Asset Management Plan
Stormwater

2024 - 2034

GREAT LAKE TAUPŌ
Taupō District Council

Stormwater Asset Management Plan 2024 - 2034

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Executive Summary

Introduction

Taupō District Council manages Stormwater to reduce the likelihood of harm to people and the environment. This asset management plan enables Council to manage and demonstrate its stewardship of Stormwater assets on behalf of its communities in order to provide services cost-effectively, both now and into the future.

Stormwater infrastructure provision within the Taupō district is different to most Councils as the stormwater network predominantly only drains roads with private property required to dispose stormwater on site up to a 1 in10-year event (10% AEP).

The purpose of this asset management plan is to describe how Stormwater assets in the Taupō District will be managed so that acceptable levels of service are provided in the most cost-effective manner and contribute to the achievement of the 2024 – 2034 Long Term Plan (LTP).

This plan details information about:

- The strategic outcomes that Council is seeking to achieve related to Stormwater infrastructure.
- The level of service to be provided.
- The infrastructure that needs to be maintained, renewed and developed to meet the demands placed on it over the next 30 years.
- How these services are to be provided.
- What funding is required to meet these demands.
- The associated risks.

The AMP covers the period 1 July 2024 to 30 June 2034 with a particular focus on work programs over the next five years. It informs the Councils 2024/34 10 Year plan and the 30-year infrastructure strategy and contributes to meeting Councils identified strategic outcomes.

What we do

Council owns, operates and maintains 220 km stormwater collection networks and disposal schemes in all the urban areas within the district.

The services that are provided to the community through the stormwater assets in this plan are as follows:

- A reticulated stormwater system of pipes and channels (primary network) sufficient to cope with frequent rainfall events within the road reserves.
- A secondary stormwater system comprising swales, gullies, road, kerb and channel and both formal and informal overland flow paths sufficient to control stormwater from less frequent rainfall events
- Planning and building controls to restrict building in high flood risk areas, require minimum floor levels and require mitigation of stormwater runoff effects to prevent stormwater entry to habitable buildings.
- Planning and policy initiatives to minimise stormwater quality and quantity effects at source.
- Gross pollutant traps or similar treatment devices to reduce debris and contaminant levels in stormwater discharge.

Council manages physical Stormwater assets with a replacement value of $126 million (August 2023). Our physical Stormwater assets are listed below:

Asset Function	Asset Type	Quantity now
Reticulation	Pipes	220km
	Standard Manholes	3992
	Catchpit manholes Lamphole	20 9
	Inlets	60
	Raised manhole – pond inlet with debris screen	13

	Pump Stations	3
Stormwater quality improvements	Attenuation / detention ponds	50
	CDS units Enviropods	13 224
Disposal	Unknown outlet type	82
	Pond outlet with debris screen Pond outlet with wingwall & debris screen Lake outlet	32 20 78
	River outlet	59
	Gully outlet	262
	Land Outlet	41

Asset data is continually being updated as developers vest new assets from developments as well as council receives data from its contractors and staff as they undertake maintenance. Data is also obtained from surveys such as CCTV programs.

Why we do it

The provision of Stormwater collection networks is vital to the needs and aspirations of all who live in the District. They provide the means of safe, reliable and efficient disposal of stormwater for 24 hours a day, 365 days a year in a manner that is safe for both human health and property and for the health of the natural environment.

Strategy

Council's Stormwater strategy is to manage flows for public safety and for environmental protection. The external strategic environment is also of relevance in that the performance of the stormwater network is governed by legislative obligations and dependant on the management of the receiving waters which fall under the control of the Waikato Regional Council.

The external strategic environment is also of relevance in that the performance of the Stormwater network is governed by legislative obligations such as, Local Government Act, Resource Management Act, Health Act (Drinking Water) Amendment Act and Drinking Water Standards for New Zealand.

Council's strategy presents what we are going to do for the next ten years to make our district a better place to live and work. At the core of our strategy is our vision, our outcomes and our strategies. From a strategic perspective, there are a number of issues for Council to consider:

1 **Climate change** is predicted to increase the severity of severe weather events including storms, so there will be more intense flows, more often. This increases risks to people, to communities and to the environment. Council's Stormwater Strategy (2009) took account of climate change impacts and addresses flooding, degradation of overland flow paths, degradation of Lake Taupō and aquatic environments, and public health and safety. For example, new property developments are now required to have increased Stormwater capacity to ensure that additions to the system have sufficient capacity for increased flows.

3. **Growth** Stormwater infrastructure will be established for the growing developments in the district. An inevitable consequence of urban growth is an increased demand for Stormwater disposal services. Council will continue to assess the need for service extensions to areas of growth. It is imperative that our Stormwater network is fit for purpose in terms of a growing population and the associated demand, as well as the effects of climate change on stormwater flows. Stormwater disposal is an essential contribution to economic growth and increased quality of life to mitigated flooding and contamination of water courses.

4. **Relationships:** We will build stronger relationships with Iwi and Māori along with community and business groups to ensure that by working together we can achieve a growing and a resilient community.

5. **Resilience:** We all, Council and community, need to anticipate, resist, respond to and recover from significant change or events.

AMP Response to the Strategic Context

The approach taken in this AMP is to ensure that safe and reliable collection, treatment transport and disposal of stormwater to protect community health and the environment. Specific issues focussed on for the 2024 – 34 period and addressed in the plan are:

- Staged upgrades of the existing stormwater network to meet projected growth and rainfall trends.
- Staged upgrades to meet existing Levels of Service (LoS) shortfalls in the stormwater network
- Completion of necessary upgrades to stormwater treatment to meet enhanced resource consent requirements
- The benefits of addressing these problems and the consequences of not addressing them are outlined in this AMP.

Overarching Issues for stormwater

- Comprehensive consent renewal
- Stormwater discharge quality Improvement
- Public safety /Over land flow paths
- Changes to legislation
- Changes to regional rules particularly WRC Plan Change1
- Three waters reform/Water Services Act

Stormwater discharge quality Improvement

The avoidance of degradation of Lake Taupō and aquatic environments requires Council to make sure that Stormwater quality does not affect receiving environments. This is underpinned by conditions set in Councils comprehensive stormwater consent. (Section 30 Quality Improvement Program)

Stormwater quality will drive a large portion of Councils capital expenditure on the Stormwater activity such as installation on catchpit devices such as Enviropods/Litta Traps and CDS units (Hynds Down Stream Defenders or similar) and the use of best practise.

The long-term goal is to provide Stormwater quality improvements to all direct Lake and River discharges, and this will be achieved over time starting with the installation of treatment devices on the larger diameter outlets and working progressively through the smaller outlets in the network.

The current programme is to identify and treat Stormwater from pipe outlets 750 diameter and above as these outlets are discharging the largest containment load to receiving environments. Over time, this improvement program will focus on the smaller discharge points.

Stormwater quality from new developments is dealt with as part of the consent conditions by WRC, with developers now required to use a scoring matrix (developed by the Waikato Regional Council) to make sure that there is enough improvement capability before Council receives the assets.

A large portion of the new developments around the Taupō township discharge road water only into natural gullies where ponds are used for detention and soakage, and large flows are able to slowly bleed into the main gully system. WRC now also require treatment within the road reserve with the use of swales and rain gardens or other mechanical treatment systems prior to discharge to land.

Public Safety

The safety of the public has also set some design criteria around open stormwater systems for Council and developers in the future and has identified specific network reticulation issues such as inlets and outlets and their requirement for them to be safe.

Council will continue to monitor the reticulated network to identify manhole lids that are popping in wet weather and look to either bolt them down or provide a grate on the top to allow flow to flow over land. This is to reduce the risk of people falling down the manhole after high rainfall events. Further stormwater network modelling will assist in developing permanent solutions to this problem.

Councils comprehensive discharge consent also sets conditions that impact on how Stormwater services are delivered in the future, such as the requirement for Catchment Management Plans for green fields' developments as well as the ongoing monitoring program for stormwater quality.

Analysing the impacts of over land flow paths and providing possible solutions is also a key issue to ensure public safety. There are a number of projects listed in the AMP that identify where properties are impacted and where additional analysis is required to determine possible solutions.

Funding for completing the overland flow path modelling is included in this AMP and the next 2024 – 2027 LTP which will include modelling parts of the network that have an impact on overland flow paths.

Councils ongoing CCTV program enables real time updating of asset information with condition ratings and assist in determining future renewal and maintenance programs, as well as identifying any health and safety needs.

Changes to Legislation

Healthy Rivers/Wai Ora is the WRC proposed plan change 1, this was developed alongside iwi and key stakeholders. The proposed plan change seeks to reduce the amount of contaminants entering the Waikato and Waipa river catchments and to give effect to the National Policy Statement for Fresh Water Management (NPS-FM) The Waikato Regional Council Plan Change 1 was notified on 22nd April 2022, this has been appealed by a number of parties including the Taupō District Council. This is still under appeal and has not yet resulted in changes to maintenance, renewal or capital spend to date.

It is envisaged that rules around discharge quality and contaminants will change as a result of the adoption of this plan change. Council, under the comprehensive discharge consent, undertakes regular testing of discharge quality, and the extent and breadth of this testing may need to be increased to better support funding requirements in the future. Also new contaminant discharge levels may require council to alter the current improvement program.

At this time, it is too early to determine what implications there will be from any legislation changes regarding discharge quality, so councils short to medium term planning will continue with the current quality improvement program.

Comprehensive Consent Renewal

Councils current consent expires in 2027 and it is currently unknown as to what additional conditions may be applied through any new consent, or how difficult it might be to obtain a new consent. The proposed WRC Plan Change 1 will bring in more stringent requirements regarding contaminants. This is a change to the *Waikato Regional Plan*, with rules to manage both point source discharges (such as sewage from towns and waste from factories) and non-point source discharges linked to agriculture. Developed with the community, it allows for the management of nitrogen, phosphorus, sediment and bacteria in the Waikato and Waipā rivers.

Without knowing what these conditions might be it is difficult to determine a different capital program than that which has been put forward for quality improvement in the short to medium term. It is anticipated that future improvement programmes will be developed as part to the consent renewal process which will then be added to this AMP and LTP,

Government Water Reforms

The Three Waters Reform Programme was launched by the Government in July 2020 to improve the regulation and delivery of the three water services, drinking water, wastewater and stormwater, across New Zealand.

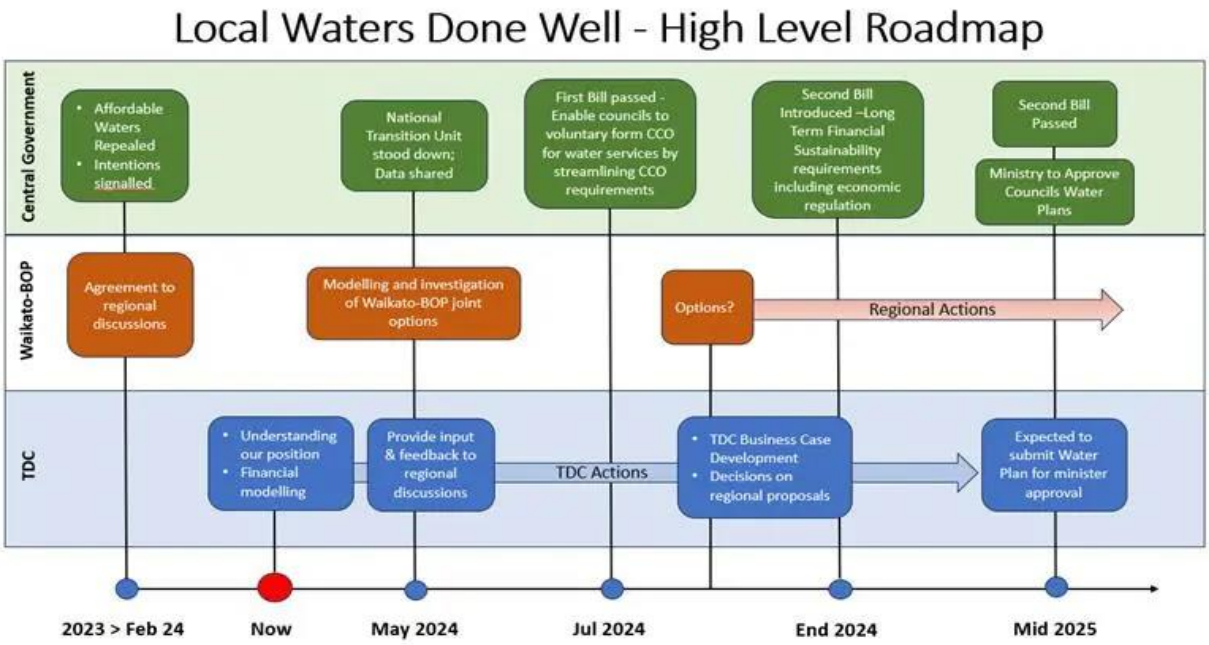
These included the:

- Water Services Act 2021
- Water Services Entities Act 2022 [now repealed]
- Water Services Economic Efficiency and Consumer Protection Act 2023 [now repealed].

The change of government in 2023 led to a change in direction for the future of the Three Waters industry and some of the recently enacted legislation was repealed (noted above). A new policy of 'Local Water Done Well' is set to be developed however details of this policy are not yet available.

The details are yet to be clarified, but we anticipate the following requirements:
Water Quality Standards – continuing compliance with Taumata Arowai water regulator.

- Economic Regulation around the following areas:
  - Rules around investment and pricing
  - Backstop / penalties for non-compliance with economic regulations
- Financial Sustainability
- Requirement to demonstrate adequate investment into 3W infrastructure
- Submission of a "Water Services Plan" by mid 2025
- Revenue sufficiency, balance sheet separation, ring-fencing and funding for growth
- Government to introduce legislation to enable easier Council Controlled Organisation (CCO) delivery - a new class of financially separate CCO.



With the creation of a new water regulator Taumata Arowai the performance of our Stormwater activities will be under additional scrutiny.

There is currently strong policy direction from national and local government to improve the state of our waterbodies as reflected in the Vision and Strategy, the National Policy Statement for Freshwater Management, the National Environmental Standard for Freshwater, the Waikato Regional Policy Statement, and Plan Change 1 of the Waikato Regional Plan.

These policies expect improvements in water quality nationally and their implementation can be expected to require a shift in Stormwater and stormwater management. This will require TAs across the region to continue to seek funding through Long Term Planning processes to resource further upgrades.

With Stormwater being included in the reform discussions, it is likely in the future that Council may not be responsible for the asset outputs or funding requirements of the asset.

The current stormwater AMP ignores any reform discussions and is based on current objectives and funding requirements.

Levels of Service

Customers' expectations of the service have been identified and subsequently defined in terms of Levels of Service and Performance Indicators that can be monitored, measured and reported. Council has an ongoing need to measure how satisfied residents are with stormwater management, and services provided by the Council, and to prioritise improvement opportunities that will be valued by the community.

Council is responsible for Stormwater flows from public land, roads and Stormwater flooding on crown land, while private property is the responsibility of the landowners. Council owns and operates its Stormwater assets so that it can manage Stormwater flows for public safety and for environmental protection. It provides a level of service that meets all of these measures:

- the Stormwater scheme minimises flooding.
- Stormwater schemes minimise erosion from the Stormwater network.
- Stormwater discharges are of sufficient quality when they enter receiving environments.
- Stormwater services do not cause health and safety problems.
- Stormwater services minimise risk of health problems.
- The Stormwater network is operated within its consent requirements.

This plan supports Council providing:

- Stormwater collection and monitoring systems which protect residential, industrial and commercial properties in the District from flooding of habitable buildings for all rainfall events up to a 1 in 100-year return period.
- Stormwater infrastructure which meets the growth requirements outlined by Council.
- Stormwater services which comply with regulatory and consenting requirements.

The Following Key Performance Indicators (KPIs) relate to the Stormwater activity:

- Council will have no properties flooded during a storm event[1].
- Stormwater: There will be no "Formal Enforcement Actions[2]" from the consenting authority (Waikato Regional Council) regarding Council's compliance with resource consent conditions relating to stormwater.
- Stormwater: The median response times for callouts in response to a fault or interruption to Council's stormwater reticulation system does not exceed one hours of notice during a flood event. A flood event is defined as an occasion where buildings that are compliant with the Building Code and are serviced by Council's reticulated stormwater system experience flooding.
- Stormwater: The total number of complaints received does not exceed eight complaints per 1,000 connections[3] to Council's stormwater system. (KPI stormwater connections will be amended per year to account for changes in property numbers in the district)

Consents

Council's Stormwater consents are of primary importance without discharge consents the physical assets are of limited value. Council's Comprehensive Stormwater Discharge Consents from Waikato Regional Council (WRC) require Council to focus on:

- Stormwater quality
- ongoing monitoring
- providing appropriate infrastructure

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1 For each flooding event, the number of habitable floors affected. (Expressed per 1000 properties connected to the territorial authority's stormwater system.)

2 This means no abatement notices, infringement notices, enforcement orders or convictions

3 Note, that Council's stormwater network drains the roading network only so there are no properties who connect to the stormwater network. For the purposes of this performance measure, we have considered that each property within the district indirectly benefits from the stormwater network and is therefore "connected".

Councils are under increasing pressure from Regional Councils to improve stormwater discharge quality so that Stormwater does not have adverse effects on the environments where it falls and flows (especially outfalls to waterways). Stormwater is discharged in many cases untreated into our lakes, rivers and streams so the goal is to provide treatment where needed. Council commits resources each year to improving water quality to Lake Taupō and the surrounding river environs, and we have sampling schedules and standards to test Stormwater for pollution from sewerage, heavy metals and other contaminants. In future, disposing of Stormwater directly to waterways without first improving its quality will be the exception rather than the norm.

Physical assets

The main Stormwater management issues relate to

- the need to increase our quality improvement mechanisms
- the need to identify overland flow paths
- maintenance of outfalls especially into Lake Taupō when lake levels are high
- a change in practice from underground reticulated systems to above ground open systems, which are easier to maintain but have higher maintenance costs.
- Maintenance of the underground network to maintain performance
- Maintenance of ephemeral gullies and areas of possible erosion

Asset Condition and Performance

The pipe network appears to be in generally moderate condition based on the frequency of the fault and failure incidents. However some assets are coming to the end of their useful life. Renewal expenditure is primarily targeted to replace these pipes based on pipe condition and areas of flooding events.

In the case of stormwater pipelines, the condition of the pipe is taken as being directly related to its age unless better information is available. Council does not have a complete or accurate set of condition ratings for stormwater assets in its database, however there is an improvement task to address this. Without knowledge of the condition of each stormwater pipeline it has been necessary to adopt standard life expectancies based on pipeline age and expected useful life rather than by analysis of condition grades. Estimates of average life expectancy for the various makes of pipe were assessed using local knowledge, published data from other local authorities and technical papers such as the International Infrastructure Management Manual.

While it is expected that most of the network is in good condition, inspection and condition assessment data for a representative cross section of the network is required to confirm this.

Demand forecast

The growth model projects growth in new properties, with the majority in and around the Taupō Township.

Developers are responsible for providing Stormwater in new sub-divisions, so residential growth in the District would only have a major impact on demand for Council's Stormwater services if Council funding policy changed.

Developers must also provide for capacity of the downstream network when increasing the flow into the network.

New developments are encouraged to provide above ground solutions to Stormwater quality and velocity.

The following key issues have been identified for the ten-year planning period:

- Renewal of global resource consents for stormwater discharges
- Construction of new stormwater treatment either at source or within the network to meet new consent requirements.
- Increasing capacity in some areas due to higher intensity storms and population growth.

New works

New works are planned to provide increased network capacity (overland and reticulated) and to improve the quality of Stormwater discharges to the Lake and rivers in the district.

The following are the significant projects planned for the first 3 years of this AMP:

Name	Location	Background	24/25	25/26	26/27	Total
Mangakino flood mitigation	Mangakino	flood mitigation. Current Iwi farm catchment flows through Mangakino Township. Infrastructure required to divert flows around township.	$193,000	$344,000		$537,000
Turangi Stormwater Flood Mitigation (SH1)	Turangi Town	flood mitigation. Modelling indicated that overland flow passes through private properties (16-20 properties)	$50,000	$350,000	$60,000	$460,000
Turangitukua park (Hirangi Rd carpark drainage)	Turangi Town	surface flooding across carpark due to blocked overground drain. Tapu land beside which NT have stated we cannot drain into. Water table high. Requires engineering solution/refall of carpark	$750,000			$750,000
Turangitukua Park (te Aonini carpark seal)	Turangi Town	extend carpark seal over grassed area. Requires additional drainage	$350,000			$350,000
Motuapa Stormwater Flood Mitigation around WWPS	Tūrangi-Tongariro	Flood mitigation. Modelling indicated that stormwater atter	$50,000	$125,000	$25,000	$200,000
Mobil station Lake Terrace Improvement device	Taupō	Improvement of the stormwater quality being discharged into the environment	$343,000			$343,000
Motutahae Road Stormwater Flood Mitigation	Taupō	flood mitigation. Modelling indicated that overland flow passes through private properties (10-12 properties)	$50,000	$225,000	$25,000	$300,000
Stormwater Network Renewals Programme	Taupō	Improvement of the stormwater quality being discharged into the lake	$150,000	$150,000	$150,000	$450,000

Lifecycle management

Operations and maintenance

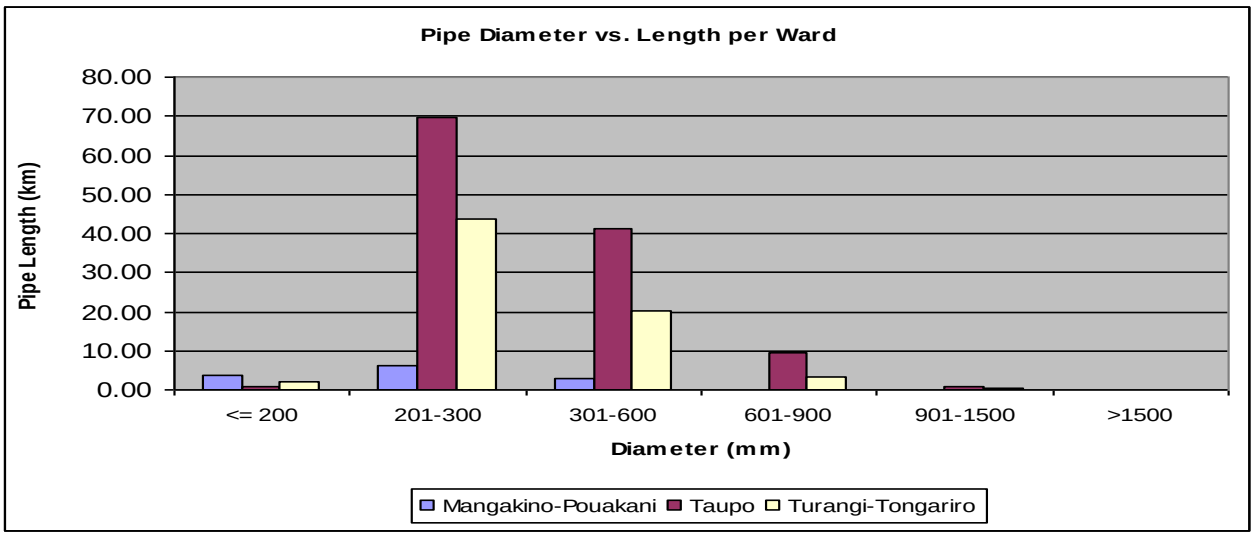
Stormwater operations and maintenance strategies set out how the stormwater activity will be operated and maintained on a day-to-day basis to consistently achieve the optimum use of assets. The operation and maintenance of stormwater assets is carried out using a combination of Council Asset Management staff and external contractors (Downers).

The maintenance regime has historically focused on ensuring key above ground structures particularly gated outlets, open channels and water courses are maintained to operate reliably at their design capacity. Less attention has been given to the piped networks on the assumption that given most of the network is less than 50 years old that there will be few significant problems.

Council will continue to undertake condition and performance assessments of the underground and above ground network, which includes pipe cleaning, and the removal of sediment as well as inlet and outlet maintenance.

The major Stormwater assets include:

Pipes (mostly of reinforced concrete and between 225mm and 1200mm in diameter as shown below).



- Manholes at points where pipes intersect or their direction changes.
- Catchpits with gratings to collect stormwater run-off at roadsides and elsewhere.
- Inlet and outlet structures on the ends of pipelines to protect land and control water flow.
- Quality Improvement devices
- Detention facilities to store and detain stormwater resulting in reduced flow rate and improved water quality.

This enables the individual components to be depreciated and the replacement value calculated. Reports can be produced forecasting renewal and replacement programs and costs.

Renewal

Council replaces assets when performance is unacceptable, based on age, condition, service breaks, complaint volumes and criticality. Due to the age of the network and from observations through the CCTV program the network is in good condition with only minor renewal works needed.

Disposal

Disposal of assets is not expected to be required over the next ten years.

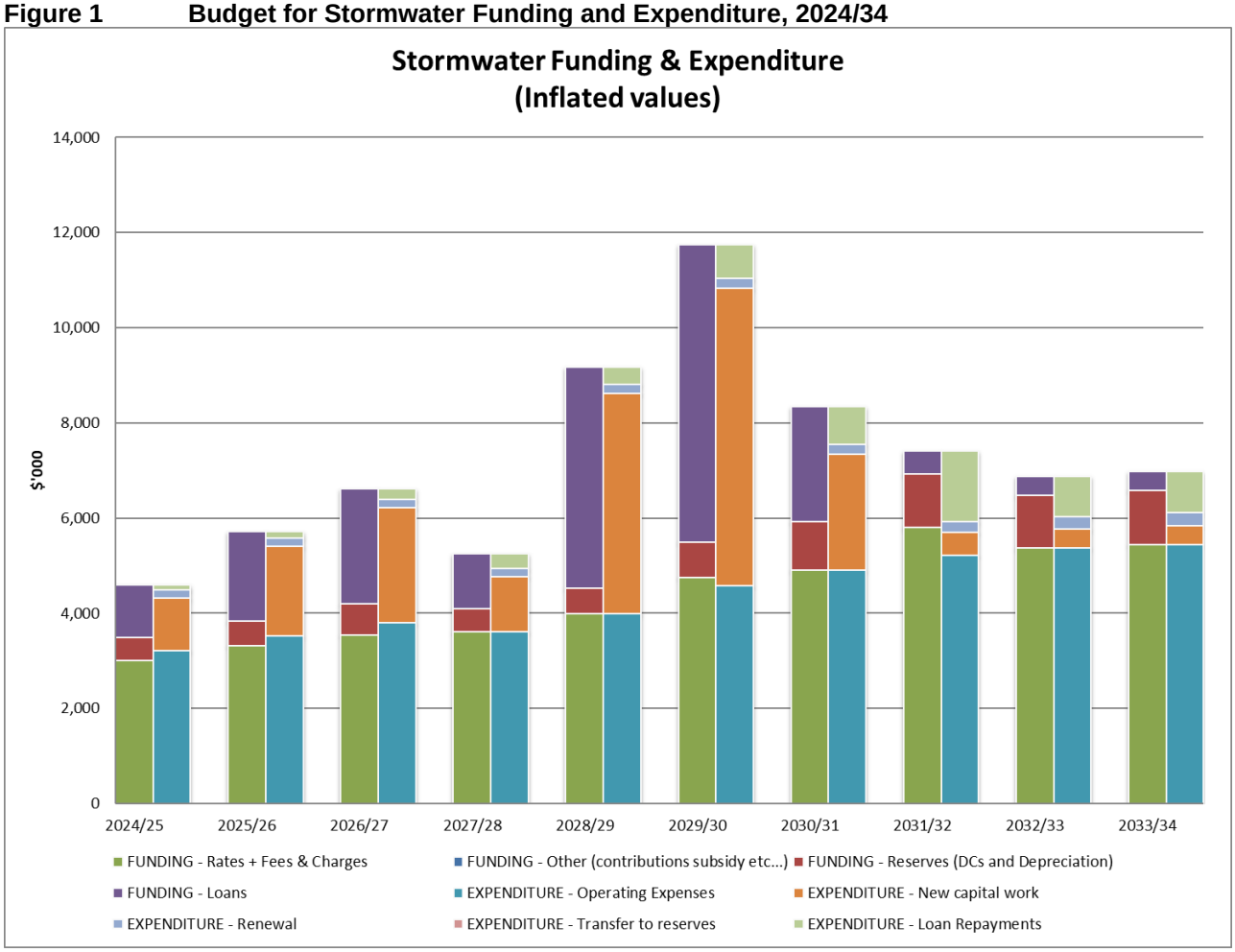
Changes Post consultation

No changes have been made to the Stormwater AMP following the public consultation process and subsequent Council deliberations.

Financials

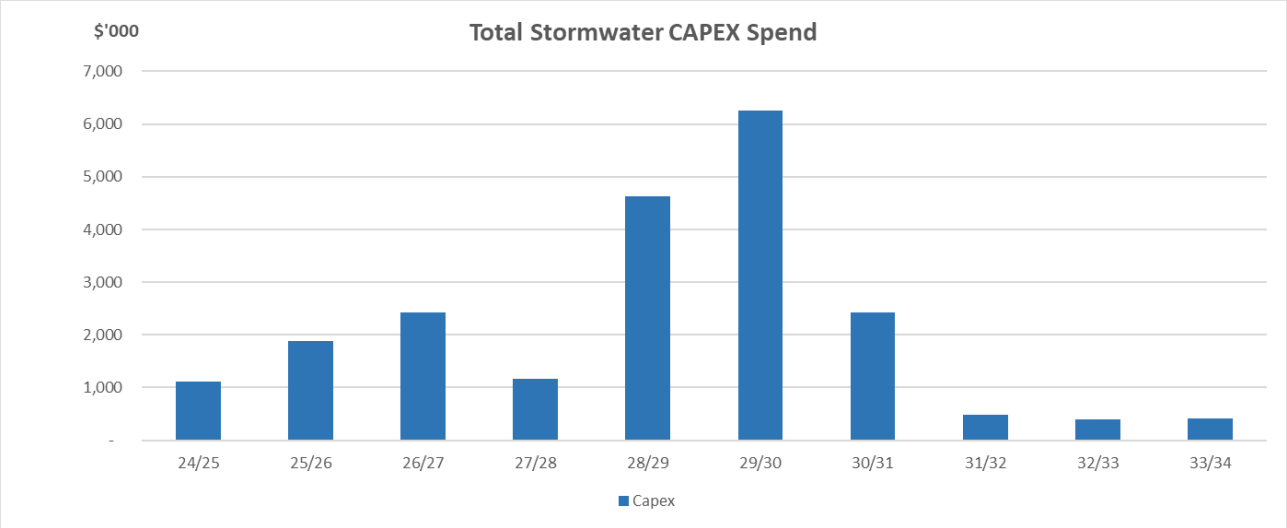
The thirty-year financial forecast for Stormwater services was determined by evaluating current maintenance and renewal plans for each set of components (pipes, outlets, ponds etc) and identification of new works. The ten-year projections are summarised in Figure 1 below.

Figure 1 Budget for Stormwater Funding and Expenditure, 2024/34



New works

Capital expenditure averages $2M per year over the ten-year AMP period, for improvements to network capacity, flood mitigation and discharge quality.

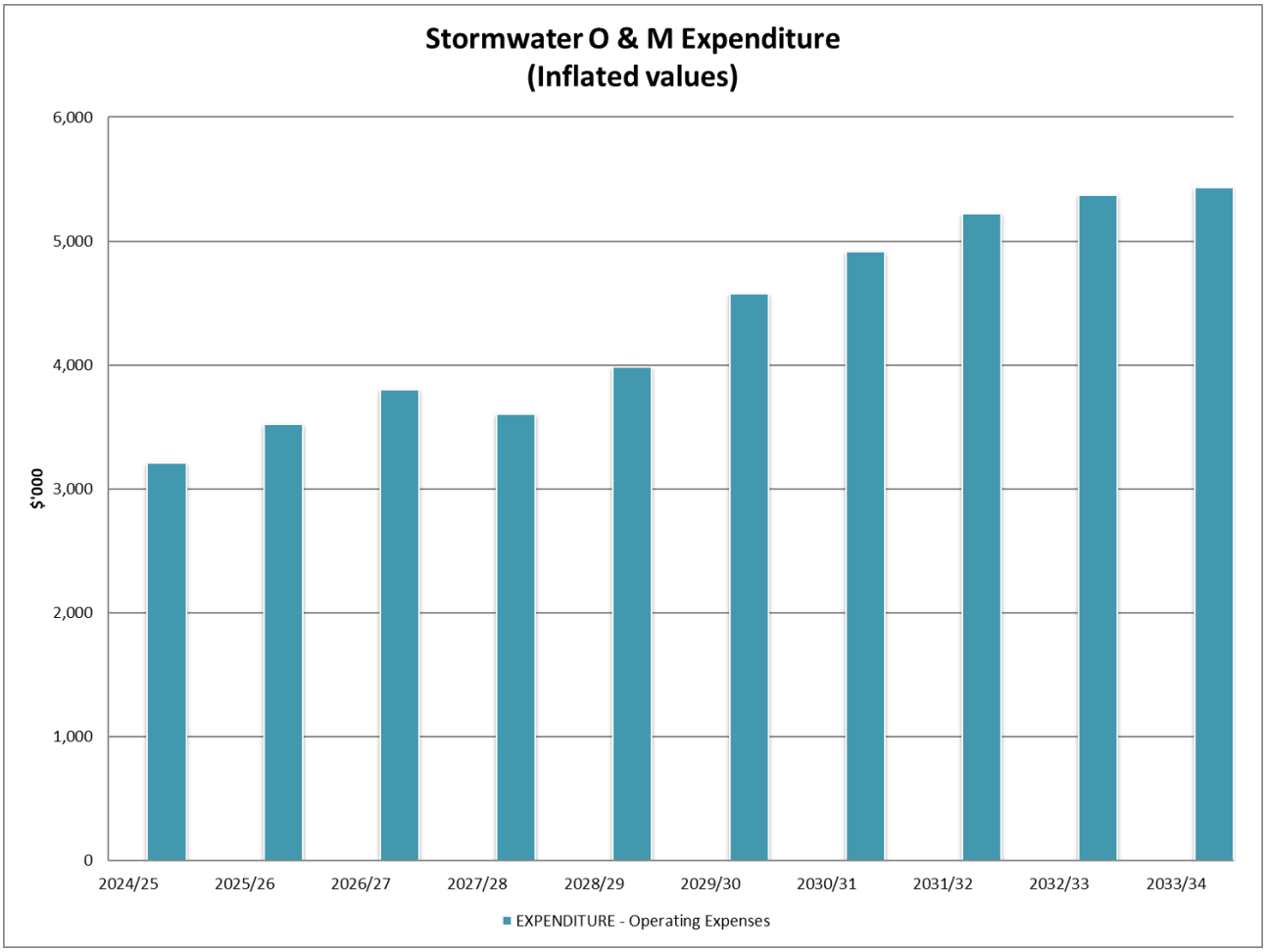


Renewal

Renewal costs vary according to the age and performance of the plant and network being considered. Council has undertaken a comprehensive condition assessment program for the outlying districts and the pipe network while showing its age is in a generally good condition. Cleaning and pipe condition assessment are programmed to continue in the town of Taupō to confirm the pipe condition. General renewal expenditure averages $200,000 per annum over the ten-year period.

Operations and maintenance

Operation and maintenance costs including interest & depreciation are projected to have an average cost $4,372,000 per year for the next 10 years.



Corporate Risk

The Corporate Risk Management Policy addresses community outcomes, vision statement and strategic themes. Full details can be found in the Taupō District Council Risk Register and Risk Profile, which ranks the risks and includes control measures, where they exist.

Sustainable and reliable delivery of the Stormwater service requires careful consideration of the various types of risk associated with the service.

Risks are events that may compromise the delivery of council's strategic objectives.

The risk management context:

- Risk management is a core business driver that influences all decision making and is not an isolated process.
- The corporate risk framework is applied across the organisation and identifies the criteria for risk evaluation and the responsibilities for managing risk.

The major risks addressed in this asset management plan include:

Significant Negative Effect	Description of Effect	Mitigation Measures
Poor water quality	Pollution and contamination of the stormwater from runoff and cross-connections with the wastewater network, resulting in contaminants entering the stormwater network and discharging to streams	Identifying and targeting sites that are at high risk of discharging significant contaminants. Runoff from industrial areas with the potential for adverse stormwater contamination is managed through the building consenting and trade waste regulatory processes. The clean-up for any pollution incidents is managed by emergency response plans (with Waikato Regional Council). Behaviour change initiatives within the community focus on reducing illegal dumping, littering and discharging of hazardous substances into the stormwater system.
Excessive wastewater volumes	Stormwater entry to the wastewater network through cross-connections and illegal connections resulting in excess volumes of wastewater to be treated and potential detrimental impacts on the quality of treated effluent discharged.	A comprehensive programme of monitoring, inspection and corrective work to reduce the volume of stormwater infiltration and inflow into the wastewater system.
Flooding of property	Failure of the system in flooding habitable residential and commercial buildings	Capital works to address capacity constraints, effective building controls, site specific detention and attenuation of stormwater in new growth and infill subdivisions

Asset Risk management

Risk management is fundamental to management of Council assets so that essential services such as stormwater service provision can be provided consistently. Council imposes high health and safety standards for its plant and network, especially where the Stormwater network is built on low-lying land near lakeshores or riverbeds, or volcanic and/or seismically unstable areas. Using a likelihood and consequence matrix to assess risks, the following high risks have been identified:

- Fire, causing electrical or structural damage to the system, including the reticulation network
- Volcanic eruption, with the pipe and overland flow path networks blocking
- Earthquake, damaging the reticulation network and reducing the capacity of the network
- Tomos, causing breaks in the reticulation system, or diverting overland flow paths
- External contractor failure, leading to failures in the network, service failures, or other consent condition failures
- Illegal disposal of contaminants into system, by firms or individuals

- Excessive costs to maintain, renew or create assets - Failure to comply with resource consents -
- Public safety matters such as open manholes or non-grilled inlets and outlets
- Stormwater treatment devices
- Assets with critical customers

All of these risks have potentially serious consequences for people in the District and for the District's economic wellbeing because they jeopardise the District's reputation and therefore, the visitor industry.

Council has undertaken a criticality assessment to enable Council to identify the most critical Stormwater assets, which enables council to focus on where the Stormwater network will require additional maintenance and renewal expenditure.

Business Continuity Risk

Council has developed a stormwater management plan that address the continuation of service delivery in the event of a disaster or failure of critical infrastructure. This is also linked to the regional lifelines program involving all territorial authorities in the greater Waikato and other utility providers.

Other key risks for the activity as a whole are:

- Climate change.
- Non-compliance with legislation and legal requirements.
- Discharge of hazardous or dangerous contaminants to the stormwater network

Asset management practices

Council uses a range of decision-making tools to establish its maintenance, renewal and new works expenditure, including process, analysis and evaluation techniques for life cycle asset management; information systems to store and manipulate data; and data and information from a number of sources (technical, financial, customer service, asset database).

Councils asset management system, Asset-Finda can incorporate asset condition, assessments, criticality, age as well as past maintenance history to help determine future maintenance and renewal funding.

Asset-Finda is also used to log system faults and determine monthly contract payments.

Plan improvement programme

Councils are required to have plan improvement programmes to improve their asset management planning, and we will continue to implement our improvement plan.

International infrastructure management

The plan is an intermediate plan based on the requirements of the International Infrastructure Management Manual.

Conclusion

This AMP sets out programs for operating, maintaining, renewal and development of the Stormwater Activity over the next thirty years that will ensure that the required level of service is delivered to the community, the service potential of the assets is maintained for future generations, and that the growth of the District is provided for.

Ka ora te wai, Ka ora te whenua. Ka ora te whenua, Ka ora te tangata.

If the water is healthy, The land will be nourished. If the land is nourished, The people will be provided for.

1.0 Introduction

1.1 Background

This Asset Management Plan (AMP) for Stormwater describes in detail how the activity will be managed to support the Council's Vision, Outcomes and Strategies for the Taupō District, particularly over the next 10 years as encapsulated in the Long-Term Plan 2024 - 2034

This AMP covers:

- Why the Council manages Stormwater
- How Stormwater management contributes to Council's Strategy
- What level of service we will provide
- Planning for the future
- How we deliver our services
- Quantifying and managing the issues and risks
- Lifecycle management plans of Stormwater's assets
- Projected costs of the service for the next 10 years
- Planned improvements to asset information and management
- To comply with the requirements of relevant legislation

Forward planning for the 3 waters is based around communities of interest which then feeds into an integrated management regime for the District, resulting in efficiencies across the District's Stormwater schemes, stormwater treatment services and management of stormwater.

1.2 Purpose of the plan

Taupō District Council is responsible for managing a range of community owned assets such as the Stormwater network. The purpose of this Asset Management Plan is to ensure that stormwater assets are planned, provided, operated and maintained in a sustainable and cost-effective manner, so that they provide the required level of service for the present and future customers.

The Stormwater AMP supports the purpose by:

- Demonstrating responsible management and operation of Stormwater assets which represent a significant, strategic and valuable asset belonging to the Taupō District Council
- Justifying funding requirements
- Demonstrating regulatory compliance, of note is section 94(1) of the LGA 2002 which in summary requires the Long-Term Plan (LTP) to be supported by:
- Quality information and assumptions underlying forecast information
- A framework for forecast information and performance measures that are appropriate to assessing meaningful levels of service
- Demonstrating clear linkage to community agreed outcomes with stated levels of service

The size of the Stormwater investment and importance of stormwater services to the community demands excellence in the management of these assets. The stormwater service delivery is a core service and the community expects the Stormwater network to be managed in such a way that costs are minimised while providing the levels of service the community desires.

1.2.1 OBJECTIVES

The objectives of this Stormwater AMP are to demonstrate that Council:

- Delivers the required level of service to existing and future customers in the most cost-effective way
- Understands how the outcomes delivered by the assets link to the wider community outcomes
- Understands what asset capacity will be required in the future, and what issues drive this capacity requirement
- Has an ever-improving knowledge of its asset locations, ages and service conditions
- Has robust and transparent processes in place for managing, operating, maintaining, renewing and extending assets
- Has adequately considered the classes of risk its activities face, and has systematic processes in place to mitigate identified risks
- Provides adequate funding for asset provision, operations, maintenance, renewals, extensions and depreciation
-

Delivers outcomes that are aligned to the community's wishes and to other internally and externally imposed levels.

1.2.2 Legislative Requirements For Asset Management Planning

The recent focus on AM planning, results from the Local Government Act 2002 and amendments. This Act places an emphasis on strategic financial planning and requires local authorities to:

- Prepare and adopt a Long-Term Plan (LTP) with a 10-year planning horizon, every three years, considering asset creation, realisation, and loss of asset service potential.
- In determining their long-term financial strategy, consider all relevant information and assess the cost/benefit of options.
- Manage assets prudently, in the interests of the district and its inhabitants and ratepayers.
- Clearly identify significant forecasting assumptions and risks underlying financial estimates.
- Identify 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.

The preparation and implementation of an AMP from which long-term financial strategies will be developed, is a means of TDC complying with these requirements.

1.2.3 Legislative Documents

The key legislative documents relating to the management of the Stormwater service assets are listed in the following table.

Table 1.1 Key legislative Documents

Legislation & Regulation	Asset Group Impacted	*Impact Range
Water Services Act 2021	All	***
Biosecurity Act 1993	Water race Land drainage	*
Building Act 2004 (and amendments)	All	*
Central North Island Forests Land Collective Settlement Act 2008	All	*
Civil Defence Emergency Management Act 2002	All	***
Climate Change (Emissions Trading and Renewable Preference) Act 2008	All	*
Climate Change Response Act 2002 (and amendments)	All	**
Energy Efficiency and Conservation Act 2000	All	*
Environmental Protection Authority Act 2011	All	*
Epidemic Preparedness Amendment Act 2010	All	*
Hazardous Substances and New Organisms Act 1996	Water race Land drainage	**
Health Act 1956	Water, Stormwater, Landfill	***
Health and Safety at Work Act 2015	All	***
Historic Places Act 1993 (and amendments)	All	*
Heritage New Zealand Pouhere Taonga Act 2014	All	***
Infrastructure (Amendments Relating to Utilities Access) Act 2010	All	**
Land Drainage Act 1908	Land Drainage Stormwater	*
Local Government Act 2002 (and amendments)	All	***
Local Government Act 1974 (and amendments)	All	**
Local Government (Financial Reporting) Regulations 2011	All	*
Local Government Rating Act 2002 (and amendments)	All	**
Local Government Rating Act 1979	All	*
Marine and Coastal (Takutai Moana) Act 2011	Water race Land drainage	*
Ngati Tuwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act 2011	All	*
Public Works Act 1981 (and amendments)	All	*
Railways Act 2005	Transport Utilities	*
Railway and Corridor Management and Safety Act 1992	Transport Utilities	*
Reserves Act 1977 (and amendments)	Community All	** *
Resource Management Act 1991 (and amendments)	All	***
Transit New Zealand Act 1989	Transport	*
Utilities Access Act 2010	All	***
Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010	All	*

***Impact Range:** Different legislation has differing levels of impact on the groups of activities; this is indicated under Impact Range (Broad ***, Moderate **, Limited *)

Major Legislation Details

The legislation that has or will have the most effect on the Stormwater Activity is expanded in the following section.

Civil Defence Emergency Management Act 2002

The expectations under the CDEM Act 2002 are that Council's services will function at the fullest possible extent during and after an emergency, even though this may be at a reduced level. In addition, Council has established planning and operational relationships with regional CDEM groups to deliver emergency management within our boundaries. A further Amendment was made in 2016 (CDEM Amendment Act 2016) that helps recovery from emergencies to be more efficient and effective.

Stormwater management is regarded as a critical service and is given special consideration within Council emergency management procedures. Every effort will be given immediately after an event to at least provide adequate minimise the adverse effects of stormwater flooding.

Health and Safety at Work Act 2015

This recognises that a well-functioning health and safety system relies on participation, leadership and accountability by government, business and works.

The HSWA came into force on 4 April 2016 and sets out the principles, duties and rights in relation to workplace health and safety.

Council must ensure the safety of the public and all workers (including contractors) when undertaking the Stormwater Activity.

Land Drainage Act 1908

Common Law, the Land Drainage Act 1908 and amendments provide mechanisms for Drainage Boards to operate, for Local Authorities to carry out some drainage works, and for protecting the rights of private drain owners.

Taupō District Council does not own or operate any land drainage schemes; however, stormwater detention is provided in some areas to attenuate peak flows following heavy rainfall.

Local Government Act 2002

Incorporating the Local Government Act 2002 and amendments, this act defines the purpose of local government as:
(a) to enable democratic local decision-making and action by, and on behalf of, communities; and (b) to promote the social, economic, environmental, and cultural well-being of communities in the present and for the future.

In addition to the general requirements of the Local Government Act there are some specific clauses that apply to Stormwater services.

- S125 places a requirement to assess water and other sanitary services from time to time
- S130 imposes an obligation to maintain water services and places limitations on the transfer or selling of assets
- S136 empowers Councils to enter into Contracts relating to provision of water services for periods not exceeding 35 years whilst maintaining control over the pricing of the service, retain legal responsibility for the service and being responsible for the development of policy related to the water services
- S137 empowers Councils to enter joint local government arrangements and joint arrangements with other entities for the provision of water services, with the same constraints as S136

Resource Management Act 1991

The RMA 1991 provides an environmentally conscious framework for Local and Regional Authorities to administer powers with regard to development and the management of natural resources. The RMA 1991 focuses on the effects of activities rather than on the activities themselves. SWDC's District Plan provides the rules that apply to subdivision, land use consent and development in conjunction (where necessary) with Waikato Regional Council's regional plans – (see above) that also provide for the control of urban stormwater discharges. The RMA also requires Council to:

- Sustain the potential of natural and physical resources to meet the reasonably foreseeable needs of future generation.
- Comply with the District and Regional Plan.
- To avoid, remedy or mitigate any adverse effect on the environment; and

Take into account the principles of the Treaty of Waitangi in exercising functions and powers under the Act relating to the use, development, and protection of natural and physical resources.

Ngati Tuwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act 2011

The legislation provides for improving the health and well-being of the Waikato River through a partnership arrangement between iwi and the Crown. Part of the legislation covers co-management arrangements for the Waikato River from Te Toka a Tia near Taupō through to Karāpiro and the first agreement was signed with Raukawa on 10 May 2012 at Pikitu Marae, south-west of Putāruru,

The Waikato River Authority is a statutory body formed under the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010 and is the sole Trustee of the Waikato River Clean-up Trust whose role is to fund projects that meet the purpose of the Authority.

Mana Whakahono Agreement

This is an agreement negotiated between the Taupō District Council and Ngāti Tūrangitukua and represents the aspirations of both the Council and Ngāti Tūrangitukua to work in partnership reflecting their status as mana whenua and an iwi authority by working together:

- on the management of reserves within the Mana Whakahono boundary;
- on matters under the RMA;
- to reduce the adverse effects of infrastructure on wāhi tapu;
- to establish the Tūrangi Co-Governance Committee that will benefit the broader public;
- to develop Council policies and regulations that directly affect the Ngāti Tūrangitukua rohe; and
- to establish and maintain agreed processes to enable a strong working relationship.

Waikato Regional Plan and Regional Policy Statement

The Waikato Regional Plan is fully operative and implements the Regional Policy Statement. The Plan provides direction regarding the use, development and protection of natural and physical resources in the Waikato region. The Plan contains modules covering Matters of Significance to Māori, Water, River and Lake Beds, Land and Soil, Air, and Geothermal Resources. Effects on asset management include:

Waikato River Authority requirements regarding taking water and discharging treated effluent

- Allocation and use of fresh water
- Adapting to climate change
- Integration of transportation and land use

1.2.4 Water And Sanitary Assessment

A Three Waters and Sanitary Assessment was undertaken in April 2017. The sanitary assessment determined the ability of the stormwater network to provide a sanitary environment for the community. It was found that the Stormwater network was sufficient, and this was reinforced by the very small number of flooding incidences reported.

The new growth model numbers still reflect very minimal growth in the district and during the intervening period no houses have experienced flooding, so it is considered that Council still provides a stormwater service that meets Health Act requirements.

The comprehensive monitoring program also identifies that apart from isolated incidences stormwater discharges are with the required parameters.

Section 17A review

Council undertook a review in 2020[4] of the “Three Waters” service delivery provided by Council and determined that the preferred service delivery option was an enhanced status quo with a contract of 5+2+2 duration incorporating network and electrical maintenance of the three waters.

[4] Completed by the Officials Working Party for the Lake Taupō Project Joint Committee

Code of Practice for the Development of Land

A revised code was adopted by Council in September 2009 and is intended to provide a guide to subdivision and developments within the Taupō District. It sets out a set of procedures and minimal technical standards for development against which all proposals submitted can be measured to assess their suitability for construction. It sets out what the Taupō District Council needs from developers so that the requirements of the Resource Management Act and the Taupō District Plan are met.

This document sets standards for design including capacities for stormwater assets that will become assets within this document.

The code of practice also considers climate change and effects on the district. The code provisions require that the a 1:10 year event is soaked to ground for private property (pumice soils allow this) and Councils Stormwater network that predominantly services the roading network is now required to cater for a 1:10 year event and over land flow paths are designed up to a 1:100 year event. The Turangi township is an exception to this rule, due to the high-water table where a majority of the town discharges to the kerb.

The older infrastructure installed before the allowance for climate change is sized to cater for 1:2 – 1:5-year events. Council has district specific climate change rainfall data included into the code.

The Waikato Regional Council is updating their Stormwater guidelines and this document will be incorporated into Taupō's code once they have it finalised. There may be some district specific changes needed to reflect the Taupō district pumice soils.

The guidelines now provide a scoring matrix to enable stormwater quality improvement prior to discharge to the receiving environment.

1.3 Linkages to other plans

The way in which AM planning links the Strategic planning process with operations and annual plans is illustrated below.

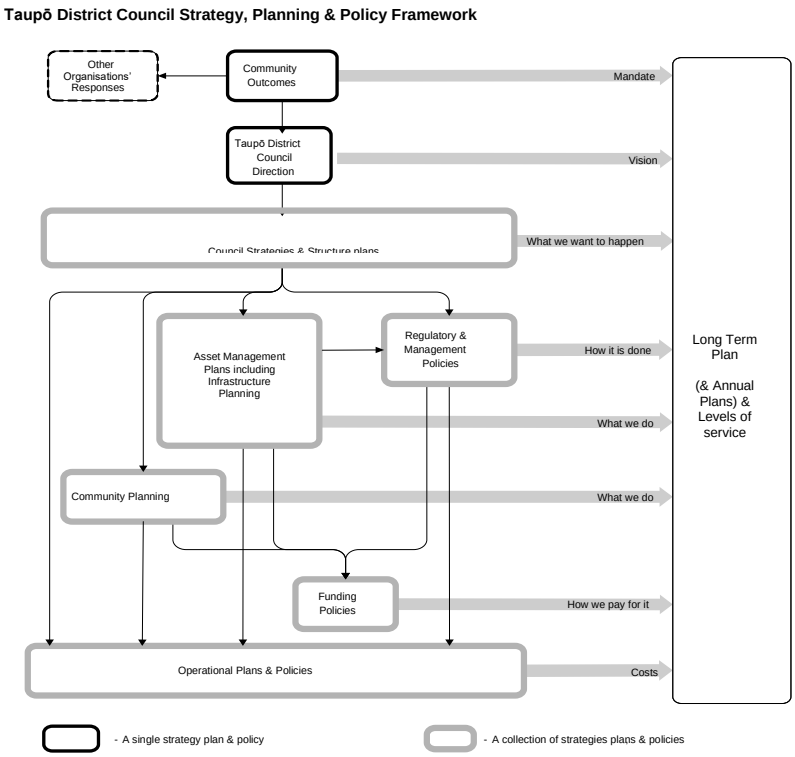


Figure 1.1: Council Planning Structure

AMP's are tactical plans for achieving strategies resulting from the strategic planning process. AMP's are a key component of the council planning process linking with the following documents.

LTP: The Long-Term Plan sets the strategic direction for the Council and is the overarching planning tool which describes the activities the Council will undertake to deliver. It identifies the outcomes the community would like to achieve. It also contains the financial forecast for the next 10 years. This financial forecast is drawn from the AMP.

Annual Plan: This sets out how Council will undertake its strategic goals and details the specific activities, functions for the first three years of the LTP. The works identified in the AMP should automatically become the basis on which future LTP's and annual plans are prepared.

District Plan: The District plan is an implementation tool used to protect values and outcomes important to the community. The stormwater network is essential in the transportation of stormwater and the avoidance of flooding in the District and provides for the economic and physical wellbeing of the community.

Business cases: The service levels policies, processes and budgets defined in AMPs are incorporated into business plans as activity budgets, management strategies and performance measures.

Legislation: The AMP must comply with all relevant legislation and provide the means of meeting legislative requirements.

Bylaws: standards and policies: These tools for asset creation and subsequent management are needed to support AM tactics. (It is considered that there is currently no need for a Stormwater Bylaw).

Waikato Regional Council Policy Statement (Stormwater): These references give the policy framework and give effect to the preferred strategic direction and a vision of what kind of stormwater systems the region wants, a set of desired outcomes the region wants to achieve and a specific direction to focus the region's efforts in meeting these objectives.

Proposed Healthy Rivers Plan Change
The regional council is looking to enforce the requirements of healthy rivers, by measuring and assessing impacts to rivers and their tributaries. This may have an impact of storm water disposal quality.

Infrastructure Strategy: As required by the amendment to the local government Act, the Infrastructure strategy provides a thirty-year overarching strategy for the provision of infrastructure within the district.

Taupō Tree and Vegetation Strategy:
This document gives some direction as to planting on reserves and in stormwater gullies and overland flow paths.

Stormwater Strategy:

The stormwater Strategy coordinates stormwater management through a variety of management plans and codes of practice. Its purpose is to help Council meet its long-term plan objectives of protecting and enhancing the environment and improving living environments in the urban areas of the Taupō District.

Stormwater Management Plan:
This plan is a management (required as a condition of the Comprehensive discharge consent) document which records the way in which the existing municipal system is operated. It will seek to detail and guide the operation and ongoing performance of the municipal stormwater system to continually improve stormwater management and avoid, remedy and or mitigate adverse water quality and quantity effects in the receiving environment. This plan covers the exiting municipal system and outlines the procedures by which the new stormwater assets and discharges/diversions are incorporated into this plan. This document exists in parallel with the Stormwater Asset management Plan.

Comprehensive Discharge Consents:
Discharge consents are granted under the Resource Management Act 1991 based on the provisions detailed in the relevant Waikato Regional plans. They assess the discharge of contaminants into or onto land or water, and the discharge of water into water. In June 2007 Environment Waikato granted Council three Comprehensive Discharge Consents to divert and discharge urban area stormwater runoff and associated contaminants into receiving environments;

- Resource Consent 105048: for Taupō urban areas (Resource Consent schedule B), including Taupō, Eastern Bays, Waitahanui, Acacia Bay and Kinloch.
- Resource Consent 105049: for Turangi urban areas (Resource Consent schedule C) including Turangi, Tokaanu, Motuoapa, Omori, Kuratau, Whareroa, Tauranga Taupō and Hatepe.
- Resource Consent 105050: for Waikato River urban areas (Resource Consent schedule D), including Wairakei, River Road, Atiamuri, Whakamaru and Mangakino.

These consents impose legally binding conditions for stormwater management in the district, which include the provision of Catchment Management plans for Green Field developments and a stormwater management plan prepared by Council. The conditions also require a stormwater quality improvement program, so existing infrastructure will be upgraded in response to compliance issues and priorities identified through Councils Stormwater monitoring program. It is Councils

aim to achieve 100% compliance with the conditions of the Comprehensive Discharge Consents. The current consents expire in 2027 and funds have been placed in the LTP to support the consent renewal.

Councils improvement program to date has included an Enviropod program and Downstream defender program, with these programs focused on the existing built infrastructure where the pipes discharge directly to the receiving environment.

Stormwater Monitoring Program:
Is a requirement of Councils Comprehensive Discharge Consent. Existing infrastructure will be upgraded in response to compliance issues and priorities identified through Councils Stormwater monitoring program. It is Councils aim to achieve 100% compliance with the conditions of the Comprehensive Discharge Consents.

Transportation Asset Management Plan:
The Transportation assets are closely interwoven with stormwater assets. The boundary between these asset types are clearly defined within the stormwater asset management plans. Road catch pits and leads are considered to be roading assets. All costs associated with those catch-pits and leads, e.g. operational costs of cleaning sediment from roading catch pits are reported in the Transportation AMP. Catch-pits and leads in other than public roads, e.g. car parks and industrial sites and service stations are included within the Stormwater AMP.

Stormwater Quality Improvement Program
The comprehensive Stormwater consents requires Council to have a quality improvement program designed to improve the quality of municipal Stormwater discharges.

Growth Management Strategy 2050:
At the core of Taupō District 2050 are 12 Strategic directions. These provide the framework of interrelated policies that guide decision making and growth-related issues. Strategic direction 8 and 9 relate to Transportation AMP (refer page 7 of GMS).

Structure Plans:
Adopted and proposed structure plans outline how growth is to be managed within areas - Taupō Urban Structure Plan (TUSP), Taupō Town Centre Structure Plan (TTCSP), Kinloch Community Structure Plan (KCSP), Turangi and Southern lakeshore Settlements Structure Plan and the (CISP) Commercial and Industrial structure plan.

Contracts:
The service levels, strategies and information requirements contained in AMPs are translated into contract specifications and reporting requirements. Contract number TDC/1516/155, was due to expire in 2022 but has two, 2-year extension options for Three Waters Maintenance includes all the operations necessary to maintain, repair, monitor record and report the operation and conditions of the stormwater systems in the Taupō District. This contract incorporates management and maintenance of Wastewater, Stormwater and Water assets.

This contract aims to satisfy the conditions of the Comprehensive Discharge Consents and the objectives of the Stormwater Management Plan.

1.4 Description of the Stormwater Activity

The key function of the stormwater activity is to provide for surface water collection and drainage which limits the risk of flooding of residential habitable dwellings and commercial buildings as well as limit the impact of stormwater discharges on the receiving environment in the urban areas of the district.

The stormwater drainage system comprises both a primary system comprising a network of pipes and open drains designed to cope with surface runoff from frequent rainfall events of average intensity and a secondary overland flow network including roads, swales and informal drainage paths for less frequent and more intense rainfall events. In managing stormwater drainage localised ponding, informal storage basins and formal surface attenuation devices reduce peak flows by detaining stormwater until drainage networks and receiving water courses are able to cope with the flows. When the primary pipe system is at capacity, the secondary system must be able to cope with the additional stormwater drainage effectively if the flood hazard to residential and commercial properties is to be mitigated.
Council does not own or operate any flood control schemes, the sump, kerb and channel assets are managed separately in accordance with the stormwater management plan by the road maintenance contractor.

The Stormwater Management Plan (SMP) revised in 2021 is a key document and a companion reference to this Asset Management Plan.

The Stormwater Activity requires the infrastructure to be provided, operated, maintained, renewed, upgraded, extended and, in rare cases, dismantled or abandoned.

In addition to these physical activities, administrative activities include:

- Responding to requests from consumers or other residents regarding Stormwater
- Obtaining and complying with resource consents
- Recording and costing of expenditure
- Complying with accepted standards and consent conditions through:
  - Controlling private developments that discharge into Council's infrastructure
  - Monitoring discharge impacts on receiving waters
  - Managing the asset inventory

This Asset Management Plan records the activities, providing a reference to policies, management decisions and programmes. At the same time, it is intended to demonstrate that the activity is being conducted in a responsible and cost-effective way which is sustainable over the long term.

1.4.1 Ownership Of Assets

The provision of Stormwater collection networks is vital to the needs and aspirations of all who live in the District. They provide the means of safe, reliable and efficient disposal of stormwater for resident's homes, schools, and businesses 24 hours a day, 365 days a year in a manner that is safe for both human health and property.

The stormwater assets are owned by the community they serve. The Local Government Act 2002 and amendments (LGA) has clearly signaled that stormwater services are a core service provision for Councils.

Stormwater asset ownership and responsibility matrix	Legal Issues	AM plans & budgeting	Data Collection & Maintenance	Maintenance	Level of Service	Inplement new works	Opex - Overheads	Opex - Rates	Opex – Interest	Opex - Insurance	Opex - Cleaning	Renewal	Technical advice/input	Valuation
Stormwater piped Network														
Ephemeral Gullies														
Storm water to bottom of catch pits & leads														
Urban street cleaning														
Culvert maintenance rural / urban														
Enviropod Maintenance														
CDS Maintenance														
Street cleaning - rural sweeping														
Gully mowing														
Monitoring and Testing														

Stormwater asset responsibility
Parks & Reserves responsibility
Infrastructure Asset data Team
Transportation responsibility

Figure 1.2: Ownership and Responsibility Matrix

1.4.2 Organisations Vision, Mission, Objectives, Goals

The 2024 – 2034 LTP process has now identified the Vision and Community Outcomes which Council has adopted as shown below.

Figure 1.3: Councils Vision & Community Outcomes

Community Outcomes are taken into account when determining life cycle strategies, levels of service, etc.

Council's response to the Community Outcomes acknowledged that managing growth is one of the biggest issues for Taupō District Council over the next 10 years, and in June 2006 published TD2050 which was revised in 2018.

TD2050 Strategic Directions

Council's Vision and Values have been translated into seven strategic directions related to the ongoing management of growth:

- Plan for a district characterised by contained urban communities, bordered by a productive, functional rural environment.
- Design and plan compact, walkable and adaptable urban areas.
- Create vibrant, diverse places and spaces where people love to live, work, play and invest.
- Recognise tāngata whenua cultural identity and build strong, collaborative relationships.
- Provide the platform for a sustainable economy.
- Integrate sustainable infrastructure provision, land use and funding.
- Manage development to enhance and protect the natural environment. The TD2050 Strategic directions link to and contribute in the achievement of Council's core values as shown on the following table:

Table 1.2: TDC 2050 Strategic Directions

TD2050 Strategic Directions	Related Council Values
1. Plan for a **district characterised** by contained urban communities, bordered by a productive, functional rural environment.	
2. Design and plan compact, walkable and adaptable **urban areas.**	
3. Create vibrant, diverse **places and spaces** where people love to live, work, play and invest.	
4. Recognise **tangata whenua** cultural identity and build strong, collaborative relationships.	
5. Provide the platform for a **sustainable economy.**	
6. Integrate sustainable **infrastructure** provision, land use and funding.	
7. Manage development to enhance and protect the **natural environment.**	

World Class Authentic Resilient Charming Vibrant Quality Value

TD2050 provides a policy framework to guide where and how future growth should occur and identifies a series of actions to achieve this desired pattern of urban growth. At the core of TD2050 are the 7 Strategic Directions referenced above. These provide the framework of interrelated policies that guide decision making on growth related issues. Over time they will be achieved by putting into effect identified policies and undertaking the specific actions identified in TD2050.

1.4.3 Stormwaters Contribution To Corporate Objectives

Council's goal, as set out in the LTP relating to the Stormwater network:

The stormwater activity of Council has adopted the following aims to support Council's commitments.
To provide a stormwater system that:

- Services the whole community,
- Is affordable and managed at the lowest possible cost,
- Reduces the incidence of flooding impacts on people and property,
- Is managed in an environmentally sustainable manner.

1.5.1 Key Stakeholders

The following table lists those who have significant specific involvement with the assets (and/or the service facilitated by the assets) and describes their particular main interests. The table is limited to the main issues for key stakeholder groups. 'Public Service providers' include schools, dentists, doctors, hospitals, and other government organisations. 'Asset Managers' are those District Council staff (Engineers and others) whose responsibility it is to manage the services made possible by the assets covered in this AMP.

This AMP recognises the following as key stakeholders:

Table 1.3: Key Stakeholders

Stakeholders - External & National stakeholders	Stakeholders main interest	Engagement Methods/Touch points
NZ Govt	Three waters reform/local Water done Well	Surveys / funding
Audit New Zealand	Legislative responsibilities as defined in Legislation.	As per audit processes.
Local Government New Zealand/Te Kahui Kaunihera ō Aotearoa/Central Government	To ensure Local Government Act is complied with (via Auditor-General). Enhance value of decision-making process. Three Waters performance survey	Occasional correspondence Through annual survey
Ministry for the Environment	New Policy	Very occasional correspondence/Public consultation on new policy
Ministry of Health	New policy	Occasional correspondence Submissions if required
Taumata Arowai	Water services Regulator	TBD

Stakeholders – External and Regional	Stakeholders main interest	Engagement Methods
Bay of Plenty District Health Board (includes Lake District Board area)	Sanitary assessments	Survey of service provision
Neighbouring Councils – South Waikato, Rotorua, Hastings & Otorohanga	Information sharing and best practise	Ongoing contact with three waters staff looking at best practice
Waikato Regional Council	Stormwater consenting and monitoring, spill response	Ongoing contact with relevant staff. Regular contact, Annual report

Stakeholders – External and Local	Stakeholders main interest	Engagement Methods
Taupō District Council ratepayers, residents, customers and visitors	Recognised as large & significant stakeholders. Reliable Stormwater network services at an affordable cost that have minimal environmental effects on receiving environment.	Broad methods such as phone, service requests, general correspondence, email, meetings, face book, social media, face to face, meetings (informal) service requests.
Tūwharetoa Maori Trust Board	Impact of Stormwater on lake and river quality Maintenance of Council assets on the bed of Lake Taupō	Regular discussions. Applications to undertake maintenance. Updates on Stormwater quality improvement provision
Tūrangaitukua	Impact of Stormwater on lake and river quality Maintenance of Council assets on the bed of Lake Taupō	Regular discussions. Applications to undertake maintenance. Updates on Stormwater quality improvement provision

Lakes and waterways	Recognised as a significant stakeholder. Interested in lake and river water quality	They hold quarterly meetings; Council provide environmental monitoring data when requested
Bike Taupō	Recognised as a significant advocacy group. Advocate for safer cycle network on and off road. (stormwater gullies) Walking and cycling strategy (cycling component) Cycle trail development.	Occasional correspondence - phone, informal meetings, email updates, Bike Taupō newsletters, website.
Consultants and Contractors	Commercial opportunities Project development Maintenance contracts Project designs	Formal and informal meetings Occasional correspondence Short term agreements Offer of service.
Emergency services	Identification of at-risk property during flooding events Over land flow paths	Contact with civil defence
Local contractors	Service provision	Day to day contact
Greening Taupō/ Kids Greening Taupō Predator free Taupō	Planting of native species fauna to protect and enhance ephemeral gully systems as well as trapping of pests	Regular formal and informal discussions

Stakeholders – Internal	Stakeholders main interest	Engagement Methods
Asset Managers	Implementation of infrastructure and service management activities (e.g. operations, demand management, maintenance, construction). Effective decision making, finance, communications, IT etc	Continual discussion via informal meetings, face to face, regular asset manager meetings.
Infrastructure Asset Management	Operation of Asset Data function for Three Waters	Day to day collaboration
Chief Executive	Compliance with regulations, service reliability, quality and economy	Updates when required
Communication team	Project updates, event updates	Councillor weekly update, communication plans, emails, phone, meetings etc
Community engagement team	Accessible transport network Neighbourhood events Accessible audits	Informal meetings, phone, email
Contract Managers	Responsible for implementation of infrastructure and service management activities	Continual discussion via informal meetings, face to face
Council committees	As per delegated authority	Regular meetings

Customer services	Customer service request systems which minimise and resolve complaints/enquiries relating to the activity.	Broad methods such as phone, service requests, general correspondence, email, meetings, Facebook, social media, face to face, meetings (informal).
Elected members	Owner of assets, responsible for sustaining service levels under the LGA 2000.	Councillor weekly updates, regular meetings, email, occasional correspondence.
Financial team	Budget requirements (income and expenditure) including forecasting, annual plan, Long term planning	Spreadsheets updated regularly, phone, email, meetings.
Infrastructure team and manager	Input into the AMP/Activity plan, AMP policy development and Infrastructure 30-year policy	Regular meetings, open plan office discussions
Parks & Reserves team	Walkways/Access/Footpath links	Asset Manager meetings
Planners & Policy team	AMP support for Long term plans, infrastructure support for current/future district activities	Regular meetings

1.6 Assumptions

1.6.1 Financial

The following financial assumptions have been made. Further information can be found in the TYP document.

Table 1.4: Key Assumptions

Assumption	Potential risk	Mitigation measure
1. Asset Revaluations completed July 2023 have been used as the basis for asset values.	Time between AMP completion and last revaluation	Council undertakes an annual price variance assumption report
2. Investment Returns eventuate as predicted.	Not the required funds to undertake capital works	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy
3. Interest Rate on borrowings remains as predicted within the financial model.	Not the required funds to undertake capital works	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy
4. Expenditure of capital projects occur and estimated debt levels are as predicted	Potential under performance in capital spend reflected in Council revenue	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy
5. No allowance has been made for inflation adjustment within this AMP. The source of funds for the future replacement of significant assets is stated in the revenue and Financing Policy.	Under funding of cost centre	Finance team make allowances for GST in funding plan and policy

Assumption	Potential risk	Mitigation measure
6. The useful lives of significant assets are as per the accounting policies documented in the TYP. Depreciation is charged at 50% for the first year and 100% in subsequent years.	Asset lives have been incorrectly calculated meaning a funding shortfall	Council has asset depreciation checked externally. Asset lives are compared to the latest asset information nationally
7. Levels of service and funding has been based on historic data	The community desires change to level of service which are not reflected in this document.	Council undertakes pre LTP consolation to gauge the community for different service level needs. Council undertakes consultation with the community as part of the development of this LTP document
8. Allowance has been made for vested assets	The level of allowance for vested assets is incorrect.	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy
9. Assume that the revenue received from Rates is as per expected.	A shortfall in rates funding	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy
10. Assume no costs associated with structures on the lake bed	An increase in unbudgeted operational cost	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy.
11. Development Contributions will continue not to be collected.	Unplanned works will be needed to be funded through rates as opposed to developer funded	Stormwater network provision is provided by developers apart from quality improvement device's which are a benefit to the whole community.
12. Possible three waters amalgamation has not impacted budgeting	Changes to funding requirements	LTP or annual plans will be adjusted accordingly to any changes in who provides services

1.6.2 Non Financial

Table 1.4: Key Assumptions (cont)

Assumption	Potential risk	Mitigation measure
1. Assume that growth is going to occur as per the Growth Model predictions.	Changes in growth will impact capital and operational spending	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy
2. The Stormwater discharge quality requirements will remain constant within the framework of the comprehensive discharge consent conditions.	Changes to discharge quality through the resource consent will require an increase in operational and capital expenditure	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy
3. Contractors will be available for development and construction of projects.	A shortage on contractors for project completion will mean an increase in project cost	Council can extend tender periods to enable contractors more time to schedule in works.

Assumption	Potential risk	Mitigation measure
4. There will be continued growth in public participation in the democratic process and Council will need to respond to this growth.	Increased growth in participation could result in changes in levels of service delivery.	Councils LTP and annual plan spend can be adjusted annually to meet Councils revenue and finance policy
5. There will be no unforeseen legislative changes or central government policy changes that will affect this asset.	Changes in legislation could impact on the funding levels	Changes in legislation have an implementation period to enable Councils to plan
6. Economic and labour market constraints may have a direct effect on recruitment.	If Council is unable to recruit to the required level to complete the works program for the year this could have impact on Councils credibility	Council may have to hire consultants to provide support; this could increase the cost of service delivery which will need to be funded through the annual plan process.
7. That Councils resource consents for its activities will be renewed as required.	The renewal of resource consents will depend on Councils prior performance in meeting the conditions of the existing consent and any changes in legislation	Council works closely with the Regional council to achieve consent compliance. Compliance is also a staff performance criterion, so Council is focused on consent compliance and it is considered that any consent related issues can be resolved.

1.7 Significant Negative Effects

In general, providing Stormwater services to the community has public health and environmental benefits.

There are however negative effects in providing this service.

Table 1.5: Significant Negative effects

Significant Negative Effect	Description of Effect	Mitigation Measures
Poor water quality	Pollution and contamination of the stormwater from runoff and cross-connections with the wastewater network, resulting in contaminants entering the stormwater network and discharging to streams, rivers of lakes.	Identifying and targeting sites that are at high risk of discharging significant contaminants. Runoff from industrial areas with the potential for adverse stormwater contamination is managed through the building consenting and trade waste regulatory processes. The clean-up for any pollution incidents is managed by emergency response plans (with Waikato Regional Council). Behaviour change initiatives within the community focus on reducing illegal dumping, littering and discharging of hazardous substances into the stormwater system.
Excessive wastewater volumes	Stormwater entry to the wastewater network through cross-connections and illegal connections resulting in excess volumes of wastewater to	A comprehensive programme of monitoring, inspection and corrective work to reduce the volume of stormwater infiltration and inflow into the wastewater system.

	be treated and potential detrimental impacts on the quality of treated effluent discharged.	
Flooding of property	Failure of the system resulting in flooding habitable residential and commercial buildings	Capital works to address capacity constraints, effective building controls, site specific detention and attenuation of stormwater in new growth and infill subdivisions

1.8 Asset Management Plan Complexity

1.8.1 Outline Of Approach

The objective of Council's Asset Management Policy is to ensure that Council's service delivery is optimised to deliver agreed community outcomes and levels of service, manage related risks, and optimise expenditure over the entire lifecycle of the service delivery, using appropriate assets as required. The Asset Management Policy requires that the management of assets be in a systematic process to guide planning, acquisition, operation and maintenance, renewal and disposal of the required assets. Delivery of service is required to be sustainable in the long term and deliver on Council's objectives.

The Stormwater Asset Management Plan 2024 follows the IIMM framework and it has been developed and collated internally by the Stormwater Asset Manager with respect to the appropriate level of asset management practice adopted for the SW AMP as intermediate level

The difference between core and intermediate/advanced is that:

- Future demand is predicted
- High knowledge of asset owned including condition assessment and performance
- Knowledge of current utilisation and ultimate capacity
- Ability to predict failure modes
- Ability to analyse alternative options
- Ability to optimise maintenance and operational activities.

The complexity of this iteration of the Stormwater Asset Management Plan sits in between Core and Intermediate as shown in the graph below[5]:

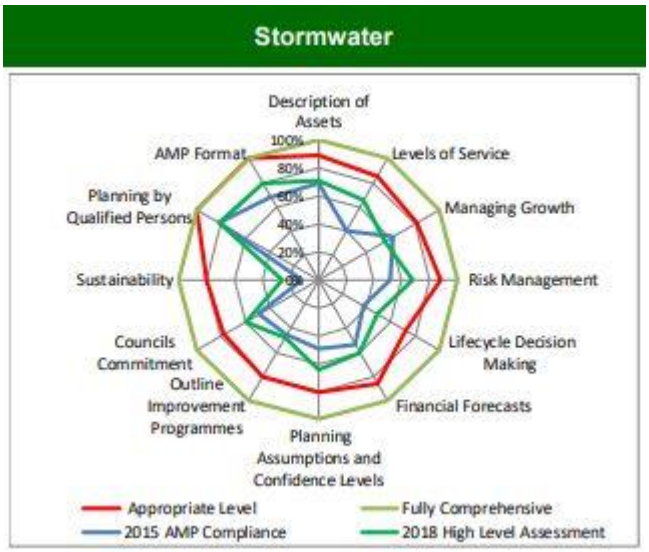


Figure 4: SW Compliance Graph

[5] Taupō DC Asset Plan Peer review 2018 (Waugh)

The overall purpose of asset management (AM) planning is:

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

AMP's are therefore concerned with outlining optimal life cycle management strategies and providing details of the associated costs. This identification of future needs, management options and cash flows provide the ability to even out peak funding demands and account for asset depreciation loss of service potential.

The assessed appropriate asset management practice levels for Taupō District Councils AMP's, are shown in highlighted green in the table below.

Table 1.6: SW AMP Compliance Status[6]

Service	Items	Description of Assets	Levels of Service	Managing Demand	Risk Management	Lifecycle Decision Making	Financial Forecasts	Planning Assumptions and Confidence Levels	Outline Improvement Programmes	Councils Commitment	Sustainability and Resilient Infrastructure	Planning by Qualified Persons	AMP Format	Infrastructure Strategy
Water (Intermediate)	Existing Status	72%	62%	63%	62%	48%	58%	59%	59%	68%	8%	83%	70%	77%
	Appropriate Level	89%	86%	82%	88%	73%	86%	80%	80%	78%	86%	100%	100%	100%
	With improvement items	73%	62%	65%	63%	52%	64%	59%	59%	68%	8%	83%	70%	77%
Wastewater (Intermediate)	Existing Status	64%	46%	60%	50%	47%	56%	52%	46%	64%	8%	79%	50%	63%
	Appropriate Level	89%	86%	82%	88%	73%	86%	80%	80%	78%	100%	100%	100%	100%
	With improvement items	67%	47%	62%	52%	48%	62%	52%	46%	64%	8%	79%	50%	63%
Stormwater (Intermediate)	Existing Status	71%	55%	63%	61%	48%	57%	60%	57%	63%	8%	85%	68%	77%
	Appropriate Level	89%	86%	82%	88%	73%	86%	80%	80%	78%	86%	100%	100%	100%
	With improvement items	71%	56%	63%	61%	48%	57%	60%	57%	63%	8%	85%	68%	77%
Transport (Intermediate)	Existing Status	72%	30%	49%	55%	37%	55%	48%	58%	55%	15%	59%	72%	61%
	Appropriate Level	89%	86%	82%	88%	73%	86%	80%	80%	78%	86%	100%	100%	100%
	With improvement items	78%	54%	55%	64%	51%	61%	48%	60%	59%	20%	59%	75%	81%
Solid Waste (Intermediate)	Existing Status	74%	57%	65%	61%	50%	59%	59%	57%	66%	17%	85%	73%	77%
	Appropriate Level	89%	86%	82%	88%	73%	86%	80%	80%	78%	86%	100%	100%	100%
	With improvement items	75%	57%	65%	64%	50%	59%	59%	57%	66%	17%	85%	73%	77%

Overall the assessment indicates that the AMPs are assessed as close to the target compliance level. It is expected that many of the remaining gaps identified will be closed by implementation of AMP improvement programmes.

The overland flow path model while not a reticulation network model does enable council to identify where there are capacity issues within the network. Thus, Council is able to understand the current utilisation and capacity of the total Stormwater network. This data is then compiled within the three waters asset data system where condition, age, historical maintenance and criticality, are analyzed and renewal funding profiles determined.

The main benefits derived from AM planning are:

- Improved understanding of service level options and standards.
- Minimum lifecycle (long term) costs are identified for an agreed level of service.
- Better understanding and forecasting of asset related management options and costs.
- Managed risk of asset failure.
- Improved decision making based on costs and benefits of alternatives.
- Clear justification of forward works programs and funding requirements.
- Improved accountability over the use of public resources.
- Improved customer satisfaction and organisational image.
- Improved understanding of the funding requirements based on a programed condition assessment program
- Understanding of asset criticality and associated maintenance and renewal expenditure

A fundamental objective throughout the preparation (and future review) of this plan will be to identify potential opportunities for reductions in asset lifecycle costs.

[6] AMP compliance Audit 2022 (Waugh)

AMP review by council
The involvement by councilors, including the reviewing and approving of the AMPs is briefly outlined below:

Workshops are held with the council for group of activities including AMPs which gives them following information

- What we do
- Key issues
- The service(s) we provide
- Levels of service, performance measures and targets
- Key projects over the next three years
- Who pays?
- Fees and charges
- Financials
- Capital expenditure (including renewals)
- Operating expenditure
- Draft AMPs are provided to councilors to view
- Council finally adopts the AMP
- Program performance measures

1.8.2 Limitations Of This AMP

Levels of Service require detailed consultation to make these more current.

- Asset condition and performance assessment need to be verified through ongoing investigations and the asset data system needs to be finalised so that accurate records of the full asset are available.
- Further network modelling needs to be undertaken to identify ultimate capacity.

1.9 Asset Management Policy

PURPOSE
The Asset Management Policy supports Council's long-term strategic goals found in the 2024 - 34 LTP of:

- Ensure that the Taupō District remains a great place to live
- Promote economic development
- Protect our water resources and use them wisely
- Maintain the quality infrastructure that we have
- Keep rates and debt affordable

OBJECTIVE
The objective of Council's Asset Management Policy is to:

- ensure service delivery is optimized to deliver agreed community outcomes and levels of service for both residents, visitors and the environment
- optimize expenditure over the life cycle of the assets
- risks are managed appropriately
- provide a service delivery that is sustainable

PRINCIPLES
The following principles will be used by Council to guide asset management planning and decision making:

- effective consultation to determine appropriate levels of service
- Integration of asset management within Council's strategic, tactical and operational planning frameworks including corporate, financial, and business planning
- Informed decision making using a lifecycle and risk management and inter-generational approach
- Transparent and accountable asset management decision making
- Sustainable management of assets for present and future needs

Corporate Framework
This Asset Management Policy links to Council's LTP, Infrastructure and Financial Strategy and Asset Management Plans. It builds on Council's strategic goals by promoting an integrated approach to the management of service delivery and across all asset classes.

Structured Assessment Of Asset Management Practice

Council has undertaken a structured assessment of the appropriate level of asset management practice for each of the asset classes. This structured assessment follows the guidelines provided in Section 2.1.3 of the International Infrastructure Manual (IIMM 2011v4).

Maturity Assessment

In the 2022 the maturity level of each of the Asset Management Plans has been assessed through an external review process to determine the actual level of maturity. This review will form the basis for the further refinement of each of the AMP's Improvement plans.

1.10 Asset Management Development Focus

The focus previously has been the implementation and development of asset management practices associated with:

- Improved knowledge of the assets
- Ensuring the asset register was at the appropriate standard
- Continuity of the three waters asset knowledge within Council
- Consultation framework and implementation
- Compliance with resource consent conditions

1.11 Issues arising within the ten-year planning horizon

The following describes the future issues that are expected to arise the current 10-year planning horizon period.

Table 1.7 Issues Arising Within the Ten-Year Planning Horizon

Description	Will/May Arise	Resolution/Comments
SW1. Some of the existing stormwater infrastructure may be of insufficient capacity to guarantee flood protection during the higher-rainfall events included in the (2002) increased standard	Will Arise	Capacity will be monitored and checked following storm events
SW2. Monitor population demographic changes	Will Arise	District wide monitoring to establish changes and effects
SW3. Predicted climate change effects, including increased temperatures and rainfall intensity requiring greater stormwater system capacities; driving costs for tighter environmental compliance; increased vegetation and pest control. For a 2° temperature rise, an average 16% increase in the rainfall depth for any one rain event is predicted.	Will Arise	The impact of the greater frequency of any rain event is an increased flood risk for flooding susceptible areas of the network. More frequent ponding is likely to occur in all areas, it is only in areas where more frequent flooding of habitable residential and commercial buildings is likely would Council propose to investigate mitigation options. Modelling will be utilised to assess the feasibility and efficacy of capital projects to attenuate, divert or contain additional runoff. Areas likely to be targeted initially will be those already experiencing flood damage effects.
SW4. Surface water quality	May Arise	The new Stormwater global discharge consent is likely to include provisions for improved water treatment.
SW5. Population Growth	Will Arise	Infrastructure improvement required for population growth

2.0 Definitions

As-built	Refers to a survey or drawing of the actual assets that have been constructed, recognising that they can sometimes vary from what was planned before work started on site. As-built drawings are needed to ensure that asset information systems contain data on the asset as it has been constructed, not how it was planned in theory.
Community Outcomes	Under section 5 of the Local Government Act 2002, community outcomes "mean the outcomes for that district or region that are identified as priorities for the time being". Community outcomes are what New Zealanders want for their local community, now and in the future. Assets have a role in supporting the achievement of those aims.
Catchment	means the area of land within which stormwater flows (whether by gravity, pumping, piping or otherwise) to a given point.
Catchment management plan	means a plan prepared by or for Council for the understanding, control and management of stormwater and stormwater related hazards within a catchment.
Code of Practice	TDC Code of practice for Land Development 2009
Council	Means the Taupō District Council and includes any person or committee acting under authority duly delegated by the Taupō DC.
Critical Assets	Those assets with a high consequence of failure. They are often found as part of a network in which, for example their failure would compromise the performance of the entire network or affect a critical customer.
Detention pond	An area designed to hold stormwater until the effects of percolation, evaporation and or controlled release return the area to its normal dry state.
Development	In relation to any land means altering the stormwater runoff characteristics of the land by stormwater drainage works, building work, subdivision or change of use or ground cover.
Development Contributions	Funds paid, typically by developers, to local authorities to help with the cost of growth. These contributions are authorised by Part 8 of the Local Government Act 2002.
Ephemeral flow path or watercourse	A watercourse where overland flow occurs intermittently but whose bed is likely to be dry at other times
Flood plain	Means a low-lying area which is expected to or predicted to flood in a storm event usually described as an Average Return Interval (ARI) 100 year event.
Greenfield site	Land on which no urban development has previously taken place.
Industry Best Practice	The most effective techniques available to the Stormwater management industry which minimises stormwater runoff, reduce stormwater velocities and peak flows and improve stormwater quality as close to source as possible. Taking account of local conditions, the techniques attempt to minimise the adverse effects of stormwater on the receiving environments within the constraints of social, cultural and financial expediency, which may include low impact urban design.

Overland flow path	means a path along or across any land where surface water is predicted or observed to flow and is likely to cause flooding of more than a minor nature.
Stormwater	Stormwater is defined as rainwater that flows either into surface or subsurface watercourses or is channelled into pipes, channels or constructed infiltration facilities which constitute stormwater systems to be discharged into receiving environments.
Stormwater Treatment Device	means any measure or device designed to remove contaminants from stormwater prior to its discharge to the environment.
Te Mana o Te Wai	Te Mana o te Wai refers to the vital importance of water. When managing freshwater, it ensures the health and well-being of the water is protected and human health needs are provided for before enabling other uses of water.
Watercourse	means every river, stream, passage, and channel on or under the ground, whether natural or not, through which water flows, whether continuously or intermittently.
Vested Assets	Assets that are transferred to a public entity at nominal or zero cost. Typically, this might result from a situation where a developer has installed assets as part of developing a site and passes them to a public entity to manage, maintain, and deliver services through. The fair value of these assets has to be determined as they are integrated into the organisation's asset information system so that they can be appropriately managed.

3.0 Acronyms / Abbreviations

AEP	Annual Exceedance Probability (Rainfall)
AM	Asset Manager
AMP	Asset Management Plan
AMS	Asset Management System
ARI	Average Return Interval (Rainfall)
Audit	Audit New Zealand
CAPEX	Capital Expenditure
CCTV	Closed Circuit Television – common method of inspecting pipes
CDC	Comprehensive Discharge Consent
CDS	Continuous Deflective Separation Devices
CMP	Catchment Management Plan
CEO	Chief Executive Officer
Council	Taupō District Council
CSA	Control Self Assessment (Risk Management)
DC	Development Contribution
ES	Environmental Services Group at Taupō District Council
GIS	Geographical Information System
GMS	Growth Management Strategy
LDS	Land Disposal Site
LGA	Local Government Act 2002
LoS	Level of Service
LTP	Long Term Plan
NPS-FM	National Policy Statement – Freshwater Management 2020
NZTA/Waka Kotahi	New Zealand Transport Agency
OPEX	Operational Expenditure
PRAMP	Property Asset Management Plan
RMA	Resource Management Act
RPS	Environment Waikato Regional Policy Statement

SAMP	Solid Waste Asset Management Plan
SLG	Senior Leadership Group (CEO, 2nd Tier Managers and selected 3rd Tier Managers)
SWMP	Stormwater Management Plan
SWAMP	Stormwater Asset Management Plan
SW	Stormwater
TAMP	Transportation Asset Management Plan
WAMP	Water Asset Management Plan
WRC	Waikato Regional Council
WW	Wastewater
WWAMP	Wastewater Asset Management Plan
WWTP	Wastewater Treatment Plant

4.0 STATE OF THE ASSETS

4.1 Network overview

Council owns, operates and maintains stormwater collection networks and disposal schemes in all the urban areas within the district.

The services that are provided to the community through the stormwater assets in this plan are as follows:

- A reticulated stormwater system of pipes and channels (primary network) sufficient to cope with frequent rainfall events within the road reserves.
- A secondary stormwater system comprising swales, gullies, road, kerb and channel and both formal and informal overland flow paths sufficient to control stormwater from less frequent rainfall events
- Planning and building controls to restrict building in high flood risk areas, require minimum floor levels and require mitigation of stormwater runoff effects to prevent stormwater entry to habitable buildings.
- Planning and policy initiatives to minimise stormwater quality and quantity effects at source.
- Gross pollutant traps or similar treatment devices to reduce debris and contaminant levels in stormwater discharge.

This Asset management Plan encompasses TDC's stormwater assets, which transport stormwater from developed urban catchment areas as well as from undeveloped rural areas. Catchpits and the pipes connecting to them are owned and maintained by the Roading team with the exception of catchpits with Enviropods which are cleaned by the SW network contractor and billed to Roading.

The key assets the contribute to providing these services are summarised in the table below:

Table 4.1 Stormwater Assets – Key Components

Asset Function	Asset Type	Quantity
Reticulation	Pipes	220km
	Standard Manholes	3992
	Catchpit manholes Lamphole	20 9
	Inlets	60
	Raised manhole – pond inlet with debris screen	13
	Pump Stations	3
Stormwater quality improvements	Attenuation / detention ponds	50
	Vortex units Enviropods	13 224
Disposal	Unknown outlet type	82
	Pond outlet with debris screen Pond outlet with wingwall & debris screen Lake outlet	32 20 78
	River outlet	59
	Gully outlet	262
	Land Outlet	41

The total replacement value of the Stormwater Assets is estimated as $126 million (June 2023 valuation)
This valuation was undertaken AECOM and has been completed in accordance with the following standards and guidelines:

- Public Benefit Entity International Public Sector Accounting Standard 17 Property, Plant and Equipment (PBE IPSAS 17) (incorporating amendments to 31 January 2021), and
- New Zealand Infrastructure Valuation and Depreciation Guidelines, issued by the New Zealand Asset Management Support Group (NAMS) of IPWEA.

The infrastructure assets that were included in the latest revaluation are:

- Catchpits
- Inlets and outlets
- Debris risers
- Soakholes
- Channels
- Attenuation ponds
- Pipelines, including all manholes and fittings.

Excluded Assets
The following asset types have been excluded from the scope of this valuation:

- Land and Buildings
- Capital works in progress

The value of the stormwater assets has increased by 32% over the previous valuation in 2021, reasons for this increase include:

- Inflation in construction costs.
- Additional assets that have been added since the 2021 valuation (partially offset by assets which have been removed).
- Assets constructed as part of TDC 3 waters capital programmes.
- There has been an emphasis by TDC over the past 3 years on data cleansing which has resulted in new found assets and changes to asset attributes
- The application of additional depreciation since the 2021 valuation
- The relative proportion (by value) of pipes, catchpits, manholes, inlets and outlets is generally the same for each of the wards in the District and is illustrated in Figure 4.2.3, pipes make up the majority of the value of stormwater assets.

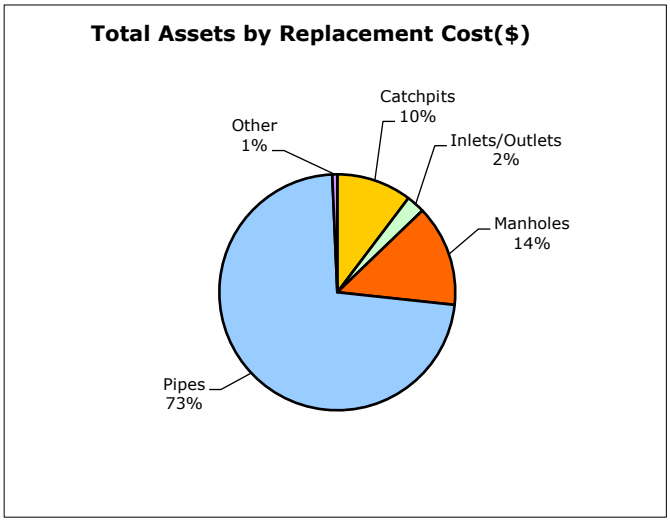


Figure 4.1 Stormwater Components by Percentage of Total Replacement Cost

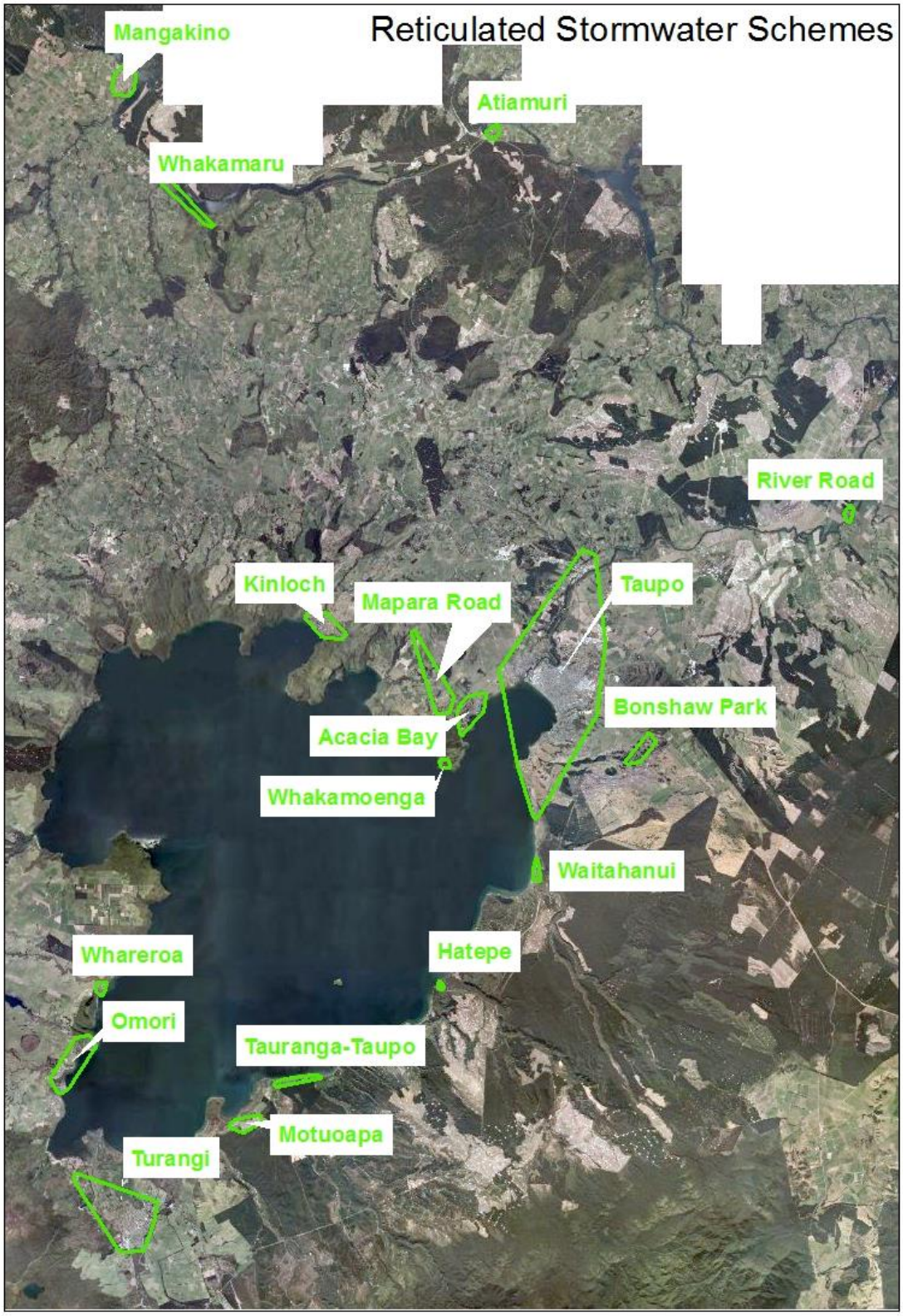


Figure 4.2. Location of TDC Reticulated Stormwater Systems

4.2 Physical parameters

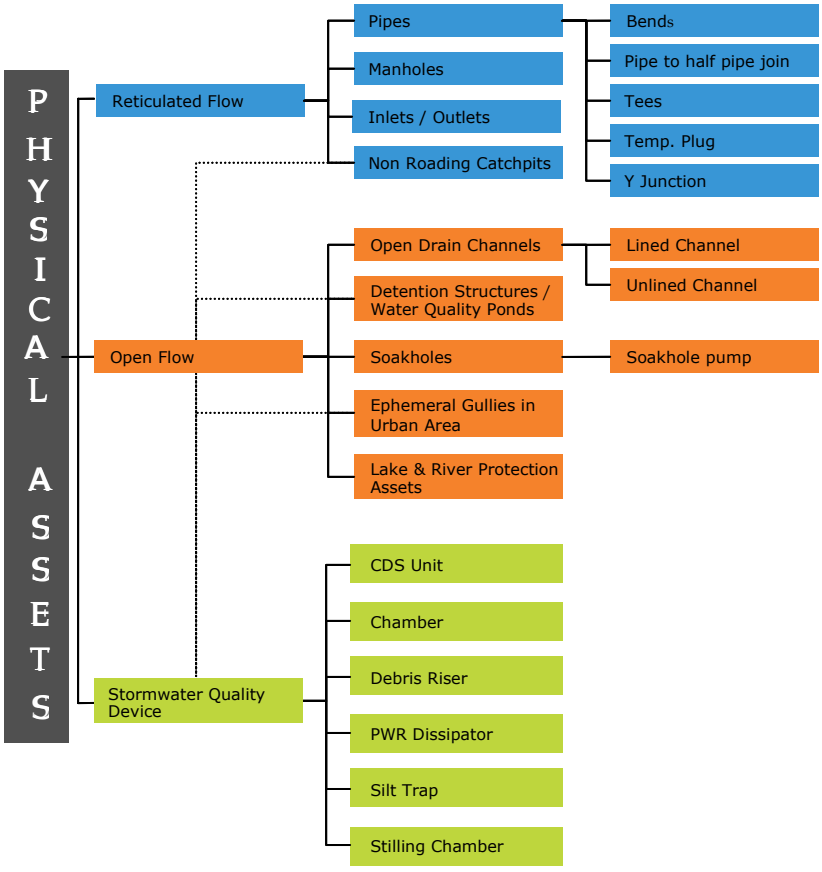


Figure 4.3 Hierarchy of Stormwater Assets

The asset categories depicted in Figure 4.3 are further described in Table 4.2 below:

Asset Type	Component	Description
Open Flow	Open Drains/ Channels	The purpose of open drains is to accept discharge from outlets, confine water flows within its banks, and convey the flows to receiving water bodies. In this asset management plan, open drains refer to lined channels, unlined channels and natural watercourses including gullies through which stormwater flows, whether continuously or intermittently
	Flow Paths / Flow Routes	Generally there are two paths available to flood waters; a primary path and a secondary path. The primary path is usually a piped system, but may be an open channel, or drainage gully. The secondary path is the route taken by floodwaters when the primary system is unable to cope, either because of blockage or because the hydraulic capacity of the primary path is exceeded.

Asset Type	Component	Description
	Attenuation or Soak hole areas	These will reduce peak flows and/or dispose of stormwater through soakage. They provide water quality improvement through silt depositions soakage.
Reticulated Flow	Pipelines	The purpose of the pipes is to convey the flow received from the catchpits directly to the receiving environment, generally water bodies or land.
Stormwater Quality Improvement Devices	Gross Pollutant Traps/Vortex Separators & Filtration	Gross pollutant treatment devices come in a number of different forms, including catchpit devices(Enviropods/Litta traps), Vortex separators (Downstream Defenders/Vortcapture and CDS), and filtration devices such as Storm vault or other filtration type devices.

Table 4.2. Description of Asset Categories

Councils Asset Management System AssetFinda holds all Stormwater asset data and is used as the primary source for asset management planning.

Council undertakes condition assessments on the inlets and outlet structures as well as the manholes within the network. CCTV condition assessment of the piped network is also being undertaken with at least 10% of the network being done annually. The CCTV surveys are externally audited and reported on in terms of the latest IIMM manuals, any faults that need immediate attention are identified and an assessment of remaining useful life are made. These surveys and reports are recorded and saved into our asset management system AssetFinda to allow for later review and reporting. CCTV surveys completed in the last 10 years are shown below in figure 4.4. The following guidelines are used as the basis of assessment.

Rank	Description of Condition
1	**Perfect/Excellent Condition** Only normal maintenance required
2	**Minor Defects Only** Minor maintenance required (5%)
3	**Backlog Maintenance Required** Significant maintenance required (10-20%)
4	**Requires Major Renewal** Significant renewal/upgrade required (20-40%)
5	**Asset Unserviceable** Over 50% of asset requires replacement

Table 4.6 - Condition Assessment Guidelines

The three waters asset data base can be used to identify assets that are of greatest value. The value of assets is also considered as part of the maintenance and renewal strategy. When undertaking the condition assessment of the piped network, Council has identified the network that has a renewal requirement of ten years and less, then has put together a program where a range of pipe capacities and locations can be assessed. Council has also considered issues such as trees placed over pipes and the criticality of the asset.

The Stormwater renewal program is based on a mix of age, condition assessment information from CCTV and criticality of asset, which is mainly a reflection of size of the asset in most cases.

The renewal and maintenance requirements are also overlaid by service request information to determine future work priorities. These priorities can be broken to down to component level such as outlet, pipe, inlet as well as asset values to enable future funding priorities.

Works orders and service requests are analysed to determine if maintenance issues are determining the need for future renewal or capex expenditure, contract reports provide details of works as well as preventative maintenance such as outlet unblocking. Expenditure is then compared with renewal and condition assessments which then form planned expenditure and projects.

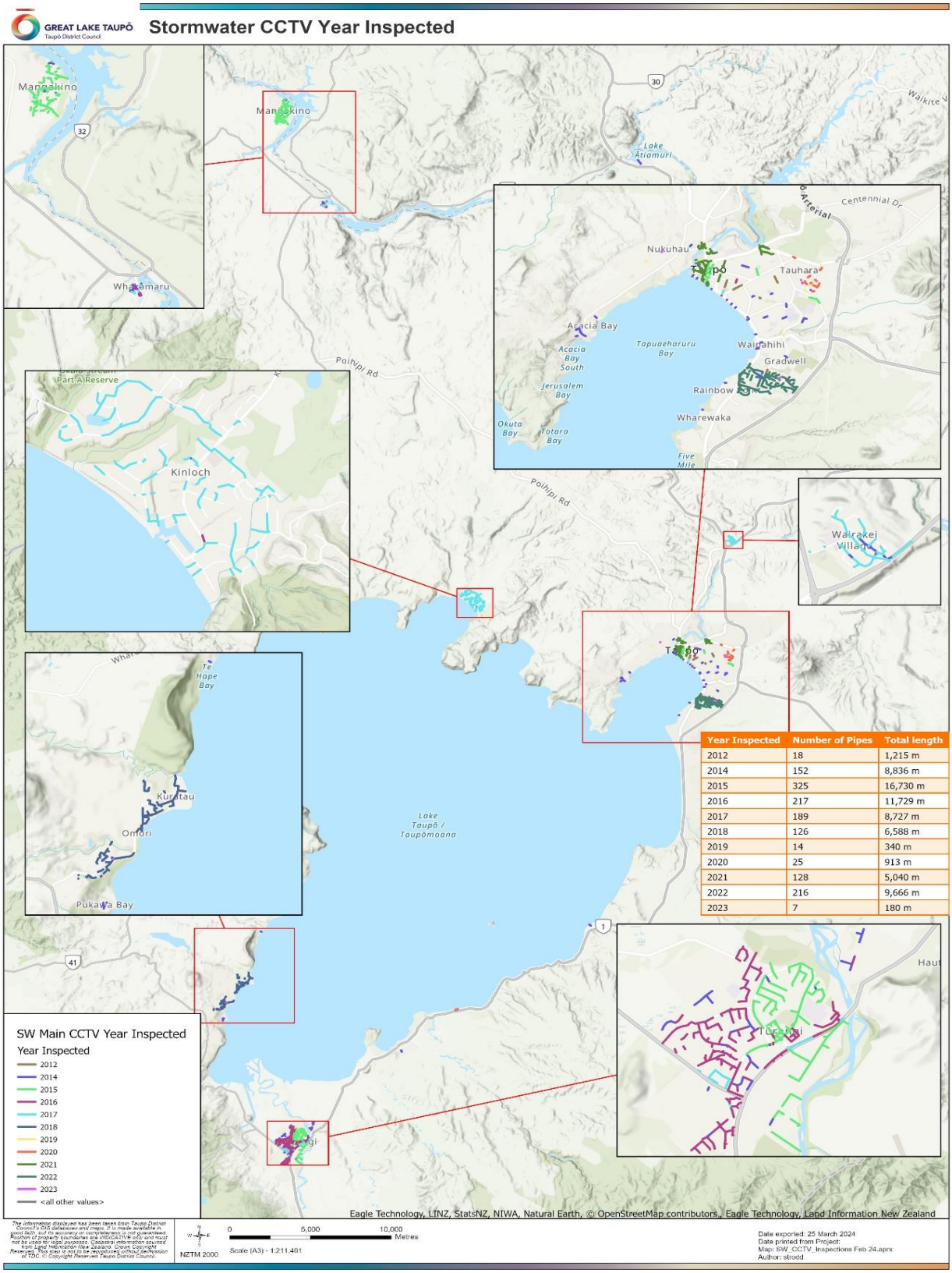


Figure 4.4 CCTV of Stormwater by Year

4.3 Outlets Asset Group

4.3.1 Outlets

Discharges from the stormwater system into Lake Taupō, gullies, streams and channels, and the Waikato River. The number of outlets discharging into each is given in Table 4.3

Township	Number of Outlet Systems				
	Land/Gulley	Lake	Stream/ Channel	River	Total
Taupō	73	49	0	20	141
Acacia Bay	4	8	0	0	12
Kinloch	31	9	8	0	48
Tokaanu	0	0	0	9	9
Waitahanui	0	3	0	3	6
Motuoapa	5	5	0	0	10
Tauranga-Taupō	0	3	0	0	3
5 Mile Bay	1	6	0	0	7
Mangakino	8	0	0	4	12
Turangi	3	0	15	9	27
Pukawa	3	0	5	0	8
Atiamuri	1	0	0	1	2
Acacia Heights	5	0	0	0	5
Hatepe	2	1	0	0	3
Wairakei	2	0	1	0	3
Kuratau	2	5	0	0	7
River Road	1	0	0	2	3
Whakamaru	1	0	0	0	1
Omori	0	2	2	0	4
Whareroa	0	1	0	0	1
TOTALS	105	92	31	48	312

Table 4.3 Summary of Stormwater Outlet Assets

4.3.2 Capacity / Performance

The capacity and performance of Stormwater outlets has been graded in accordance with industry standards (see table 4.8) this grading is ongoing as the network has 92 outlets that feed directly into Lake Taupō. These lake outlets have been affected with high lake levels as a large majority are situated in the foreshore.

Council has carried out an outlet survey to determine their condition, which will then support the maintenance and renewal program. Outlets located on the Taupō lakebed, are located on Tūwharetoa Trust Board land and are coming under increased scrutiny as is discharge quality.

The location of the outlets in the foreshore means that at times of high Lake Level and high winds, outlets can be covered over and blocked by sand.

Council's maintenance contractors are required to inspect these structures prior to high rainfall events to avoid the potential for flooding.

Outlets located on the foreshore may in the future need to be either extended into the lake or moved back away from any chance of blocking. These outlets are also in some places being undermined as wave action and high lake levels remove structures supporting material. Allowance in the renewal budget has been made to enable the ongoing renewal of outlet structures affected by lake conditions.

Capacity of outlets in general is considered satisfactory, with most of the infrastructure designed to provide for at least a 5-year return period rain event.

The performance of the Stormwater network is generally assessed via analysis of service requests and resource consent compliance. An Annual Report is prepared for EW on the whole of the network detailing its performance against specific conditions as listed in the Consent. All of the annual reports provided under the comprehensive consent have been given full compliance from EW.

Extending of Stormwater Outlets further into the Lake could become problematic as Iwi ownership of the Lakebed means that further intrusion may trigger the need for charging and applications for extension will require extensive consultation and may in the end be unsuccessful.

There are number of large outlets that discharge directly from the urban environment to the Lake and rivers which carry significant containments in the first flush which at times exceed the parameters identified in Councils monitoring program. A number of these outlets have been selected to have quality improvement devices upstream.

Recent inspections of beach areas after rainfall events that have been proceeded by periods of no rainfall has shown that the beach areas around these outlets have a considerable build-up of floatable contaminants, mainly plastics that end up washed up on the beach leading to contamination of the area and eyesore for our Tourist community.

Discharges at locations that have a quality improvement devices placed above the outlet have shown dramatic increase in quality.

4.3.3 Condition

The condition of the network outlets has greatly improved due to regular inspection and maintenance performed under the maintenance contract. Condition rating information has been compiled and is being added to the Asset data system.

Council has implemented an annual CCTV program to assess the condition of stormwater assets. This condition assessment is compared with age of the assets and any maintenance records to determine the remaining life.

4.4 Pipes Asset Group

The Stormwater reticulation is shown as only halfway through its useful life with Stormwater pipes having an expected life of some 80-100 years. This has been reflected in the renewals program for Stormwater.

To date Council has not had an extensive renewal program as the age of the assets does not at this time warrant the expenditure.

Figure 4.5 shows the age of the Stormwater pipe network in the district, with majority of the networking, including outlets falling 36 to 50-year range.

The condition assessment program has identified a number of assets that have had faults and or have shown ware. The criticality program has been included in determining the short term 10-year renewal program.

Pipes that have been found to be poor with a high criticality are programmed into the first three years of this program with poor quality pipes with lower criticality pushed further out. Some smoothing of the expenditure has been undertaken to remove yearly spikes.

The CCTV program will continue to assess at least 10% of the network going forward and faults will be prioritised as they are identified. In future Council will not rely on the age only to determine renewal spend as the information gathered through the CCTV program will overlay the age data to provide accurate condition assessment to enable Council to refine the renewal expenditure going forward.

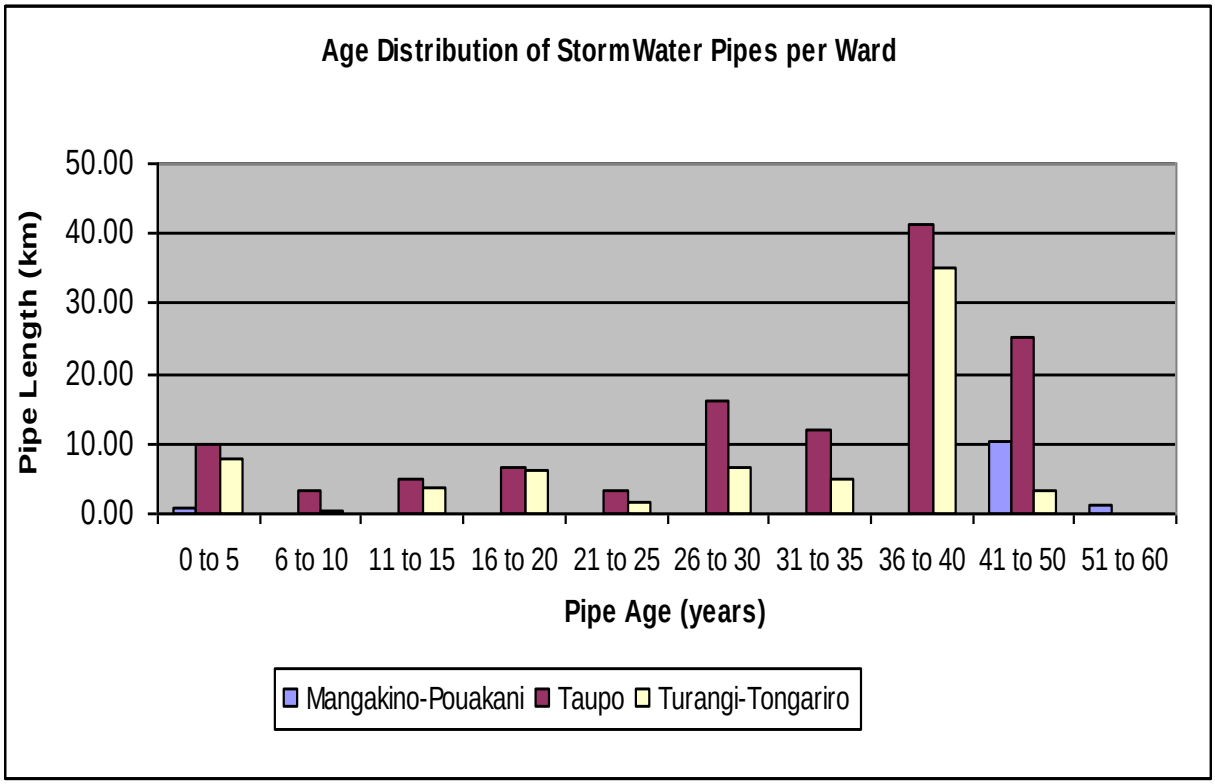


Figure 4.5 - Age of Stormwater Pipes[7]

Figure 4.6 below shows that most of the stormwater pipe assets are constructed using reinforced concrete rubber ring jointed pipes.

[7] Only wards with stormwater assets are represented

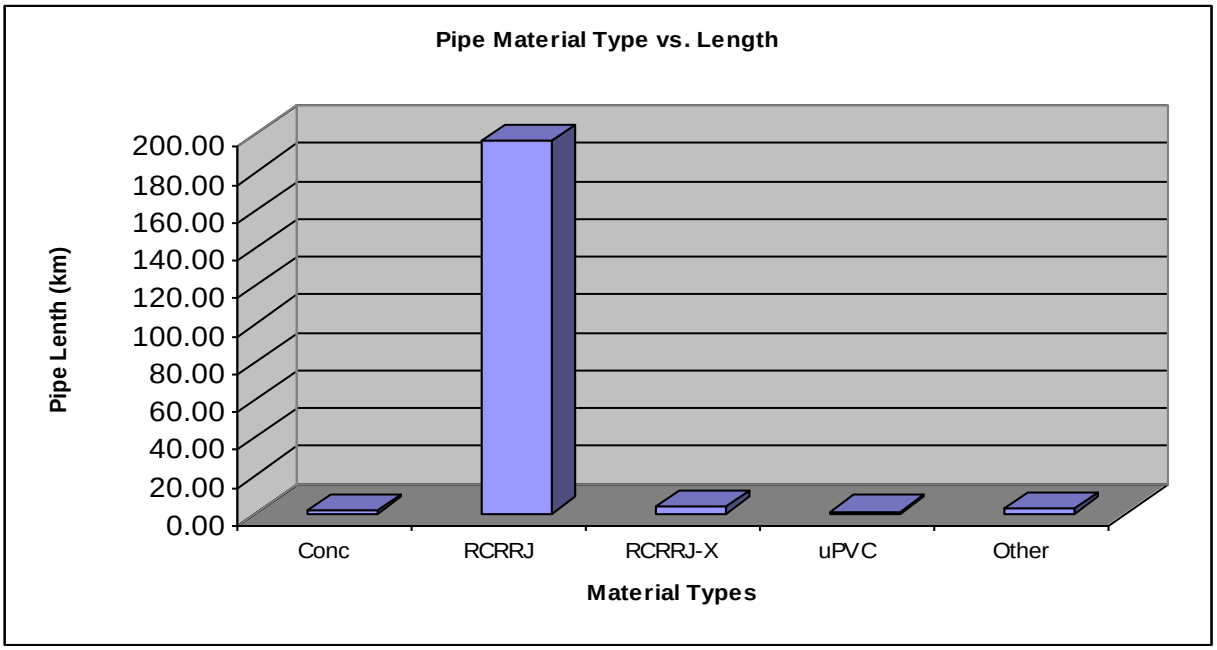


Figure 4.6 Pipe materials

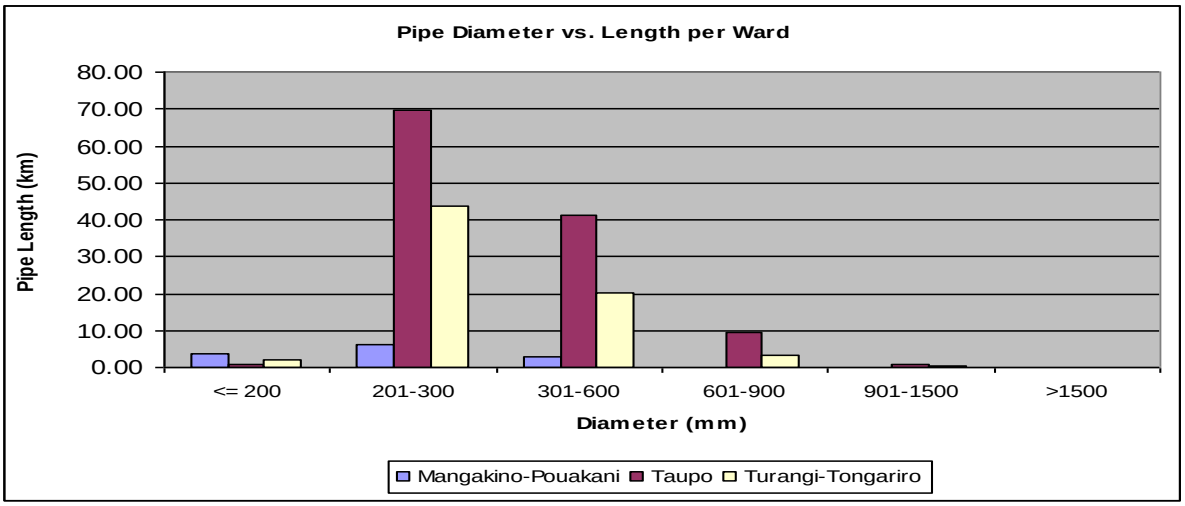


Figure 4.7 - Size of Stormwater Pipes[8]

Size Distribution

As can be seen from the graph, the majority of pipes are between 225 mm and 600 mm diameter. This is due to majority of the piped network only receiving road stormwater with excess flows handled by overland flow paths.

Materials

Almost all stormwater pipes are rubber-ring jointed, and made of centrifugally moulded, steel-reinforced concrete. The majority of the remaining 4% of pipe assets are PVC plastic, flush jointed large diameter

[8] Only wards with stormwater assets are represented

reinforced concrete, and modern galvanised steel. These are all well-known materials with proven performance in this application, provided design and construction is correctly carried out. Small quantities exist of small diameter glazed earthenware.

4.4.1 Asset Capacity / Performance

Performance is regarded as "the capability of the asset to meet defined service criteria". A subjective desktop assessment of current stormwater asset performance was carried out in 2007, with some modelling work also undertaken and the result is shown in Table 4.5. A review of this performance assessment is overdue and will be undertaken in the next AMP period.

Rank	Description of Performance
1	Very good
2	Good
3	Moderate
4	Poor
5	Very poor

Table 4.4 Performance Grading System

Stormwater Asset Type	Performance Grade assigned to each Township																			
	ACACIA BAY	ACACIA HEIGHTS DRIVE	5 MILE BAY	KINLOCH	RIVER ROAD	TAUPO	WAIRAKEI	WAITAHANUI	HATEPE	KURATAU	MOTUOAPA	OMORI	PUKAWA	TAURANGA-TAUPO	TOKANNU	TURANGI	WHAREROA	ATIAMURI	MANGAKINO	WHAKAMARU
Zone assigned by TDC for Performance Grading	D	D	D	D	D	E	A	E	C	B	D	B	B	C	C	C	B	A	A	A
Pipeline	2	2	2	2	2	3	5	3	4	3	2	3	3	4	4	4	3	5	5	5
Manholes	2	2	2	2	2	3	5	3	4	3	2	3	3	4	4	4	3	5	5	5
Catchpits	2	2	2	2	2	3	5	3	4	3	2	3	3	4	4	4	3	5	5	5
Inlets / Outlets	2	2	2	2	2	3	5	3	4	3	2	3	3	4	4	4	3	5	5	5
Open Drains	2	2	2	2	2	3	5	3	4	3	2	3	3	4	4	4	3	5	5	5
Channels	2	2	2	2	2	3	-	3	4	3	2	3	3	4	4	4	3	-	-	-
Flow Paths / Flow Routes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soakholes	-	-	-	-	-	3	-	-	-	-	2	-	-	-	-	-	-	-	-	-
CDS Unit	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chamber	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Debris Riser	2	2	2	2	2	3	5	3	4	-	2	-	-	4	4	4	3	-	-	-
PWR Dissipator	-	-	-	-	-	-	-	-	-	3	-	3	3	-	-	-	-	-	-	-
Reducer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silt Trap	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stilling Chamber	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(Zones A - D refer to overall performance A = very poor, D = Good)

Table 4.5 Network Performance Grading

4.4.2 Condition

Asset condition reflects the physical state of the asset, which may or may not affect the performance. The performance of the asset is the ability to provide the required level of service to customers. At present, TDC have very little documented knowledge or record of asset performance except for assets that are obviously underperforming or in such a condition that they are likely to fail.

While condition, remaining life, material, and installation date and deterioration rates are not as accurate as desired, faults frequency generally demonstrates that within this ten-year plan period, buried components are unlikely to require significant renewal. Depreciation rates have been conservatively set, so that in future plan periods there should be adequate funding to sustain a renewal programme based on better data.

Council does not have a complete or accurate set of condition ratings for stormwater assets in its database, however there is an improvement task to address this.

Council has previously undertaken CCTVs for at least 5% of the piped network annually to provide condition assessment and this has now increased to 10%. The outlets and inlet structures were inspected in 2020, with outlets currently being resurveyed, these assets are also inspected during ongoing maintenance work.

The assessment of the asset's condition is aligned to its "structural integrity" – what shape is it in? Whereas it may be performing adequately, and the customer is not aware of a reduced level of service, there could still be significant maintenance and repair work, or costs associated with the asset due to its poor physical condition. No strength testing has been carried out on stormwater pipes at this time.

Council's maintenance contractor is now collecting condition information regarding the stormwater assets and this information is being downloaded into the asset management system.

The CCTV inspection records coupled with the criticality rating requires that there is funding allocated to address the faults that have been found during the condition assessment program.

It is envisaged that as the CCTV program is rolled out, that additional network faults will be located. The Mangakino assessment identified that there are parts of the piped network located under houses. These pipes have been identified as high criticality due to the risk of failure and impacts on private property. The condition assessment data will be adjusted as repairs are undertaken.

As the network age is only averaging 60 years old the bulk of the network renewal funding requirement won't be needed until 2050 onwards.

4.4.3 Service Connections Asset Group

Service connections, which carry private stormwater to public pipes or road channel, are rarely required in the district due to the well draining pumice soils which provide adequate soakage for private discharges. The number of service connections is small compared to the approximately 20,844 properties, some are connections for businesses. However most are small pipes of 100-150 mm diameter or less. The property owner is responsible for maintenance of service connections to the public stormwater system. No specific plans and policies exist for these assets due to their small number.

4.5 Open flow network

4.5.1 Description

Drainage gullies in urban areas are the responsibility of TDC and are generally designated as Local Purpose Reserves. TDC's Tree and Vegetation Policy, code of practice and stormwater strategy identifies the importance of these areas for drainage conveyance and natural disposal and Council has also identified that drainage gullies in the district form an integral part of the stormwater network.

Council's comprehensive stormwater consent promotes the integration of the natural environment with the treatment and disposal of stormwater in the district. Council has promoted this concept through the code of Practice to enable gully systems to be incorporated into the design for stormwater in future developments.

Gullies in the Taupō Region can serve several purposes depending on their level of development. If undeveloped, they will continue to serve their natural overland flow purpose. If developed, they may currently be used for passive recreation purposes and/or stormwater purposes.

In some locations the gullies remain in private ownership in those cases private property owners do have a requirement to keep overland flow paths clear and mown regularly to avoid erosion and sediment loss.

Council will continue to work with community groups such as Bike Taupō to enable enhancement and recreational opportunities to be maximised where appropriate. Council will try where possible to maximise the dual usage potential of overland flow paths for passive transport usage i.e. walking and cycling to enable and enhance "off road" linkages throughout the urban area.

The drainage gullies are not included on the asset register at present except for the hard assets that are located within them. However there is maintenance expenditure involved in weed and scrub control to allow effective stormwater flow and ensure the geographical features are preserved. The planting of gullies and ongoing maintenance of the planting is a requirement of the comprehensive stormwater consents. Gullies are also used to provide treatment in the form of detention ponds, which need to be maintained over time to remove contaminants.

Capacity / Performance

Recent new developments in the district that have been providing gully disposal for stormwater have provided capacity information that shows that they are able to provide for the requirements of Councils code of practice.

Existing gully capacity has been identified through our SW modelling studies which has identifed overland flow paths up to a 1 in 100-year event.

Where gully systems are on private land, Council will look to work with property owners to make sure that obstructions to flow paths are removed. Council has a policy requirement that gully systems are owned by council, so developer must provide these to council as Local Purpose reserves. Council require that developers have a planting program which incorporates a plant maintenance program of five years.

Taupō District Council (TDC) commissioned CDM Consultants Ltd (CDM) during late 2017 to develop two-dimensional (2D) Rain-on-Grid (ROG) stormwater models for their urban areas in order to better understand overland flow-paths affecting properties. The models included the best information made available by TDC at the time, with improvements and field validation undertaken by various summer students with CDM guidance.

InfoWorks ICM (Integrated Catchment Management) software was utilised to undertake this hydraulic modelling for TDC. ICM is reputable software, known to be one of the best packages available for this purpose and holds similar licences for wastewater and water supply modelling.

The original ROG modelling was developed for a different scope and purpose from what is its intended use now which could be inclusion into the District Plan or the LIMs process. Further model development was necessary to ensure that the final models are more robust for these proposed uses. Taupō has been affected by relatively few severe urban stormwater floods in recent years with the most significant being January 2011. This event was estimated to be in the order of a 100-year return period event of 24-hours duration (not a critical duration). The models have not been calibrated or validated against known rainfall events as TDC does not collect measurable data for this purpose.

The models are a valuable tool if used with the understanding that a hydraulic model is never absolutely correct but is likely the best available tool to better understand the operation of the stormwater network during extreme rainfall events. The models are certainly useful for the purpose of understanding hazards and can easily define flow velocities, flood depths and therefore hazards. The challenge is being sure as to whether the absolute extent of predicted flooding is accurate.

It is expected that the existing flow-path locations are accurate but conservative with slightly wider extents and greater depths than reality. This confidence could be modified and improved further with reduction of rainfall-runoff and more understanding of groundwater infiltration. Survey of critical asset data, such as all larger culverts would also be a worthwhile improvement where possible.

The models (although populated with the most recent data) are not absolutely finalized. Latest LIDAR is still being released to continue updating the models, and subsequently, the extent of flood affected properties. Outstanding data includes:

- The most recent LiDAR data (in some remaining areas).
- Culvert/pipe data (to be updated as more recent data is made available).
- Ongoing research to identify more optimized infiltration/roughness data for all models.
- Model optimization through further auditing changes where considered necessary.

Condition

The condition of the district gully systems requires ongoing assessment, with inspections undertaken in areas where overland flow velocities have scoured or damaged the flow paths. Remedial works are then undertaken under the maintenance contract.

As Taupō's Pumice soils are particularly prone to erosion from high velocity water movement, Council has a planned gully planting program that targets those gullies that have high stormwater velocity, and this planting program not only strengthens the gully walls but also places small planting barriers in the flow paths to slow water down to enable containments and sediment to drop out as well as to avoid erosion.

Overland Flow Paths / Network Capacity

Council has undertaken computer modeling to determine stormwater flows in a 1:100 storm event through the urban areas of the District. The work to date does not incorporate the piped network, so the data on effects of flooding on private property still needs to be improved before being released to the public. A project has been placed in to the LTP for funding over the first two years to complete this additional work.

4.6 Quality improvement Devices

4.6.1 Description

With the adoption of Councils stormwater strategy and the granting of Councils comprehensive stormwater consents, there was more emphasis placed on the quality of the discharges from council's stormwater network, be it from overland flow or the reticulated network.

The Comprehensive consent has a monitoring program that compares receiving water quality with a national data set that enables Council to identify areas where stormwater quality is an issue.

Currently there are a number of capital programs for the installation of quality improvement devices into the network. These devices will be located in areas where stormwater drains from the central CBD areas as well as large outlets from the urban area to the Lake shore.

Currently council has 12 Quality Improvement devices installed within the reticulated network as well as 220 Enviropods located in Taupō and Tūrangi.

Council's comprehensive consent requires any new catchpits installed under the consent to include sediment and floatable contaminant capture. But for an urban residential street the level of contaminates is low and the extra cost of maintenance of additional Enviropods is not seen as cost effective for general area wide use. For areas such as the CBD, commercial and light industrial areas the capture of pollutants with Enviropods are a cost-effective solution.

A report undertaken by Opus International regarding the effectiveness of stormwater quality devices for the Taupō and Tūrangi CBDS, recommended an initial protection of Enviropods followed by CDS units at or close to major outlets. This philosophy underpins Councils quality improvement program.

Council will continue to provide quality improvement to our stormwater discharges through the installation of the appropriate treatment solutions.

Council will continue to work with developers and the regional Council to provide the best and most cost-effective stormwater quality improvement devices for Councils network. Recently this has been achieved by more open pond-based systems where pollutant traps are above ground and easily maintained.

The regional council has now released their stormwater management guidelines (May 2020) which result in quality improvement at the road incorporating swales. This document provides guidance for engineers, planners, landscape architects, developers, and contractors in selecting, designing, constructing and maintaining stormwater management systems for urban areas, with a focus on encouraging a low impact design approach.

The guideline provides design criteria and standards recommended by the Waikato regional Council.

4.6.2 Capacity / Performance

The existing CDS units have been sized for a 1 in 5-year storm event. With rainfall events over this return period, the CDS units are able to bypass these flows and thus avoid localised flooding. Any new quality improvement devices will be designed taking into account the new rainfall data but will generally be sized to deal with the first flush only also known as the water quality flows.

CDS units are regularly inspected and are cleaned under the Stormwater maintenance contract and the optimum time between cleans is around four months, but this clean time will vary depending on the size of the catchment and contaminant loadings.

The Enviropods located throughout the district have been maintained under the roading maintenance contract but this has now been handed over to the SW maintenance Contractor and are regularly inspected and cleaned.

Road catchpit capacity can quickly be reduced if Enviropods are not maintained on a regular basis and this does incur some additional maintenance expenditure for the roading division.

Open pond-based systems have been designed either under the old code of practice that required the 1 in 5 storm event or more recently developments have designed to meet a 1 in 10 storm event.

Access to the pond systems for maintenance is generally easy and the removal of sediment and pollutants is regularly undertaken.

4.6.3 Condition

The district quality improvement devices are now included into Councils three waters contract for inspection and maintenance. These devices are regularly inspected as to there condition and are maintained when necessary.

The current condition rating for the quality improvement devices shows that they are in good condition.

4.7 Asset Lives

Table 4.11 summarizes the asset lives that were used in the calculation of asset depreciation. Asset lives have been determined by TDC asset management staff, based on information in the NAMS guideline, but modified to better reflect the actual situation being experienced in Taupō district.

Asset Type	Expected Life
Pipes	80 - 100
Manholes / catchpits	80 - 100
Flood control systems	15 - 18

Table 4.7 – Asset Lives

The anticipated life of assets is dependent on material type and operational circumstances and location.

4.8 Asset Confidence Rating

The asset valuation assigns confidence ratings to the source data and unit cost rates and to other items as appropriate. The overall confidence rating for the Stormwater Asset is B**-.**

Grade Score	Grade	Description	Accuracy
1-2	A	High Accuracies, data based on reliable documents	±5%
2-3	B	Data based on some supporting documentation	±10%

3-4	C	50% Estimated, data based on local knowledge	±15%
4-5	D	Significant Data Estimated / No Data, data based on best estimate of experienced person	±30%

Table 4.8 Key to Asset Confidence Rating

Attribute	Confidence Grade							
	D		C		B		A	
Asset data								
Physical properties								
Location								
Age								
Condition								
Performance								
Deterioration rate								
Financial data								
Opex								
Operation costs								
Maintenance costs								
Asset management costs								
Interest rates								
Depreciation								
Renewals								
Unit rates								
Project scope								
Cost estimates								
Capital works								
Demand forecast								
Project timing								
Project scope								
Project costs								
Project prioritisation								

Table 4.9 Asset Confidence Rating

Storm Water Assets	Average of Data Confidence Score		Confidence Grade
Size	2.5	2.43	C+
Material	2.6		
Length	2.2		
Location	2.20	2.20	B+
Age	2.25	2.25	B+

Table 4.10 Summary of Asset Confidence Ratings

Councils knowledge of its asset has increased from the previous AMPs due to processes put in place around asset and maintenance data capture and storage.

Council has made a significant effort to process and store data records that have been “sitting in boxes” as well as recording data from CCTV records. Council has had additional staff employed solely to bring the data to a level to enable asset staff to provide robust renewal porograms.

Councils “Three Waters” maintenance contractor is also required to check the validity of asset data while undertaking maintenance and update the data if necessary.

Our Asset data base incorporates day to day maintenace operations, and updates assets as maintanece is undertaken. This has enabled council to verify asset data whicle mainteance is being undertaken.

4.9 Resource consents

TDC have acquired numerous resource consents for the discharge of stormwater. Table 4.11 summarises the consented stormwater discharges, together with the date that the consent expires.

Site	Resource Consent number	Renewal date
Taupō Urban Areas Taupō (& Eastern Bays) Waitahanui Acacia Bay Kinloch	105048	15 June 2027
Turangi Urban Areas Turangi Tokaanu Motuoapa Omori/Pukawa/Kuratau Whareroa Tauranga-Taupō Hatepe	105049	15 June 2027
Waikato Urban Areas Wairakei River Road Atiamuri Whakamaru Mangakino	105050	15 June 2027
Taupō - Poihipi Road (Vaucluse Subdivision) 4 x detention dams	102594	
SH5/Kiddle Road Onekeneke detention dams	104043	1/01/2026
Flood Control works Kowhai/Chad gullies	793558	1/01/2026

Site	Resource Consent number	Renewal date
Detention pond Kenrigg Rd	109323	30/11/2038
2.4m culvert SH1 Wharewaka	110714	25/03/2039
Weir Kathleen stream Spa Rd	114276	8/10/2042
Kenrigg Rd, Kinloch – dam to create detention pond	109322	30/11/2038

Table 4.11 Summary of Resource Consents

The primary consents that will affect the management of the stormwater activity into the future are the three comprehensive discharge consents (105048, 105049, and 105050) which are due to expire in June 2027. Funding has been provided in the LTP for renewal of the comprehensive consent.

The Comprehensive Discharge Consents for urban stormwater runoff have a significant impact on the management, operations and maintenance of the stormwater system in the coming years. The consent requires the following:

- Investigate actual and potential adverse effects of stormwater discharges on the receiving environment.
- provide information to develop stormwater initiatives
- determine compliance

5.0 Levels Of Service

5.1 Introduction

Following on from the definition of Council's Vision, Outcomes and Strategies the relevant Council units responsible for delivering services to the community have defined specific **Levels of Service** (LOS) that describe what the customer will receive from a particular activity.

The LOS are associated with **Performance Measures** that are expressed in both customer and technical terms.

This SW AMP defines levels of service (LoS) as statements that describes how the Council intends to deliver to its customers. Levels of Service are used to:

- Inform customers of the LoS they can expect
- Enable customers to assess suitability, affordability and equity of the service offered
- As a focus for asset management strategies to deliver the required LoS
- Enable the measurement of the effectiveness of this AMP
- Identify the costs and benefits of the service provided.

Levels of service in the stormwater activity have historically been based around setting a return period (e.g., 1 in 100 years) or an annual exceedance probability percentage (e.g., AEP %) for either the primary network or the overall stormwater system. While the obligation to meet such a standard remains via legislation such as for example the Building Act provisions, the practicality and relevance of setting and benchmarking performance against such a standard is problematic given the changing frequency of high intensity rainfall events and the recognition that building larger capacity stormwater networks is neither cost effective nor sustainable.

Key Performance Indicators have been developed for the purpose of monitoring and reporting by the service provider, to ensure that the service is being delivered to the defined performance level.

In addition to the above, the Department of Internal Affairs introduced in 2013 a series of Mandatory Non-Financial Performance Measures that have been addressed in the LTP and supporting AMPs. These measures were introduced to establish a baseline set of data to enable performance to be measured comparatively between all Local Authorities in the country.

The Performance Management process ensures that all activities are coordinated and aligned with the global objectives of the LTP and are described in detail both there and in the individual AMPs.

A "Service Level Gap" exists when the reported results of service level monitoring are lower than the service level "target". Customer service level gaps may arise from a difference between perception and expectation, particularly if a service level is expressed in terms of public satisfaction. From this point, improvements can be developed that may involve altering the parameters of fixed assets or altering process features.

The results of Council's regular customer surveys, which include "public satisfaction", can be influenced by factors unrelated to actual measured service, such as 'how well council communicated its achievements', and the general attitude of respondents to the Council.

To deal objectively with shortfalls requires a clear distinction to be made between perceived and technical levels of service. The service levels adopted in the AMPs generally avoid use of "customer satisfaction", reflecting the advice of the Auditor-General.

The following diagram illustrates the key aspects of the service level setting process including emphasis of the translation of customer expectations into technical standards.

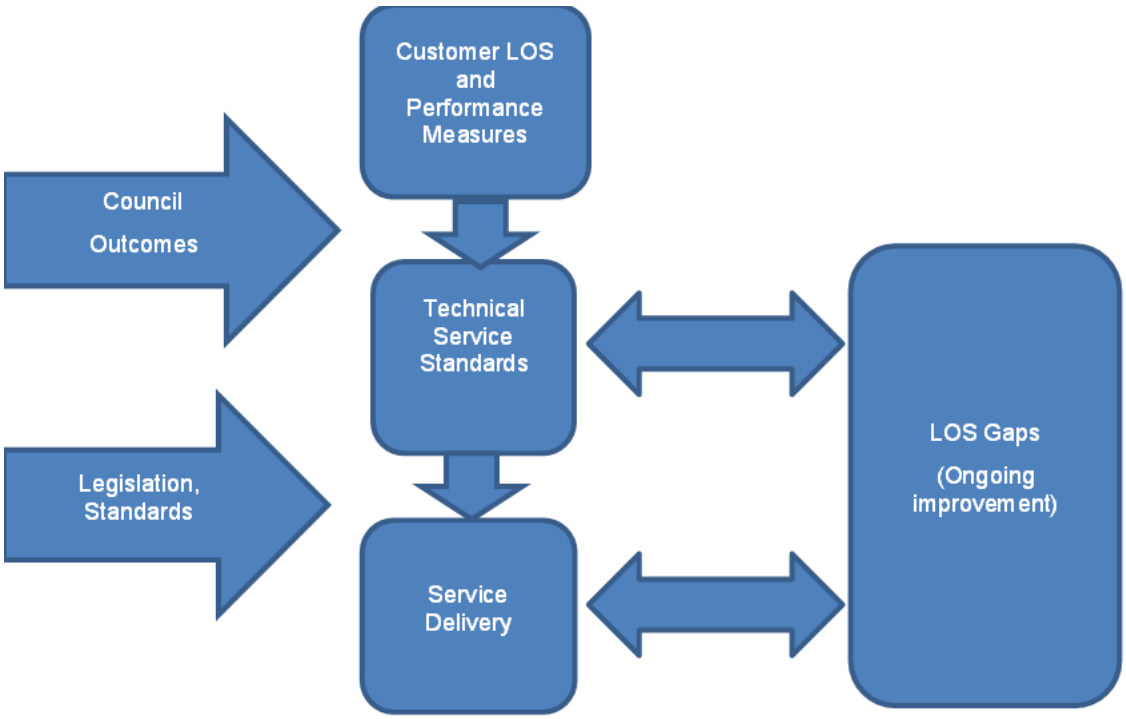


Figure 5.1 Key Aspects of the Service Level Setting Process

Community Outcomes: Provide guidelines for the scope of current and future services offered and manner of service delivery and define general levels of service which the community wishes to receive.

Customer Expectations: Information gained from customers on expected quality and price of services.

Statutory Requirements: Legislation, regulations, environmental standards and Council By-laws that impact on the way assets are managed (i.e.: resource consents, building regulations, health and safety legislation). These requirements set the minimum level of service to be provided.

Strategic and Corporate Goals: Provide guidelines for the scope of current and future services offered and manner of service delivery and define specific levels of service which the organisation wishes to achieve.

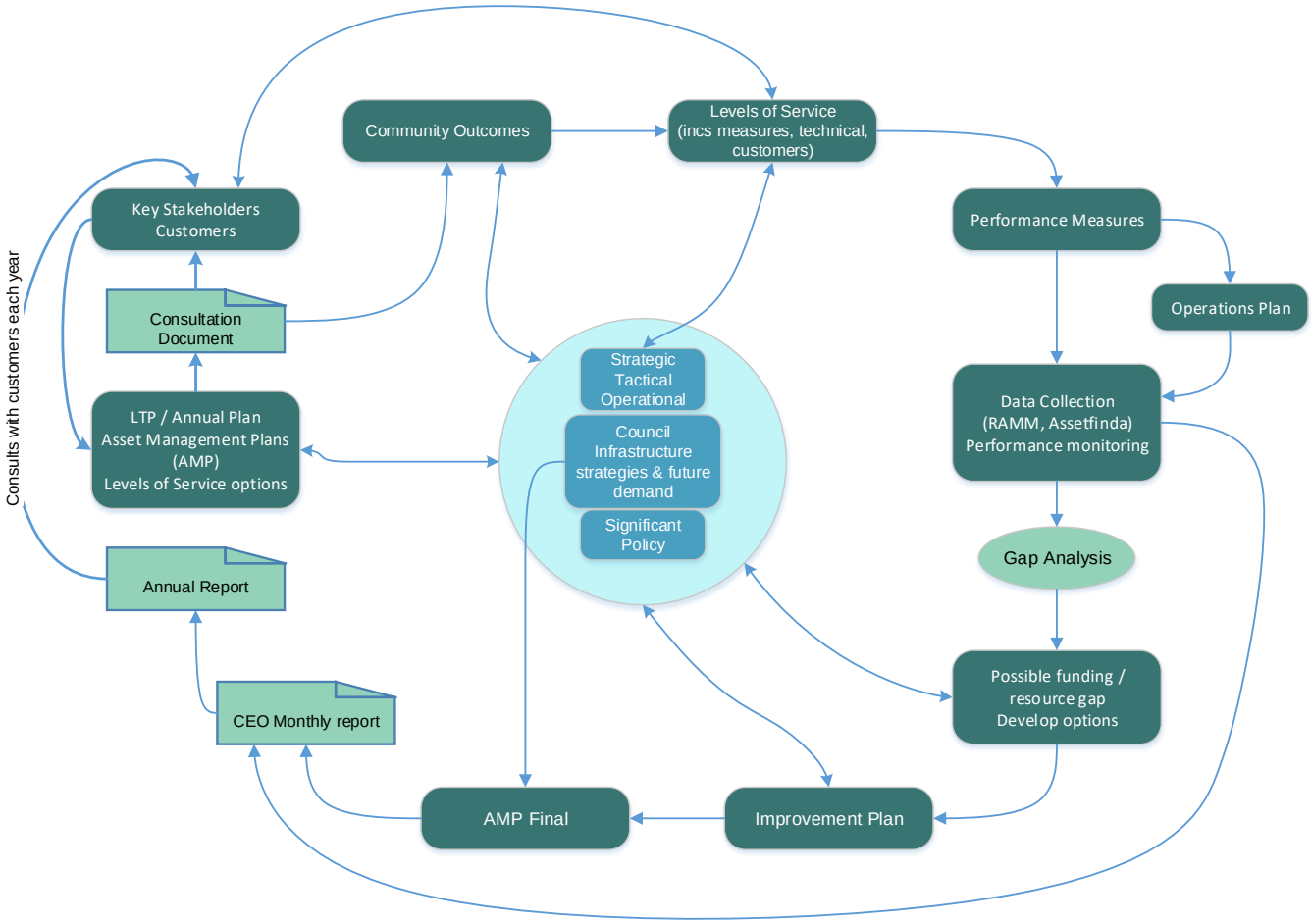


Figure 5.2 Consultation Process and Linkages

The above diagram identifies the consultation process and reporting requirements for levels of service. It also incorporates the links to strategic documents and gap analysis and how this links into the Annual Plan and Long-Term Plan (LTP).

5.2 Types of Levels of Service

5.2.1 Operational

Current operational levels of service for stormwater are scheduled in Table 5.1

The levels of service are “how we maintain our existing assets” for our customers.

Operational levels of service fall into two categories:

Technical (asset/product related) measures, which relate to the outputs the customer receives in terms of:

- Quality
- Capacity
- Quantity
- Environmental impacts
- Availability
- Cost/ affordability
- Legislative requirements
- Comfort
- Maintainability
- Safety
- Reliability and performance
- Hazard Effects
- Criticality

5.2.2 Service level Gaps

Service level gaps arise where actual service levels "fall short" of customer expectations. To deal objectively with short falls requires a clear distinction to be made between perceived and technical levels of service.

Technical service level gaps require actual levels of service to be compared with desired levels. From this point changes can be made in contract agreements to "close the gap" between actual and expected levels of service**.**

5.2.3 Tactical

The levels of service stated within Table 5.1 are "why we build new assets". These are thresholds which warrant the creation of a new asset in order to maintain an optimum level of service for the asset.

5.2.4 National Strategies And Plans

National Infrastructure Plan

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

A Vision for New Zealand's Infrastructure in the NIP is:

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

More specifically the vision for the Water Sector is:

- *The sector will be recognised for its mature asset management practices across all providers, underpinned by reliable and accurate data on the state and performance of the network to support better decision-making. A key focus is optimising the existing three waters network.*

The National Infrastructure Plan sets out six specific goals for water infrastructure, which have broad implications for local government in water infrastructure development, operation, management and reporting

Te Mana o Te Wai

Te Mana o te Wai refers to the vital importance of water. When managing freshwater, it ensures the health and well-being of the water is protected and human health needs are provided for before enabling other uses of water. It expresses the special connection all New Zealanders have with freshwater. By protecting the health and well-being of our freshwater we protect the health and well-being of our people and environments. Through engagement and discussion, regional councils, communities and tangata whenua will determine how Te Mana o te Wai is applied locally in freshwater management. Te Mana o te Wai has been part of the National Policy Statement for Freshwater Management since 2014, though there are changes to how the concept is described and how it must be applied.

National Policy Statement (NPS) – Freshwater Management 2020

The National Policy Statement for Freshwater Management 2020 sets out the objectives and policies for freshwater management under the Resource Management Act 1991. It came into effect on 3 September 2020 and replaces the National Policy Statement for Freshwater Management 2014 (amended 2017).

Government has noted this as Part 1, to be followed by:

- Water limit setting – includes non-point source discharges such as those from agricultural practices
- New regulatory tools – designed to properly manage limits

Requirements of the Freshwater NPS include:

- Manage freshwater in a way that 'gives effect' to Te Mana o te Wai:
- Improve degraded water bodies, and maintain or improve all others using bottom lines defined in the Freshwater NPS

- Avoid any further loss or degradation of wetlands and streams, map existing wetlands and encourage their restoration
- Tangata whenua involvement
- Every local authority must actively involve Tangata whenua (to the extent they wish to be involved) in freshwater management (including decision making processes) including in all the following:
- Identifying the local approach to giving effect to Te Mana o Te Wai
- making or changing regional policy statements and regional and district plans so far as they relate to freshwater management.

Taumata Arowai / Regulatory Context

In 2019, the Taumata Arowai-Water Services Regulator Bill was introduced to Parliament with the purpose to establish a new regulatory body by the same name. Initially, Taumata Arowai will be responsible for administering and enforcing a new drinking water regulatory system and a small number of complementary functions relating to improving the environmental performance of wastewater and stormwater networks.

A freshwater policy review is also underway. This will likely mean stronger regulations and more interregional coordination. We expect this would mainly lead to a stronger emphasis on protecting waterways.

National Environmental Standards for Freshwater

The National Environmental Standards for Freshwater 2020 (Freshwater NES) will set requirements for carrying out certain activities that pose risks to freshwater and freshwater ecosystems. Anyone carrying out these activities will need to comply with the standards.

The standards are designed to:

- Protect existing inland and coastal wetlands
- Protect urban and rural streams from in-filling
- Ensure connectivity of fish habitat (fish passage)
- Set minimum requirements for feedlots and other stockholding areas (to take effect in winter of 2021)
- Improve poor practice intensive winter grazing of forage crops (to take effect in winter of 2021)
- Restrict further agricultural intensification until the end of 2024
- Limit the discharge of synthetic nitrogen fertiliser to land and require reporting of fertiliser use (to take effect in winter of 2021).

The **Water Services Act 2021** has significantly impacted upon 3-waters management in New Zealand. The new water regulator, Taumata Arowai, has specific powers to regulate stormwater utility providers and regulators (including Regional Council regulatory responsibilities). The Water Services Act will mean additional monitoring and reporting requirements for the management of water supply, stormwater and wastewater activities. To date only water and wastewater have been included in the updated monitoring requirements with the timeframe to include stormwater not determined yet.

Key and Regulation– Implications for Asset Management

Legislation is established by Central Government and must be complied with at Local Government Level. Significant legislation and regulations affecting the water activities are provided in the table below. Council must comply with any relevant legislation enacted by Parliament. Commentary related to some of the key legislation is provided below.

Table 5.1 Legislation and Regulation Affecting the Stormwater Activity

Legislation & Regulation	Asset Group Impacted	*Impact Range
Water Services Act 2021	All	***
Biosecurity Act 1993	Water race Land drainage	*
Building Act 2004 (and amendments)	All	*
Central North Island Forests Land Collective Settlement Act 2008	All	*
Civil Defence Emergency Management Act 2002	All	***
Climate Change (Emissions Trading and Renewable Preference) Act 2008	All	*
Climate Change Response Act 2002 (and amendments)	All	**
Energy Efficiency and Conservation Act 2000	All	*
Environmental Protection Authority Act 2011	All	*
Epidemic Preparedness Amendment Act 2010	All	*
Hazardous Substances and New Organisms Act 1996	Water race Land drainage	**
Health Act 1956	Water, Stormwater, Landfill	***
Health and Safety in Employment Act 1992 (and amendments)	All	***
Historic Places Act 1993 (and amendments)	All	*
Heritage New Zealand Pouhere taonga Act 2014	All	***
Infrastructure (Amendments Relating to Utilities Access) Act 2010	All	**
Land Drainage Act 1908	Land Drainage Stormwater	*
Local Government Act 2002 (and amendments)	All	***
Local Government Act 1974 (and amendments)	All	**
Local Government (Financial Reporting) Regulations 2011	All	*
Local Government Rating Act 2002 (and amendments)	All	**
Local Government Rating Act 1979	All	*
Marine and Coastal (Takutai Moana) Act 2011	Water race Land drainage	*
Ngati Tuwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act 2011	All	*
Public Works Act 1981 (and amendments)	All	*
Railways Act 2005	Transport Utilities	*
Railway and Corridor Management and Safety Act 1992	Transport Utilities	*
Reserves Act 1977 (and amendments)	Community All	** *
Resource Management Act 1991 (and amendments)	All	***
Transit New Zealand Act 1989	Transport	*
Utilities Access Act 2010	All	***
Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010	All	*

Major Legislation Details

The legislation that has or will have the most effect on the Stormwater Activity is expanded in the following section.

Civil Defence Emergency Management Act 2002

The expectations under the CDEM Act 2002 are that Council's services will function at the fullest possible extent during and after an emergency, even though this may be at a reduced level. In addition, Council has established planning and operational relationships with regional CDEM groups to deliver emergency management within our boundaries. A further Amendment was made in 2016 (CDEM Amendment Act 2016) that helps recovery from emergencies to be more efficient and effective.

Stormwater management is regarded as a critical service and is given special consideration within Council emergency management procedures. Every effort will be given immediately after an event to at least provide adequate minimise the adverse effects of stormwater flooding.

Health and Safety at Work Act 2015

This recognises that a well-functioning health and safety system relies on participation, leadership and accountability by government, business and works.

The HSWA came into force on 4 April 2016 and sets out the principles, duties and rights in relation to workplace health and safety.

Council must ensure the safety of the public and all workers (including contractors) when undertaking the Stormwater Activity.

Land Drainage Act 1908

Common Law, the Land Drainage Act 1908 and amendments provide mechanisms for Drainage Boards to operate, for Local Authorities to carry out some drainage works, and for protecting the rights of private drain owners.

South Waikato District Council does not own or operate any land drainage schemes; however, stormwater detention is provided in some areas to attenuate peak flows following heavy rainfall.

Local Government Act 2002

Incorporating the Local Government Act 2002 and amendments, this act defines the purpose of local government as:
(a) to enable democratic local decision-making and action by, and on behalf of, communities; and (b) to promote the social, economic, environmental, and cultural well-being of communities in the present and for the future.

In addition to the general requirements of the Local Government Act there are some specific clauses that apply to Stormwater services.

- S125 places a requirement to assess water and other sanitary services from time to time
- S130 imposes an obligation to maintain water services and places limitations on the transfer or selling of assets
- S136 empowers Councils to enter into Contracts relating to provision of water services for periods not exceeding 35 years whilst maintaining control over the pricing of the service, retain legal responsibility for the service and being responsible for the development of policy related to the water services
- S137 empowers Councils to enter joint local government arrangements and joint arrangements with other entities for the provision of water services, with the same constraints as S136

Resource Management Act 1991

The RMA 1991 provides an environmentally conscious framework for Local and Regional Authorities to administer powers with regard to development and the management of natural resources. The RMA 1991 focuses on the effects of activities rather than on the activities themselves. SWDC's District Plan provides the rules that apply to subdivision, land use consent and development in conjunction (where necessary) with Waikato Regional Council's regional plans – (see above) that also provide for the control of urban stormwater discharges. The RMA also requires Council to:

- Sustain the potential of natural and physical resources to meet the reasonably foreseeable needs of future generation.
- Comply with the District and Regional Plan.
- To avoid, remedy or mitigate any adverse effect on the environment; and
- Take into account the principles of the Treaty of Waitangi in exercising functions and powers under the Act relating to the use, development, and protection of natural and physical resources.

5.2.5 Regional Policies & Plans

Ngati Tuwharetoa, Raukawa, and Te Arawa River Iwi Waikato River Act 2011

The legislation provides for improving the health and well-being of the Waikato River through a partnership arrangement between iwi and the Crown. Part of the legislation covers co-management arrangements for the Waikato River from Te Toka a Tia near Taupō through to Karāpiro and the first agreement was signed with Raukawa on 10 May 2012 at Pikitu Marae, south-west of Putāruru,

The Waikato River Authority is a statutory body formed under the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010 and is the sole Trustee of the Waikato River Clean-up Trust whose role is to fund projects that meet the purpose of the Authority.

Mana Whakahono Agreement

This is an agreement negotiated between the Taupō District Council and Ngāti Tūrangitukua and represents the aspirations of both the Council and Ngāti Tūrangitukua to work in partnership reflecting their status as mana whenua and an iwi authority by working together:

- on the management of reserves within the Mana Whakahono boundary;
- on matters under the RMA;
- to reduce the adverse effects of infrastructure on wāhi tapu;
- to establish the Tūrangi Co-Governance Committee that will benefit the broader public;
- to develop Council policies and regulations that directly affect the Ngāti Tūrangitukua rohe; and
- to establish and maintain agreed processes to enable a strong working relationship.

Waikato Regional Plan and Regional Policy Statement

The Waikato Regional Plan is fully operative and implements the Regional Policy Statement. The Plan provides direction regarding the use, development and protection of natural and physical resources in the Waikato region. The Plan contains modules covering Matters of Significance to Māori, Water, River and Lake Beds, Land and Soil, Air, and Geothermal Resources.

Effects on asset management include:

- Waikato River Authority requirements regarding taking water and discharging treated effluent
- Allocation and use of fresh water
- Adapting to climate change
- Integration of transportation and land use

5.2.6 Significant service delivered

Significant service for stormwater is to protect public health and property without compromising the environment this includes the effects of erosion.

This service level has been supported by the review of the Councils code of practise which takes into account the effects of climate change, as well as the work being done to identify overland flow paths in our urban areas.

5.3 Current Levels of Service

Stormwater Objective: To provide a stormwater system that, services the whole community, is affordable and managed at lowest possible cost, reduces the incidence of flooding impacts on people and property and is managed in an environmentally sustainable manner.

A * identifies that the level of service or measure is included in the LTP

Number	Core Value / Key Service Criteria	Level of Service	How we measure it (customer)	How we measure it (technical)	Current LoS Performance	How We Monitor Performance	Target LoS Medium Term (1-3 years)	Target LoS Long Term (4-10 Years)
ST.01, ST.02	Economy	We manage the stormwater network to protect public health and property without compromising the environment. We mitigate adverse effects of stormwater discharge on the environment and minimise erosion caused by the stormwater network.*	The number of flooding events that occur in a territorial authority district.	Number of flooding events in the district 0 properties each year are affected by flooding inside the habitable dwelling as a result of stormwater originating from public land such as parks, roads and reserves. (this measure excludes properties in designated flood hazard zones)*	no dwelling that had flooding inside of the dwelling	Analysis of flooding incidents reported to Council. Service requests	0 properties each year are affected by flooding inside the dwelling as a result of stormwater originating from public land such as parks, roads and reserves. (this measure excludes properties in designated flood hazard zones)*	0 properties each year are affected by flooding inside the dwelling as a result of stormwater originating from public land such as parks, roads and reserves. (this measure excludes properties in designated flood hazard zones)*
ST.03 Fault response time	Percentage of failure responded within the specified time	Median response time from Council receiving notification of the fault to the time that service	• Service requests	Analysis of service requests and contactors KPI	Median response time to attend to a flooding event	• Analysis of contract records and	Fault response time	Percentage of failure responded within the

Number	Core Value / Key Service Criteria	Level of Service	How we measure it (customer)	How we measure it (technical)	Current LoS Performance	How We Monitor Performance	Target LoS Medium Term (1-3 years)	Target LoS Long Term (4-10 Years)
Median response time from Council receiving notification of the fault to the time that service personnel reach the site in an emergency event • ≤1hr Median time from Council receiving notification of the fault to the time that service personnel confirm resolution of the blockage or other fault. • Within 4 hrs		personnel reach the site. If there is a civil defence event identify it and discuss the impacts of it.	• Service requests		• ≤1hr (90% of times) Median time to resolve the problem • Within 4 hrs (85% of times)	• service requests • Analysis of contract records and service requests	Median response time from Council receiving notification of the fault to the time that service personnel reach the site in an emergency event • ≤1hr Median time from Council receiving notification of the fault to the time that service personnel confirm resolution of the blockage or other fault. • Within 4 hrs	specified time
ST.04 We manage the stormwater network to protect public health and property without compromising	The number of complaints received by a territorial authority about the performance of its stormwater system, expressed per	The number of complaints received by a territorial authority about the performance of its stormwater system, expressed per 1000 properties connected to the territorial authority's stormwater system.	Less than 8	Less than 8	Less than 8	• Analysis of contract records and service requests	Less than 8	Less than 8

Number	Core Value / Key Service Criteria	Level of Service	How we measure it (customer)	How we measure it (technical)	Current LoS Performance	How We Monitor Performance	Target LoS Medium Term (1-3 years)	Target LoS Long Term (4-10 Years)
the environment	1000 properties[9] connected to the territorial authority's stormwater system.							
ST.05	We will comply with our Resource Consent for discharge from our stormwater system.	Number of abatement notices received by Council in relation to Resource Consents for discharge from our stormwater system.	Numbers of Abatement notices	Correspondence from Regional Council	Consents are fully compliant	Correspondence from Regional Council	Consents are fully compliant 0 Abatement notices,	Consents are fully compliant 0 Abatement notices,
ST.06	We will comply with our Resource Consent for discharge from our stormwater system.	Number of infringement notices received by Council in relation to Resource Consents for discharge from our stormwater system.	Numbers of: Infringement notices	Correspondence from Regional Council	Consents are fully compliant	Correspondence from Regional Council	Consents are fully compliant 0 Infringement notices,	Consents are fully compliant 0 Infringement notices,
ST.07	We will comply with our Resource Consent for discharge from our stormwater system.	Number of enforcement orders received by Council in relation to Resource Consents for discharge from our stormwater system.	Numbers of: Enforcement orders	Correspondence from Regional Council	Consents are fully compliant	Correspondence from Regional Council	Consents are fully compliant 0 Enforcement orders	Consents are fully compliant Enforcement orders

[9] Note that Council's stormwater network drains the roading network so there are no properties who connect to the stormwater network. For the purposes of this performance measure, we have considered that each property within the district benefits from the stormwater network and is therefore "connected" to our stormwater network.

Number	Core Value / Key Service Criteria	Level of Service	How we measure it (customer)	How we measure it (technical)	Current LoS Performance	How We Monitor Performance	Target LoS Medium Term (1-3 years)	Target LoS Long Term (4-10 Years)
ST.08	We will comply with our Resource Consent for discharge from our stormwater system.	Number of convictions received by Council in relation to Resource Consents for discharge from our stormwater system.	Numbers of: convictions	Correspondence from Regional Council	Consents are fully compliant	Correspondence from Regional Council	Consents are fully compliant 0 convictions	Consents are fully compliant 0 convictions
T2	Economy	Adequate Stormwater provision to minimise erosion from the Stormwater network	Fewer than 10 justifiable complaints of erosion caused by the Stormwater network	There are less the 10 complaints of erosion caused by the stormwater network	0 complaints of erosion caused by the stormwater network .	Analysis of service requests regarding erosion	There are less the 10 complaints of erosion caused by the stormwater network *	There are less the 10 complaints of erosion caused by the stormwater network *

Table 5.1: Mandated Levels of Service

5.4 Reliability and Security of Supply

The Local Government Act requires us to plan and provide infrastructure assets that are resilient to the effects of natural hazards. For the Stormwater Activity this will mean focusing on mitigating flood damage risk. In addition, the nature of the Stormwater Activity is that failure is only apparent when demand is highest – which is in periods of intense rainfall. Therefore, resilience in the context of stormwater network is predominately centered around emergency preparedness.

The following comments relate to reliability and security of the installed assets and are not intended to cover major disruptions such as seismic activity. Response planning both for typical failures and for major events is the subject of an Emergency Response Plan (to be developed). This has been prepared under the guidelines of the Risk Assessment.

Asset performance failures, other than in terms of capacity, generally occur due to blockages. While design measures are provided to minimise this, debris carried by a stormwater flow may block catchpit grates at the entry points to the system, causing overflows to occur even though the reticulation system is capable of carrying the volume being discharged.

Blockages are avoided whenever possible, and rectified promptly, by routine maintenance. This includes cleaning of inlet grates and openings, which is stepped up when seasonal conditions may create additional debris such as leaves, and inspection of known critical points during severe rain events.

5.5 Consultation

Levels of service consultation for the Stormwater Asset is included in the consultation process for the Long-Term Plan (LTP) and to a lesser extent the annual plans.

At present resident contact is generally on a one on one situation in the handling of customer complaints or in council and community board meetings. Consultation on the 2024 LTP will provide the community an opportunity to have input into the levels of service going forward. Submissions and suggestions for desired project and improvement work for Council consideration and inclusion into the LTP are called for during consultation.

5.6 Changes to Level of Service

Capital expenditure to improve the level of service includes;

- Reticulation upgrades
- Treatment and Reticulation Renewals
- Installation of Treatment devices
- Flood prevention

Operational Projects to improve the level of service include the network modelling program this underpins the overland flow path mapping which identifies the potential hazards to the community to overland flows in a 1:100-year storm.

For a full list of capital projects: (see the Lifecycle and Finance section of this AMP).

Pipe upgrade investigations for areas that have historic flooding issues.

District quality improvement of discharges to receiving environments in line with the requirements of the Comprehension Discharge Consents in the form of Enviropods and CDS units.

The formation of detention ponds in areas that are shown to be at flood risk, detention ponds utilising existing reserve space if acceptable to the local community.

- Network Modelling in the form of Overland Flow paths to determine at risk properties and to drive future network improvement programs.

5.7 Service Level Measurement

Service level achievement is measured by way of service request performance and information gleamed from monthly contract meetings with contractors. The community is also able to submit to Council during annual and ten-year plan development.

Resource consent compliance is reported yearly by the Waikato Regional Council after they undertake onsite audits and reply to complaints and review Councils annual compliance report which is required as a condition of the Comprehensive discharge Consents held by Council.

Key performance indicators are reported to council on a monthly basis and overall asset performance is provided in the annual performance report.

Council also report against performance to the Tūwharetoa trust board who are interested in discharge quality and system performance, as well as maintenance regimes.

6.0 Growth And Demand

This section sets out the factors impacting on the management and development of the assets to meet the requirements of growth and other demands place on the Stormwater assets as follows:

- Growth trends, increasing industrial and residential growth in the District
- Land-use strategies (residential, industrial, retail and rural-residential)
- Changes in Regional policies i.e., Healthy Rivers
- Consumption and use patterns
- Future demand for treatment of Stormwater driven by technological changes
- Demand management strategies; and
- Climate change impacts on demand.

The latest census data available to TDC is from 2018[10] has revealed the district as having an estimated population of 37,203 compared to an estimated 32,097 in 2013 this represents a 15.9% total increase.

Table 6.1: Population Census data 2018

Census Data	2013	2018
Population	32,097	37,203
Occupied Dwelling	13,395	14,904
Unoccupied dwelling	6,171	6,588
Dwellings under construction	78	159
Total Private Dwellings	19,644	20,844

6.1 Future Demand Drivers

Asset planning necessarily involves a long-term approach that takes account of many factors and must also align with Council's Long Term Plan projections.

In addition to the Asset Management Plans, the Local Government Amendment Act requires Council to develop a 30 Year Infrastructure Strategy that addresses key issues and identifies necessary investment in new or upgraded infrastructure; replacement of ageing infrastructure and related operations and maintenance expenditure.

The Asset Management Plans comply with the Purpose of Local Government, stated in LGA 2012 as "to meet the current and future needs of communities for good quality local infrastructure, local public services and the performance of regulatory functions in a way that is most cost-effective for households and businesses".

- Future demand drivers for reticulated Stormwater services in the Taupō District are outlined below:
- Climate change projections
- Demographic projections, including population growth/decline, age distribution and location
- Economic development projections

[10] Census 2023 data not yet available

- Demand projections, including customer expectations and ability to pay. Conversely, demand management may help to reduce or delay expenditure on extensions and upgrades to infrastructure, extend useful service lives and also to reduce operation and maintenance costs.
- Changes to land use (e.g., conversion from forestry to dairy production)
- Compliance with existing and projected legislation (e.g., drinking water standards, public health and safety), national strategies (e.g., transportation and related funding provided) and regional strategies (e.g., higher standards regarding environmental effects)
- Agreed Levels of Service and projected changes thereto
- Replacement of ageing infrastructure prior to assumed failure, which would interrupt service delivery and incur related consequences and costs.
- Ensuring sufficient capacity to cope with total demand and the variability of demand (e.g., peak rainfalls for short periods)
- Managing demand appropriately to control costs and contribute to sustainable management of natural resources.
- Efficient and effective service delivery mechanisms (e.g., contracting, shared services)
- Introduction of new technology, where appropriate, with higher performance and more cost effective
- Affordability for the community and the mechanisms for creating revenue.
- Lifecycle management, which aims to optimise expenditure throughout the operating life of the infrastructure, including provision, operation, maintenance and disposal of assets (see Chapter 4)
- The concept of sustainability and cultural considerations (including Tangata Whenua)
- Resilience or the ability to maintain service delivery by alternative means following a major disruptive event, such as power failure, earthquake, volcanic eruption or flooding and to restore normal services as quickly as possible thereafter.
- National policy statements are issued by central government to provide direction to local government about how to carry out their responsibilities under the Resource Management Act 1991 and Water Services Act 2021 when it comes to matters of national significance e.g. National Policy Statement for Fresh Water Management.

In addition to the above, infrastructure planning should allow a degree of flexibility to allow adaptation to changing and unforeseen circumstances.

Growth and Forecasting Assumptions

The table below identifies a number of assumptions that apply to planning across the organisation and the stormwater activity in particular.

A revised Growth Model was prepared in 2022 “Growth Model 2022 – 2060 which was prepared using the latest population figures and updated assumptions to further guide and inform TDC.

Table 6.2: Growth Assumptions

Assumption	Relevance to this activity
Growth model assumptions	Population projections occur in-line with the medium growth scenario developed using growth model developed in-house. Growth Model 2022 -2060 The growth assumptions are significantly higher than previous growth assumptions but possibly more likely.
Growth Areas	We plan to provide for growth in the catchment areas are set out in the growth model. These are Mangakino, Kinloch, Taupō, Tūrangi, Omori and Whareroa.
Impact of the growth model	The 2023 growth model shows an increase in growth compared to the previous growth model. The areas where increases are most impactful are Taupō, Mangakino and Tūrangi. Kinloch is growing rapidly however growth is limited by the Structure Plan.

6.2 Summary of Existing Capacity

Council has undertaken modelling works for catchments across the district such as the Taupō CBD and Industrial areas where future growth or network capacity is not sufficient. Council has not undertaken modelling of the entire network due to the cost but may need to undertake this work in certain areas to support the identification of over land flow paths and their effects on private property.

Council uses its service request system as well as contract reports for the three waters contract to determine network utilisation and capacity issues. These sites are then further investigated to determine solutions.

Network demand can be affected by things such as climate change, which has led Council to change its code of practice in regard to network provision to 1:10 network 1:100 flow path provision. Due to climate change, large portions of Councils network is not now appropriately sized, but due to the cost of increasing the network capacity Council has made the decision not to undertake upgrades unless properties are experiencing flooding or for growth and thus rely on overland flow.

Areas such as parts of the Taupō CBD while there would be impact from 1:100-year event the need for upgrading is mitigated to a degree by the fact that stormwater will mostly be handled by the overland flow paths (predominantly roads) to the Lake, and so costly upgrades of the network can be delayed. (Some areas will require mitigation) Council has identified where overland flow will enter the lake and undertaken works to mitigate any possible erosion impacts.

After the validating of overland flow paths these will form part of Councils hazards register. Council records information regarding capacity issues, such as manhole lids lifting and flooding incidents and uses this information to plan network upgrades. Council considers that the accuracy of data on the maintenance of the network is sufficient, but more work needs to be done to determine the condition of assets which will drive the renewal program and so has programmed a CCTV program to inspect around at least 10% of the piped network per year.

6.3 Climate Change

There has been considerable work undertaken at a national level on the possible effects of climate change and sea level rise. The New Zealand Government has published projections of climate change to 2080. The general projected trend in the published projections for the District is of winters being wetter and the other seasons being drier. More frequent and more intense rainfall events have been

predicted. By 2090's the published projections show that in the Waikato region the typical temperature rise is expected to be up to +2.3 degrees Celsius and the region wetter by 20%.

The projected impacts of climate change are likely to become more noticeable towards the end of the current planning period, and have greatest relevance to Wastewater, Stormwater and Water assets.

The New Zealand Climate Change Office has released a report on the impacts of the changing climate in New Zealand which concluded:

- Higher temperatures, more in the north than in the south
- Rising sea levels
- More frequent extreme weather events such as droughts and floods
- A change in rainfall patterns – higher rainfall in the west and less in the east

The projected key climate influences on the Council's Stormwater Activity are detailed in the following table.

Table 6.1 Key Climate Influences on Council's Activities

Activity	Influences	Effects
Water Services	Changing weather patterns - Longer dry spells and higher temperatures will lead to more hot days during summer	Change in water usage patterns – higher water demands in summer
Wastewater Services	Higher intensity rainfall events	More water inflow and infiltration into the wastewater system, with potential subsequent increases **in** the risk of wet weather overflow events
Stormwater	**Higher intensity rainfall events**	**Increase Stormwater inflow to the wastewater system** **Increased infrastructure capacity to cope with the increased rainfall intensity** **Increased risk of flooding**
Emergency response/ Rural Fire	Seasonal swings in moisture availability or excess	Increased exposure to fire and other weather-related matters has potential to increase costs to the community

The impact of the greater frequency of any rain event is an increased risk of flooding in susceptible areas of the network.

More frequent ponding is likely to occur in low lying areas and gullies. This will require more robust assessment and mitigation of stormwater flooding risk at the building and subdivision consent stage if greater stormwater damage losses are to be avoided with new developments. However, it is only in areas where more frequent flooding of habitable residential and commercial buildings is likely that Council would propose to investigate mitigation options.

Problems could also arise with sedimentation in pipes due to low to no flows during extended dry periods. This could lead to an increase in maintenance being required to ensure pipe capacities are maintained for higher flow periods.

Design of all new stormwater infrastructure will consider climate change. Modelling will be utilised, using the most up to date rainfall predictions from NIWA and, as data is collected, with comparison against data collected by Council rain gauges, to assess the feasibility and efficacy of capital projects to manage additional runoff. Areas likely to be targeted will be those already experiencing flood damage effects, with other areas being looked at in turn. This modelling analysis will also be used to target upgrades to the existing network, as well as new infrastructure, for the largest benefit.

6.3.1 Overview of Sustainability

Sustainability is the capacity to endure. In the context of asset management, it is about meeting the needs of the future by balancing Council outcomes or needs when making decisions today.

Sustainable Management is at the core of the Resource Management Act, which governs virtually all aspects of resource use in New Zealand.

Sustainable solutions involve a balanced consideration of social, environmental, economic and cultural factors.

Sustainable Development meets the needs of the present without compromising the ability of future generations to meet their own needs.

The concepts of Sustainability drive the Life Cycle Management of infrastructure, as described in the various AMPs and are the guiding principle of the new WRC SW Management Guidelines. Non-asset-based options are also considered where appropriate.

6.4 Demand Management

Demand management is:

"……*the modification customer demands for services in order to maximise use of existing assets or to reduce or defer the need for new assets."*

A unique feature of demand management in Taupō District is the local soil structure that allows high levels of ground soakage, but also has the ability of becoming Hydrophobic after long periods without rainfall. (See results of Paenoa Rd event 2011)

Council in 2009 reviewed its Code of Practice for the development of land to allow for the effects of climate change as well as increasing the capacity size requirements of new infrastructure.

Taupō CBD

Council through the District Plan has provided rules that identify that most domestic properties are to dispose of stormwater up to a 1:10 year event on site. The district plan also has selected areas within the industrial and CBD areas of the district where more intensive development may occur, and which may require additional infrastructure to service.

As properties can still discharge to ground due to the pumice soils, they still have an option when considering developing their sites. Levels of service for this area to date have not been compromised but it is inevitable that developers will want to increase coverage on their sites and will look to Council to provide connections. The provision of this infrastructure will depend on the cost of the network upgrade verses the cost of onsite soakage in the future.

Most, if not all of the central CBD is now hard surface, and a large portion of the buildings are connected to the network. If storm events exceed the current network capacity the over land flow path modelling identifies that the roads act as a conduit to transport Stormwater to the Lake or river.

The Lidar survey data identifies that the over land flow paths (mainly roadways) can cater for large flows and where flow crosses private property these sites will be investigated during the validation process.

Further modelling of the network as part of the over land flow path identification works will also assist in determining future capacity issues in these areas.

This Asset management plan will endeavour to provide the required infrastructure as required by the Growth management plan but must also consider Councils current funding strategy.

Industrial Area Taupō

Areas such as the Taupō industrial area, bounded by Manuka and Matai streets are progressively being built on with buildings having total site coverage. There are still a number of these properties disposing of Stormwater on site, usually by soak holes underneath the building envelope.

Council staff has previously investigated the cost of providing increased service capacity to enable site connections. Part of the catchment would travel south to dispose into the gully adjacent to crown park which would mean the downstream infrastructure would also require increased capacity and the residual catchment would need to drain north into the Tauhara soakage pond. At this stage this is not creating levels of service problems due to the good soakage, but as site development intensifies there may be increased demand to connect to the network.

Currently there has not been a demand to increase coverage over these sites as more industrial and light commercial properties have come onto the market. So growth at this time does not trigger this investment so the project has been pushed out of the thirty year plan and will need to be considered in future Amp documents.

TDC currently uses the following techniques to manage demand for Stormwater:

- Comprehensive discharge, resource consent requirements and conditions.
- Education through increased customer consultation.
- District Plan.
- Code of Practice
- Encouragement of sustainable land use practises/Water Sensitive Design Principles
- Education in Schools plus paper and radio
- Non network-based demand measures

Stormwater infrastructure for new developments is supplied by the developer. Council's updated code of practice includes climate change as well as best practice stormwater design principles.

Council's intention is to use where possible land-based disposal systems where stormwater quality can be enhanced. Where green fields development occurs Councils, comprehensive consent requires that catchment management plans are developed. Council will also continue to develop structure plans that identify the location and size of developments which will impact the ability of areas to develop.

Council is now looking to utilise the numerous gully systems to provide quality improvement and disposal capacity as the gully systems have considerable capacity to store and soak large rainfall events but care must be taken to ensure this soakage potential is not lost during any earthworks.

6.5 Meeting increased/changing demand

Increased/changing demand can be met by using several methods including.

- Capital improvements
- Operational strategies
- Developer provided improvements
- Use of ephemeral gullies
- Rain gardens
- Use of roadside swales

6.5.1 Non Asset Solutions

Increased/changing demand can be met by using several non asset methods including;

- On site disposal
- Ongoing education

6.5.2 Capital Expenditure Due To Changes In Demand

The development of new lots in the district in the coming ten years will require new infrastructure as well as necessitating the upgrading of the current network to cater for the additional demand.
Developers are responsible for providing infrastructure for new developments and the increasing of capacity in the existing network if required.
These upgrades may incorporate:

- The use of storage and detention systems
- Low impact urban design
- Above ground stormwater solutions including rain tanks and rain gardens as well overland swales.
- The use of ephemeral gullies for detention, quality improvement and for avoiding erosion.
- Modelling of the network affected.
- Use of best practise Stormwater disposal

Council has not provided any capex funding for increases in demand in the short term as this will be primarily developer driven. Capex has been provided for quality improvement upgrades and back log demand where the exiting network is below capacity due to climate change or other factors.

6.5.3 Operational expenditure due to changes in demand

The development of new lots in the district in the coming ten years will have an impact on operational costs.

Operational/maintenance expenditure – there may be a change to the cost to operate or maintain Councils assets due to growth or to changes in demand. There may also be increased operations and maintenance due to new assets created. E.g. increased maintenance costs of new Stormwater infrastructure built to cater for growth (swales).

Council will see an increase in operational costs as Council obtains additional Stormwater reserves and gully systems with detention ponds, and gully walls that will require planting mowing and pest plant removal as well a new quality improvement devices that will require regular cleaning.

Budget has been provided for increased maintenance across new developments in the district which reflects the increasing use of swales/raingardens and similar devices, as these are maintenance intensive.

Funding of this expenditure is discussed in the financial section of this asset management plan (section 9 Financial Summary) and strategies for operation and maintenance of assets in section 8 Lifecycle Management Plan.

6.6 Plans Related to Growth

In addition to the general Council planning documents such as the District Plan there are other planning documents that relate to demand in relation to the Stormwater asset. These include:

Growth Management Taupō 2050 - The Council's asset management plans need to be aligned with the strategy to ensure more efficient and affordable provision of infrastructure for the identified growth areas.

- Taupō Urban Structure Plan
- Taupō Town Structure Plan
- Kinloch Structure Plan
- Taupō West Structure Plan
- Southern structure Plan
- Commercial Industrial structure Plan

6.6.1 Growth management strategy

In June 2006 the Council adopted Taupō District 2050 (TD2050) and this was amended in 2018,as the Growth Management Strategy for the District. The growth management strategy identifies where urban growth is anticipated so that land use and infrastructure planning can be aligned. TD2050 has been incorporated into the District Plan by way of plan changes, particularly Plan Change 21 which identifies the future urban growth areas.

The Growth Model[11] was updated and revised in September 2022 and this has been used to inform this AMP document.

This strategic approach to integrating land use and infrastructure is intended to be supported by subsequent structure planning of the urban growth areas to identify the detailed settlement pattern and infrastructure servicing. Council has prepared structure plans for:

- Kinloch
- Mapara Valley
- South-western Bays Settlements (including Tūrangi); and
- Commercial and industrial areas within Taupō Township

The Taupō township and its environs are growing, and the Taupō District Council (TDC) needs to plan ahead and manage urban growth in a sustainable way that allows it to continue to grow and to thrive. Robust population projections and a good understanding of residential housing construction in the district provides the evidence-base for effective decision-making. The growth model and the projections it produces enable TDC to:

- identify future growth areas and the extent and timing for zoning new land
- understand the need and scale of new infrastructure to service new growth areas
- estimate the development contributions payable in new developments for new infrastructure • support asset management plans and the Long-Term Plan (LTP)1
- assess the development capacity of the residential housing sector
- support the release of Council-owned land starting with the East Urban Lands (EUL)
- fulfil reporting requirements including those required by the National Policy Statement on Urban Development (NPS-UD)3
- support the housing strategy for the Taupō district through a housing needs assessment
- provide evidence to support inclusionary zoning, if this is investigated in the future
- support various policies such rates remissions and funding applications

The growth model incorporates SNZ data on Taupō population from 1998 to 2021 by gender and age group. The 2021 population estimates are taken as the base year for all the projections produced by the growth model. The projections cover the period 2022-2060 and therefore cover the short, medium and long-term. The NPS-UD guidelines recommend that projections are divided into three time-periods as shown in Table 2.

Table 6.4: Time periods recommended in the NPS-UD guidelines

NPS-UD Guidelines		Growth Model Time periods
Short Term	0-3 years[12]	2022-2024
Medium term	4-10 years	2025-2034
Long term	11-30 years	2035-2060

[11] Growth Model 2022-209 September 2022 Version 2

[12] From Base year 2021

Given the inherent uncertainty in all long-term projections, it is standard practice to produce multiple scenarios, including a minimum and maximum range, to show the impact of changes to one or more input parameters relative to the medium scenario. A medium, low and high scenarios were produced for all 23 SA2[13] units and time-periods.

Statistical Area 2 unit	Community Catchment
Acacia Bay	Taupō Township
Bird Area	
Brentwood	
Hilltop	
Mountview	
Nukuhau-Rangatira Park	
Richmond Heights	
Tauhara	
Taupo Central East	
Taupo Central West	
Waipahihi	
Waitahanui	
Wharewaka	
Tūrangi	Tūrangi
Mapara	Mapara (Kinloch)
Marotiri	Marotiri (Mangakino)
Lake Taupo Bays	Lake Taupō Bays
Ohakuri	Northern Rural Communities
Wairakei-Broadlands	
Kaimanawa	Eastern Rural Communities
Rangataiki	
Taharua	
Te More	
Lake Taupō	Not Applicable (Removed)

Table 6.5: SA2 Units for Taupō District

To identify the future housing needs in Taupō, the population projections need to be translated into residential household units (households). Household projections guide policymakers to zone appropriate areas for residential housing development purposes and to plan for the required infrastructural services.

[13] SA2 units agglomerate similarly sized populations typically no larger than 2000 persons

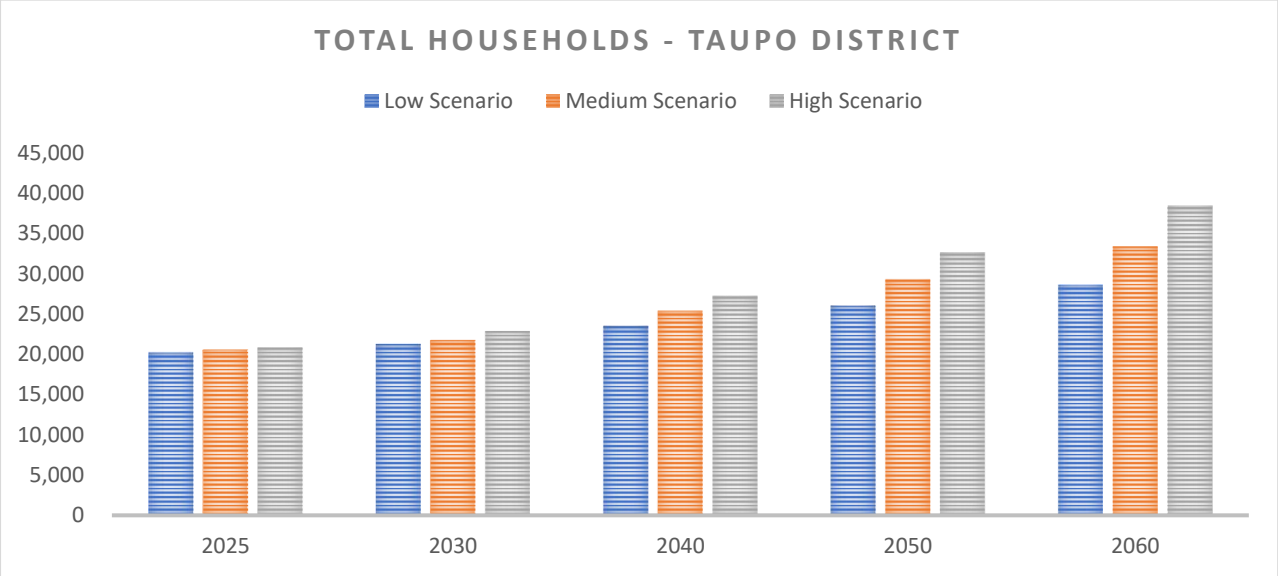


Figure 6.1: Projected Household Growth for each Scenario

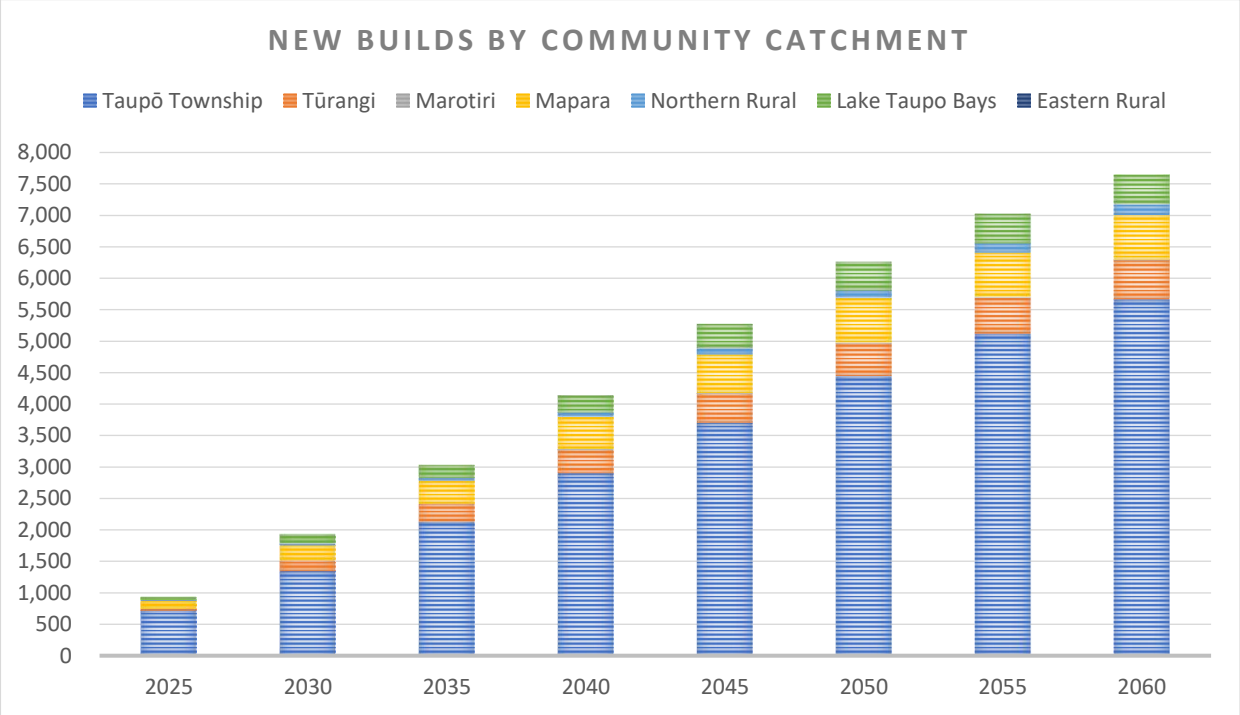


Figure 6.2: Projected New Builds by Community

The model accounts for differences in average household size and occupancy rates observed across the Taupō district by using SA2 unit-specific data to produce separate household projections.

6.6.2 Occupancy Rate

The long-term trend for more than fifty years has been for a decrease in the number of people per dwelling. This is true across all ages. Occupancy among aging populations is especially low, with widowed partners typically living alone.

Council uses a Household Unit Equivalent (HUE) to convert between population figures and the number of dwellings.

The average household size is another key variable required to estimate future households from population projections. The average household size is a measure of the number of residents living in a household. Several factors influence this variable including household composition, residents' age, their income (or more precisely, wealth) and ethnicity.

Since cohorts with similar ethnic, demographic and economic backgrounds tend to reside in the same area, there are noticeable differences in the observed average household size between SA2[14] units in the Taupō district. SNZ Census 2018 shows that the average household size in the Taupō district is 2.7 but ranging between 2.2 in Wharewaka and 2.9 in Wairakei-Broadlands.

In Taupō District, this figure is complicated by holiday homes which form approximately 30% of the district's dwellings. This figure is difficult to fully determine due to the difference between out-of-town ratepayers and what is likely to be deemed a holiday home.

However, as a consequence of this high number of possibly empty homes for a significant part of the year Council needs to consider peak usage and populations when determining demand. This peak demand is particularly relevant when considering demand on infrastructure, such as water and wastewater outlined in detail in the *DC Policy* and *Taupō Growth Model*.

Household numbers are generally not relevant for the stormwater assets, but lot numbers are as this will determine impervious areas in new subdivisions.

Total Population					
2021 = 41,040					
	2025	**2030**	**2040**	**2050**	**2060**
Low Scenario	42,100	44,300	48,900	54,100	59,400
Medium Scenario	42,500	45,800	53,000	61,400	70,200
High Scenario	42,900	47,300	57,200	69,000	81,800

Table 6.6: Population Forecast Taupō District

6.6.3 Estimate of New lots over Planning Period

The Council has identified as part of its growth strategy the number of lots currently available for growth and their location. The larger share of greenfield land is in the Taupō township, Acacia bay & Kinloch. The EUL development consists of 40% of all residential zoned greenfield land in the Taupō township. The projected residential houses that can be built on these land parcels in any given year is constrained by the construction capacity available with Taupō district.

In the growth model developed by Council, an average annual figure of 30 subdivisions per year was assumed for the period 2022-2025 for the medium scenario. This figure was assumed to increase by 30% between 2030-2039 and an additional 30% between 2040-2050. This equates to an average annual infill developments of 50 per year by 2040. A margin of 10% relative to the medium scenario was assumed for the high and low scenarios, as shown in Table below.

		Scenario		
		Low	**Medium**	**High**
Increase in infill development from 2022-2025 average	**2030 - 2039**	20%	30%	40%
	2040 - 2050	20%	30%	40%

Table 6.7: Assumptions for projected increase in infill developments

[14] SA2 means Statistical area 2 and are used by Statistics NZ to agglomerate similarly sized populations together representing communities that interact socially and economically.

	Estimated Lots
East Urban Lands	1600
Wharewaka East Ltd (Ngā Roto)	446
Brentwood	168
Lakeside Brentwood	350
Vineyard on Huka falls	36
Acacia Bay	526
Kinloch	582
Seven Oaks	85
Kuratau/Omori	81
Mohi	50
Whareroa North	160
Five Mile Bay site A and C	440
Nukuhau Private Plan Change	780
Tūrangi	254
Total	**5558**

Table 6.8: Inventory of Greenfield lots in Taupō District

6.7 Externally Mandated Changes

Any externally mandated changes are likely to be driven by increased compliance conditions when resource consents are renewed. The current assessment criteria applied by Waikato Regional Council include whether an application:

- Conflicts with any policies or plans
- Considers the principles of the Treaty of Waitangi
- Considers Te mana o Te Wai

Considers and promotes other matters, such as:

- Efficient use of natural resources
- Public access to the Coastal Marine Area, lakes and rivers
- Protection of wildlife habitats
- Traditional Māori values
- Heritage sites and areas
- Maintenance and enhancement of the environment
- Will have positive or negative effects on the environment
- Has alternatives
- May breach water quality standards

6.8 Community Expectations

- Customers are primarily concerned with expansion of existing network services such as:
  - Pipe network
  - Overland flow path provision
  - Quality improvement
  - Ephemeral gully development
  - Health & Safety

6.9 Tourism/Non-Resident Demands

The effect of tourism is to increase the population and perceived growth over short periods.

This taken into account in that we design stormwater assets for peak demand and we base this on lots rather that permanent population.

Overall Tourism does not have a significant impact on Councils reticulated network, but Tourism has an impact on the decisions around stormwater quality and the discharges into the receiving environments.

The local community and tourists to the district are no longer satisfied with seeing floatable contaminants coming from stormwater outlets, especially, but not limited to those on the Taupō lakeshore.
This in part has driven the quality improvement program. It has also driven the provision of adequate litter service to make sure that the community and visitors have the ability to discard material appropriately when that are out and about.

As the Lake is also the main tourist attraction and is also used for a number of high-profile events it is imperative that local lake and river quality is not only maintained but enhanced.

7.0 QUANTIFYING & MANAGING RISK

7.1 Introduction

Risk in its various forms is managed for all of Council's activities, not just the asset infrastructure. This chapter of the AMP identifies how risk is managed corporately and then how asset risk is managed.

Risks are events that may compromise the delivery of council's strategic objectives.

The risk management context:

- Risk management is a core business driver that influences all decision making and is not an isolated process.
- The corporate risk framework is applied across the organisation and identifies the criteria for risk evaluation and the responsibilities for managing risk.

The Risk management Policy is supported by TDC's Risk Appetite[15] and Risk management Framework which are key elements of our risk management system.

7.1.1 Background

Council has previously reviewed and adopted in 1999 a Risk Management Charter. In 2013 Council's Audit & Risk Committee reviewed and adopted a revised Risk Management Charter. Council determined its overall policy is to continually develop a Risk Management System that reflects best practice.

[15] Risk appetite refers to the amount of risk Council is willing to accept or retain in pursuit of its goals. Page 1 of 18 Taupō District Council Risk Management Policy - February 2024

Risk management System is used as a strategic decision-making tool to assist with developing and prioritising strategies and work programmes.

TDC currently manages its risks as Business Risk, Asset Risk, Emergency Management and Public Health Risks separately, based on the following risk documents:

Corporate Risk Management Policy. Revised February 2024)

Criticality Framework and Criticality by Asset Group (ProjectMax August 2016)

TDC Water Supplies Public Health Risk Management Plan. These have been renamed as Water Safety Plans.

Key objectives are:

- to provide a logical and systematic method for identifying and managing risk within the organisation that will assist the organisation to meet its goals and objectives efficiently and effectively. This achieved by aligning key organisational objectives, risks, and mitigating controls,
- to minimise losses and maximise opportunities – Risk Management is as much about defining opportunities as avoiding and mitigating losses.
- to improve the decision-making capabilities of staff recognising that the greatest knowledge and capacity for management of risks often rests with those".

Overarching strategies for managing risk within Council are:

- Council's Chief Executive Officer will establish and implement a Risk Management system that is relevant to the organisation, and which reflects the provisions of Council's Charter. The overarching objective of that Risk Management system will be to identify, and where feasible, mitigate risk factors that might prevent Council achieving its objectives. Risk Management systems established within Council will reflect prevailing best practice including relevant industry standards – especially AS/NZS Risk Management Standard 4360 and AS/NZS ISO 31000.
- The ongoing effectiveness of Councils Risk Management systems and compliance with them by employees will be demonstrated by appropriate reporting to Council and its appropriate Committees. Currently this is achieved by programmed reporting to Council's Audit & Risk Committee who meet 3-4 times per annum.

7.1.1.1 Current Risk Management Status

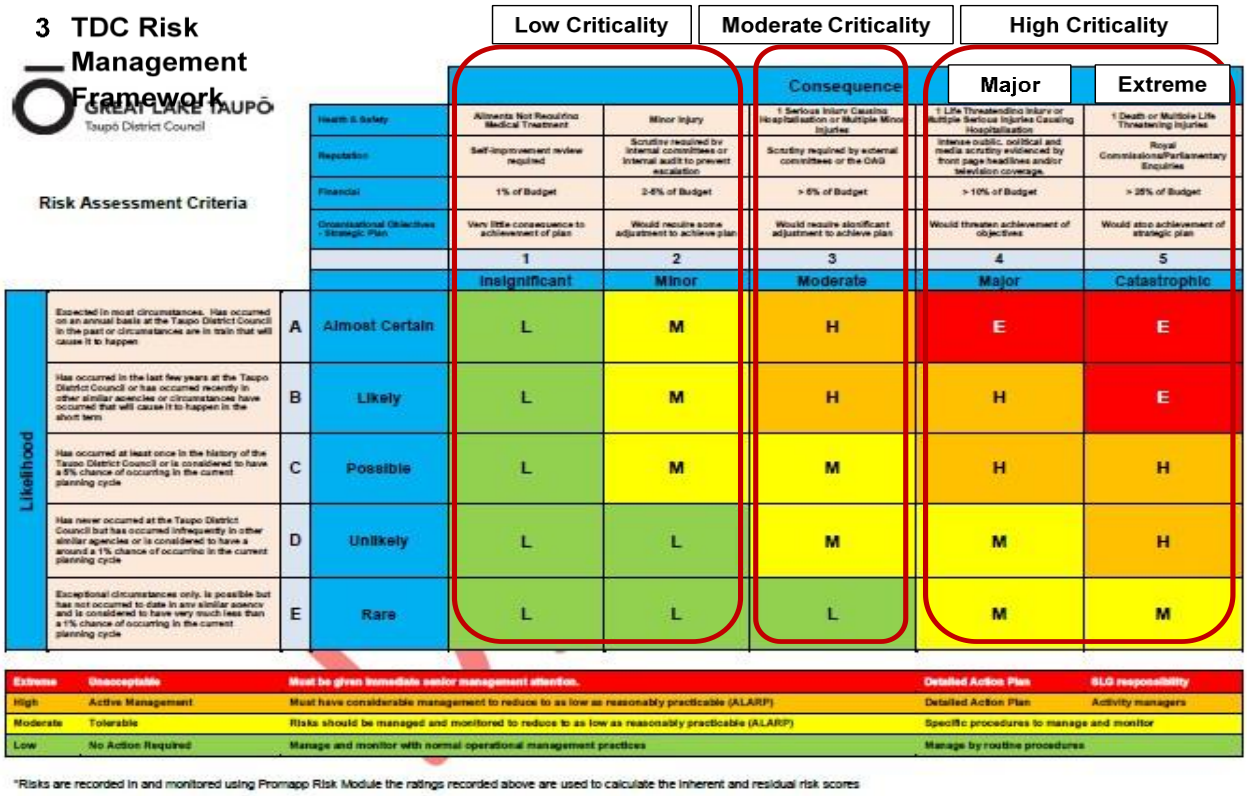
Council has an Audit & Risk Committee, which oversees the governance of a Risk Management Programme within the Taupō District Council. Risk Management is continuously being integrated into Councils culture, philosophy, practices, activities and plans rather than being viewed or practised as a separate programme.

The accountability for the management of risk is not removed from the specific activity managers and the Senior Leadership team or those responsible for the management of assets and this is viewed as a collaborative process between governance and management.

Waikato Regional Council audits the compliance with consent conditions annually, which may affect the environment. The non-compliance with any of the conditions are either modified by WRC and or capital / operational improvement activity is planned to meet those conditions if they are achievable cost efficiently. These processes have identified components within the TDC Stormwater network that may be vulnerable to seismic, flood or volcanic events and the impact of failure of these assets. The critical assets include pump stations, major pipelines and overland flow paths. Some may even need to be replaced or upgraded.

TDC is also a member of the Waikato Utility Lifelines group and the wider Waikato Civil Defence and Emergency Management Group.

The Three waters maintenance contract includes an after-hours emergency response for network issues and customer complaints. After hours staff (the Tauranga call centre) receives calls and forward emergency calls directly to the contractor who are required to respond in a certain time.
Asset managers are also notified of emergency calls and for Wastewater spills that have come through the Stormwater network there is a spill response protocol.



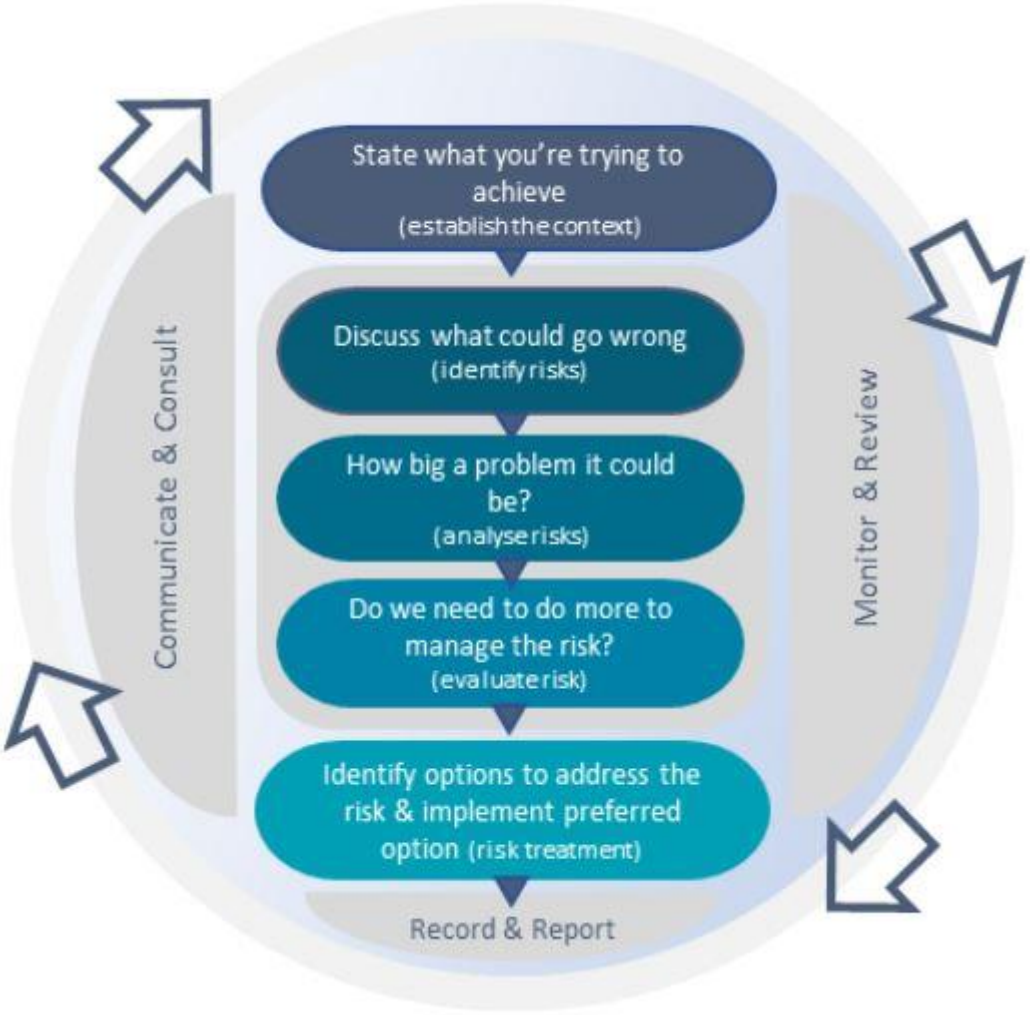
*Risks are recorded in and monitored using Promapp Risk Module the ratings recorded above are used to calculate the inherent and residual risk scores

7.1.2 Risk Management Process

The Risk Management Process outlined below is an internationally accepted, structured and consistent way to think about risk (Figure 4). It involves a series of steps that if followed will help you to determine where you should focus your attention first.

Ultimately, the purpose of risk management is to increase the likelihood of achieving your objectives by proactively identifying and managing potential threats.

Applying the risk management process outlined in Figure 4 allows us to focus our attention on our biggest risks, and helps ensure we proactively control these by either mitigating their impacts, completely avoiding them, or reduce their likelihood and/or impacts. While it may appear to be a sequential process with start and finish it is in fact iterative in practice, with the process repeating itself in a constant cycle of improvement.



7.1.3 Criticality

Taupō District Council Defining Asset Criticality for Water Services

Taupō District Council provides water supply, wastewater drainage and Stormwater drainage to most of the communities within the district. Most of these communities are located immediately adjacent to one of the lakes or rivers that are the primary focus for recreation and tourism by residents and visitors.

Providing these services utilises a wide range of civil, mechanical, monitoring and electrical assets, which need to be operated, maintained and ultimately renewed or enhanced.

The principles of asset management are fundamental to operating these assets and capture the concepts of:

- Delivering the desired service to an agreed Level of Service
- Managing the risks associated with providing the service to an acceptable level.
- Seeking to optimise the life cycle costs of owning and operating/maintaining the assets.

A key tool for asset management is the concept of Criticality, which is closely linked to the Consequences of Failure. It follows that low criticality assets have low consequences of failure and can be largely managed on a 'fix when fail' basis. At the other end of the spectrum, high criticality assets have high consequences of

failure, and the management of such assets will be focussed on trying to avoid failures through a range of pro-active monitoring, inspection, assessment and renewal processes.

Alongside the assessment of 'Consequences of Failure', all assets can also be assessed in relation to their 'Likelihood of Failure', which is largely a measure of their age, life expectancy and the extent of deterioration that has occurred. Assets that exhibit both high consequence and high likelihood represent the highest risk to the organisation's ability to deliver the required services to the community.

Understanding which assets have an elevated criticality allows the organisation to focus resources on their care and eventual renewal. Typically, there is a relatively small number of these assets, and the process is manageable.

Equally important is the identification of assets that have the lowest criticality. While these assets still need to be maintained and eventually replaced, this can largely be managed by generic processes with relatively minimal management overview and intervention. In an industry characterised by limited resources in relation to skills, manpower and funding this difference allows the resourcing to be focussed on the assets that will cause the most pain if they fail.

Note: the full criticality report is stored in Councils Objective data storage system.

7.1.4 Likelihood

The Council uses the following **Likelihood scale**[16] as an important **Risk Analysis** step.

Description	Probability (per annum)	(return period)
Rare 1	<10%	Unlikely to occur within a 10-year period, or only in exceptional circumstances.
Unlikely 2	10%-39%	Likely to occur every 2.5 – 10-year period
Possible 3	40%-69%	Likely to occur every 1.5 – 2.5-year period
Likely 4	70%-89%	Likely to occur within a 1 – 1.15-year period
Almost Certain 5	>=90%	Likely to occur within the next year.

Table 2: Risk Likelihood

7.1.5 Consequence

The Council uses the following **consequence**[17] table in its assessment of criticality.

	Insignificant 1	Minor 2	Moderate 3	Major 4	Extreme 5
Performance & Service delivery	No impacts	Minor loss of service	Minor loss of service 1 – 3 days	Loss of core services 1 – 3 days	Loss of core service impacting large part of community.

[16] Taupō District Council Risk Management framework – RF3 – Likelihood Table February 2024

[17] Taupō District Council Risk Management framework Consequence Table February 2024

Financial	<$50,000	Impact $50K - $200K	Impact $200K to $750k	Impact $750K to $1,500K	Serious long-term implications >$1,500K
Health & Safety	No treatment	First aid required.	May require medical attention.	Lost time and is notifiable.	Significant injury/death, notifiable
Regulatory & Legal	Minor legal impacts.	Minor impacts/possible fines.	Small legal breach/potential litigation.	Major breach/legal proceedings.	Serious breach/significant liabilities.
People	Minimal turnover.	Minimal specialist skill gaps.	Moderate specialist skill gaps.	Major specialist skill gaps.	Turnover >20% Serious business disruption.
Reputation	No Media or political attention.	Negative local coverage 1 – 2 days	Negative local/regional coverage 3 – 7 days.	Ongoing negative regional/nationwide coverage 1 – 2 weeks.	Sustained adverse media coverage over several weeks/loss of public trust.
Information management	Isolated equipment failure.	Compromise of user password or information management processes.	Data breaches contained internally.	Significant disruptions to critical activities 1 – 2 days.	Critical data permanently lost/confidential information exposed/significant disruption.
Environment & Climate	Minimal impacts	Minor damages/limited business impacts. Recovery 2 – 8 weeks	Localised environmental damage 2 – 4 months recovery	Major, Localised environmental damage, 4 – 12 months recovery	Extensive & widespread environmental damage recovery exceeds 12 months.

7.2 Council Funding for Risk

Council looks to provide funding for disaster recovery through a separate reserve. It appropriates funding each year to a Disaster Recovery Fund reserve to enable access to ready cash in the event of a natural disaster. This is intended to assist reinstatement and to finance any short-term needs in the time between any disaster and the recommencement of services. As of June 2020, the reserve fund had a balance of over $2 million. Council has chosen not to insure it's below ground assets given the position of its reserves.

The TEL Fund was established in September 1995 when TDC sold its investments in Taupō Electricity Ltd and Taupō Generation Ltd. The use of that sale capital and subsequent investment income generated each year are included in Council's Treasury Management Policy 2015. One requirement of that policy is that the portfolio and funds are managed in a manner that reflects their potential utilisation as a disaster recovery fund in the event of a natural disaster within the Taupō district. The value of the fund as of 30 June 2020 is approximately $61.3 million.

With these two funding mechanisms in place Council considers it is prudently but effectively managing the risk of being able to fund both short- and long-term needs with respect to potential natural disaster and subsequent recovery operations in the district.

7.2.1 Insurance

The Finance Team manages the insurance on behalf of all the activities across Council. There are several policies, as listed below:

- Material Damage (excluding Fire) Policy
- Infrastructure Policy
- Material Damage (Fire) Policy
- Business Interruption Policy

- Public Liability Policy
- Professional Indemnity Policy
- Commercial Motor Vehicle Policy
- Employers Liability Policy
- Statutory Liability Policy
- Crime Policy

Council has general public liability insurance in place. Currently all Council's owned assets within this activity are insured.

7.3 Civil Defence, Lifelines & Emergency Response

Civil Defence Emergency Management

The Civil Defence Emergency Management (CDEM) Act 2002 requires Local Authorities to coordinate Plans, Programmes and Activities related to CDEM across the areas of Risk Reduction, Readiness, Response and Recovery. It also encourages cooperation and joint action within regional groups.

Council recognises its obligations under the CDEM Act and participates in a Waikato Region-wide Civil Defence Emergency Management Group (EMG). The Waikato CDEMG is responsible for all matters involving staff training, general Civil Defence public awareness and maintaining contact lists for schools, pre-schools, rest-homes and the like. Each Local Authority maintains its own contacts for local resources.

The District is generally sheltered from most natural disasters, although there are risks associated with high wind, flooding, and wind-blown ash from volcanic eruption from Mount Ruapehu.

The following documents are available for guidance in Civil Defence and Emergency Management:

(The Emergency Management Manager will update these to align with the Waikato CDEM processes)

- TDC Emergency Response Plan Emergency Operating Procedures 2016/2017
- Civil Defence Emergency Management Plan Southern Emergency Operations Area of South Waikato and Taupō Districts.
- Waikato Civil Defence Emergency Management Group Plan 2011-2015.
- The National Civil Defence Emergency Management Plan

Waikato Lifelines Utilities Group (WLUG)

Lifelines are the essential 'utility' services that support the life of a community. These services include Water, Stormwater, Power, Gas, Telecommunications and Transportation networks.

TDC is a member of the WLUG, which is comprised of representatives from the Waikato region's territorial authorities and major energy, telecommunications, and transportation sector organisations. The WLUG provides support to the Emergency Operations Centres that may be required during a major service failure or civil defence emergency.

Current projects include:

- The Group Vulnerability Project - Assessing the Waikato's utilities infrastructure vulnerability to natural and man-made hazards and developing measures to reduce the effects.
- The Group Priority and Alternative Route Plan - Identifying the routes that may be used during an event, to ensure that access is available for emergency services, access to critical utilities and evacuation purposes.
- The Critical Fuel Supply Plan - Planning for fuel to be available to both the Lifelines utilities and the public during an emergency event.
- The Coordination Protocols - To assist Lifelines utilities to coordinate, communicate and share information during the Response and Recovery phases of an emergency. An associated Contact Details List is maintained for reference.
- The Group Lifeline Utilities Coordinator and Supporting Staff - Role Descriptions - Ensuring that coordinators are appointed and trained to manage activities during an emergency.

TDC continues to co-operate within the framework of the WLUG to implement the guidelines outlined in Working Together Lifeline Utilities and Emergency Management.

Based on the District's geographical location, the most significant hazard TDC faces is the spread of volcanic ash from an eruption. Emergency Management plans are in place for this scenario.

TDC is committed to monitoring and reviewing its policies around climate change to ensure alignment with national legislation.

Continual development of contingency planning requires revising and improving these plans through emergency response exercises or scenarios.

Business Continuity Policy[18]

This Policy and Framework outlines Taupō District Council's approach to developing and maintaining an effective Business Continuity Program. This includes the objectives and scope of the program, leadership requirements, roles and responsibilities, team structures, workflows for each part of the Business Continuity lifecycle and processes for monitoring performance.

Purpose of this Business Continuity Program

The purpose of this Business Continuity Program is to establish an effective, documented methodology to "protect against, reduce the likelihood of occurrence, prepare for, respond to, and recover from disruptions when they arise" (ISO 22301).

This Business Continuity Program ensures the operational integrity of critical business functions and ensures that such business functions can be maintained or restored within acceptable timeframes should a business continuity event disrupt Taupō District Council's operations.

7.4 Risk Register

The specific asset risk register (see following) identifies risks, the consequence of the risk, the existing controls in place, treatment options and the level of risk to the asset as assessed and updated by Council Officers.

Risk Classification Matrices

High to Extreme risk would normally involve more detailed studies, action plans and management responsibility specifically assigned.

Moderate risk would be managed by monitoring or response procedures and management responsibility specified.

7.4.1 Significant Negative Effects

The operation of community Stormwater network and associated assets generate effects on the community, other infrastructure and the environment. These effects are managed within legislative and consulting frameworks.

The Negative Effects associated with the Stormwater Activity are listed in the table below, along with Council's approach and/or future actions to mitigate or avoid the effects where practical.

These Negative Effects must be balanced against the positive contribution the activity makes to achieving Council's Vision, Outcomes and Strategies.

[18] Business Continuity Management Policy & Framework – June 2020

Significant Negative Effect	Description of Effect	Mitigation Measures
Poor water quality	Pollution and contamination of the stormwater from runoff and cross-connections with the wastewater network, resulting in contaminants entering the stormwater network and discharging to streams	Identifying and targeting sites that are at high risk of discharging significant contaminants. Runoff from industrial areas with the potential for adverse stormwater contamination is managed through the building consenting and trade waste regulatory processes. The clean-up for any pollution incidents is managed by emergency response plans (with Waikato Regional Council). Behaviour change initiatives within the community focus on reducing illegal dumping, littering and discharging of hazardous substances into the stormwater system.
Excessive wastewater volumes	Stormwater entry to the wastewater network through cross-connections and illegal connections resulting in excess volumes of wastewater to be treated and potential detrimental impacts on the quality of treated effluent discharged.	A comprehensive programme of monitoring, inspection and corrective work to reduce the volume of stormwater infiltration and inflow into the wastewater system.
Flooding of property	Failure of the system in flooding habitable residential and commercial buildings	Capital works to address capacity constraints, effective building controls, site specific detention and attenuation of stormwater in new growth and infill subdivisions

Table-3: Identified High Risks

7.5 Critical Assets

The Stormwater AMP does have some overlap with the transportation AMP when it comes to identifying and providing for overall risk. The transportation AMP has allowed for the risk associated with culverts and stormwater assets in the rural environment while this AMP provides risk analysis for urban stormwater assets.

Flooding has been identified as the highest risk from the breakdown of Stormwater asset delivery. To counter this risk Council has undertaking an overland flow path study, which has identified the path Stormwater will take once the stormwater network is full. Council has also increased the design size for new networks to allow for climate change, this increase in capacity provides greater protection to property and our unique environment from the effects of major rainfall events.

The overland flow path identification will also allow council to protect areas where water will travel overland and enable Council to plan building envelopes on properties to mitigate flooding risk (once completed). To enable Council to have a full understanding of the Risks of flooding on private property, modelling of the network needs to be undertaken as flooding or capacity issues arise. Currently the flow path mapping assumes that the pipes are full but does not fully consider the impact that network may have on flooding levels.

Council has also identified that with the advent of stormwater treatment at source Council will see an increase in the use of ephemeral gullies as well as pond-based systems, the public should be made aware of the Health and safety risks and be prevented access if appropriate.

Pond design requires that side slopes are 1-4 to remove the fall hazard. Where fall can't not be designed out then fences are installed.

Council has a program in place to attach safety grills on inlets and outlets 450 diameter and over to reduce the risk of access. This assessment also must take into account the risks of debris being caught in grate and thus causing flood damage.

Council will also continue to identify manhole lids that “pop” in high rainfall events. Either manholes will be bolted down or a lid with a grill will be placed on to allow water to flow over land if possible.
Through Levels of Service monitoring and continuous condition assessment while implementing the Stormwater Maintenance Contract, critical risks will be effectively controlled.

The Council has a responsibility through its global stormwater discharge consents to reduce containment discharges into the environment. Council will use a mix of education and enforcement to make sure that contaminants are not disposed of into the Stormwater system leading to contamination of the receiving environment and a breach of Resource Consent. This will also be assisted by introducing stormwater quality devices into the network, and multiple devices (primarily Hynds Downstream Defenders) have been installed along the lakefront to date with more planned in this AMP/LTP period.

The Stormwater management plan which is a requirement of Councils comprehensive stormwater discharge consent identifies a number of “High Risk” sites (high-risk facility sites are defined as Commercial and industrial sites as listed in Section 3.5.12 of the Waikato Regional Plan). These high-risk sites relate directly to their environmental harm potential from the commercial businesses that operate within their catchment, Council is progressively working through these sites to provide ongoing maintenance and enforcement and to provide Stormwater quality improvement devices where applicable.

Council is also building a register of quality improvement devices located within the district, these devices are critical in reducing the effects of stormwater on the districts receiving environments, they are maintained on a regular basis.

From an overall risk perspective, it is imperative that Council continues to develop its overland flow study to determine overland flows after either asset failure or assets reaching their design capacity as this study will enable Councils regulatory arm to prevent development in these areas.

In the Taupō district, Council does have a number of gully systems that can be utilised as stormwater flow paths, it is also important that gullies are maintained in Council ownership so that development in them is prevented and also so that they can be planted and maintained appropriately to avoid erosion.

The asset management team have had a number of meetings to determine which assets are critical to the networks based on a number of criteria such as:

- Political
- Environmental
- Value
- Cost to repair
- Capacity
- Discharge location
- Catchment size
- Over land flow path

The identification of these assets has been coordinated by the assets team with the assets selected displayed on a number of maps which will be added to a GIS layer. These maps will also have the lifelines critical assets included as another layer. The GIS layers will be available to the assets managers as well as the civil defence team to enable the coordination of any emergency response program.

The critical assets will undergo regular condition assessments to make sure that renewal and maintenance works are planned appropriately.

The Civil defence team are aware of the overland flow path data as it will assist them in identify where there may be flooding issues in heavy rainfall events.
The layer is also available to the building control staff that can use the draft data to determine if an issue exits prior to allowing building activity to commence.

The Taupō district has seen some major volcanic eruptions In the past and this issue rates highly in regard to possible risk to the Stormwater network.

A volcanic eruption could see large amounts of ash falling across urban centres that could block the piped network, fill detention ponds and effect over land flow paths. If there were a weather event or even rainfall at the time of the event, then the piped network would be compromised.
The overland flow path model does identify where water will flow in a 1:100yr event and this will give staff an idea as to which areas would be impacted and enable them to concentrate maintenance operations.

As Council has only one significant pump station in the Stormwater network, council would have the ability to take this offline and use the pond for detention in the short term and or bring in an alternative pump if pond levels were to get too high, or make sure that the overland flow path won't impact any property.

Council would implement a program of network cleaning once the volcanic event had ceased to remove material from the pipes before it hardened.

7.6 Conclusion

Fundamentally, the Stormwater assets do not have a backlog of renewal and maintenance requirements and have not had a history of unplanned asset failure. Over the term of the Comprehensive Consent and further historically Council has never breached its Consent requirements.

Council now has a robust data management system (Asset Finda) that can accurately combine age, condition, criticality and past maintenance history to determine future renewal spend and asset value. The recently completed criticality assessment of the Three Waters Assets and its inclusion into Asset Finda has enabled increased inspection, and maintenance of critical assets.

The condition assessment program has identified that the piped network is reasonably good condition for its age although there is the need to undertake some renewals over the next ten years.

The Three Waters maintenance contract provides for emergency response as well as real time collection of asset data.

Council is prone to the effects of climate change, but Council has modelled over land flow paths and is working on determining properties affected and this Asset Management Plan provides options to lessen impacts.

Increased pressure on Stormwater quality is being provided for in the quality improvement devices being installed in the network as well as the use of land-based disposal options. To support quality improvements Council undertakes a comprehensive monitoring program.

Damage to Council infrastructure is funded internally with the provision of a risk funding pool.

Demand is mainly funded by developers apart from backlog capacity improvement and quality improvement.

Asset management Plans are externally audited and progress on service levels and work programs are reported to Council monthly.

Stormwater Asset Management Plan

Risk Register

Division:	Assets	Compiled by:	Brent Aitken	Date:	10/05/2021
Asset:	Stormwater & Land Drainage	Reviewed by:		Date:	

NATURAL RISKS

Asset Risks	The risk: What can happen and how it can happen	The consequences of an event happening		Adequacy of existing controls	Consequence rating	Likelihood rating	Level of risk	Risk priority
		Consequences	Likelihood					
Earthquake	Stormwater & Land Drainage network damaged due to earthquake due to:							
	Pipe Fracture	Moderate	Unlikely	E	3	D	L	
	Earth slip failure	Major	Unlikely	E	4	D	M	
	Access to network, due to roading system failure	Major	Unlikely		4	D	M	
	Surrounding environment flooded due to network failure, not able to access network.	Major	Unlikely		4	D	M	
	Land subsidence causing changes of grade in pipe network. Blocking of inlet and outlet structures	Moderate	Unlikely		3	D	L	
Volcanic Eruption	Drainage network fails as a result: - Blockage of inlet systems from debris	Major	Likely	E	4	C	M	
Ash fall	Blockage of pipes due to sediment from ash or debris, constricting flows	Major	Rare	E	2	E	L	
	- Access to network blocked	Moderate	Rare		3	E	L	
Lahar	Failure of outlets at streams and rivers through silting of river or stream bed from Lahar mud	Minor	Rare	E	2	E	L	
Flooding	Failure of primary and secondary network by: Blockage from debris	Moderate	Unlikely	E	3 3	D D	L L	
	Access to network blocked, contracting staff. cannot remedy.	Moderate	Unlikely	E	4	D	M	
	- Silting of primary pipe network by debris and silt	Moderate	Likely	E	3	D	L	
	- Damage to private property	Moderate	Likely	E	3	C	M	
Tsunami	Damage to Lake outlet structures from debris and instability caused via waves	Minor	Rare	E	1	E	L	
Fire	Drainage secondary network failure affected by: Reduction in vegetative cover causing erosion. and instability in gullies	Major	Possible	E	4	C	M	
	- Greater debris in open watercourse's	Moderate	Possible		3	C	M	
	Primary Drainage network affected by hazardous substance fire or explosion from pollution spill: causing structural damage to pipe and manhole network Damage at outlet from system				4	C	M	
	3rd party damage as a result of fire blow back to various inlets					D	M	
High winds	Potential for structural damage outlet structures from high winds causing: Damage to structural integrity of outlets Silting of pipes	Minor Minor	Unlikely Almost certain	E	2 2	D A	L M	

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	Silting of water channels							
Land slip/slide	Silting of primary and secondary network caused from slip, blocking network	Moderate	Possible	E	3	C	M	
Tomos	Failure of primary network as a result of loss of support for pipe system or manhole	Moderate	Likely	NC	3	D	L	
Geothermal activity	Failure of primary network as a result of: loss of support for pipe system or manhole by way of geothermal activity reduction in life assets as a result of geothermal activity	Moderate Major	Possible Likely	NC NC	3 4	C C	M M	

PHYSICAL RISKS

Asset Risk	The risk: What can happen and how it can happen	The consequences of an event happening		Adequacy of existing controls	Consequence rating	Likelihood rating	Level of risk	Risk priority
		Consequences	Likelihood					
Inadequate design, construction or maintenance of asset	Failure of network as a result of: Damage to network causing flooding. Pollutants entering the surrounding environments	Major major	Possible Possible	E E	4 4	C C	M M	

EXTERNAL RISKS

Asset Risk	The risk: What can happen and how it can happen	The consequences of an event happening		Adequacy of existing controls	Consequence rating	Likelihood rating	Level of risk	Risk priority
		Consequences	Likelihood					
War	Failure or primary network as a result: damage to network by war events - access to maintain network denied as result of war.	Major Major	Almost impossible	NC NC	4 4	N N	N N	
Terrorism	Failure of network as a result of: damage caused by act of terrorism. use of network by terrorists for destructive purposes. - access to maintain network denied	Minor Minor Moderate	Rare Rare Rare	NC NC NC	2 3 3	E E E	L L L	
Protest/Riots	Failure of drainage network as a result of: blockage by debris effect of flooding during a protest	Moderate Moderate	Rare Rare	NC PE	3 3	E E	L L	
Vehicle accident	Failure of network due to pollution from vehicle accident - likelihood of accident due to failure of system from flooding events	Moderate	Likely	E	3	B	L	
Contractual obligations not fulfilled by external parties	Delayed works programme potentially resulting from: network failing and causing flooding - increased potential for pollution to reach receiving environment as a result of lack of maintenance, contravention to RC's.	Minor Major	Almost certain Unlikely	E E	2 4	A D	M M	
Excessive costs to maintain, renew or create assets	Excessively high maintenance and construction costs due: disposal of residual material callouts for flooding events	Moderate	Unlikely		3	D	L	
Lack of contractors to carry out works	Loss of competitive rates and increased contract rates due to having to import contractors from outside the District	Moderate	Unlikely	E	3	D	L	

OPERATIONAL RISKS

Asset Risk	The risk: What can happen and how it can happen	The consequences of an event happening		Adequacy of existing controls	Consequence rating	Likelihood rating	Level of risk	Risk priority
		Consequences	Likelihood					
Commercial competition	Privately run drainage systems affecting performance of TDC's own assets	Major	Possible		4	C	M	
Legislative non-compliance	Not obtaining Resource Consent: - not abiding by LGA major Resource Consent Breach not achieving targets set in MFE guidelines or Council Management/Corporate Goals not achieving Annual Plan objectives not achieving LTCCP objectives	 Major Major Major Moderate Moderate	 Possible Possible Possible Possible Possible	 E E E E E	 4 4 3 3 3	 D C C C C	 M M M M M	
Failure to identify all assets condition and value	Failure of unknown networks by: not already in IMS System recorded incorrectly	 Moderate Moderate	 Possible Possible	 PE PE	 3 3	 C C	 M M	
Incorrect assessment of financing required to renew or create assets	Over-spent budget and/or delayed project completion	Minor	Likely	E	2	B	M	
Community expectation not met	Communities' faith and trust of Council lost	Moderate	Likely	PE	3	B	M	
Loss of Council reputation	Communities' faith and trust of Council lost	Moderate	Likely	PE	3	B	B	
Public Safety in non-compliance	Public Safety put at risk by flooding event. Health risk due to access to pollution event	Major Major	Likely Likely	PE PE	4 4	B B	H H	
Loss of electronic data/information on assets	No access to data: Potential for work to be delayed. Loss of data: Work significantly delayed	 Minor Minor	 Rare Rare		 2 2	E	L	
Loss of Council employees from high staff turnover	Loss of local knowledge: present knowledge historical knowledge	Moderate	Likely		3	B	M	

Table 5.1 – Risk Register of Stormwater Assets

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INADEQUATE RESOURCING Short term focus and long-term uncertainty due to political swings in strategy and objectives				
TREATED RISK **Moderate** (Risks to be actively managed and monitored with specific procedures) UNTREATED RISK **High** (Untolerable. Requires management over and above standard operational procedures to reduce the risk))		NEGATIVE IMPACTS ON ORGANISATION • Potential to impact of long-term financial sustainability. • May cause result in on compliance with legal and regulatory obligations. • Potential to fail to meet customer & ratepayer commitments.	TREATMENT MC00102 Modification of the risk by way reduction of the likelihood of the risk occurring by the completion of Long Term and Annual Planning in accordance with sections 93 & 95 of the Local Government Act 2002.	TREATMENT/RISK STATUS Long term planning id being undertaken as per the requirements of the Local Government Act, and these are expected to ensure that adequate resources are available to deliver the policies and outcomes required by the community and is nearing completion. Within Council's risk appetite with no breaches of legal compliance and strategic goals are being achieved and no incidents of reputational damage recorded.
UNTREATED LIKELIHOOD	Likely			
UNTREATED SEVERITY	Catastrophic			
TREATED LIKELIHOOD	Unlikely			
TREATED SEVERITY	Catastrophic			

HEALTH AND SAFETY AT WORK ACT 2015 Potential liabilities for elected representatives if all reasonably practical steps are not taken to manage health and safety risks				
TREATED RISK **Moderate** (Tolerable but requires risks to be actively managed And monitored with specific procedures) UNTREATED RISK **High** (Untolerable. Requires management over and above standard operational procedures to reduce the risk)		NEGATIVE IMPACTS ON ORGANISATION • Risk of compromising peoples safety & welfare • Potential for non compliance with legal and regulatory obligations. • Penalties for non compliance could have a significant impact of long term financial performance. • Seen as a failure to meet customer & ratepayer commitments	TREATMENT The risk is being modified to reduce the likelihood of it occurring by ensuring that the Chief Executive Officer has appropriate processes and procedures in place to reduce and this is managed with specific KPIs in their individual employment agreement. .	TREATMENT/RISK STATUS Delegated authority to the Chief Executive Officer and specific KPIs are in their individual employment agreement. Act comes into effect on 4 April 2016. Health and Safety reviews of departments to commence to ensure that the Council is meeting its obligations under the Act. Council has no appetite for anything that compromises safety, welfare and legal non compliance. No non compliances recorded but 36 minor injuries recorded and 3 moderate injuries that required medical attention. No serious harm incidents.
UNTREATED LIKELIHOOD	Possible			
UNTREATED SEVERITY	Major			
TREATED LIKELIHOOD	Unlikely			
TREATED SEVERITY	Moderate			

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Risk Management

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8.0 Lifecycle Management Plan

8.1 Our District

Our district is in the centre of the North Island of New Zealand and within the Waikato Region. Sitting at the heart of our district is the biggest freshwater lake in New Zealand, which is surrounded by mountains, forests, rivers and national parks. Complementing our natural environment are the vibrant and diverse communities that make up our urban places.

Taupō has become a key visitor and event destination possessing many unique attributes such as its panoramic stunning lake and volcanic landscape.

Lake Taupō is the biggest lake in the southern hemisphere, and it is rated by the district as our most important asset

The Taupō District occupies a large proportion of the Central North Island Volcanic Plateau together with the complete catchment area of Lake Taupō and Upper Waikato River areas.

Whilst the majority of the District is situated within the Waikato Region, a small proportion also intrudes into the Bay of Plenty, Hawkes Bay and Manawatu-Wanganui regions. The District comprises 6354sqkm of land and 616sqkm of lake.

Prior to 1950, the District was largely undeveloped and sparsely populated. Since that time, population has increased rapidly to approximately 37,203 (2018). Urban growth has focused on Taupō Township and various lakeshore settlements, whilst rural land development has been dramatic with the conversion of scrub wastelands to productive farmlands and vast exotic forest plantations and future conversion to lifestyle properties.

Lake Taupō and its surrounds have also become an important national and international tourist destination, renowned for its scenic attractions and wide-ranging recreational activities.

Overall Objective
Council will manage its urban area stormwater systems to avoid, remedy or mitigate adverse effects of Stormwater discharges and in particular to:

- Comply with conditions of its Comprehensive discharge consents.

- Minimise adverse effects of overland flow and flooding.
- Reduce sediment and contaminant discharges to the receiving environment.
- Protect and enhance the state of our Lake, rivers, wetlands and natural overland flow paths including Gully systems.

Ensure provision of effective stormwater systems as far as practicable, taking into account long-term operability and whole of life costs.

8.2 Overview of Lifecycle Management

Lifecycle Asset Management aims to minimise the lifecycle cost in all AM strategies and practices associated with an asset or group of assets.

The Lifecycle Cost is the total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal costs.

Typically, the greatest opportunity to influence the lifecycle costs and impacts of a project occurs before the assets are created. Once in place it can be costly to make substantial changes to the way it is managed. It is important to state the problem as broadly as possible, in order to encourage consideration of as many options as possible.

Assets that support the stormwater activity can be divided into three functional areas – being collection, flood protection and treatment. However, for the management of the lifecycle of these assets they are divided into different groups, this is because the functional areas contain a mix of assets with different lifecycle requirements.

Table 8.1 Stormwater assets lifecycle grouping

Functional Area	Asset List	Lifecycle Group
Collection	Pipes incl. pipe connections	Pipe Network
	Manholes	Pipe Network
	Inlets/Outlet structures (associated with reticulation)	Pipe Network
	Culverts	Channel Structures
	Protection Works	Channel Structures
	Gullies, Channels, natural and artificial	Streams, Channels and earth structures
Flood protection	Floodgates	Channel Structures
	Stop Banks	Streams, Channels and earth structures
	Detention Basins	Streams, Channels and earth structures
	Pump Stations	Pump Stations
Treatment	Constructed wetlands Rain gardens Gross litter traps (including outlet nets) SW Quality Improvement Devices (SQID) Sump traps Grass swales	Treatment Devices

8.3 Lifecycle Management Requirements

Council's strategic goals, customer requirements and external environment influences decisions about which activities are carried out and how they are best delivered.

The Asset Management Policy framework guides the priorities and sets out responsibilities, objectives, targets and plans for AM development.

Levels of Service have been defined and a Council-wide performance management framework has been developed to ensure that the agreed stakeholder expectations are delivered.

8.3.1 Asset Condition and Performance

In the case of stormwater pipelines, the condition of the pipe is taken as being directly related to its age unless better information is available. Council does not have a complete or accurate set of condition ratings for stormwater assets in its database, however there is an improvement task to address this. Without knowledge of the condition of each stormwater pipeline it has been necessary to adopt standard life expectancies based on pipeline age and expected useful life rather than by analysis of condition grades. Estimates of average life expectancy for the various makes of pipe were assessed using local knowledge, published data from other local authorities and technical papers such as the International Infrastructure Management Manual. The majority of stormwater pipes are due for renewal within 30 years as shown below,

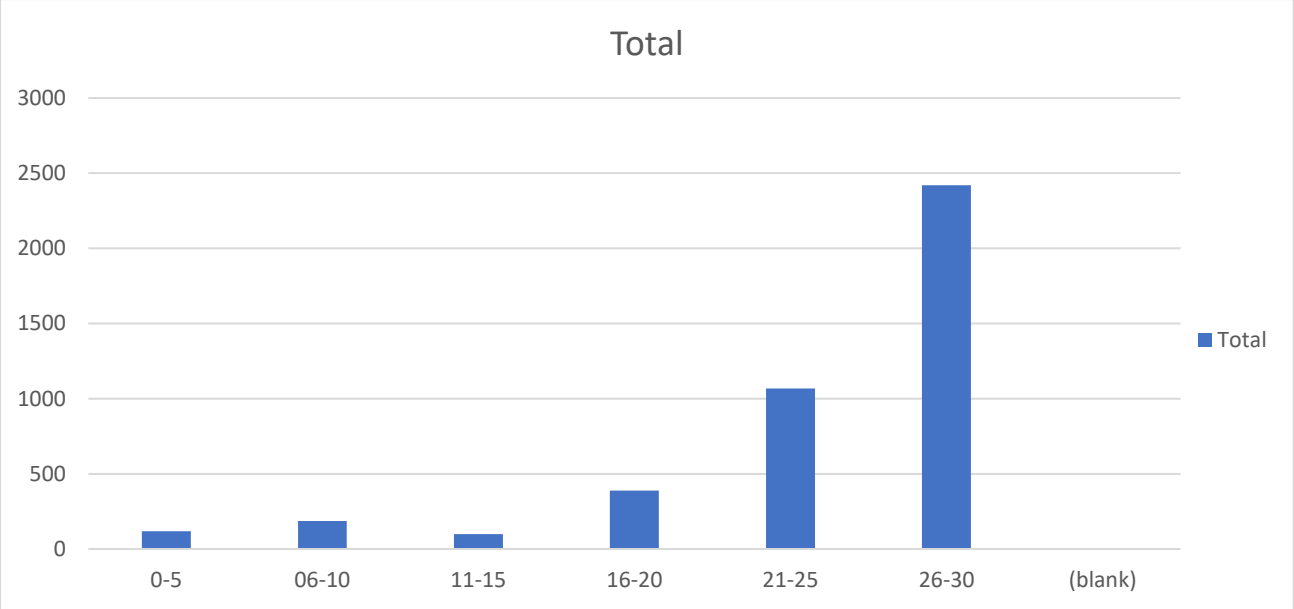


Figure 8.1Stormwater Pipes - Expected asset remaining useful life

Stormwater collection and disposal is required to prevent flooding in areas where human activities take place. However, the collection of Stormwater flows can have adverse effects to both public health and the environment. Stormwater flows entrain material that can adversely affect human health including animal faeces, heavy metals and chemicals and deposit them into areas where water may be used for drinking, recreation, or other purposes. Stormwater flows can also contribute to erosion because the collection of water flows and their subsequent discharge provides the flows with energy, which can erode land, gravel, river and lakeshores. For these reasons, management of Stormwater is important in both urban and rural areas.

Taupō District Council provides stormwater services as part of the roading network or off road via gullies and overland flow paths in the urban areas within the district (Taupō, Tūrangi, Tokaanu, Acacia Bay, Kinloch, Motuoapa, Waitahanui, Omori, Kuratau and Pukawa included, Whareroa, Motutere, Whakamaru, Atiamuri and Mangakino).

This section contains life cycle management plans for the following stormwater asset components:

- Quality Improvement devices
- Reticulation (pipes, manholes)
- detention ponds, gullies, overland flow paths

Council has undertaken a criticality assessment that allows council to focus maintenance and renewal expenditure as well as regular asset inspections.

Background data for the asset type including asset description, capacity, performance, condition and valuations is included in the Asset Data section.

This section contains the general *management strategies,* to achieve the levels of service defined in the Level of Service section. These strategies are divided into three main work categories (routine maintenance, renewal, capital and disposal) as illustrated in the following figure.

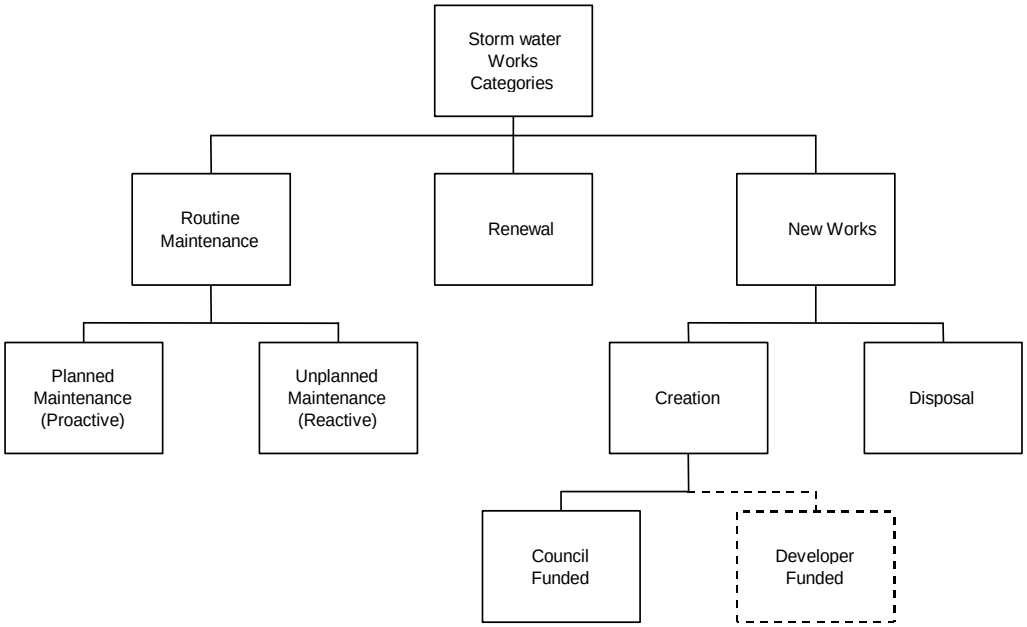


Figure 5.2 Asset Works Categories

The work categories are defined as follows:

Routine Maintenance

Routine maintenance falls into two broad categories as follows:

Planned (Proactive) Maintenance: Proactive inspection and maintenance works planned to prevent asset failure.

Unplanned (Reactive) Maintenance: Reactive action to correct asset malfunctions and failures on an as required basis (i.e. emergency repairs).

A key element of asset management planning is determining the most cost-effective blend of planned and unplanned maintenance as illustrated in the following figure.

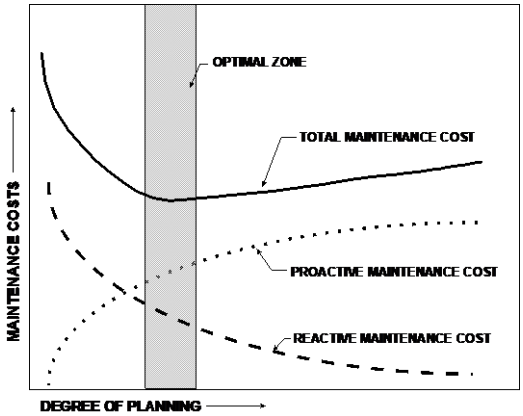


Figure 5.3 Balancing Proactive and Reactive Maintenance

New Works: See the following

Renewals: See the following

8.4 Asset Development Planning

The development of asset infrastructure becomes necessary when a service deficiency has been identified. The solution may require the creation of a new asset or the replacement or renewal of existing assets, particularly if a "non-asset based' solution is not appropriate. In each case a project assessment is required to determine the amount of capital investment required.

In accounting terms, the capital expenditure assets are grouped into three categories, according to whether they satisfy (i) growth, or (ii) increased level of service, or (iii) renewal requirements. In some cases, the expenditure may address a combination of those requirements, particularly where there is an opportunity to introduce new technology or materials or processes.

The decisions on new asset projects will influence the long-term operating and maintenance costs and therefore the lifecycle costs of the infrastructure.

Determining the scope of the project includes considering the purpose of the project, estimated lifecycle costs, expected benefits, likely risks, funding arrangements and physical delivery. A range of options should be compared before selecting the preferred solution.

For some projects a Business Case may be required, in order to consider procurement strategies, commercial markets and funding mechanisms.

Where a number of projects is being considered, it is necessary to consider the timeframes and funding requirements, so that an implementation programme can be developed in an affordable manner, thereby avoiding peaks and troughs in expenditure and associated pressure on funds required.

New Works:

Creation Works: New works, which extend or upsize assets, which are required to cater for new development and growth and new works that form part of Councils quality improvement program as required by the Comprehensive Consent and identified by the monitoring program. Creation works fall into two separate categories as follows:

Council funded - Works funded and constructed by TDC.
Developer funded - Works funded by developers as part of sub divisional development or by way of contributions that are then vested in Council.

Future developments are funded by developers who must increase the capacity of the downstream network if their development requires additional capacity.

Asset disposal: Retirement or sale of surplus assets. Council has no plans to dispose of any of the Stormwater assets over the period of this Ten-year plan.

A forecast of the 10-year expenditure for each asset group in each of the categories outlined above has been provided in the Financial Summary section.

Renewals: This capital cost is for replacing stormwater reticulation system component and treatment devices to maintain the agreed environmental levels of service. Renewal or restoration of assets is required to ensure that the service potential of the assets is maintained and that the level of service can continue to be delivered. It is funded by drawing from the depreciation reserve.

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

Asset Disposal: When an asset is no longer required its appropriate decommissioning and disposal needs to be considered. Ideally this would have been considered in the planning for the asset.

8.5 Overarching Issues/Strategies for stormwater

Council in 2009 adopted the "Taupō District Council Stormwater Strategy" which identified and provided policy direction for a number of issues relating to stormwater in the district.
These issues fell under the following broad headings.

- Flooding
- Degradation of overland flow paths
- Degradation of Lake Taupō and aquatic environments
- Public health and safety

The strategy adopts 1:10 and 1:100 flow regimes for future development. Maintenance programs are proactive with the ongoing condition assessment of the underground network. Council will continue to protect gully walls from erosion by additional planting. Lake outfalls that silt up when there are high lake levels are inspected prior to bad weather warnings. The coordinated CCTV program, which has assessed at least 10% of the underground network per year, has enabled Council to match age with condition, criticality, and past maintenance history to enable more accurate renewal forecasting.

This strategy provides clear direction around making sure that people and property are not affected by flooding, and the document sets policy around infrastructure design requirements that feed into the review of the Code of Practise.

Overland flow paths have previously not been adequately protected and this has seen in some cases building development that now impedes natural flow paths. Council has been working to identify overland flow paths in urban areas and where they are not council owned, provide some protection over them. This protection measure may be undertaken by negotiation with the property owners or by legal means if necessary.

Council has identified the overland flow paths in the existing urban environments through use of the SW network model which incorporates the latest climate change data and additional hydrographic information.

Model Confidence
A high level of confidence can be considered on the location of overland flow-paths, and therefore on flood hazard areas. Until further recommended model development can be completed, there is lower level of confidence in the exact flood width, depths and velocities. It must be understood that a hydraulic model is often the best available information at the time. Model validation has only been achieved in some areas by means of reviewing previous overland flow-path flood mapping. This has provided reasonable confidence in model outputs. There is low confidence in a significant amount of stormwater pipe network asset data, however this is not generally believed to have a significant impact for 100-year return period rainfall events.

Recommendations
It would be in the best interests of TDC to continue investing in improvements and updates for this important project to better understand overland flow path flood risks in order that residents can be advised on flood risk potentially affecting them where necessary.

The models (although populated with the most recent data) are not absolutely finalized. Latest LIDAR is still being released to continue updating the models, and subsequently, the extent of flood affected properties. Outstanding data includes:

- The most recent LiDAR data (in some remaining areas).
- Culvert/pipe data (to be updated as more recent data is made available).
- Ongoing research to identify more optimized infiltration/roughness data for all models.
- Model optimization through further auditing changes where considered necessary.

In addition to this, the critical outlet conditions for the culverts reaching the lake could be modelled to improve model accuracy where considered necessary.

- Damage assessments will enable determination of further diversion and remediation works
- The formation of a Council team to advance the project through to information appearing on property LIMs if Council sees this as the preferred outcome or for inclusion in the district plan hazard register.

It is expected that the existing flow-path locations are accurate but conservative with slightly wider extents and greater depths than reality. This confidence could be modified and improved further with reduction of rainfall-runoff and more understanding of groundwater infiltration. Survey of critical asset data, such as all larger culverts would also be a worthwhile improvement where possible.

Comprehensive Discharge Consents

The Council has several discharge consents covering the major urban areas of the district as shown below:

Consent No.	**Location**
105049	Tūrangi
105048	Taupō
105050	Waikato River

All of these consents are due to expire in June 2027 and therefore will require renewal prior to that date.

The new consent applications(Comprehensive Stormwater Discharge Consent CSDC) will be required to be submitted at least six months prior to their expiry. It is expected that this will require significant consultation and engagement with Tūwharetoa and Hapu and Iwi along with major water users and residents. It is considered that that this will require the engagement of one or more professional consultants to assist in the preparation of the new applications and consent process and will be a multi-year (3) project.

Quality Improvement

Stormwater quality will drive a large portion of Councils capital expenditure on Stormwater over the next AMP period, this will include treatment devices such as Enviropods and CDS units, fine filters and multi barrier approaches and will be the primary driver of the new CSDC's that are required by 2027.

The long-term goal is to provide Stormwater quality improvement to all of the direct Lake and River discharges, and this will be achieved over time starting with the larger diameter outlets and working progressively working through the network.

A number of factors need to be considered when identifying appropriate outlets for installation of treatment devices:

- Does the pipe discharge directly to a Lake or River
- Size of the upstream catchment
- If the catchment includes any high risk sites
- If the catchment includes any commercial and industrial sites
- Potential contaminant load
- If the discharge is connected directly to the network (does the discharge go to ground prior to the receiving environment)
- Is the area where the discharge occurs significant to the community,

Its is expected that micro plastics and emerging contaminants will also be factored into future treatment processes, and this will likely include fine treatment and multi barrier type approaches. It is further anticipated that in future even direct discharges to ground or into the many gullies within the district will require treatment prior to discharge.

The current plan is to identify and treat Stormwater from pipe outlets 650 diameter and above as these outlets are seen as discharging the largest containment load to receiving environments. Over time, this improvement program will focus on the smaller discharge points.

Councils comprehensive discharge consent also sets a number of conditions that impact on how Stormwater services are delivered in the future, such as the requirement for Catchment Management Plans for green fields' developments as well as the ongoing monitoring program for stormwater quality.

Public safety
The safety of the public has also set some design criteria around open stormwater systems for Council and developers in the future and has identified specific network reticulation issues such as inlets and outlets and their requirement for them to be safe.

Council will continue to monitor the reticulated network to identify manhole lids that are popping and look to either bolt them down or provide a grate on the top to allow flow to flow over land. This is to reduce the risk of people falling down the manhole after high rainfall events.

Changes to Legislation
The Healthy Rivers plan change is still being developed, so this has not resulted in changes to maintenance, renewal or capital spend to date. But it is envisaged that rules around discharge quality are going to be change. Council, under the comprehensive discharge consent, undertake regular testing of discharge quality, and the breath of this testing my be increased to better support funding requirements in the future.

Without knowing what these conditions might be it is difficult to determine a different capital program than that which has been put forward for quality improvement in the short to medium term.
With the largest receiving environment (Lake Taupō) and its bed being owned by Tūwharetoa it is envisaged that the Trust Board will be showing a keen interest in any consent renewal process.

Government Water Reforms
The Three Waters Reform Programme was launched by the Government in July 2020 to improve the regulation and delivery of the three water services, drinking water, wastewater and stormwater, across New Zealand.

These included the:

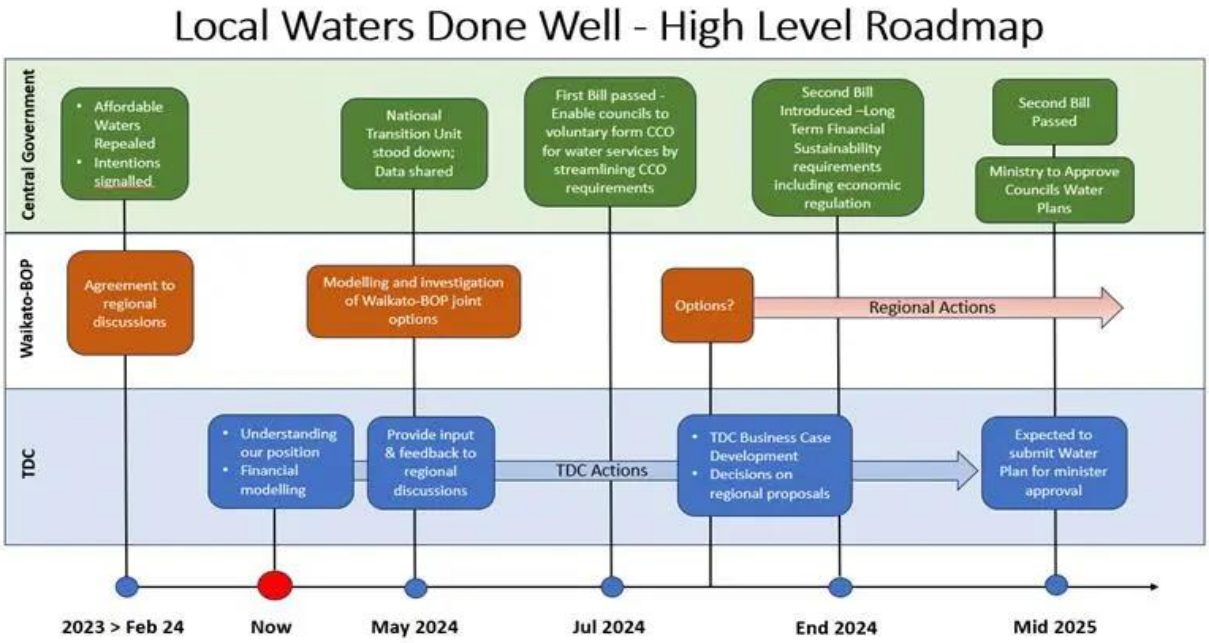
- Water Services Act 2021
- Water Services Entities Act 2022 [now repealed]
- Water Services Economic Efficiency and Consumer Protection Act 2023 [now repealed].

The change of government in 2023 led to a change in direction for the future of the Three Waters industry and some of the recently enacted legislation was repealed (noted above). A new policy of 'Local Water Done Well' is set to be developed however details of this policy are not yet available but the proposed timetable for implementation has been released.

The details are yet to be clarified, but we anticipate the following requirements:

Water Quality Standards – continuing compliance with Taumata Arowai water regulator.

- Economic Regulation around the following areas:
    - Rules around investment and pricing
    - Backstop / penalties for non-compliance with economic regulations
- Financial Sustainability
- Requirement to demonstrate adequate investment into 3W infrastructure
- Submission of a "Water Services Plan" by mid 2025
- Revenue sufficiency, balance sheet separation, ring-fencing and funding for growth
- Government to introduce legislation to enable easier Council Controlled Organisation (CCO) delivery - a new class of financially separate CCO.



With the creation of a new water regulator Taumata Arowai the performance of our Stormwater activities will be under additional scrutiny.

There is currently strong policy direction from national and local government to improve the state of our waterbodies as reflected in the Vision and Strategy, the National Policy Statement for Freshwater Management, the National Environmental Standard for Freshwater, the Waikato Regional Policy Statement, and Plan Change 1 of the Waikato Regional Plan.

These policies expect improvements in water quality nationally and their implementation can be expected to require a shift in Stormwater and stormwater management. This will require TAs across the region to continue to seek funding through Long Term Planning processes to resource further upgrades.

With Stormwater being included in the reform discussions, it is likely in the future that Council may not be responsible for the asset outputs or funding requirements of the asset.

8.6 Service Delivery and Rationale

The operation and maintenance of the stormwater assets is carried out using a combination of Council Asset Management staff and external contractors:

Three Waters Manager and staff for management and administration

External contractor for routine maintenance and cleaning activities

Specific projects are tendered for competitive pricing.

as shown in Table 8.2.

Service	Provider	Rationale
Asset Management	Council	To maintain the knowledge of the asset in house
Management of Maintenance Contracts	Council	To maintain control of the costs of the services.
Minor Design	Council	In house knowledge and resource available
Major Design	Tendered	To capitalise on external expertise resource/ experience and take advantage of competitive pricing/competition.
Bylaw development	Council	To capitalise on internal expertise resource/ experience.

Strategy Development	Council	To capitalise on internal expertise resource/ experience

Table 8.2: TDC Service and Providers

A formal maintenance contract (Contract TDC/1516/155– Three Waters Maintenance Contract) was awarded to provide maintenance, inspections, and reporting work for the stormwater network. The benefits that the maintenance contract for the Stormwater assets are:

- Regular inspection and reporting on assets will allow the asset management system to be populated with condition assessment data (in accordance with the New Zealand Water and Wastes Pipe Inspection Manual (3rd edition, 2006) – thereby allowing optimal decision making (maintenance and renewals) in the future.
- Regular maintenance of stormwater assets – thereby minimising the risk of asset failure resulting in loss of service level and / or flooding / property or environmental damage.
- Addressing day-to-day issues.

The maintenance contract has been reviewed in light of the Comprehensive Discharge Consents that have been granted to ensure that they comply with the conditions of these Resource Consents and enable integration of condition monitoring and electronic data management systems and processes as they are developed.

The contractor is responsible for the placement and maintenance of Councils stormwater quality monitoring devices that collect samples of storm flows that are then analysed to determine flow quality.

The following table shows the TDC Three Waters maintenance and renewals contract

Contract Name	Contract No.	Approx. Value ($)	Term (yrs)	Comments	Maintenance/ Renewal/ Creation
Three Waters Maintenance Contract Contractor: Downer Construction	1516/155	11.4 mil	5+2+2	Start date was 1 July 2016 Includes: Water, Wastewater, Stormwater	Mostly Maintenance but includes some renewal and creation aspects

Table 5.3 TDC Maintenance and Renewal Contracts

8.7 Operation and Maintenance Plan

8.7.1 Introduction

Stormwater Operations and Maintenance strategies set out how the stormwater activity will be operated and maintained on a day-to-day basis to consistently achieve the optimum use of assets. Operations and Maintenance activities fall into the following categories, each having distinct objectives and triggering mechanisms:

- **Operations** - Activities designed to ensure efficient utilisation of the assets, and therefore that the assets achieve their service potential. Operationally the piped stormwater network is generally a passive system which provides a controlled drainage route for stormwater. No routine day to day operational intervention by staff is undertaken on the piped network.
- **Maintenance -** Maintenance strategies are designed to enable existing assets to operate to their service potential over their useful life. This is necessary to meet service standards, achieve target standards and prevent premature asset failure or deterioration. There are three types of maintenance:
- **Programmed maintenance** - A base level of maintenance carried out to a predetermined schedule. Its objective is to maintain the service potential of the asset system, including drain clearing and vegetation control.

- **Condition maintenance** - Maintenance carried out as a result of condition or performance evaluations of components of the system. Its objective is to avoid primary system failure.
- **Reactive maintenance** - Maintenance carried out in response to reported problems or system defects. Its objective is to maintain day-to-day levels of service. Reactive maintenance tasks are typically initiated through our Service Request system, with response and resolution times recorded for measurement against our KPI's.

8.7.2 Method of Delivery

The Network maintenance engineers are responsible for the operation of the Stormwater system and are being supported by the Stormwater Management Contractor under the maintenance contract.

Network performance is reported to Council on a monthly basis, with level of service achievement being the focus. This reporting process is also an opportunity for identification of service gaps and network issues.

Assets	Inspection Frequency
Inlets & Outlets	Prior to predicted significant rain events (at least monthly), clearing if required
Pipelines	Siltation clearing as required, selected yearly CCTV (as well as reactive)
Manholes	Checks conducted alongside pipelines
Channels/Gullies & Drains	Checks and weed spraying/vegetation clearing (minimum 3 monthly up to 3 yearly) see Appendix B
Pump Stations	Pump stations are checked on an?

Table 8.4 Inspection Frequency

Overall performance reporting is recorded in the Council annual plan document.

Maintenance Strategy

Maintenance falls into two categories, planned and unplanned, each having quite different triggering mechanisms and objectives;

Unplanned maintenance:	• Corrective work carried out in response to reported problems or defects with the stormwater system (e.g. blocked drains, flooding, scouring, etc.) and analysis of CCTV data.
Planned maintenance	• Preventative maintenance carried out to a predetermined schedule with the aim of ensuring Level of Service, preserving asset design life and, if economic, extending asset life (e.g. the inspection and cleaning of critical system components, i.e. stormwater pump inspections). • On-condition maintenance carried out because of condition or performance evaluations of assets and asset components (e.g., catchpit cleaning).

Table 8.5 Maintenance Strategies

Maintenance work on stormwater assets include:

- Asset inspections
- Clearing of pipe blockages and constrictions (sediment build up and root intrusion)
- Minor Repairs (joint sealing)
- CCTV program
- Dealing with the effects of erosion activity
- Vegetation and Weed Control (Inlets, Outlets and Gully drainage)
- Maintenance of quality improvement devices and the removal of deleterious materials.
- Planting of gully walls and the removal of plant pests
- Removal of sand build up from lake shore outlets
- Undertaking the monitoring program

Performance measurement of Councils storm water infrastructure is by way of the annual report to WRC as required by council comprehensive discharge consent and by periodic satisfaction surveys. The consent focuses on discharge quality but also recognises the need for adequate flood protection.

Additional expenditure is required to renew the three comprehensive consents and money is proposed in the first three years of the 2024 – 34 LTP to address this. `

8.7.3 Operations and Maintenance Strategies

Operations
Operational activities will be undertaken by Councils external maintenance contractor. Following a flooding event, a general inspection will be carried out on the network in the vicinity of the flood. The objective is to identify any damage to the network caused by the flood, and any possible failures in the network which may have contributed to the event.

Physical Works Monitoring
Audits of work will be carried out by staff to verify compliance with standards.

Incident Management

Maintenance staff and contractors are expected to effectively manage minor incidents in accordance with the procedures set out in the SW Management Plan. Council staff will become involved in serious incidents.

8.7.4 Operations and Maintenance Activities

The annual operational cost is forecast to be as per the table below.

$'000	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34	Total Cost 10 years
Capex	1,107	1,887	2,418	1,158	4,636	6,256	2,426	477	400	409	**21,174**
Renewal	165	169	174	178	183	199	217	234	253	272	**2,044**
Operations	3,212	3,519	3,802	3,606	3,983	4,573	4,912	5,218	5,372	5,433	**43,630**
	4,484	**5,575**	**6,394**	**4,942**	**8,802**	**11,028**	**7,555**	**5,929**	**6,025**	**6,114**	**66,848**

Professional services, which include maintaining and developing asset inventories, standard specifications and drawings, project design, supervision and management, are generally provided by TDC Staff.

When necessary, specialist assistance with Asset Planning, Network Modelling and Water Quality management is sought by quotation from external consultants for example CDM or Te Miro Water for network modelling.

Insurance/LAPP' refers to Public Liability and Natural Disaster Insurance. LAPP is a cash accumulation mutual pool, established to help local authorities pay the 40% component of infrastructure replacement costs not covered by central government.

The rates charge relates to the need to keep costs of infrastructure in the correct accounts. Stormwater facilities include significant features (pipes, wadi's, detention dams and major watercourses). Rates charges are based on capital value of the assets, to be consistent with charges to private owners. The percentage of cost above reflects the comparatively low cost of other operations charges in proportion to the total. For example, stormwater is the only one of the three water services that does not incur power charges, because there are no pumping and treatment costs for this infrastructure.

Operational Expenditure (OPEX) costs for Operations and Maintenance are shown in Section 9.

Operations and Maintenance Strategies are as follows.

Table 8.6 Operations and Maintenance Strategies

Deferred Maintenance Statement	The stormwater system in each town is generally in good operating condition. Deficiencies that have been or are to be addressed in the reticulation are due to lack of capacity for current storm runoff and are not due to deterioration. The policy for these is covered in Section 5.3.1
Maintenance Activities	The contract specifications have been referenced in this section to describe standard, frequency of work etc All stormwater reticulation maintenance activities are currently carried out by Downer ("the maintenance contractor") under a recently extended five-year contract The Contractor provides a separate inspection and reporting system for open public drains and detention dams on a six-monthly frequency each April and October. Any apparent defects or maintenance requirements are reported The contract includes operating to a Quality Plan, assuring that the work is properly carried out. Scheduled meetings and reports are used to advise problems, plan future activities and identify future works for longer term planning. The contractor is given authority to act on unforeseen emergency maintenance to a point where the service is stabilised and can be referred to Council for direction. At this point service may not have been fully restored but no ongoing cost is being incurred. Council will then agree on the appropriate course of action required and costs prior to final repairs being implemented.
Inlets/Outlets Asset Group	Catchpits and other inlets are cleaned frequently, including after storms, to keep grates clear, remove blockages and maintain silt settling capacity. Reactive maintenance includes replacement of broken grates and frames, and repair or replacement of riprap or drainage water table base damaged by scour after heavy rainfall, these are maintained by the Councils Road maintenance Contractor Downer.
Pipes Asset Group	No preventative maintenance is carried out for most network pipes and channels. Faults and blockages are repaired as reported, and asset information returned as part of the operation. The majority of open drains are road water table drains, which are maintained as part of the road assets. Open drains leading to or away from pipelines have their waterways checked and maintained regularity to clear silt, debris and growth and repair any subsidence or scouring.
Manholes Asset Group	No regular maintenance of manholes is considered necessary. Reactive maintenance includes clearing occasional blockages and replacement of broken lids or frames.
Detention Facilities Asset Group	Detention dams are checked annually for damage, overgrowth or subsidence and are all in sound working condition. They are also checked after every major storm in case they have overtopped, and damage has been caused by the floodwaters.
Risk Management	As management improvements are made, some assets will be identified as critical. Inspection or maintenance for these may be required more frequently than once or twice per year. Cost of more frequent work is not included in the projections to date.

8.8 Capital Renewal and Replacement Planning

The Council's objective is to maintain assets in a condition that allows them to attain their full life expectancy while providing the required level of service. While a theoretical programme of asset renewal required over this AMP planning period would be based on asset installation dates and standard asset lives, this does not mean that assets are automatically replaced when their theoretical life should be over. Condition, reliability, contribution to water quality, maintenance cost and other factors are monitored and used to determine which assets are actually replaced.

The potential is recognised for extending the investment period of the depreciation reserves, so that cost to the community can be reduced in the long term due to growth in funds.

The decision making around whether to renew pipe network assets or continue to carry out maintenance or repairs has historically been based on staff judgement and experience and considers repair history and condition.

To improve decision making criteria for prioritising specific stormwater pipe network assets for renewal is being developed and will continue to be refined. These criteria include flooding issues, other works in the area, condition, remaining theoretical useful life, location (e.g., under stop banks), large size, and criticality.

Stormwater renewals are generally be done on a 'like for like' basis, unless the one of the following applies to the pipe to be renewed:

- Is smaller than 225 mm size
- Identified as being under capacity for required LoS targets
- Part of an approved upgrade to cater for growth
- An upgrade is required to adapt to climate change and/or provide greater service resilience
- A different standard is required to meet any relevant legislative requirements, or
- An upgrade will result in a lower overall whole life cost.

If any of these applies, then the pipe is considered for an upgrade as well as renewal. If an upgrade is required, it can be funded from the renewals budget for the like for like replacement and from a capital new budget for the upgrade portion.

Council's policy is that any increase in capacity required to meet the new service level will be calculated and provided when the assets require renewal. As a capacity upgrade, this will represent a component of 'new work' which will receive separate accounting treatment in terms of budgeting and funding.

Renewal and replacement expenditure is a part of the overall capital expenditure process and should be considered whenever new assets are created or purchased, with a view to minimising lifecycle cost.

Renewal applies to works that replace existing assets with assets of equivalent capacity or performance capability.

Replacement applies to complete replacement of assets that have reached the end of their useful life, so as to provide a similar, or agreed alternative, Level of Service.

8.8.1 Renewals Needs of Stormwater Pipes based on Age Profile

Most pipes are due for renewal within 30 years as indicated in the following figure showing pipe remaining useful life. This accounts for approximately 70% of the Stormwater pipe network. The timing of this replacement will be dependent on the criticality of the individual pipes and the condition i.e., increased intervention will be required.

Deficiencies in the piped stormwater network usually relate to poor jointing and misalignment, a function of the quality of installation and foundation conditions rather than deteriorated pipe material.

No strength testing has been carried out on stormwater pipes at this time. As pipes approach the end of their estimated life expectancy a programme of inspection and testing may need to be implemented

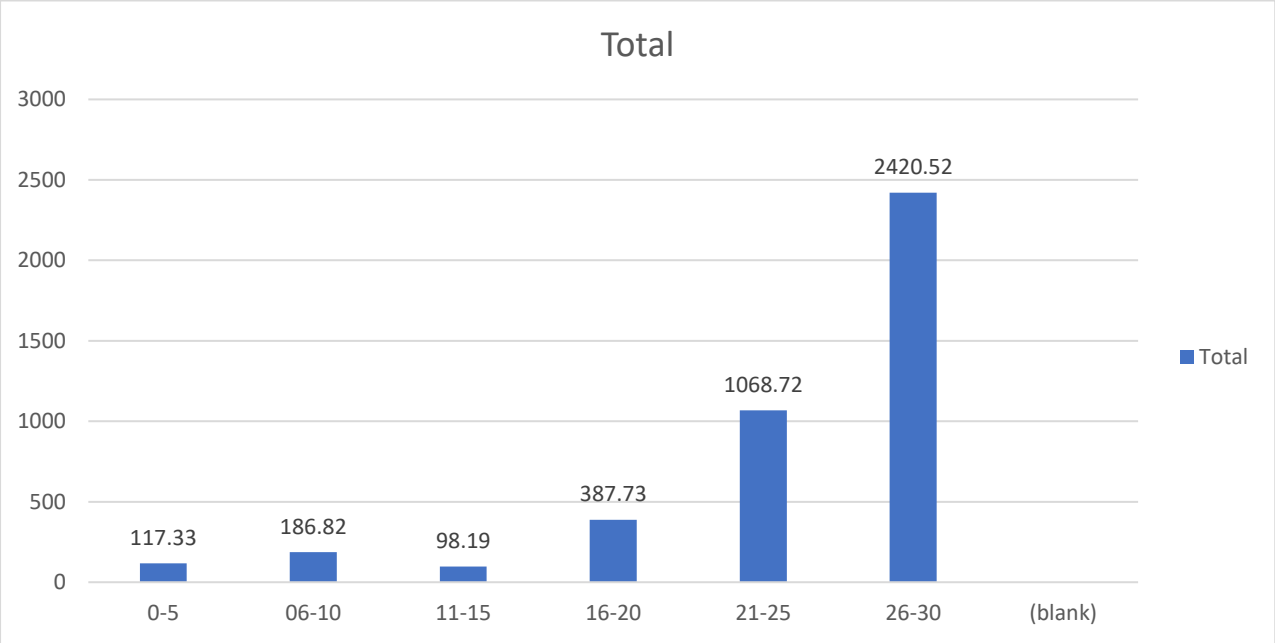


Figure 8.3 Remaining Useful Life (Based on replacement year)

8.8.2 Stormwater Network Renewals

Renewal expenditure is major work that restores an existing asset to its original capacity or the required condition. By renewing plant equipment as required the quality level of service is met.

Council is undertaking a comprehensive CCTV program to determine network condition. This program has concentrated on the older pipes and areas where trees would have effects on the integrity of the pipe network.

A large proportion of the stormwater asset is made up of a pipe network predominantly under ground, with a life expectancy of some 80-100yrs and a current age of the network is well below this. To date this has meant that there has been little in the way of a renewal program for this asset. There will continue to be the need for renewal expenditure on Lake Outlets, and this has mainly come from erosion damaging the outlet structures.

Condition data reflects that the underground asset is in a good condition with only localised issues. Due to the flat grade in Tūrangi, a significant amount of sediment was removed during the CCTV programmed works.

When faults are found as part of the CCTV inspections these are repaired as soon as practical.

The result of the CCTV program is that there have been assets that have needed maintenance, but few assets have needed a full renewal. New maintenance technology means that pipes don't need to be dug up to undertake maintenance, which has resulted in an increase in maintenance expenditure and a reduction in renewal expenditure, and longer lives for the pipe network.

8.8.3 New Renewal Projects 2024 - 34

- Stormwater network renewals program - $2,043,292

No specific renewals have been identified at this time, it is intended to use the current CCTV inspection programme to develop a more specific programme, the current budget is based around pipe age and remaining life estimates.

8.9 Capital New and Improvement Works – for Growth and Levels of Service

8.9.1 Future Levels of Service

There is a short list of works programmed to improve the drainage in specific areas. None of these works are life or property threatening and it has been the practice of Council in recent years to deal with one or two of them each year to minimise the effect on rates. Included in these works are several open channels within the residential area and on private property, which Council has not declared as public drains. Open drains between neighbouring properties tend to generate complaints, which may require Council to intervene and assume responsibility in the interests of the community.

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

- Assets within a new subdivision which are vested to us,
- We construct new network assets where the development has been confirmed, which will support residential growth areas or where stormwater services are needed.

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

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

8.9.2 Network Development

The Capex program maintains the ability of the Stormwater network to continue to provide for Stormwater disposal in the district. The capital program provides for pipe capacity issues, which are therefore backlog expenditure as well as stormwater quality improvement and erosion control measures.

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

- Assets within a new subdivision which are vested to us,
- We construct new network assets where the development has been confirmed, which will support residential growth areas or where stormwater services are needed.

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

Council's infrastructure strategy and growth model require consideration in regard to network development, but most infrastructure development is provided by developers and are consented through the Regional Council. Council then takes ownership of the new network after the development has been approved the infrastructure is adopted into Councils comprehensive consent.

8.9.3 Developer Created

This has seen in recent time more above ground stormwater networks that provide stormwater treatment prior to final disposal into receiving environments, meaning that Council will in the future inherit potentially less piped networks and more pond and gully based systems. Above ground, systems while far better at providing quality improvement inherently cost more to maintain but provide better environmental outcomes.

New developments may also incorporate other types of quality improvement devices that fit into the piped network; these will require ongoing maintenance expenditure.

Developments in previously undeveloped catchments (Green Fields) must provide a Catchment Management Plan, these plans will provide development conditions based on the ability for the catchment to treat and dispose of stormwater adequately.

Council Created

The second driver for new or enlarged development of the stormwater network is due to changes in legislation (Resource Consents) which require better treatment than the existing network can provide.

Lack of capacity is also a driver, this may be due to changes in the disposal options for selected areas, such as Commercial and CBD areas that would want to fully develop properties, but must connect to a network to do so, thus requiring the network to be improved to provide the desired capacity.

A list of the proposed capital works is detailed below and is a mix of backlog works to minimise flooding effects and Stormwater quality improvement.

These projects include:

LTP_316	Hawai reserve detention pond	Flood Mitigation	$213,000
LTP_346	Mangakino flood mitigation	Flood Mitigation	$537,000
LTP_354	Two Mile Bay flood mitigation	Flood Mitigation	$260,000
LTP_394	Motuapa Stormwater Flood Mitigation around WWPS	Flood Mitigation	$200,000
LTP_395	Turangi Stormwater Flood Mitigation (SH1)	Flood Mitigation	$460,000
LTP_344	Kimberly reserve flood mitigation	Flood Mitigation	$2,780,000
LTP_312	Acacia Bay SW culvert and lake outlet contribution	Flood Mitigation	$432,000
LTP_348	Pihanga climate change pipe capacity upgrade	Flood Mitigation	$504,000
LTP_352	Tamatea Rd flood protection	Flood Mitigation	$2,306,000
LTP_393	Motutahae Road Stormwater Flood Mitigation	Flood Mitigation	$300,000
LTP_313	Crown Rd stormwater pond reticulation	Flood Mitigation	$466,000
LTP_315	Elizabeth Street flood mitigation	Flood Mitigation	$1,650,000
LTP_392	Brice Street Stormwater Flood Mitigation	Flood Mitigation	$1,500,000
LTP_317	Miro street industrial area reticulation upgrade	Flood Mitigation	$1,820,000

Table 8.8 LoS Upgrades and Improvements

Quality Improvement Devices

There is an ongoing programme to install Stormwater quality improvement devices for major outlets that feed directly into the lake/river or other sensitive receiving environments and that have large upstream catchments, which convey significant contaminant loads. There are many benefits to installing SW QID:

1. **Public Health Benefits**: Improved water quality resulting from the use of stormwater treatment devices reduces the risk of waterborne diseases and contamination, benefiting public health and reducing healthcare costs associated with water-related illnesses.
2. **Long-Term Cost Savings**: While there is an initial investment in installing stormwater treatment devices, they can result in long-term cost savings by preventing damage to infrastructure caused by flooding, reducing the need for costly water treatment downstream, and avoiding fines or penalties for non-compliance with regulations.
3. **Enhanced Community Aesthetics**: Well-designed stormwater treatment devices can also enhance the aesthetic appeal of communities by incorporating green infrastructure elements like rain gardens, bioswales, and vegetated filter strips, which provide additional benefits such as urban beautification, recreational spaces, and improved air quality.
4. **Climate Resilience**: With the increasing frequency and intensity of storms due to climate change, stormwater treatment devices play a crucial role in enhancing resilience to extreme weather events by managing runoff effectively and reducing the impact of flooding and erosion on infrastructure and communities.

This Asset Management Plan builds on the original quality improvement program and looks to improve discharge quality from large catchments and high usage i.e. where there are high vehicle numbers or industrial areas where the pollutant load is high. Areas where outlets discharge to gullies and ponds are excluded as these areas allow for pollutant capture.

Table 8.9 Future SW QID Installations

LTP_347	Norman Smith St/Control gates improvement device	1	Quality Improvement
LTP_343	Kaimanawa Street improvement device	1	Quality Improvement
LTP_350	Rifle Range Rd improvement device	1	Quality Improvement
LTP_351	Spa RD Improvement device	1	Quality Improvement
LTP_349	Puataata Rd improvement device	1	Quality Improvement
LTP_309	Mobil station Improvement device	1	Quality Improvement
LTP_353	Tui Street improvement device	1	Quality Improvement
LTP_505	Huia Street improvement device	1	Quality Improvement
LTP_345	Lake Terrace / Napier Rd improvement device	1	Quality Improvement
LTP_342	Kinloch Improvement device	1	Quality Improvement

The provision of quality improvement devices is required under condition 30 of the resource consent that requires a quality improvement program.

Overland Flow Path Remediation

Council has a responsibility to manage the way land is used to avoid or mitigate the effects of natural hazards (s31 of the RMA1991)

Section 35 of the Resource Management Act (1991) requires Councils to monitor the environment, and maintain records of natural hazards.

Councils modeling work to date has identified where flow paths will be in a 1:50 and1:100-year event and can provide water depth and velocity. This work has not been validated as the piped network has not been included, but the model has identified a number of areas where stormwater will effect property and lead to flooding. The funding identified is to allow on site field verification works to continue.

To get this project to the final stage of placing information on to Lim report there needs to be a cross organisational team established which builds on the experience of the Lake flooding process as well as part of the IT team to make sure that the information captured is in the most usable form. To fully validate the model assumptions Council may need to develop a model of the storm water network, which would come at considerable cost.

An alternative option is to develop a model of the network for areas at risk only, which would reduce the overall cost and this could be funded over time prioritised on the overall risk to properties. This would mean that the Lim information would not be available in the short to medium time frame but the model would still be a great asset to determine where flooding exists and to plan for remedial actions. Further funding needs to be allocated to undertake further modelling.

Flood remediation and investigations and option selection

The over land flow paths work has identified a number of properties in the district that will be impacted by over land flows. The projects listed above will determine future options to reduce the impact. A number of these locations have reserves available to enable detention ponds but they would be located in residential areas where the community are not usually supportive of ponds due to the health an safety risks. An options analysis will be undertaken with options presented to council. In some cases, due to the depth of flow path council may only be able to reduce the impact and not remove it altogether.

The projects will incorporate additional asset inspections and validation, as well as the identification of affected property floor levels to enable council to fully determine current flooding impacts.
Solutions may incorporate new pipe discharges to the lake which will need sign off from both the regional council and the Tūwharetoa Trust board.

8.10 Asset Type

8.10.1 Stormwater Network

Functional Area	Asset List	Lifecycle Group
Collection	Pipes incl. pipe connections	Pipe Network
	Manholes	Pipe Network
	Inlets/Outlet structures (associated with reticulation)	Pipe Network
	Culverts	Channel Structures
	Protection Works	Channel Structures
	Channels, natural and artificial	Streams, Channels and earth structures
Flood protection	Floodgates	Channel Structures
	Stop Banks	Streams, Channels and earth structures
	Detention Basins	Streams, Channels and earth structures
	Pump Stations	Pump Stations (3)
Treatment	Constructed wetlands Rain gardens Gross litter traps (including outlet nets) SW Treatment Devices (Vortex Separators) Sump traps Grass swales	Treatment Devices

Table 8.10 Stormwater Asset types

Asset Condition and Performance

In the case of stormwater pipelines, the condition of the pipe is taken as being directly related to its age unless better information is available. Council does not have a complete or accurate set of condition ratings for stormwater assets in its database, however there is an improvement task to address this. Without knowledge of the condition of each stormwater pipeline it has been necessary to adopt standard life expectancies based on pipeline age and expected useful life rather than by analysis of condition grades. Estimates of average life expectancy for the various makes of pipe were assessed using local knowledge, published data from other local authorities and technical papers such as the International Infrastructure Management Manual.

Key network issues are:

- Pipe capacity
- Overland flow path provision
- Stormwater quality

Council has a network service level of provision of 1:10yr event but has not retrospectively upgrade the network unless there is a known flooding or erosion issue. To understand the current network capacity and identify the under-capacity areas that are causing problems, contractor reports and service requests and the overland flow path model are analysed.

Council lacks an operational model of the stormwater network, which hinders Councils ability to determine the networks effect on overland flow path levels, and without a comprehensive model, Council does not have an accurate understanding of the network's capacity.

In general terms, most of the network is sized for 2 to 5-year events but climate change lessens the capacity over time. The litmus paper test in regard to network capacity is have we had any floods. Several areas, mostly in depressions where the network is shown to be inadequate in less than a two-year event, and these sites will need to be addressed over time and when funding permits.

The modelling data is another good indicator of the levels of flooding and inundation that could occur, and by completing the Hazard Work, Council will be able to determine where capacity improvement funding may be best spent.

The current Taupō CBD stormwater network does not have the capacity to match the current Code of Practice requirements, but modelling work indicates that in a 1/100 event the roads are able to convey the majority of flow thus negating the need in the short term to increase pipe network capacity. Council is able to use the flow path model to identify where capacity issues are, and this AMP provides options to limit their impact.

8.10.2 Stormwater Network Operations and Maintenance

Maintenance is carried out on the Stormwater network to ensure that the levels of service outlined in the Level of Service section of this document are met. A summary of the change in operations and maintenance due to demand is included in Section 6, with a full financial summary in Section 9.

The network is maintained under the maintenance contract some Specialist maintenance such as CCTV and gully planting works are carried out by specialist contractors.

Council has implemented an ongoing CCTV condition assessment program that has to date compiled data for most of the urban networks apart from the Taupō Township. The CCTV program requires the contractor to clean the network as they go which has resulted in a significant amount of roots and sediment being removed from the network.

The contractor undertakes regular inspections of outlets and ephemeral gully systems, this report data along with service requests and CCTV data are then collated and analysed for maintenance and renewal requirements.

Council will CCTV at least 10% of the pipe network per year to enable conditions assessments to be undertaken.

Council's service levels have been included in the three waters maintenance contract in the form of schedule works with differing levels of priority, which are impacted by health and safety aspects as well as cost and environmental impacts. Council's criticality assessment also enables council to perform proactive maintenance on specific high criticality assets.

Gap analysis is undertaken when reviewing maintenance data and costs as well as service requests. This data is collected in Asset Finda, the Three Waters asset data system. This database allows council to consider asset age, condition assessment data and criticality to allow council to focus on proactive and preventative maintenance.
Where gaps in achievement of desired service levels are identified, this results in an options analysis process with possible funding options provided to senior management, and then through to Council.

CCTV data is peer reviewed externally to Council to validate condition assessment and to determine asset maintenance requirements. Priority is given to the worst affected pipes with a consideration to the size of the catchment and the amount of properties affected if the network was to fail.

Pipe maintenance options for damaged pipes vary from dig it up, to reline or renew altogether. These options are considered on a case-by-case basis depending on the location issues and pipe sizes and available funding.

Council funds a mix of proactive and reactive maintenance budgets, with the proactive budget applying to regular asset inspections, CCTV, root cutting programs and sediment removal. The reactive maintenance budgets are prioritised from the inspection results. Any deferred maintenance that is not critical is documented and reprioritised in the follow financial year once the budget is available.

Asset Finda can produce maps of the Stormwater network that show geo- spatially where CCTV inspections have occurred which aids the programming process. The database can also record pipe condition rating in the form of different coloured pipes for different condition rating. The ability to represent condition data in the form of a map greatly enhances the ability at the political level to understand the funding requirements.

Asset Finda can also include all projected renewal and capex expenditure for the Three Waters in map form to enable asset managers to determine where construction synergies might occur.

Root intrusion and sediment build up are the main issues with Turangi Township having a large verge tree stock.

A process of locating all trees on verges is being undertaking in Turangi to enable council to focus its root cutting and removal program going forward. This has resulted in a program of tree removal (98 trees identified for removal) as roots have been impacting on road berms and kerb and channel design.

The improvement of Stormwater quality and the reduction of degradation of receiving environments is achieved by the installations of various improvement mechanisms, such as enviropods in the urban high use areas and Hynds Downstream Defenders or similar devices above outlets as well as the use of ephemeral gullies where waters are detained to allow sediment / contaminants to drop out.

The maintenance of these mechanisms is shared with the roading division of council who maintain the enviropods and the Three Waters (Downers) contractor who maintain the CDS units. Both Council and Downers (Councils maintenance contractor) have the operational manuals for the Hynds Downstream Defenders. Ephemeral gullies are maintained with a mix of internal parks staff for mowing and selected contractors for gully plant maintenance.

Downers routinely inspects Stormwater outlets that discharge directly to the Lake as these outlets suffer sand build up in certain wind directions, this proactive maintenance reduces the amount of localised flooding incidents from blocked outlets. Ephemeral gullies are also regularly inspected to identify potential blockages and bank instability as well as for mowing and plant maintenance and planting.

Quality improvement devices are scheduled to be emptied three times per year but are inspected after periods of high rainfall to make sure they still have capacity.

Customer service staff log network faults directly into Asset Finda, which links directly to Downers call centre. They then dispatch this information to their field staff.

Depending on the priority of the fault, Downers have differing response times for arrival on site and completion of the fault. High priority faults are also copied to the relevant Council staff and Asset Managers.
Downer field staff when completing the fault log identifies which scheduled items are to be paid and make any changes to the field information pertaining to the network and update the network data if incorrect.

Council can then analyse the historic maintenance spend on specific assets to determine future options if needed for improvement.

Condition assessment of TDC storm-water infrastructure by area

CCTV condition assessments of approximately 70% of the storm-water assets across the Taupō district have been carried out to enable a determination of asset condition by area for renewal purposes. Each areas asset condition assessment carried out has been graded 1 – 5 as described in the table below. As more condition assessments are undertaken in the coming years a clearer picture will be achieved, and from this an improved renewal program for these assets.

Grade	Condition description and approximate remaining life assessment
1	**Very good condition:** Storm-water asset should meet or exceed designed life expectation (100 % +)
2	**Good condition:** Storm-water asset showing first signs of deterioration, asset is expected to meet (80 - 100%) of original life expectation
3	**Average condition:** Storm-water asset has deteriorated and the asset is expected to have (60 - 80%) of original life expectation
4	**Poor condition:** Storm-water asset has deteriorated significantly and the asset is expected to have (40 - 60%) of original life expectation
5	**Very poor condition:** Storm-water asset failing or high risk of imminent failure renewal needed within 0 - 3 years (0 – 40%) of original life expectation

Table 8.12 Pipe Condition Ratings

Most storm-water assets had an install date of 1960/70s and had a life expectancy of 80-100 years. Most of the assets are now 40+ years old, 50% through their expected design life.

Storm-water condition assessment by area:

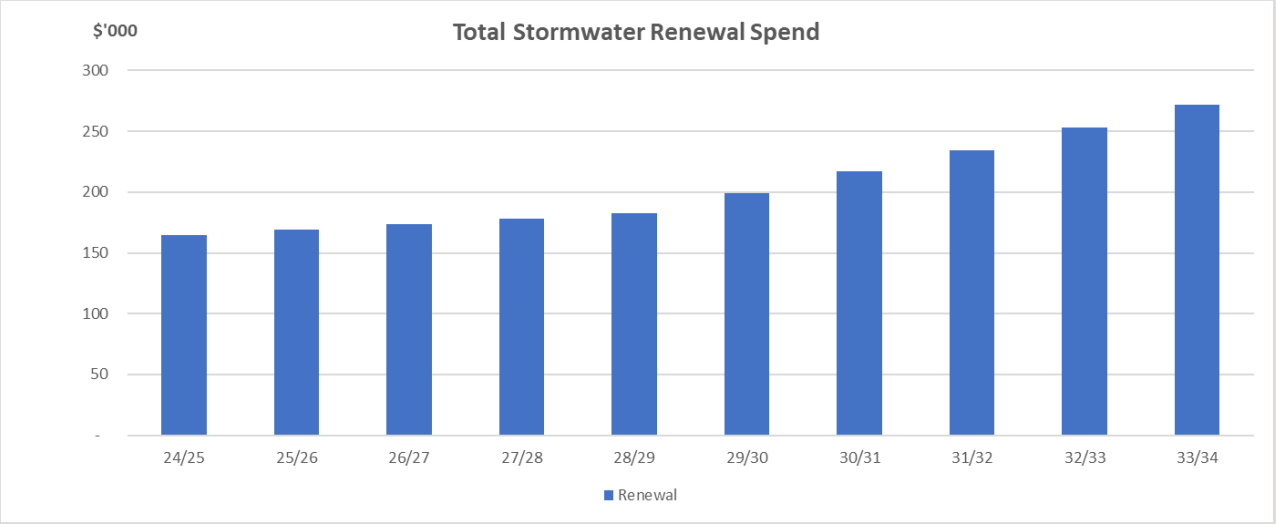
Table 8.13 Pipe Condition rating by Area

Area	Grade	Condition description/approximate remaining life assessment
ACACIA BAY	1	**Very good condition:** Storm-water asset should meet or exceed designed life expectation (100 % +)
TAUPŌ	1	**Very good condition:** Storm-water asset should meet or exceed designed life expectation (100 % +)
HATEPE	1	**Very good condition:** Storm-water asset should meet or exceed designed life expectation (100 % +)

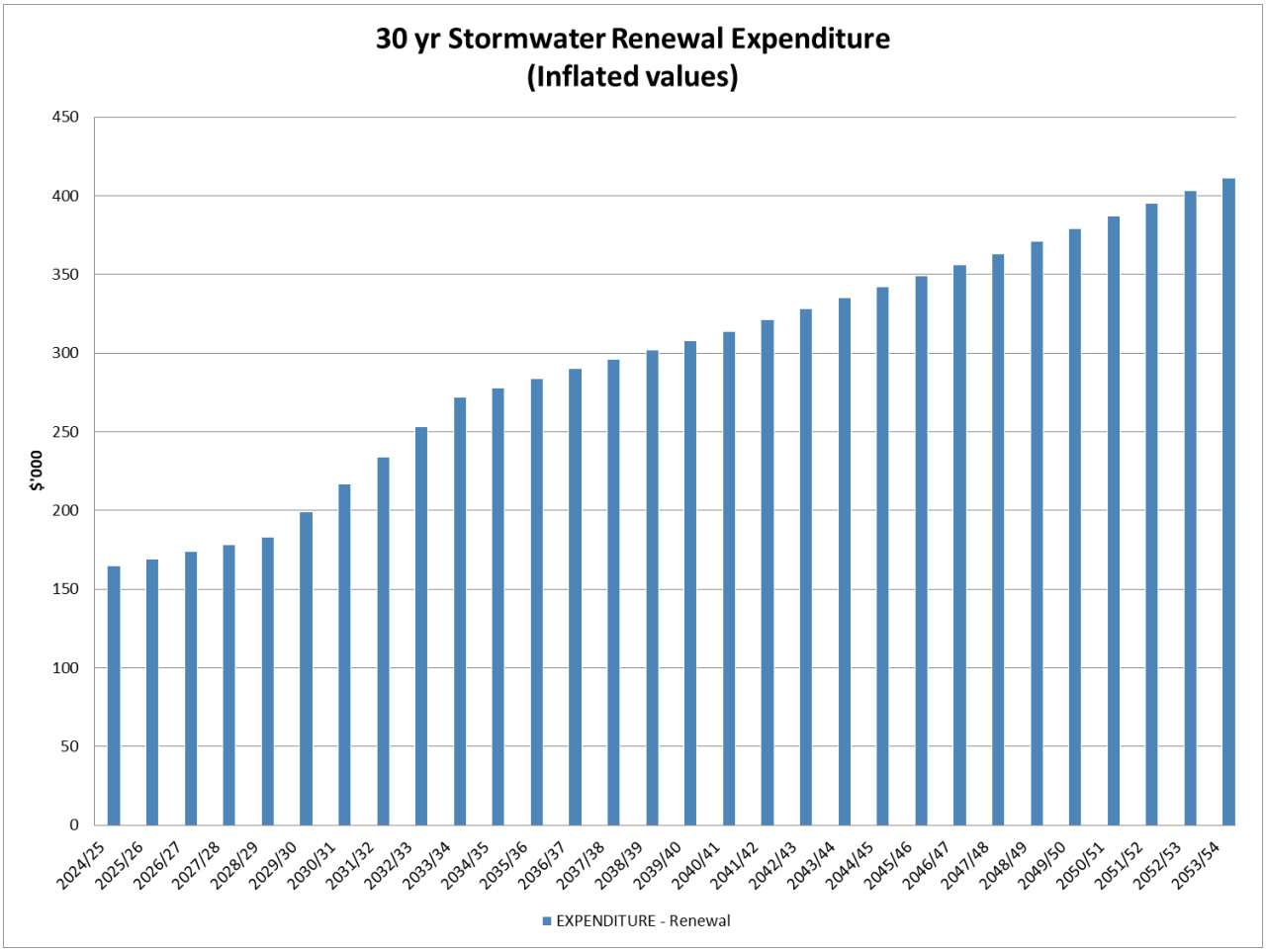
MOTUOAPA	1	**Very good condition:** Storm-water asset should meet or exceed designed life expectation (100 % +)
TURANGI	3	**Average condition:** Storm-water asset has deteriorated and the asset is expected to have (60 - 80%) of original life expectation
PUKAWA	3	**Average condition:** Storm-water asset has deteriorated and the asset is expected to have (60 - 80%) of original life expectation
OMORI	1	**Very good condition:** Storm-water asset should meet or exceed designed life expectation (100 % +)
KURATAU	1	**Very good condition:** Storm-water asset should meet or exceed designed life expectation (100 % +)
WHAREROA	1	**Very good condition:** Storm-water asset should meet or exceed designed life expectation (100 % +)
WAIRAKEI	2	**Good condition:** Storm-water asset showing first signs of deterioration, asset is expected to meet (80 - 100%) of original life expectation
KINLOCH	2	**Good condition:** Storm-water asset showing first signs of deterioration, asset is expected to meet (80 - 100%) of original life expectation
MANGAKINO	2	**Good condition:** Storm-water asset showing first signs of deterioration, asset is expected to meet (80 - 100%) of original life expectation
WHAKAMARU	3	**Average condition:** Storm-water asset has deteriorated and the asset is expected to have (60 - 80%) of original life expectation
ATIAMURI	1	**Very good condition:** Storm-water asset should meet or exceed designed life expectation (100 % +)

Conclusion: From the information received so far the condition of the storm-water assets across the district is generally very good and it is expected that the bulk of the assets will meet or exceed their designed life expectation. There are some areas were the storm-water assets have deteriorated quicker than expected due environmental factors such as local soil conditions and ground movement.

Graph 8.4 10 Year Renewal funding



The above graph shows the required funding levels over the next ten years based on condition, criticality and age. As Council has concentrated the CCTV work in areas outside of the Taupō Township, which makes up 60% of the overall network, the funding level outside of the ten-year window has been estimated to plateau. This is due to the bulk of the age based renewal cost not being until 2060. Long term funding estimates will change as more condition information is obtained.



Graph 8.5 30 Year Renewal Expenditure

Above graph identifies the age-based renewal funding, reflecting the 100 life given to a majority of the piped network. This funding profile will be adjusted, with some good quality condition assessed pipes having extended lives.

Forward CCTV program

Council has provided funding to allow for 10% of the stormwater network to be condition assessed each year. Data provided from this work will allow ongoing improvement to long-term renewal expenditure.

Over the next three years, the condition assessment program will concentrate on the network mainly in the Taupō township, concentrating on the older parts of the town.

Some additional works will be undertaken to support shovel ready programs to make sure that assets are not going to be needed to be renewed after the shovel ready projects have been completed.

8.10.3 Future Renewals 10yr only

Table 8.6 Capital expenditure

					24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34	
25	Code	Name	Location	Background	1	2	3	4	5	6	7	8	9	10	Total
DISTRICT WIDE PROJECTS															
1	LTP_388	Taupo Urban Stormwater Modelling	District-wide	The exising stormwater models need to be continously updated as new data is m	$180,000	$130,000	$70,000								**$380,000**
MANGAKINO															
4	LTP_346	Mangakino flood mitigation	Mangakino	flood mitigation. Current Iwi farm catchment flows through Mangakino Township. Infrastructure required to divert flows around township.	$193,000	$344,000									**$537,000**
TURANGI															
2	LTP_395	Turangi Stormwater Flood Mitigation (SH1)	Turangi Town	flood mitigation. Modelling indicated that overland flow passes through private properties (16-20 properties)	$50,000	$350,000	$60,000								**$460,000**
12	LTP_349	Puataata Rd improvement device	Turangi Town	Improvement of the stormwater quality being discharged into the environment						$354,000					**$354,000**
26	LTP_046	Turangitukua park (Hirangi Rd carpark drainage)	Turangi Town	surface flooding across carpark due to blocked overground drain. Tapu land beside which NT have stated we cannot drain into. Water table high. Requires engineering solution/refall of carpark	$750,000										**$750,000**
27	LTP_047	Turangitukua Park (te Aonini carpark seal)	Turangi Town	extend carpark seal over grassed area. Requires additional drainage	$350,000										**$350,000**
6	LTP_394	Motuapa Stormwater Flood Mitigation around WWPS	Tūrangi-Tongariro	Flood mitigation. Modelling indicated that stormwater attenuation around WWPS	$50,000	$125,000	$25,000								**$200,000**
TAUPO															
3	LTP_316	Hawai reserve detention pond	Taupō	flood mitigation. To achieve 100 year flood mitigation level of service.	$33,000	$180,000									**$213,000**
5	LTP_354	Two Mile Bay flood mitigation	Taupō	flood mitigation. Modelling indicates that Overland flow path passes through hotel.	$24,000	$236,000									**$260,000**
7	LTP_344	Kimberly reserve flood mitigation	Taupō	flood mitigation. Stormwater model shows overland flows through private property.		$52,000	$39,000	$444,000	$2,245,000						**$2,780,000**
8	LTP_347	Puataata Rd improvement device	Turangi Town	Improvement of the stormwater quality being discharged into the environment											**$0**
9	LTP_343	Puataata Rd improvement device	Turangi Town	Improvement of the stormwater quality being discharged into the environment											**$0**
10	LTP_350	Puataata Rd improvement device	Turangi Town	Improvement of the stormwater quality being discharged into the environment				$343,000							**$343,000**
11	LTP_351	Puataata Rd improvement device	Turangi Town	Improvement of the stormwater quality being discharged into the environment					$343,000						**$343,000**
13	LTP_309	Puataata Rd improvement device	Turangi Town	Improvement of the stormwater quality being discharged into the environment											**$0**
14	LTP_312	Acacia Bay SW culvert and lake outlet contribution	Taupō	Flood mitigation (new subdivision)				$82,000	$350,000						**$432,000**
15	LTP_348	Pihanga climate change pipe capacity upgrade	Taupō	Pipe capcity currently for a 1 in 5 year storm event and has flooded recently. Needs to be upsized.				$4,000	$150,000	$350,000					**$504,000**
16	LTP_352	Tamatea Rd flood protection	Taupō	flood mitigation. Modelling indicated that overland flow passes through private property				$53,000	$136,000	$2,117,000					**$2,306,000**
17	LTP_393	Motutahae Road Stormwater Flood Mitigation	Taupō	flood mitigation. Modelling indicated that overland flow passes through private properties (10-12 properties)	$50,000	$225,000	$25,000								**$300,000**
18	LTP_353	Puataata Rd improvement device	Turangi Town	Improvement of the stormwater quality being discharged into the environment							$343,000				**$343,000**
19	LTP_313	Crown Rd stormwater pond reticulation	Taupō	flood mitigation & public safety. The existing SW pond is in a geothermal Area and Contact Energy have requested that it be moved.					$22,000	$444,000					**$466,000**
20	LTP_315	Elizabeth Street flood mitigation	Taupō	flood mitigation. Constraints in the Stormwater network causing overland flow through private properties.					$50,000	$100,000	$1,500,000				**$1,650,000**
21	LTP_392	Brice Street Stormwater Flood Mitigation	Taupō	flood mitigation. Modelling indicated that overland flow passes through private properties (8-10 properties)					$285,000	$1,154,250	$60,750				**$1,500,000**
22	LTP_505	Puataata Rd improvement device	Turangi Town	Improvement of the stormwater quality being discharged into the environment								$365,000			**$365,000**
	LTP 340	Stormwater Network Renewals Programme	Taupō	Improvement of the stormwater quality being discharged into the lake	$150,000	$150,000	$150,000	$150,000	$150,000	$160,000	$170,000	$180,000	$190,000	$200,000	**$1,650,000**
23	LTP_317	Miro street industrial area reticulation upgrade	Taupō	flood mitigation. The stormwater network is undersized causing constraints in the network and risk of flooding.								$44,000	$111,000	$1,665,000	**$1,820,000**
24	LTP_345	Puataata Rd improvement device	Turangi Town	Improvement of the stormwater quality being discharged into the environment									$301,000		**$301,000**
34	LTP_360	Puataata Rd improvement device	Turangi Town	Improvement of the stormwater quality being discharged into the environment											**$0**
KINLOCH															
28	LTP_342	Kinloch Improvement device	Kinloch	Improvement of the stormwater quality being discharged into the environment										$301,000	**$301,000**
					$1,830,000	**$1,792,000**	**$369,000**	**$1,076,000**	**$3,731,000**	**$4,679,250**	**$2,073,750**	**$589,000**	**$602,000**	**$2,166,000**	**$18,908,000**

8.1.1.5 Stormwater Network Disposal

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

When a pipe asset is renewed on an alternative alignment or new location, the original assets is left in situ. Buried assets should be decommissioned by being filled to prevent voids forming around the pipe.

Pipes may be replaced on an alternative alignment for several reasons including better accessibility. There are no specific programmes associated with disposal of stormwater pipes and associated assets.

Where privately owned gully systems act as overland flow paths, Council will work to protect these flow paths into the future to prevent development in these areas and to remove obstructions from flow paths to avoid the risk of flooding.

Gully systems also provide additional benefits over and above the conveyance of stormwater, in that they can act as passive transport routes and can enhance the natural environment to attract native bird species.

Assets disposed of out of Council's stormwater network will also have to be removed from councils Comprehensive discharge consent, and will need a business case provided to the SLG and or Council to approve.

8.11 Disposal Plan

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

When a pipe asset is renewed on an alternative alignment or new location, the original assets is left in situ. Buried assets should be decommissioned by being filled to prevent voids forming around the pipe.

Pipes may be replaced on an alternative alignment for several reasons including better accessibility. There are no specific programmes associated with disposal of stormwater pipes and associated assets.

9.0 FINANCIAL SUMMARY

9.1 Process of Determining Financial Forecast

The provisional 30year financial forecast for Stormwater was determined by identifying new works, and the continuation/evaluation of current maintenance and renewal strategies within the reticulation network. Changes to the operations (OPEX) and capital projects (CAPEX) expenditure are generally due to maintaining current level of services and increased contract rates.

Level of service consultation carried out in the previous LTP indicated the community were generally satisfied with Councils current spending within the various asset groups. This feedback was also used when determining provisional budgets. Refer to table 9.4 for the final version of the 10-yr financial forecasts for both OPEX and CAPEX budgets. A Council wide 10yr expenditure review is carried out. The strategy for this review is to:

- assign realistic timing to projects given the resources available under Councils current funding sources and in relation to impacts in other Asset Management Plans.
- optimise timing of projects.
- generate consistent budgeting philosophies across all Council divisions.
- align expenditure with growth predictions.

9.1.1 Funding Strategy

The focus of this AMP is to identify the optimum (lowest lifecycle) cost for the Stormwater cost centre and to identify the cost for each asset group necessary to produce the desired level of service. How this cash flow will be funded is outlined in Council's long-term financial strategy.

Current funding sources available for stormwater include:

- Rates – income generated by the collection of general, separate and differential rates.
- One off capital contribution – contributions made by individual developers for projects that are of particular benefit to them that are being constructed by TDC
- Private (developer) funded works – projects completely built and funded by developers where ownership is handed over to TDC on completion (vested assets).
- Interest on general funds.

The Stormwater service provision is funded by Council, 100% through general rate which reflects the general public good of having properties not being flooded and good quality stormwater entering receiving environments.

In order to provide for on-going operation of the Stormwater network Council will need to continue to invest capital expenditure within the district.

Council will also receive infrastructure from developers which will fall under Councils Comprehensive discharge consent prior to Council accepting the new infrastructure.

The provision of Capital expenditure for growth projects can be undertaken through deed of arrangement with developers as Council has made the decision not to apply development contributions.

The overall Stormwater cost centre is currently funded by general rate as urban stormwater infrastructure protects private property from flooding and erosion. There is clearly a public component in relation to the runoff of water onto roads and to ensure access to properties during periods of high flooding. There is also an intergenerational component.

9.1.2 Allocation of Funds

The process of allocating funds is generally based on:

Maintenance and operations are funded from General Rates.

Renewal works are funded by Depreciation.

New Works are funded by either or a combination of Loans, Individual Contributions (e.g., to increase downstream pipe capacity) and Depreciation (if it has not all been used for Renewal Works).

9.2 Historical and Forecast Expenditure

Detailed historic expenditure for the stormwater activity is shown below:

$'000	2015-2016	2016-2017	2017-2019	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
Operations and Maintenance	1,677	1,667	1,697	1,769	1,839	853	952	1,144
New Works	175	127	111	391	337	532	53	319
Renewal	125	155	325	138	155	136	207	29
Total	**1,977**	**1,949**	**2,133**	**2,298**	**2,331**	**1,521**	**1,212**	**1,492**

Forecast stormwater expenditure for the next 10 years is summarised on the following pages.

9.2.1 Operation And Maintenance Expenditure

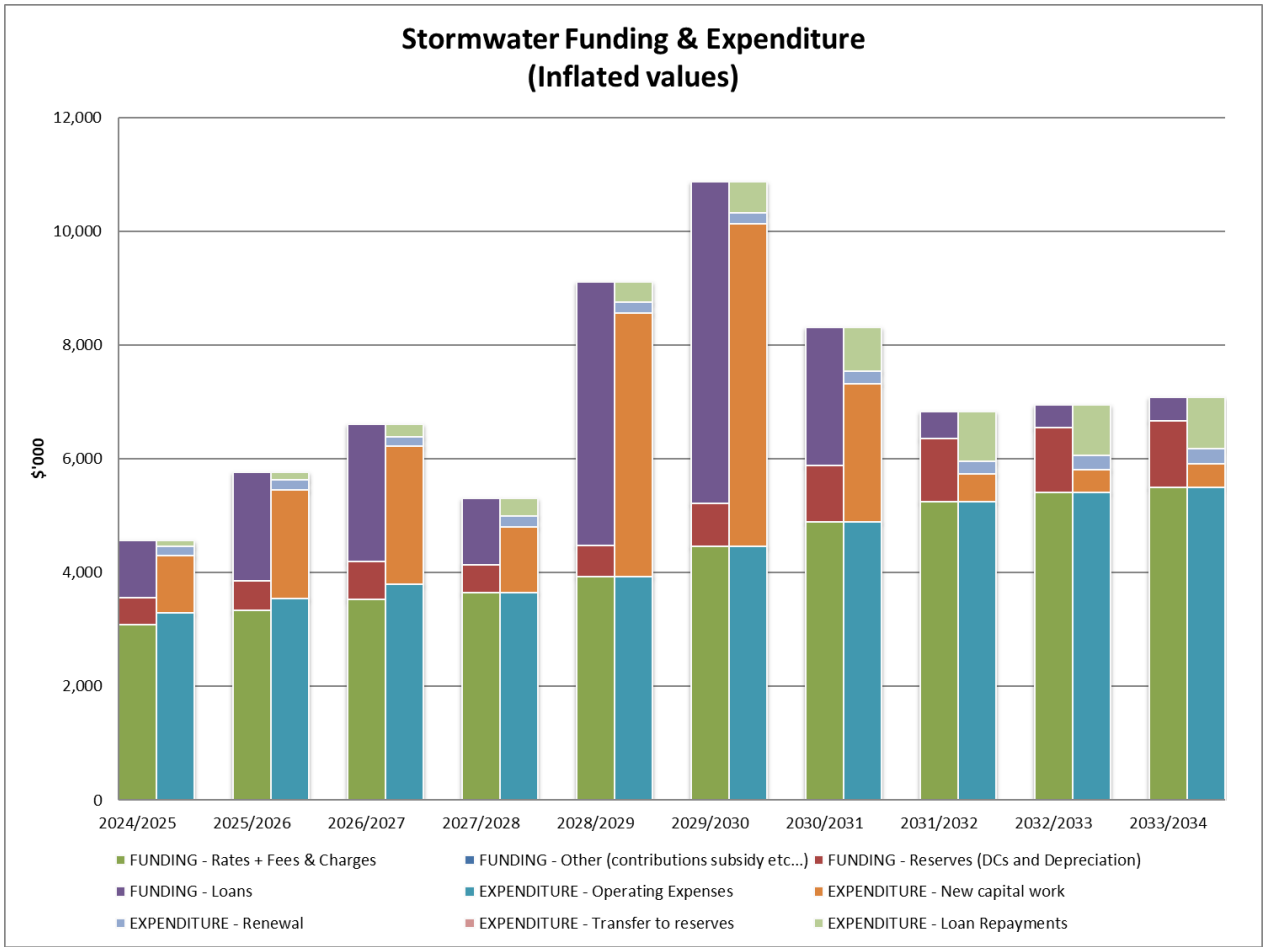


Figure 5.2: Operating and Maintenance Expenditure ($,000)

Operation and maintenance costs average approximately $450k/year for the next 10 years and this is similar to the preceding years. 30yr operational costs can be found in the appendices and in the graph below. Increase in 24 - 26 is to allow for consent renewals.

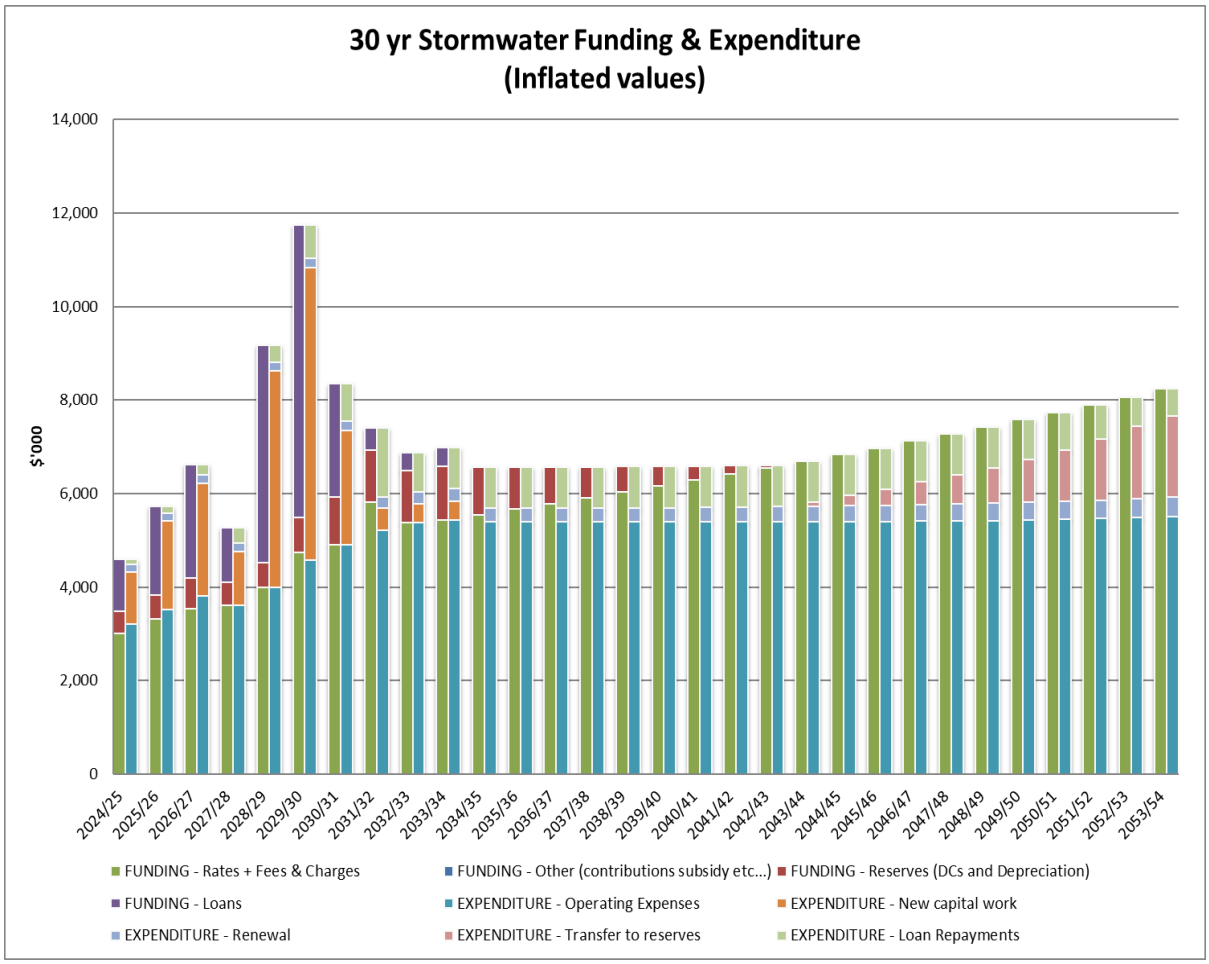


Figure 5.3: 30 yr Operating and Maintenance Expenditure ($,000)

The maintenance is carried out by contractors who are appointed in accordance with Council's procurement policy.

9.2.2 Renewal Expenditure

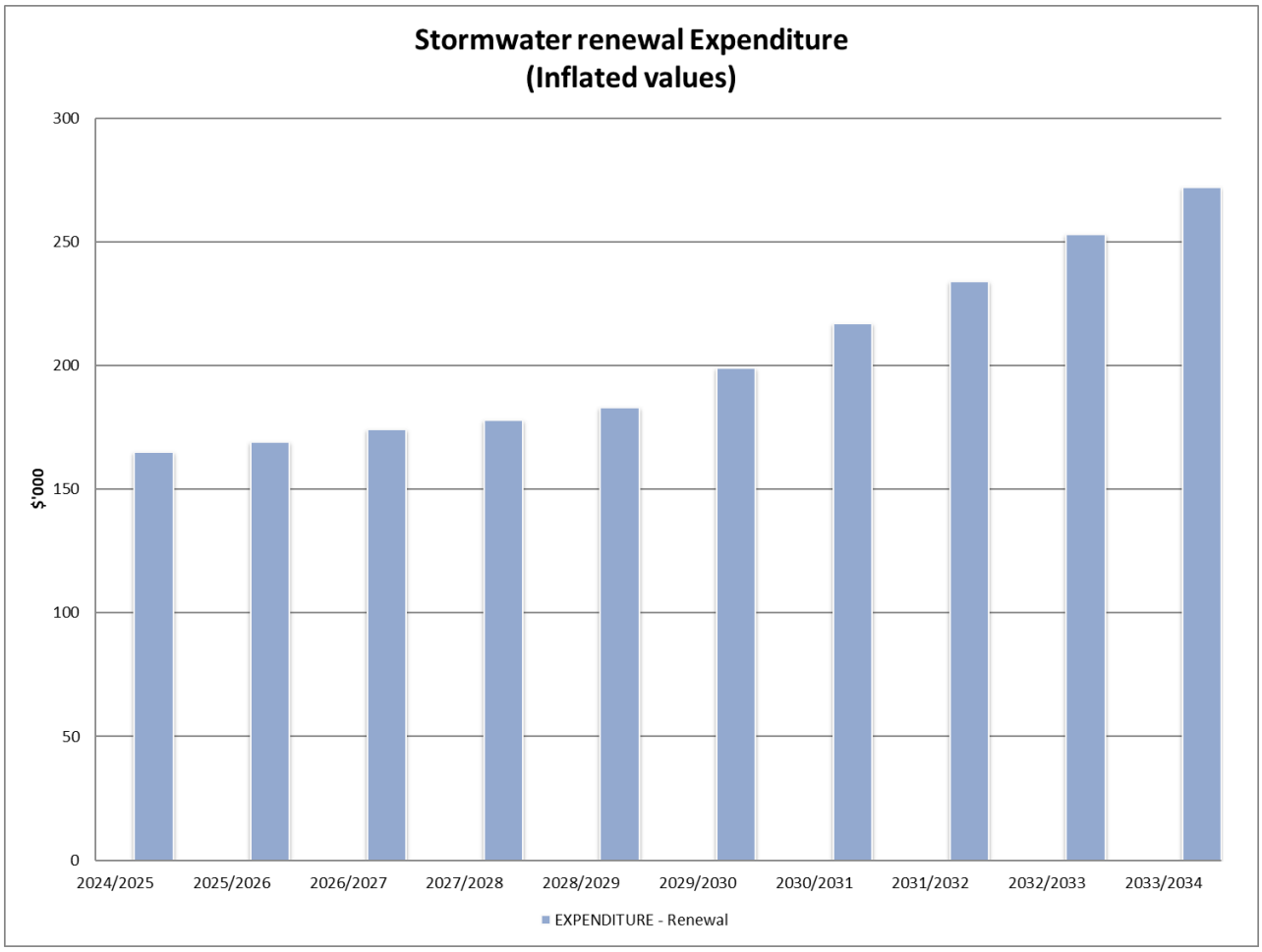


Figure 5.4: Renewals Expenditure ($,000)

Renewals include any items where an existing asset is replaced for example outlet structures pipe etc. Council has also invested in Enviropods to improve the quality of its lake discharges these will need ongoing renewal expenditure. Some quality improvement devices will require renewal expenditure during the 10-year period.

Generally, the timing of renewal for an asset is based on condition assessment data gathered by CCTV or by visual inspection, the criticality of the asset, past maintenance history and the age of the asset compared to its useful life. Loss in service potential is calculated by straight-line depreciation except for land which is not depreciated. The depreciation rates are applied at a component level and are dependent on the remaining useful life of each component. The total useful lives have been updated and are assumed as follows as per Asset Valuation report.

Component	Useful Life (years)
Manholes & cesspits	75 -100
Pipes	80- 100
Flood control systems	50- 100

Table 5.1: Stormwater Asset Useful Lives

A summary of the depreciation of stormwater assets is presented in the Taupō District Council Annual Report.

9.2.3 CAPEX: New works Expenditure

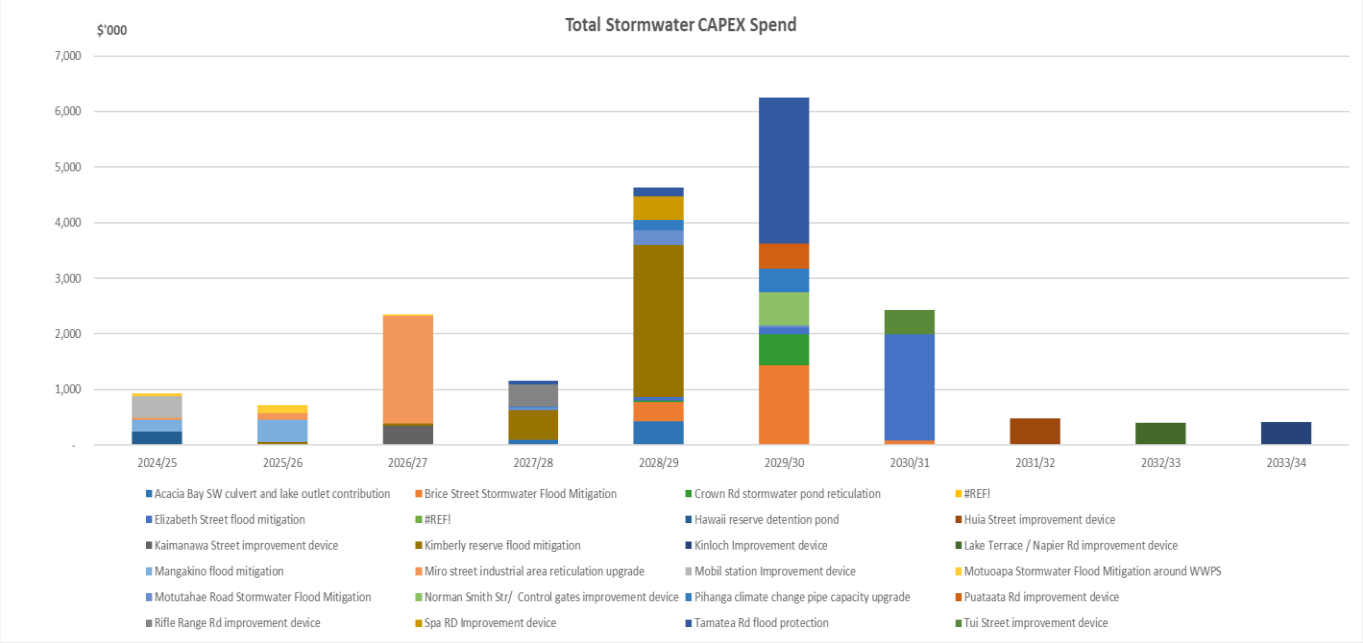


Figure 5.5: New Works Expenditure ($,000)

New works expenditure is governed by works required to meet resource consent requirements, risk and levels of service. Structure Planning documents have been and will continue to be used to support the assessment of future expenditure.

Expenditure reflects the ongoing quality improvement device installations, and the peak between 28-30 reflects possible solutions to overland flow path mitigation.

The Council has adopted a Policy for Maintenance, Renewal and Capital expenditure to be applied to our three waters assets and this sets benchmarks regarding service potential and capitalisation of our assets.

In determining the classification of asset expenditure consideration should be made of:

Service Potential
Service potential is the capacity that the system can produce from August 2023

The key element in determining the expenditure classification of expenditure is the effect or change on the service potential of the asset or system.

- Where the service potential is restored to its original level, this constitutes renewal expenditure.
- Where the service potential increases above the current service potential, this constitutes capital expenditure.

Thresholds

- The appropriate threshold for reviewing expenditure classification is at the component level e.g. Generally, if expenditure does not constitute a component it should be considered maintenance. For information on the component levels refer to the individual asset component registers.

- Consider the materiality of the expenditure (in value and in substance). As guidance expenditure < $700 should be treated as maintenance expenditure. In most instances it is not practical to capitalise expenditure below this level

9.2.4 CAPEX: disposal

Council will not be disposing of any Stormwater assets over the period of this AMP. The disposal of Stormwater assets needs to be supported by a business case signed off by the senior leadership group.

Expenditure Linkages to Level of Service
Section 5 (LOS) outlines how each of the budgeted items relates back to the level of service being provided.

9.3 Total Expenditure and Funding

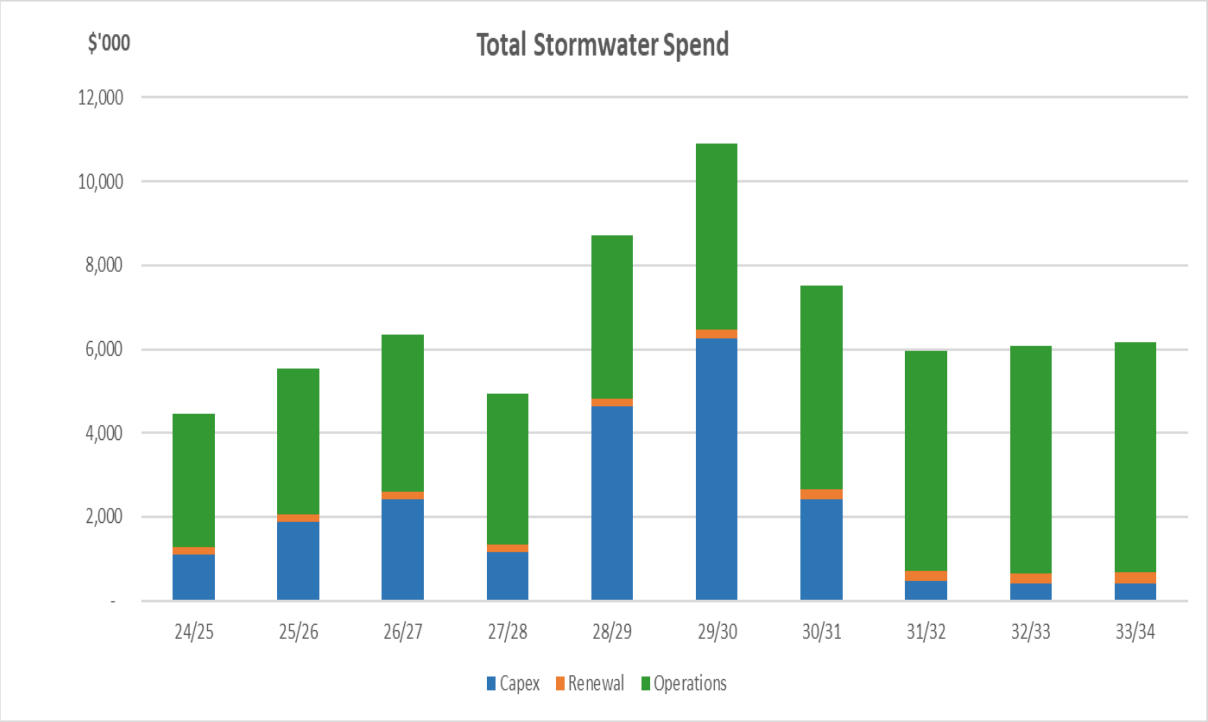


Figure 5.6: Total Expenditure & Funding ($,000)

9.4 Valuation of Stormwater Assets

Stormwater assets provide a continuing service to the community and are not generally regarded as tradable. The most recent valuation of assets was performed by AECOM in August 2023 using the following assumptions.

- Replacement assets are based on the reproduction costs of the specific assets with adjustments where appropriate for optimisation due to over-design or surplus capacity.
- Replacement costs are those for modern equivalent assets.
- The standard of asset data assessed during their site visit is representative of the overall standard of asset data.
- Remaining useful lives of assets reflect the age and base lives of the assets amended where appropriate for local conditions and actual asset condition information.

- Straight-line depreciation has been applied in determining the depreciated replacement cost value of the asset.

The full report is available on request.

9.5 Key Assumptions

9.5.1 Financial Assumptions

The following financial assumptions have been made. Further information can be found in the LTP document.

- Asset valuation are as at June 2023 have been used as the basis for asset values.
- The revenue received from Rates meets the expectation.
- Development Contributions Income is assumed to eventuate as predicted.
- Investment Returns eventuate as predicted.
- Interest Rate on borrowings remains as predicted within the financial model.
- Expenditure of capital projects occurs, and estimated debt levels are as predicted.
- No allowance has been made for inflation adjustment within this AMP. The source of funds for the future replacement of significant assets is stated in the revenue and Financing Policy.
- The useful lives of significant assets are as per the accounting policies documented in the LTP. Depreciation is charged at 50% for the first year and 100% in subsequent years.

The financial assumptions are included in the Introduction Section (section 1).

9.5.2 Asset Condition

Without knowledge of the condition of each pipeline it has been necessary to adopt standard life expectancies. Estimates of average life expectancy for the various makes of pipe were assessed using local knowledge, published data from other local authorities and technical papers such as the International Infrastructure Management Manual.

It is assumed that stormwater assets deteriorate uniformly over their life. This is industry standard practice for stormwater pipeline networks.

9.6 Financial Confidence Levels

The confidence in the asset data used as a basis for the financial forecasts has been assessed using the following grading system from the International Infrastructure Management Manual – Australia/New Zealand Edition, April 2000.

Confidence Grade	General Meaning
A	Highly reliable. Data based on sound records, procedure, investigation and analysis, documented properly and recognised as the best method of assessment
B	Reliable. Data based on sound records, procedures, investigation and analysis, documented properly but has minor shortcomings, for example the data are old, some documentation is missing, and reliance is placed on unconfirmed reports or some extrapolation.
C	Uncertain

Confidence Grade	General Meaning
	Data based on sound records, procedure, investigation and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available
D	Very Uncertain. Data based on unconfirmed verbal reports and/or cursory inspection and analysis.

Table 5.2: Confidence Grading Table

The confidence level is A overall.

Financial forecasts within the first three years are reliable with the reliability decreasing with time. The reliability depends on the phase of the project, with reliability increasing as the project moves from scoping to construction.

Scoping	Increasing Reliability
Investigation	
Design	
Construction	

Table 5.3: Reliability Table

Stormwater	AP 23/24	Year 00	Year 01	Variance Year 01-AP23/24	Year 02	Year 03	Year 04	Year 05	Year 06	Year 07	Year 08	Year 09	Year 10
Revenue													
Rates revenue	-	**(1,878,752)**	**(2,977,071)**	**(2,977,071)**	**(3,268,256)**	**(3,489,527)**	**(3,586,618)**	**(3,884,324)**	**(4,442,371)**	**(4,880,111)**	**(5,250,257)**	**(5,419,643)**	**(5,479,971)**
General rates - 10001	-	(1,878,752)	(2,977,071)	(2,977,071)	(3,268,256)	(3,489,527)	(3,586,618)	(3,884,324)	(4,442,371)	(4,880,111)	(5,250,257)	(5,419,643)	(5,479,971)
Grants & subsidies	-	-	-	-	-	-	-	-	-	-	-	-	-
Government grants & subsidies - capital/renew al - 18530	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Income	-	-	**(785,976)**	**(785,976)**	**(879,447)**	**(975,734)**	**(1,095,731)**	**(1,105,792)**	**(1,134,811)**	**(1,160,965)**	**(1,197,539)**	**(1,226,509)**	**(1,252,279)**
Vested Assets - Stormw ater Reticulation - 19348	-	-	(785,976)	(785,976)	(879,447)	(975,734)	(1,095,731)	(1,105,792)	(1,134,811)	(1,160,965)	(1,197,539)	(1,226,509)	(1,252,279)
Miscellaneous non-operating revenue - 19900	-	-	-	-	-	-	-	-	-	-	-	-	-
Operation Revenue	-	**(1,878,752)**	**(3,763,047)**	**(3,763,047)**	**(4,147,703)**	**(4,465,261)**	**(4,682,349)**	**(4,990,116)**	**(5,577,182)**	**(6,041,075)**	**(6,447,796)**	**(6,646,152)**	**(6,732,250)**
Revenue	-	**(1,878,752)**	**(3,763,047)**	**(3,763,047)**	**(4,147,703)**	**(4,465,261)**	**(4,682,349)**	**(4,990,116)**	**(5,577,182)**	**(6,041,075)**	**(6,447,796)**	**(6,646,152)**	**(6,732,250)**
Expenditure													
Depreciation and amortisation	-	**1,258,567**	**1,372,053**	**1,372,053**	**1,481,535**	**1,605,691**	**1,756,606**	**1,865,875**	**2,048,286**	**2,254,051**	**2,438,768**	**2,551,635**	**2,666,562**
Budgeted Depreciation - 20000	-	-	-	-	-	-	-	-	-	-	-	-	-
Depreciation - Stormw ater Treatment - 20147	-	1,258,532	1,369,926	1,369,926	1,457,179	1,519,438	1,595,993	1,673,294	1,750,229	1,838,661	1,917,684	1,996,178	2,075,467
Depreciation - Stormw ater Reticulation - 20148	-	35	2,127	2,127	24,357	86,253	160,613	192,581	298,057	415,391	521,084	555,456	591,096
Personnel costs	-	-	-	-	-	-	-	-	-	-	-	-	-
Staff training - 22700	-	-	-	-	-	-	-	-	-	-	-	-	-
General operating expenditure	-	**19,500**	**149,695**	**149,695**	**154,105**	**158,971**	**104,433**	**107,821**	**111,117**	**114,532**	**117,937**	**121,354**	**124,883**
Legal fees - 23200	-	-	-	-	-	-	-	-	-	-	-	-	-
Valuation fees - 23210	-	-	-	-	-	-	-	-	-	-	-	-	-
Professional services - 23220	-	5,000	105,000	105,000	107,625	110,534	54,000	55,350	56,625	57,930	59,200	60,445	61,715
Electricity - 23300	-	-	2,656	2,656	2,722	2,796	2,868	2,940	3,008	3,077	3,145	3,211	3,278
Rates - council ow ned properties - 23315	-	-	279	279	293	308	324	341	357	374	392	411	430
Regional Council Rates - 23320	-	-	25,760	25,760	27,064	28,490	29,960	31,478	33,008	34,613	36,256	37,945	39,711
Softw are licensing - 23600	-	8,500	10,000	10,000	10,250	10,527	10,800	11,070	11,325	11,586	11,840	12,089	12,343
Grants - 24100	-	6,000	6,000	6,000	6,150	6,316	6,480	6,642	6,795	6,952	7,104	7,253	7,406
Direct costs of activities	-	**539,500**	**1,045,000**	**1,045,000**	**1,141,543**	**1,191,341**	**877,392**	**1,000,839**	**1,144,731**	**1,188,955**	**1,224,138**	**1,259,190**	**1,295,151**
Consulting - 25300	-	5,000	176,000	176,000	146,575	81,058	-	-	-	-	-	-	-
Maintenance - 25700	-	491,000	569,000	569,000	677,218	783,946	812,592	934,419	1,059,794	1,102,060	1,135,338	1,168,523	1,202,578
Ground Maintenance - 25730	-	-	-	-	-	-	-	-	-	-	-	-	-
Resource Consent Compliance - 26010	-	30,000	30,000	30,000	41,000	42,108	43,200	44,280	62,288	63,723	65,120	66,490	67,887
Resource Consent Renew als - 26015	-	10,000	250,000	250,000	256,250	263,175	-	-	-	-	-	-	-
Rubbish disposal - 26020	-	-	-	-	-	-	-	-	-	-	-	-	-
Materials & supplies - 27000	-	3,500	20,000	20,000	20,500	21,054	21,600	22,140	22,650	23,172	23,680	24,178	24,686
Finance expense	-	**94,271**	**120,016**	**120,016**	**153,973**	**220,089**	**316,787**	**366,048**	**576,028**	**867,158**	**969,185**	**977,320**	**971,723**
Interest on borrow ings - 28000	-	-	-	-	-	-	-	-	-	-	-	-	-
Budget interest on borrow ings (capex) - 28010	-	94,271	120,016	120,016	153,973	220,089	316,787	366,048	576,028	867,158	969,185	977,320	971,723
Operating Expenditure	-	**1,911,839**	**2,686,764**	**2,686,764**	**2,931,155**	**3,176,092**	**3,055,217**	**3,340,582**	**3,880,162**	**4,424,697**	**4,750,028**	**4,909,500**	**5,058,320**
Overhead allocation	-	**82,169**	**492,679**	**492,679**	**545,723**	**576,610**	**531,401**	**543,741**	**562,208**	**455,414**	**500,229**	**510,143**	**421,652**
Recharges in Water & Wastew ater operations - 32000	-	32,474	131,716	131,716	139,533	150,095	125,275	127,928	135,330	93,950	106,348	110,887	75,391
Recharges in Infrastructure Asset Management - 33000	-	4,665	17,108	17,108	18,368	18,644	18,965	19,363	19,968	19,454	20,539	20,768	21,133
Recharges in Water & Wastes Netw ork Management - 33010	-	-	186,019	186,019	218,529	227,028	237,498	242,935	247,752	235,917	250,468	253,588	249,436
Recharges in Project Management Office - 33020	-	-	32,534	32,534	38,661	43,681	11,531	12,043	14,040	(34,031)	(26,642)	(27,390)	(78,016)
Recharges in Stormw ater & Solid Waste Administration - 33030	-	25,347	-	-	-	-	-	-	-	-	-	-	-
Recharges in Infrastructure Asset Management - 33050	-	4,802	65,917	65,917	68,793	71,562	72,850	74,464	75,860	73,253	78,641	79,497	80,945
Recharges in District Parks and Recreation Management - 34000	-	7,380	59,385	59,385	61,839	65,601	65,281	67,009	69,258	66,870	70,875	72,793	72,762
Overheads in Finance - 36080	-	5,183	-	-	-	-	-	-	-	-	-	-	-
Overheads in Customer Services - 36090	-	2,319	-	-	-	-	-	-	-	-	-	-	-
Non-operating Expenditure	-	**82,169**	**492,679**	**492,679**	**545,723**	**576,610**	**531,401**	**543,741**	**562,208**	**455,414**	**500,229**	**510,143**	**421,652**
Expenditure	-	**1,994,008**	**3,179,443**	**3,179,443**	**3,476,878**	**3,752,702**	**3,586,618**	**3,884,324**	**4,442,371**	**4,880,111**	**5,250,257**	**5,419,643**	**5,479,971**
Revenue & Expenditure	-	**115,256**	**(583,604)**	**(583,604)**	**(670,825)**	**(712,559)**	**(1,095,731)**	**(1,105,792)**	**(1,134,812)**	**(1,160,965)**	**(1,197,539)**	**(1,226,509)**	**(1,252,279)**

10.0 Asset Management Practices

This section describes how TDC manages its asset infrastructure in an integrated manner.

10.1 Responsibilities for Asset Management Outcomes

Council's infrastructure assets are managed by the Assets Group.

The Group Manager Operations and Delivery is responsible for managing the infrastructural assets that provide the services of Land Transport, Stormwater, Water, Wastewater, Airport, Refuse Landfills and Community Facilities and Property. This responsibility includes:

- Ensuring that infrastructure is provided and maintained in a manner that it is capable of delivering the agreed Levels of Service and complies with resource consent conditions
- Planning and long-term budgeting of capital, operating and maintenance requirements
- Monitoring Levels of Service provided by the assets
- Identifying and managing asset and service-related risk
- Reporting of Level of Service, Key performance indicators and Risks at asset level
- Achieving Asset Management practice defined in the Asset Management Policy
- Asset Strategy - Coordination of asset management plans and improvements

The GM Operations and Delivery is supported by Asset Managers responsible for:

- Three Waters, Stormwater, Water & Wastewater
- Solid Waste & Recycling
- Roading - Land Transport
- Property - Buildings (offices, service centres, information centres, libraries, toilets, pools, Sports and Events Centre, community halls), Pensioner housing
- Parks - Parks, Reserves, Playgrounds, Sports grounds, Cemeteries.
- Business Support - Coordination of asset management plans and improvements

The activities and services provided by the Three Waters, Roading and Parks and Property Facilities assets are managed directly by their respective Asset Managers, while the leisure services activities of the pools, libraries and Events Centre are managed by the Community Group. The Community Group also provides the Customer Services interface with the public (enquiries and service requests).

The Group Manager Organisation and performance is responsible for corporate wide financial, information services, risk management, legal services and the overall Strategic direction of Council.

10.2 Business Processes

10.2.1 Asset Management Systems (AMS)

TDC operates two separate asset management systems for maintaining an up-to-date inventory of assets, expected useful lives, age, condition and performance assessment, renewal timeframes, installed cost, replacement cost and maintenance history.

- **AssetFinda** is used for the 3 Waters, Landfill, Parks and Property assets

- **RAMM** (Road Assessment and Maintenance Management) is used for Land Transport assets.

AssetFinda is a cost-effective solution for a number of smaller councils in NZ.

AssetFinda is used to manage and produce asset inventory reports. It is integrated with the MapInfo data tables to permit input, querying, reporting and financial modelling using the asset register data. Reports can be produced for high level asset groups ("lines, points and plant"), monthly depreciation for additions and deletions as well as summaries since the last revaluation. Asset Group data can be filtered from the standard report by output to, and manipulation in, a spreadsheet.

The default valuation process used by AssetFinda is capable of recognising asset condition, extending the life of the asset if appropriate, and recalculating revised depreciated value and annual depreciation.

AssetFinda is reviewed, upgraded and extended from time by the vendors, to meet the requirements of the users.

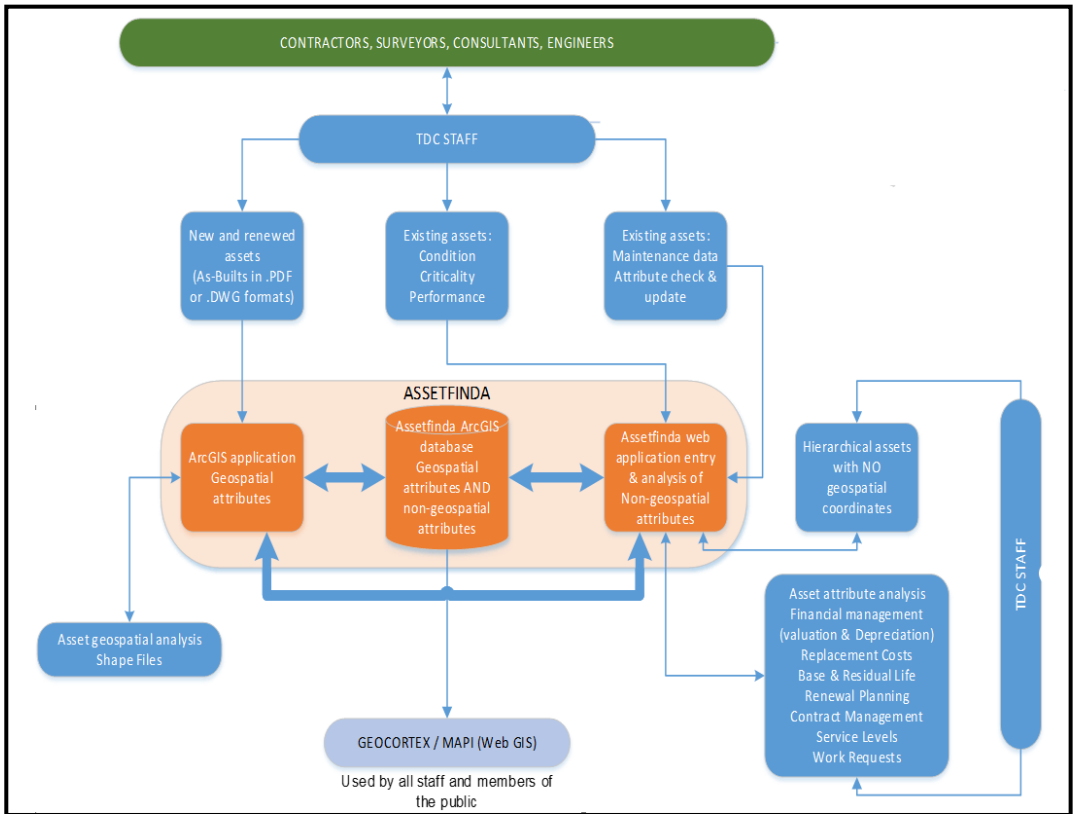


Figure 10.1: Asset Data Management

Financial Management

TDC operates the Technology One corporate financial management software (CiA), which has been developed specifically for local government planning, operational and reporting purposes. Technology One does not store or compute asset management information, however, could be used to determine the number of properties billed for rates for checks against connections to the infrastructure shown in GIS.

Technology One currently holds the Fixed Asset Register and Property related data. The Fixed Asset Register, which is part of the Technology One Accounting software, holds the valuation information for buildings and depreciation of buildings is calculated using MagiQ software. Depreciation for the 3 waters assets is calculated using functions in AssetFinda.

Each of the asset infrastructure groups has its own cost centre in Council's accounts. The income from fees and charges and the costs of maintenance, operation and capital improvements are accrued to the group to which they apply.

Council uses a renewal accounting system. The asset management renewal and capital expenditure policy are included as Appendix ?.

Document Management

TDC currently operates electronic document software called Objective for storing documents this will shortly be moving to CiA ECM supplied by Technology One.

Historical paper drawing records are stored in secure filing cabinets with an electronic catalogue, while more recent CAD drawings are stored electronically in a network drive.

Resource Consent Management

Water outlook is used to record resource consent information issued by the Waikato Regional Council and to manage the relevant consent compliance monitoring and reporting requirements. The software also provides alerts for actions that are required. Relevant consent documents are stored in excel in Objective (soon to be ECM).

Geographical Information System (GIS)

The Assets Group operates a GIS to display and manage core infrastructural asset data held in the Asset Management System.

The GIS provides the following functionality:

- The spatial component (geometry) of AMS data is be created, deleted, or edited.
- Displays asset data as map feature layers for internal and external users.
- Map features can be queried to retrieve feature attributes, and spatial relationships between layers can be analysed.
- Non-asset data layers such as property parcels, road centrelines (CRS), building outlines and aerial photography is available.
- Property layers linked to Council's rates and valuation systems can return owner and land information
- Provides a link between Map features, as-built drawings and other documents held in Council's document management system

There are standard operating procedures to ensure that the GIS database is maintained up to date, and to ensure that correct information is given out to users of the database.

10.2.2 Key Information flows and processes

Key information flows and process linkages include:

- Developing the LTP including the Public Consultation phase (from which the Council Outcomes are derived)
- Translating the Council Outcomes into detailed levels of service and performance measures that can be embodied in fixed assets, processes and contracts for service
- Identifying future demand and then planning appropriate capacity increases
- Identifying and planning upgrades to comply with legal requirements or to improve performance
- Preparation of long term and annual budgets, and associated on-going reporting
- Establishing service level agreements with Councils contractors

- Developing contract specifications and standards, and then engaging external contractors through prescribed procurement processes
- Ongoing management of those contracts and service level agreements
- Ongoing compliance monitoring and reporting of environmental performance
- Responding to customer requests for service and complaints

These key information flows and process linkages are shown diagrammatically as seen below in the Performance Management System Hierarchy.

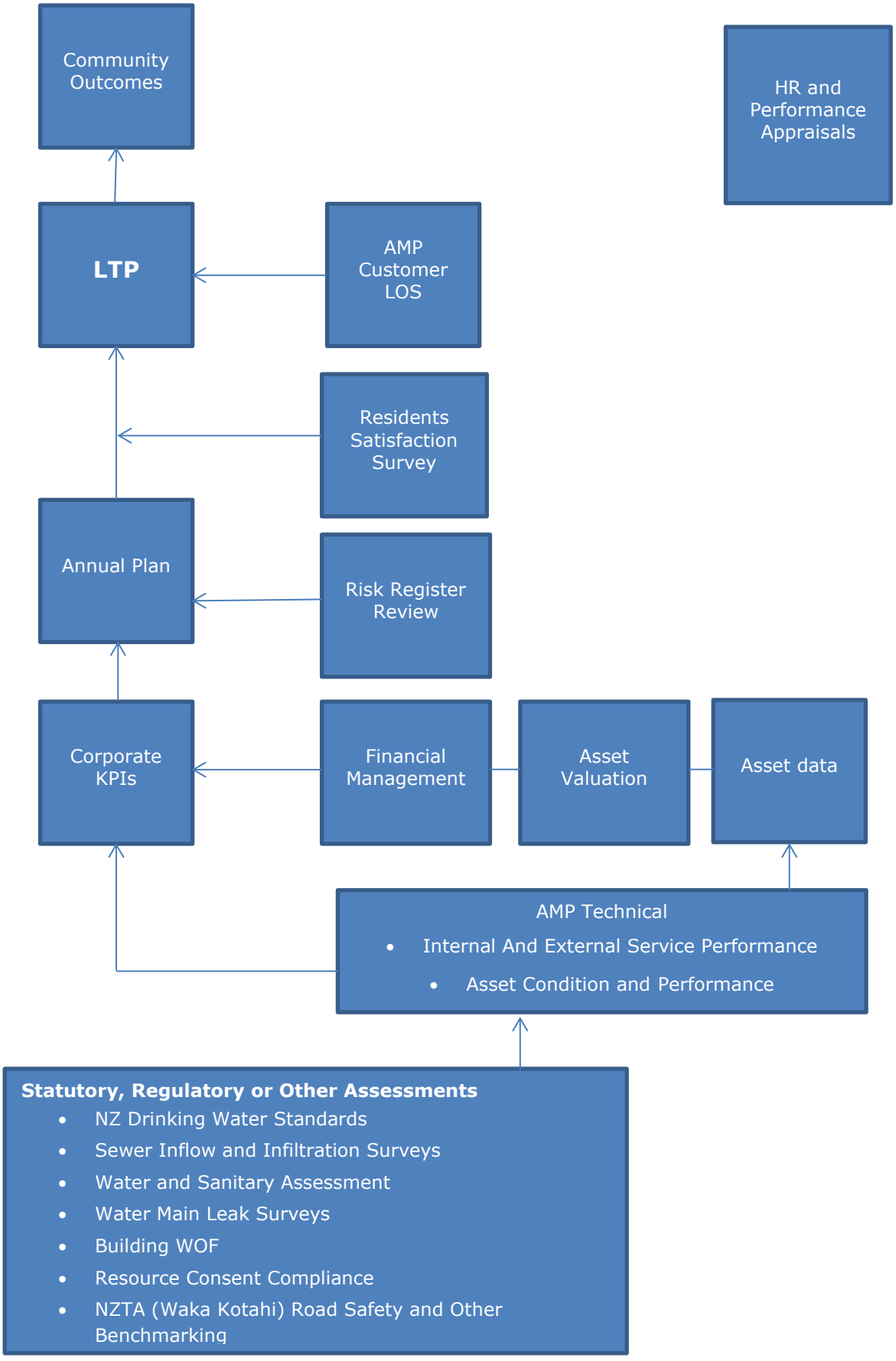


Figure 10.3 Performance Management System Hierarchy

Table 10.4 Key Asset Processes

	–
Procurement	Professional Services are obtained from external suppliers Water and Stormwater maintenance activities are carried out by Council's Three Waters Contractor Downer Stormwater renewal and capital upgrades are carried out by an external contractors, arranged through competitively tendered contracts.
Expenditure Decision-making	Formal processes have still to be developed. This will require the development of guidelines and indicators which trigger the desired response, and rank projects according to risk, financial capability and optimised lifecycle costing. These processes will include: Trigger point for renewal Trigger point for extension or new capacity Evaluating/prioritising projects Evaluating/prioritising renewal projects Evaluating/prioritising new works projects
Asset Operation & Maintenance	The following processes are used for maintaining and operating water assets: Standards as described in the Levels of Service, Maintenance Contract Specification and Service Agreements Operating Standards as defined in the operating procedures (SOPs) Maintenance Standards and policies defined in procedures are established by reviewing the performance and cost of maintenance work Routine (programmed) maintenance check inspections are carried out for critical assets
Asset Renewals	The following processes/practices are used for renewing assets: Rehabilitating existing assets where economically justified Condition assessment Asset criticality Matrix criteria Financial treatment of renewal-projects Most plant renewal is reliability-driven Current criterion for renewal of network pipes is a failure rate greater than or equal to two breaks per year for two consecutive years in any individual residential block
Constructing/ Vesting of New Assets	Procedures are used for: Constructing New Assets, particularly where demand for additional capacity may arise from commercial customers and where upgrades are driven by consent conditions Vesting assets to Council, most likely to occur in the case of subdivision Existing Assets to be bought by Council, however this is not expected to happen

	–
Disposal of Assets	Procedures are used for the following: Trigger point for decommissioning Issues to be considered for disposal as outlined in the LGA 2002
As-Built Records	The AssetFinda inventory largely relies on information from Council's maintenance contractors, as-built records of new works and results of monitoring and testing activities. Fieldwork recording sheets and processes to ensure the records are updated in the asset register and GIS, have been put in place. The sheets identify any existing asset that is being renewed or replaced and record the details necessary to fully update the asset register or the GIS system as appropriate
Quality Management	Management is guided by the requirements of the following: Generally accepted accounting practice - NZ IAS 16 The International Infrastructure Management Manual Council Asset Management Policy Resource Consent Conditions Council Health and Safety Plan Council Quality Assurance Documents Council's Stormwater Management Plan 2021 (SMP) is a key document and a companion reference to this Asset Management Plan. It identifies the issues, values and opportunities associated with urban stormwater. Planning tools that provide the basis for management, and details of the legal framework are discussed in the SMP Stormwater operations are in accordance with consent conditions
Performance Management Process	Monitoring and reporting of service levels Monitoring and reporting of consent compliance Public Health monitoring QA system via Standard Operating Procedures Monthly and quarterly Management Reporting

10.3 Monitoring and Reporting Performance

Monitoring of performance and service delivery is achieved by various means, including:

- Service delivery, service requests as recorded in MagiQ, projects, performance measures and KPIs are reported six-weekly to Council.
- Resource consent compliance reports are submitted to the regulatory authority (Waikato Regional Council)
- Drinking water quality test results are submitted to the District Health Board
- Roading reports are submitted to the funding authority (NZTA) - including condition rating, traffic data and the annual Achievement Report
- Financial performance is reported monthly to Council

Further details are provided in the respective activity AMPs.

10.4 Quality Management/Confidence

Data quality in AssetFinda is audited randomly to verify the existence and location of particular assets, as well as the condition, where the items are visible.

CCTV inspections of piped assets are reviewed and assessed to give a condition rating and remaining useful life estimate.

More detailed verification is required and independently reviewed for the triennial asset revaluations, at which time the remaining useful lives and replacement costs are updated.

New construction and renewal/replacement items are recorded in AssetFinda, following the capitalisation process, which includes all related project costs such as investigation, reporting, consenting, design, procurement, installation and supervision. As-built information is provided by the individual contractors or developers.

11.0 Improvement Plan And Monitoring

11.1 Improvement Plan

Improving the management of Taupō District Council's Stormwater assets is a continual and ongoing process.

During the course of updating this plan, AM improvement tasks have been noted for follow-up over the next three years in conjunction with reviewing and improving this plan. This programme reflects the overall aim of improving asset management practices, which is to deliver the right level of service at the lowest long-term cost to TDC's customers.
The highest improvement tasks all focus on meeting that goal by:

- Ensuring the right level of funding is being allocated to maintain the asset service potential.
- Consulting with customers to ensure that their views are considered when selecting the best scenario.
- On-going NAMs training is provided for staff involved in the production of the asset management plans to facilitate best management of the assets.
- Asset Managers participate in the Council's asset management planning group which facilitates improvements in planning for all categories of assets.

11.1.1 Background

The Asset Management Plan (AMP) has been updated to reflect changes in national policy (Local Govt Act amendment) and local thinking.

The AMPs were independently peer reviewed in 2018 and again in 2022 and improvements made in line with these reviews. Details from the latest review can be found in the report from Waugh Infrastructure Management Ltd[19]:

This independent peer reviews looked at the Wastewater, Water and Stormwater AMPs and a number of improvements were identified from this review to raise these AMPs from core to advanced, where appropriate.

A detailed assessment has been done, where all asset managers have met regularly to discuss the methodology, on how to implement and manage these recommendations. The methodology chosen to implement these improvements was to filter all individual scores from 0 to 5 and give a higher priority to those with a 0 or 1 score particularly where the consequence of not doing these is major.

Most, if not all of the recommendations with a 0 or 1 score have now been completed where score 2 and above will be included in the planned improvement process.

Council now has an adopted AM policy or overarching strategy. A memo was presented at the SLT level which outlined the need for robust asset management planning in order to ensure the defensibility of the long term planning with TDC and provide SLT with a corporate framework and a direction sought from SLT. SLT decided to identify which AMPS would be Core or Advanced with the main difference between core and advanced being that at an advanced level future demand is predicted, high knowledge of assets owned, including condition assessment and performance etc.

[19] AMP Compliance report dated April 2022

On-going NAMS training is provided to all staff involved in the production of the asset management plans to facilitate the best management of the assets.

Asset Management plans are compiled by individual asset managers responsible for their assets. Asset managers are also part of the Asset Management Team who work together to ensure quality outcomes. The team has key relationships with the policy division to make sure that customer expectations are understood as well as key outcomes are achieved. The Finance team also assist in the preparation of finance section. Project information as well as overall budgeting is then passed to senior management to enable further analysis as well as support. Asset management plans are then presented to Council where further prioritisation occurs.

With the introduction of Asset Finda, and the implementation of the proactive maintenance program which includes the CCTV program asset managers have a far greater understanding and knowledge of their assets which has also enabled a more robust asset management plan to be developed.

The Stormwater Asset Manager is responsible for the production of the Stormwater Asset Management Plan.

11.2 Improvement Programme Resources

Task ID	Area for improvement	Action/task description	Priority	Target date	Resources		Status
					Resource	Progress/ comments	
1	AMP coordination	Make sure we don't dig up the road twice	1	21/22	TDC internal	Look how we can identify projects and coordinate them across the council	ongoing
2	Risk management	Ongoing identification of Stormwater Critical Assets	3	2021-31	TDC Internal	Internal planning	Completed, but now ongoing
3	Life Cycle Management Plan	H & S review of network	3	2021-23	TDC Internal	Detailing requirements feedback for maintenance contractor and asset surveys	On-going
4	Level of service	Level of service review and public consultation	2	20/21	TDC Internal	Work with comms regarding issues requiring consultation	Level of service consultation to be undertaken as part of the LTP process
5	Finance	Annual plan project review	1	To review prior to each annual plan document release	TDC Internal	Will need to align with funding ability	Completed prior to LTP consultation, will reassess after consultation
6	Asset Management Practises	review of AMP documents and preparation methodology what are the learnings	1	21/22	TDC Internal / external	Review will look to build on 2021 docs	Not started
7	Asset Management Practises	LTP preparation	1	2020/21	TDC Internal	Will need to align with funding ability	completed
8	Asset Management practises	Complete update from Waugh report for priorities 2 and 3	2	21-23	TDC internal	To be developed in conjunction with AMP team	ongoing
9	Valuations	AMP is to be updated the data from the latest asset valuation data.	3	2021	Consultant	As required	Data updated for relevant AMP.
10	Improvement Programme	To be monitored and updated regularly	2	ongoing	TDC Internal	ongoing	ongoing
11	Gap analysis	Update improvement plan to show the extent of the gap between existing practice and best practice.	2	ongoing	TDC Internal	ongoing	ongoing
16	Respond to external Asset management plan review	Finalise prioritisation and timing of improvement tasks	1	On going	TDC Internal	In Progress	Underway
17	Evaluate and plan for impact of changes to legislation	Various policy changes will impact stormwater assets in the future	2	22-25	TDC Internal	policy still being developed	Not started
18	Develop a gully planting schedule	Program to identify gully works with priorities	1	2021/23	TDC internal	ongoing	On-going
19	Condition Assessment	Develop a CCTV program for at least 5% of network per year	1	2021/23	TDC Internal	ongoing	On-going
20	Prepare for Comprehensive consent renewal	Consult with WRSC and other parties regarding any possible new conditions	1	23-25	TDC Internal / some external consultant support	Develop in conjunction with WRC	Not started
21	Finance	Develop business cases for developing project lists	1	21-23	TDC internal	Monitored quarterly	Completed for this LTP round

22	Revaluate monitoring program	Determine if pre and post quality improvement device sampling should be undertaken	2	21-23	TDC Internal	Will work with environment scientist to determine value of data	underway

Table 11.5: Improvement Plan

(cost and time) have yet to be approved and are only estimates at the time of updating AMP. These may need to be reviewed when task is in progress to judge if timeframe and cost is realistic

11.2.1 Completed Improvement Plan Tasks

Following is a list of Improvement Plan Tasks that have been completed since the development of the last Asset Management Plan.

- Input into reserves management plans
- Implemented condition assessment program CCTV
- Developed projects and business cases for properties impacted by over land flow
- Asset data system has been implemented
- A criticality assessment has been undertaken
- Health and Safety review is ongoing
- Levels of service consulted on during the LTP process
- Annual plan project review is ongoing
- Improvement tasks have been updated; more work needs to be undertaken
- Implemented proactive maintenance program
- Renewal program based on age, maintenance history, condition and criticality has been provided
- Comparison of asset data with data in Ram, and removal of duplication and updating of data to reflect asset owner
- Developed and adopted plant lists for gully development
- Developed list of improvement device locations and business cases
- Undertaken an outlet survey to identify renewal and maintenance expenditure
- Completed business cases for capital and renewal expenditure for 2021 LTP

11.3 Monitoring & Review Procedures

The most important review procedure is the 3-yearly review of the AMP that takes into account asset performance during the previous 3 years and identifies future trends and input into Council's strategic planning process. The 3-yearly cycle of TDC strategic planning is as shown in below.

The AMP group collectively identify any changes/updates required to the main text and comments are made and discussed with the AMP group before any changes are made to Individual AMPS. Any changes to the text are made using track changes for auditing purposes, the changes made can be easily seen between the draft and final documents. These are saved in Council's Objective filing system.

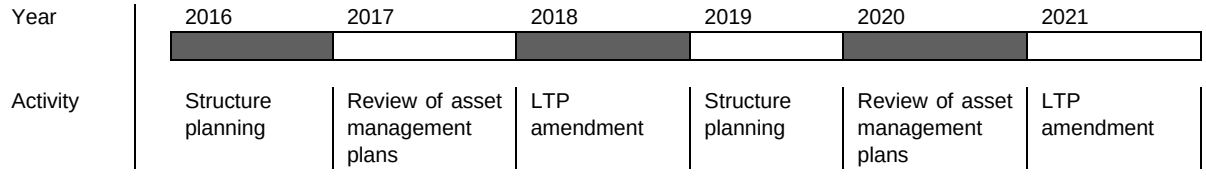


Figure 11.1: TDC Three Yearly Planning Cycle

The framework for the 3-yearly review of the AMP in terms of the breadth of considerations is illustrated in the following figure.

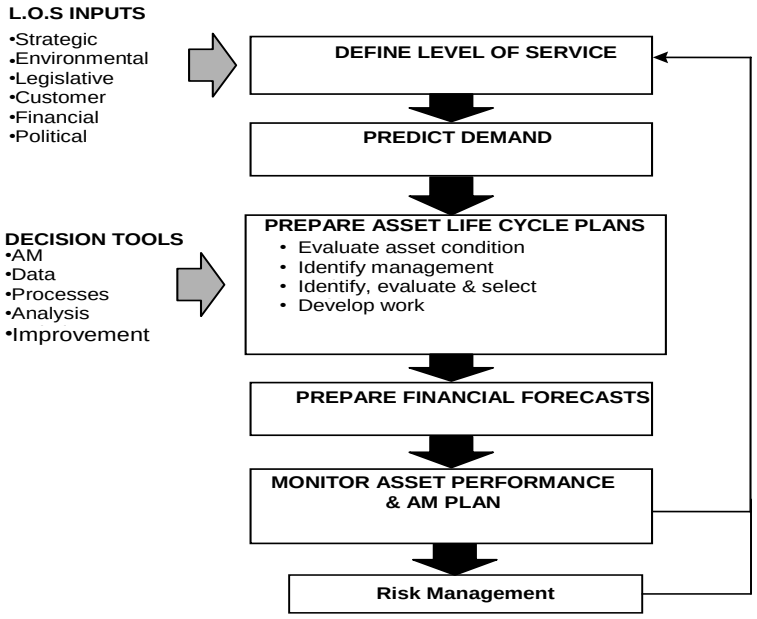


Figure 11.2: Asset Management Plan Review Procedure