

Wastewater Asset Management Plan Summary

2008



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ME HEKE KI PŌNEKE
WELLINGTON CITY COUNCIL

Wellington

This Asset Management Plan has been prepared by



Summary Wastewater Asset Management Plan 2009

Wellington City Council

January 2009

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1.0 Overview

1.1 Activity description

The wastewater network collects, conveys, treats and disposes of wastewater and is essential for public health, the environment, and the viability of the city as a whole. Each year, the network carries about 29 million cubic metres of sewage to treatment plants at Karori, Moa Point and Porirua. The network is made up of more than 1000 kilometres of sewer pipes and tunnels, and more than 60 pumping stations with a replacement value of approximately \$639 million.

The wastewater network is managed in accordance with the wastewater asset management plan, which ensures service level requirements such as network condition and capacity, reducing risk of overflows, response to faults/complaints, and criteria for upgrades and renewals are met. The plan details how the Council will comply with all relevant legislation and regulatory requirements.

Key service level requirements and underlying standards include:

- Overflows from the wastewater system should be minimised.
- Discharges from the wastewater system should have minimal public health and environmental impact.

This plan covers the ten year planning period from 2009/10 to 2017/18.

1.2 Council involvement

Adequate systems for the collection and disposal of wastewater are a fundamental requirement for the health and general well-being of the community, including providing support for business development.

In urban areas, wastewater is most effectively disposed of by means of reticulated systems, allowing the costs associated with maintaining high standards and efficient infrastructure to be spread over a wide population. The existing wastewater system has been developed and built up over many years as a public system to meet community needs.

The Council manages Wellington's wastewater activity because:

- The activity directly supports the achievement of a number of community outcomes (outcomes the Wellington community believe describe the city they wish to live in). It also directly supports the achievement of Council outcome nine (safer – protecting public health and the environment, Figure 2), and supports economic growth of the community.
- The Council can provide a specified level of service in a cost-effective manner.
- The Local Government Act 2002 (section 130) requires the Council to provide water services (including wastewater services) and maintain its capacity to do so.
- The Health Act 1956, (sections 23 and 29) requires the Council to “improve, promote and protect public health” within the district as necessary.
- The community, through the community outcome process, has strongly indicated its support of Council involvement to sustainably manage the wastewater activity to protect public and environmental health, critical infrastructure and property, and to actively reduce adverse environmental impacts.

1.3 Key wastewater issues

Key wastewater issues identified by the Wellington City Council which are being addressed are:

- **Levels of service.** The level of service provided to Wellington City by the wastewater activity is consistent with current industry standards and levels of service provided by other councils in New Zealand and analysis indicates the current level of service broadly satisfies community expectations. The Council will continue to gather data to better describe the actual level of service provided and determine resident satisfaction with a greater level of confidence.
- **Future change.** The effects of future climate change are uncertain, although warmer temperatures, increased peak rainfalls and rises in sea levels, with consequent rising of groundwater levels in some areas, are expected. There is also an increased likelihood of network faults as the public and private systems age. These factors increase risk of stormwater entry into the wastewater network through increased frequency of surface flooding (inflow) and increased groundwater levels (infiltration). Population growth and urbanisation, with associated increases in water use and wastewater generation are also expected to continue. The projected increase in flows, particularly from entry of stormwater and groundwater, requires active management, especially since planning for change and implementing identified initiatives takes time.
- **Environmental impact from wastewater overflows.** Excessive flows during wet weather lead to occasional overflows to the stormwater system through a series of constructed overflows. The stormwater, contaminated with dilute wastewater, is then discharged to watercourses or the sea. Although the public and environmental health consequences of such events may not always be high, it is culturally offensive to iwi and becoming less tolerated by the community. The Council has a number of programmes in place to manage and reduce overflow frequency and impact.
- **Risk of natural disaster.** A catastrophic natural disaster, such as a major earthquake, could limit the ability to safely collect and dispose of wastewater from the community. This would lead to elevated public health risks in a short time frame. Reinstating systems to collect and transport wastewater, as well as to treat and dispose of it, would be costly and would take considerable time.
- **Continuous improvement.** The Council recognises the fundamental need to continually improve its asset management processes. Wastewater must be collected and disposed of at agreed service levels and with increasing efficiency to reduce costs, reduce resource use and minimise environmental impacts.

2.0 Strategic context

2.1 Strategic framework

The Council has facilitated the identification and definition of Community Outcomes by the Wellington “community”. The Community Outcomes guided the development of the Council’s own City Outcomes which interpret the Community Outcomes over which the Council has direct influence. The Council has identified key strategy areas, and within each of these areas has developed strategies in order to deliver the City Outcomes. In turn, these strategies form a key input into the asset management plans, along with stakeholder and legislative requirements, current and future demand information, and risk issues.

Figure 1 indicates the links between the key legislation, planning and documents that guide the Council’s wastewater activity.

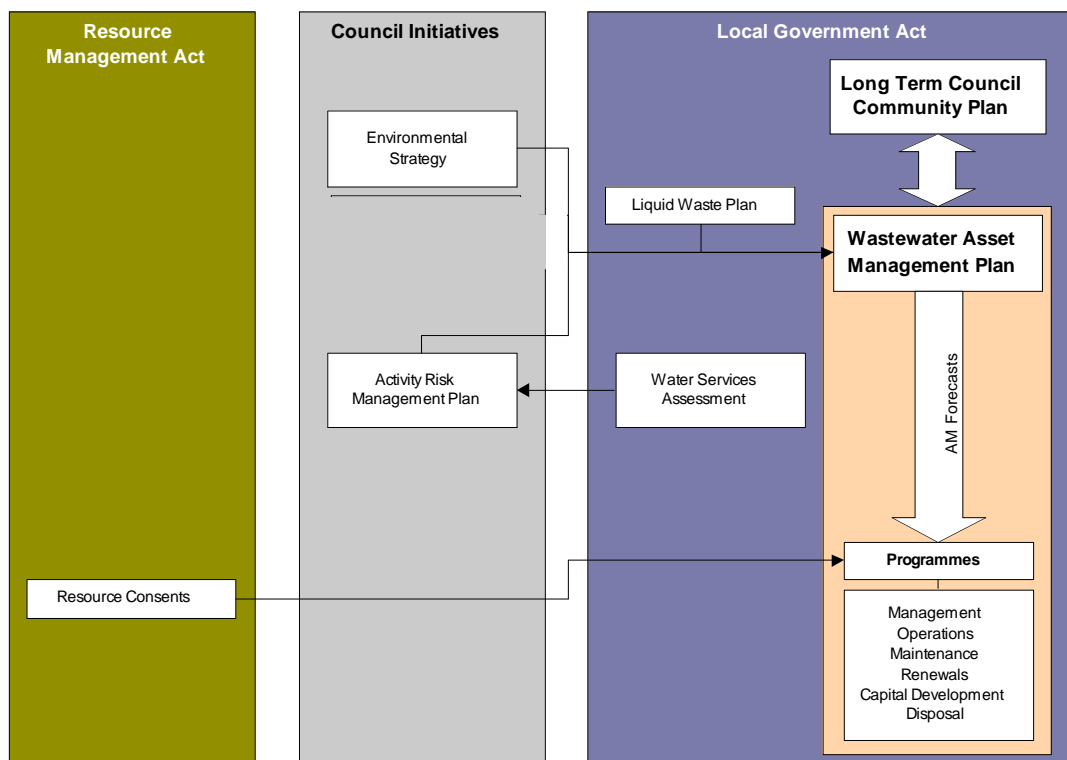


Figure 1 – Strategic framework

The wastewater activity contributes to the following Community Outcome
'Wellington’s long-term environmental health will be protected by well-planned and well-maintained infrastructure’.

This plan gives effect to the high level strategies, Council and Community Outcomes by having specific plans and a detailed programme of works to support and encourage quality of life, enterprise and prosperity through the provision of wastewater collection and disposal services.

Figure 2 shows the linkages between the Community Outcomes defined in the Long Term Council Community Plan and the wastewater activity and the nature of the contribution.

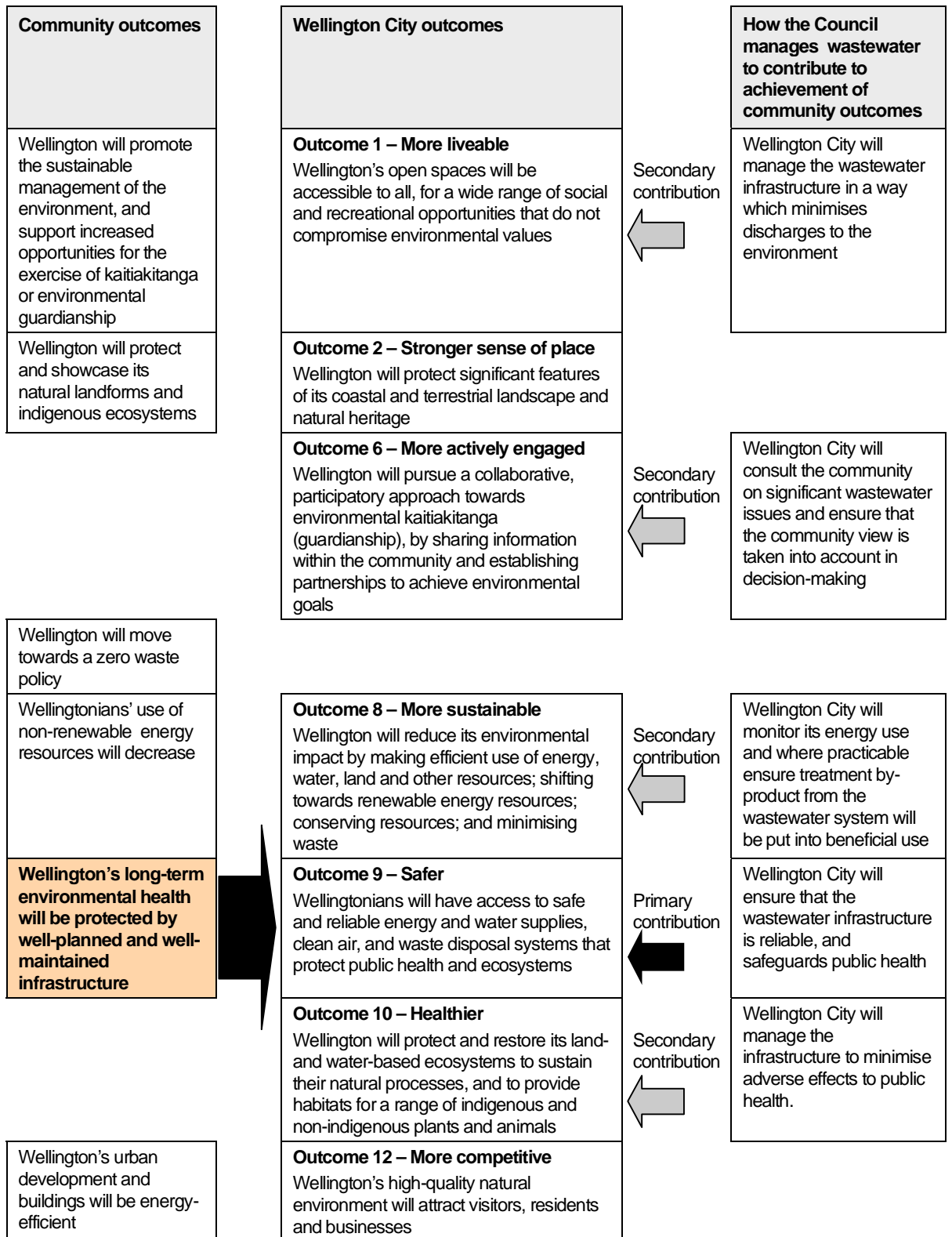


Figure 2- Community Outcomes, City Outcomes and strategies

2.1.1 Environmental Strategy and the Network Strategic Plan

The Environmental Strategy adopted by the Council in 2006 provides a high-level statement of the Council's long-term environmental intentions for Wellington as well as shorter-term priority areas for action. The Network Strategic Plan, when completed, will identify the key strategic issues facing the wastewater network and set out our approach to managing these issues.

2.1.2 Resource consents

The Council holds a number of resource consents for the operation of the Western Wastewater Treatment Plant, the Moa Point Wastewater Treatment Plant and the Southern Landfill Sludge Disposal Plant. The resource consents for the latter two facilities expire on 8 January 2008 and 16 February 2008 respectively. Applications for new consents have been lodged.

2.1.3 Waste Management Plan

This plan was adopted by the Council in 2005 to meet the requirements set out in the Local Government Act 2002, the Waste Minimisation Act 2008 and the New Zealand Waste Strategy 2002. The plan states objectives, policies and actions relating to the sustainable management of stormwater and wastewater discharges which provide a framework for asset management planning. The goals of the Liquid Waste Plan are to:

- Lower the social costs and risks of waste.
- Reduce damage to the environment from waste generation and disposal.
- Increase economic benefit by more efficient use of materials.

2.2 Growth in demand

2.2.1 Changing demand

Factors which influence demand for the wastewater activity are:

- Growth
 - population change
 - sub-divisional activity and residential change
 - commercial and industrial change
- Stormwater inflow and infiltration
- Climate change
- Increasing customer expectations.

2.2.2 Key issues with changing demand

Wastewater management is an activity that influences a range of outcomes, including environmental well-being, health, sustainability and economic development. The key issues for the wastewater activity related to the well-being of the city are outlined below.

Social

The expected growth rate in Wellington City is predicted to be approximately 0.7 per cent per year over the next 20 years¹ (an increase of approximately 27,000 residents). Further, the average number of people per dwelling is decreasing in Wellington, as it is elsewhere in New Zealand. Commercial premises are being converted into apartments within the

¹ A slow down in growth is expected around 2030 in conjunction with an ageing population and projected slowing of world population growth

central business district, and housing needs are changing to smaller lot sizes. In line with declining household size, Wellington will need to provide approximately 24,000 additional dwellings between 2006 and 2026.

Increasing population implies increasing water demand, accentuated by the declining household size, and therefore increased wastewater flows with more buildings connected to the system. Further, development changes and changes in the local economy and growth of particular kinds of business will affect the volumes and type of wastewater generated. However, flows associated with this population growth and development is not anticipated to significantly affect total flows to the treatment facilities and subsequent generation of bio-solids within the planning period. Low density rural/residential development continues to be serviced with on-site disposal systems. Risks identified in non-reticulated areas are not sufficient for the Council to provide reticulation to service these communities.

Inflow from stormwater pipes and infiltration of groundwater has the largest effect on wastewater flows, and causes overflow of wastewater occasionally despite programmes to reduce and contain them. Climate change leading to higher intensity rainfall events could increase stormwater inflow to the wastewater system due to flooding around gully traps and manholes. Increased sea level increases continuous infiltration into low-lying pipes which may result in early rehabilitation requirements. The Council will continue to implement a range of strategies intended to reduce wet weather overloading and the potential for overflows from the wastewater systems, principally caused by inflow and infiltration where benefits exceed the costs.

Changes in growth and demand on the wastewater infrastructure affect:

- The capacity of the wastewater network to meet the increase of wastewater flows.
- The inflow from stormwater pipes into wastewater from urban areas.
- Residents adjacent to overflow locations, and the occasional flooding of habitable dwellings in extreme events.
- Awareness of public health safety issues, leading to a higher expectation of a safe and reliable wastewater network and continued improvement in wastewater receiving environments.

Environmental

There is an increasing focus on the quality of the environment including water quality in watercourses and the coastal receiving waters. Overflows from the wastewater system are generally to the stormwater system through a series of constructed overflows, discharging diluted wastewater to watercourses and the sea. The Council has invested heavily in improving the water quality of harbour, sea and streams through assessment, monitoring and investigation projects, and implementation of physical works. The focus has been on reducing wastewater pollution from the city's stormwater system at 11 consented sites and other selected sites.

Cultural

The discharge of stormwater contaminated with sewage to receiving waters is offensive to the Tangata Whenua. Asset management planning includes a range of strategies to identify and eliminate the causes of wastewater overflows to the stormwater system.

Economic

An effective and reliable wastewater system supports economic activity in the city. Changes in the local economy and growth of particular kinds of business will affect the volumes and types of wastewater discharge. The strategies and funding policies in the asset management plan are focused on minimising the cost of services and ensuring the equitable allocation of costs while maintaining and improving the quality of the wastewater service.

2.3 Wastewater demand projections

2.3.1 Flows to Moa Point treatment plant

Approximately 85 per cent of wastewater generated in Wellington is conveyed to the Moa Point treatment facility. The Council is planning for an increase in average dry-weather wastewater flows in line with the predicted population increase of approximately 0.7 per cent per year over the next 20 years, and some increases in industrial and commercial waste discharges in some catchments. This is well below the facility's capability to fully treat 3000 l/s.

Assuming ongoing management of stormwater inflow and groundwater infiltration into the network, wet-weather flows are not forecast to exceed 4000 l/s (the capacity of the inlet pump station) over this planning period and beyond. However, full treatment capability is currently exceeded approximately three times a year (with an average overflow volume of 4915m³). The frequency of these overflows is projected to increase to approximately nine times per year. Proposals to address this issue include a provision to treat overflows, upgrades to the inlet pumping station and further work to reduce inflow and infiltration in the upstream catchments.

2.3.2 Flows to Western treatment plant

Approximately 5 per cent of wastewater generated in Wellington is conveyed to the Western treatment facility. The Council is planning for an increase in average dry-weather flows in line with a 0.7 per cent per year population increase over the next 20 years. The facility has sufficient capability to fully treat these flows throughout the planning period and beyond.

Wet-weather overflows of diluted partially treated wastewater from this facility occur approximately once or twice a year. Forecasts indicate that current programmes should limit these occurrences, with future growth not playing a significant part. Further work to reduce inflow and infiltration in the upstream catchments would reduce wet-weather flows and decrease the frequency of overflows.

2.3.3 Flows to Porirua treatment plant

This treatment plant is operated and managed by Porirua City Council. The Council currently exceeds its capacity allocation, and work is underway to better quantify future flows to this facility taking into account the expected growth in the northern suburbs.

2.4 Demand management

In addition to asset development works, the Council currently implements the following demand management techniques:

Regulation – This includes:

- trade waste management
- the sewage pollution elimination project, which allows the identification of inflows, the majority of which are on private property, and requires the householder to carry out corrective works.

Charging practices – volumetric charging for water supply for commercial and industrial users to reduce water consumption and subsequent wastewater generation.

Education – promotion of water conservation and sustainability initiatives to reduce wastewater generation.

Changing technology – the Council has used new technology to more effectively and efficiently handle the wastewater loads to optimise the utilisation of their assets, and therefore to minimise upgrading works required (e.g. treatment technology, rehabilitation of pipes to minimise infiltration, pump station co-ordination).

3.0 Our assets

3.1 Asset description

The broad asset groups and the physical quantities are shown in Figure 3. Figure 4 shows the layout of the city's wastewater system and the location of the treatment facilities, and Figure 5 show the current replacement cost of the main wastewater asset groups.

Activity	Asset components	Quantity
Pipe network	Pipes	979 km
	Manholes	35,400
	Sewer tunnels	19 km
	Permanent flow meters	12
Pumping stations	Pumping stations	62
Treatment facilities	Western Treatment Plant	1
	Moa Point Treatment Plant	1
	Porirua Treatment Plant	28% share with Porirua City Council
	Carey's Gully Sludge Dewatering Plant	1

Figure 3 - Wastewater assets summary

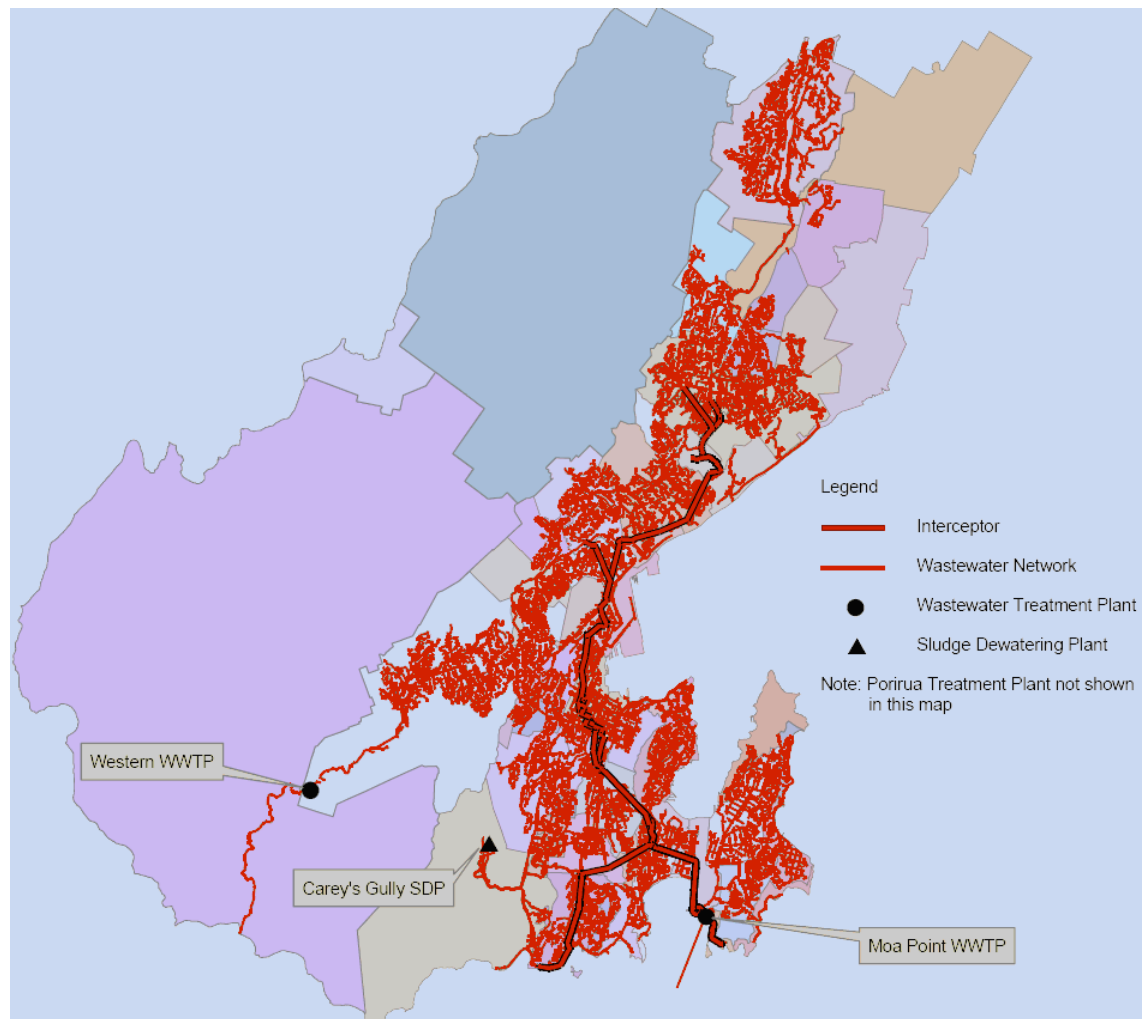


Figure 4 - Wellington's wastewater network

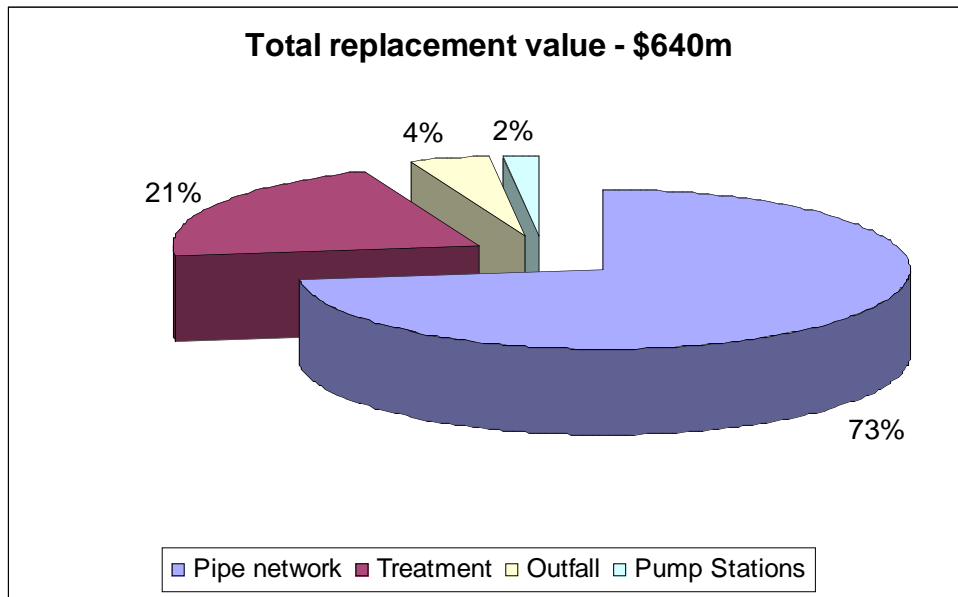


Figure 5 - Wastewater asset replacement cost

3.1.1 Pipe network

Wastewater is collected from residences and businesses and conveyed to the main intercepting sewer through the local reticulation network, which in turn conveys it to the treatment facilities.

- The majority of pipes are earthenware and are 150mm diameter or smaller. Only 15 per cent of network by replacement cost is of 300mm diameter or greater.
- 64 per cent of tunnels are ovoid, including all of the tunnels constructed of brick.
- The network is old by New Zealand standards. Although 20 per cent of the network was installed less than 20 years ago, 40 per cent of the network is older than 60 years, and 20 per cent is older than 80 years, as presented in Figure 6.

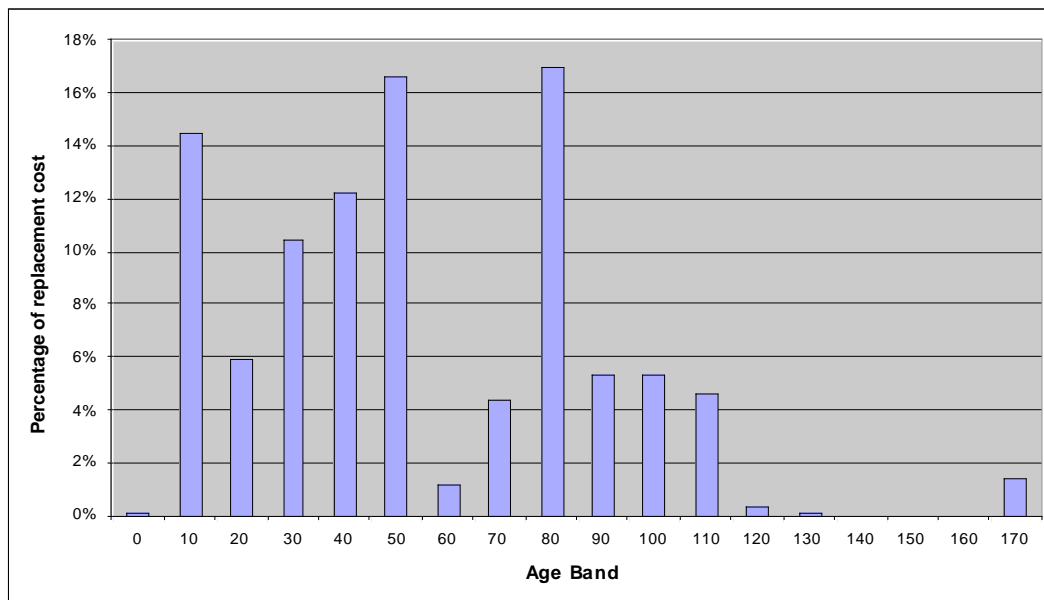


Figure 6 – Pipe network age profile

3.1.2 Pumping stations

Pumping stations assist conveyance of wastewater from low-lying areas.

- 53 of the 62 pumping stations are small (<5kW) to medium (between 5 and 20kW).
- Approximately 80 per cent of the pumping station equipment, including pump-sets, electrical and instrumentation, and pipes, valves and fittings is less than 15 years old, 75 per cent of the base life, as presented in Figure 7.

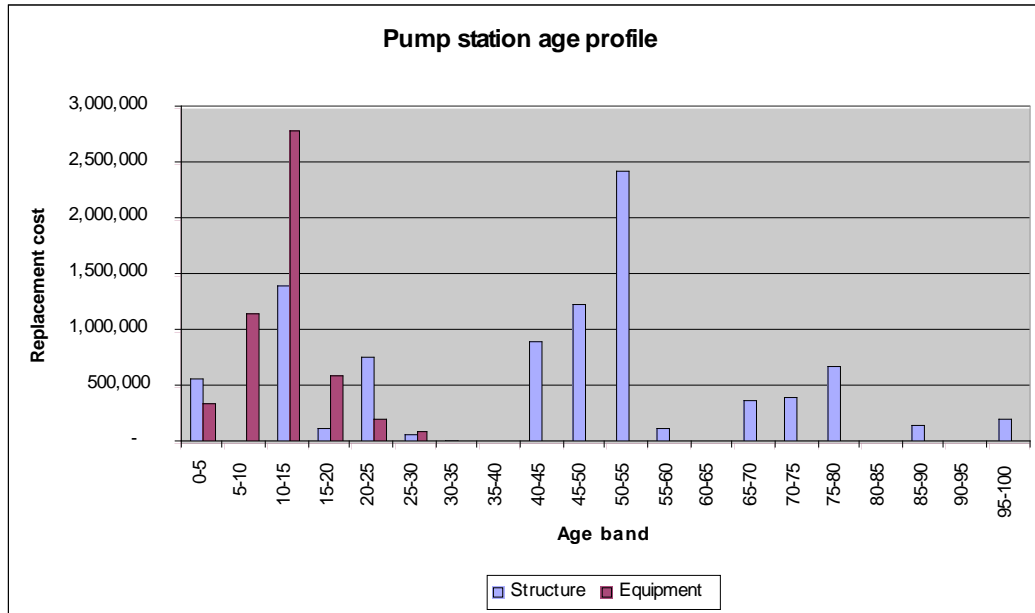


Figure 7 – Pumping station age profile

3.1.3 Treatment plants

Treatment plants use mechanical, biological and other processes to remove harmful constituents from wastewater before discharging it to the sea. The facilities are summarised below.

- Moa Point Treatment Plant
 - Receives wastewater from all of Wellington except as noted below (135,000 people).
 - Inlet pumping station.
 - Primary, secondary and tertiary treatment.
 - 1.8km ocean outfall pipe.
 - 9km twin sludge pipelines to Carey's Gully Sludge Dewatering Plant.
- Western Treatment Plant
 - Receives wastewater from Karori (11,000 people).
 - Secondary and tertiary treatment.
- Carey's Gully Sludge Dewatering Plant
 - Receives sludge from Moa Point Wastewater Treatment Plant.
- Porirua City Council Wastewater Treatment Plant
 - Receives wastewater from Churton Park, Paparangi, Glenside, Grenada, Tawa and parts of Johnsonville and Newlands (22,000 people).
 - Jointly owned by Porirua City Council and Wellington City Council, and managed by Porirua City Council. Wellington City Council provides annual financial contribution based on flow proportion.

3.2 Asset capacity and performance

3.2.1 Pipe network

- Various pipes in the city have been identified as having insufficient capacity for current peak wet-weather flows. Actual flows occasionally exceed design flows due to entry of stormwater and groundwater to the wastewater system. They are being addressed through ongoing investigations and physical works projects aided by computer modelling of the main interceptor to investigate the locations, frequency and environmental impact of overflows from the network.
- The improvements in stormwater quality achieved as a result of sewage pollution elimination works carried out over the past 12 years are demonstrated in, which shows a 92% improvement in the pollution indicator counts.
- Infiltration into private laterals is perceived to be a major issue affecting the Council's abilities to minimise wet-weather flows using current controls, although no studies have been undertaken to quantify it.

Graph



3.2.2 Pumping stations

- All 62 pumping stations have sufficient capacity for peak dry weather flows.
- Occasional overflows from some pump stations are recorded in wet weather events due to inflow and infiltration, although analysis indicates that these overflow frequencies are lower than many other similar systems in New Zealand.

3.2.3 Treatment plants

- The Moa Point and Western Treatment Plants have sufficient capacity to treat peak dry weather flows from the population forecast throughout this 10 year planning period and beyond.
- Full treatment capability is currently exceeded approximately three times a year (with an average overflow volume of 4915m³). The frequency of these overflows is projected to increase to approximately nine times per year by 2043. Proposals to address this issue include provisions to treat overflows, upgrades to the inlet pumping station and further work to reduce inflow and infiltration in the upstream catchments.
- The Western Treatment Plant has sufficient capacity to treat all dry weather and wet weather flows up to four times average dry weather flows. Heavy and prolonged rainfall can cause wet weather flows to exceed this leading to overflows to the South Coast and Karori Stream on average three times a year. Resource consent applications to authorise the continued operation of the plant are currently being appealed to the Environment Court.
- The Council's capacity has been exceeded in the Porirua treatment plant and discussion is underway to draw up a new agreement and to share maintenance as well as capital upgrading costs. Investigations continue in conjunction with Porirua City Council to determine future expansion requirements of the plant and the works identified as necessary will be included in the next version of this plan.
- Each of these three treatment plants has a finite trade waste capacity. The Council has a team dedicated to the management of trade wastes and impacts.

- Increasing environmental expectations may lead to pressure for wastewater infrastructure and treatment plant upgrade through the resource consent renewal process.
- There are some risks in un-serviced communities with inappropriately designed, installed or maintained septic tanks. Whilst it is unlikely that the Council will reticulate these areas in the foreseeable future, the Council is considering mechanisms that would ensure septic tanks and on-site wastewater disposal systems are installed and maintained in a manner that prevents their failure and ensures effective operation.

3.3 Asset condition

3.3.1 Pipe network

- A "top-down" assessment of the pipe condition has defined the condition grade profile as shown in Figure 8 (where grading 1 indicates very good condition and grading 5 indicates that pipes have failed or are about to fail). The network is generally in moderate condition, and assessed to be in better condition than in 2000.

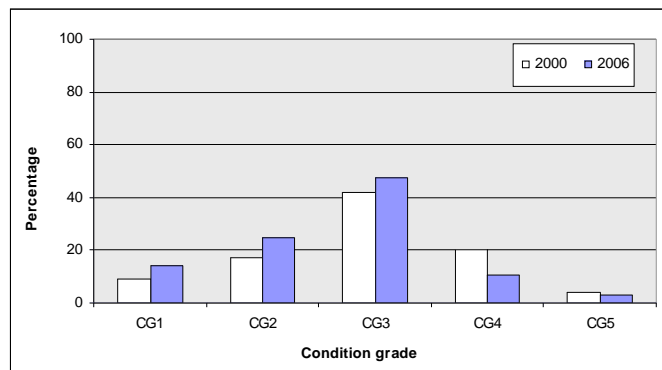


Figure 8 - Citywide condition grade profile for wastewater pipes

- Sections of the main interceptor were visually inspected in 2002, 2003 and 2004 and found to be in better than expected condition with residual life estimated to be in the order of 80 years.

3.3.2 Pumping stations

- The mechanical and electrical plants at the pumping stations are assessed to be in good working order after recent upgrades.

3.3.3 Treatment plants

- The Moa Point and Western Wastewater Treatment Plants are operated under contract by United Water International (UWI). They are assessed to be in good condition and are covered in separate asset management plans being prepared by UWI.
- The Porirua treatment plant is operated by Porirua City and Wellington City Council makes an annual contribution for loan payments, operating and maintenance costs associated with wastewater treatment, the trunk sewer, pumping station and the cost of treating trade waste.
- The 1.8km ocean outfall from the Moa Point Wastewater Treatment Plant is assessed to be in good condition.

3.4 Significant negative effects

The potential significant negative effects of the wastewater activity are:

Environmental values can be degraded by:

- overflows of untreated wastewater from the wastewater network due to blockages, pump station or other plant malfunction, excessive inflow/infiltration of stormwater into the wastewater network and/ or insufficient design capacity
- discharge of partially treated wastewater effluent through the long outfall on the South Coast due to treatment facility overflow or process failure, causing contamination of marine waters (the discharge of fully treated effluent into the ocean has no significant impact on the receiving water quality)
- disposal of treatment by-products, such as bio-solids, discussed in more detail in the composting plant asset management plan
- environmental damage caused by inappropriate or poorly maintained septic tanks in non-reticulated (rural) areas.



Social – the quality of life and public health can be diminished by:

- overflows of untreated wastewater from the wastewater network
- odour from the treatment facilities
- health risks from inappropriate or poorly maintained septic tanks in non-reticulated (rural) areas.

Cultural sensitivities are compromised by:

- overflows of untreated wastewater from the wastewater network
- discharge of partially treated wastewater effluent to the South Coast due to treatment facility overflow, causing contamination of marine waters
- overflows of untreated wastewater from inappropriate or poorly maintained septic tanks in non-reticulated (rural) areas.

Economic costs to the community are incurred to clean up wastewater contamination.

The Council mitigates these potential negative effects through a mix of:

- asset management planning
- monitoring and testing
- asset maintenance, renewal and development work
- compliance with comprehensive environmental and health and safety procedures
- demand management initiatives
- public education

3.5 Levels of service

3.5.1 Broad approach

The Council plans to continue delivering broadly the same level of service within the wastewater activity, with gradual reductions to wastewater overflow frequencies and consequent improvements to environmental protection. Operational improvements introduced are expected to increase operational efficiency, cost-effectiveness and environmental performance through:

- developing robust frameworks to increase confidence in correct project option selection and works prioritisation
- reviewing, consolidating and implementing outcomes from studies examining inflow and infiltration.

3.5.2 Performance measures

The contribution of the wastewater activity to the achievement of the city's Community Outcomes is measured by the activity key performance measures presented in the Long Term Council and Community Plan (LTCCP). They cover the aspects of service that are of most interest to the community and are reported in the Annual Report.

The Council has developed a number of operational measures to enable us to assess the overall quality of the wastewater activity (such as environmental, technical and cost effectiveness standards). These measures are reported on in the detailed asset management plan.

The current and future activity measures adopted, and the level of performance achieved, are shown in Figure 9.

Performance measure	Target	How we are doing
Activity measures		
<ul style="list-style-type: none"> Response time to service requests – percentage of service requests responded to within one hour of notification (response includes investigation and prioritisation of work). 	07/08 97%	
	08/09 97%	
	09/10 97%	
	17/18 97%	
<ul style="list-style-type: none"> Customer satisfaction – percentage of customers who are satisfied with work carried out (specific to wastewater collection and disposal operations and maintenance activities). 	07/08 75%	
	08/09 75%	
	09/10 75%	
	17/18 80%	
<ul style="list-style-type: none"> The percentage of monitored consented harbour/coastal sites where the median annual level of faecal coliform bacteria counts are less than 2000 per 100ml. 	07/08 80%	
	08/09 80%	
	09/10 80%	
	17/18 80%	
<ul style="list-style-type: none"> Wastewater treatment resource consent compliance – the number of infringement notices received. 	07/08 Nil	Achieved
	08/09 Nil	
	09/10 Nil	
	17/18 Nil	
<ul style="list-style-type: none"> The percentage of businesses producing trade waste that are inspected throughout the year 	07/08 100%	100%
	08/09 100%	
	09/10 100%	
	17/18 100%	

Figure 9- Activity and operational performance measures

3.6 Community engagement

The Local Government Act (2002) requires the Council to consult with affected and interested parties in making decisions. The Council ensures that all interested stakeholders have an opportunity to influence level of service decisions by:

- ongoing consultation with the community regarding community outcomes as part of the LTCCP development
- consultation with the community in 2000 as part of the Strategic Review (for the consultation process, alternative levels of service were developed together with associated cost implications, but feedback received from the community was not comprehensive)
- consultation as part of the preparation of the Assessment of Water and Sanitary Services (2005), including the consultation with Ngati Toa and the Tenths Trust, the Makara and Ohariu valleys, the South Karori and Horokiwi communities, and 157 resident and special interest organisations
- making asset management plans available on the request
- consulting with affected persons on specific projects (as required by the Resource Management Act 2001)
- distributing newsletters with rates notices.

While much of the Council's consultation will continue to be done at a high level, there is a need to seek the community's view on the trade offs necessary where there are conflicting goals. We need to establish a balance between capacity and cost; this is realised in the frequency and location of overflows from the network resulting in potential public health and environmental risks, and financial and other implications of improving this.

4.0 Managing our assets

4.1 Asset management model

The asset management planning process implemented by the Council is shown in Figure 10.

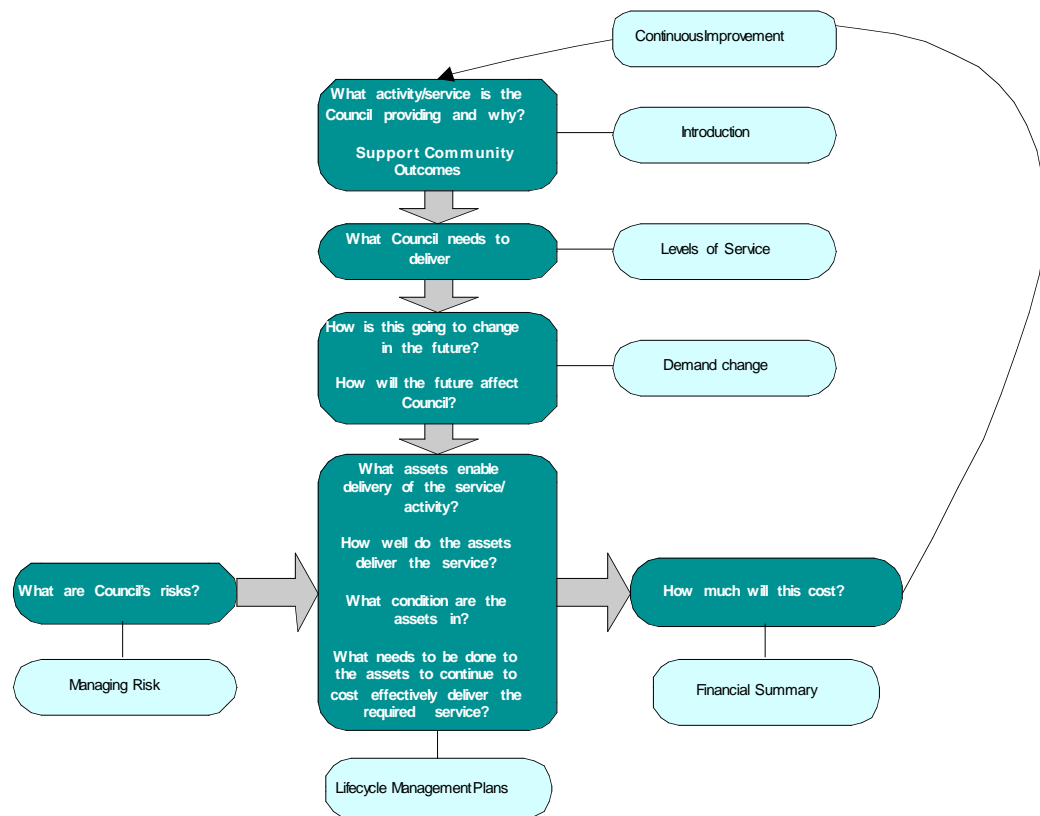


Figure 10 – Asset management planning model

4.2 Risk management

Risk management is an inherent part of the Council's overall wastewater management approach. Management of service levels, environmental and demand/growth related risks are dealt with through the strategies outlined in sections two and three of this plan and this section.

The Council's current approach to risk management can be summarised as:

- Address known high and extreme risks with new management and operational strategies and/or a forward programme of remedial works, with priorities based on a risk matrix system.
- Manage the current known lesser risks within the existing strategies and work programmes.
- Where risks are unknown, develop a plan to better identify and/or quantify the risks prior to implementation of appropriate risk mitigation measures.

The Council is improving its understanding of risk which includes programmes to improve asset knowledge. Works activities and associated expenditure requirements are being reviewed constantly as knowledge of these assets improves. Operating and maintaining the assets

The operations and maintenance strategy is intended to maintain the current levels of service, mitigate risk and minimise costs by implementing a balanced programme of planned and reactive works.

Although the Council's maintenance strategy for pipelines is mainly reactive, we operate an asset condition monitoring programme that records service fault notifications, and includes closed circuit television (CCTV) and physical drain inspections. Pumping stations are maintained through regular inspection and overflow monitoring and control equipment. Only piped systems that are considered to be in the "critical"² category (18 per cent) are proactively inspected to assess structural integrity.

The use of modelling for main trunk sewer and overflow mitigation enables solutions to be identified to achieve optimum performance of the network capacity. A comprehensive emergency management plan is in place. The Council investigates the opportunities to introduce new technologies and wastewater management techniques.

4.3 Asset investment and growth

The Council aims to enhance the capability and integrity of our assets at lowest long term cost and ensure inter-generational equity.

In terms of asset investment, this is largely driven by the closure of identified service gaps such as capacity shortfalls or recreational water quality issues. The Council plans to ensure that focus is placed on the best value projects that deliver the highest benefits per dollar spent, and that the project option chosen to close these service gaps is the best practicable option.

4.3.1 Asset renewals

Longer term asset renewal needs are identified through analysis of condition assessments. More detailed, shorter term prioritised programmes are developed with reference to failure history, risk assessment (including consideration of financial, environmental and social implications of failure), and, in the case of critical drains and plant items, CCTV and visual condition assessments and site inspection information. Assets are therefore renewed when analysis indicates it is more cost effective in the long term to replace rather than continue to maintain it.

4.3.2 Asset development

Upgrade works required to close service gaps are primarily identified as a result of risk assessments and targeted investigations, assisted by computer-based hydraulic models.

Identified upgrade works include the construction of new pipes, increase in size of existing pipes upon renewal and the construction of new works such as pumping station storage. The costs and benefits of development projects are assessed to develop a prioritised works programme.

Pipelines no longer required to transport wastewater and are not being physically replaced are marked as "disused" on records. These pipes are kept intact, where possible, as the Council or others may use these again in the future.

² Pipes for which failure would result in severe consequences, generally large diameter pipes or pipes under dwellings.

5.0 Financial requirements

5.1 Financial forecast

The consolidated 10 year financial forecasts for the wastewater activity are presented in Figure 11. The consolidated financial forecast is included as an attachment.

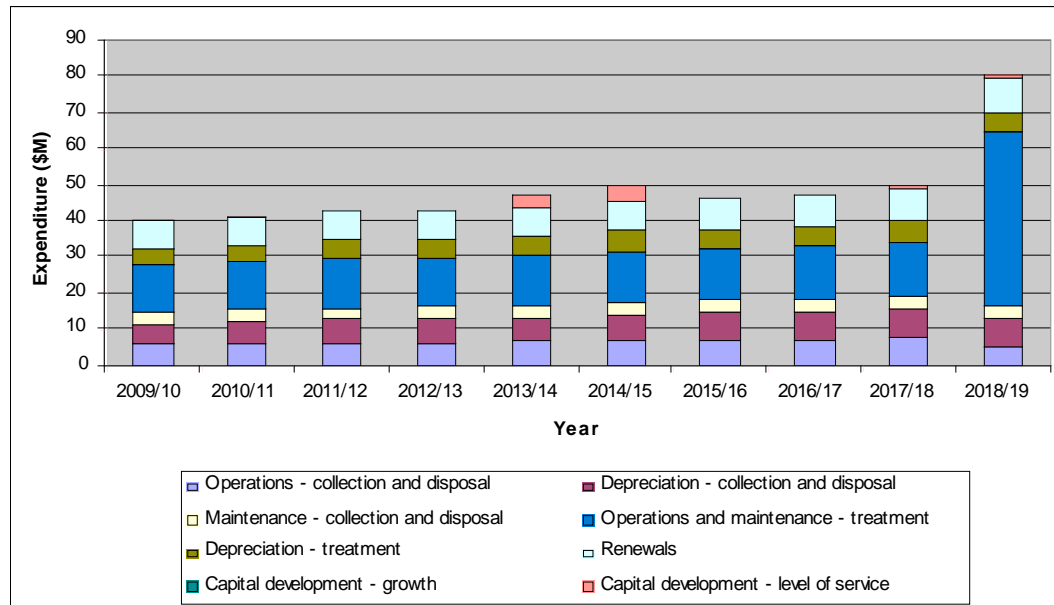


Figure 11 - Consolidated financial forecast

The key trends in the 10 year financial forecast are:

- Operations, collection and disposal – increases 10 per cent over the 10-year planning period from \$5.8 million due to increases in the corporate interest allocation, and, to a lesser extent, marginal increases in all programmes to reflect the aging of the network.
- Maintenance, collection and disposal – marginal increase over the planning period to reflect additional unplanned maintenance needs as the network ages.
- Operations and maintenance, treatment – constant expenditure of \$12.5 million per annum throughout the 10-year planning period.
- Depreciation – marginal increase over the planning period to reflect the acquisition of vested assets and the network renewal programme.
- Renewals – \$72 million is budgeted over the next 10 years for pipeline renewals.
- Capital development for level of service enhancement – \$2.3 million is budgeted over the next 10 years for ongoing pipe network upgrades (\$0.17 million per annum) and the completion of the pump station sewage overflow prevention programme (\$0.5 million) in 2007/08.
- Capital development for growth – no growth-related projects have been identified.

5.2 Assumptions and data confidence

5.2.1 Assumptions

The following general assumptions have been made in preparing the expenditure forecasts:

- Wastewater assets will remain in Council ownership throughout the planning period, except where specifically identified.
- All expenditure is stated in dollar values as of June 2008 with allowance made for inflation over the 10-year planning period. They will be inflation-indexed in terms of the BERL economic forecast index for the water industry, as recommended by the Audit Office, prior to finalising in the LTCCP.
- The rate and pattern of urban growth and development continues as assumed and noted within Section 2.2 of this plan.
- Maintenance costs are based largely on historical expenditure and assume there are no significant changes in contract rates (above the rate of inflation).
- Maintenance and renewal allocations are based on preserving current levels of service, and expenditure levels are increased to match the growth of new assets and achieve the target levels of service noted in Section 2.
- Remaining lives for pipeline renewals planning are based on a top-down condition assessment and assumed deterioration profile.
- Repairs exceeding \$10,000 are capitalised as a renewals item.
- Many capital projects have renewals and upgrading components within them. The Council estimates the proportion of upgrade costs accounted for over the year as renewal works, and funds a single project from this upgrade account.

5.2.2 Confidence levels

The short term forecasts have been assessed as being reliable based on the grading system from the NZ Guidelines for Infrastructure Asset Grading Standards. The most significant potential changes to the forecasts may result from the following factors:

- changes in the desired level of service and service standards from those identified in this asset management plan, particularly consent and other regulatory or legislative requirements
- changes in inflow and infiltration, particularly infiltration from aging pipe networks including private laterals, and the effect of climate change
- assumptions are made as to the average useful lives and average remaining lives of the asset groups based on current local knowledge and experience, historical trends, and predictive modelling outputs (these need to be reviewed and the accuracy improved based on real time assessments of asset deterioration – review of the effective economic life of pipeline assets has the potential for greatest variance in future cost predictions)
- changes in contract rates above inflation due to market or other external influences.

5.3 Development contributions

Development contributions for the wastewater activity are levied to recognise the investment required for:

- The ongoing citywide upgrade of the capacity of pipes and pump stations; a proportion of renewal expenditure is assigned to growth to recognise the additional capacity provided in these projects to cater for future growth in demand.
- Historical Council funded capital works associated with the provision of the Moa Point and Western treatment facilities which included additional capacity for growth.
- Capital expenditure incurred to purchase additional capacity in the Porirua treatment plant from Porirua City Council.

5.4 Funding the wastewater activity

The activities undertaken in order to provide the wastewater service are funded as described below:

Operating expenditure

- Who benefits:
 - identifiable parts of the community – 80 per cent
 - whole community – 20 per cent
- Who pays:
 - base (residential sector) – 60 per cent
 - commercial sector – 40 per cent
- Funding mechanism:
 - residential targeted rates - 60 per cent
 - commercial targeted rates – 40 per cent

Capital expenditure

- Renewal and rehabilitation:
 - funded from depreciation (an operating expense funded from rates). Any annual surplus depreciation is used to repay borrowings.
- Capital development (level of service enhancement):
 - primarily funded from borrowings
 - contributions from third party capital subsidies
 - contributions from sale of surplus assets where applicable (this is decided on a case-by-case basis - funds received in this manner which are not applied to capital development works are used to repay borrowings)
 - contributions from restricted or special funds where applicable (this is decided on a case-by-case basis)
- Capital development (growth):
 - primarily funded from development contributions
 - RMA-based financial contributions continue to be used in some circumstances
 - contributions from borrowings.

