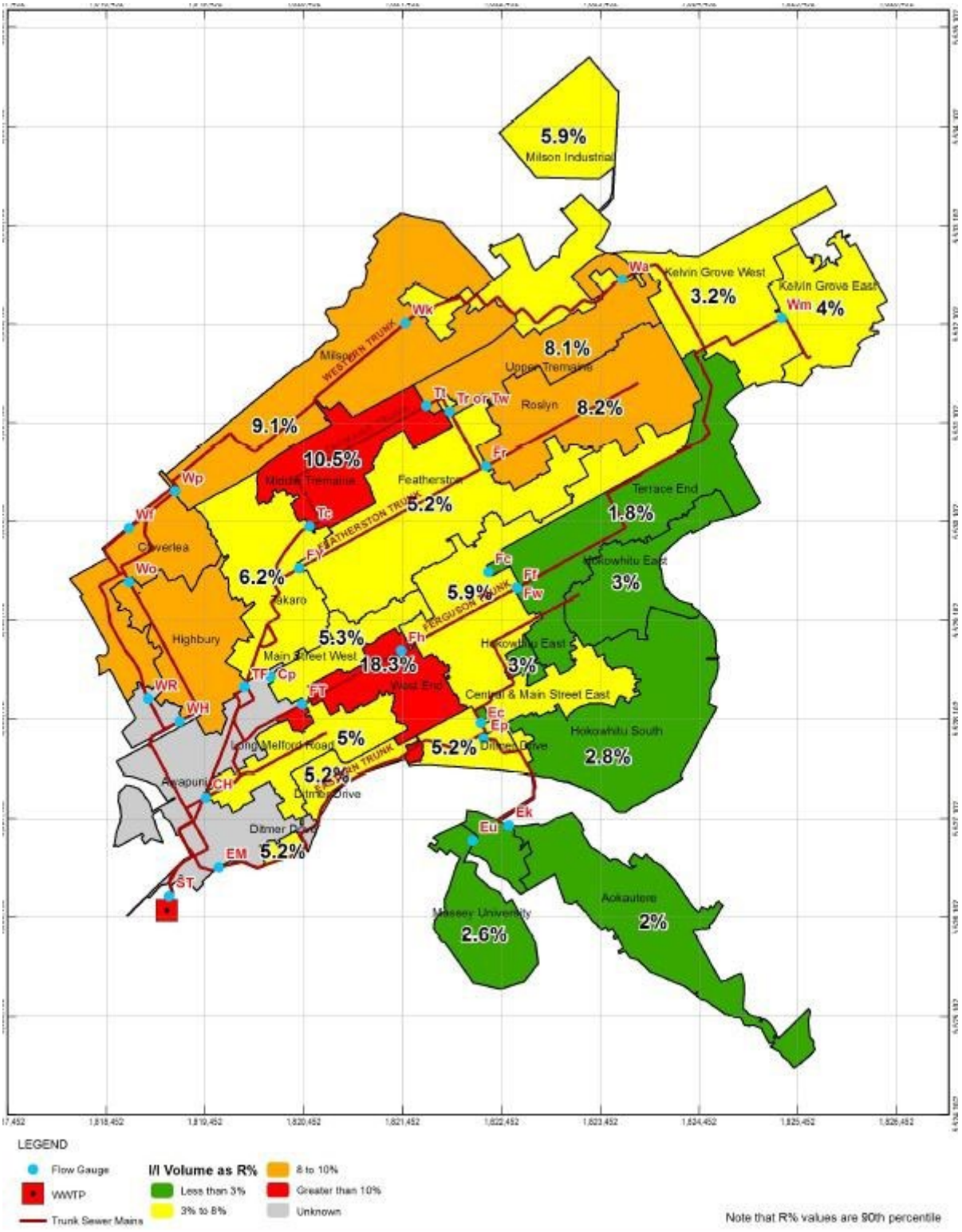


Figure 19: Inflow and Infiltration Volume by Wastewater Catchment

Red areas shown are those with the highest stormwater inflow and infiltration (GHD 2013).[6] The R% is the percentage of rainfall volume in any rain event that is estimated as typically entering the wastewater network in each catchment and it is one of a number of indicators of the severity of the issue (other indicators include peaking factor).

The catchments with the highest assessed inflow and infiltration have also been the focus for the network renewal programme over the last few years.

Overflows can occur through a service defect such as pump failure or blockage, or through wet weather flows exceeding the capacity of the pipeline or pump stations. The City does not have a major overflow problem, and only during prolonged periods of heavy rainfall does the network become surcharged sufficiently to cause overflow at known low spots around the City. Part of this problem is thought to be due to the entry of ponded stormwater to the wastewater network in low-lying areas in the city, which greatly increases the rate of inflow and infiltration into the wastewater system.

Areas with overflow problems include the low-lying areas of the Tremaine/Featherston catchment, and the top end of the Western Trunk. Where practical, properties with known overflow problems have been fitted with reflux (non-return) valves to their connections to prevent backflow and spills.

Pump Capacity and Wet Well Storage

Pump stations were previously designed so that the installed pumping capacity is twice that required to meet wet weather flows. This allows for one pump, in the event of a main pump failure or removal of a pump for servicing, to meet the required level of service. The 2021 revision of our pump station design standards is more comprehensive. All pump stations need to be reassessed against the new standards.

Studies undertaken in 2011 indicated there were two pump stations with insufficient capacity. At Maxwell's Line Pump Station all four of the existing pumps were replaced with pumps of larger capacity and greater efficiency.

Investigations at Massey pump station showed that all three pumps were operating at significantly less than their theoretical capacity. Further investigations revealed that the constraint was in the capacity of the rising main. The operating regime used at Massey pump station resulted in lower pipe velocities than those necessary to prevent settlement of solids. In addition, the existing pumps had high wear and lower than desirable efficiencies. The pumps at Massey pump station have now been replaced with new, high efficiency pumps, and the operating philosophy changed to ensure regular flushing flows are created to prevent settlement in the rising main.

Tōtara Road Wastewater Treatment Plant Capacity

The capacity of the plant provides for a population equivalent of 100,000 or 42,000 m^3/day dry weather flow, which could be reached in 2030 or earlier. Current peak wet weather flows can get close to this capacity. In 2014 a report was commissioned (Totara Road treatment plant Inlet Works and Primary Treatment Capacity, Capacity Review of Inlet Works and Primary Treatment, Harrison Grierson, June 2014). The key issues identified at the time that have since been resolved or put on hold are:

- **Inlet screens:** Capacity constrained at current flows, low solids capture rate, and odour issues. This resulted in the replacement of the inlet screens;
- **Lift pumps:** No redundancy in the system at current wet weather flows, insufficient capacity to cater for the future flows, Worthington Simpson Pumps which are no longer manufactured. Through an extensive investigation and planning program, it was decided to install the bigger pumps on the existing sub-ground pipe arrangement. Spatial and hydraulic constraints resulted in an option that would not gain a significant amount of volume output, but a big improvement in reliability and efficiency. First two pumps were replaced in 2021.
- **Grit Removal System:** Insufficient capacity to cater for the future flows and odour issues. This will be resolved under the Nature Calls project.
- **Primary Sedimentation Tanks:** Capacity constrained at current flows and unsafe concrete structure. Capacity issues will be resolved under the Nature Calls project and the concrete structure was refurbished in 2021.

6 GHD, NEIZ WW Capacity Assessment, 2013 – DM 1052063

Tōtara Road Wastewater Treatment Plant Performance

In recent years, the organic load to the plant has increased, particularly from several wet industries in Palmerston North and the Longburn Industrial Area. A further increase in flows has occurred following the connection of Ashhurst, Bunnythorpe and Longburn.

Investigations into the performance of the aerated lagoons found that the increased load was not being sufficiently treated. An additional two floating aerators were installed into the first aeration pond and additional dissolved oxygen (DO) monitors were installed to improve treatment performance and efficiency (i.e. reduce power usage). This has addressed the shortfall in aeration capacity in pond one and here is now a surplus of aeration capacity in pond two to cater for predicted domestic and commercial growth over the period prior to the upgrade the wastewater treatment plant under Nature Calls.

Tōtara Road Wastewater Treatment Plant Resource Consent Compliance

Since the consent was reviewed in 2013 the plant has continued to treat wastewater to within levels specified by its consent conditions. A summary of our current resource consents is provided in **Appendix C**

The current plant will not meet the water quality and periphyton biomass targets specified in Horizons' One Plan.

Other Environmental Compliance

In the past six years there have been several overflows at the Reserve Road Longburn pump station. In November 2020 a hydrostatic level controller failed in the pump station wet well, leading to a series of plant failures, which, coupled with a heavy rain event, resulted in an unconsented sewage discharge from a surcharging manhole on the Goodman Fielder site. An abatement notice was served by Horizons. To mitigate the risk of this occurring again we have replaced the defective equipment and have scoped options to increase the resilience at the site.

6.7 Actions to Address Condition and Performance Issues

6.7.1 Asset Deterioration

We have ongoing renewals programmes for our treatment plant, pump stations and network assets. The highest proportion of investment is required for replacing plant and pump station assets which are at the end of their useful lives.

6.7.2 Understanding Condition and Performance

As mentioned above, more investment is required to better understand the condition and performance of our assets and optimise capital decision making. The following initiatives are proposed:

- **Network Condition Assessments** – develop and implement a condition assessment programme for network assets to better inform our renewals programme
- Infiltration & Inflow Investigations
- Wastewater Facility Condition Assessment Programme
- Operate and Maintain Wastewater Network Model

6.7.3 Meeting Compliance Requirements

Future planned activities to meet compliance requirements are:

- Totara Road Wastewater Treatment Plant - Consent Renewal Upgrade

6.7.4 Meeting Levels of Service

The following activities are planned to achieve/maintain our levels of service beyond regular ongoing programmes:

- **Wastewater Pump Station Upgrades** - this program will endeavour to standardise all WWPS to try and achieve desired operational standards with regards to safety in design, health and safety, monitoring, emergency storage and emergency power supply.
- Wastewater Treatment Pond Sludge Removal
- Wastewater Treatment Plant - Building Maintenance

6.8 Improvement Actions

- Apply an asset criticality methodology to identify which assets should be prioritised for condition assessment and where applicable renewal works
- To better focus our renewals programme investment, we propose to develop preventative maintenance and condition assessment programmes. Examples of recent renewals are:
    - WWTP Nog Wash screens renewals.
    - Replacement Inlet pumps to achieve improved resilience and efficiency.
    - WW network flow monitors were installed at key wastewater network locations to provide valuable data that would feed into the hydraulic modelling calibration and I&I planning.
- An improvement item is to include more condition assessment information about treatment plant assets in this AMP.
- Implement the draft condition and performance policy (including improvement actions)

7 Risk Management

This section outlines how we identify and manage risks associated with our assets and services. It also describes how we incorporate criticality and resilience into the planning and management of our assets and services.

The SAMP describes our risk policy and risk management framework and the council-wide approach to managing risk across our different asset portfolios.

7.1 Activity Risks

7.1.1 Risk Management Processes

The table below outlines how we identify, evaluate and treat risks associated with the wastewater activity.

Table 14: Summary of risk identification, treatment, risk register

How we identify risk	How we evaluate and treatment of risk	Risk Register
• Periodic risk review workshop with the Risk Advisor • Day to day operations and maintenance • Routine inspections • Condition assessments • Renewal work or upgrade work • Our risks are identified through our business processes.	Risk mitigation actions are mainly through: • Asset response - integration within day to day operations & maintenance work and planning • Through direct work programme targeting the risk (renewal programmes, operations and maintenance programmes, compliance programmes) Non – asset responses work process changes • Root Cause Analysis to understand repetition reduction	• The 3 Waters Risk register is reviewed periodically and as needed by the Waters Division to ensure that it is up to date and that actions are being implemented and planned for. • The risk treatment plan is completed by the risk owner. Our Risk Management Advisor liaises with the Waters Manager to ensure that each raw risk has mitigation measures and plans to turn into a residual risk. • Identified risks, consequences and mitigation actions to reduce the impacts of the identified risk are captured in the Waters Risk Register.

7.1.2 Key Activity Risks and Risk Register

Risk management at the Activity level was reviewed in 2022 and aligned with the latest Risk Management Framework (June 2021). Refer to **Appendix D** for a copy of the latest risk register. The controls we have put in place are mostly effective. This has resulted that our overall residual risks for our assets are now at a medium to low level only.

Key activity risks and proposed mitigation measures are provided below:

- **Wastewater reticulation –** risks to the network centre around maintaining operation and service to our customers. We mitigate these risks by carrying out renewals of aged assets and improving resilience by upgrading pipelines and pump stations. These aspects are all covered in our proposed operational and capital works programme.
- **Wastewater treatment plant** – risks to the treatment plant include equipment and plant failure. The plant operation is also reliant on power, water and control systems being available. Condition assessment, renewals and appropriate back up systems are covered in our proposed operational and capital works programme.
- **Compliance** – the main risks around Wastewater compliance are ingress of stormwater and groundwater into the wastewater network and blockage events/incident resulting in unwanted discharge. further testing, inspection, and regular sample analysis are propsoed to identify issues. public education, financial penalties and infrigement notices are also effective approaches for this risk.

7.1.3 Improvements to Risk Management

Our risk management improvements will be focused on ensuring our mitigations or controls are working effectively. Ensuring our overall residual risk is within our risk tolerance. The following improvements were identified as part of our most recent asset management maturity assessment (Asset Management Maturity Assessment Report, Infrastructure Associates, July 2022).

Corporate Risk Improvements

The 2022 maturity assessment found that Council had improved its risk management practice since the last review in 2019. Although there was a corporate (divisional) risk register and associated processes in place, it observed that further work was required to embed these in activity level business processes. It is also recommended that Council complete asset crticiality identification and embed prioritisation of critical assets in its business processes. Elected members were more aware of the risk narrative but that Council needed to accommodate for its legacy in underinvestment in renewals.

Key risk improvements were:

- Embed standard operating policies, processes, and procedures for documenting and escalating new risks to provide a consolidated and consistent view across all activities.
- Develop and implement a risk management information system to manage the capture, assessment, and management of operational (Divisional) and enterprise risks.

Three Waters Risk Improvements

The 2022 maturity assessment acknowldged that the 3 Waters activity had completed a risk assessment with the Risk Management Advisor. It was noted that since 2019, we had improved resilience of power supply to the treatment plants, there is a strategic programme to deal with seismic risk and that the annual dam safety review was completed.

The assessment recommended that the Infrastructure Unit need to fully develop and embed the risk capture and escalation process across the unit.

7.2 Risk Assurance

Reference should be made to the Strategic Asset Management Plan.

7.3 Critical Assets and Services

Critical assets are defined as those that have a high consequence when they fail and cease to function. Criticality is one of the categories we consider alongside, risk, performance, condition and levels of service. We are still starting out with incorporating criticality into our renewals and maintenance work programmes.

7.3.1 Essential Services

In 2009 (see OASIS 1731539) the Wastewater Activity was identified as an essential service. Maintenance of critical assets was also identified as essential activities. This was confirmed during our response to Covid-19.

7.3.2 Asset Criticality

The PNCC Asset Criticality Framework is made up of Parts A to G. Part A is provides the overall Council Framework (Part A: PNCC Asset Criticality Framework and Guidelines, Palmerston North City Council, July 2022) with other parts for specific activities. The SAMP describes the overall principles and processes for applying the criticality framework. The four key criteria are based on financial, environment, health and safety and service delivery.

The wastewater activity is covered by Part D: Wastewater Pipes – Asset Criticality Framework and Guidelines, July 2022. Criticality ratings have been applied for all three waters network assets and a sample set of above ground assets.

Wastewater Supply Pipes Criticality

For wastewater, the pipe parameters influencing the extent of impact on the Council consequence criteria were identified as:

- Pipe diameter - acts as a proxy for extent of service failure, i.e. numbers of customers likely to be impacted in a pipe failure, volume of wastewater likely to overflow.
- Asset near waterway - likelihood of discharge to waterway causing environmental impacts, possibly health risks and higher management and clean-up costs.
- Location (repair costs are likely to be higher in these areas and may cause disruption to the road/building/railway that it is located in).

The wastewater pipes criticality model is shown below.

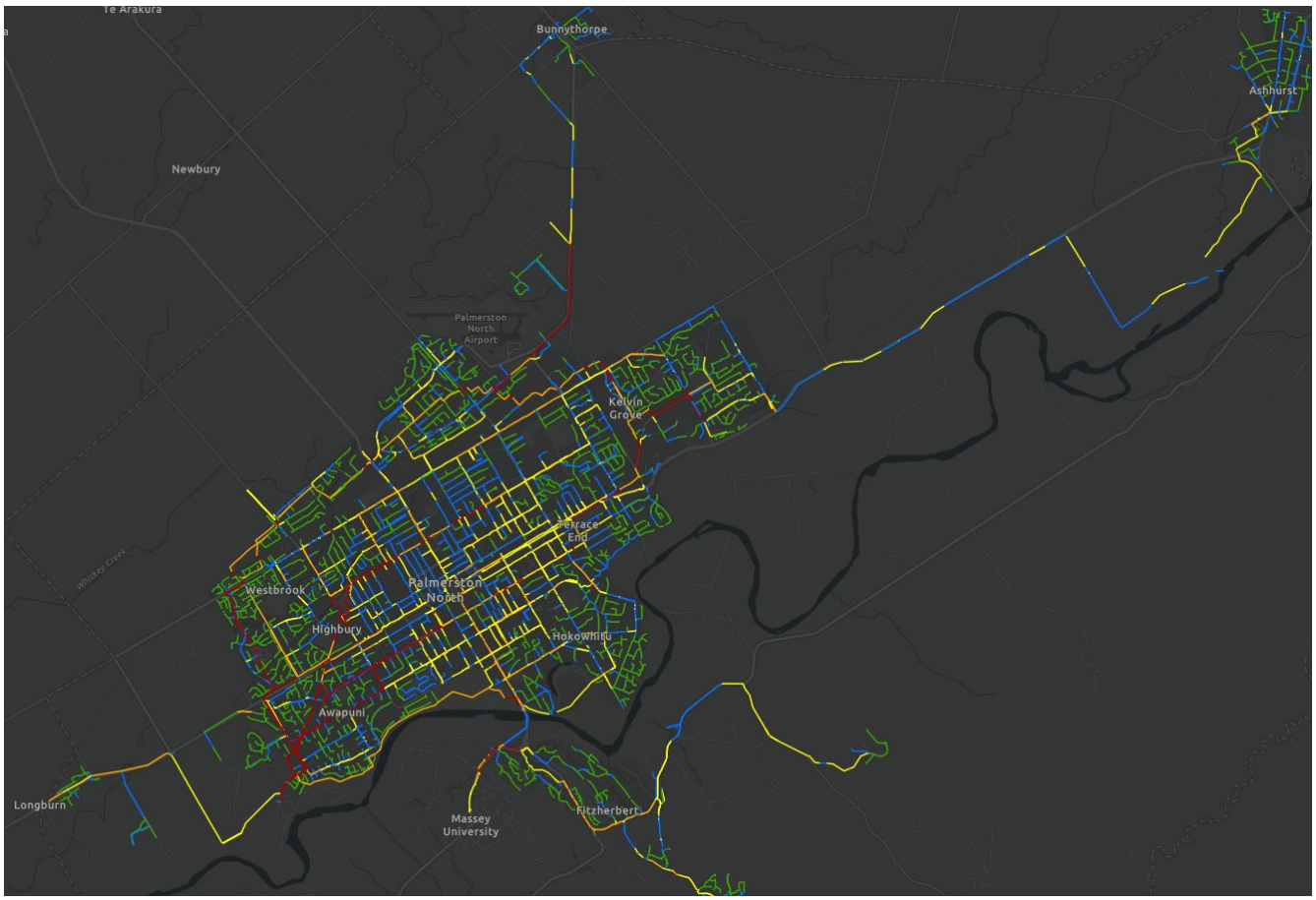


Figure 20: Wastewater Supply Pipes Criticality Model (Source: Part D: PNCC Asset Criticality Framework and Guidelines, Palmerston North City Council, July 2022)

Criticality of Collection and Treatment Assets

The criticality of collection and treatment assets are yet to be integrated into the criticality framework. The collection and treatment assets' criticality was derived from the population served. The population-based criticality grading criteria are shown below.

Table 15: Criticality Grading Criteria

Population Affected	Criticality
Above 8,000 persons	**High**
Between 6,000 and 8,000 persons	**Medium**
Between 4,000 and 6,000 persons	**Low**
Up to 4,000 persons	**Non-Critical**

The table below contains a summary of the available criticality grading of non-pipe assets. Additional work is required to determine the more critical assets at each complex.

Table 16: Criticality Grading for Wastewater Assets

Component	Criticality
Pump Stations	
Maxwells Line	High
Massey	High
Jickell Street	Medium
College Street	Medium
Tremaine Avenue	Medium
Kairanga-Bunnythorpe Road	Medium
Ashhurst Pond	Low

7.3.3 Critical Customers

Critical customers have not been assessed on the basis that a disruption to a pipe downstream of a critical customer will not usually require that site to stop operating - any overflow would be mitigated at the failure location.

7.3.4 Critical Suppliers

Critical suppliers are those providing services required for the Wastewater Activity and includes:

- Radio communication
- Fuel
- Power
- Spare parts for pumps and plant
- Building access
- Information Management
- Chemicals

7.3.5 Criticality Improvements

Further work is required to:

- Assign criticality ratings for all above ground assets
- Apply asset criticality in wastewater condition assessment and renewal programmes
- Further embed asset criticality in other investment decision making processes

7.6 Resilience

Resilience is the ability of infrastructure assets and networks to anticipate, absorb, adapt to and/or rapidly recover from a potentially disruptive event. This section highlights the need to make our assets and services more resilient to the impacts of seismic, flooding, and volcanic events and climate change. More information about resilience can be found in our SAMP.

7.6.1 Civil Defence and Emergency Management

The National Disaster Resilience Strategy outlines the vision and long-term goals for civil defence emergency management in New Zealand. We participate in the Manawatū-Whanganui Civil Defence Emergency Management (MWCDEM) Group. Our commitment and activities are further described in the SAMP.

As a lifeline utility we have obligations under the Civil Defence and Emergency Management Act 2002. It is important that we participate in the Manawatū-Whanganui Lifelines Advisory Group with other lifeline organisations. An improvement action is to update this AMP with current commitments to regional CDEM and Lifeline groups.

In New Zealand, in order to prepare for disasters, we classify risks into five categories:

- Natural hazard risks
- Biological hazard risks
- Technological risks
- Security risks
- Economic risks

Our asset planning considers the resilience of the built environment only.

Description of Risk	Potential Effect on Assets/Service	Mitigation Measures
Natural Hazards		
Seismic	Pipe network: • 70% pipes classified as brittle (more vulnerable to seismic events) Seismic strength of buildings and plants	Renewal with ductile pipe materials Prioritise pipe replacement for critical services or those in seismically vulnerable areas Ongoing seismic assessment and strengthening programme for buildings and plants
Storms (Flooding, Lightning and other Severe Weather)	Disruption of access to wastewater treatment plant Loss of power Overflowing wastewater network assets	Probability analysis carried out Ability to mitigate risk and provide control measures to support the wastewater networks in the events of flooding or severe weather (EG: Flow meter monitoring to Smart Manhole covers)
Volcanic	Ashfall unlikely to affect wastewater assets	
Biological Hazards	Availability of staff to carry out operations, preventative maintenance and inspections of critical assets (such as pump stations and grills) during a pandemic.	Procedures in place to protect our staff and maintain workforce availability during a pandemic
Technology Risks	Reliance on technology to deliver services	Telecommunications and control systems recently upgraded
Security Risks	Security and cyber-attacks affecting services	Recent review of building access security Dedicated security advisor role Cyber security protocols in place
Economic Risks	Supply chain issues delaying upgrades and impacting operations	Early procurement Spares inventory

7.6.2 Business Continuity Planning

The 3 Waters Business Continuity Plan (BCP) was updated in 2023. The Plan details strategies including co-ordination of people and resources to ensure that we can reduce the impact of any disruption on our critical services. Our priorities in any disruption are to:

- Ensure the health, safety and wellbeing of staff, contractors and the community
- Reduce the impact (and costs) of any event
- Resume core functions effectively and efficiently

The BCP outlines the maximum tolerable downtime, key inputs and contingency plans for the following critical services/functions:

- Water treatment plant, bores, reservoirs and network assets
- Wastewater treatment plants, ponds and network assets
- Stormwater flood protection

The BCP is reviewed by the Group Manager – 3 Waters and delegates at least every six months, and immediately following any significant organisational change.

7.6.3 Improvement Actions

- Fully develop and embed the risk capture and escalation process across the Infrastructure unit (which covers this activity).
- Assign criticality ratings for all above ground assets
- Formally incorporate collection and treatment assets into the criticality framework
- Apply asset criticality in condition assessment and renewal programmes
- Further embed asset criticality in other investment decision making processes
- Update this AMP with current commitments to regional CDEM and Lifeline groups

8 Lifecycle Management

This section outlines how we plan for, manage, and operate the assets at the agreed level of service while minimising lifecycle costs.

8.1 Lifecycle Overview

8.1.1 Asset Lifecycle

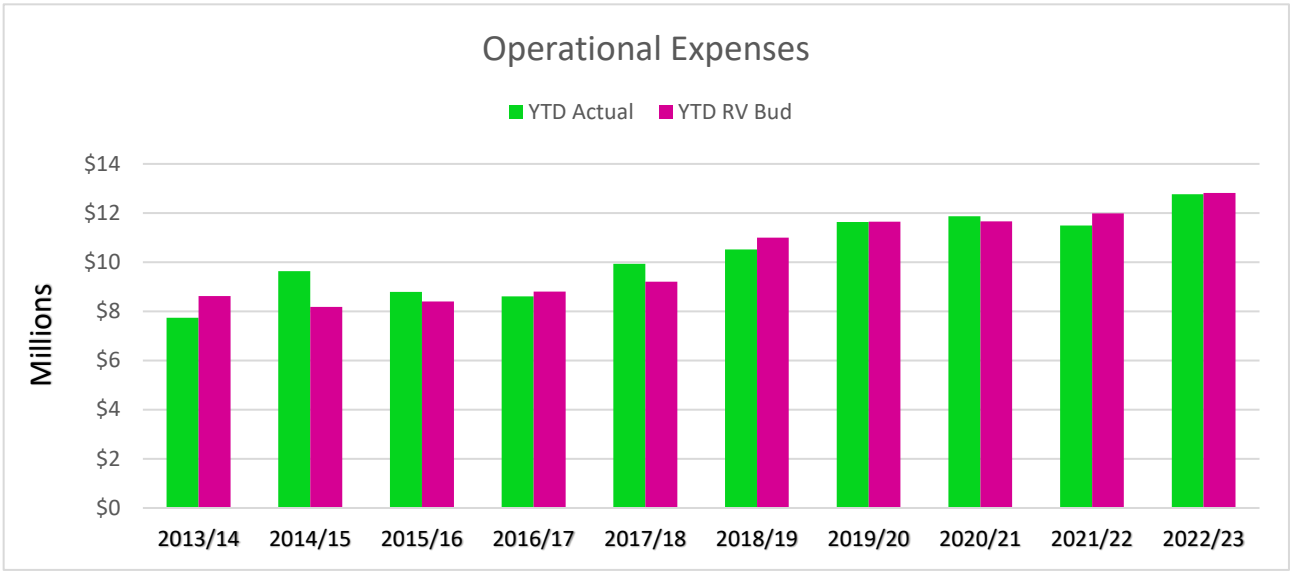
The Wastewater Supply activity is planned for, managed and operated in three distinct functional areas: network, pump stations and treatment. This section considers the following aspects of the asset lifecycle for each functional area.

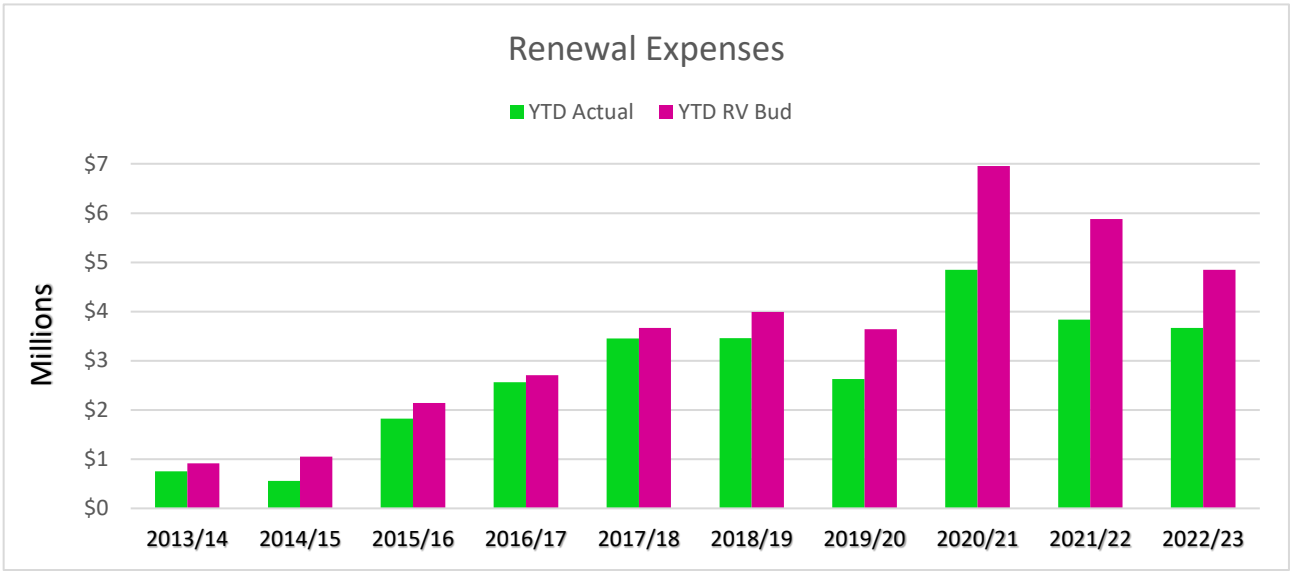
Table 17: Lifecycle Elements

Lifecycle Elements	Description
Customer and Strategic Issues	Links levels of service, strategic direction, activity challenges, and risks through to specific assets. Translates these into short term goals, long term goals, and life cycle impacts sought from investment.
Operations and Maintenance	How we operate and maintain our assets is important for asset performance. Operational activities ensure the successful continuation of the service, while maintenance activities serve to extend the life of the asset, delaying the need for asset renewal.
Renewals Plan	The renewal plan aims to identify the optimum level of renewal investment to minimise whole of life costs while delivering an appropriate level of service to the customers.
Asset Improvement and New Assets	To deliver the outcomes sought for the Wastewater Activity, asset improvement and capital new investment may also be required. Asset improvement will typically be required where there is a gap between a level of service and what is currently being delivered.
Asset Disposal	When an asset is no longer required, it is appropriate that decommissioning and disposal be considered. Ideally, this would have been considered in the planning for the asset. In July 2023, a draft staff policy was prepared with guidance for the disposal of assets.

8.1.2 What the Wastewater Activity Currently Costs

Costs associated with this activity have been shown in Figure 21 below for operational, renewal and new capital expenses. Annual operational expenses have increased over the last 10 years. The cost of treatment and disposal has had the largest increase and wastewater operation costs are now at $10M per year. Investment in building new assets is modest as developers tend to construct and vest assets. The cost of renewing assets is increasing across our services as our treatment and pipe assets are aging. We have invested in new treatment assets, pipes and treatment/discharge design to support future consent changes.





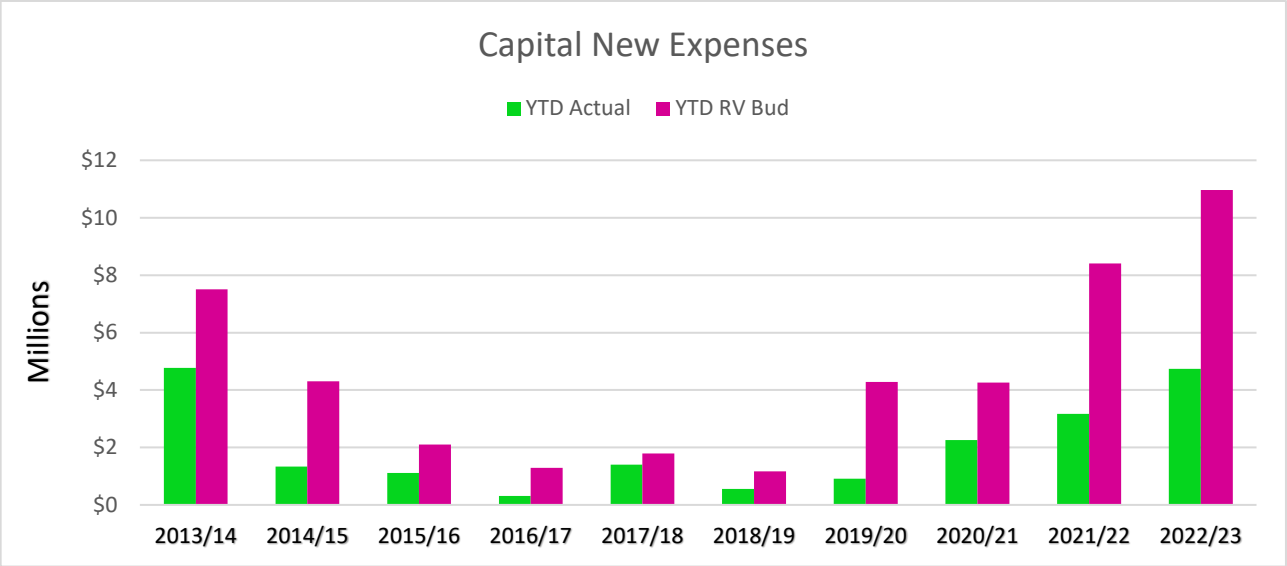


Figure 21: Activity Expenses for the Last 10 Years

8.2 Wastewater Network

8.2.1 Service Overview

Network assets allow the safe and reliable collection and conveyance of wastewater from private connections at the property boundary to the wastewater treatment plant.

8.2.2 Customer and Strategic Issues

The table below summarises the links between service levels and the lifecycle management of the collection assets.

Table 18: Wastewater Network Life Cycle Intent and Impacts

Life Cycle Intent Statement	Indicator	Short Term Goal	Long Term Goal	Life Cycle Impacts
Continuous service is maintained by ensuring an adequate quality collection and reticulation network.	Average condition grading of the network.	All critical pipeline <10 years remaining life have reliable condition scores by Year 2.	Renewal strategy is informed by reliable condition data and criticality.	Optimal balance between renewal and maintenance costs. Critical pipes are renewed before they are at risk of failure.
Interruptions to continuous service are minimised.	Complaints regarding faults and blockages	O&M trends are analysed within next three years to enable renewals trade-offs.	Repairs and renewals are based on a robust, well documented strategy.	Optimal balance between renewal and maintenance costs.
Wastewater services are affordable and efficient	The operating cost of the wastewater services per property.		All network O&M procedures are documented.	O&M effort is targeted and optimised.

8.2.3 Operations and Maintenance

The following activities are included as part of the operation and maintenance of the wastewater network assets:

- Inspection of assets; CCTV, Condition, Thermography
- Proactive Maintenance
- Mechanical and Electrical Testing
- Reactive Maintenance
- Network blockage clearances
- Flushing and cleaning of assets
- Wastewater sampling

Operations and Maintenance Practices

Operational and maintenance practices for the wastewater network are mainly documented in the Citywide Wastewater Reticulation Maintenance Service Level Agreement (SLA). This was the service provision agreement between the Water Operations Division and the previous iteration of the Council Infrastructure Unit developed to provide the documented wastewater collection levels of service. The schedule is pushed out to the Water Operations division through the IPS system.

Reactive maintenance tasks are also detailed in the SLA and any reactive tasks are initiated through a KBase customer request, which includes response and recorded resolution times. The reactive maintenance works are also recorded in IPS and the data received from reactive works is analysed to improve future maintenance regimes.

Wastewater Standard Operating Procedures provide greater detail about individual operational and maintenance tasks, critical or irregular field work, however not all tasks are covered by an SOP. Water Operations staff develop new SOPs when they identify a need.

Tasks without an SOP are guided by experienced staff and judgement, and the technical requirements for these tasks are passed on as institutional knowledge. Site observations and issues are discussed weekly by the Water Operations leadership, with options for alternative operations and maintenance methods. This process needs to be reviewed, in conjunction with the whole SOP development process, to determine a way of documenting all procedures to reduce reliance on institutional knowledge.

Critical to effective management of the wastewater network is completion of regular CCTV condition inspections. There are currently insufficient inspections being carried out over time to assess the overall condition of the network and rate of deterioration of assets. Ideally all critical network components should be inspected once every 10 years.

Improvement Opportunity:

The following improvement project opportunities have been identified for operation and maintenance planning:

- Collate all existing information for Wastewater SLA into collection and reticulation operation and maintenance practice documents
- Undertake gap analysis of SOPs and plan for documentation of all procedures
- Develop feedback and improvement processes for operation and maintenance practices and procedures
- Continue to undertake formal reviews and/or optimisation studies of maintenance and operations activities based on data and risk
- Allocate additional funding to wastewater network operation and maintenance
- Increase amount of CCTV condition inspections sufficient to assess the overall condition of the network and rate of deterioration of assets.

Programmes that address operational and maintenance issues in the wastewater network are shown in 8.6.1 below. Many of them also link to the issues raised in the previous sections in terms of risk management, levels of service, and demands and drivers

8.2.4 Renewal Plan

The decision making around whether to renew network assets or continue to carry out maintenance or repairs has historically been based on staff judgement and experience. Candidates for renewals are generated from a decision process embedded in IPS. This decision tree was developed historically and considers repair history and condition.

To improve decision making criteria for prioritising specific wastewater pipelines assets for renewal is being developed and will continue to be refined. These criteria include other works in the area, condition, criticality, failure history and degree of inflow and infiltration and from here a long term plan can be created prioritising what assets should be replaced and when.

Renewal programmes for the wastewater network are shown in 8.6.2 below.

8.2.5 Asset Improvement and New Assets

The drivers which lead to capital new planning for Wastewater systems and supporting infrastructure have been outlined in earlier sections of the AMP.

Planning for new wastewater network assets and improvement to existing wastewater network assets considers factors detailed in previous sections. This includes:

- Reducing risk and increasing resilience in the network;
- Responding to changes in level of service agreed with the community;
- Meeting the needs of residential, commercial and industrial growth where the assets cannot be provided by the developer; and
- Responding to other demands and drivers.

The wastewater network hydraulic model is used as a planning tool for both potential upgrades of existing infrastructure and new infrastructure to respond to the above issues. The model is used to assess relevant factors and drivers listed above to provide the basis of the infrastructure required.

The model shows improvements to the wastewater network to reduce wet weather overflows on private properties will be required. The effects of climate change on the network will increase the overflow risk and this will require further capital investment in capacity upgrades and more demand management initiatives.

New assets to meet the needs of growth are acquired in a variety of ways, as follows:

- Assets within a new subdivision, including pump stations, and pressure sewer assets which are vested to us;
- We construct new network assets where the development has been confirmed, which will support residential growth areas or where wastewater services are needed.

The risk, costs and benefits of accepting vested assets will be reviewed and a decision regarding approval for acquisition will be made on a case-by-case basis by staff. When satisfactorily completed in accordance with our standards and any approvals given, we will accept such assets into public ownership.

Like capital-renewal planning, there is an opportunity to better plan out capital-new projects to coincide where possible with renewals and/or new projects across services. This will increase efficiency of the projects (particularly for horizontal infrastructure) and reduce any potential rework and disruption of the network.

Programmes that address requirements for new capital and/or improvements in the wastewater network are shown in 8.6.3 below. Many of them also link to the issues raised in the previous sections in terms of risk management, levels of service, and demands and drivers.

Capital Investment

Capital new programmes for water collection assets are shown below in 8.6.3.

8.2.6 Asset Disposal

Asset disposal is primarily included as part of renewals consideration as most wastewater pipes are replaced on the same alignment. Therefore, the old asset is both physically disposed of, and disposed of in the information system when the replacement asset is entered.

When a pipe asset is renewed on an alternative alignment, the original pipe is left in situ and should be decommissioned by being filled to prevent voids forming around the pipe. Again, this is normally carried out when the replacement pipe is constructed. Pipes may be replaced on an alternative alignment for several reasons including better accessibility and material safety (asbestos pipes to be replaced are generally left in position).

Historically, many wastewater pipes which have been abandoned when realigned have not been physically disposed of in the appropriate manner. These have been capped at either end, but not filled. They may pose a future risk, particularly those located below private properties and roads.

Asset disposal programmes for the wastewater network are shown in 8.6.1 below.

8.3 Wastewater Pump Stations

8.3.1 Service Overview

Pump station assets support network assets in allowing the safe and reliable collection of wastewater by lifting flow from one level to another. This prevents the gravity network from becoming too deep, therefore allowing the network to cover a wider area. Pump stations also allow wastewater service to be provide to areas lower than the existing network.

8.3.2 Customer and Strategic Issues

Table 19 summarises the links between service levels and the management of the lifecycle of the pump station assets.

Table 19: Wastewater Pump Station Life Cycle Intent and Impacts

Life Cycle Intent Statement	Indicator	Short Term Goal	Long Term Goal	Life Cycle Impacts
Continuous service is maintained by ensuring an adequate quality pump station network.	Average condition grading of pump stations.	All pump stations have reliable condition scores by Year 2.	Renewal strategy is informed by reliable condition data and criticality.	Optimal balance between renewal and maintenance costs with reduced risk of critical failures.
Interruptions to continuous service are minimised.	Complaints regarding faults and blockages	O&M trends are analysed to enable renewals trade-offs.	Renewals are based on a robust, well documented strategy.	Optimal balance between renewal and maintenance costs.

8.3.3 Operations and Maintenance

The following activities are included within operation and maintenance of the wastewater pump stations:

- Carrying out regular inspections of the pump stations, including electrical inspections
- Wet well cleaning
- Regular servicing of mechanical and electrical equipment
- Responding to callouts, service requests/complaints
- Unblocking of pumps
- Reactive pump, motor and electrical repairs
- Emergency work

In the same manner as for networks above pump station maintenance SLAs, although no longer required, are still a good record of the schedule of operation and maintenance frequencies.

- Wastewater Pump Station Operations & Maintenance SLA
- Linton Wastewater Pump Station Operations & Maintenance SLA

Further details on scheduling of pump station operation and proactive maintenance, and the tasks carried out, is contained on a spreadsheet at the wastewater treatment plant. This spreadsheet also contains the recording of the operation and maintenance. Limited operational and maintenance data is recorded in IPS.

Reactive maintenance works are referred to in the SLA, but very little detail is specified. These are typically initiated by operators after alarm responses or as a result of regular inspections. The reactive maintenance works are supposed to be recorded in IPS, but this process is currently quite variable.

The SLA was last renewed and updated in 2017. As with the wastewater collection SLA there is no process to review and amend the overall schedule, and the process for adding additional pump stations to the list is not clear. Again, it would be more appropriate to move to a collectively owned way of documenting the operational and maintenance practices, with an agreed process for feedback and improvement to the tasks and frequencies including analysis of maintenance data to improve the practices.

Providing greater detail about individual operational and maintenance tasks and procedures in the SLA are the Water Operations Standard Operating Procedures (SOPs), but as with the network not all tasks are covered by an SOP. Water Operations staff develop new SOPs when they identify a need.

Tasks without an SOP are guided by experienced staff and judgement, and the technical requirements for these tasks are passed on as institutional knowledge. This process needs to be reviewed to determine a way of documenting all procedures to reduce reliance on institutional knowledge.

Critical to effective management of the wastewater pump stations is adequate condition data. There is currently insufficient data being collected and recorded over time to assess the overall condition of the pump station assets and their rate of deterioration.

The following improvement project opportunities have been identified for operation and maintenance planning:

- Turn the existing SLAs and spreadsheet into pump station operation and maintenance practice documents
- Undertake gap analysis of SOPs and plan for documentation of all procedures
- Improve recording of pump station operational and maintenance data in IPS
- Develop feedback and improvement processes for operation and maintenance practices and procedures, including introducing new pump stations into the processes
- Undertake formal reviews and/or optimisation studies of maintenance and operations activities based on data and risk
- Increase condition inspections sufficient to assess the overall condition of the pump station assets and their rate of deterioration

Programmes that address operational and maintenance issues for wastewater pump stations are shown in 8.6.1 below. Many of them also link to the issues raised in the previous sections in terms of risk management, levels of service, and demands and drivers

8.3.4 Renewal Plan

Renewals Plan

The selection for renewal of specific pump station mechanical and electrical equipment has historically been finalised at the start of every budget year. This is being replaced by a more robust 6-year renewals programme. Considered in this process are informal assessments of repair history, criticality and current condition.

As with the network the renewal programme budgets are developed primarily by the value and expected useful life of the assets as contained in the asset register (IPS). This is used to generate a projected cumulative replacement value for an asset group over the next 100 years. The existing cumulative renewals budget is compared with the projected replacement value to see if there is a shortfall or not in the required renewals budget. From this the required renewals budget is adjusted to match over time the projected replacement value.

During this assessment and development of the renewal budgets the breakdown and arrangement of pump station assets in IPS was informally reviewed. This cast some doubt about the overall usefulness of the current breakdown. From this an overall review needs to be carried out to see if these concerns are valid.

Renewal programmes for wastewater pump stations are shown in 8.6.2 below.

8.3.5 Asset Improvement and New Assets

Asset Improvement and New Assets

The drivers which lead to capital new planning for Wastewater Pump Stations have been outlined in earlier sections of this AMP.

The wastewater network hydraulic model includes network pump stations and is used as a planning tool for both potential upgrades of existing infrastructure and new infrastructure to respond to the above issues. The model is used to assess relevant factors and drivers listed above to provide the basis of the infrastructure required.

The model shows improvements to the wastewater network to reduce wet weather overflows on private properties will be required. This may also result in pump station improvement programmes. The effects of climate change on the network will result in the need for capital investment in pump station components, and additional storage capacity.

New assets to meet the needs of growth are acquired in a variety of ways, as follows:

- Assets within a new subdivision, including pump stations, and pressure sewer assets which are vested to us;
- We construct new network assets where the development has been confirmed, which will support residential growth areas or where wastewater services are needed.

Programmes that address requirements for new capital and/or improvements for wastewater pump stations are shown in 8.6.3 below. Many of them also link to the issues raised in the previous sections in terms of risk management, levels of service, and demands and drivers.

8.3.6 Asset Disposal

Asset Disposal

Asset disposal is primarily included as part of renewals consideration as most wastewater pump station components are physically removed and disposed of to allow for the replacement component. Wherever possible, redundant assets are sold for scrap value with revenue used to further enhance the wastewater system.

8.4 Wastewater Treatment and Disposal

8.4.1 Service Overview

A summary of the wastewater treatment and disposal assets can be found in Section 6.

8.4.2 Customer and Strategic Issues

The table below summarises the links between service levels and the management of the lifecycle of the treatment and disposal assets.

Table18: Wastewater Treatment and Disposal Life Cycle Intent and Impacts

Life Cycle Intent Statement	Indicator	Short Term Goal	Long Term Goal	Life Cycle Impacts
Treatment of all collected wastewater is ensured by adequate quality treatment infrastructure	Average condition grading of treatment components.	All treatment components have reliable condition scores by Year 2.	Renewal strategy is informed by reliable condition data.	Optimal balance between renewal and maintenance costs with reduced risk of critical failures
Ability to treat all collected wastewater to discharge requirements is maintained.	Compliance with resource and discharge consents.	Future asset requirements are considered to optimise renewals/O&M trade-off.	Write off of assets when new treatment plant is constructed is minimised.	Optimisation of all costs to in transition to new treatment and disposal options.
Wastewater services are affordable and efficient	The treatment cost the wastewater services per property.		All network O&M procedures are documented.	O&M effort is targeted and optimised.

8.4.3 Operations and Maintenance

The following activities are included within operation and maintenance of the wastewater treatment plant:

- Operation of treatment processes
- Cleaning and flushing of treatment equipment
- Scheduled inspections
- Setting of levels and controls
- Sampling of raw wastewater and treated effluent
- Disposal of digested sludge
- Regular servicing of mechanical and electrical equipment, including the biogas generator
- Refurbishment of mechanical and electrical equipment
- Grounds, structures, and building maintenance
- Responding to callouts, service requests/complaints etc.
- Clearing blockages
- Reactive pump, motor and electrical repairs
- Emergency work

The treatment and disposal SLAs, although no longer required, are still a good record of the schedule of operation and maintenance frequencies.

- Totara Road Wastewater Treatment Plant Operation and Maintenance SLA
- Ashhurst Wastewater Oxidation Ponds Operation and Maintenance SLA
- Totara Road Wastewater Treatment Plant Digester Biogas Co-generation Engine SLA

Further detail on the proactive maintenance tasks and frequencies for the treatment and disposal assets is contained on a wall planner chart at the Totara Road plant. This outlines the upcoming weekly, monthly and annual activities, and has been developed from operator and staff experience as well as manufacturers' and supplier recommendations. Limited operational and maintenance data is recorded in IPS.

Reactive maintenance works are referred to in the SLA, but very little detail is specified. These are typically initiated by operators after alarm responses or as a result of regular inspections. The reactive maintenance works are supposed to be recorded in IPS, but this process is currently quite variable. Historically some of this was also recorded as text notes in the treatment plant SCADA.

The SLA was last renewed and updated in 2017. As with other SLAs there is no process to review and amend the overall schedule. Again, it would be more appropriate to move to a collectively owned way of documenting the operational and maintenance practices, with an agreed process for feedback and improvement to the tasks and frequencies including analysis of maintenance data to improve the practices.

Providing greater detail about individual operational and maintenance tasks and procedures in the SLA are the treatment plant processes manuals and the site-specific Treatment Plant Health & Safety Manual. These must be continually updated as new equipment, compliance requirements, or processes are introduced. In addition, the processes are yet to be integrated into Promapp.

Critical to effective management of the wastewater treatment and disposal is adequate condition data. Capture of condition information during the scheduled maintenance is planned.

The following improvement project opportunities have been identified for operation and maintenance planning:

- Turn the existing SLAs and wall planner into treatment and disposal operation and maintenance practice documents
- Integrate treatment plant processes into ProMapp
- Improve recording of treatment and disposal operational and maintenance data in IPS
- Undertake formal reviews and/or optimisation studies of maintenance and operations activities based on data and risk
- Capture condition information during the scheduled maintenance activities

Programmes that address operational and maintenance issues for wastewater treatment and disposal are shown in 8.6.1 below. Many of them also link to the issues raised in the previous sections in terms of risk management, levels of service, and demands and driver.

8.4.4 Renewal Plan

The decision making around whether to renew treatment and disposal assets or continue to carry out maintenance or repairs is generally based on staff judgement and experience. With the Nature Calls project, whether the asset will be required long term will also be considered.

In the same manner as pump stations, the selection for renewal of specific treatment and disposal mechanical and electrical equipment has historically been finalised at the start of every budget year. This is being replaced by a more robust 6-year renewals programme. Considered in this process are informal assessments of repair history, criticality, current condition, and now, the need for the asset post upgrade.

Renewal planning for the wastewater treatment buildings is to be determined, but they will be managed in the same way as other buildings. Further information on this and the building assets can be found in the Property AMP.

As with the network and the pump stations renewal programme, budgets are developed primarily by the value and expected useful life of the assets as contained in the asset register (IPS). This is used to generate a profile of renewals over the next 100 years. The first 10 years of renewals of the existing renewals budget is projected to see if there is a shortfall or not in the required renewals budget. From there the renewals profile is adjusted to smooth the required renewals budget to match the accumulated replacement value of the assets that require renewing.

Renewal programmes for wastewater treatment and disposal are shown in 8.6.2 below.

8.4.5 Asset Improvement and New Assets

Planning for new assets and improvement to existing assets for wastewater treatment and disposal considers factors detailed in previous sections.

Of greatest significance for new and improved wastewater treatment and disposal assets are legal and regulatory requirements. Obtaining and maintaining a discharge consent for the wastewater treatment plant requires significant capital investment. As mentioned in section 3.2.2 the capital investment that will be required as part of the current consent renewal (Nature Calls project) will be substantial.

The assumption in this AMP is that significant new developments at the Totara Road treatment plant other than at the head of the plant will not occur until after new resource consents are granted.

A key driver of the new and improvement work at the wastewater treatment plant is the desire to increase resilience and provide some redundancy.

Programmes that address requirements for new capital and/or improvements for wastewater treatment are shown in 8.6.3 below. Many of them also link to the issues raised in the previous sections in terms of risk management, levels of service, and demands and drivers.

8.4.6 Asset Disposal

Asset disposal is primarily included as part of renewals consideration as most wastewater treatment and disposal components are physically removed and disposed of to allow for the replacement component.

In other cases, treatment and disposal components may cease to be used because the drivers that require it no longer exist. These drivers would be of a similar nature as those that would drive new and improved assets (legislation changes, technology changes, changes in acceptable risk, etc). In some cases, the existing component is removed, but in other cases it remains even though it is redundant.

Wherever possible, above ground assets are sold for scrap value with revenue used to further enhance the wastewater system.

In general, the old asset is disposed of in the information system when the replacement asset is entered. This process is currently informal and does not necessarily consider where a redundant component remains.

There are no specific programmes associated with wastewater treatment and disposal asset disposal.

8.5 Lifecycle Management Alternatives

As stated in the SAMP lifecycle decision making is an area of improvement. This includes consideration of lifecycle alternatives for wastewater. This will be addressed in the proposed lifecycle decision making improvements, which include risk-based analysis of alternatives and embedding of the business case development process. The Nature calls project considered a range of alternatives for treatment and discharge including whole of life costs.

8.6 Lifecycle Proposed Investment Summary

8.6.1 Proposed Operations and Maintenance Expenditure

Existing operations and maintenance budgets were reviewed against historic expenditure and levels of service requirements. This was used to forecast future budget needs for existing assets, and to estimate the budget required for new assets programmed to be created.

Figure 22 shows us the Proposed Operations and Maintenance project expenditure for the next 10 years.

In years 24/25 and 25/26 we expect to spend up to $1.4 million with a significant project for oxidation pond and sludge lagoon de-sludging. The other project expenditure is related to inflow and infiltration investigations.

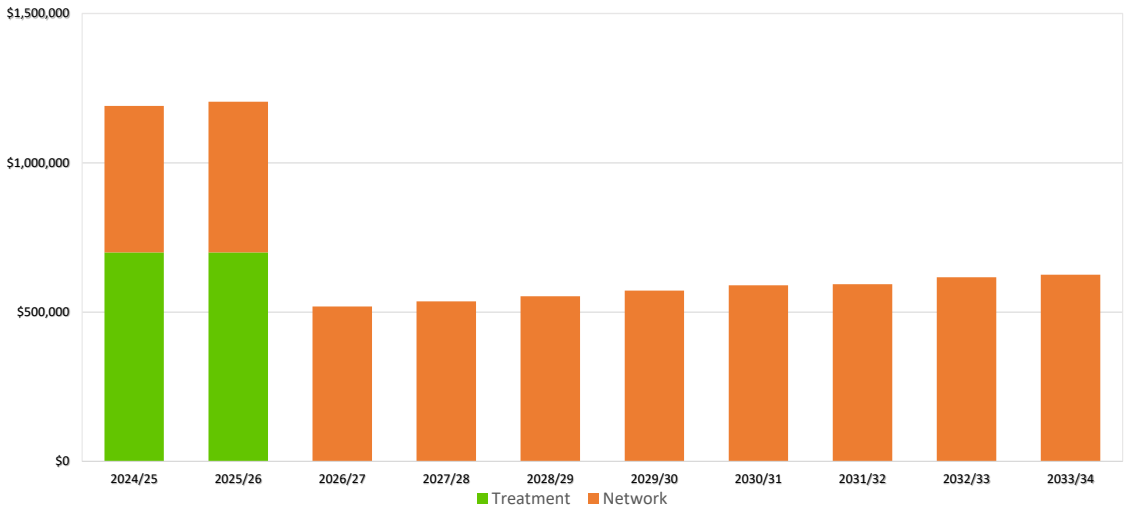


Figure 22: Proposed O&M 10-year Expenditure Plan

The figures below show the breakdown of the proposed operations and maintenance budgets for the next ten and 30 years. Different expenditure categories are:

- **Maintain Service Level or MSL**: budget for the operation and maintenance of the existing assets;
- **Operational Programmes**: budgets for discrete operational programmes, for example the collection of base asset condition data, resource consent renewal, or business case preparation; and
- **Capital New (Consequential Opex)**: budget allowance for operation and maintenance due to the creation of new assets each year

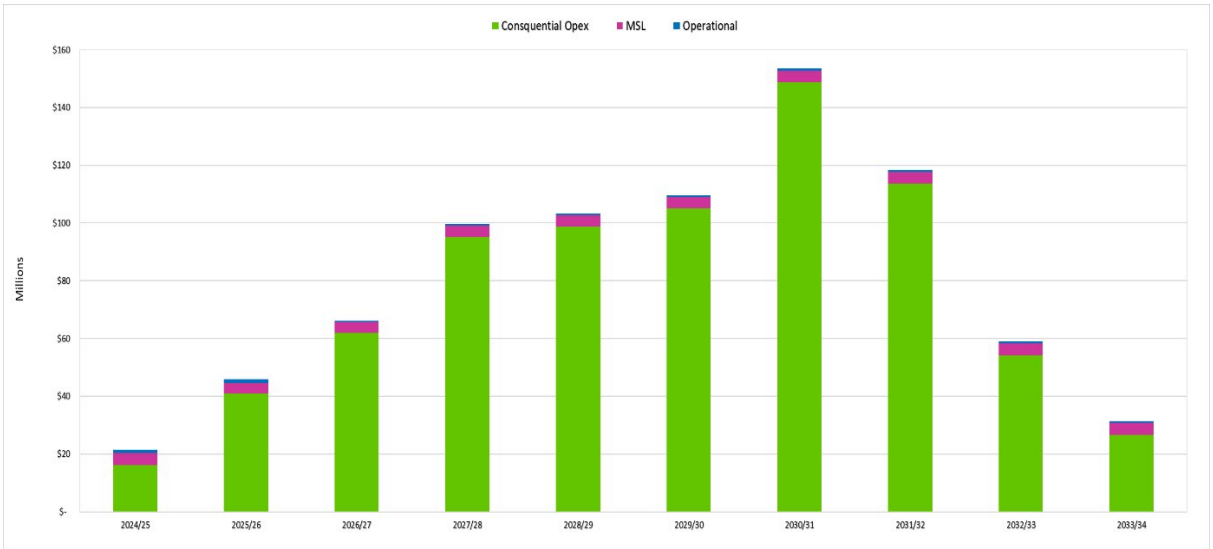


Figure 23: Wastewater Proposed Operational Budget Breakdown

The figure below**Error! Reference source not found.** shows further detail on the breakdown of the MSL budgets (excluding revenue and inflation). About 2% of the budget is for consultants, who are typically used for specialist investigations and design work. Maintenance costs are associated with labour, consumables, plant and physical works. Administration costs cover insurance, software, rates (Regional Council) amongst other items.

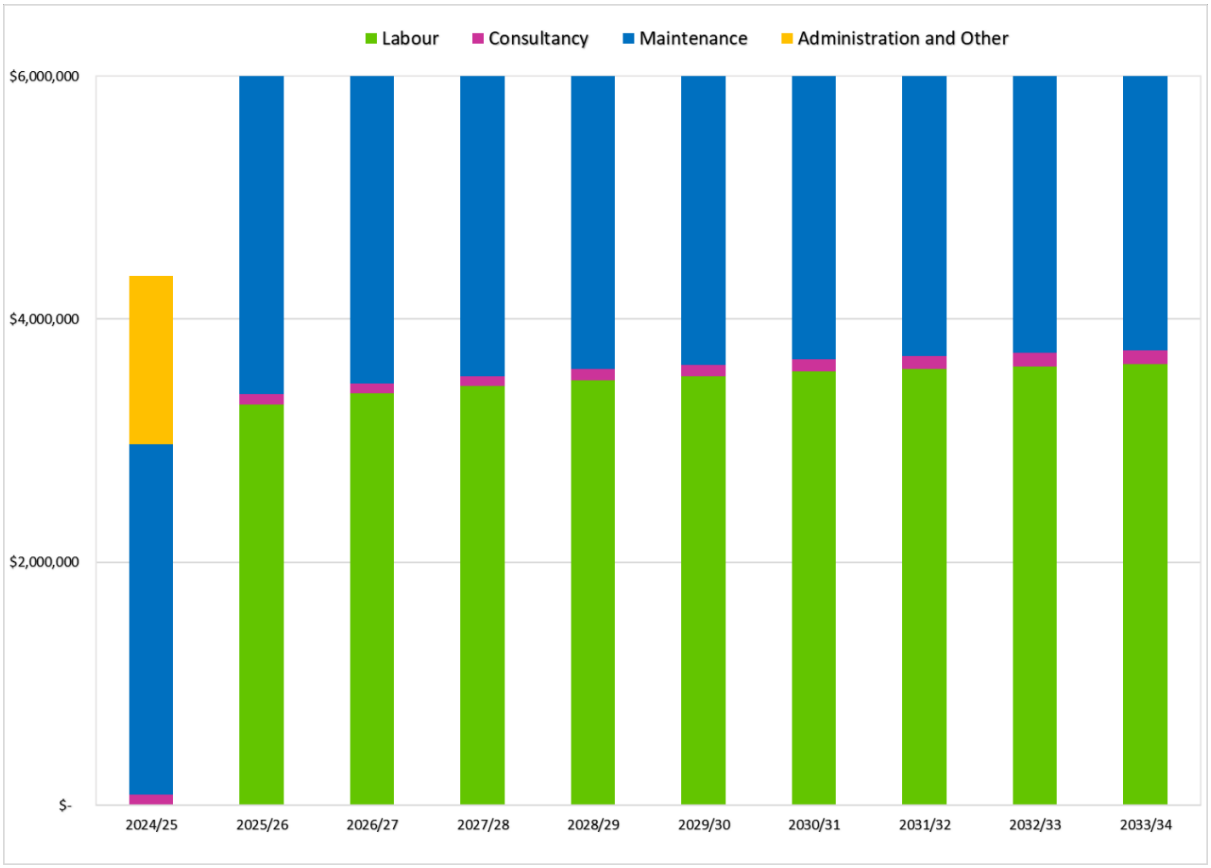


Figure 24: Wastewater Proposed MSL Budget Breakdown

Status: Final

Table 20:Proposed O&M 10 year Expenditure Plan

Prog. Type	Prog. No. & Name	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	10 Year Total
MSL	Maintain Service Level	$ 7,397,737	$ 7,088,474	$ 7,252,339	$ 7,357,072	$ 7,487,283	$ 7,599,487	$ 7,682,897	$ 7,752,421	$ 7,828,776	$ 7,889,287	**$ 75,335,776**
Capital New	Consequential Opex	$ 16,194,000	$ 40,940,000	$ 61,876,600	$ 95,208,600	$ 98,772,600	$ 105,054,600	$ 148,737,600	$ 113,572,500	$ 54,166,000	$ 26,582,500	**$ 761,105,000**
O&M	1401 - City-wide - Infiltration & Inflow Investigations	$ 490,770	$ 504,990	$ 519,120	$ 535,725	$ 553,410	$ 572,220	$ 589,950	$ 593,357	$ 617,000	$ 625,360	**$ 5,601,902**
O&M	2411 - Dredging and Dewatering of Oxidation Ponds and Sludge Lagoons	$ 700,000	$ 700,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 1,400,000**
Capital	Total Expenditure	**$ 24,782,507**	**$ 49,233,464**	**$ 69,648,059**	**$ 103,101,397**	**$ 106,813,293**	**$ 113,226,307**	**$ 157,010,447**	**$ 121,918,278**	**$ 62,611,776**	**$ 35,097,147**	**$ 843,442,678**

8.6.2 Proposed Renewal Expenditure

The renewal programme budgets are developed primarily by the value and expected useful life of the assets as contained in the asset register (IPS). This is used to generate a projected cumulative replacement value for an asset group over the next 100 years. The existing cumulative renewals budget is compared with the projected replacement value to see if there is a shortfall or not in the required renewals budget. From this, the required renewals budget is adjusted to match over time the projected replacement value.

Refer to **Appendix E** for theoretical asset renewal profiles.

Proposed renewals over the next 10 years are shown below. The majority of proposed expenditure is for replacement of network assets. Technically the proposed profile would be expected to increase over time as assets age but this is not evident in the renewals programme. This indicates that further work is required to develop the renewals programme.

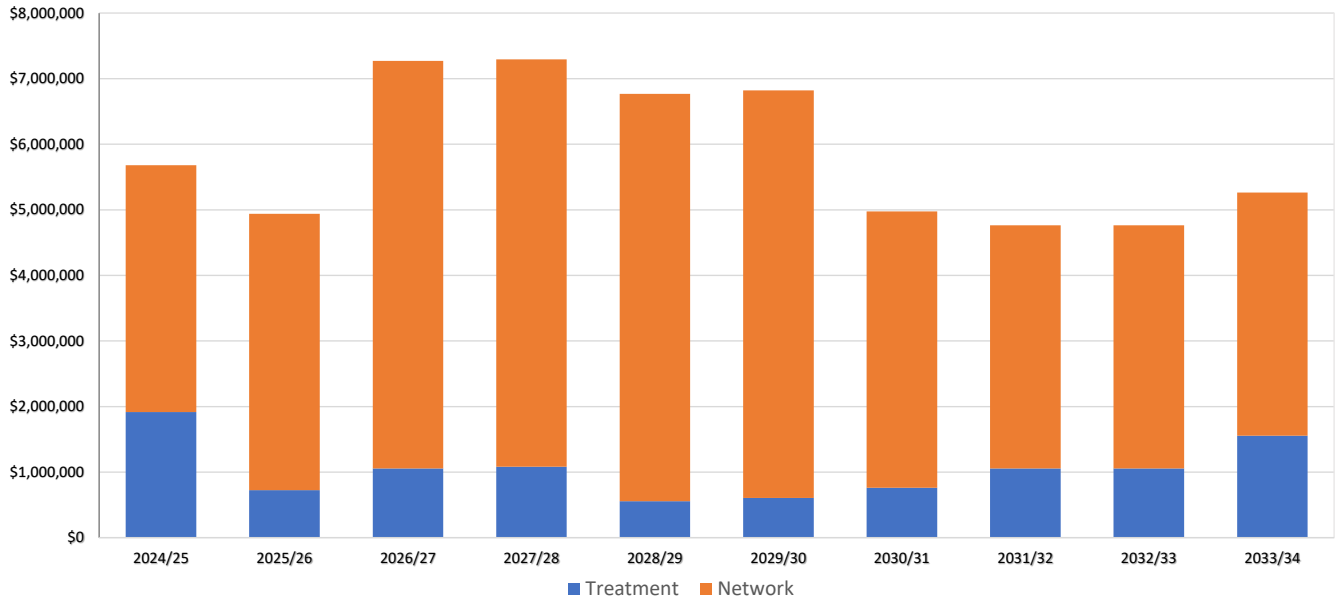


Figure 25: Proposed Renewal 10-year Expenditure Plan

Status: Final

Table 21:Proposed Renewal 10 year Expenditure Plan

Prog. Type	Prog. No. & Name	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	10 year Total
Renewal	54 - City-wide - Wastewater Pipe Renewal	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	**$30,000,000**
Renewal	65 - City-wide - Wastewater Pump Station Renewal	$165,000	$165,000	$165,000	$165,000	$165,000	$165,000	$165,000	$160,000	$160,000	$160,000	**$1,635,000**
Renewal	179 - Totara Road Wastewater Treatment Plant - Minor Equipment Renewals	$414,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	**$4,014,000**
Renewal	1068 - Totara Road Wastewater Treatment Plant - Replacement of Inlet Pumps	$1,242,000	$200,000	$500,000	$500,000	$0	$0	$0	$0	$0	$0	**$2,442,000**
Renewal	1380 - Totara Rd WWTP - Biogas Generator Major Overhauls	$258,750	$124,200	$155,250	$181,125	$155,250	$207,000	$362,250	$155,250	$155,250	$155,250	**$1,909,575**
Renewal	1714 - City-wide Wastewater Trunk Mains Renewal	$550,000	$1,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$1,000,000	$500,000	$500,000	$500,000	**$16,050,000**
Renewal	1887 - 3 Waters Minor Equipment Renewals	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	**$500,000**
Renewal	2268 - Biogas Engine Replacement	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,000,000	**$1,000,000**
Renewal	2332 - Sedimentation Tank Remediation	$0	$0	$0	$0	$0	$0	$0	$500,000	$500,000	$0	**$1,000,000**
Renewal	Total Annual Expenditure	**$5,679,750**	**$4,939,200**	**$7,270,250**	**$7,296,125**	**$6,770,250**	**$6,822,000**	**$4,977,250**	**$4,765,250**	**$4,765,250**	**$5,265,250**	**$58,550,575**

8.6.3 Proposed Capital Expenditure

The proposed budgets for capital new programmes are based on the information available for each programme. This could be a design, a feasibility study with various costed options, or simply a programme concept.

Proposed capital expenditure over the next 10 years is shown below. The highest proportion of investment is in treatment which is driven by earthquake strengthening of civil structures and the Nature Calls project. Network expenditure is mostly related to growth areas.

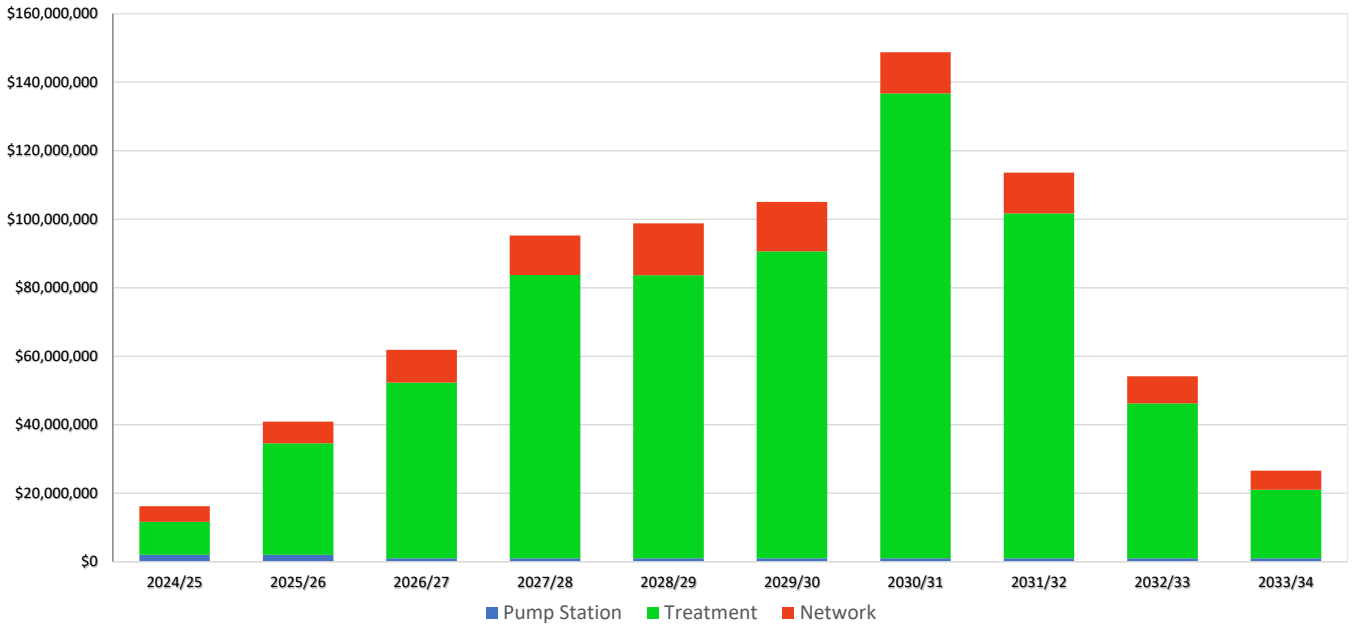


Figure 26: Proposed New Capital 10-year Expenditure Plan

Table 22:Proposed New Capital 10 year Expenditure Plan

Prog. Type	Prog. No. & Name	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34	10 Year Total
Capital	66 - Totara Road Wastewater Treatment Plant - Resilience Programme	$ 250,000	$ 250,000	$ 786,600	$ 986,600	$ 582,100	$ 582,100	$ 582,100	$ 573,000	$ -	$ -	**$ 4,592,500**
Capital	73 - Urban Growth - Development Contributions - Wastewater	$ 104,000	$ 150,000	$ 150,000	$ 200,000	$ 200,000	$ 200,000	$ 200,000	$ 250,000	$ 250,000	$ 250,000	**$ 1,954,000**
Capital	210 - Urban Growth - NEIZ - Wastewater	$ -	$ -	$ -	$ 517,000	$ 1,200,000	$ 2,500,000	$ 2,000,000	$ -	$ -	$ -	**$ 6,217,000**
Capital	628 - Totara Road Wastewater Treatment Plant - Consent Renewal Upgrade	$ 5,000,000	$ 27,000,000	$ 48,000,000	$ 79,100,000	$ 81,400,000	$ 89,000,000	$ 135,000,000	$ 100,000,000	$ 45,000,000	$ 20,000,000	**$ 629,500,000**
Capital	1000 - Urban Growth - Whakarongo - Wastewater	$ -	$ -	$ -	$ 350,000	$ 2,000,000	$ 2,000,000	$ -	$ -	$ -	$ -	**$ 4,350,000**
Capital	1055 - Urban Growth - Kakatangiata - Wastewater	$ -	$ 300,000	$ 3,000,000	$ 2,000,000	$ 2,000,000	$ 300,000	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 200,000	**$ 13,800,000**
Capital	1074 - Totara Road Wastewater Treatment Plant - Earthquake Strengthening of Civil Structures	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ -	$ -	$ -	$ -	$ -	$ -	**$ 8,000,000**
Capital	1412 - Urban Growth - Ashhurst - Wastewater	$ -	$ -	$ -	$ 250,000	$ 1,550,000	$ 200,000	$ 500,000	$ 1,000,000	$ -	$ -	**$ 3,500,000**
Capital	1616 - City-wide - Wastewater Pump Station - Capacity Upgrade	$ 2,000,000	$ 2,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	**$ 12,000,000**
Capital	1617 - Totara Road Wastewater Treatment Plant - Biogas System Improvements	$ 2,200,000	$ 2,600,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 4,800,000**
Capital	1677 - Upsizing of Kairanga Bunnythorpe Road Sewer and Storage	$ -	$ -	$ 1,000,000	$ 2,000,000	$ 2,000,000	$ -	$ -	$ -	$ -	$ -	**$ 5,000,000**
Capital	1712 - City-wide Wastewater wet weather overflow mitigation	$ 250,000	$ 1,500,000	$ 300,000	$ 2,000,000	$ 300,000	$ 552,500	$ 320,000	$ 1,759,500	$ 207,000	$ 1,552,500	**$ 8,741,500**
Capital	1821 - City-wide Wastewater Pipeline Realignment of at-risk mains	$ 1,600,000	$ 1,400,000	$ 1,500,000	$ 190,000	$ 190,000	$ 1,600,000	$ 1,400,000	$ 1,500,000	$ 130,000	$ 130,000	**$ 9,640,000**
Capital	2030 - Urban Growth - Aokautere - Wastewater	$ -	$ -	$ -	$ 250,000	$ 310,500	$ 700,000	$ 950,500	$ 600,000	$ -	$ -	**$ 2,811,000**
Capital	2229 - City-wide - Wastewater Pipe Improvement	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	**$ 10,000,000**
Capital	2248 - Urban Growth - NEIZ - Wastewater Asset Upgrade	$ -	$ -	$ -	$ -	$ 200,000	$ 500,000	$ 1,500,000	$ 2,000,000	$ 2,500,000	$ 1,000,000	**$ 7,700,000**
Capital	2249 - Wastewater Trunk Main - Infill Upgrades	$ 250,000	$ 500,000	$ 700,000	$ 275,000	$ 600,000	$ 750,000	$ 295,000	$ 650,000	$ 789,000	$ 310,000	**$ 5,119,000**
Capital	2250 - Bunnythorpe - Wastewater Reticulation Renewals	$ 200,000	$ 400,000	$ 400,000	$ 250,000	$ 650,000	$ 650,000	$ -	$ -	$ -	$ -	**$ 2,550,000**
Capital	2252 - WWTP - Replacement of PLCs and SCADA	$ -	$ -	$ -	$ -	$ -	$ -	$ 100,000	$ 100,000	$ 150,000	$ -	**$ 350,000**
Capital	2253 - Citywide - Aeration Pond Wave Band Repairs	$ 150,000	$ 200,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 350,000**
Capital	2257 - Citywide - Discharge Smart Meters for Large Tradewaste Customers	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	**$ 400,000**
Capital	2259 - WWTP - Emergency Bypass Upgrades	$ -	$ -	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ -	$ -	$ -	$ -	**$ 600,000**
Capital	2322 - Bunnythorpe - Wastewater Network Upgrades	$ -	$ -	$ 250,000	$ 1,000,000	$ 1,700,000	$ 2,230,000	$ 750,000	$ -	$ -	$ -	**$ 5,930,000**
Capital	2323 - Citywide - Relining of Wastewater Pipes	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	**$ 10,000,000**
Capital	2329 - Citywide - Wastewater Pump Station H&S Upgrades	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	**$ 500,000**
Capital	2330 - 3 Waters Telemetry Upgrades	$ -	$ 500,000	$ 500,000	$ 550,000	$ 600,000	$ -	$ -	$ -	$ -	$ -	**$ 2,150,000**
Capital	2331 - Citywide Wastewater Critical Spares	$ 100,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	**$ 550,000**
Capital	Total Expenditure	**$ 16,194,000**	**$ 40,940,000**	**$ 61,876,600**	**$ 95,208,600**	**$ 98,772,600**	**$ 105,054,600**	**$ 148,737,600**	**$ 113,572,500**	**$ 54,166,000**	**$ 26,582,500**	**$ 761,105,000**

8.7 Improvement Items

Items identified that would improve lifecycle management are:

- Turn the existing SLAs and various dispersed planning documents into operation and maintenance practice documents for the wastewater network, pump stations, and treatment and disposal.
- Undertake gap analysis of SOPs and plan for documentation of all procedures.
- Improve recording of pump station, treatment and disposal operational and maintenance data in IPS.
- Increase amount of condition inspections sufficient to assess the overall condition of and rate of deterioration of the network, pump stations, and treatment and disposal assets (including incorporating into scheduled maintenance routines).
- Expand out GIS mapping of forward works to avoid clashes to 30 years.
- Extend our pipe renewal programming out to six years to reduce the risk of conflicts with other services that also need to be renewed.
- Optimise CCTV and condition inspections in order to assess the overall condition of the network, pump stations and treatment plant and rate of deterioration of assets.

9 Financial Summary

This section outlines the long-term financial requirements for the operations, maintenance, capital renewal and capital new to meet the agreed levels of service for the wastewater activity. These requirements have been identified and assessed individually throughout this plan and are summarised in this section. This section also includes discussion on the strategies used to develop the financial budgets, as well as the assumptions and risks inherent in the budget forecasts.

A theoretical renewals profile (based upon asset valuation information) is provided in **Appendix E**Error! Reference source not found.**.**

Key assumptions made in preparing proposed financial requirements are provided in **Appendix F.**

9.1 Asset Valuation

Our assets were last valued in 2022 (Revaluation of PNCC 3 Waters Assets 2022, AECOM, August 2022). The valuation covered all three waters assets and excluded capital works in progress and capitalised cost items associated with asset repairs, maintenance or labour. Land values were provided by Council and included in the valuation report for completeness.

The tables below shows a breakdown of asset value between reticulation and non-reticulation assets and movements since the last valuation in 2020.

Table 23: Wastewater Revaluation 2022 (Source: Revaluation of PNCC Waters Assets 2022, AECOM, August 2022)

Asset Group	Optimised Replacement Cost 30-Jun-22	Optimised Depreciated Replacement Cost 30-Jun-22	Annual Depreciation 2022
Reticulation	$412,608,271	$204,830,596	$3,888,195
Non-reticulation	$75,098,314	$45,843,031	$1,371,955
Total	$487,706,585	$250,673,626	$5,260,150

Table 24: Comparison between Revaluation 2020 and 2022 (Source: Revaluation of PNCC 3 Waters Assets 2022, AECOM, August 2022)

Asset Group	Optimised Replacement Cost change since 2020	Optimised Depreciated Replacement Cost change since 2020	Annual Depreciation change since 2020
Reticulation	+$76,809,127	+$37,845,538	+$651,699
Non-reticulation	+$10,641,345	+$5,910,039	+$234,710
Total	+$87,450,472	+$43,755,577	+$886,408
% increase 2022 vs 2020	21.85%	21.15%	20.27%

The asset values have increased significantly since the last valuation in 2020. The report found that general movements were due to:

1. Inflation in construction costs.
2. Additional assets that have been added since the 2020 valuation (partially offset by assets which have been removed).
3. The application of an additional 2 year's depreciation.
4. Changes from 2020 to 2022 in the base asset data. This reflects PNCC's commitment to ongoing improvement in the quality of its asset data.

Specific comments for wastewater were:

- The wastewater assets have increased in Optimised Replacement Cost, Optimised Depreciated Replacement Cost, and Annual Depreciation by 22%, 21% and 20%, respectively. The majority of these increases were due to the addition of assets and inflation in construction costs as reflected in the changes to the capital goods price indices.

9.1.1 Valuation Improvements

The 2022 valuation report recommended the following improvements to future Three Waters asset valuations.

- **Unit rates** – unit rates from contracts carried out during the year are captured in a suitable database and that the supply of rates in a suitable format and incorporating an appropriate apportionment of contract costs such as P&G, Insurances etc. is a contract condition for 3 waters construction contracts.
- **Asset remaining lives validation** - a sample of actual asset condition data is used to confirm the assumption that asset condition and remaining life is proportional to age.
- **Verification of Unit Rates** - unit rates from this valuation are compared with actual construction costs in the local market and identifying future movements in rates (either upwards or downwards) that may be appropriate
- **Site Visit** - undertake a site visit to validate a sample of asset data
- **Standardisation of Valuation Approaches** - discussions with Audit NZ and/or the National Transition Unit of the Department of Internal Affairs regarding the standardisation of the valuation approach, assumptions and interpretation prior to the formation of the proposed Water Entities.

9.2 Financial Forecasts

Thirty year capital and operational forecasts proposed in the draft Long Term Plan 2024/34 and Infrastructure Strategy are shown below. Years 11 to 30 are shown in five year groups.

9.2.1 Overall Capital and Operational Forecast

The largest proportion of proposed investment is to achieve levels of service over the next 30 years. This is followed by renewals and growth. Focused investment is required to implement the Nature Calls project, renew critical assets and provide infrastructure for new growth areas.

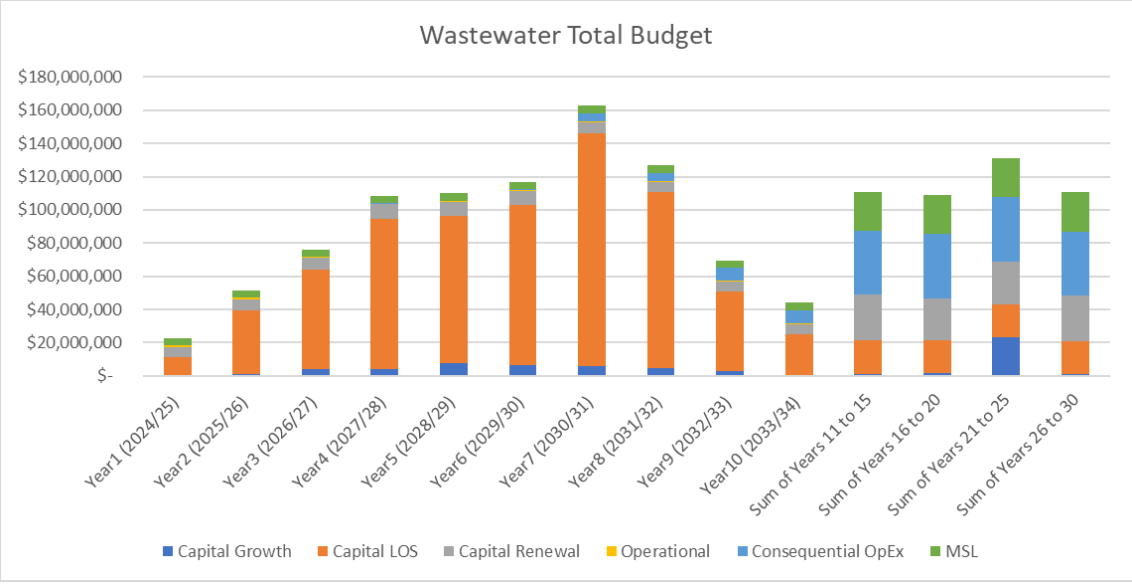


Figure 27: Overall Capital and Operational Forecast

9.2.2 Operations and Maintenance Forecast

The highest proportion of operational expenditure is to operate and maintain existing assets. Consequential operational expenditure (from the creation of new assets) increases steadily from year 7 due to the Nature Calls projects and new assets associated with growth areas.

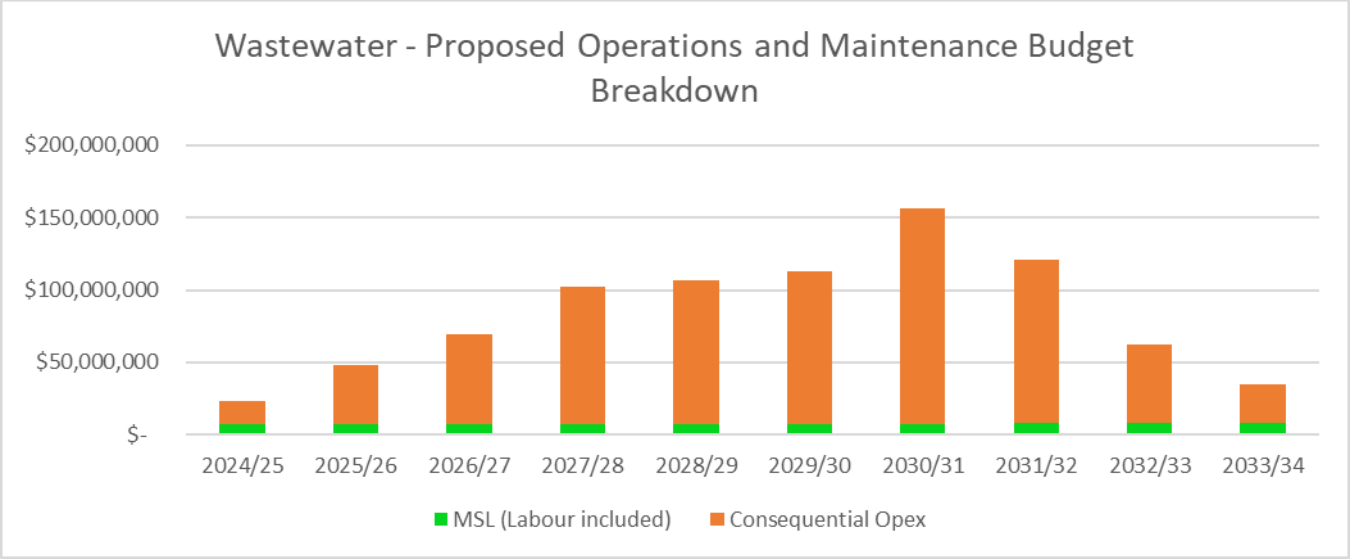


Figure 28: Operations and Maintenance Forecast

9.2.3 Renewal Forecast

The forecast annual renewals expenditure is similar to annual depreciation values and is steady for the next thirty years.

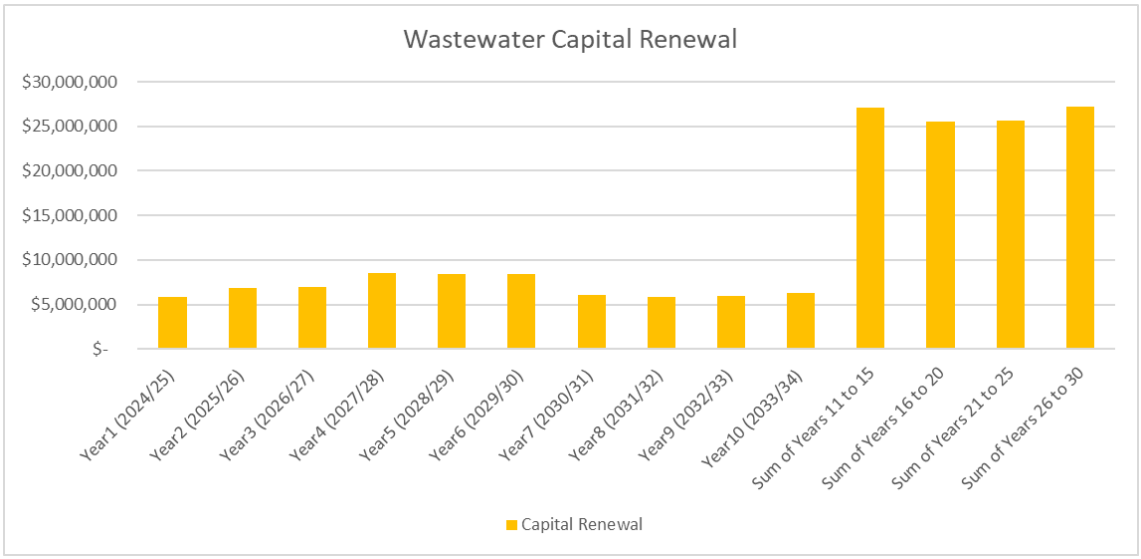


Figure 29: Renewals Forecast

9.2.4 Capital Forecast

Capital investment is mainly for levels of service and then to meet project growth demands. Actual service growth is dependent on timing of developments.

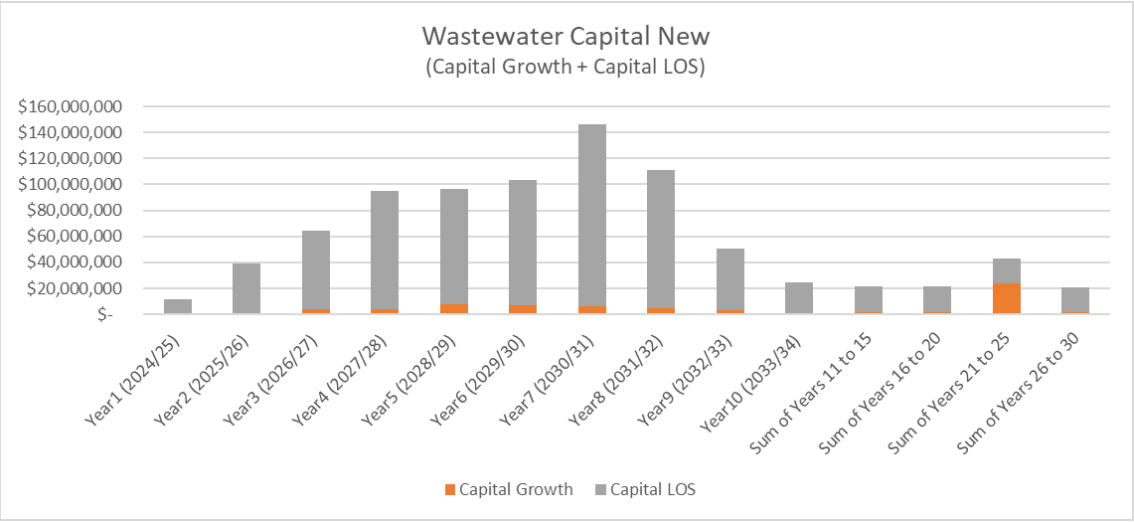


Figure 30: Capital LOS and Growth Forecast

9.3 How We Will Pay for It

The different types of expenditure are funded in different ways. These are as follows:

- **Operations and maintenance** are funded by trade waste fees and charges and targeted rates, depending on how the benefits of the activity are assessed - as a public or private benefit - or where costs can be attributed to an individual entity.

  Trade waste charges are calculated on a flow and load proportional basis in accordance with the Council's Trade Waste Bylaw. Targeted rates for the wastewater activity are calculated as a fixed charge per separately used or inhabited part for residential properties, and for all other properties, a fixed charge per rating unit.

- **Capital renewal** is funded from trade waste fees and charges, rates revenue collected to cover renewal costs and loan finance if necessary.

- **Capital new** is funded from subsidies and grants (where available), user contributions, reserves, and, where necessary, from borrowing. Subsidies and grants relate to Central Government funding contributions towards the cost of wastewater capital upgrades, and research into new innovations involving sustainable treatment of wastewater by-products (e.g. sludge). There is currently no Central Government funding available for wastewater capital renewal works. Programmes that are attributable to growth are shown in this AMP. Through the application of its Development Contributions Policy, the Council seeks to obtain contributions to fund the infrastructure that is required due to City growth. Development contributions for wastewater are area specific.

9.4 Financial Forecast Uncertainty

9.4.1 Potential Effects of Uncertainty

Expenditure forecasts are based on the best available information. The longer-term budgets will be refined both in scope and costing as these programmes get closer to implementation. Periodic revision and adjustment to the schedule of works every three years enables the adverse effect of uncertainty in the financial forecasts to be mitigated.

Should the required level of funding not be available, then there is a potential risk of deferred maintenance and renewal or development. This may not be noticeable immediately but would ultimately result in agreed levels of service not being met.

The ideal cost accuracy for any programme (operational, renewal and new) is based on when the programme first appears in the 10 Year Plan or Infrastructure Strategy. These ideal accuracies are:

Years 1 to 3 (2024/25 -2027/28): The scope and pricing of work should be reliable, based on good market information for unit rates, etc.

Years 4 to 6 (2027/28 - 2029/30): Estimates should be reliable, with detailed design work not yet carried out.

Years 7 to 10 (2010/11 - 2033/34): Estimates generally based on a high-level idea of what the programme will involve.

Years 11 to 30 (2034/35 onwards): Rough order costing based on the estimated quantum of work; forecasts could change significantly with further investigation.

9.4.2 Operational and Maintenance Forecast Reliability

How we operate and maintain our assets day-to-day is important in the performance of the wastewater activity. Operational activities ensure the successful continuation of the service, while maintenance activities serve to extend the life of the asset, delaying the need for asset renewal.

Forecasts of operational and maintenance expenditure are reasonably reliable based on a known quanta and scope of work. However, as the operational and maintenance procedures are collected and documented, there will be more certainty and reliability in forecasting the operations and maintenance budgets.

Obtaining condition data will also have an impact on O&M budgets as some specific assets may require immediate maintenance in response to the condition inspections. The impact of this will not be known until the condition inspections are begun.

9.4.3 Capital Renewal Forecast Reliability

The renewals expenditure forecast is mostly based on the asset information out of IPS. Renewal budget for different asset types were created using the asset install date, estimated useful life, and the replacement cost from the recent asset revaluation. There is some uncertainty when using the estimated useful life of any asset for forecasting renewals budget.

The reliability of the renewals forecast will improve once asset condition and performance data is obtained. However, the budgets are expected to be of the right quantum over 30 years, with the condition data changing the date of renewal of specific assets as opposed to the overall budgets.

Another factor that may affect the certainty of the long-term renewals forecast is the rate of increase in the value of the assets. If the overall valuation increases at the same rate as inflation, then the forecast renewals budget with an inflation adjustment will adequate. If the asset value increases at a greater rate than inflation, as has occurred in the last three years, then the forecast renewals budgets will need to be revised.

9.4.4 Capital New Forecasts Reliability

The budget forecast for each capital new programme is based on the assumptions and information available for that programme, and thus the reliability varies between programmes. The data associated with each programme indicates the reliability of the budget for that programme.

The timing of the growth programmes assumes that the demand for these programmes will occur in a predicted year. However, when this demand will trigger the need for the growth programmes occur is uncertain. While the budget for each growth programme has a stated level of reliability, the timing of the programme has a relatively low level of reliability. The development scenario for residential growth is based on meeting the needs of a growing population and includes the additional margins required by the National Policy Statement for Urban Development Capacity.

9.5 Improvement Actions

There are no improvements actions for this section.

10 How We Manage the Wastewater

10.1 Asset Management Leadership and Teams

Asset ownership ultimately sites with the Elected Members and Executive Leadership Team while Asset Management as a forward focus is primarily lead by Strategy and Planning. The Three Waters Division (Infrastructure Unit) is primarily accountable for the management of the Wastewaer Activity (service delivery).

The Three Waters Division is also supported by functions that sit within other Units of Council as summarised inTable 25. In time, Asset Management leadership will include a, yet to be established, cross-functional Steering Group.

Table 25: Asset Management Functions and Teams

Function		Unit | Division | Team
Leadership		Elected Members Executive Leadership Team
Finance	Support Service	Finance Infrastructure | Asset Planning | Asset Planning Team
IT		People and Performance | Digital Solutions
HR		People and Performance | People Operations People and Performance | Employee Experience
Asset Management Plans	Forward Focus	Strategic Planning | City Planning Infrastructure | Asset Planning | Asset Management Team
Risk Management		Finance | Risk and Resilience
Performance Management		Strategic Planning | Community Planning People and Performance | Organisation Performance
Continual Improvement		Infrastructure | Asset Planning | Asset Planning
Construction	Present Day	Infrastructure | Three Waters Infrastructure | Project Management Office
Operations		Infrastructure | Three Waters
Maintenance		Infrastructure | Three Waters
Customer Interface		Customer | Customer Contact
Technical Specialists	All	Various Internal and External Design Panel
GIS	Data	People and Performance | Digital Solutions | GIS
Asset Management System		Infrastructure | Asset Planning
Records		People and Performance | Digital Solutions | Records Information

An organisation chart is provided for reference in Figure 31below.

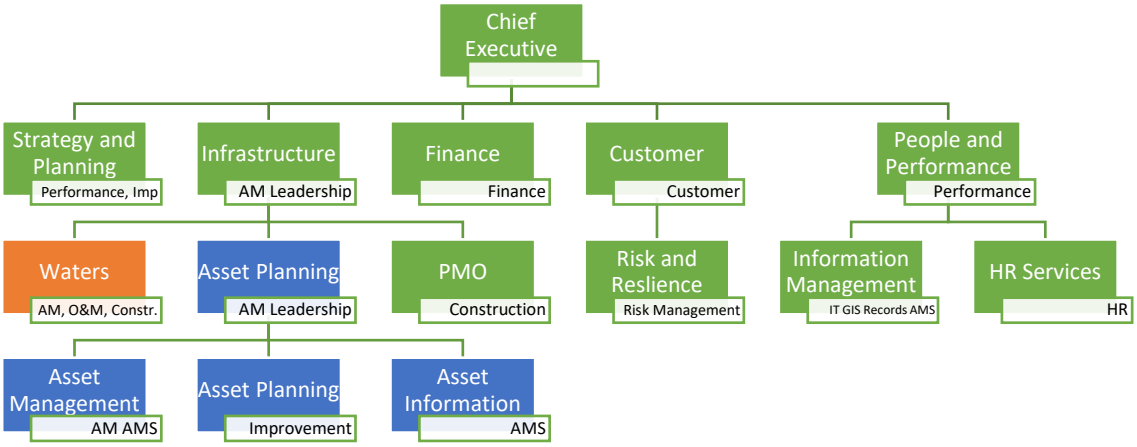


Figure 31: Organisation Chart with Asset Management Functions

10.2 Service Delivery

10.2.1 Overview of Service Delivery Model

While many Councils have outsourced their Wastewater service delivery, we have retained significant capability in-house, as summarised in Table 26 below. Essentially, either more complex activities (such as the design and construction of treatment plants), or less frequent (such as the design and construction of trunk mains), are delivered through the procurement of external contractors.

External contractors are procured in line with our Management Team Policy for procurement and are managed predominantly by in-house Project Managers. Note that external consultants are also engaged to carry out specialist investigations or provide technical advice on planning, consenting and policy matters, or temporarily fill vacancies as part of the asset management function.

Table 26: Service Delivery Model by Sub-Activity

Service Delivery Function	Internal Service Delivery Team	Internal Capabilities	External Service Delivery
Design	Three Waters > Activities Team	Network renewals	Design Panel established May 2022 for most projects
Construct	Three Waters > Networks Operations Three Waters > Networks Capital	Minor projects (Fitting, mechanical and electrical) Pipe renewals and channel upgrades	Some operational projects delivered externally Plant, equipment and large capital upgrades
Operate	Three Waters > Networks Operations, Treatment	All Minor CCTV capability	Backflow device testing and laboratory services CCTV inspection
Maintenance	Three Waters > Networks Operations, Treatment	All reticulation Minor treatment repairs (fitters)	Mechanical and electrical repairs

10.2.2 Section 17A Review of Service Delivery Model

The service delivery model was not reviewed in 2017 with other Activities as the service delivery model will be determined by the national Three Waters Reform.

10.3 Asset Management Planning

The development of this Asset Management Plan was led by the Asset Management Team and sponsored by the Three Waters Division. Teams responsible for the asset management functions that support the Wastewater Activity (see Table 25 above) were engaged with as key stakeholders in order to produce the 2023 version of the Wastewater AMP.

10.4 Management Systems

10.4.1 Asset Management System

The Asset Management Maturity Assessment also found organisational issues with the Management System:

- **Scope:** This is now defined in the SAMP.
- **Asset portfolio:** This is now defined in the SAMP.
- **Asset Management Functions:** Refer to Table 25.
- **Processes:** Few processes have been documented.
- **Asset Management Maturity Levels:** These were set during the 2022 Asset Management Maturity Assessment.

10.4.2 Business Process Mapping

For the Wastewater Activity there are few processes mapped and heavy reliance on key people. Standard Operating Procedures however are well established where there are risks to quality or health and safety. This is expected to improve once the Asset Management Policy is adopted.

10.5 Information Systems and Tools

Table 27 below contains a summary of the Asset Information System used by this Activity and commentary on recent improvements or issues. Further commentary on software specific to the Activity and data is provided below.

Table 27: Asset Information Systems

Component Type	Components	Improvements and Issues
Procedures and Standards	• Staff have begun documenting procedures in Promapp. • Standard Operating Procedures are saved in OASIS (document management system). •	• Standard Operating Procedures are established but require continual review for relevance and accuracy • Maintenance management – needs improvement
People	• The 2022 Asset Maturity Assessment noted: The organisational restructure brought together asset management information and planning teams, and created a project management office. In addition, transport was split into a separate group from the three waters There has been a significant turnover of staff, with many fairly new to their roles. There are also roles that have yet to be filled in some teams. It is expected that with a continued focus on asset management, staff training and experience that the gap in maturity will close over the next three years.	• Asset information integration with financial and customer service systems is limited. • The customer services system has been linked with asset information via GIS – a special layer has been created, at the request of operations staff, to enhance visibility of issues. The Asset Investigations and Planning team have been meeting monthly with Depot Three Waters operations staff to understand and respond to their data/data analysis needs, and to provide visibility to existing data and data systems.

Component Type	Components	Improvements and Issues
Data	• Asset hierarchy in place. • Asset naming convention in place. • Asset register is complete enough for valuation purposes. • Data confidence has been assessed. • Field asset data is collected by Operations team using the Field Inspector add-on to IPS The Criticality Framework and Condition and Performance policies have both been completed over the past 3 years	• The Asset Information Team have conducted a number of training sessions, including site visits, to train Operations staff to use the Field Inspector add-on to IPS. Use of Field Inspector enables capture of Asset Data in the field, including maintenance data. • Consider training Treatment Plant staff in using field inspector for plant assets (as relevant) • Data is being collected but not necessarily being fully utilised in improvements. No formal asset data programme to address information gaps. • Asset data confidence and reliability requires validation • Criticality scores have not yet been applied at a component level in IPS – this is an improvement item across Infrastructure and all AI systems Existing time series data is not easily accessible (SCADA and Telemetry data) – partly due to security concerns – however there is a programme proposed to make this data accessible and able to be interrogated safely
Software	• IPS Hansen (waters), RAMM (transportation), SPM (buildings) - asset as-built attributes, condition, maintenance, criticality, valuation details • Salesforce Quality Supply and Demand (QSD) reporting and analytics • Infrastructure Data – migrating from RCMonitoring for water quality/consent compliance and other time series data (e.g. rainfall, dam water levels, stream flows). • Authority Altitude (financial, corporate valuation) • KBase (Customer Requests) • RCMonitoring App (consent management) • ArcGIS (geographical information system) • Hydraulic modelling - Hydraulic modelling – Mike Plus for water supply and wastewater models. Tuflow model for stormwater model (2D) and Waternet advisor (DHI) for strategic modelling • Project Management – plans to replace Project Status with new software MagiQ – financial and programme tracking and reporting tool	• Corporate project to improve data integration by creating data lake across datasets • Limited reporting and analytics. Need more development of models and planning tools for renewals and capital upgrades.

10.6 Quality of Data Supporting the Plan

10.6.1 Asset Data Requirements

The quality of our asset data is the foundation to staff making evidence-based decisions when managing this Activity. The business processes for the capture and recording of data are not well defined. This includes, when to collect data, what data is collected, how the data is collected and who should collect the data.

While we have enough information to complete asset valuation (basis attributes, replacement cost and asset age/life) we have limited criticality information (completed for piped network) to support prioritisation of programmes.

10.6.2 Asset Hierarchy

An Asset Hierarchy for the activity has been established (refer OASIS 2931127 and 2927045).

10.6.3 Data Management and Confidence Levels

Table 28Table 28 contains the data confidence levels for different asset attributes, which have been assessed using the confidence categories in Table 29

Table 29. As data requirements are specified and data collection prioritised, it is expected that data confidence levels will increase.

Table 28: Summary of Asset Data Confidence Levels

Asset	As-Built Attributes	Condition	Repairs and Maintenance	Utilisation	Demand and Forecasts	Criticality	Risk	Resilience	Service Performance	Valuation	Financial Performance
Pipelines	5	3	4	3	4	4	3	3	3	4	3
Manholes	4	3	4	3	same as pipes	same as pipes	3	2	3	4	3
Laterals	3	2	3	3	3	Not relevant	3	2	3	3	3
Pump Stations	3	3	2	3	4	3	3	3	3	4	3
Treatment Plants	4	4	4	3	4	3	3	3	3	3	3
Oxidations Ponds	2	2	2	3	2	2	2	2	3	3	3
Valves	3	3	3	2	2	3	0	0	2	4	0

Table 29: Asset Data Confidence Level Grading System

Confidence Grade	Description	Processes	Asset Data
5	Highly reliable/ Audited	Strictly formal process for collecting and analysing data. Process is documented and always followed by all staff. Process is recognised by industry as best method of assessment.	Very high level of data confidence. Data is believed to be 95 to 100% complete and ±5% accurate. Regular data audits verify high level of accuracy in data received.
4	Reliable/ Verified	Strong process to collect data. May not be fully documented but usually undertaken by most staff.	Good level of data confidence. Data is believed to be 80 to 95% complete and ±10 to 15% accurate. Some minor data extrapolation or assumptions has been applied. Occasional data audits verify reasonable level of confidence.
3	Less Reliable	Process to collect data established. May not be fully documented but usually undertaken by most staff.	Average level of data confidence. Data is believed to be 50 to 80% complete and ±15 to 20% accurate. Some data extrapolation has been applied based on supported assumptions. Occasional data audits verify reasonable level of confidence.
2	Uncertain	Semiformal process usually followed. Poor documentation. Process to collect data followed about half the time.	Not sure of data confidence, or data confidence is good for some data, but most of dataset is based on extrapolation of incomplete data set with unsupported assumptions.
1	Very uncertain	Ad hoc procedures to collect data. Minimal or no process documentation. Process followed occasionally.	Very low data confidence. Data based on very large unsupported assumptions, cursory inspection and analysis. Data may have been developed by extrapolation from small, unverified data sets.
0	No data	No process exists to collect data.	No data available.

10.7 Improvement Actions

- Update this AMP with latest Waters organisation chart
- Consider training Treatment Plant staff in using field inspector for plant assets (as relevant)
- Maintenance management process needs improvement
- Improve asset information integration with financial and customer service systems
- Develop processes for asset and performance data to be better utilised in improvements.
- Consider formal asset data programme to address information gaps.
- Asset data confidence and reliability requires validation
- Criticality scores have not yet been applied at a component level in IPS – this is an improvement item across Infrastructure and all AI systems
- Improve accessibility of existing time series data (SCADA and telemetry data)
- Corporate project to improve data integration by creating data lake across datasets
- Improve data and performance reporting and analytics.
- Further development of models and planning tools for renewals and capital upgrades.

11 Plan Monitoring and Improvements

This section describes activity specific asset management improvements made in the last three years and our proposed focus improvement areas for the next three years. It also summarises our recent asset management maturity assessment results and improvements identified in this AMP.

11.1 Achievements

Over the past three years several identified asset management improvement items have been completed by the Wastewater Activity team.

Two key improvements which have had a significant impact on activity have been:

- an improved understanding of our wastewater network. This has been achieved by taking ownership of the wastewater model, updating the model engine and developing a full understanding of how the model works. Ownership of the model has given PNCC the ability to respond quickly to requests from developers for wastewater assessments and to carry out its own assessment of the impacts of urban intensification on the network
- the award of a maintenance contract for mechanical and electrical wastewater assets (excluding mechanical maintenance at the WWTP). This will result in improved knowledge about asset condition, asset maintenance, creation of a critical spares inventory, and the introduction of a preventative maintenance schedule. Asset reliability is expected to improve, and reactive maintenance costs are expected to reduce over time as this contract progresses.

Further improvements have been the establishment of a CCTV condition assessment programme, targeted at the most critical and poor condition assets to inform our renewals programme.

Note that staff turnover and vacant roles in the team have limited their capacity to implement improvements.

Pan-Infrastructure work has also been carried out to develop Asset Condition and Performance policies for all activity groups.

Further work has been completed to develop a Criticality Framework for all activity groups and asset classes, however the framework has yet to be applied to all assets.

11.2 Next steps

To align with pan-Infrastructure Asset Management improvement items, the Wastewater Activity team have identified four Improvement Items to focus on over the next three years (refer to table below). Many of these programmes and associated improvement activities have already been identified in the Infrastructure Asset Management Improvement Plan.

Table 30: Activity Improvement Plan Focus Areas

	Proposed Improvement Action	Status	Comment	Who is responsible
1.	Calibration of wastewater model	In Progress	Deployment of 10 flow measurement devices at critical locations throughout the network, during 2023, followed by recalibration of the model, planned to occur in 2024.	Service Manager - Wastewater
2.	Renewals programme	In Progress	Further develop the wastewater pipe renewals programme based on asset criticality, condition and performance	Service Manager - Wastewater
3.	Cost to Serve	Not started	Development of “zero base” budgets. Determine inputs required to deliver promised Levels of Service. This will be an Infrastructure wide programme of work and will enable various growth scenarios for the Wastewater network and treatment plant to be costed.	
4.	Promapp of processes	Not started	Documentation of AM and operating and maintenance processes. This will occur in parallel with Item 3 and will help to inform both Items 2 and 3.	

11.3 Maturity Assessment

Recent external reviews of Council's asset management practice were undertaken in July 2019 and May 2022. Both reviews were carried out by Infrastructure Associates Ltd using the New Zealand Treasury framework. The broader discussion of the results of these are outlined in the SAMP. One of the outputs of the reviews was a list of activity specific improvement items. Many of the more generic improvement items have and are continuing to be addressed by the Asset Planning Division, alongside the development of the Asset Management Policy and Strategic Asset Management Plan.

The maturity assessment improvement items are listed in the table below. For each item there is comment on the status and progress that has been made, as well as where it is addressed, either in the SAMP or this AMP.

Table 31: 2022 Maturity Assessment Actions

AM Function	Recommended Improvements	AMMA Priority	Progress	AMP/SAMP
Strategic Direction	Consider developing activity related asset management policies.	Medium	Not started	
Levels of Service Framework	Review three waters levels of service performance measures and develop options for the next LTP round.	High		
Demand Forecasting and Management	Review the impact of demand resulting from infill development on existing infrastructure	High Yr2	Not started although work on the WW model will enable scenario exploration	
Asset Condition and Performance	Develop process to capture asset condition data during routine inspections and repair work.	Medium	In progress CCTV programme in place	
Managing Risk and Resilience	Need to fully develop and embed risk capture and escalation process across the Infrastructure Unit.	Medium	In progress Risk Framework in place	This AMP refer to Section 7
Operational Planning	Develop process to centrally develop and track proactive maintenance schedules.	High Yr1	In progress	This AMP refer to Section 8
Asset Data and Information	Complete the review of the critical assets and classify the criticality of the three waters assets within the asset database.	High Yr2	In progress Criticality framework complete, but not all assets have been classified yet	This AMP refer to Section 7
Asset Management Information Systems (AMIS)	Reconfigure IPS system to improve functionality, especially around the capture of condition data.	High Yr1	In progress	This AMP refer to Section 10

AM Function	Recommended Improvements	AMMA Priority	Progress	AMP/SAMP
			IPS hierarchy has been reset	
AM Process Management	Complete mapping of processes in ProMapp	Medium	In progress	

11.4 Improvement Plan

Section 7.2 of the SAMP describes how the Asset Management Improvement Plan (AMIP) has been developed and is being implemented. This plan captures, contains and tracks progress of all identified improvement items for each Activity Area, including Resource Recovery, as well as for Council and Infrastructure wide improvements.

11.5 Improvements identified in this AMP

The table below summarises activity and AMP improvements identified in this AMP. These are yet to be prioritised and allocated to staff for action.

Table 32: AMP Improvements

AM Function	Recommended Improvements	AMMA Priority	Progress	AMP/SAMP
Climate change plan	• Council includes specific actions for three waters activities in the next update of its climate change action plan			
Managing risk and resilience	• Fully develop and embed the risk capture and escalation process across the Infrastructure unit (which covers this activity). • Assign criticality ratings for all above ground assets • Formally incorporate collection and treatment assets into the criticality framework • Apply asset criticality in condition assessment and renewal programmes • Further embed asset criticality in other investment decision making processes			
Asset condition and performance	• Implement the draft condition and performance policy (including improvement actions) • To better focus our renewals programme investment, we propose to develop preventative			

AM Function	Recommended Improvements	AMMA Priority	Progress	AMP/SAMP
	maintenance and condition assessment programmes • Optimise amount of pipe sampling and condition inspections in order to assess the overall condition of the network and rate of deterioration of assets • Develop the scheduled maintenance to ensure that the condition information required is captured			
Improvements to this AMP	• Include more condition assessment information about treatment plant assets in this AMP. • Update this AMP with current commitments to regional CDEM and Lifeline groups • Update this AMP with most recent water safety plan risks • Update this AMP with latest asset data confidence table			AMP
Operational planning/ Promapp of processes	• Turn the existing SLAs and various dispersed planning documents into operation and maintenance practice documents for the water collection, treatment, and reticulation • Undertake a gap analysis of SOPs and plan for documentation of all procedures • Process map all operational and maintenance practices and procedures. • Develop feedback and improvement processes for operation and maintenance practices and procedures. • Undertake formal reviews and/or optimisation studies of maintenance and operations activities based on data and risk			

AM Function	Recommended Improvements	AMMA Priority	Progress	AMP/SAMP
	• Review, revise and process map the processes for disposal of plant and equipment • Integrate treatment plant processes into Promapp • Maintenance management process needs improvement • Develop processes for asset and performance data to be better utilised in improvements			
Asset Information Systems	• Review the breakdown of plant and equipment in IPS to ensure it is appropriate for valuation, maintenance and renewal • Improve recording of treatment and disposal operational and maintenance data in IPS • Consider training Treatment Plant staff in using IPS Field Inspector for plant assets (as relevant)			
Capital Works Planning	• Extend our pipe renewal programming out to six years to reduce the risk of conflicts with other services that also need to be renewed			
Asset Data and Information	• Improve asset information integration with financial and customer service systems • Consider formal asset data programme to address information gaps • Asset data confidence and reliability requires validation • Improve accessibility of existing time series data (SCADA and telemetry data) • Corporate project to improve data integration by creating data lake across datasets • Improve data and performance reporting and analytics			

AM Function	Recommended Improvements	AMMA Priority	Progress	AMP/SAMP
	• Further development of models and planning tools for renewals and capital upgrades			

12 Appendices

A. Glossary

The following terms and acronyms (in brackets) are used in this Asset Management Plan.

Term / Acronym	Definition
Activity	An activity is the work undertaken on an asset or group of assets to achieve a desired outcome.
Advanced Asset Management (AAM)	Asset management practice that has evolved to a state that matches business needs. AAM employs predictive modelling, risk management and optimised renewal decision making techniques to establish asset lifecycle treatment options and related long term cashflow predictions. (See Core asset management).
Annual Budget	The Annual Budget provides a statement of the direction of Council and ensures consistency and co-ordination in both making policies and decisions concerning the use of Council resources. It is a reference document for monitoring and measuring performance for the community as well as the Council itself.
Asset	A physical component of a facility which has value, enables services to be provided and has an economic life of greater than 12 months.
Asset Management (AM)	The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost effective manner.
Asset Management System (AMS)	A system (usually computerised) for collecting analysing and reporting data on the utilisation, performance, lifecycle management and funding of existing assets.
Asset Management Plan (AMP)	A plan developed for the management of one or more infrastructure assets that combines multi-disciplinary management techniques (including technical and financial) over the lifecycle of the asset in the most cost effective manner to provide a specified level of service. A significant component of the plan is a long term cashflow projection for the activities.
Asset Management Strategy	A strategy for asset management covering, the development and implementation of plans and programmes for asset creation, operation, maintenance, renewal, disposal and performance monitoring to ensure that the desired levels of service and other operational objectives are achieved at optimum cost.
Asset Management Team	The team appointed by an organisation to review and monitor the corporate asset management improvement programme and ensure the development of integrated asset management systems and plans consistent with organisational goals and objectives.
Asset Register	A record of asset information considered worthy of separate identification including inventory, historical, financial, condition, construction, technical and financial information about each.
Benefit Cost Ratio (B/C)	The sum of the present values of all benefits (including residual value, if any) over a specified period, or the life cycle of the asset or facility, divided by the sum of the present value of all costs.
Business Plan	A plan produced by an organisation (or business units within it) which translate the objectives contained in an Annual Budget into detailed work plans for a particular, or range of, business activities. Activities may include marketing, development, operations, management, personnel, technology and financial planning
Capital Expenditure (CAPEX)	Expenditure used to create new assets or to increase the capacity of existing assets beyond their original design capacity or service potential. CAPEX increases the value of an asset.
Cash Flow	The stream of costs and/or benefits over time resulting from a project investment or ownership of an asset.

Term / Acronym	Definition
Components	Specific parts of an asset having independent physical or functional identity and having specific attributes such as different life expectancy, maintenance regimes, risk or criticality.
Condition Monitoring	Continuous or periodic inspection, assessment, measurement and interpretation of resulting data, to indicate the condition of a specific component so as to determine the need for some preventive or remedial action
Core Asset Management	Asset management which relies primarily on the use of an asset register, maintenance history, condition assessment, defined levels of service, and simple risk and benefit/ cost assessments in order to establish work priorities and long term cashflow predictions.
Critical Assets	Assets for which the financial, business or service level consequences of failure are sufficiently severe to justify proactive inspection and rehabilitation. Critical assets have a lower threshold for action than non-critical assets.
Current Replacement Cost	The cost of replacing the service potential of an existing asset, by reference to some measure of capacity, with an appropriate modern equivalent asset.
Deferred Maintenance	The shortfall in rehabilitation work required to maintain the service potential of an asset.
Demand Management	The active intervention in the market to influence demand for services and assets with forecast consequences, usually to avoid or defer CAPEX expenditure. Demand management is based on the notion that as needs are satisfied expectations rise automatically and almost every action taken to satisfy demand will stimulate further demand.
Depreciated Replacement Cost (DRC)	The replacement cost of an existing asset after deducting an allowance for wear or consumption to reflect the remaining economic life of the existing asset.
Depreciation	The wearing out, consumption or other loss of value of an asset whether arising from use, passing of time or obsolescence through technological and market changes. It is accounted for by the allocation of the historical cost (or revalued amount) of the asset less its residual value over its useful life.
Disposal	Activities necessary to dispose of decommissioned assets.
Economic Life	The period from the acquisition of the asset to the time when the asset, while physically able to provide a service, ceases to be the lowest cost alternative to satisfy a particular level of service. The economic life is at the maximum when equal to the physical life however obsolescence will often ensure that the economic life is less than the physical life.
Facility	A complex comprising many assets (e.g. a hospital, water treatment plant, recreation complex, etc.) which represents a single management unit for financial, operational, maintenance or other purposes.
Geographic Information System (GIS)	Software which provides a means of spatially viewing, searching, manipulating, and analysing an electronic data-base.
I&I	Infiltration and Inflow.
Infrastructure Assets	Stationary systems forming a network and serving whole communities, where the system as a whole is intended to be maintained indefinitely at a particular level of service potential by the

Term / Acronym	Definition
	continuing replacement and refurbishment of its components. The network may include normally Recognised 'ordinary' assets as components.
Level Of Service	The defined service quality for a particular activity (i.e. roading) or service area (i.e. street-lighting) against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental acceptability and cost.
Life	A measure of the anticipated life of an asset or component; such as time, number of cycles, distance intervals etc.
Life Cycle	Life cycle has two meanings: The cycle of activities that an asset (or facility) goes through while it retains an identify as a particular asset i.e. from planning and design to decommissioning or disposal. The period of time between a selected date and the last year over which the criteria (e.g. costs) relating to a decision or alternative under study will be assessed.
Life Cycle Cost	The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal costs.
Maintenance	All actions necessary for retaining an asset as near as practicable to its original condition, but excluding rehabilitation or renewal.
Maintenance Plan	Collated information, policies and procedures for the optimum maintenance of an asset, or group of assets.
Maintenance Standards	The standards set for the maintenance service, usually contained in preventive maintenance schedules, operation and maintenance manuals, codes of practice, estimating criteria, statutory regulations and mandatory requirements, in accordance with maintenance quality objectives.
Net Present Value (NPV)	The value of an asset to the organisation, derived from the continued use and subsequent disposal in present monetary values. It is the net amount of discounted total cash inflows arising from the continued use and subsequent disposal of the asset after deducting the value of the discounted total cash outflows.
Objective	An objective is a general statement of intention relating to a specific output or activity. They are longer term aims and are not necessarily outcomes that managers can control.
Operation	The active process of utilising an asset which will consume resources such as manpower, energy, chemicals and materials. Operation costs are part of an assets life cycle costs.
Optimised Renewal Decision Making (ORDM)	An optimisation process for considering and prioritising all options to rectify performance failures of assets. The process encompasses NPV analysis and risk assessment.
Performance Indicator (PI)	A qualitative or quantitative measure of a service or activity used to compare actual performance against a standard or other target. Performance indicators commonly relate to statutory limits, safety, responsiveness, cost, comfort, asset performance, reliability, efficiency, environmental protection and customer satisfaction.
Performance Monitoring	Continuous or periodic quantitative and qualitative assessments of the actual performance compared with specific objectives, targets or standards.
Pipeline Asset Management System	The computerised utilities asset management software system (IPS) supplied by Infor.

Term / Acronym	Definition
Planned Maintenance	Planned maintenance activities fall into 3 categories : Periodic - necessary to ensure the reliability or sustain the design life of an asset. Predictive - condition monitoring activities used to predict failure. Preventive - maintenance that can be initiated without routine or continuous checking (e.g. using information contained in maintenance manuals or manufacturers' recommendations) and is not condition-based.
Rehabilitation	Works to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. Generally involves repairing the asset using available techniques and standards to deliver its original level of service (i.e. heavy patching of roads, slip-lining of sewer mains, etc.) without resorting to significant upgrading or replacement.
Renewal	Works to upgrade, refurbish, rehabilitate or replace existing facilities with facilities of equivalent capacity or performance capability.
Renewal Accounting	A method of infrastructure asset accounting which recognises that infrastructure assets are maintained at an agreed service level through regular planned maintenance, rehabilitation and renewal programmes contained in an asset management plan. The system as a whole is maintained in perpetuity and therefore does not need to be depreciated. The relevant rehabilitation and renewal costs are treated as operational rather than capital expenditure and any loss in service potential is recognised as deferred maintenance.
Repair	Action to restore an item to its previous condition after failure or damage.
Replacement	The complete replacement of an asset that has reached the end of its life, so as to provide a similar, or agreed alternative, level of service.
Remaining Economic Life	The time remaining until an asset ceases to provide service level or economic usefulness.
Risk Cost	The assessed annual cost or benefit relating to the consequence of an event. Risk cost equals the costs relating to the event multiplied by the probability of the event occurring.
Risk Management	The application of a formal process to the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probability of occurrence.
Routine Maintenance	Day to day operational activities to keep the asset operating (replacement of light bulbs, cleaning of drains, repairing leaks, etc.) and which form part of the annual operating budget, including preventative maintenance.
Service Potential	The total future service capacity of an asset. It is normally determined by reference to the operating capacity and economic life of an asset.
Sewage	Water or other liquid, including waste matter in solution or suspension, discharged from a premise.
Sewerage	System of pipes, pump stations and pressure mains constructed to transport sewage from each premise to the point of sewage treatment or discharge.
Sewer	Piped sewerage asset through which sewage conveyed.

Term / Acronym	Definition
	Public sewer; the section of sewer downstream of the point of discharge which is owned and maintained by Council. Private sewer / private drain (or lateral); the section of sewer between the customer's premises and the point of discharge through which sewage is conveyed from the premises. This section of drain is owned and maintained by the customer.
Strategic Plan	Strategic planning involves making decisions about the long term goals and strategies of an organisation. Strategic plans have a strong external focus, cover major portions of the organisation and identify major targets, actions and resource allocations relating to the long term survival, value and growth of the organisation.
Trade Waste	Discharge is any liquid, with or without matter in suspension of solution, that is or may be discharged from trade premises in the course of any trade or industrial process or operation
Unplanned Maintenance	Corrective work required in the short term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity.
Upgrading	The replacement of an asset or addition/ replacement of an asset component which materially improves the original service potential of the asset.
Valuation	Estimated asset value which may depend on the purpose for which the valuation is required, i.e. replacement value for determining maintenance levels or market value for life cycle costing.

B. Wastewater – DRAFT Condition and Performance Policy (July 2023)

Introduction

The following policy statement outlines Council's approach to assessing the physical condition and monitoring the performance of the wastewater assets. The aim of this statement is to document and standardise (as much as practicably possible) the approach to condition assessment and performance monitoring. The statement captures Council's intentions, including aligning condition and assessment processes with the recently completed asset criticality identification. Council has decided the most appropriate level of guidance required for condition assessment and performance monitoring is a practice-based policy statement rather a stand-alone policy. The policy statement is intended to be included in the Wastewater Asset Management Plan and fulfils one of the recommended improvements in the 2022 Asset Management Maturity Assessment.

The policy statement aligns with the following best practice recommendations and principles:

A) Monitoring performance includes both customer and technical/operational monitoring techniques.

B) Recognition that condition assessment is a prerequisite to renewal decisions and maintenance planning

C) The outcomes, key roles and responsibilities for the Condition Assessment Programme are documented and referred to for guidance and direction

D) The approach to condition assessment is primarily based on asset criticality, and the useful remaining life of the asset.

E) Condition assessment standards, procedures, training, methods, and policies will be documented.

Council recognises that condition assessment and performance monitoring is an essential element of asset management practice.

Condition assessment involves inspecting, assessing, measuring asset components, and then interpreting the resulting data to determine the physical condition of the component.

Performance monitoring involves the continuous or periodic quantitative or qualitative assessment of the asset compared with specific objectives, targets, and standards.

Why do we do it?

The Council relies on well performing Wastewater assets to deliver a wide range of services to community. To ensure assets are fit for purpose Council regularly assesses the condition and performance of Wastewater assets. Understanding the condition of assets and how well they are performing enables Council to make informed decisions about the need and timing of preventative or remedial action. The overall aim is to maintain the service potential of the assets for the lowest lifecycle cost and avoid loss of service to the community. By collecting and monitoring asset information, Council can get a better understanding of asset performance and forecast remaining asset life, and plan for asset management interventions and expenditure. Information can be used to:

- Create effective and proactive maintenance plans
- Monitor the actual level of service achieved against desired levels
- Forecast remaining asset life and plan for renewals
- Demonstrate achievement towards council's objectives
- Demonstrate effective stewardship of assets to stakeholders and customers
- Identify asset management improvement opportunities and
- Measure the effectiveness and performance of service delivery providers.

How do we do it? What's our approach?

Council's approach to Condition Assessment and Performance Monitoring takes account of the following considerations.

3.1 Council's aspiration – Advancing Asset Management Practice

As per Council's Asset Management Policy, the organisation is aiming to advance the current level of asset management practice. Improvements are required to reach the appropriate level of asset management practice which has been set at the 'high intermediate' level (or a score of 80) for Council overall. Currently the condition assessment and performance monitoring element for Council overall has an 'intermediate' score of 60 against an 'advanced' target of 85[7]. Similarly, the Wastewater activity has an 'core' score of 60 against a 'high intermediate' maturity target of 80. Medium priority improvements required to increase the current rating include developing processes to capture asset condition data during routine inspections and repair work.

3.2 Best Practice Guidelines

Council uses best practice guidelines from the International Infrastructure Management Manual to determine its approach to condition assessment and performance monitoring. In practice this involves using a detailed performance assessment and monitoring methodology that includes:

- Using criticality assessment to identify what assets are most important to monitor and maintain
- Condition assessment undertaken at the component level
- The use of grading systems and expert independent assessment (where necessary)
- Performance monitoring using range of customer and technical performance measures
- Recording data into Asset Management Information Systems.

3.3 Incorporating Criticality

In 2022 Council developed its first consistent criticality framework across all asset areas. The Council and is currently in the process of incorporating this information into its asset management practice. One of the significant improvement actions Council will undertake in 2023 is to align criticality information with condition assessment and performance monitoring practices[8]. See Improvements section 8.

The Asset Criticality Framework[9] is used to assess the consequence of an asset not operating, known as asset failure. Four criteria are used to assess the consequence of asset failure (financial, environmental health, safety and wellbeing, and service delivery). The higher the consequence[10] of failure the more critical an asset is deemed to be. The approach taken to condition assessment and performance monitoring will be aligned to the criticality of the asset, alongside other considerations. Generally, the higher the criticality rating the more frequent the assessment and monitoring.

Table 1. Criticality and Approach to Condition Assessment and Performance Monitoring

Criticality Rating[11]	Consequences of asset failure	Examples	Approach to Condition Assessment and Performance Monitoring
5 Severe	Financial loss > $1 million and/or Asset Value >$10 million. Extensive widespread irreversible damage to land and/or ecosystems. Permanent severe disability or loss of life, or multiple serious injuries, widespread sickness in the community. Severe loss of operational capability and disruption to service levels.	Rising main diameter > 500mm	A separate plan is developed for individual assets. This plan will include the condition assessment requirements as well as detail for how the results will be used to manage the asset.

[7] As noted in the Asset Management Maturity Assessment, July 2022
[8] As noted in the Asset Management Maturity Assessment 2022.
[9] Palmerston North City Council Criticality Framework Part A, Draft March 2022
[10] Consequence of failure is not necessarily the most expensive in dollar terms, it may be the cost or consequence of failure to the provision of a service or the cost or consequence of failure to the wellbeing of the community.
[11] Based on Maximum Criticality Score, Palmerston North Criticality Framework Part D, Wastewater Pipes v1.0 March 2022

Criticality Rating[11]	Consequences of asset failure	Examples	Approach to Condition Assessment and Performance Monitoring
	Suburb, multi suburb or critical facility/service impact to essential service delivery.		
4-5 Major	Financial loss $500k-$1million and/or asset value $5-10million. Widespread long term (but reversible) environmental damage or localized long term irreversible damage. Serious injury and/or sickness requiring specialist medical treatment or hospitalisation. Long Term disability or 3+ month incapacitation. Major loss of operation capability and disruption to service levels. Suburb, multi suburb or critical facility/service impact to essential service delivery.	Gravity pipe diameter 600-749mm	A combination of separate plans for individual assets and sample assets from each critical area.
3-4 Serious	Financial loss $200k-$500k and/or asset value $1-5million. Measurable damage to the environment requiring significant corrective action resulting in localized medium term reversible damage to land/or water ecosystems. Injury and/or sickness requiring medical treatment up to 3 months incapacitation. Serious loss of operational capability and disruption to service levels. Isolated or suburb wide impact to essential service delivery/facility.	Rising main diameter 250-399 mm	A predetermined sample of assets from each critical area will be collected and assessed. Assessments are subject to subject matter expert judgement
2-3 Moderate	Financial loss $50k-$200k and/or asset value $200k 1 million. Contained and reversible (minimal) environmental impact resulting in localized or minor reversible damage to land and/or water ecosystems. Minor injury requiring first aid. Loss of operational capability in some areas and/or some disruption to service levels. Localised impact/outage to essential service delivery.	Gravity pipe diameter 151—399 mm	A combination of assessment samples from each critical areas and representative samples from predetermined cohorts and assessed to extrapolate condition grades.

Criticality Rating[11]	Consequences of asset failure	Examples	Approach to Condition Assessment and Performance Monitoring
1-2 Minor	Financial loss <$50k and/or asset value <$200k. Small localized and reversible environmental impact resulting in slight short-term damage to land and/or water ecosystems. Minor injury or near miss, first aid not required. No loss of operational capability and/or minimal disruption to service levels.	Rising main diameter < 75mm	Representative samples will be collected from predetermined cohorts and assessed to extrapolate condition grades

3.4 Operational Knowledge

As with all areas of asset management practice, condition assessment and performance monitoring are not undertaken in isolation. Operational knowledge, the life stage of the asset, actual performance results, asset failure, customer complaints and other considerations may result in assets being assessed more or less frequently than recommended by the criticality assessment framework.

What is measured and when?

The main asset types for the wastewater activity include the wastewater network pipes, plant and equipment (e.g. pump stations). Council currently uses a combination of customer and technical monitoring techniques to assess condition and performance. Currently the asset condition is largely theoretical and based on the age of assets. Wastewater pipes are the only assets where actual condition assessments via CCTV have been carried out and recorded, and to have criticality assessed. Overall performance assessments have been based on the number of sewer overflows and the volume of stormwater inflow and infiltration. The current condition and assessment activities that are carried out are generally not structured or well documented. Treatment plant operators have a good level of historical knowledge about wastewater treatment plant assets but IT systems require improvement to enable data capture and reliability. There is little actual conditional and performance data currently being recorded in the asset information systems. Uncertainty exists about where the data is stored and its use.

Table 2 below outlines what asset types are measured and when.

*Please note that the assets that are currently measured and the frequency may change upon implementation of Improvements in Section 8.

Table 2.

Network pipes	
Condition Assessment	Frequency
Inspections	10 years
Performance Monitoring	Frequency
Residents' Satisfaction Survey	Annually
Monitoring of customer complaints and requests	Ongoing

Plant	
Condition Assessment	Frequency
Inspections	Various
Performance Monitoring	Frequency
Residents' Satisfaction Survey	Annually
Monitoring of customer complaints and requests	Ongoing

Equipment	
Condition Assessment	Frequency
Inspections	Various
Performance Monitoring	Frequency
Residents' Satisfaction Survey	Annually
Monitoring of customer complaints and requests	Ongoing

How is it measured?

Council uses a range of processes and systems to determine and analyse condition and performance data as shown in Table 3. Once collected data is entered into systems. The systems are used to link the asset registers with the asset inspections, and store captured data so that it can be managed. Systems provide tools for completing data analysis, calculation of overall grades and ranking against targets. Council is currently developing a new IT system that aims to improve the functionality and reliability issues associated with capturing condition and performance data at the wastewater treatment plant.

Table 3

Network pipes				
Component	Method	System	Range of grading scores	Target
	CCTV	IPS	TBC	TBC
	Inspection	IPS	TBC	TBC
Plant				
	Method	System	Range of grading scores	Target
Various	Scheduled inspection	In development	Not applicable	Not applicable
	Scheduled inspection	RAMM	TBC	TBC
	Scheduled inspection	SCADA/Whiteboard	TBC	TBC
Equipment				
	Method	System	Range of grading scores	Target
Various	Schedule inspection	In development	Not applicable	Not applicable

What can data tell us about the future of Wastewater assets?

Data assists Council to understand:

- The current point in time condition of its Wastewater assets, and
- How the condition and performance of the Wastewater assets are going to change in the future i.e. where the assets are in their life cycle.

This allows Council to determine when it is best to carry out planned maintenance, refurbish or replace either components or the complete asset.

To do this Council uses the following methods to calculate what the deterioration of its Wastewater assets will be over a period of time.

- Forecasting models in RAMM, IPS and SPM? Check please?
- Inspections
- Expert judgement.

How do we use data for reporting?

Council reports on Wastewater asset service and performance in a number of ways:

- Internal operational and technical sections such as asset managers and operational staff
- Executive leadership team
- Elected members, and

- External stakeholders and customers

The level and approach to reporting is determined by the specific audience targeted and that audience's information requirements. The amount of data and performance information shared is determined by how the audience will use the data i.e. operational and technical staff will require detailed and disaggregated data as opposed to elected members and stakeholders who will require aggregated data such as performance against levels of service.

Improvements

The following improvements will assist Council to further advance its Condition and Performance practices.

Table 4

Action	Who	When
Undertake a detailed condition assessment of the existing wastewater treatment plant and equipment.	Asset Activity Manager	TBC
Complete a review of the current condition and performance data held for the Wastewater Activity to identify its use in decision making and programme initiatives.	Asset Activity Manager and Asset Data Team	TBC
Developing processes to capture asset condition data during routine inspections and repair work.	Operators and Field Inspection Staff	Ongoing
Complete criticality rating work for the remaining wastewater assets (where appropriate)	Asset Planning Team	2023
Align criticality information with condition assessment and performance monitoring practices.	Asset Activity Manager and Asset Planners	2023
Create individual plans for Wastewater assets with criticality rating 5. Plan should outline the condition and assessment requirements as well as detail for how the results will be used to manage the assets.	Asset Activity Managers	TBC
Create a combination of separate plans for individual assets and sample assets from each critical area for Wastewater assets with criticality rating 4.	Asset Activity Managers	TBC
Create a predetermined sample of assets from each critical area and conduct assessments for Wastewater assets with a criticality rating 3-4.	Asset Activity Managers	TBC

Action	Who	When
Assessments should be subject to subject matter expert judgement.		
Undertake a combination of assessment samples from each critical area and representative samples from predetermined cohorts and assess to extrapolate condition grades for Wastewater assets with a criticality rating 2.	Asset Activity Managers	TBC
Select representative samples to be collected from predetermined cohorts and asses to extrapolate condition grades on Wastewater assets with a criticality rating 1.	Asset Activity Manager	TBC
Review Customer Satisfaction Survey questions to provide more meaningful information	Asset Planning Team and Community Development Team	Before next survey date TBC

C. Resource Consents

Table C1: Summary of Resource Consents

Consent No.	Term [Yr]	Expiry Date	Type	Consent Subtype	Location	Description
101841	35	16/05/2038	Water Permit	Divert	Totara Road WWTP	To excavate and disturb the bed of the Manawatū river and adjacent bank to construct use and maintain an effluent discharge structure within the riverbed and adjacent bank and the associated temporary diversion of the flow of the Manawatū river Palmerston North.
105443	23	1/07/2033	Water Permit	Groundwater Take	Totara Road WWTP	To take 150 cubic metres per day of water from well number 335025 for the purpose of process water and washwater at Palmerston North City Council wastewater treatment plant Totara Road Palmerston North.
ATH-2014015336.02 ATH-2014015337.02	18	1/07/2033	Discharge Permit	Discharge to Land	Ashhurst WW Oxidation Ponds	This consent authorises the discharge into land of wastewater for the purpose of storing wastewater in ponds and to land via seepage and any ancillary discharge of odour to air on the property legally described as pt sec 67 sbdn p dist Manchester and pt lot 2 dp 4733.
101830	25	16/05/2028	Discharge Permit	Discharge to Land	Totara Road WWTP	To discharge digested sewage sludge into and onto land at the sludge lagoons located at the Palmerston North wastewater treatment plant.
101831	25	16/05/2028	Discharge Permit	Discharge to Land	Totara Road WWTP	To discharge treated wastewater to land part of the wetland pond system at the Palmerston North wastewater treatment plant.
101832	25	16/05/2028	Discharge Permit	Discharge to Water	Totara Road WWTP	Emergency discharge into the Mangaone stream.
101829/2	25	16/05/2028	Discharge Permit	Discharge to Water	Totara Road WWTP	To discharge treated wastewater from the Palmerston North wastewater treatment plant via an outfall structure into the Manawatū river
APP-2017201590.00	3	30/04/2022	Discharge Permit	Misc.	Totara Road WWTP	Decision on application for resource consent to discharge contaminants and undertake works in the

						Manawatū river for the purpose of nutrient investigation.

D. Wastewater Risk Register

Target Risk Rating	Reputational	Low	Likelihood	Rare	Consequence	Serious
Target Risk Rating Overall	Low					

Risk Management Framework: Risk Register Working Paper		Division/Unit:	Three Waters, Infrastructure
Process Name	Wastewater Reticulation WOP05	Process Owner	Group Manager - Three Waters
Sub Process	• Collection network • Pump station activities		
Potential Failure	1. Pipe damage 2. Pipe blockages 3. Overflow events 4. Pump mechanical or electrical failure 5. Pump blockages 6. Non-return valve failure		
Risk Category	Service Delivery	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Serious
Raw Risk Rating	Very High		
Risk Category	Environmental	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Serious
Raw Risk Rating	Very High		
Risk Category	Reputational	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Serious
Raw Risk Rating	Very High		
Raw Risk Rating Overall	Very High		
Causes	1. Tree root invasion 2. Third party intervention 3. Earth subsidence 4. Fat burgs/ Oils and grease 5. Non-permissible substances and products flushed 6. Weather related events (principally stormwater intrusion) 7. Power failures		

	8. Poor or inadequate maintenance 9. Inadequate renewals planning and programme		
Controls & Owners (Include control description, % population checked, Material items checked, source of any check, how is check performed)	Control Type	Control Effectiveness	Control Reliance
	Choose an item.	Effective	Choose an item.
	1. Routine pipe inspection by camera Partially Effective 2. GIS maps Partially Effective 3. Trade waste bylaw Effective 4. Public education Partially Effective 5. Routine maintenance including flushing, particularly known trouble spots Effective 6. Redundancy of pump capacity Effective 7. Standby emergency generators on major interceptors, with routine testing and service plan Effective 8. Inflow and infiltration inspections Non-existent 9. Pump station maintenance, including valves Effective 10. Sewer relining programme Partially Effective		

Residual Risk Likelihood	Unlikely		Residual Risk Consequence	Moderate
Residual Risk Rating	Service Delivery	Medium	Within Risk Tolerance	Yes - No Further Action
Residual Risk Likelihood	Unlikely		Residual Risk Consequence	Moderate
Residual Risk Rating	Environmental	Medium	Within Risk Tolerance	Yes - No Further Action
Residual Risk Likelihood	Unlikely		Residual Risk Consequence	Moderate
Residual Risk Rating	Reputational	Medium	Within Risk Tolerance	Yes - No Further Action
Residual Risk Rating Overall	Choose an item.			

Control Sample Testing (To be undertaken in later phase)	CST Description	Control	Frequency	Sample Size

Process Control Design Improvement / Risk Treatment Options	1. Standup I&I team 2. Dial before you dig

Target Risk Rating	Service Delivery	Medium	Likelihood	Unlikely	Consequence	Moderate
Target Risk Rating	Environmental	Medium	Likelihood	Unlikely	Consequence	Moderate
Target Risk Rating	Reputational	Medium	Likelihood	Unlikely	Consequence	Moderate
Target Risk Rating Overall	Medium					

Status: Final

Process Name	Sewer Treatment Plant WOP06	Process Owner	Group Manager - Three Waters
Sub Process		• Inlet works with preliminary screening • Primary plant operation with gravity separation • Secondary biological processing • Tertiary treatment including nutrient removal • Final treated effluent testing and discharge	
Potential Failure	1. Power failure 2. Inundation from I & I 3. Mechanical equipment failure 4. Screen equipment failure 5. Water supply failure 6. Chemical supply failure 7. PLC/SCADA control failure 8. Discharge untreated effluent into river 9. Lagoon seepage 10. Negative impact on the mauri of the water environment		
Risk Category	Service Delivery	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Likely	Raw Risk Consequence	Severe
Raw Risk Rating	Extreme		
Risk Category	Environmental	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Likely	Raw Risk Consequence	Serious
Raw Risk Rating	Very High		
Risk Category	Reputational	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Major
Raw Risk Rating	Extreme		
Risk Category	Cultural	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Serious
Raw Risk Rating	Very High		
Raw Risk Rating Overall	Extreme		
Causes	1. Power supplier failure 2. Poor or inadequate maintenance of electrical equipment 3. Poor or inadequate maintenance of mechanical equipment 4. Water supplier shortage or pipe delivery disruption		

	5. Laboratory testing not effective 6. Chemical supply chain management disfunction 7. Extreme wet weather event with excess inundation 8. Ground subsidence 9. Inadequate renewals planning and programme

Controls & Owners (Include control description, % population checked, Material items checked, source of any check, how is check performed)	Control Type	Control Effectiveness	Control Reliance
	Choose an item.	Effective	Choose an item.

1. Generator backup Effective
2. Routine, scheduled maintenance Effective
3. Critical plant redundancy Effective
4. Reclaimed, recycled effluent as secondary source for water requirements Effective
5. Supply chain management with minimum8 weeks supply on site Effective
6. Maintaining condition assessments and renewals up to date Effective
7. Discharge testing with contracted lab, post facto, up to daily in periods of low river flow Effective
8. Local bore holes sampled in accordance with consent conditions Effective
9. Established protocols for engagement with local Iwi in protecting mauri Partially Effective

Residual Risk Likelihood	Unlikely		Residual Risk Consequence	Serious
Residual Risk Rating	Service Delivery	Medium	Within Risk Tolerance	Yes - No Further Action
Residual Risk Likelihood	Unlikely		Residual Risk Consequence	Moderate
Residual Risk Rating	Environmental	Medium	Within Risk Tolerance	Yes - No Further Action
Residual Risk Likelihood	Unlikely		Residual Risk Consequence	Moderate
Residual Risk Rating	Reputational	Medium	Within Risk Tolerance	Yes - No Further Action
Residual Risk Likelihood	Unlikely		Residual Risk Consequence	Moderate
Residual Risk Rating	Cultural	Medium	Within Risk Tolerance	Yes - No Further Action
Residual Risk Rating Overall	Medium			

Control Sample Testing (To be undertaken in later phase)	CST Description	Control	Frequency	Sample Size

Process Control Design Improvement / Risk Treatment Options	1.

Target Risk Rating	Service Delivery	Medium	Likelihood	Unlikely	Consequence	Serious
Target Risk Rating	Environmental	Medium	Likelihood	Unlikely	Consequence	Moderate

Target Risk Rating	Reputational	Medium	Likelihood	Unlikely	Consequence	Moderate
Target Risk Rating Overall	Medium					

Target Risk Rating	Environmental	Medium	Likelihood	Unlikely	Consequence	Moderate
Target Risk Rating Overall	Medium					

Risk Management Framework: Risk Register Working Paper		Division/Unit:	Three Waters, Infrastructure
Process Name WOP08	Wastewater and Stormwater Compliance	Process Owner	Group Manager - Three Waters
Sub Process	• Inspection and compliance enforcement of liquid waste in accordance with bylaws • Stormwater monitoring		
Potential Failure	1. Creation of unmanageable quantities of wastewater 2. Creation of excessive amounts of untreatable wastewater 3. Reduced wastewater treatment processes 4. Inability to identify sources of unlawful waste discharge 5. Creation of PNCC failure under Horizons discharge consents 6. Inability to identify unacceptable trade waste types and amounts through testing 7. Ingress of unacceptable substances into stormwater 8. Increased maintenance requirements due to excessive wear and tear on infrastructure 9. Incident resulting in unwanted discharge		
Risk Category	Legal/Compliance	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Unlikely	Raw Risk Consequence	Moderate
Raw Risk Rating	Medium		
Risk Category	Environmental	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Unlikely	Raw Risk Consequence	Major
Raw Risk Rating	High		
Risk Category	Financial	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Likely	Raw Risk Consequence	Moderate
Raw Risk Rating	High		
Raw Risk Rating Overall	High		
Causes	1. Extreme localised weather event 2. Illegal actions of polluting parties/businesses 3. Inadequate commercial cleaning procedures and equipment 4. Inadequate compliance testing and inspection		

	5. Inadequate register of business subject to trade waste compliance oversight		
Controls & Owners (Include control description, % population checked, Material items checked, source of any check, how is check performed)	Control Type	Control Effectiveness	Control Reliance
	Choose an item.	Effective	Choose an item.
	1. Sound policy in place Effective 2. Public education Effective 3. Dye testing in identifying issues Effective 4. Periodic inspections of commercial premises Effective 5. Financial penalties and infringement notices Effective 6. Maintenance of records on prior inspections Effective 7. Whilst blower procedures Effective 8. Trade waste testing and storm water testing Effective 9. Register of conditional consent holders (CCH) Effective 10. Monthly /weekly sample analysis of CCH Effective		

Residual Risk Likelihood	Rare		Residual Risk Consequence	Moderate
Residual Risk Rating	Legal/Compliance	Low	Within Risk Tolerance	Yes - No Further Action
Residual Risk Likelihood	Rare		Residual Risk Consequence	Serious
Residual Risk Rating	Environmental	Low	Within Risk Tolerance	Yes - No Further Action
Residual Risk Likelihood	Rare		Residual Risk Consequence	Minor
Residual Risk Rating	Financial	Low	Within Risk Tolerance	Yes - No Further Action
Residual Risk Rating Overall	Low			

Control Sample Testing (To be undertaken in later phase)	CST Description	Control	Frequency	Sample Size
Process Control Design Improvement / Risk Treatment Options	1.			

Target Risk Rating	Legal/Compliance	Low	Likelihood	Rare	Consequence	Moderate
Target Risk Rating	Environmental	Low	Likelihood	Rare	Consequence	Serious
Target Risk Rating	Financial	Low	Likelihood	Rare	Consequence	Minor
Target Risk Rating Overall	Low					

Sub Process	Creation of understanding of asset landscape	• Describe all assets • Determine asset condition and design life expectancies • Determine performance/capacity/capability of assets and any remediation/replacement needs • Determine needs for upgrades under Capital New
Potential Failure	1. Receipt of incomplete data on assets (Location, age, replacement requirements, life expectancy, current condition, fit for purpose attributes, material content) 2. Conditions inspections not initiated in timely manner 3. Budget allocation insufficient to engage inspection/survey companies 4. Condition inspections not identifying condition issues 5. Output from inspections not captured and documented against asset in IPS	

Risk Category	Service Delivery	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Severe
Raw Risk Rating	Extreme		
Risk Category	Financial	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Likely	Raw Risk Consequence	Major
Raw Risk Rating	Very High		
Risk Category	Health & Safety	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Likely	Raw Risk Consequence	Severe
Raw Risk Rating	Extreme		
Raw Risk Rating Overall	Extreme		

Causes	1. Ambiguity on asset data ownership and custodianship 2. Poor quality data held on assets 3. Inability to identify records 4. Inspections not undertaken to adequate standard 5. No documented or adequate standard processes for timeline management of asset condition understanding 6. Engagement with inspections not properly termed on scope or works 7. Lack of understanding by officers of lifecycle terms and against asset categories

Controls & Owners (Include control description, % population checked, Material items checked,	Control Type	Control Effectiveness	Control Reliance
	Choose an item.	Partially Effective	Choose an item.
	1. Fully resourced fit for purpose Asset and Planning Department Partially Effective 2. Budgetary allocation in LTP for inspections and quality assessments Partially Effective 3. Experienced and qualified inspection companies used Effective 4. SOPs in place for determining workflow on assessments Ineffective		

source of any check, how is check performed)	5. Repository of life expectancy of assets Partially Effective					
Residual Risk Likelihood	Unlikely		Residual Risk Consequence	Moderate		
Residual Risk Rating	Service Delivery	Medium	Within Risk Tolerance	Yes - No Further Action		
Residual Risk Likelihood	Unlikely		Residual Risk Consequence	Moderate		
Residual Risk Rating	Financial	Medium	Within Risk Tolerance	Yes - No Further Action		
Residual Risk Likelihood	Unlikely		Residual Risk Consequence	Moderate		
Residual Risk Rating	Health & Safety	Medium	Within Risk Tolerance	No - Seek Approval or Improve Mitigation		
Residual Risk Rating Overall	Medium					
Control Sample Testing (To be undertaken in later phase)	CST Description		Control	Frequency	Sample Size	
Process Control Design Improvement / Risk Treatment Options	1. Improve effectiveness of controls					
Target Risk Rating	Service Delivery	Medium	Likelihood	Unlikely	Consequence	Moderate
Target Risk Rating	Financial	Medium	Likelihood	Unlikely	Consequence	Moderate
Target Risk Rating	Health & Safety	Medium	Likelihood	Unlikely	Consequence	Moderate
Target Risk Rating Overall	Medium					

Risk Management Framework: Risk Register Working Paper		Division/Unit:	Three Waters, Infrastructure
Process Name WOP10	Design	Process Owner	Group Manager - Three Waters
Sub Process		• Creation of design for construction from LTP • Quality and quantity specifications drawn up • Pre-design testing to determine specification requirements • Hand off to contact environment for tender &/or costing &/or build	
Potential Failure	1. Inadequate scoping and testing 2. Incorrect quantity assessments 3. Quality requirements inadequate to meet needs 4. Quality assurance processes not complied 5. Technical sign off not in line with regulatory requirements		

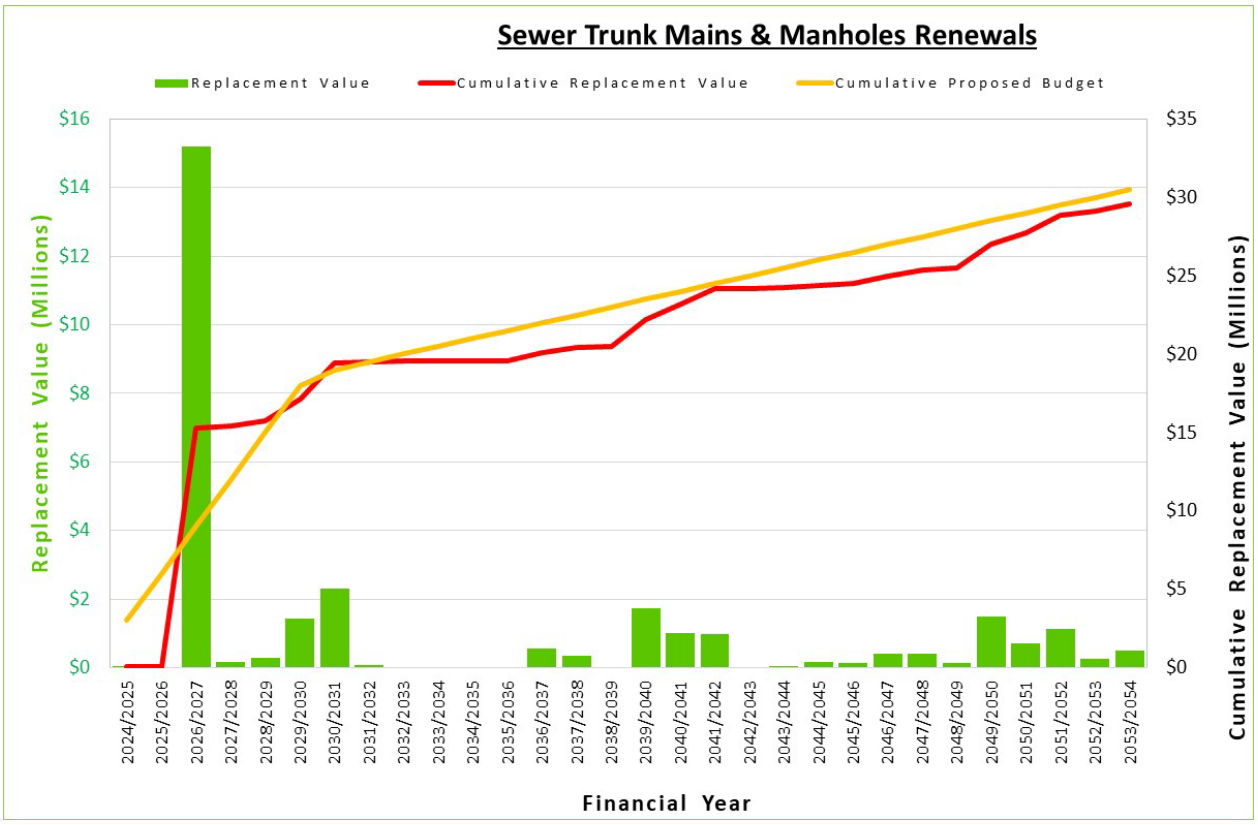
	6. Design doesn't meet scoping requirements 7. Not delivering projects in LTP within required timeframe 8. Supply chain disruption		
Risk Category	Service Delivery	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Serious
Raw Risk Rating	Very High		
Risk Category	Financial	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Almost Certain	Raw Risk Consequence	Major
Raw Risk Rating	Extreme		
Risk Category	Reputational	Link to Strat. Goal	Choose an item.
Raw Risk Likelihood	Possible	Raw Risk Consequence	Serious
Raw Risk Rating	High		
Raw Risk Rating Overall	Extreme		
Causes	1. Resource capacity and capability 2. Inadequate workflow management processes 3. Challenges to work remotely 4. Incorrect technical sign off of designs and at hold points 5. Inadequate scoped and phasing of multi-year projects in LTP, i.e. undeliverable 6. Third party dependencies not delivered upon creating "at risk" programmes 7. Excess demand in the market driving supply chain challenges 8. Cost escalations		
Controls & Owners (Include control description, % population checked, Material items checked, source of any check, how is check performed)	Control Type	Control Effectiveness	Control Reliance
	Choose an item.	Partially Effective	Choose an item.
	1. Adequately resourced functions Partially Effective 2. Adequate technical hold sign off points Effective 3. Discipline in process and workflow management Partially Effective 4. Robust SOP Partially Effective 5. Data base of recent costs in projects Partially Effective 6. Assess/insight and management of market data base Partially Effective 7. Trained and experienced staff Partially Effective 8. Effective planning in LTP process through an effective Asset Planning process Partially Effective		
Residual Risk Likelihood	Possible	Residual Risk Consequence	Moderate
Residual Risk Rating	Service Delivery / Medium	Within Risk Tolerance	Yes - No Further Action

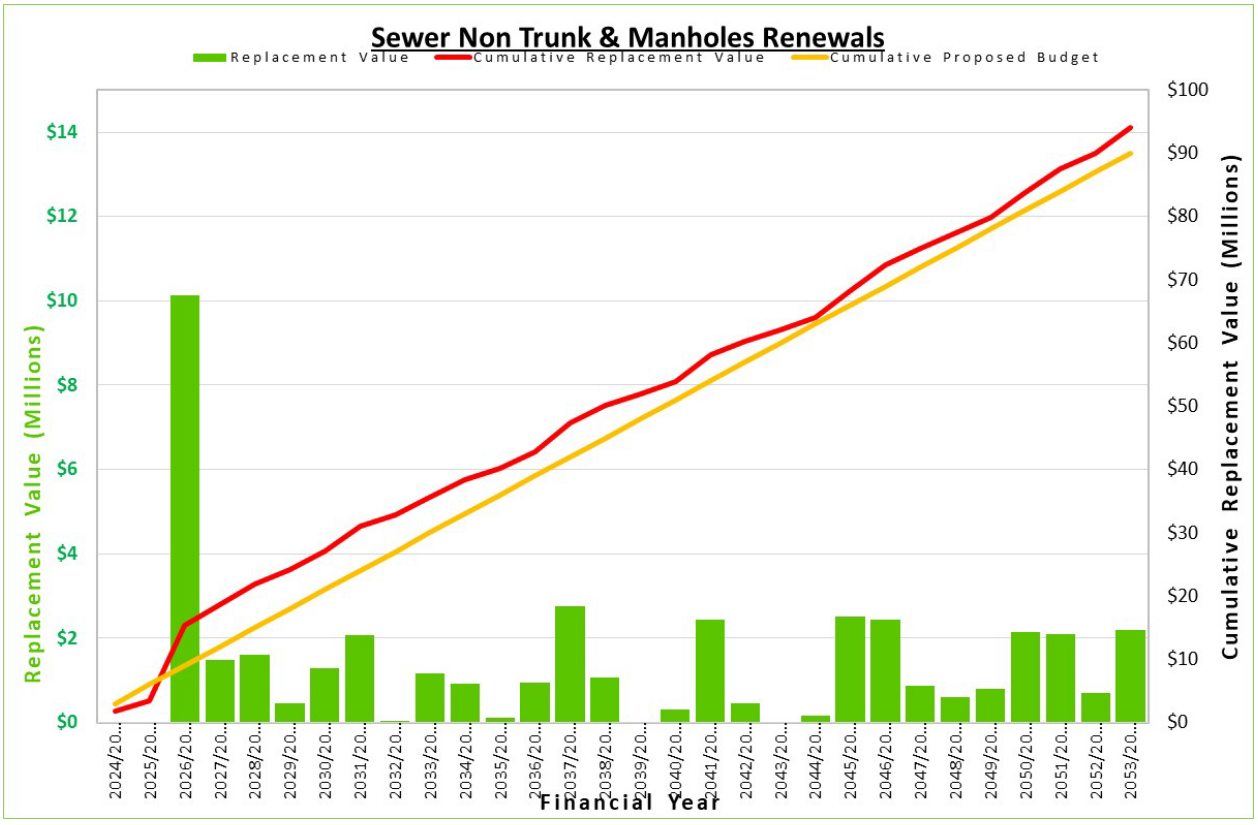
Residual Risk Likelihood	Possible		Residual Risk Consequence	Moderate	
Residual Risk Rating	Financial	Medium	Within Risk Tolerance	Yes - No Further Action	
Residual Risk Likelihood	Unlikely		Residual Risk Consequence	Moderate	
Residual Risk Rating	Reputational	Medium	Within Risk Tolerance	Yes - No Further Action	
Residual Risk Rating Overall	Medium				
Control Sample Testing (To be undertaken in later phase)	CST Description		Control	Frequency	Sample Size
Process Control Design Improvement / Risk Treatment Options	1.				

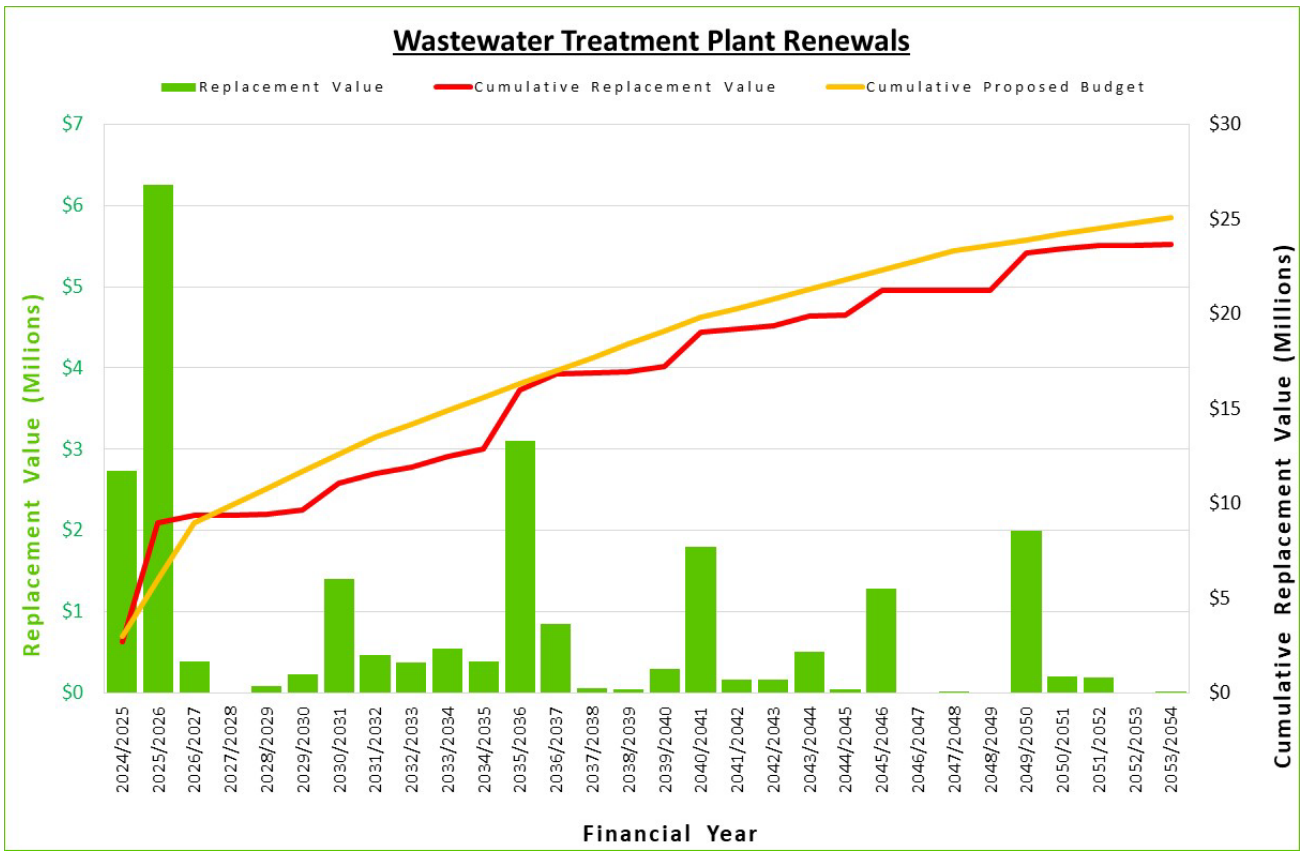
Target Risk Rating	Service Delivery	Medium	Likelihood	Possible	Consequence	Moderate
Target Risk Rating	Financial	Medium	Likelihood	Possible	Consequence	Moderate
Target Risk Rating	Reputational	Medium	Likelihood	Unlikely	Consequence	Moderate
Target Risk Rating Overall	Medium					

E. Theoretical Renewals Profile

Based upon information stored in IPS and valuation information, the theoretical renewal profile for wastewater assets is shown below. In reality, renewals profiles consider more asset condition and performance information but this provides an indication of the likely level of expenditure required.






Wastewater Treatment Plant Renewals
Replacement Value
Cumulative Replacement Value
Cumulative Proposed Budget
Replacement Value (Milions)
Cumulative Replacement Value (Millions)
$0
$1
$2
$3
$4
$5
$6
$7
$0
$5
$10
$15
$20
$25
$30
2024/2025
2025/2026
2026/2027
2027/2028
2028/2029
2029/2030
2030/2031
2031/2032
2032/2033
2033/2034
2034/2035
2035/2036
2036/2037
2037/2038
2038/2039
2039/2040
2040/2041
2041/2042
2042/2043
2043/2044
2044/2045
2045/2046
2046/2047
2047/2048
2048/2049
2049/2050
2050/2051
2051/2052
2052/2053
2053/2054
Financial Year

F. Key Assumptions

The following assumptions have been adopted for this AMP.

Inflation

Financial projections are based on July 2022 estimated costs. No inflation factors have been applied.

BERL inflation factors will be applied to the programmes and budgets in the 10 Year Plan. Budgets for successive years of the Annual Budget are based on the corresponding year of the 10 Year Plan.

Depreciation

Average asset lives at a project level for new works have been used to calculate depreciation.

New works are a small percentage of total depreciation. Differences from actual due to averaging of lives are relatively minor.

Vested Assets

On average the same level of assets are gifted to the Council as a result of subdivision as has occurred over the last 5 years.

Note that the rate of change of development will be taken account of in future revisions of the AMP and subsequent O&M and depreciation taken into account.

Service Potential

Service potential of the asset is maintained by the renewal and maintenance programme.

There is low risk that the service potential of the asset will not be maintained by implementation of the renewal programme since this is based on reliable asset and condition information from the asset management system.

Asset lives

Asset lives are accurately stated.

The risk that lives are inaccurate is low. Lives are based on generally accepted industry values modified by local knowledge. The asset database gives a good knowledge of asset condition and an extensive field assessment has recently been undertaken.

Natural Disasters

That there are no major natural disasters during the planning period requiring additional funds.

There is medium risk of a natural disaster occurring during this period requiring additional funds to repair or reinstate assets. Some further provision for increasing the resilience of the assets has been built into this plan but there is still further work to be undertaken to determine the desired level of resilience and the further asset improvements to achieve this.

Council Policy

No significant change to Council policy that impacts on assets and services.

Any significant change will require a full review of the AMP and implications identified at the time.

Interest Rate

Interest on term debt is calculated using an interest rate of 5% for the first three years of the LTP and 5.2% thereafter. To allow for anticipated timing of capital expenditure, interest is provided for on only 50% of forecast new loan amounts in the year of the capital expenditure, but on the full amount in each year thereafter

G. Wastewater Addendum 2024

Several changes have been made to the AMP budget through the 10 Year Plan - Long Term Plan (LTP) process due to internal and external constraints. Draft AMP documents were finalised on 30 September 2023 and were based on a best for asset approach.

Elected members reviewed the plans in November and December 2023 during the preparation of the 2024 – 2034 Long Term Plan and the Consultation Document. During these discussions elected members were concerned about the affordability of what was proposed. In some cases, further information was available that provided more accurate view of budget requirements.

To address concerns programmes were deferred, reduced in scope, or removed from the LTP. In some cases new programme had to be inserted as a result.

The addendum captures the changes and comments on the effects on Levels of Service and Risk that will result from the change in funding in the Adopted LTP and Consultation Document.

Each programme has two scenarios:

Proposed AMP Budget – The proposed budgets were set prior to 31 August 2023. This AMP's operational and maintenance, renewals and capital new costs are informed the 31 August 2023 budget scenario.

Adopted LTP Budget – The adopted budget reflects the budgets in the 10 Year 2024-34 Long Term Plan. They reflect the outcomes of internal and external consultation as part of the 10 Year Plan process.

Challenges in budget creation:

In 2023, we faced some challenges with finalising the asset management plan scenario for our budgets. This included upgrading our financial system which led to challenges with allocating the labour component to our operations and maintenance (MSL) budgets and growth timing for some programmes changed.

3 Waters Reform

Our Asset Management plans were prepared on the basis that the 3 waters activity would be transferred to a new entity in 2026. We were requested by the entity to develop budgets for the full 30 years for the Infrastructure Strategy and AMP's so that they would have a forward view of funding requirements.

In late October 2023 a General Election was held resulting in a change of Government. The new collation had campaigned on the repeal of the 3 waters legislation within the first 100 day of being in office. The Water Services Acts Repeal Act 2024 was passed on 16 February 2024 resulting in the 3 waters activities remaining under control of PNCC.

The new Government intends to introduce new legislation in the latter half of 2024 that will enable Territorial Local Authorities to form separate conglomerate entities to manage provision of 3 Waters services.

Types of changes to budgets:

Changes in any of our work programmes fall into one or more of the following categories:

- Budget decrease – Where there has been a significant decrease in budgets over the next 10 years.
- Budget increase - Where there has been a significant increase in budgets over the next 10 years.
- Not adopted – Where a programme has not been adopted for this LTP - 10 Year Plan.
- Introduced – Where a new programme has been introduced as result of consultation or when an existing programme has been recategorised, for example from a capital new growth programme to a capital new level of service programme.
- Programme timing change - Where there has been a programme timing change within a 10 year period.

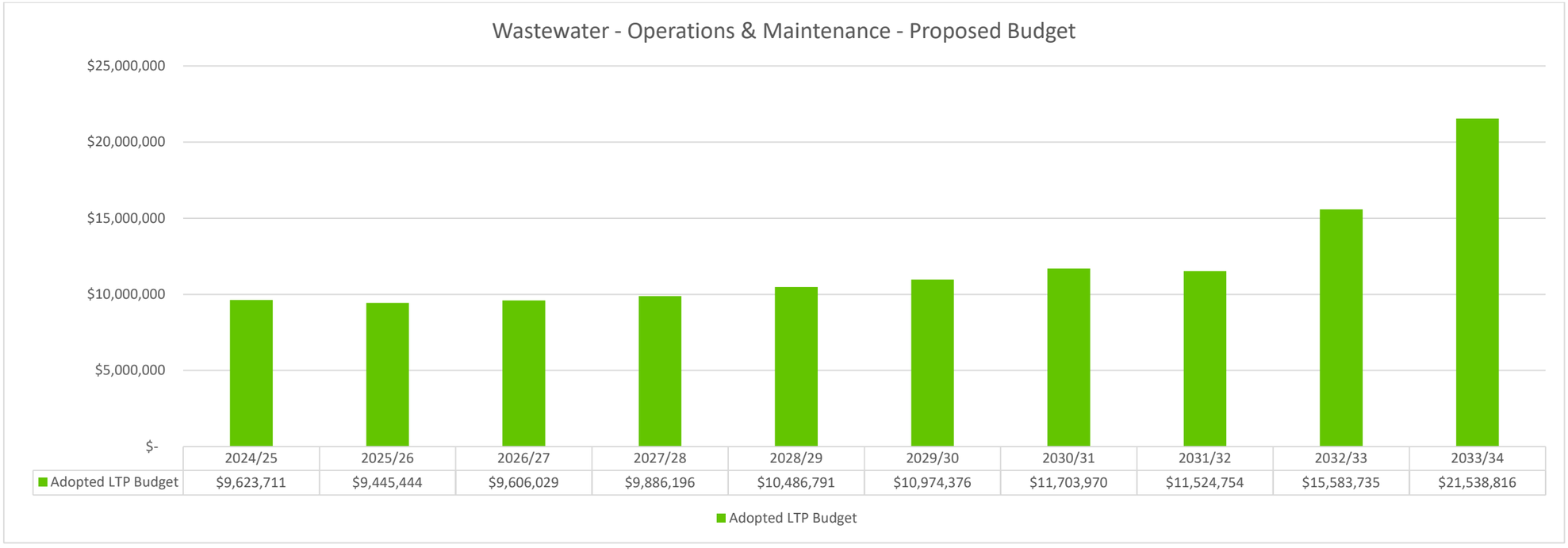
Programmes that did not have any changes have been omitted from this addendum view.

Operations and Maintenance

Operations and maintenance budgets contained in the Wastewater Asset Management Plan were based on best available data at 30 August 2023, when the draft plan was finalised. At that time internal overheads and were under development and were not included in estimates. Subsequently these budgets have been refined to ensure that they reflect a true and fair view of estimated expenditure.

There has been no material change to budgets except those relating to allocation of labour.

Consequential Operational budgets are operational costs associated with the operation of new assets built from Capital New LOS, and Growth. Change to the timing of Consequential Operational Budgets therefore will move financial years. Change to Consequential Operational Budgets will follow any changes to Capital New budgets



Wastewater	Year 1 2024 / 25	Year2 2025 /26	Year 3 2026 /27	Year 4 2027 / 28	Year 5 2028 /29	Year 6 2029 / 30	Year 7 2030 / 31	Year 8 2031 / 32	Year 9 2032 / 33	Year 10 2033 / 34
Admin and other	$4,123,889	$3,970,724	$4,058,105	$4,156,885	$4,306,727	$4,429,751	$4,563,416	$4,669,855	$4,722,507	$4,722,498
Consultancy	$550,770	$546,541	$571,206	$663,699	$602,603	$618,971	$711,255	$636,183	$656,837	$739,270
Maintenance	$1,760,000	$1,856,105	$1,877,021	$1,912,631	$2,345,428	$2,616,049	$3,003,132	$2,707,012	$4,642,369	$7,500,724
Remuneration	$3,189,052	$3,070,314	$3,092,736	$3,132,611	$3,200,338	$3,271,345	$3,330,934	$3,385,053	$3,406,834	$3,409,639
Consequential OpEx	$ 0	$ 1,760	$ 6,960	$ 20,370	$ 31,695	$ 38,260	$ 95,233	$ 126,650	$ 2,155,187	$ 5,166,684
Wastewater Total	**$9,623,711**	**$9,445,444**	**$9,606,029**	**$9,886,196**	**$10,486,791**	**$10,974,376**	**$11,703,970**	**$11,524,754**	**$15,583,735**	**$21,538,816**

Operational Programmes

Operational programmes provide funding for specific operational activities that fall outside of the definition of operation and maintenance of the asset. They relate to programmes which are completed within a defined period of time and have a specific purpose, as distinct from general operations and maintenance. These programmes often support other capital programmes and may be capitalised in the future, if they are required to enable the capital works to take place. Examples include, but are not limited to;

- Feasibility studies and optioning for future capital works
- Resource Consent applications
- Capacity Modelling
- Reserve Management Plans
- The tables below identify changes to proposed Operational Programme budgets through the development of the LTP.

There was one change to proposed Operational Programme budgets for the Wastewater Activity through the development of the LTP.

Not Adopted

There was a reduction of $1,400,000 in the Wastewater Operating budget resulting from Programme 2411 being deleted as an Operational Programme and replaced as a Renewal Programme

Programme Type: Operating Programmes														
Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels on Service (LOS)
2411 - Dredging and Dewatering of Oxidation Ponds and Sludge Lagoons	AMP View	$700,000	$700,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,400,000	Moved to Renewals	No change	No change

Renewals

Overall, wastewater renewals budgets have decreased in the LTP from the proposed AMP budgets for the first six years. The seventh year represents an increase, and years 8-10 are approximately the same in the two views. Overall, there is a decrease of $5.1M in budgets over the ten years. It is a true decrease as these budgets have not been moved beyond the LTP into years 11-30.

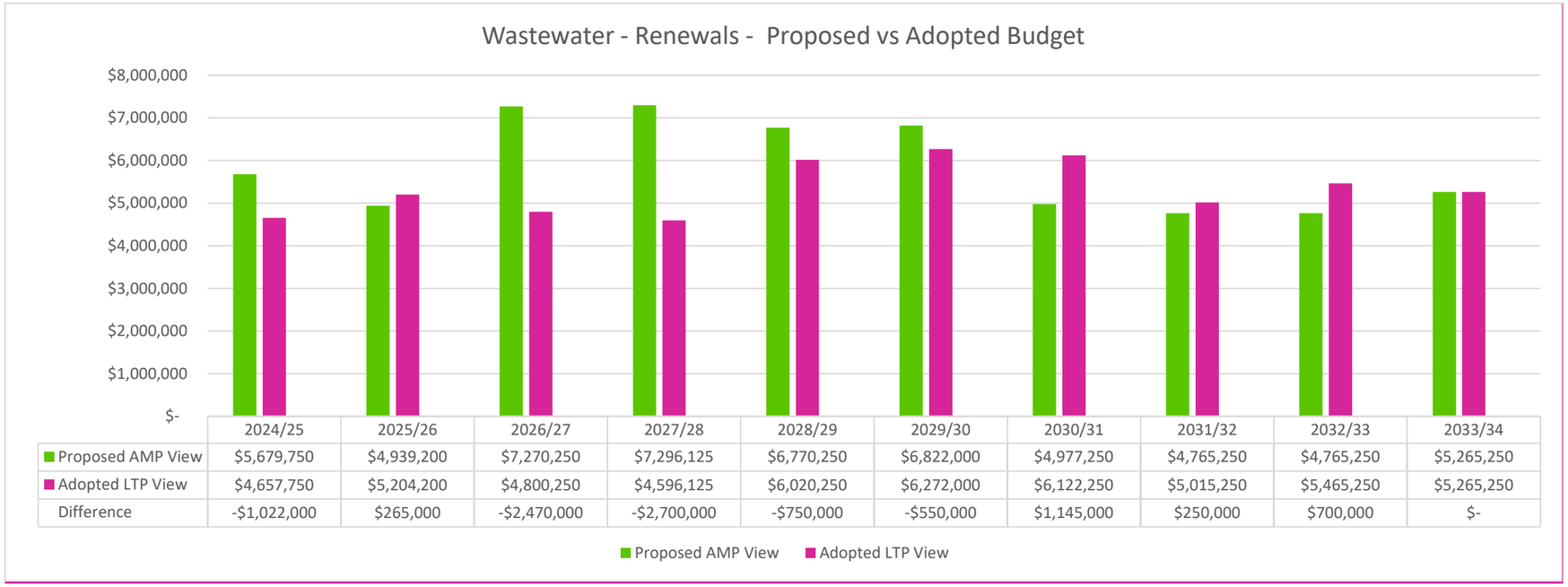
As mentioned above, part of the preparation of the draft LTP a resolution was passed to prepare draft budgets that stepped renewals from a Council wide prescribed budget value in Year 1 to a prescribed budget value in Year 10[12]. These draft budgets were prepared and subsequently accepted.

An analysis on the impacts of the resolution was also requested, which can be found here: Agenda of Council - Wednesday, 13 December 2023 (infocouncil.biz). The attachment entitled 'Impact and Risks of moderating the Capital Renewals Programme' details the impacts of the changes to the budgets, including risk implications and potential impact on levels of service. The primary impacts are:

- The overall condition of all our assets will continue to decrease resulting in increasing risk of asset failure and unplanned service disruptions
- Addressing the backlog of renewals will be deferred, so that the cost of those renewals will become an issue for future generations

The deferral of addressing the backlog means that the date at which the cumulative total of renewal budgets equals the value of the backlog is further in the future and thus the value of the backlog is increasing.

In general, the decrease in wastewater renewals budgets is in response to this resolution.



	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Proposed AMP View	$5,679,750	$4,939,200	$7,270,250	$7,296,125	$6,770,250	$6,822,000	$4,977,250	$4,765,250	$4,765,250	$5,265,250
Adopted LTP View	$4,657,750	$5,204,200	$4,800,250	$4,596,125	$6,020,250	$6,272,000	$6,122,250	$5,015,250	$5,465,250	$5,265,250
Difference	-$1,022,000	$265,000	-$2,470,000	-$2,700,000	-$750,000	-$550,000	$1,145,000	$250,000	$700,000	$-

The tables below contain a summary of the renewal programme changes within a 10 year period as a result of the LTP consultation process, implications for the changes and effects on levels of service as a result of a change.

[12] Minutes of Extraordinary Council Meeting 29 November 2023, Clause 193-23, Attachment 1a: That a version of the draft LTP Capital Renewal programme starting at $32M in Year 1 and stepping up to no more than $40M per annum by Year 5 and no more than $55M per annum by Year 10 be prepared for consideration alongside Opex programmes for Council meeting of 13 December 2023.https://palmerstonnorth.infocouncil.biz//Open/2023/11/COU_20231129_MIN_11232_EXTRA.PDF

Budget Decrease

There was an $18,644,000 decrease in the renewal budget. The table below provides a detailed view of affected programmes and the effect on risk, opportunity, and levels of service;

Programme Type : Renewals															
Programme Name	**Budget view**	**Year1**	**Year2**	**Year3**	**Year4**	**Year5**	**Year6**	**Year7**	**Year8**	**Year9**	**Year10**	**Total**	**Description of Change**	**Implication/Risk/Opportunity**	**Effect on Levels of Service (LOS)**
		2024/25	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**2031/32**	**2032/33**	**2033/34**				
54 - City-wide - Wastewater Pipe Renewal	AMP View	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$30,000,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Risk of increased maintenance requirement. Increased risk of asset failure and unplanned service disruptions. Consequential reputational and financial risks	No effect on current LoS
54 - City-wide - Wastewater Pipe Renewal	LTP View	$1,800,000	$1,800,000	$2,000,000	$2,000,000	$3,000,000	$3,000,000	$2,600,000	$2,300,000	$2,300,000	$2,300,000	$23,100,000			
179 - Totara Road Wastewater Treatment Plant - Minor Equipment Renewals	AMP View	$414,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$400,000	$4,014,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Inability to renew equipment, which will impact on failure rate and ability to provide service.	May not be able to provide LoS in terms of meeting consent conditions
179 - Totara Road Wastewater Treatment Plant - Minor Equipment Renewals	LTP View	$264,000	$195,000	$250,000	$250,000	$300,000	$300,000	$300,000	$300,000	$200,000	$200,000	$2,559,000			
1714 - City-wide Wastewater Trunk Mains Renewal	AMP View	$550,000	$1,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$1,000,000	$500,000	$500,000	$500,000	$16,050,000	There was a reduction and smoothing over the first seven years in accordance with resolution as part of LTP programme prioritisation.	Risk of increased maintenance requirement. Increased risk of asset failure and unplanned service disruptions. Consequential reputational and financial risks.	Failure of assets will result in loss of the service they provide.
1714 - City-wide Wastewater Trunk Mains Renewal	LTP View	$500,000	$1,000,000	$1,200,000	$1,100,000	$1,100,000	$1,300,000	$1,600,000	$500,000	$500,000	$1,000,000	$9,800,000			
1878 - 3 Waters Minor Equipment Renewals	AMP View	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$500,000	Minor decrease	Risk that we don't have the tools to complete the work, which may impact Health and Safety, or quality of the work. Perhaps we will need to hire or get in contractor. Increased risk of failing to meet compliance requirements	LoS may not be met in event of equipment failure
1878 - 3 Waters Minor Equipment Renewals	LTP View	$20,000	$20,000	$30,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$420,000			
2323 - Citywide - Relining of Wastewater Pipes	AMP View	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$10,000,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Increased risk of asset failure and unplanned service disruptions. Consequential reputational and financial risks.	Failure of assets will result in loss of the service they provide.
2323 - Citywide - Relining of Wastewater Pipes	LTP View	$600,000	$600,000	$600,000	$600,000	$600,000	$600,000	$600,000	$600,000	$600,000	$600,000	$6,000,000			

Budget Increase

There was a $220,000 increase in the renewal budget. The table below provides a detailed view of affected programmes and the effect on risk, opportunity, and levels of service;

Programme Type : Renewals															
Programme Name	**Budget view**	**Year1**	**Year2**	**Year3**	**Year4**	**Year5**	**Year6**	**Year7**	**Year8**	**Year9**	**Year10**	**Total**	**Description of Change**	**Implication/Risk/Opportunity**	**Effect on Levels of Service (LOS)**
		2024/25	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**2031/32**	**2032/33**	**2033/34**				
65 - City-wide - Wastewater Pump Station Renewal	AMP View	$165,000	$165,000	$165,000	$165,000	$165,000	$165,000	$165,000	$160,000	$160,000	$160,000	$1,635,000	Long lead in times and inflationary costs have driven up the price of pumps leading to the request for an increase	Improved ability to deliver the proposed Programme on time and within budget	No effect on current LoS
65 - City-wide - Wastewater Pump Station Renewal	LTP View	$165,000	$165,000	$165,000	$165,000	$165,000	$165,000	$385,000	$160,000	$160,000	$160,000	$1,855,000			

Programme Timing Change and Budget Decrease

There was a $1,317,000 decrease in the renewal budget as a result of changes to timing of one programme. Some budget for this programme was pushed into years 11 to 30, beyond the 10 year LTP window.

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect on Levels of Service (LOS)
1068 - Totara Road Wastewater Treatment Plant - Replacement of Inlet Pumps	AMP View	$1,242,000	$200,000	$500,000	$500,000	$0	$0	$0	$0	$0	$0	$2,442,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Risk reduced by installation of previous new pumps. Rescoped Risk that additional capacity is needed sooner. Risk of failure of old pumps prior to replacement. Risk to operational budgets in the event of failure.	LoS may not be met in event of pump failure
1068 - Totara Road Wastewater Treatment Plant - Replacement of Inlet Pumps	LTP View	$0	$0	$0	$0	$0	$0	$125,000	$350,000	$350,000	$300,000	$1,125,000			
2368 - Biogas Engine Replacement	AMP View	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,000,000	$1,000,000	Programme split over two financial years. No overall decrease	No additional risk	Maintain LOS
2368 - Biogas Engine Replacement	LTP View	$0	$0	$0	$0	$0	$0	$0	$0	$500,000	$500,000	$1,000,000			

Introduced

There was an increase of $1,750,000 to the renewal budgets as a result of two existing programmes being reclassified as renewal programmes.

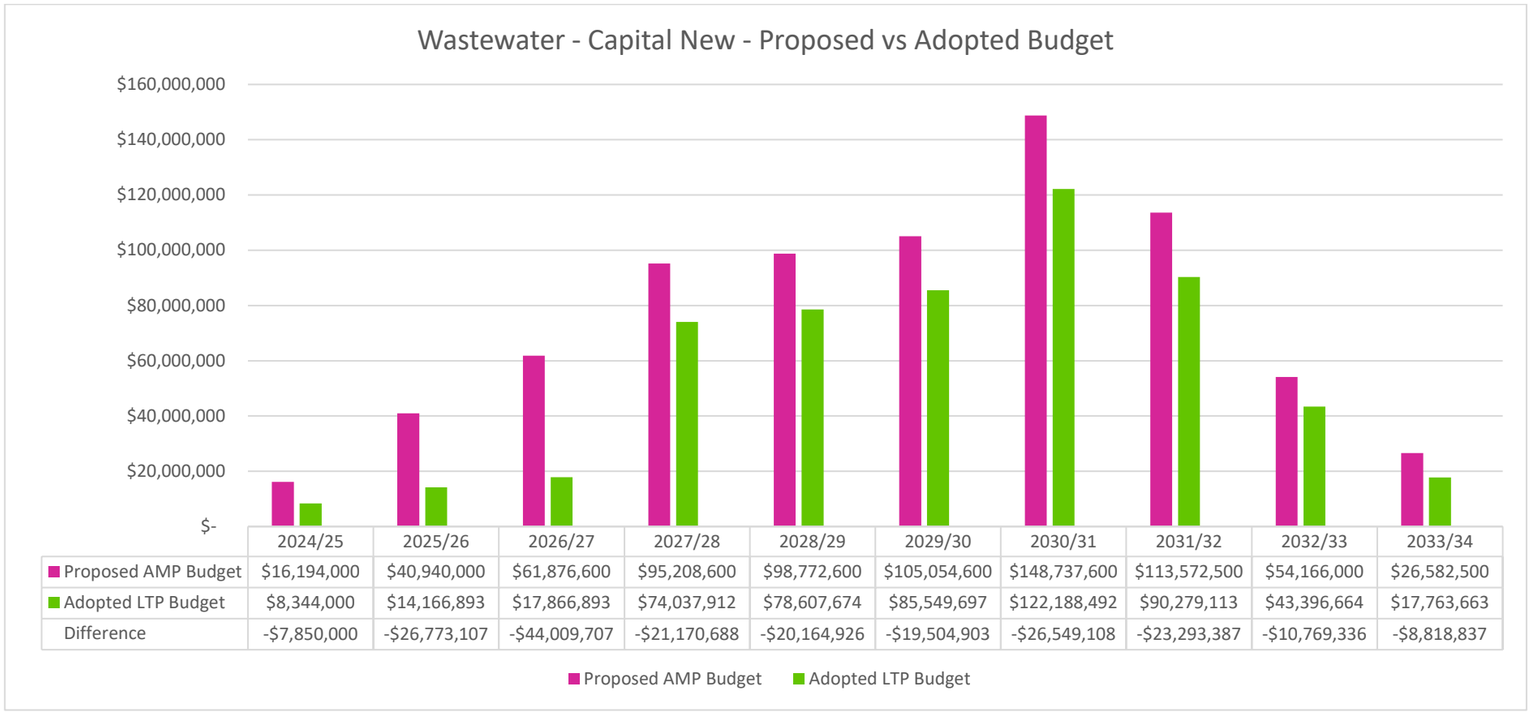
Programme Type : Renewals															
Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect on Levels of Service (LOS)
2411 - Renewal of Oxidation Ponds and Sludge Lagoons	LTP View	$700,000	$700,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,400,000	This programme was moved from Operational to Renewal.	No additional risk	Maintain LOS
601 - Citywide - Aeration Pond Wave Band Repairs	LTP View	$150,000	$200,000	$0	$0	$0	$0	$0	$0	$0	$0	$350,000	Programme 2253 – moved from Capital New to Renewals and renamed Programme 601	No additional risk	Maintain LOS

Capital New

Capital investment is required to meet promised Council levels of service both now and into the future. Nature Calls takes up the majority of our capital new budget over the next 10 years. In addition to this we need to upgrade parts of the pipe network and increase network storage capacity to reduce the probability of overflow during rainfall events, as these events are predicted to be more frequent and more intense in the future.

There is also a need to realign at risk pipelines (those under stream beds and buildings) and ensure that we can extend our wastewater network to future growth areas. To do this work, we expect to be investing at least $7 to $11 million per year over the next 10 years.

Investment in resilience makes networks more reliable and in general can reduce lifecycle costs, particularly during recovery from damaging events.



	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
Proposed AMP Budget	$16,194,000	$40,940,000	$61,876,600	$95,208,600	$98,772,600	$105,054,600	$148,737,600	$113,572,500	$54,166,000	$26,582,500
Adopted LTP Budget	$8,344,000	$14,166,893	$17,866,893	$74,037,912	$78,607,674	$85,549,697	$122,188,492	$90,279,113	$43,396,664	$17,763,663
Difference	-$7,850,000	-$26,773,107	-$44,009,707	-$21,170,688	-$20,164,926	-$19,504,903	-$26,549,108	-$23,293,387	-$10,769,336	-$8,818,837

The tables below contain a summary of the capital new programme changes within a 10 year period as a result of the LTP consultation process, implications for the changes and effects on levels of service as a result of a change.

Capital New - Levels of Service

Budget Decrease

There was a $95,800,000 reduction in Wastewater Capital New budgets. This was primarily due to a $150,000,000 reduction in the Nature Calls programme. The table below provides a detailed view of affected programmes and the effect on risk, opportunity, and levels of service;

Programme Type : Capital New - Levels of Service															
Programme Name	**Budget view**	**Year1**	**Year2**	**Year3**	**Year4**	**Year5**	**Year6**	**Year7**	**Year8**	**Year9**	**Year10**	**Total**	**Description of Change**	**Implication/Risk/Opportunity**	**Effect of Levels on Service (LOS)**
		2024/25	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**2031/32**	**2032/33**	**2033/34**				
66 - Totara Road Wastewater Treatment Plant - Resilience Programme	AMP View	$250,000	$250,000	$786,600	$986,600	$582,100	$582,100	$582,100	$573,000	$0	$0	$4,592,500	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Increased chance of equipment and process failure.	May not be able to provide LoS in terms of meeting consent conditions in the event of unplanned equipment or process failure
66 - Totara Road Wastewater Treatment Plant - Resilience Programme	LTP View	$250,000	$250,000	$250,000	$250,000	$250,000	$250,000	$250,000	$250,000	$100,000	$100,000	$2,200,000			
628 - Totara Road Wastewater Treatment Plant - Consent Renewal Upgrade	AMP View	$5,000,000	$27,000,000	$48,000,000	$79,100,000	$81,400,000	$89,000,000	$135,000,000	$100,000,000	$45,000,000	$20,000,000	$629,500,000	Budget deferred to beyond Y10 in accordance with resolution as part of LTP programme prioritisation.	Risk of not completing project on time to meet resource consent conditions. May result in prosecution.	May not be able to provide LoS in terms of meeting consent conditions
628 - Totara Road Wastewater Treatment Plant - Consent Renewal Upgrade	LTP View	$3,000,000	$4,126,893	$4,126,893	$67,405,912	$70,157,174	$75,659,697	$115,552,992	$85,289,113	$38,517,664	$16,163,663	$480,000,000			
1074 - Totara Road Wastewater Treatment Plant - Earthquake Strengthening of Civil Structures	AMP View	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$0	$0	$0	$0	$0	$0	$8,000,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation. Scope of the programme has been reviewed and is based on more cost-efficient solution.	No apparent risks	No effect on current LoS
1074 - Totara Road Wastewater Treatment Plant - Earthquake Strengthening of Civil Structures	LTP View	$1,000,000	$2,500,000	$2,500,000	$0	$0	$0	$0	$0	$0	$0	$6,000,000			
1616 - City-wide - Wastewater Pump Station - Capacity Upgrade	AMP View	$2,000,000	$2,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$12,000,000	Budget removed from year 4 onwards. This would have addressed under capacity pump stations.	High risk of not providing LoS or being able to cater for growth	Under capacity pump stations are at risk of not providing LoS
1616 - City-wide - Wastewater Pump Station - Capacity Upgrade	LTP View	$1,000,000	$2,200,000	$2,200,000	$0	$0	$0	$0	$0	$0	$0	$5,400,000			
1617 - Totara Road Wastewater Treatment Plant - Biogas System Improvements	AMP View	$2,200,000	$2,600,000	$0	$0	$0	$0	$0	$0	$0	$0	$4,800,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation. Scope of the programme has been reviewed and is based on more cost-efficient solution.	No apparent risks	No effect on current LoS
1617 - Totara Road Wastewater Treatment Plant - Biogas System Improvements	LTP View	$250,000	$1,500,000	$1,250,000	$0	$0	$0	$0	$0	$0	$0	$3,000,000			
1677 - Upsizing of Kairanga Bunnythorpe Road Sewer and Storage	AMP View	$0	$0	$1,000,000	$2,000,000	$2,000,000	$0	$0	$0	$0	$0	$5,000,000	Uncertainty over timing. Budget realigned to co-ordinate with PNITI. Budget now allows for design and land purchase only prior to 2034	The risks are that growth occurs early and there is no budget available for construction prior to 2034	LoS are not currently being met in this area. The effect is that this will continue.
1677 - Upsizing of Kairanga Bunnythorpe Road Sewer and Storage	LTP View	$0	$50,000	$750,000	$0	$0	$0	$0	$0	$0	$0	$800,000			
1712 - City-wide Wastewater wet weather overflow mitigation	AMP View	$250,000	$1,500,000	$300,000	$2,000,000	$300,000	$552,500	$320,000	$1,759,500	$207,000	$1,552,500	$8,741,500	Budget deferred to beyond Y10 in accordance with resolution as part of LTP programme prioritisation.	Risk is that wet weather overflows will continue and become more frequent due to urban intensification and climate change.	LoS will continue to not be met, both in terms of overflows in wet weather and compliance requirements.
1712 - City-wide Wastewater wet weather overflow mitigation	LTP View	$500,000	$500,000	$500,000	$0	$0	$0	$0	$0	$0	$0	$1,500,000			

Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels on Service (LOS)
1821 - City-wide Wastewater Pipeline Realignment of critical at-risk mains	AMP View	$1,600,000	$1,400,000	$1,500,000	$190,000	$190,000	$1,600,000	$1,400,000	$1,500,000	$130,000	$130,000	$9,640,000	Budget deferred to beyond Y10 in accordance with resolution as part of LTP programme prioritisation.	Risk of failure of pipes under houses, streams will increase over time. Risk to private property and risk to environment will increase over time. Significant unknown level of risk as full extent of problem is not known.	LoS may not be met in event of pipe failure - both in terms of service and environment as well as reputational and financial.
1821 - City-wide Wastewater Pipeline Realignment of critical at-risk mains	LTP View	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$100,000	$100,000	$100,000	$100,000	$3,400,000			
2299 - City-wide - Wastewater Pipe Improvement	AMP View	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$10,000,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation.	Risk of continued failure to provide levels of service in areas targeted by the programme. Risk of maintenance costs increasing over time and a parallel reduction in the efficiency and effectiveness of the network.	LoS are not currently being met in areas identified for improvement. The effect is that this will continue.
2299 - City-wide - Wastewater Pipe Improvement	LTP View	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$500,000	$500,000	$500,000	$500,000	$8,000,000			
2330 - 3 Waters Telemetry Upgrades	AMP View	$0	$500,000	$500,000	$550,000	$600,000	$0	$0	$0	$0	$0	$2,150,000	Budget reduced in accordance with resolution as part of LTP programme prioritisation. Scope of the programme has been reviewed and is based on more cost-efficient solution.	No apparent risks	No effect on current LoS
2330 - 3 Waters Telemetry Upgrades	LTP View	$0	$150,000	$500,000	$1,150,000	$0	$0	$0	$0	$0	$0	$1,800,000			

Programme Timing Change

There was a $5,030,000 decrease in budgets as a result of changes to the timing of a single programme, as shown in the table below.

Programme Type: Capital New - Levels of Service															
Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels on Service (LOS)
2322 - Bunnythorpe - Wastewater Network Upgrades	AMP View	$0	$0	$250,000	$1,000,000	$1,700,000	$2,230,000	$750,000	$0	$0	$0	$5,930,000	Rising main will be done with pump station as part of Programme 1677	Risk of continued failure to provide levels of service in areas targeted by the programme. Risk of maintenance costs increasing over time and a parallel reduction in the efficiency and effectiveness of the network.	LoS are not currently being met in this area. The effect is that this will continue.
2322 - Bunnythorpe - Wastewater Network Upgrades	LTP View	$300,000	$300,000	$300,000	$0	$0	$0	$0	$0	$0	$0	$900,000			

Introduced

There was $5,100,000 introduced into the Capital New budget when Programme 2249 was moved from the Capital Growth area.

Programme Type: Capital New - Levels of Service															
Programme Name	Budget view	Year1 2024/25	Year2 2025/26	Year3 2026/27	Year4 2027/28	Year5 2028/29	Year6 2029/30	Year7 2030/31	Year8 2031/32	Year9 2032/33	Year10 2033/34	Total	Description of Change	Implication/Risk/Opportunity	Effect of Levels on Service (LOS)
2347 - Wastewater Trunk Main - Infill Upgrades	LTP View	$250,000	$500,000	$700,000	$275,000	$600,000	$750,000	$295,000	$650,000	$789,000	$310,000	$5,119,000	Programme 2249 moved from Capital Growth to Capital Levels of Service. No change to budget	No change	No change

Not Adopted

There was a decrease of $950,000. The table below provides a detailed view of affected programmes and the effect on risk, opportunity, and levels of service;

Programme Type: Capital New - Levels of Service															
Programme Name	**Budget view**	**Year1**	**Year2**	**Year3**	**Year4**	**Year5**	**Year6**	**Year7**	**Year8**	**Year9**	**Year10**	**Total**	**Description of Change**	**Implication/Risk/Opportunity**	**Effect of Levels on Service (LOS)**
		2024/25	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**2031/32**	**2032/33**	**2033/34**				
2253 - Citywide - Aeration Pond Wave Band Repairs	AMP View	$150,000	$200,000	$0	$0	$0	$0	$0	$0	$0	$0	$350,000	Moved from Capital New to Renewals and renamed Programme 601	No change	No change
2259 - WWTP - Emergency Bypass Upgrades	AMP View	$0	$0	$150,000	$150,000	$150,000	$150,000	$0	$0	$0	$0	$600,000	Rolled into Programme 628. However, no increase to 628, so effective Budget Decrease	Will be carried out as part of WWTP Upgrade works. Risk of breaching consent conditions will increase over time.	No effect on current LoS

Capital New – Growth

Capital investment is also required to cater for expansion of the city and to meet growth demands. Actual service growth is dependent on timing of developments.

The timing of the growth programmes has been adjusted in accordance with revised growth timing assumptions. As stated in the Strategic Asset Management Plan these assumptions are made Council wide based on population projections, economic projections, government policy on requirements for dwellings and projections of greenfield development areas.

These assumptions have some inherent risks – which are detailed in the Significant Forecasting Assumptions for the Long-Term Plan. Those most relevant to programmes is that growth is at significantly different rates than assumed. The impact on programmes is that budget is not available to service the growth at the time it occurs. This will in turn affect the ability to provide standard levels of service to the growth that has occurred.

Several programmes were adjusted during the Council prioritisation process, as timing expectations for particular development areas were revised by the Strategy and Planning Team.

Programme Timing Change and Budget Decrease

Changes in the timing of two programmes to align with the latest growth projections had no impact on the overall budget. However, one budget was split, resulting in a budget decrease of $7,300,000 and subsequent equal increase in the Introduced budgets category.

Programme Type: Capital New - Growth															
Programme Name	**Budget view**	**Year1**	**Year2**	**Year3**	**Year4**	**Year5**	**Year6**	**Year7**	**Year8**	**Year9**	**Year10**	**Total**	**Description of Change**	**Implication/Risk/Opportunity**	**Effect of Levels on Service (LOS)**
		2024/25	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**2031/32**	**2032/33**	**2033/34**				
1055 - Urban Growth - Kakatangiata - Wastewater	AMP View	$0	$300,000	$3,000,000	$2,000,000	$2,000,000	$300,000	$2,000,000	$2,000,000	$2,000,000	$200,000	$13,800,000	Programme 2511 was split from this budget for transparency. Timing realigned to reflect growth predictions.	No change	No effect on current LoS
1055 - Urban Growth - Kakatangiata - Wastewater	LTP View	$0	$0	$0	$0	$0	$300,000	$2,000,000	$2,000,000	$2,000,000	$200,000	$6,500,000			
1412 - Urban Growth - Ashhurst - Wastewater	AMP View	$0	$0	$0	$250,000	$1,550,000	$200,000	$500,000	$1,000,000	$0	$0	$3,500,000	Realigned to growth predictions	No change	No effect on current LoS
1412 - Urban Growth - Ashhurst - Wastewater	LTP View	$0	$0	$0	$0	$250,000	$1,550,000	$200,000	$500,000	$1,000,000	$0	$3,500,000			

Introduced

An additional programme was introduced as a result of splitting out the Kikiwhenua Urban Growth area from Kakatangiata. There was no overall change to Capital New budgets, as the $7,300,000 increase shown in this table was balanced out by a decrease in the table above.

Programme Type: Capital New - Growth															
Programme Name	**Budget view**	**Year1**	**Year2**	**Year3**	**Year4**	**Year5**	**Year6**	**Year7**	**Year8**	**Year9**	**Year10**	**Total**	**Description of Change**	**Implication/Risk/Opportunity**	**Effect of Levels on Service (LOS)**
		2024/25	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**2031/32**	**2032/33**	**2033/34**				
2511 - Urban Growth - Kikiwhenua - Wastewater	LTP View	$0	$300,000	$3,000,000	$2,000,000	$2,000,000	$0	$0	$0	$0	$0	$7,300,000	Separated out from Programme 1055 for transparency	No change	No effect on current LoS

growth

Not Adopted

There was a budget decrease of $12,820,000 when two programmes were removed. The table below provides a detailed view of affected programmes and the effect on risk, opportunity, and levels of service;

Status: Final

Programme Type: Capital New - Growth															
Programme Name	**Budget view**	**Year1**	**Year2**	**Year3**	**Year4**	**Year5**	**Year6**	**Year7**	**Year8**	**Year9**	**Year10**	**Total**	**Description of Change**	**Implication/Risk/Opportunity**	**Effect of Levels on Service (LOS)**
		2024/25	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**2031/32**	**2032/33**	**2033/34**				
2248 - Urban Growth - NEIZ - Wastewater Asset Upgrade	AMP View	$0	$0	$0	$0	$200,000	$500,000	$1,500,000	$2,000,000	$2,500,000	$1,000,000	$7,700,000	Rolled into Programme 210	Risk that LoS will not be able to be delivered for the NEIZ	May not be able to provide LoS to new development
2249 - Wastewater Trunk Main - Infill Upgrades	AMP View	$250,000	$500,000	$700,000	$275,000	$600,000	$750,000	$295,000	$650,000	$789,000	$310,000	$5,119,000	Renamed as Programme 2347 and put into Capital New	No change	No change

Te Kaunihera o Papaioea
Palmerston North City Council

pncc.govt.nz / info@pncc.govt.nz / 06 356 8199