

Three Waters

Summary Asset Management Plan

*Incorporating Water Supply, Wastewater and Stormwater
2011/12 – 2020/21*



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WELLINGTON CITY COUNCIL

Wellington

This Summary Asset Management Plan has been prepared by





A message from Director of Infrastructure – Stavros Michael

Drinking water, wastewater and stormwater services have a significant impact on how well we achieve the Council's long-term outcome of providing Wellington with *“access to safe and reliable energy and water supplies, clean air, and waste disposal systems that protect public health and ecosystems”*.

Wellington as a city, prides itself on looking to the future in its planning and is aware that the reliable and efficient provision of the three water services is essential in developing a robust and resilient foundation for the future that we all want.

It is important that the Council is able to make informed decisions about how infrastructure should be developed, maintained and disposed of in order to meet these goals of resilience and efficiency. Although this may entail making some difficult decisions, we are always working towards ensuring our residents and businesses feature high in our planning for a sustainable outcome.

Recent events in Christchurch have highlighted the importance for robust planning, mitigation and response to difficulties in the delivery of essential infrastructure services. To this end it is important to understand the criticality of a dependable water supply, effective waste disposal assets and robust stormwater networks.

The water supply is critical in that it provides clean drinking water to our communities. The wastewater assets contribute significantly in the collection, treatment and disposal of our city's sewage to protect people's health and property whilst minimising effects on the environment, while the stormwater network keeps the city safe through flood protection.

These are essential foundation services on which our society depends.

This Council is committed to a process of ongoing improvement in the management of water services to the people of Wellington and this document articulates in summary how that will be achieved over the following years.

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This Summary Asset management Plan was prepared by Capacity Infrastructure Services Ltd and provides for the mechanisms, processes, financial planning and supporting documents that allow the management of the assets used for the supply of potable water, the collection transportation, treatment and disposal of wastewater; and the management, collection and disposal of stormwater.

This Summary Asset Management Plan covers the period of 2011/12 – 2020/21. Financial information and forecasting contained within can be considered accurate as at the time of production.

Part one

What we do

Water is a fundamental need and Wellington City Council ensures a reliable supply of clean, safe, drinkable water is available to the city's residents, businesses and visitors under normal circumstances at all times.

The management of wastewater and stormwater can be linked with the Council's aims for a safe and sustainable city. Both of these products of urbanisation need to be managed in ways that protect public health but also respect our bio-diversity.

How we manage the three water activities

The management of the assets that provide for the delivery of potable water; the collection, transportation, treatment and disposal of wastewater; and the collection and disposal of stormwater that does not unduly affect the environment all fall under the management structures of the Wellington City Council.

In order to manage some of its assets and activities more efficiently and in a regionally consistent manner, the Wellington City Council established a number of trusts and organisations to independently manage different activities.

Outcomes, strategies, policies and budgets are still set by the Council while the day-to-day management and maintenance operations, asset development and planning for the assets are undertaken by the particular organisations.

For the management of the three water activities (water supply, wastewater and stormwater) Wellington City Council, along with Hutt

City Council, established Capacity Infrastructure Services Limited (Capacity) to:

- provide water services to customers in the respective council jurisdictions
- maintain the water, wastewater and stormwater infrastructure for the two cities.

Capacity, who are also contracted to supply similar infrastructure management services to Upper Hutt City Council on a contract basis, was established in 2004 and is based in Petone.

Requirements for planning

The basis for the development of this Summary Asset Management Plan (AMP) can be found within the Local Government Act (LGA) 2002. This requires territorial authorities to present planning documents that outline the activities they undertake, their respective costs and negative impacts, and how the assets will be managed in a sustainable manner that allows the achievement of council and community outcomes.

Community outcomes dictate the direction undertaken by the Council in establishing how the water service assets are managed in order to meet the expectations of the city's communities. The AMP is designed to show how this will be achieved.

Why it is important

A modern city cannot function without effective, efficient, sustainable and robust infrastructure. Water, being critical for the health and well-being of Wellington's residents, remains one of the core activities undertaken by the Council. The water supply provides for domestic and commercial needs as well as providing for firefighting and emergency needs.

The management and maintenance of the wastewater and stormwater networks, as well as the treatment of wastewater prior to disposal, is also essential for the public's health and well-being, for protecting property from flooding and for protecting the environment.

Without the three water services, Wellington could not operate as an internationally competitive city.

Contributions to council and community outcomes

All three of the water activities contribute directly to the outcome of *“protecting Wellington’s long-term environmental health through well-planned and well-maintained infrastructure”*.

In addition to this outcome, the wastewater and stormwater activities contribute to the outcome of *“Wellingtonians protecting and having access to our coastlines”*.

What we plan to deliver

Wellington City Council sources its potable water from the Greater Wellington Regional Council (GWRC) via a ‘bulk water supply’ agreement that provides parameters for the delivery of a reliable and safe water supply.

Currently we spend almost \$13 million for that water to be collected, treated and delivered to strategic locations throughout the city. The delivery of about 30 billion litres each year currently meets the city’s consumption requirement without the need for any additional restrictions¹ or curtailment of the service.

¹ Residential garden watering restrictions allow for sprinklers to be used on gardens and lawns on alternative days between 6am and 8am or 7pm and 9pm.

In order to achieve this, the city requires over 1,000 kilometres of pipeline, 34 pumping stations, and 81 reservoirs and pressure maintenance tanks. There are over 7,300 fire hydrants spread throughout the city to meet firefighting and maintenance needs.

Capacity is tasked with ensuring Wellington’s residents, businesses and visitors have high quality water available to them under normal operating circumstances in order to meet their drinking, cooking, household and business requirements.

In delivering the wastewater and stormwater activities Wellington City Council requires Capacity to ensure that Wellingtonians can go about their daily lives and business activities free from danger and impediment from flooding or threats to their health and well-being from wastewater issues.

To enable the management of wastewater and stormwater, there are nearly 1,000 kilometres of wastewater pipes and nearly 650 kilometres of stormwater network. We operate over 60 wastewater pump stations to move wastewater from the suburbs to the three wastewater treatment plants used to treat the city’s waste prior to disposal.

Each year, Wellington’s residents, businesses and visitors ‘produce’ about 29 million cubic metres of wastewater effluent that needs to be treated prior to its disposal. In addition, the stormwater network ‘conveys’ almost 80 million cubic metres of rain from kerbs, channels, roofs, and commercial and household drains to the streams and marine environment each year.

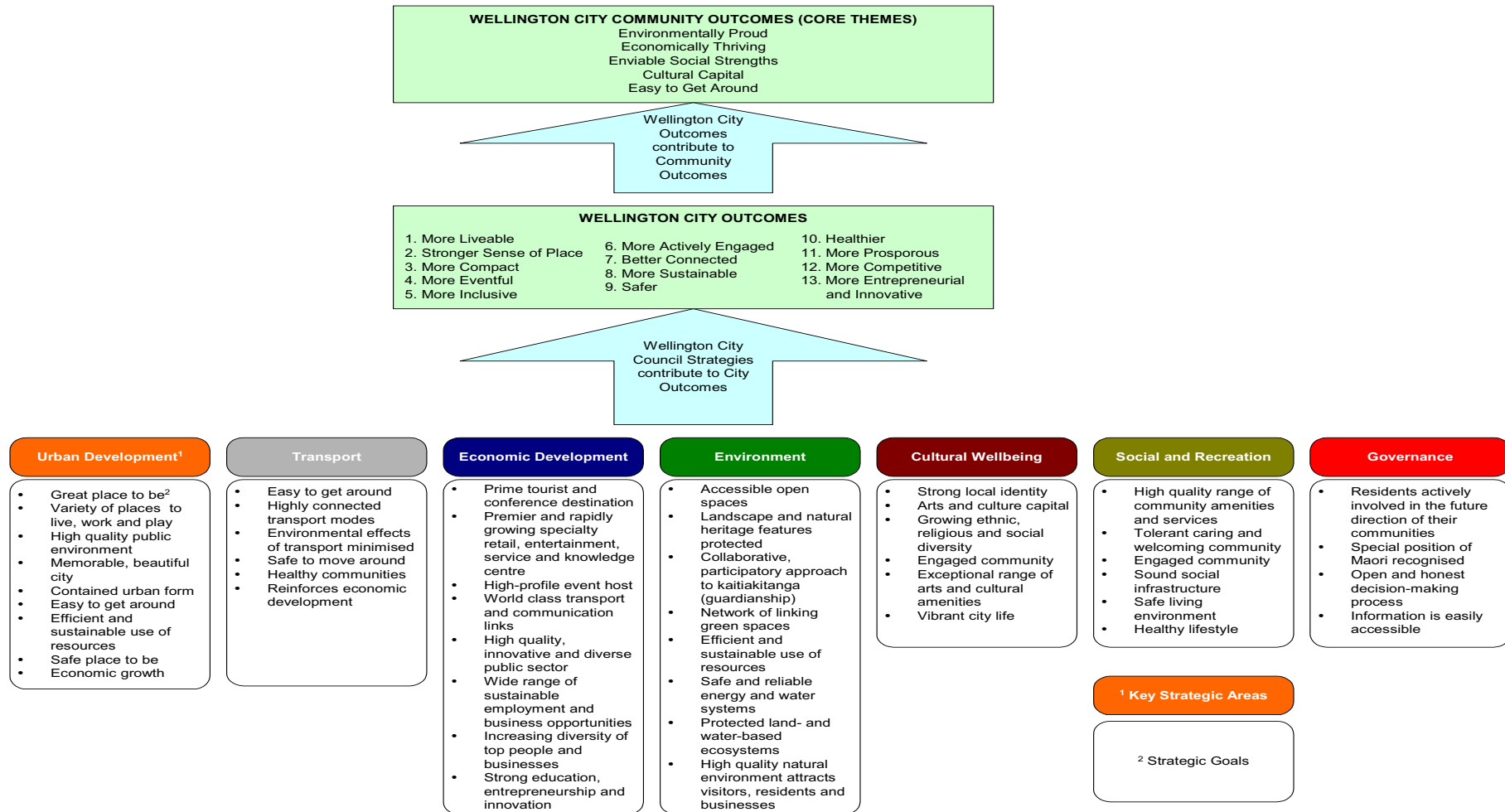
Capacity is also responsible for the efficient delivery of services in relation to:

- new connections
- ensuring all statutory requirements and environmental standards are met

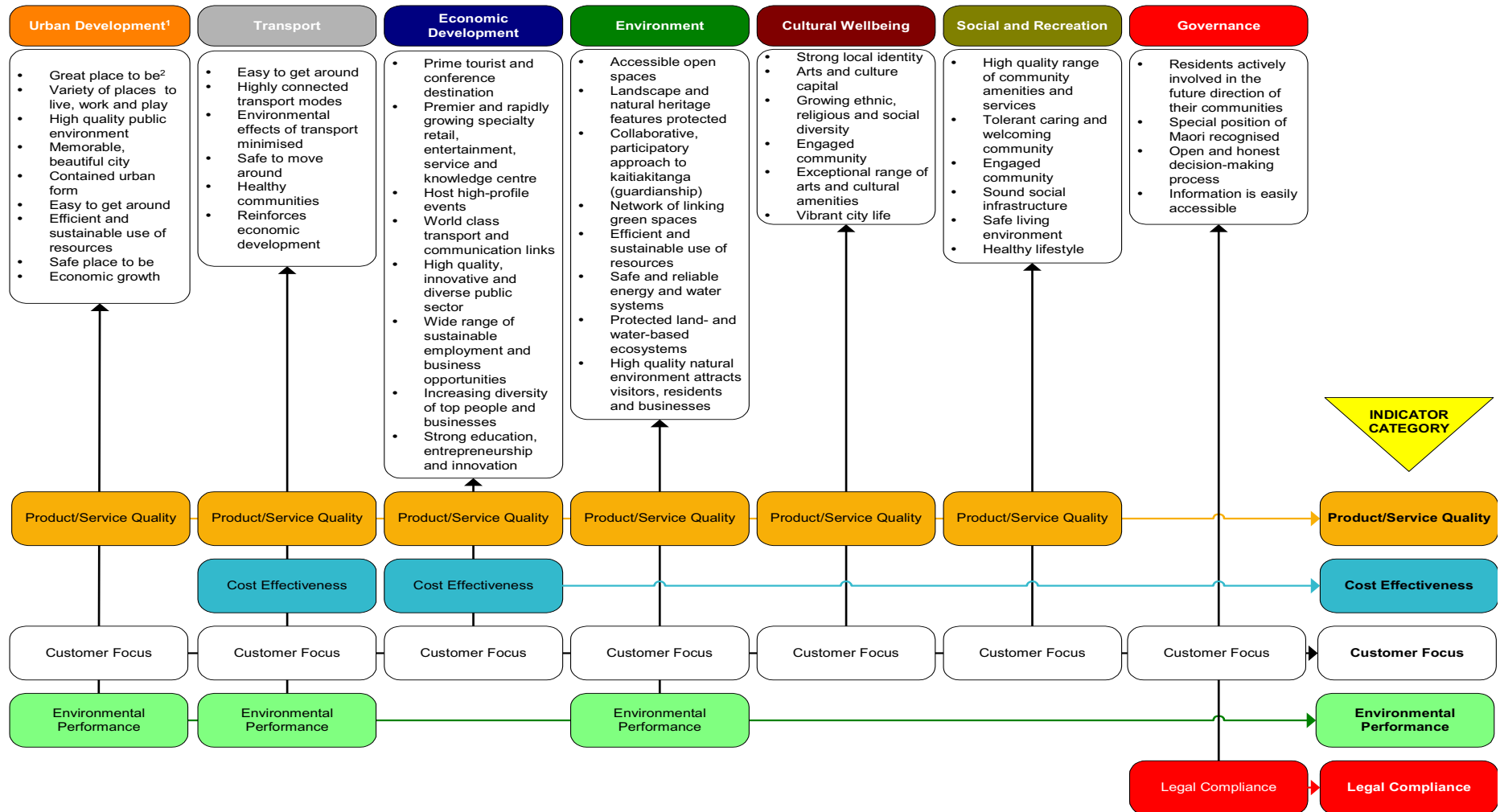
- installing water meters and undertaking meter reading for billing purposes
- managing and maintaining all parts of the network so that water is available on demand and at a pressure appropriate to the area
- monitoring water quality to meet national drinking water standards so that a risk to public health does not develop
- responding to and fixing all leaks and faults in the respective networks within agreed time frames
- upgrading areas of the respective networks that are non-existent, too small or not performing
- flushing drains, and clearing sumps and culverts to allow stormwater passage
- developing, promoting and implementing water conservation measures
- undertaking forward planning in order to anticipate future demand, the effects of climate change, and the city's growth and development
- ensuring that the environment is protected from any adverse effects from the three water activities; this includes, where possible and practical, the contamination of surface waters and our coastal marine environments.



Strategic goals and outcomes diagram



Core themes for performance indicators diagram



Strategic planning

In 2009, Capacity introduced a long planning cycle to the management structure used for the three water activities, their respective assets and associated levels of service. The creation of a Three Waters Strategic Plan was to ensure the effective delivery of services by highlighting existing and potential gaps in existing planning mechanisms, and outlining potential solutions and remedies.

The planning framework adopted affords consideration to the social, economic, environmental and cultural well-beings of the city's diverse communities whilst evaluating the most appropriate levels of service in relation to the assets' capabilities and future development.

Key elements of this approach are:

- allowing a 'big picture' or long-term view to be taken across the management of the three water activities' assets – this allows proactive infrastructural and development planning as opposed to reactive approaches to changes in needs or events
 - catering for future challenges that are expected to place additional demand on the three water activities and their assets – this may include climate change, population growth or emergency response
 - identifying and addressing key issues and challenges at the planning stage
 - determining and prioritising actions in relation to changing community expectations and needs as expressed in community outcomes and Council planning documents
- creating efficiencies and effectiveness through the incremental development of the city's water activity networks.

The strategic framework adopted allows for reviews of the processes, identification and assessment of issues, and implementation of strategies to be undertaken on a six-year cycle alongside the detailed AMP and Long Term Council Community Plans in order to remain relevant and consistent with the changing landscape.

Strategic issues

Issues that have been identified as requiring significant attention can be summarised as follows:

- Water supply:
 - water availability and supply limitations
 - responding to increased demand
 - reliability and security within current supply parameters.
- Wastewater:
 - wet-weather overflows (environmental and legislative concerns)
 - hydrogen sulphide creation within the network.
- Stormwater:
 - flooding of land, properties, buildings and infrastructure
 - pollution of receiving waters and the environment from contaminants in stormwater or conveyed by the stormwater network.

Interaction with other Council activities

The water supply, wastewater and stormwater activities also interact with other Council services and activities so there are mutual benefits that can be gained by taking into account the opportunities and synergies presented by planning with other departments.

There is also scope to take an integrated approach with other departments to see if a combined delivery or planning can further benefit the Council and communities in improving the delivery of services.

An example of this could be a Regional Code of Practice for Land Development that includes a joint approach to managing land development, water conservation and stormwater treatment. Integral in this approach is investigating and assessing how the three water activities impact on each other and enhancing the synergies that exist between the assets and activities.

In considering issues that we believe are affecting the delivery of the water supply, wastewater and stormwater services – or could do in the future – it is important that there is a widespread understanding of the issues in a more general setting. Influences such as climate change, population growth, sea-level rise or increased demand have an effect on the Council's ability to deliver roading, community services, housing and recreational activities; this means that our planning needs to take into consideration the communities' needs in these areas also as we seek funding or prioritise work projects.

Sometimes the implications of concurrent activities with other Council activities will be obvious; for example, rainwater collection to irrigate a park or garden area, or roadside swales that can make roads more attractive to residents but also treat stormwater run-off.

The use of rainwater tanks could contribute to a community's, household's or businesses resilience against long term shortages or provide relief after a major civil defence event.

Other times the connections are less obvious, such as using roads as secondary flow-paths for stormwater.

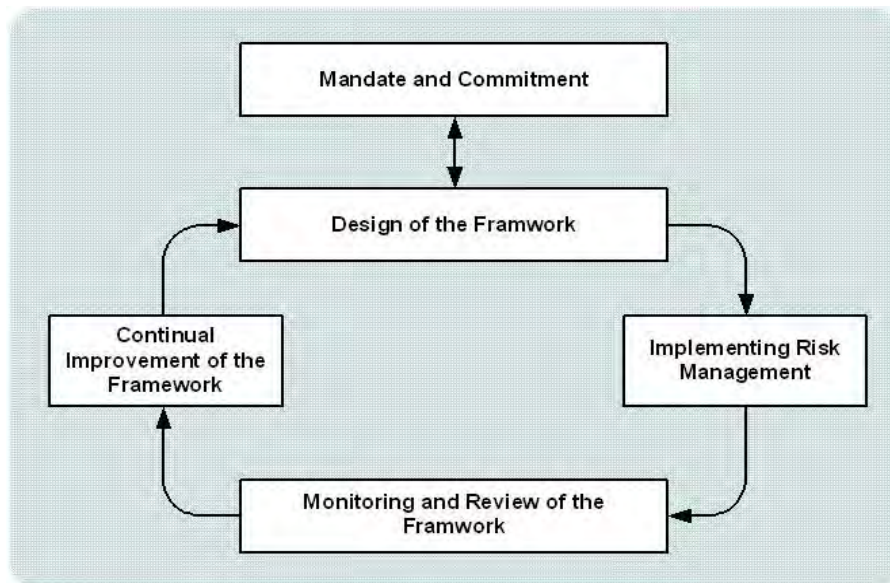
For each of the three activities there are mutual gains also – less water consumption equates to less wastewater requiring treatment. Rainwater collection that conserves potable water can mean less stormwater that can cause surface flooding.

Ultimately, viewing interaction, or integration, as a beneficial option we can look forward to greater efficiencies and fewer impacts on the city.

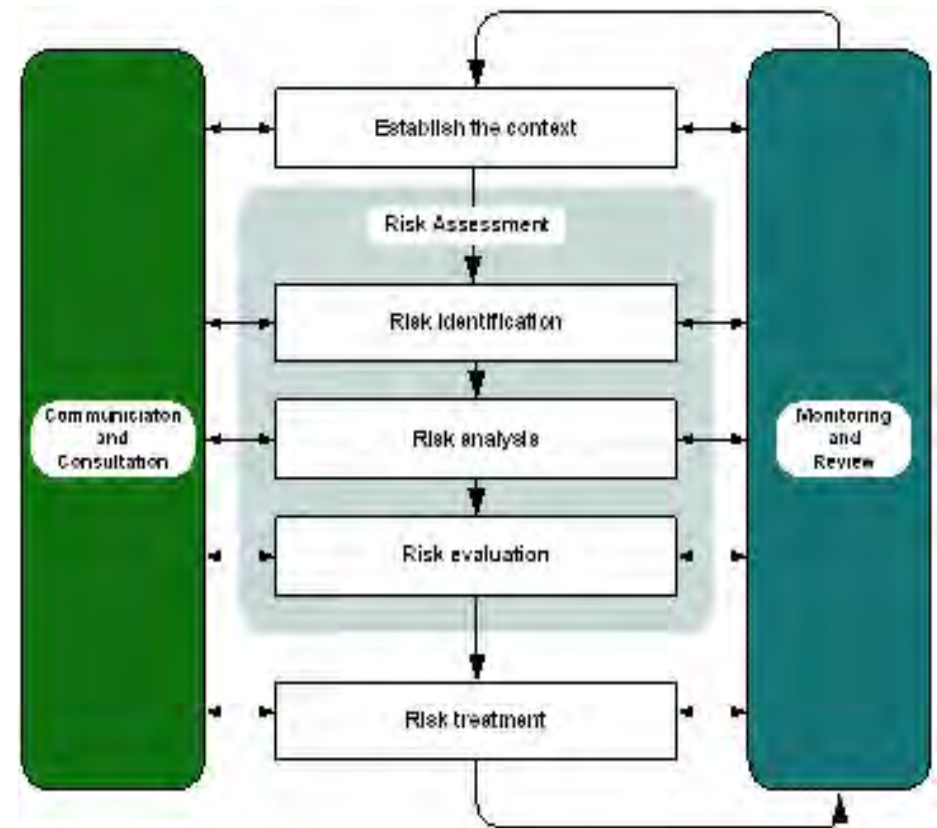
Risk management

Events that lead to a failure or a weakness in our ability to achieve the required level of service can compromise the reaching of community outcomes and performance standards.





Events, or influences that can enable these circumstances to eventuate have been identified and their causes, likelihood and consequences defined.



Risk options

Options considered in the reduction or removal of causes that lessen the probability and reduce or mitigate the impacts of an event's occurrence are:

- do nothing and accept the risk (including the consequences)

- management strategies – the implementation of enhanced strategies that cover areas such as demand management, contingency planning, quality assurance processes, staff training requirements, data analysis, and the evaluation and reporting of service standard targets
- operational strategies – developing actions to reduce peak demands or stresses on an asset, operator training and documentation of operational procedures
- maintenance strategies – develop modifications to maintenance regimes that allow the asset to be made more reliable, less vulnerable or provide it with a longer operational life
- asset renewal strategies – plan for the rehabilitation or replacement of assets in order to maintain or enhance service levels
- development strategies – planning for the augmentation or replacement of assets
- asset rationalisation or disposal – disposal of assets that are no longer needed in the delivery of water activity services, either through rationalisation or upgrades elsewhere in the network.

Negative effects

Changes in the natural environment, including natural hazards and long-term influences such as climate change and sea level rise, can be unpredictable. This unpredictability drives the building of contingencies and redundancies that may not appear to be the most cost-effective option.

This also leads to a constant reviewing of forecasts and risk management planning tools, and planned renewals and upgrades.

In effect, any events that result in damage to an asset or an interruption to a service caused by a natural event can result in other activities or maintenance being deferred due to altering priorities.

Risk assessment and management processes seek to achieve a balance between the cost of risk exposure and the cost of preventative measures. Despite structured decision-making processes, implementation of some strategic options may be inherently problematic due to unpredictable events – this includes factors such as budget constraints, or a changing legal or social environment.

Council, and Capacity, understand that there is potential within the delivery of the three water activities for negative effects to be experienced. These may be at an environmental, a social or a cultural level, and in a similar way to managing risk need to be assessed alongside the benefits of providing the levels of service expected by the community.

For the three water activities delivered to Wellington City, the potential for negative effects are summarised in the following table.



The wastewater and stormwater activities can generate negative effects on the environment and can include the introduction of wastewater or contaminated stormwater. The introduction of untreated wastewater or contaminated stormwater also carries risk to public health, negative cultural effects and potential for social ramifications.

Any negative effect created by the delivery of the three water activities on the health and well-being of the community and their ability to utilise the city's natural environs, or creates cultural offence is of great importance to the Council.

The water supply activity is considered to have the potential to cause least negative effect in areas of cultural significance, although the Council is mindful that social effects could arise from poorly managed assets and infrastructure or ill-considered policy, and environmental effects could arise from mismanaged assets or maintenance operations if not carried out in a considered manner.

Negative effects can be difficult to quantify as they mean different things to different groups or service receivers. The potential for impacting on each of the three water activities is demonstrated in principle in the illustrations following.

Climate change

The effects of climate change generate considerable debate amongst many different parts of the community – the consensus is that any effect will be felt on a global basis with effects felt at national, local and personal levels over time.

The effects of climate change are still mostly based on predictions, and those that could be seen here in Wellington include weather events of a more extreme nature (flooding, more frequent and violent storm events, cyclones and drought). Side effects could

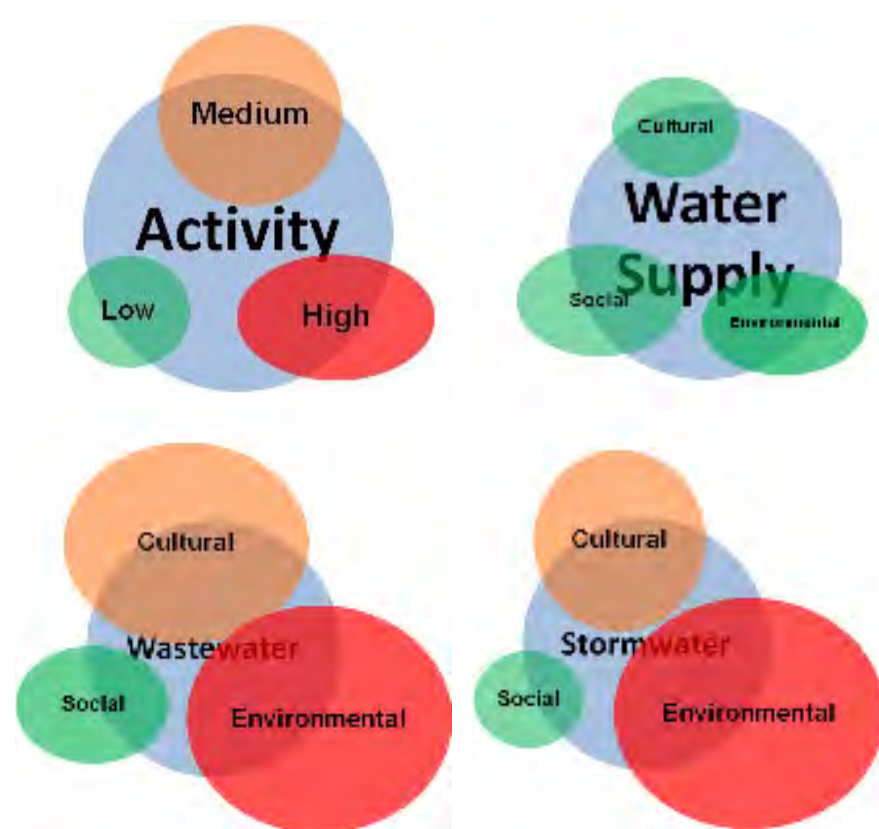


Figure 1: Indicative 'negative' effects for each of the activities

include damage such as landslips that impact on ecosystems and limit the city's productivity through blocked railways or roads.

The effects of climate change are expected to become more and more evident and are likely to continue over future generations as remedial actions slowly kick in. Climate change, via occurrences such as sea level rise, will affect how we build our future houses, place our roads, and approach the development of the three water activities and their respective assets.

Impacts of climate change on the three water activities

According to data presented by bodies such as NIWA, Wellington is likely to experience warmer temperatures all year round and rainfall of a higher intensity and frequency. This could have significant impacts on water availability during periods of higher demand.

It is believed that the most likely implications of climate change for the three water activities in Wellington are:

- higher summer water demand with increased ground watering being required to maintain parks, gardens and lawns
- a decrease in the security of supply (ensuring water availability for essential services and requirements)
- stormwater conveyance and disposal concerns (capacity and disposal effects)
- wastewater infrastructure performance (due to increased inflow and infiltration from stormwater and seawater)
- rises in sea level (affecting network performance and resulting in flooding).

Wellington is also expected to experience wetter winters, which could result in landslips threatening the piped networks in hilly suburbs.

In planning for climate change, we need to make sure that our efforts to seek efficiencies, or efforts to minimise environmental impacts, do not affect our ability to make gains in protecting public health or ensuring that residents and businesses have a robust and reliable service from the three networks.

Through our strategic plan we expect to respond to challenges by:

- being adaptive in our planning, development and maintenance operations to proactively prepare for change wherever practicable
- pursuing opportunities to reduce our carbon footprint
- adopting measures to balance supply and demand
- investigate sustainable solutions to surface water drainage issues
- proactive approaches to assessing, influencing and responding to legislative, regulatory or policy changes and initiatives.

The approach taken by Council in dealing with climate change and sustainability is influenced by three overarching policy and strategy documents; these are:

- Environmental Strategy 2006
- Climate Change Action Plan 2010

These documents, along with other strategic planning documents and reports, outline the aspirations and the direction chosen by Wellington City Council to progress infrastructure projects and operational decisions.

The primary focus for Council is a reduction in the production of greenhouse gases from operations and community activities and facilities. Some of the initiatives have action areas that include:

- green-rated buildings that use less power, use less water and produce less waste products
- balancing the four well-beings
- more efficient use of power for pump stations
- demand management strategies (for example rain water tanks where appropriate, more efficient fittings)
- minimising and avoiding waste.

Key tasks or projects underway

The following section outlines some of the key tasks and projects underway now and into the following two years. Although other significant renewal and upgrade projects are being undertaken to replace pipes and other assets, the projects following stand out as being essential in delivering levels of service or enhancing the activity's outcomes.

Disaster and emergency planning

The consequences of a major earthquake in Wellington City are likely to be severe, not only in terms of damage to the infrastructure, but in terms of the expected rate of recovery for the infrastructure, both economically socially and environmentally.

The three waters' infrastructure has been identified as both critical to the economic and social recovery of the city, and being most at risk of being out of commission for long periods in a post-seismic-event environment.

Following a major seismic event the bulk water supply is not expected to be fully restored to some areas for over two months, which is likely to inhibit economic activity and social recovery in these areas.

The areas of water supply that require focus are:

- improving the security of water through seismic strengthening and retrofits
- improving the resilience of the primary distribution network through upgrades and redundancy works
- increasing the level of preparedness through planning and analysis, and
- improving Council's event response through training, planning and appropriate response equipment.

The wastewater network is also likely to be severely damaged and will take months, if not years, to restore to a satisfactory level of operation. Although preparatory damage mitigation is difficult, measures, such as using HDPE pipe, have been put in place to mitigate the consequences of failure and thus improve the resilience of the networks.

With the ultimate aim of compressing any recovery period, our main areas of focus are:

- improving design and construction methods to improve seismic resilience
- further development of response and recovery plans, and
- carrying out planning around the recovery activities of key pipes and facilities.

In a similar fashion, the stormwater network is also likely to be heavily impacted in a post-seismic-event environment, and will be

required to serve the secondary function of combined wastewater and stormwater pipe.

Little consideration has been afforded the stormwater network in the past, and catchment management plans need to be updated to indicate weaknesses in the network and the likely consequences of these failures.

Water conservation and efficiency planning

In September 2010, Council presented to the community a draft Water Conservation and Efficiency Plan that outlined options for demand management into the future.

This came about due to a report by the region's bulk water supplier (Greater Wellington Regional Council) that stated that without demand management there would be a need to augment supply to aggressively address consumption if the region did not wish to experience a greater likelihood of watering restrictions.

A number of options – ranging from free plumbing services, subsidies for rain water tanks and grey-water recycling, greater use and enforcement of restrictions, universal metering and volumetric charging, and legislating for water efficiency in new buildings – were offered by submitters during the consultation phase.

Early next year a plan will be completed to address some of the demand issues with implementation commencing prior to the expected increase in demand over summer..

Should demand not be managed to a level that meets levels of service, for both regional and local authorities, there is likely to be a need for an increase to be made to the region's storage capacity. The construction of another storage lake, enhancing an aquifer in Upper Hutt or constructing a large storage dam on the Whakatikei River would provide water for the region for the next 80 years or so – but at a large expense. The most expensive of these options – a

dam on the Whakatikei River – is expected to cost somewhere around 140–150 million dollars.

Rationally we need to determine how much money can be spent conserving water or introducing efficiencies before we are spending more money than the construction of a dam, or introducing other short-term supply enhancement options, would cost.

Messines Road reservoir upgrade

Over the next two years we are carrying out upgrade work to the Messines Road reservoirs. Both tanks are beyond their respective life expectancies and are unlikely to withstand a major seismic event.

As part of the upgrade project, the Messines Road reservoirs will be replaced with two larger tanks that will almost double the capacity of the asset. As with other reservoirs in the city seismic shut-off devices will be fitted to the new reservoirs to ensure that water remains in the structure in the event of a significant earthquake.

Additional security-of-supply measures that will enhance Karori's water supply are valves that will also shut off in the event of a water main bursting and putting sudden demand on the reservoir.

The outcome of this project is an increased capacity with 6,000 cubic metres of water being stored underneath the park area.

This project is part of an ongoing programme to renew reservoirs and optimise their performance.

Part two

Our water activity assets

The broad asset groups and the physical quantities of assets which enable the delivery of the three water activities, are laid out on the following tables. As of June 2008 the total replacement value of the assets across the three water activities was \$772.7 million; this is also broken down in the following tables.

Water supply

Activity	Water supply asset component	Value ²
Storage	Reservoirs and storage tanks	\$ 50,393,090
	Flow and level monitoring devices	\$ 1,324,990
Reticulation	Pipes	\$ 104,278,870
	Customer connections and fittings	\$ 58,241,250
	Pressure reduction devices	\$ 276,285
	Fire hydrants	\$ 7,568,940
	Network fitting and control valves	\$ 27,373,170
	Network area meters	\$ 267,443
	Customer water meters	\$ 5,687,000
Pumping stations	Pumping stations	2,212,050

² As at 30 June 2008.

Activity	Water supply asset component	Quantity
Storage	Reservoirs and storage tanks	81
	Dams ³	2
	Flow and level monitoring devices	113
Reticulation	Pipes	1,020 km
	Domestic connections	67,650
	Commercial connections	4,000
	Pressure reduction devices	21
	Fire hydrants	7,850
Pumping stations	Pumping stations	34
	Flow control stations	30



³ These dams are historic and are not used actively as part of the water supply activity.

Wastewater

Activity	Wastewater asset component	Value
Reticulation	Pipes	\$ 173,541,760
	Sewer tunnels	\$ 119,409,11
	Permanent flow meters	\$ 105,530
Pumping stations	Pumping stations	\$ 8,380,050

Activity	Wastewater asset component	Quantity
Reticulation	Pipes	1,022 km
	Manholes	19,726
	Sewer tunnels	19 km
	Permanent flow meters	12
Pumping stations	Pumping stations	62
Treatment facilities	Wastewater treatment plants	2.27 ⁴
	Sludge de-watering plant	1

Stormwater

Reticulation	Pipes	\$ 249,805,800
	Stormwater tunnels	\$ 6,824,660
	Stormwater fittings	\$74,490,980
Pumping stations	Pumping stations	\$2,000,000

⁴ This includes a 27.6% share of the Porirua wastewater treatment plant.

Activity	Stormwater asset component	Quantity
Reticulation	Pipes	650 km
	Stormwater tunnels	20 km
	Stormwater chambers & grit collection facilities	37
	Manholes	17,189
	Roadside sumps	12,000
Pumping stations	Pumping stations	1 ⁵
Natural systems	Belmont Stream	2.1 km
	Horokiwi Stream	2.1 km
	Kaiwharawhara Stream	9.3 km
	Karori Stream	15.5 km
	Ngauranga Stream	4.3 km
	Owhiro Stream	4.8 km
	Porirua Stream ⁶	14.4 km
	Stebbing Stream	3.7 km
	Takapu Stream	1.1 km

⁵ Under construction in Tacy Street (Kilbirnie).

⁶ This 14.4 km portion of Porirua Stream falls in the Wellington City Council jurisdiction.

Asset descriptions

Reservoirs

Reservoirs provide storage capacity to better manage any fluctuations in demand or pressure within the reticulated network and provide for emergency storage capacity. This allows for any remedial work or temporary loss of supply to be accommodated with minimal disruption to the residents or businesses of the suburb in question.

The reservoirs also provide a buffer for unexpected high demand, but short duration, events such as a major fire. The majority of this storage capacity is contained in the 35 largest reservoirs (90.3%). Of these 35 largest sites, there are 32 that are fitted with seismic control valves that will prevent large volumes of water passing through the network in the event of a damage-causing earthquake.

Seventy-five per cent of our reservoirs are less than 60 years old, with 16 sites being less than 20 years old.

Reticulated water supply network (pipes)

Water is distributed throughout the communities served by Wellington City Council via a considerable network of water (pipes) mains and feeder pipes, the majority (87%) of which are less than 190 millimetres in diameter. The remaining 13% of the network is greater than 300 millimetres in diameter.

Water supply pumping stations

Pumping stations are used to move water from the supply points to the reservoirs and in some areas boost the pressure within the reticulation. The majority (89%) of the 34 pumping stations'

equipment (pumps, electronics and instrumentation, pipes, valves, and fittings) are less than 30 years old and considered fit to meet current demand requirements.

The pumping stations have been assessed as being in generally good condition with some maintenance work planned. Six of the pumping stations are programmed for renewal work to replace mechanical and/or electrical components.

Future developments may see some pumping stations being combined in order to optimise operations.

Pressure reduction devices

There are 21 pressure reduction devices operating within the water supply network. These devices regulate flows to avoid fluctuations and also divert flows when a high-demand event occurs. All are considered to be fully operative and effective.

Wastewater reticulated network (pipes)

Wellington's wastewater is collected and then conveyed from residences and businesses to the main interceptor via a reticulated network consisting mainly of pipes 150 millimetres in diameter.

Only 15% of the reticulated network is greater than 300 millimetres in diameter, with approximately 6% being of an unknown or unrecorded size.

A reasonably large proportion (41%) of the reticulation is made of earthenware or brick.

Eighty per cent of the network is recorded at being less than 60 years old - overall this results in over 80% of the pipes having a condition grading of three or better.

Wastewater pumping stations

Wellington City Council's wastewater reticulation operates with the assistance of 62 pumping stations of which 42 serve the Moa Point wastewater treatment plant and 13 serve the plant at Porirua.

Forty of the pumping stations have components that are above ground but this only reflects 41% of the replacement cost given the complexities of installations constructed underground.

Eighty per cent of the pumping station equipment is less than 15 years old. This percentage of relatively young, new assets contrasts with other structures, which may be as old as 55 years. This reflects the robustness of the pumping station design and their general good condition.

Due to the nature of the risks and consequences of pumping station failures, 43 of these facilities are considered to be critical assets – this assessment results in regular inspections of both the plant and the structure.

Wastewater interceptor

The interceptor manages dry-weather flows and operates as the main central wastewater conveyance feature from Thorndon through to Moa Point. The Mt Albert intercepting tunnel performs the same role from the southern suburbs and connects to the main interceptor near Mt Victoria. Under normal circumstances the interceptor manages flows well however in moderate wet-weather events, the motorway crossing in Thorndon (Murphy Street) creates a hydraulic restriction within the system.

In more extreme wet-weather events, the majority of the interceptor system is reaching capacity. It is also thought that a number of

manholes downstream of the Mount Victoria tunnel may be close to reaching their overflow levels.

Significant system relief is given by the constructed overflow at Murphy Street, which is estimated to operate approximately four times a year. These overflows do not pose significant public health or environmental risk due to their relatively infrequent nature and restricted public access to the modified receiving environment.

Other interceptor overflows are rare and have little impact when compared to stormwater discharges, which may be contaminated with overflows from the local wastewater reticulation system.

The interceptor is assessed as being in:

- very good condition in the Mount Albert tunnel and the foothills tunnel
- good condition in the Ghuznee Street to Vivian Street, and Buckle Street to Tainui Terrace, areas with only a few minor defects noted
- reasonable condition between Sar Street and Tinakori Road, with some isolated areas of moderate infiltration and root ingress.

Wastewater treatment facilities

There are three wastewater treatment plants receiving wastewater from Wellington City: Moa Point, Western (Karori) and Porirua. These all have limitations in the volumes that can be stored or treated.

Flows that exceed the treatment and storage capacity of the respective plant are discharged either to a stream or to the sea. Both of these circumstances could potentially breach resource consent conditions.

Moa Point and Western treatment plants are both believed to carry enough capacity to meet demand for the ensuing 20 years.

Wellington City Council owns nearly a third of the Porirua wastewater treatment plant but currently contributes approximately 40% of the wastewater being treated.

Stormwater reticulated network (pipes)

The city's stormwater pipes exhibit an age profile generally between one and 130 years. Continual deterioration of pipe condition and performance is consistent with this age profile and leads to the need for renewal programmes.

Approximately 80% of the stormwater pipes are between 40 and 60 years old, and currently about 10% meet the current 50-year return standard set by Wellington City Council. The remaining 90% not meeting the current design standard generally have between a two- and a fifty-year return capacity. Currently, priorities for pipe renewals are often given to 'known' or 'predictable' problem areas, performance and condition issues, or where the risks are greatest, including critical drains (deep drains, drains under buildings, or drains under major roads and railways), and to drains with ongoing faults or are potentially at risk of collapse.

The stormwater network can be viewed as providing a certain level of service to the community, property, infrastructure and city generally. The principal service to be provided is the removal of excess stormwater without undue flooding; flood damage to buildings, roads and property; or risk to the community, and this driver generally sets the size, extent and cost of the network.

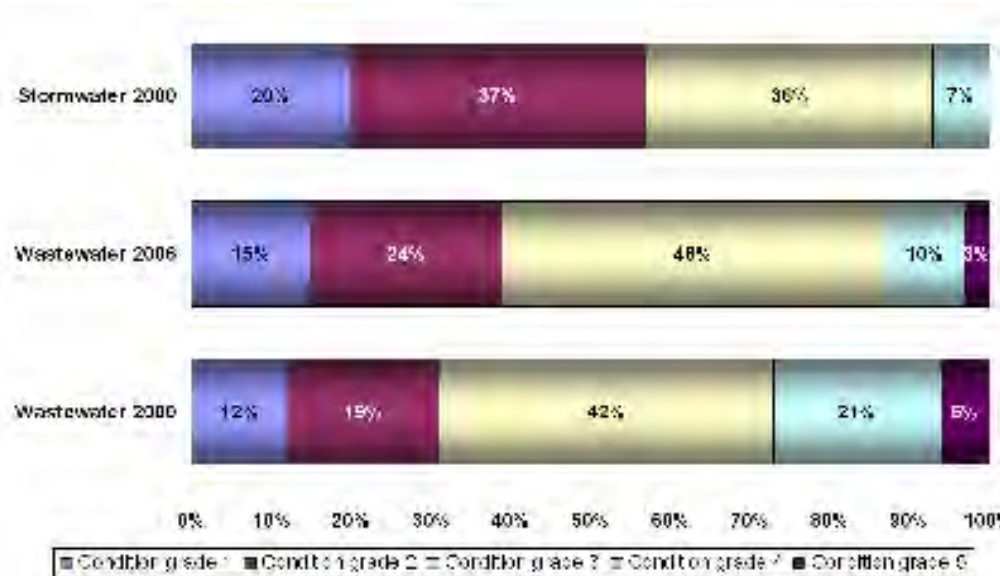
Streams

Although many of Wellington's streams are small, and some are dry at certain times of the year (ephemeral), their biological health is important both for the species that they support and for the harbour and marine areas that they flow into.

The streams provide important contributions to the management of stormwater flows for Wellington's suburbs, but care needs to be taken to ensure that the burden of development and an increase in impermeable surfaces does not fall excessively on the natural stormwater systems.

The filling in and piping of streams can lead to habitat loss for aquatic species and also can present barriers to fish passage. Water quality is affected by the sediments and contaminants that get into the water systems via stormwater run-off.

Asset condition



A 'top-down' assessment of the pipe condition has provided the Council with the condition grade profile as shown in the above graph. Where condition grade one indicates very good condition, any pipes in condition grade five have failed or are about to fail.

The pipe network is generally in moderate to good condition, and is consistent with the assessments made in 2000 and again in 2006.

Confidence in this grading assessment is based on the ongoing critical drains inspection programme for the stormwater and wastewater networks, and the assessment of pipes and other assets undertaken during responsive maintenance programmes or assumptions based on similar assets that have been renewed or

upgraded. Reservoirs and pumping station inspections also reveal a generally good condition.

A programme of seismic strengthening has been identified for the reservoirs and will work towards these structures meeting the Building Regulations 1992 requirements.

Critical drains inspection programme

Critical drains are those where the consequences of failure of the drains for public safety, cost and social disruption justify programmed inspections and preventative rehabilitation. Critical pipelines are identified as Critical A, Critical B or Critical C. Pumping stations and treatment facilities are identified as critical. Critical assets are routinely inspected and works planned. This strategy has three priorities for work:

- Rehabilitate the 'critical drains' where collapse is imminent and all drains where collapse has occurred.
- Alleviate hazard where occupied premises are flooded by wastewater more frequently than once every 10 years.
- Alleviate hazard when unoccupied buildings, yards and streets are flooded by wastewater more frequently than once every five years and drainage to provide for (existing) development.

Critical drains are inspected via CCTV (closed-circuit television) technologies that are then scrutinised against contractor reports and maintenance records. The following table shows the length of pipework for the stormwater and wastewater networks that has been inspected over the past three years and next year's planned programme.

	Wastewater	Stormwater
2008/2009	22.5 km	13.1 km
2009/2010	26.8 km	21.6 km
2010/2011 (projected)	18.0 km	12.0 km
2011/12 (projected)	18.0 km	12.0 km

Managing our assets

Operations and maintenance activities are described below:

Asset operations – is the active process of utilising an asset which will consume resources such as manpower, energy and materials. Operations include routine inspections and testing to monitor asset condition, and identify the need for maintenance and repair work.

Asset maintenance – the day-to-day work activity required to keep assets serviceable and prevent premature deterioration or failure.

Two categories of maintenance are carried out:

- Unplanned maintenance – work carried out in response to reported problems or defects (for example, pipe burst or leakage).
- Planned maintenance – work carried out to a predetermined schedule (for example, routine servicing of pumping station equipment) or programmed as a result of identified needs (for example, repairs of faults of a more significant nature, but which do not pose a hazard).

Wellington City Council delivers water supply services using performance-based contracts designed to apportion a share of risk to the contractor and provide incentives for innovation, the introduction of new techniques and optimal maintenance programming to achieve target service standards. Periodic contract

policy reviews will cover contract-packaging, scope, reporting requirements, tender evaluation and performance assessment.

Renewals strategies

Asset renewal describes major work that restores an asset to its original capacity or the required condition. It includes rehabilitation and replacement.

Renewal forecasts for pipe assets are based on assigned condition grades and an assumed second-order deterioration profile.

Remaining lives for discrete assets have been estimated from inspections, maintenance history and customer issues.

Cyclic renewal needs are identified by analysing:

- age and material type data
- condition reports
- maintenance records (asset failure and expenditure history)
- “request for service” performance
- asset criticality
- observations of staff and contractors.

The renewal programme is based on a prioritised assessment of the asset’s condition, performance, the number and type of failures, water quality problems, pressure problems, flow route, area affected and consequence of failure.

The financial forecasts, which include renewal and upgrades budgets for all assets over the next 10 years, can be found in part three of this Summary Asset Management Plan – this includes pumping stations, reservoirs and the reticulated networks.

Upgrade or capital development strategies

Asset development or upgrade activities are described as:

- the creation of new assets or works which upgrade or improve an existing asset beyond its existing capacity or performance, in response to changes in demand or levels of service targets.

Decisions on development works consider the short- and long-term effects on the operating and structural integrity of the system.

In determining the requirement for capital or asset development works, the short- and long-term effects on the operating and structural integrity of the system are considered, together with any forecast increase in loading upon the system.

Development works are designed and undertaken in accordance with industry standards (or known future standards) and system design loadings.

The following considerations are made when asset development or upgrade work is required for any of the three water activities:

- Identification of development needs – asset development needs are identified from analysis of system performance monitoring (overflows and so on), flow monitoring and network modelling, demand forecasts, risk assessment and customer service requests.
- Prioritisation of development projects – development projects are justified and prioritised using a risk-based process.
- Project approval – a long-term development programme is prepared from projects meeting the assessment criteria, and all projects are approved through the annual plan process.

- Project design – all asset development works will be designed and constructed in accordance with current adopted industry standards (or known future standards). System performance and rationalisation options are investigated as part of project design.
- Vested assets – the risk, cost and benefits of accepting any new privately funded assets constructed in association with property development will be considered on a case-by-case basis in approval decisions.

Upgrade or capital development programmes, and the length of affected network that are currently being undertaken or have been completed over the last two years, are reflected in the following table.

Demand and performance issues

Population and commercial growth is generating increased water demand, and water supplies are now becoming limited or insufficient to meet peak demands during particularly dry or warm summer periods.

Climate change, increasing environmental standards and expectations are also likely to impact on demand and the availability of supplies in the foreseeable future.

Whilst winter demand generally does not present supply issues due to the availability of a plentiful supply of source water, demand in summer can exceed supply dependent on prevailing weather conditions.

In addressing security of supply and increasing demand, there is the choice of building additional capacity and creating new infrastructure, or alternatively taking action to both manage and

reduce demand through a range or combination of demand management strategies.

Essentially we need to strike a balance between increasing demand and water supply availability in a way that provides for the sustainable management of drinking water, now and in the future.

Even if we are unable to avoid the creation of new assets, there is still a compelling argument for sustainable management of water consumption into the future. Sustainable management of water and wastewater infrastructure includes demand management.

There is a tendency to only consider sources of supply when dealing with increasing demand. It must also be borne in mind that increasing demand also puts strain on the reticulation network infrastructure that may have insufficient capacity to convey and store the amount of water needed to satisfy demand. This reason alone justifies the pursuit of demand management strategies. A demand management strategy reflecting the current situation is now required if difficulties in meeting demand and additional infrastructure expenditure are to be avoided or deferred.

In establishing a demand management strategy, it needs to be recognised that the real issue and first priority for the Wellington region is reducing summer peak demand.

The overriding benefit of reducing demand is that, not only does it lessen the need for new source water, but it also reduces energy for treatment and pumping; and therefore reduces greenhouse gas emission and reduces the extraction of water from the environment.

Although there has been an increase in the use of domestic water-consuming devices, there is an increasing public awareness that water is a valuable resource that should be conserved. Individual consumption decisions and the Council's initiatives to reduce water

wastage and promote more efficient use of water, has resulted in decreased water consumption per capita to offset the effects of growth.

Wastewater

Inflow and infiltration (I&I) represents the greatest demand on the wastewater network. It is caused by stormwater flowing into the network through direct connections or flooded gully traps, and by groundwater infiltrating through poorly sealed joints and cracks in the pipework. I&I will increase the effluent load on the reticulation, pumping stations, trunk mains and treatment facilities.

This additional loading on the network can exceed the network capacity and manifest itself through discharges from manholes, constructed overflows, gully traps and faulty sections of pipe.

Pipe age and material type are factors that affect the level of I&I in the network. Public and private earthenware pipes, predominantly older than 80 years, are likely to have very high levels of I&I. This was corroborated by a hydraulic analysis of the interceptor, carried out in 2001. This identified I&I is a significant problem in older areas of the city, especially the CBD (central business district) through to Hospital Road in Newtown.

Similarly, of the overflows currently monitored, those with the worst stormwater quality results are associated with older areas of the city with a large inventory of earthenware and concrete pipes.

Wet-weather overflows also affect stormwater discharge quality and have a negative impact on stormwater discharge consents, which are required to be renewed on a recurring basis.

Effort is being made to further understand the short and long-term environmental impacts of overflows with an increased focus on the quality of the receiving environment of streams and coastal waters.

Community demands have resulted in regional authorities setting wastewater discharge standards significantly higher than previously required.

These increased standards are putting the onus on the Council to monitor and report on various contaminants, other than microbiological, to gain an understanding on the extent of the impact they have on the receiving environment.

Hydrogen sulphide also causes odour issues which can be offensive, and potentially dangerous, to the public and can also result in a breach of our resource consent conditions. Corrosion of pipes from hydrogen sulphide is likely to occur at a rising main's discharge point and/or where there are partially flowing gravity sewers.

Severe corrosion identified in one major part of the pipeline that carries centrate from the wastewater treatment plant, has been mostly attributed to the presence of hydrogen sulphide. The majority of the pipeline has been renewed and manholes have been rehabilitated. However, recent inspections have revealed further corrosion and deterioration in some manholes.

Stormwater

As the city's population increases, ongoing urban development, redevelopment and infill housing will have an influence on flooding by creating greater proportions of impervious surfaces causing greater surface run-off during rainstorms. This effect accumulates down the catchment as increased pressure on undersized pipes results in overland flood-flow and general flooding.

Community expectations as to what levels of flooding are acceptable, agreed levels of service and legislation all tend to track higher over time, making older systems increasingly substandard.

Climate change is expected to increase the frequency of large storms and rainfall intensities, and will impact adversely on the flooding problem. However the rainfall intensity increase may be marginal with current expectations at around 10%.

Any major stormwater upgrade programmes are generally identified through the preparation of catchment management plans. From there, those projects with sufficient merit are taken through the Long Term Council Community Plan (LTCCP) process and are funded for as resources permit.

Lesser flooding problems from existing piped systems that need replacement due to condition (age can be a factor) and underperformance are replaced to the current full standard under the Council's ongoing network renewal programme, with the intention of maintaining the ongoing integrity of the whole stormwater asset.

Currently there are coastal areas where the stormwater system is partially drowned at high and storm tides. We know that Kilbirnie behind Cobham Drive is affected (currently has less than a two-year return capacity at high tide) and that Miramar, Seatoun and some parts of the CBD can also be affected.

In these areas it is difficult to provide designs for a 50-year return capacity in pipes. Generally this issue cannot be resolved beyond the short to medium term by using (say) new and bigger pipes alone.

Other measures such as flood proofing, partial flood bypassing in pressure pipes, raising houses or disestablishing floodable areas may be possible in some cases, but it seems inevitable that the practical long term alternative of stormwater pumping stations will

be used sooner or later and should be considered as a viable option within planning documents or discussions.

Levels of service

Levels of service are established in two separate ways. Firstly there are customer levels of service which are how the customer 'receives' the service or activity; secondly there are 'technical' levels of service which describe how we (Wellington City Council and Capacity) provide the service.

Broadly speaking, we will know we are succeeding with the water supply levels of service when our water complies with the New Zealand Drinking Water Standards all of the time, and when 90% of our residents agree that water services provide good value for money.

Levels of service are achieved for the wastewater and stormwater activities when the network operates without compromising public health and well-being, or the environment.

To us, this would mean that property-flooding events are limited to a rain or storm event that could be reasonably expected once in 50 years.

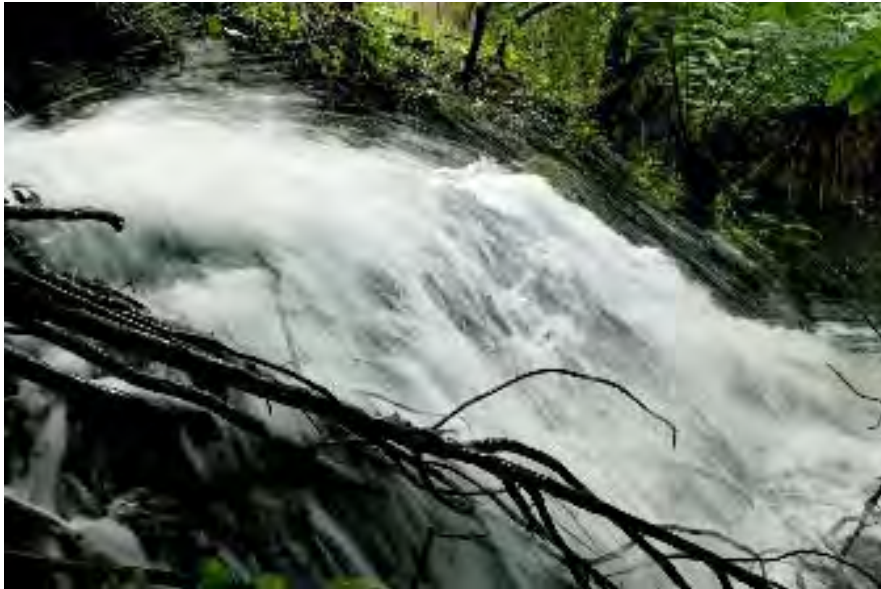
Alongside our levels of service we have performance measures. These measures are used to assess if we are delivering the water supply, wastewater or stormwater services to an appropriate level, and also to identify areas where we could be doing better or change the way in which we approach a particular aspect of the service delivery of that activity – these are detailed by activity on the following pages.

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 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 Ngāti Toa and the Port Nicholson Settlement Trust; the Makara, Ohariu Valley, south Karori and Horokiwi communities; and 157 resident and special interest organisations
- making asset management plans available on request
- newsletters distributed with invoices
- consultation with affected persons on specific projects (as required by the Resource Management Act 2001).

Improvements that will contribute to the robustness of the service level review processes have been identified. They include:

- developing a consolidated performance database that supplies information to all relevant reports, such as the asset management plan, LTCCP, water industry benchmarking and consent monitoring
- developing service performance measures that are aligned to the Council's community outcomes, are meaningful from a customer perspective and have value for managing the network.
- Engaging interested parties and community groups



Measures that will contribute to the development of future asset management plans and the service delivery to customers relate to the following areas:

Cost-effectiveness

- ⇒ operating efficiency
- ⇒ infrastructure efficiency
- ⇒ water conservation

Customer care

- ⇒ prior advice of supply interruptions
- ⇒ identification of contractors entering property

Service quality

- ⇒ quality of property reinstatement after works
- ⇒ repairs within identified time frames
- ⇒ frequency and duration of supply interruptions
- ⇒ duration of service interruptions
- ⇒ incidence of complaints
- ⇒ compliance with NZ Fire Service Fire Fighting Water Supplies Code of Practice 2008

Additionally work will be undertaken to include:

- the collation of information providing for historic performance trends against our key levels of service over the past five years
- developing a programme designed for the proactive engagement of our customers over levels of service, cost options and strategic directions across the three water activities.

What we seek to achieve ...

Level of Service Water Supply	Performance measure	Performance target			Comment
		Base line 2008	2011 / 2012	2013 - 2019	
We provide a safe, reliable drinking water supply for the city while seeking more sustainable approaches towards water supply.	Water supply compliance with Drinking Water Standards of New Zealand 2005 (revised 2008) – measured as a percentage	100% compliance	100% compliance	100% compliance	
	Water distribution network – quality grading from Ministry of Health	‘a’ – ‘b’ grading	‘a’ – ‘b’ grading	‘a’ – ‘b’ grading	
	Customer complaints regarding water quality (taste)	82	<80	<80	Measured in quantity of taste complaints received
Outcome <ul style="list-style-type: none"> • More sustainable • Safer 	Customer satisfaction with water network services (% from customer calling cards)	New measure	85%	95%	
	Properties with appropriate water pressure (%) – this is 250kPa for new developments	98%	98%	98%	
	Fire hydrants tested that meet the NZFS standard for pressure	95%	95%	95%	Derived from NZFS fire-fighting water supplies code of practice
Progress measure <ul style="list-style-type: none"> • Water consumption (residential and commercial combined) 	Response time to service requests (%) – to respond to all RFS within 1 hour of notification	97%	97%	97%	Includes any initial investigations and prioritisation of work
	Un-accounted for water from the network (%)	21%	18%	15%	
	Residential water consumption ⁷	350l/p/d	340p/p/d	300l/p/d	Refer note below
	Residents who agree that water services provide good value for money (%)	New measure	90%	90%	

⁷ Residential water consumption is based on the total bulk water supply less the metered commercial consumption divided by the resident population.

Level of Service Wastewater & Stormwater	Performance measure	Performance targets			
		Base line 2008	2011 / 2012	2013 - 2019	Comment
We manage the waste-water and stormwater networks with an aim to protect public health and property without compromising the environment.	Bathing beaches compliance with Ministry for the Environment green status guidelines (%)	93%	93%	93%	Measurement of sampling occasions
	Freshwater (streams) with acceptable faecal coliform counts (%)	89% of sites	90% of sites	90% of sites	
	Customer satisfaction with water network services (% from customer calling cards)	New measure	85%	95%	
Outcome • Safer	Response time to service requests (%) – to respond to all RFS within 1 hour of notification	97%	97%	97%	Includes initial investigations and any prioritisation of work
Progress measure • Water consumption (residential and commercial combined)	Properties flooded (buildings) as a result of a one in fifty year rain event	5	No properties flooded	No properties flooded	As reported to Wellington City Council or its contractors
	Stormwater network – resource consent compliance	Compliance achieved	100%	100%	
	Wastewater network – resource consent compliance	Compliance achieved	100%	100%	
	Residents who agree that Wastewater and Stormwater services provide good value for money (%)	New measure	90%	90%	

How we have performed...

Water supply activity Performance measures	Performance target			Actual		
	Base line 2008	2011 / 2012	2013 - 2019	2007/08	2008/09	2009/10
Water supply compliance with Drinking Water Standards of New Zealand 2005 (revised 2008) – measured as a percentage	100% compliance	100% compliance	100% compliance	Achieved	Achieved	Achieved
Water distribution network – quality grading from Ministry of Health	‘a’ – ‘b’ grading	‘a’ – ‘b’ grading	‘a’ – ‘b’ grading	Achieved	Achieved	Achieved
Customer complaints regarding water quality (taste)	82	<80	<80	92	61	377 ⁸
Customer satisfaction with water network service (established from calling cards)	New measure	85%	95%	91%	99%	93%
Properties with appropriate water pressure (%) – this is 250kPa for new developments	98%	98%	98%	97%	97%	96%
Fire hydrants tested that meet the NZFS standard for pressure	95%	95%	95%	100%	100%	- ⁹
Response time to service requests (%) – to respond to all RFS within 1 hour of notification	97%	97%	97%	99%	97%	98%
Un-accounted for water from the network (%)	21%	18%	15%	21%	17%	16%
Residential water consumption ¹⁰	350l/p/d	340p/p/d	300l/p/d	350l/p/d	350l/p/d	315l/p/d
Residents who agree that water services provide good value for money (%)	New measure	90%	90%	-	-	93%

⁸ Changes to the treatment of bulk water by Greater Wellington Regional Council’s treatment plant resulted in a high number of taste complaints although water quality was not affected

⁹ Hydrant testing was not carried out during the 2009/10 period across enough of the city to establish a valid measure of performance. Modelling indicates that over 90% of the city’s fire hydrants meet the required pressure.

¹⁰ Residential water consumption is based on the total bulk water supply less the metered commercial consumption divided by the resident population.

Wastewater & Stormwater activity Performance measures	Performance target			Actual		
	Base line 2008	2011 / 2012	2013 - 2019	2007/08	2008/09	2009/10
Bathing beaches compliance with Ministry for the Environment green status guidelines (%)	93%	93%	93%	Achieved	Achieved	Achieved
Freshwater (streams) with acceptable faecal coliform counts (%)	89% of sites	90% of sites	90% of sites	Achieved	Achieved	Achieved
Customer satisfaction with wastewater network services (% from customer calling cards)	New measure	85%	95%	100%	93%	100%
Customer satisfaction with stormwater network services (% from customer calling cards)	New measure	85%	95%	100%	93%	88%
Response time to service requests (%) – to respond to all RFS within 1 hour of notification	97%	97%	97%	100%	99%	90%
Response time to service requests (%) – to respond to all RFS within 1 hour of notification	97%	97%	97%	100%	99%	90%
Properties flooded (buildings) as a result of a one in fifty year rain event	5	No properties flooded	No properties flooded	5	0	0
Stormwater network – resource consent compliance	Compliance achieved	100%	100%	Achieved	Achieved	Achieved
Wastewater network – resource consent compliance	Compliance achieved	100%	100%	Achieved	Achieved	Achieved
Residents who agree that Wastewater and Stormwater services provide good value for money (%)	New measure	90%	90%	-	-	67%

Part three

Financial information

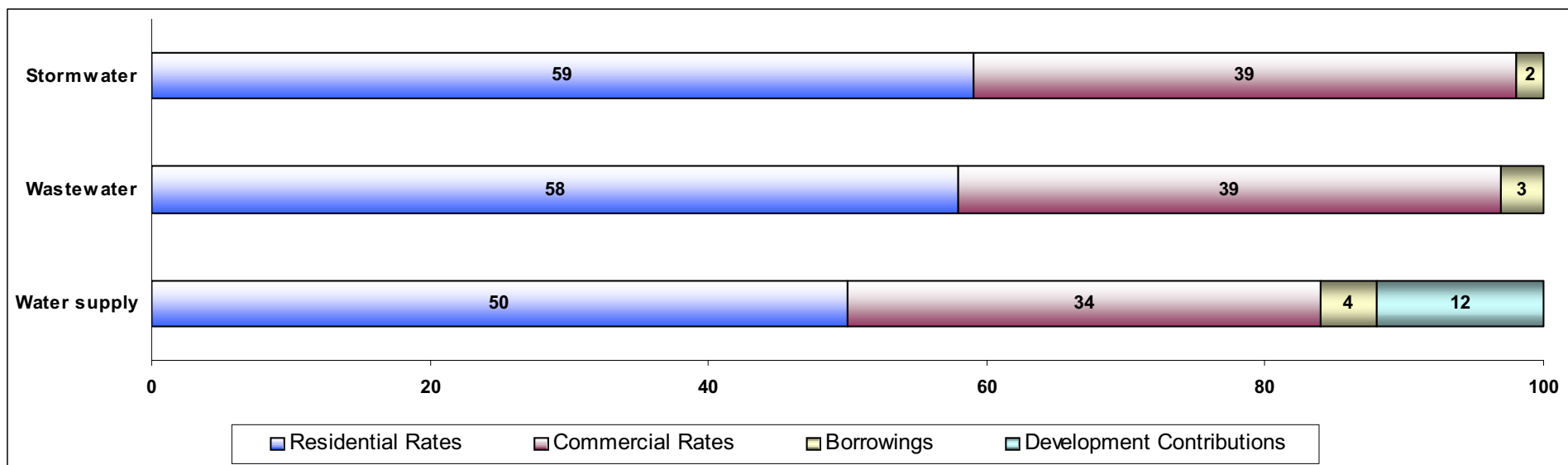
Wellington City Council funds its three water activities via the Revenue and Funding Policy, which details how each activity will be funded. The policy identifies:

- the community outcome to which the primary activity contributes
- the distribution of benefits between the community as a whole, identifiable groupings or individuals
- the costs, and benefits of funding the activity distinctly from other activities, including consequences for transparency and accountability.

Operating expenditure is currently funded as per the graph below. A breakdown of this formula, showing who benefits against who pays, is shown in the table following.

Operating expenditure		Water	Waste-water	Storm-water
Who benefits	Identified parts of the community	75%	80%	80%
	Entire community	25%	20%	20%
Who pays	Residents	60%	80%	60%
	Commercial sector	40%	20%	40%
Funding mechanism	Targeted residential rates	60%	80%	60%
	Targeted commercial rates	60%	20%	40%





Financial forecasting

On the following pages is a breakdown of the financial forecasts for the next 10 years. Although comprehensive, it does not provide for a full breakdown of the renewal or capital projects. These will be available in the next detailed Asset Management Plan, which is due to be produced to coincide with the next Long Term Council Community Plan. The detail contained here is current as at November 2010.

The detailed plan will therefore cover the period of 2012 to 2022 and will further detail improvement plans, the strategies across the three water activities that will be delivered against the strategic plan produced this year, and also detail the effects of levels of service options and performance measures.

A breakdown of the key assumptions used to develop the financial forecasts is as follows:

- All expenditure is stated in dollar values as at June 2010, with no allowance made for inflation over the 10-year planning period. They will be inflation-indexed in terms of the Business and Economic Research Limited economic forecast index for the water industry, as recommended by the audit office, prior to finalising the LTCCP.

- The rate and pattern of urban growth and development continues as assumed within Wellington City Council planning documents.
- 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 have been based on preserving current levels of service, and expenditure levels have been increased to match the growth of new assets and achieve the target levels of service noted earlier in this plan. No significant optimisation works have been allowed for, pending the outcomes of the planned network optimisation strategy work.

The most significant potential changes to the financial projections shown will result from the factors below:

- Changes in the desired level of service and service standards from those identified in the Asset Management Plan, particularly consent and other regulatory or legislative requirements.
- Assumptions have been 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).
- Reductions in unaccounted-for water, particularly through addressing leakage from the network.
- Peak stormwater flows may change due to the effects of climate change.
- Changes in inflow and infiltration, particularly inflow and infiltration and the effects of climate change.
- Changes in contract rates above inflation due to market or other external influences.

Improvements in financial forecasting

Specific improvements planned for the financial forecasting aspect of the asset management planning process include:

- reviewing depreciation calculations to capture better network condition knowledge
- annually reviewing replacement cost information
- assessing asset base lives and their residual lives.

These improvements will be built into the next detailed Asset Management Plan (2012) along with detailed breakdown of activity funding and expenditure.

Consolidated financial forecasts – WATER SUPPLY activities											
Category	Project	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Operational expenditure		5,096,508	5,287,626	5,260,389	5,215,479	5,220,620	5,225,812	5,231,056	5,236,353	5,241,703	5,241,703
Capital expenditure		10,607,027	12,327,050	12,646,901	14,192,351	11,030,170	11,310,035	12,624,429	10,693,844	10,693,845	10,693,845
Water network operations		12,790,343	13,464,807	14,005,865	15,152,283	15,760,213	16,391,799	17,048,888	17,732,564	17,732,564	17,532,564
Water asset stewardship		16,672,790	16,454,379	16,363,453	16,382,349	16,319,075	16,319,075	16,196,227	16,110,141	16,033,498	15,859,046
Rates	C463	1,135,680	1,135,680	1,135,680	1,135,680	1,135,680	1,135,680	1,135,680	1,135,680	1,135,680	1,135,680
Overheads		16,521	16,741	17,273	18,685	19,006	19,046	19,291	18,872	18,882	18,698
Interest		1,849,345	1,758,882	1,747,116	1,846,838	1,848,873	1,819,825	1,827,609	1,832,228	1,850,230	1,863,175
Insurance		511,558	511,558	511,558	511,558	511,558	511,558	511,558	511,558	511,558	511,558
Asset stewardship		244,966	240,860	249,187	252,362	254,305	255,287	256,311	257,939	259,377	260,903
Depreciation – plant, waste & water, drainage		12,914,720	12,790,658	12,702,639	12,617,226	12,549,653	12,454,831	12,359,692	12,277,221	12,175,194	12,069,032
Direct operational expenditure											
Water meter reading	C112	260,998	260,998	260,998	260,998	260,998	260,998	260,998	260,998	260,998	260,998
Area water meters	CX296	220,227	220,227	220,227	220,227	220,227	220,227	220,227	220,227	220,227	220,227
Water consent processing	C412	275,922	275,922	275,922	275,922	275,922	275,922	275,922	275,922	275,922	275,922
Water network operations – fees and user charges		(30,900)	(30,900)	(30,900)	(30,900)	(30,900)	(30,900)	(30,900)	(30,900)	(30,900)	(30,900)
Planning, policy and management											
Asset management planning	C671	416,150	576,500	476,500	426,500	426,500	426,500	426,500	426,500	426,500	426,500
Water network: compliance monitoring and information	C464	294,589	294,589	294,589	294,589	294,589	294,589	294,589	294,589	294,589	294,589
Water conservation and leak detection	C547	205,360	205,360	205,360	205,360	205,360	205,360	205,360	205,360	205,360	205,360
Water collection and treatment											
Bulk water levy	C115	12,790,343	13,464,807	14,005,865	15,152,283	15,760,213	16,391,799	17,048,888	17,732,564	17,732,564	17,732,564

Consolidated financial forecasts – WATER SUPPLY activities (continued)											
Category	Project	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Water reticulation unplanned maintenance	C113	2,897,013	2,897,013	2,897,013	2,897,013	2,897,013	2,897,013	2,897,013	2,897,013	2,897,013	2,897,013
Water reservoir / pump station operations and maintenance	C462	689,189	719,957	792,720	797,810	802,951	808,143	813,387	818,684	824,034	824,034
Planned maintenance											
Karori dam maintenance	C536	88,187	88,187	88,187	88,187	88,187	88,187	88,187	88,187	88,187	88,187
Renewals											
Water reticulation	CX126	5,042,623	5,042,622	5,042,622	5,042,623	5,042,623	5,042,622	5,042,622	5,042,622	5,042,623	5,042,623
Water reticulation maintenance renewals	CX430	1,265,843	1,265,843	1,265,843	1,265,843	1,265,843	1,265,843	1,265,843	1,265,843	1,265,843	1,265,843
Reservoirs and pump station renewals											
Reservoirs and pump stations	CX127	2,023,145	1,523,144	2,221,770	2,335,619	3,262,094	3,132,570	3,282,644	2,026,879	2,026,879	2,026,879
Capital upgrades - growth											
Water reticulation	CX326	1,401,529	982,304	546,529	1,150,129	1,199,863	1,300,363	1,222,683	547,863	547,863	547,863
Reservoirs and pump stations	CX336	653,660	3,292,910	3,349,910	4,177,910	39,520	348,410	1,590,410	1,590,410	1,590,410	1,590,410

Consolidated financial forecasts – WASTEWATER activities											
Category	Project	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Operational expenditure		3,680,838	3,601,982	3,654,292	3,480,951	3,509,647	3,513,379	3,332,150	3,335,958	3,339,803	3,339,803
Capital expenditure		7,681,938	10,655,185	10,697,212	7,834,827	7,833,345	7,850,064	7,858,776	7,859,703	7,859,703	7,859,703
Wastewater asset stewardship		11,015,517	10,960,901	11,005,513	11,140,469	11,177,233	11,186,375	11,227,338	11,269,026	11,325,919	11,383,049
Rates	A041	1,888,769	1,888,769	1,888,769	1,888,769	1,888,769	1,888,769	1,888,769	1,888,769	1,888,769	1,888,769
Overheads		9,868	10,004	10,322	11,179	11,372	11,395	11,540	11,284	11,287	11,287
Interest		1,345,875	1,296,010	1,304,592	1,398,995	1,422,396	1,423,772	1,456,199	1,489,279	1,537,164	1,585,655
Insurance		389,769	389,769	389,769	389,769	389,769	389,769	389,769	389,769	389,769	389,769
Depreciation		6,692,055	6,687,230	6,720,256	6,757,963	6,769,963	6,777,062	6,784,826	6,792,693	6,800,804	6,808,469
Asset stewardship		152,339	152,277	154,963	156,952	158,122	158,766	159,393	160,390	161,284	162,258
Asset stewardship specialists		7,964	7,964	7,964	7,964	7,964	7,964	7,964	7,964	7,964	7,964
Fees & user charges		528,878	528,878	528,878	528,878	528,878	528,878	528,878	528,878	528,878	528,878
Direct operational expenditure											
Interceptor flow monitoring	C089	525,305	424,330	424,330	247,330	272,330	272,330	87,330	87,330	87,330	87,330
Critical drain inspections	C495	389,086	389,086	389,086	389,086	389,086	389,086	389,086	389,086	389,086	389,086
Sewage pollution detection and monitoring	C501	51,068	51,068	51,068	51,068	51,068	51,068	51,068	51,068	51,068	51,068
Planning, policy and management											
Trade-waste enforcement	C084	197,927	198,362	199,392	199,464	199,537	199,610	199,685	199,760	199,835	199,835
Wastewater network maintenance											
Unplanned maintenance	C085	197,115	197,115	197,115	197,115	197,115	197,115	197,115	197,115	197,115	197,115
Information maintenance	C497	255,177	255,177	255,177	255,177	255,177	255,177	255,177	255,177	255,177	255,177
Reticulation maintenance	C086A	1,275,678	1,275,678	1,275,678	1,275,678	1,275,678	1,275,678	1,275,678	1,275,678	1,275,678	1,275,678
Pump Station	C502	789,482	811,166	862,446	866,033	869,656	873,315	877,011	880,744	884,514	884,514
Planned network maintenance											
Network upgrades	CX381	158,636	3,055,319	3,080,853	185,066	158,636	158,636	158,636	158,636	158,636	158,636
Reticulation renewals	CX334	7,523,302	7,599,866	7,616,359	7,649,761	7,674,709	7,691,428	7,700,140	7,701,067	7,701,067	7,701,067

Consolidated financial forecasts – WASTEWATER activities (Treatment plants)											
Category	Project	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Operational expenditure		17,708,336	17,717,390	17,690,933	17,449,477	17,354,639	17,247,120	17,186,102	17,114,632	17,079,184	17,079,184
Sewage TP contract and operations	C087	16,085,233	16,030,798	15,931,406	15,882,043	15,832,637	15,783,127	15,733,825	15,684,431	15,598,425	15,598,425
Porirua sewage treatment contribution	C088	1,623,103	1,686,592	1,759,527	1,567,434	1,522,002	1,463,993	1,452,277	1,430,201	1,480,759	1,480,759



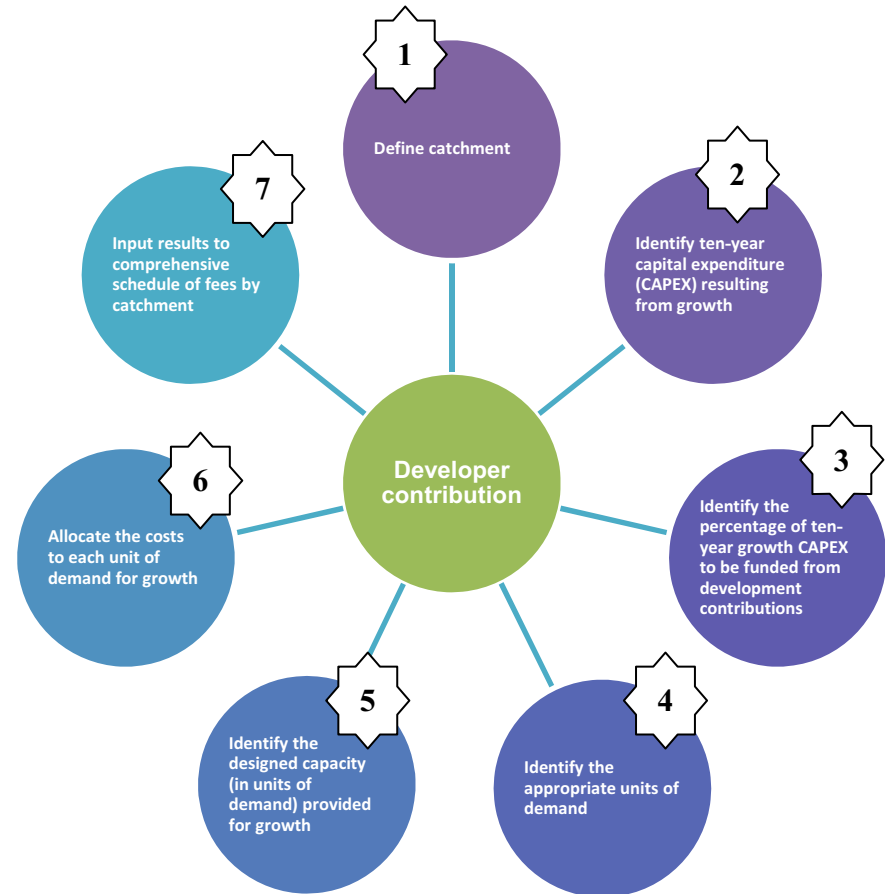
Consolidated financial forecasts – STORMWATER activities											
Category	Project	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Operational expenditure		2,236,879	2,236,879	2,236,879	2,236,879	2,236,879	2,236,879	2,236,879	2,236,879	2,236,879	2,236,879
Capital expenditure		3,579,498	3,615,282	3,669,362	3,779,743	3,856,507	4,343,653	5,157,683	7,170,095	7,232,389	7,232,389
Stormwater asset stewardship		12,177,054	12,084,238	12,125,451	12,359,912	12,444,279	12,483,319	12,603,187	12,739,060	12,936,933	13,149,294
Rates	A041A	1,697,594	1,697,594	1,697,594	1,697,594	1,697,594	1,697,594	1,697,594	1,697,594	1,697,594	1,697,594
Overheads		13,108	13,285	13,708	14,835	15,090	15,122	15,315	14,979	14,986	14,839
Interest		2,830,883	2,768,073	2,831,334	3,087,393	3,194,426	3,256,627	3,395,450	3,543,388	3,735,794	3,940,753
Insurance		812,816	812,816	812,816	812,816	812,816	812,816	812,816	812,816	812,816	812,816
Depreciation		6,617,665	6,587,116	6,561,143	6,535,851	6,511,363	6,487,362	6,467,413	6,454,361	6,458,661	6,464,988
Asset stewardship		197,474	197,390	200,892	203,459	205,026	205,834	206,635	207,958	209,118	210,340
Asset stewardship specialists		7,964	7,964	7,964	7,964	7,964	7,964	7,964	7,964	7,964	7,964
Fees & user charges		0	0	0	0	0	0	0	0	0	0
Direct operational expenditure											
Resource consent monitoring	C090	119,096	119,096	119,096	119,096	119,096	119,096	119,096	119,096	119,096	119,096
Resource consent monitoring – income	C090	(8,368)	(8,368)	(8,368)	(8,368)	(8,368)	(8,368)	(8,368)	(8,368)	(8,368)	(8,368)
Critical drain inspections	C496	407,558	407,558	407,558	407,558	407,558	407,558	407,558	407,558	407,558	407,558
Planning, policy and management											
Asset management	C498	409,600	409,600	409,600	409,600	409,600	409,600	409,600	409,600	409,600	409,600
Stormwater network maintenance											
Unplanned maintenance	C086C	1,398,993	1,398,993	1,398,993	1,398,993	1,398,993	1,398,993	1,398,993	1,398,993	1,398,993	1,398,993
Stormwater renewals											
Reticulation	CX151	3,220,075	3,307,609	3,391,689	3,472,070	3,548,834	3,621,980	3,691,510	3,757,422	3,819,716	3,819,716
Stormwater – Levels of service upgrades											
Localised flood protection projects	CX031	359,423	307,673	307,673	307,673	307,673	721,673	1,466,173	3,412,673	3,412,673	3,412,673

Developer's contributions

A development contributions policy provides the Council with a method to obtain contributions to fund infrastructure required as a result of growth.

Development contributions may be required in relation to developments if the effect of the developments is to require new or additional assets of increased capacity and as a consequence the Council incurs capital expenditure to provide appropriately for network infrastructure, community infrastructure or reserves. In addition the Council may require development contributions to pay, in full or in part, for capital expenditure already incurred by the Council in anticipation of development

Development contributions are calculated in accordance with the methodology set out in Schedule 13 of the Local Government Act (LGA) 2002. This is carried out by Wellington City Council through the use of the seven step process shown below and is detailed in the Development Contributions Policy – July 2009.



Asset management planning improvement opportunities

The process of developing and improving asset management plans is complex and requires the input of several parties and departments. These entities reflect a combination of internal and external stakeholders to the performance of the three water activities. Exploration of the varied needs of each party and then development of improvement opportunities within the asset management planning process continues behind the scenes of the operational and maintenance programmes.

Some key areas are destined to require constant attention in the search for more effective, efficient or sustainable approaches to the delivery of the activity. Primarily these constant areas are found within the establishment of levels of service, activity performance measures, and meeting resource consent conditions or legislative requirements.

The asset management improvement tasks that have been identified for the three water activities are:

- completion of key performance indicator data collection and assessment
- the development of standardised performance graphs and presentation methodology
- service gap analysis with respective capital development programmes produced as a result of the gap analysis
- improved asset condition assessment
- improved asset performance data collection and assessment
- development of works programme to mitigate outcomes from the Activity Risk Management Plans developed for the three activities
- improved activity performance monitoring, recording and presentation.

Asset Management Plan review and monitoring

Wellington City Council produces detailed asset management plans in a cycle that reflects the Long Term Council Community Plan with summary plans for the subsequent two financial years.

In order to meet the legislative requirements of activity planning, the completed plan is reviewed by an external contractor and also supplied to Audit New Zealand for further assessment against the LTCCP's community outcomes, levels of service and performance measures.

Feedback is also sought from parties that contribute to the delivery of performance targets, reporting mechanisms, planning and development functions, strategic planning as well as those responsible for managing the three water activities' operational and maintenance programmes.

Additional reference material

General

Wellington City Council Long Term Council Community Plan 2009–2019

Wellington City Council Assessment of Water and Sanitary Services (2005)

Wellington City Council Annual Plan

Wellington City Council District Plan

Wellington City Council Consolidated Bylaw 1991

Wellington Regional Strategy Building Act 2004

Civil Defence and Emergency Management Act 2002

Health Act 1956

Local Government Act 1974

Local Government Act 2002

Local Government (Rating) Act 2002

Public Works Act 1981

Resource Management Act 1991

Water

Wellington City Council Water Supply Asset Management Plan 2008

Wellington City Council Public Health Risk Management Plan for Drinking Water Health (Drinking Water) Amendment Act 2007

Water Supplies Protection Regulations 1961

Drinking Water Standards of New Zealand 2005 (revised 2008)

New Zealand Fire Service Fire Fighting Water Supplies Code of Practice 2008

Summary Asset Management Plan – glossary of terms

Activity	The work undertaken on an asset or group of assets to achieve the delivery of an outcome; that is, the provision of water supply or wastewater and stormwater services.
Annual plan	The annual plan, produced by Wellington City Council, gives a yearly statement on the information reported with the Long Term Council Community Plan.
Annual report	Audited report published by 30 November which provides information on how Wellington City Council has performed against community outcomes, budgets, policies, objectives and funding proposals.
Bio-diversity Plan	Plan to facilitate co-ordination of the Council's biodiversity activities, to identify local priorities, and actions to protect and restore bio-diversity. Designed to ensure that national targets set by the New Zealand Bio-diversity Strategy (2000) are translated into local action.
Building Act 2004	<p>The purpose of this Act is to provide for the regulation of building work, the establishment of a licensing regime for building practitioners, and the setting of performance standards for buildings, to ensure that:</p> <ul style="list-style-type: none"> (a) people who use buildings can do so safely and without endangering their health (b) buildings have attributes that contribute appropriately to the health, physical independence and well-being of the people who use them (c) people who use a building can escape from the building if it is on fire (d) buildings are designed, constructed and able to be used in ways that promote sustainable development.
Building over drains policy	Provides guidelines and conditions for those proposing to construct over existing pipelines or watercourses.
CAPEX (capital expenditure)	Spending on additions or improvements to fixed assets where the additions or improvements increase the assets' functional abilities or value. The benefit from capital expenditure must be reflected over more than one financial year.
Catchment	The area contributing surface water flow to a point on a drainage or river system. Can be divided into sub-catchments.
CCO (council-controlled organisation)	<p>A council-controlled organisation is, according to the Local Government Act 2002:</p> <ul style="list-style-type: none"> (a) a company— <ul style="list-style-type: none"> (i) in which equity securities carrying 50% or more of the voting rights at a meeting of the shareholders of the company are— <ul style="list-style-type: none"> (A) held by one or more local authorities, or (B) controlled, directly or indirectly, by one or more local authorities, or (ii) in which one or more local authorities have the right, directly or indirectly, to appoint 50% or more of the directors of the company.

CCTO (council-controlled trading organisation)	A council-controlled organisation that operates a trading undertaking for the purpose of making a profit.
Change in service potential	Service potential is the total future service capacity of an asset. It is normally determined by reference to an asset's operating capacity and economic life. The change in service potential in accounting terms is calculated as the difference between the renewals and annual depreciation.
Civil Defence Emergency Management Act 2002	The purpose of this Act is to improve and promote the sustainable management of hazards in a way that contributes to the social, economic, cultural and environmental well-being and safety of the public. This is to encourage and enable communities to achieve acceptable levels of risk. It requires local authorities to co-ordinate activities relating to civil defence emergency management.
Code of Practice for Fire Fighting Water Supplies (SNZ PAS 4509:2008)	This code of practice provides techniques to define an adequate firefighting water supply that may vary according to circumstances. It relates to the Fire Service requirements only; territorial authorities and building owners may choose to exceed the provisions. It is written in a way that will encourage flexibility and provide different options for developers and territorial authorities.
Collection and transportation of wastes Bylaw	<p>The general purposes of this bylaw are:</p> <ul style="list-style-type: none"> (a) to regulate the collection and transportation of liquid and solid waste collected from grease traps, septic tanks and trade waste premises that would require a consent under the Trade Waste Bylaw 1992 if the trade waste was discharged to the Council's sewerage system and pre-treatment works within the Wellington district (b) to regulate the transportation and discharge of liquid and solid waste from scheduled sources discharged in the Wellington district (c) to provide for the licensing of persons who collect and transport liquid and solid waste from scheduled sources in the Wellington district and/or discharge liquid and solid waste from scheduled sources at destinations within the Wellington
CONFIRM	Asset management software operated by Wellington City Council.
Critical assets	Assets for which financial or service failure are sufficiently severe to justify proactive inspection and rehabilitation. Critical assets have a lower threshold for action to be initiated than non-critical assets.
Culvert	A road culvert conveys stormwater from one side of the road to the other. All other culverts are stormwater pipelines.
Drainage	Includes wastewater (sewerage) and stormwater systems.
Deferred maintenance	The shortfall in rehabilitation work required to maintain the required service potential of an asset.
Design criteria	A set of standards agreed by the planner, developers and regulators that a proposed system should satisfy.

District plan	This core document incorporates policies and objectives for land use in Wellington, providing key planning inputs for design and asset management within the three water services.
Demand analysis	Analysis of the changes in Wellington's environment that may affect the assets required to deliver the three water services. This includes climate changes, population variation and building trends among those factors considered.
Depreciation	Depreciation takes place when an asset is consumed, worn out or loses value due to use, time, technology changes and market variations. Depreciation is calculated by taking an asset's original cost (or an assessed value amount) less its residual value over the asset's functional life.
Economic life	The period from the acquisition of an asset to when it is no longer the lowest cost alternative to deliver an outcome although still physically able to provide a service.
First flush	The initial run-off from a site or catchment following the start of a rainfall event. As run-off travels over a catchment it will pick up or dissolve pollutants and the 'first flush' portion of the flow may be the most contaminated as a result. This is especially the case in small or more uniform catchments. However, in larger or more complex catchments pollution wash-off may contaminate run-off throughout a rainfall event.
Floodplain	Land adjacent to a watercourse that would be subject to repeated flooding under natural conditions.
Grey-water	Wastewater from sinks, baths, showers and domestic appliances before it reaches the sewer (or septic tank system).
Health Act 1956	This Act provides that the Council must promote and conserve public health within Wellington City. It does this by ensuring that an adequate and convenient supply of wholesome water is available to every household, and by ensuring that no water other than clean wholesome drinking water is present in the water mains.
Health (Drinking Water) Amendment Act 2007	Introduced risk management practices into the Health Act that require water suppliers to address risks within the water supply activity. This is documented through the Public Health Risk Management Plan for Drinking Water.
Health and Safety in Employment Act 1992	Requires the provision of safe work places for all staff and contractors, and the maintenance of an audit trail to demonstrate compliance.
Inflow and infiltration (I&I)	<p>Infiltration is where groundwater enters a public sewer or private drain through defects in the system. This could be poor joints in pipework or cracks in pipes or manholes.</p> <p>Inflow is where stormwater discharged into a private drain which enters the wastewater system by way of non-compliant connections, illegal down-pipe connections or low gully traps.</p>

Industry	The methods adopted by councils and organisations to deliver water services, manage assets, set performance targets, and design or commission maintenance and works programmes.
Lateral	Refer 'Private sewer or drain'.
Lateral Policy	This policy defines ownership and maintenance obligations of the Council and property owners regarding stormwater laterals and is currently found within the Water Charter.
Levels of service	Levels of service set out what the customer can expect to receive from the different activities undertaken by the Council. For example, there may be a level of service relating to drinking-water quality, recreational beach-water quality or acceptable flooding levels. Levels of service are a requirement of the Auditor-General for the Council's LTCCP.
Local Government Act 1974	An Act to consolidate and amend the law relating to the re-organisation of the districts and functions of local authorities; to make better provision for the administration of those functions which can most effectively be carried out on a regional basis; and to make provision for the establishment of united councils, regional councils, district councils, district community councils and community councils. (Some relevant sections relating to water services and firefighting provisions are still in effect.)
Local Government Act 2002	<p>Defines the purpose of local authorities as enabling local decision making by and on behalf of the community, and allows local authorities the power of general competence. To help local authorities achieve this, the Act includes significant consultative requirements, including:</p> <ul style="list-style-type: none"> (a) the Council must, no less than every six years, identify community outcomes and priorities for its region or district (b) the Council must, no less than once every three years, prepare and adopt a long-term council community plan in accordance with the special consultative procedure (c) the Council is required to consult with the community on a range of specific issues, including changes to service delivery and transfer of Council assets (d) the Council must provide appropriate information when consulting with the community and deliver information in ways that will enable communities to participate effectively (e) the Council must outline how the asset management implications of changes to demand and service levels and standards are to be assessed and dealt with.
Local Government (Rating) Act 2002	<p>The purpose of this Act is to promote the purposes of local government set out in the Local Government Act 1974 by:</p> <ul style="list-style-type: none"> (a) providing local authorities with flexible powers to set, assess and collect rates to fund local government activities (b) ensuring that rates are set in accordance with decisions that are made in a transparent and consultative manner (c) providing for processes and information to enable ratepayers to identify and understand their liability for rates.

Long Term Council Community Plan (LTCCP)	<p>The Long Term Council Community Plan (LTCCP) describes the community outcomes for the local authority and how those outcomes were identified; contributes to strategic planning processes or documents; and how the authority will contribute to furthering those outcomes. Activities such as water services must be identified within the plan along with the assets required to perform those activities.</p> <p>The plan must outline any significant negative effects that any activity within the group of activities may have on the social, economic, environmental or cultural well-being of the local community as well as provide information on the financial aspects of providing the water services.</p>
Ministry of Health Drinking Water Standards for New Zealand 2005 (revised in 2008) (Collectively known as DWSNZ)	<p>Safe drinking water, available to everyone, is a fundamental requirement for public health. Drinking-water Standards for New Zealand 2005 replaces the previous Drinking-water Standards for New Zealand 2000 (Ministry of Health 2000). It details how to assess the quality and safety of drinking-water using the revised water quality standards and compliance criteria (collectively called the DWSNZ) that came into effect from 31 December 2005. The drinking-water standards apply to drinking water, that is, water intended to be used for human consumption, food preparation, utensil washing, oral hygiene or personal hygiene. The criteria are applicable to all drinking water except bottled water, which must comply with the Food Act 1981. The DWSNZ are intended to:</p> <ul style="list-style-type: none"> • protect public health • minimise unnecessary monitoring • be appropriate for large and small, publicly and privately owned drinking-water supplies.
Operations	The active process of utilising an asset (including application of manpower, electricity, materials and so on).
OPEX (operating expenditure)	The cost of operating and maintaining an asset. Any operational expenditure does not alter the value of an asset nor does it appear in the asset's valuation.
Optimised decision making	A formal process to identify and prioritise all potential solutions with consideration of financial viability, social and environmental responsibility, and cultural outcomes. Usually this will involve a combination of cost/benefit analysis with multi-criteria analysis of the various available options.
ORC (optimised replacement cost)	The minimum cost of replacing an existing asset with another asset offering the same utility most efficiently. The optimisation process adjusts the value for technical or functional obsolescence, surplus assets or over design.
ODRC (optimised depreciation replacement cost)	The optimised replacement cost after deducting an allowance for usage which reflects the remaining life of the asset.
Outcome	The end result for the community that Wellington City Council hopes to achieve.

Performance measure	Statement of intended results for an output or activity (water supply, wastewater and stormwater services) carried out during the financial year. They must be consistent with corporate objectives and be measurable at the completion of the activity. Managers are accountable for the achievement of the outcomes, which are independently audited and reported in the annual and business plans.
Permeable surface	A surface formed of material that is itself impervious to water but, by virtue of voids formed through the surface, allows infiltration of water to the sub-base through the pattern of voids, for example concrete block paving.
Point of service	The physical connection where the property's water services (water supply pipework, drains, plumbing connections and so on) connects to the Council's network or infrastructure. This may vary for each of the property's different water services.
Pollution	A change in the physical, chemical, radiological or biological quality of a resource (air, water or land) caused by human activity that is injurious to existing, intended or potential uses of the resource.
Private sewer or drain (lateral)	The section of sewer between a customer's premises and the point of connection with the public sewer through which wastewater and stormwater is conveyed from the premises. This section of pipework is owned and maintained by the customer.
Public Health Risk Management Plan for Drinking Water	Public health risk management plans are a requirement of the Ministry of Health designed to encourage the use of risk-management principles during treatment and distribution of drinking water so that monitoring is not the only water quality management technique used to further reduce the risk of contamination to the water supply network.
Public sewer	Section of sewer downstream from a point of discharge. From this point it is owned and maintained by Wellington City Council.
Public Works Act 1971	Allows land acquisition for public works.
Rehabilitation	Work to rebuild or replace components of an asset in order to restore it to the required functional condition and thereby extend the asset's life.
Renewals	Replacing an asset with one of similar performance (that is, same size pipes).
Repair	Action or work undertaken to return an asset to its required functional condition following damage or failure.
Replacement	The complete substitution of an asset that has reached the end of its economic life to provide a similar (or agreed) level of service.
Replacement cost	The cost of replacing an existing asset with a substantially identical new asset.

Request for service	Any communication made to the Council, its departments or contractors that call for a response to be made concerning the operations of an activity. For example, a letter or a phone call advising of a blocked drain or a leaking pipe or hydrant.
Residents' Satisfaction Survey	<p>The objectives of the survey are to provide statistically reliable measures of the views of Wellington residents on a range of services and facilities provided by Wellington City Council. The survey has been designed to produce statistical indicators that measure performance as set down in the Council's performance indicators for specified service delivery areas.</p> <p>The statistical indicators combined with additional factors aid Council decision making and policy formulation, and help to determine proprieties for resource allocation.</p>
Resource Management Act 1991	The purpose of this Act is to promote the sustainable management of natural and physical resources. In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural well-being, and for their health and safety while sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations. Sustainable management also means safeguarding the life-supporting capacity of air, water, soil and ecosystems, and avoiding, remedying or mitigating any adverse effects of activities on the environment.
Run-off	Water flow over the ground surface to the drainage system. This occurs if the ground is impermeable, is saturated or if rainfall is particularly intense.
Secondary flow-path	The route or path taken by stormwater if not able to be accommodated by a piped network or stream system.
Service fault notification	A complaint or advice received regarding the performance of an asset.
Sewage	Water or other liquid (including waste matter in solution or suspension) discharged from premises.
Swale	A shallow, vegetated channel designed to conduct and retain water, but may also permit infiltration. The vegetation filters particulate matter found in stormwater.
Trade waste	Discharge of any liquid, with or without matter in suspension or solution, that is or may be discharged from a commercial premise in the course of any trade or industrial process or operation.
Trade Waste Bylaw 2004	The purpose of the Trade Waste Bylaw is to control trade waste discharges into the wastewater system to protect: sewers; pumping stations; storage tanks; wastewater treatment plants and other related wastewater system structures; workers operating in or with the wastewater system; and the environment, by ensuring the necessary resource consents are met. The bylaw also provides a basis for charging persons who use the wastewater system and a basis for the introduction and implementation of the New Zealand Waste Strategy.
Upgrade	The replacement of a component with an item that is larger, more powerful or different from the original item.

Watercourse	A term including all rivers, streams, ditches, drains, cuts, culverts, dykes, sluices and passages through which water flows.
Water and Sanitary Services Assessment (2005)	<p>The LGA 2002 requires local authorities to make assessments of the water services. Information covered in the 2005 assessment includes:</p> <ul style="list-style-type: none"> • provisions for drinking water, wastewater and stormwater services (and sanitation) • assessment of the adequacy and quality of the services • assessment of the risks to the communities • statement of the current estimated demands • statement of the options available to meet demand now and in the future • statement of the Council's intended role in meeting demand.
Water Supplies Protection	Regulations protecting water supplies via back-flow preventers or air-gap separators pursuant to the Health Act 1956.
Wellington City Council Code of Practice for Land Development	This code provides a guide for development and subdivision in Wellington City. It integrates sustainable principles of land development intending to enhance water quality, minimise land disturbance, preserve native vegetation and minimise impervious surfaces.
Wellington City Council Consolidated Bylaw 1991	A bylaw to consolidate and amend the bylaws in force in the city of Wellington and to make provision for the good rule and government of the city, and for the administration of its local affairs.
Wellington Regional Strategy	The Wellington Regional Strategy (WRS) is a project of Greater Wellington Regional Council, Hutt City Council, Upper Hutt City Council, Kapiti Coast District Council, Porirua City Council and Wellington City Council, working together with the goal of building an internationally competitive Wellington by developing and implementing a vision and an integrated framework to achieve sustainable growth of the Wellington region. The project has a long-term outlook – to the year 2050 with a more detailed focus of action and priority for the next 10 to 20 years.
Wetland	A pond that has a high proportion of emergent vegetation in relation to open water.



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WELLINGTON CITY COUNCIL

Wellington