

2024 – 2034 Wastewater Activity Management Plan

2024 – 2034
Mahere Waipara



Quality Assurance Statement

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Cover Photo

Nelson Wastewater Treatment Plant

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EXECUTIVE SUMMARY

i. The purpose of the plan

The Wastewater Activity Management Plan (Plan) outlines the current and future operational and capital requirements needed to operate, maintain, renew and upgrade assets to achieve the overall objective and activity specific goal defined below.

The overall objective of Activity Management planning is to:

Deliver a defined level of service to existing and future customers in a sustainable and cost effective manner.

The key elements of infrastructure activity management are:

- Taking a whole of lifecycle approach.
- Developing cost-effective management strategies for the long-term.
- Providing a defined level of service and monitoring performance.
- Understanding and meeting the impact of growth through demand management and infrastructure investment.
- Managing risks associated with asset failures and climate change.
- Sustainable practices, including use of energy and physical resources.
- Recognising and providing for the maintenance and enhancement of freshwater.
- Continuous improvement in activity management practices.

A formal approach to the management of infrastructure assets is essential in order to demonstrate how levels of service will be achieved in the most cost effective manner for the benefit of customers, investors and other stakeholders.

This Plan focuses on ensuring the wastewater assets supporting the activity are operated and maintained to provide the desired level of service, meet statutory requirements and to meet the current and future community outcomes in a sustainable manner.

The Goal of the Wastewater Activity is to:

Provide a wastewater system that will prevent harm to people and property, contribute to community wellbeing and protect the environment from harm related to uncontrolled wastewater discharges.

This Plan will provide the substantiation for budget forecasts put forward in the Long Term Plan (2024-2034) for the Wastewater Activity.

What we do

Council collects, treats and disposes of wastewater for the Nelson region. It operates and maintains a network of pipes and pump stations across the city that carry wastewater from Stoke and Tahunanui for treatment at the regional Bell Island Wastewater Treatment Plant, and from the rest of the city to the Nelson Wastewater Treatment Plant near Wakapuaka.

Why we do it

Wastewater infrastructure is a high priority for Council. Providing a piped wastewater system and treatment is a core role of Council in order to prevent people from being exposed to diseases associated with wastewater and avoid contamination of the environment.

ii. Asset description

Nelson City Council (NCC) has been responsible for wastewater disposal in the city since the first piped disposal system was put in place. The city has since expanded by the amalgamation of adjoining areas. Tahunanui Town Board joined the City in 1950, Stoke was transferred from Waimea County Council in 1958, Atawhai in 1968, Wakapuaka and Stoke rural in 1989.

The following details the timeline of the wastewater treatment and disposal for the Nelson area:

- 1872 First drain (sewer and stormwater) draining into Maitai River from Rutherford, Nile, Hardy and Bridge Streets.
- 1894 Stormwater and sewer separated.
- 1904 Untreated effluent discharged to Boat Harbour.
- 1960 Construction of pumping stations in preparation for pumping to Nelson North.
- 1969 Water right secured allowing discharge to take place into Tasman Bay followed by construction of Tasman Bay outfall, work completed in 1970.
- 1979 Establishment of the current 26-hectare oxidation pond at Nelson North to treat sewage discharge.
- 1984 Fisheries discharge channelled through separate outfall, diverting this flow away from the oxidation ponds.
- 2007 Existing treatment plant facility extensively upgraded.

The extent of the NCC wastewater system is shown in Figures ES-1 and ES-2.

The wastewater assets are detailed in the Background Data section - 4.1 of this Plan. The inventory of public wastewater assets owned by NCC and managed by the Infrastructure Group - Utilities as at June 2023 is shown in Table ES-1.

Table ES-1: Summary of Wastewater Activity Assets

Asset Category	Quantity June 2023	
	km	units
Reticulation Pipes (gravity – up to 150mm diameter)	344	
Trunk Mains (gravity – 200mm diameter and above)	36.1	
Swallow Mains (pressure gravity – 200 to 525mm diameter)	5.2	
Rising Mains (pressure – 100mm to 900mm diameter)	25.3	
Access points		1,114
Manholes		7,232
Tanks (flushing and storage)		7
Valves		248
Neale Park Detention Tank		1
Pump Stations		26
Neale Park Pump Station		1
Corder Park Pump Station		1
Nelson Wastewater Treatment Plant		1

Figure ES-1: Nelson City Wastewater Network Bell Island Wastewater Treatment Plant

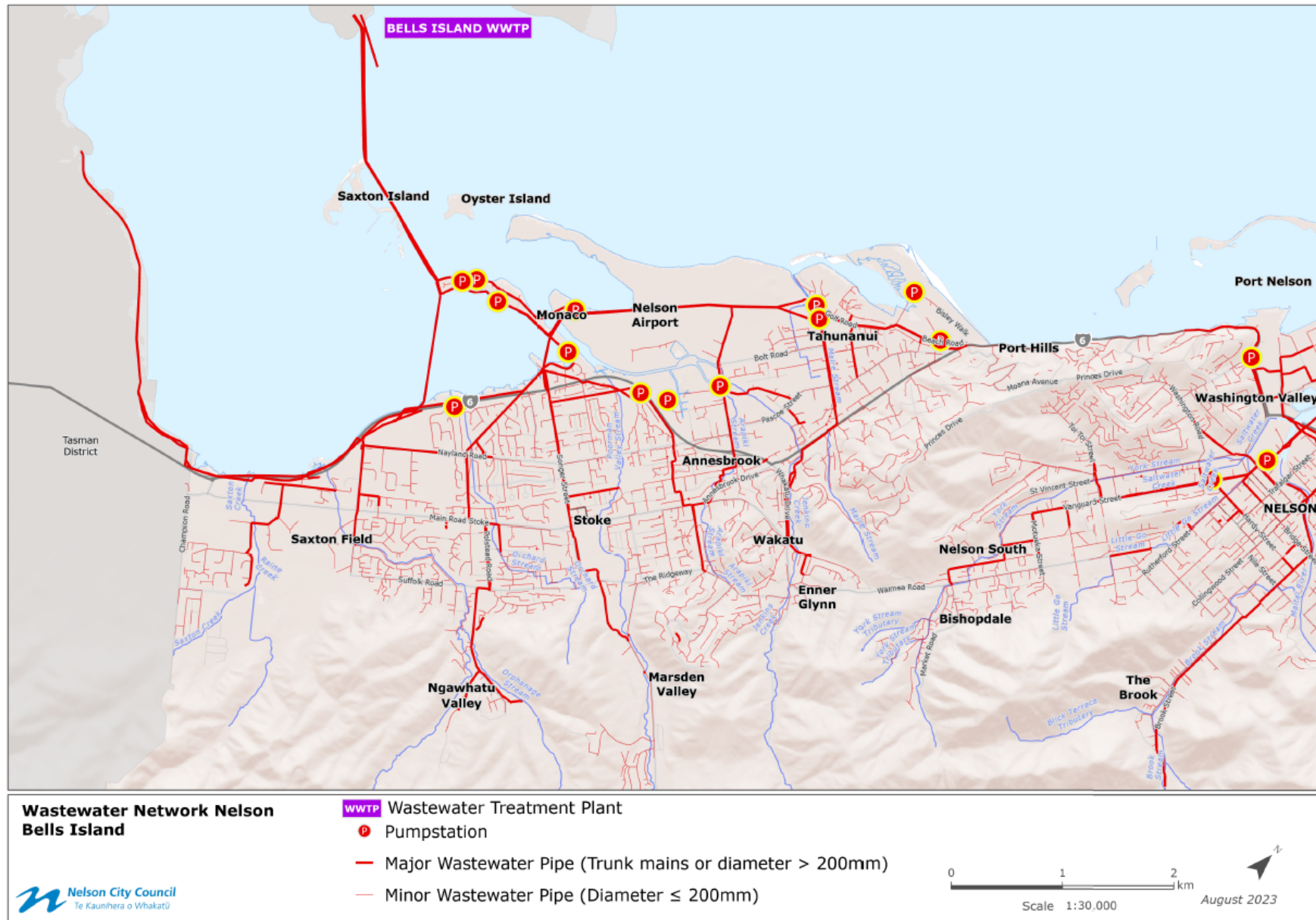
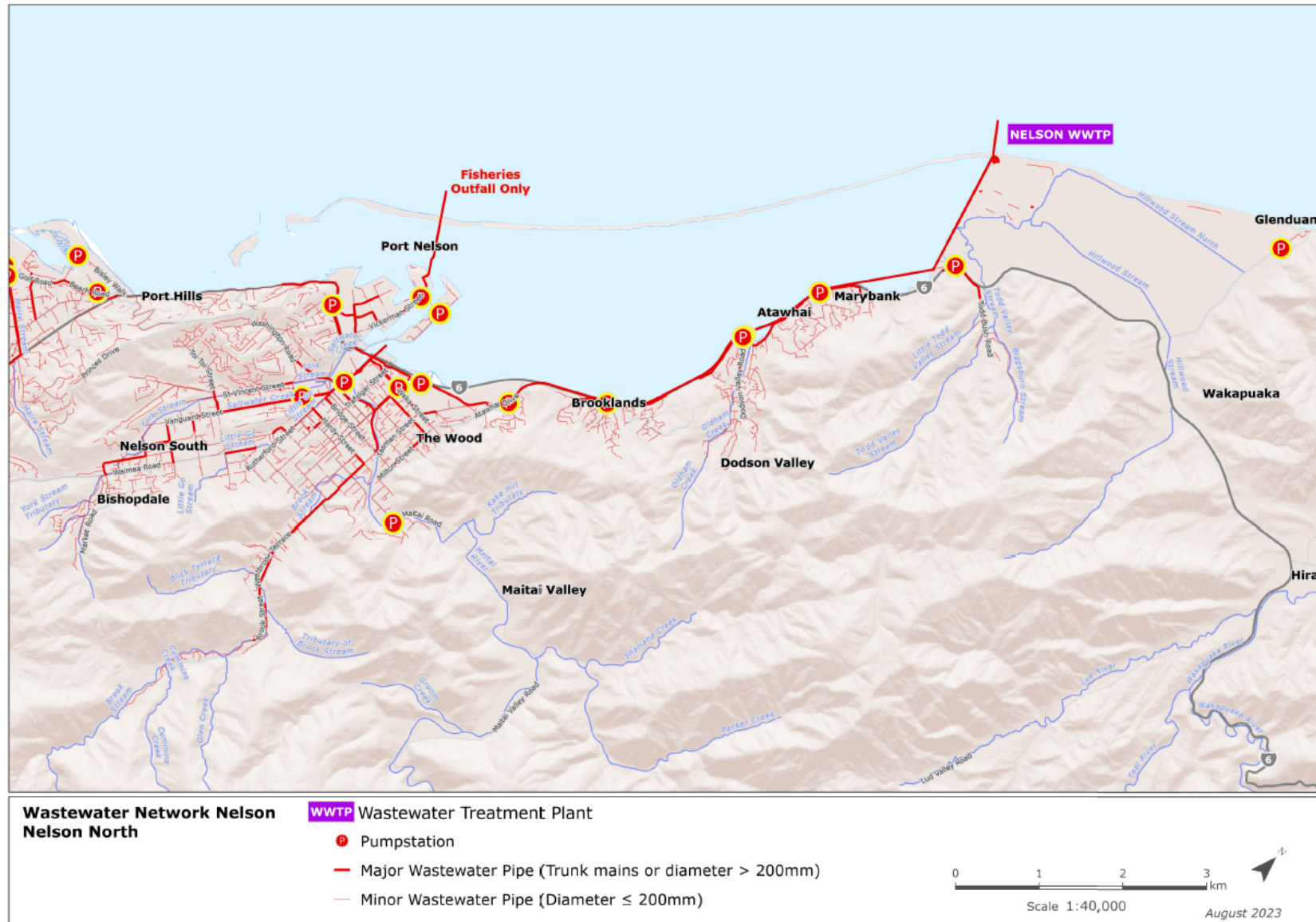


Figure ES-2: Nelson City Wastewater Network Nelson Wastewater Treatment Plant



iii. **Māori contribution to decision-making processes**

Council acknowledges that Treaty of Waitangi obligations rest with the Crown and seeks to uphold the mana of the Treaty of Waitangi Settlements for Te Taihū by continuing to build its relationship with iwi. There are numerous pieces of legislation under which Council operates that recognise the Treaty of Waitangi and recognise or acknowledge iwi and Māori.

Council believes that by working in partnership with iwi and Māori it will create benefits for the whole community.

Council signed a partnership agreement with the eight iwi and two other councils of Te Taihū in December 2023. This agreement recognises the important and unique roles that both iwi and councils play in the cultural, social, environmental and economic wellbeing of Te Taihū. It seeks to weave these aspirations together more closely, to strengthen our position as Te Taihū and deliver to our shared aspirations more effectively. It will be an enduring relational agreement that sets out protocols and tikanga that all the partners have committed to. An accompanying action plan is being developed to set out partnership priorities and actions to complete over the next three years.

Council has an online iwi engagement platform, Te Parikaranga, which enables Council officers to share projects with iwi and to receive input on the level of interest iwi have with a Council project.

iv. **Climate change**

Climate change is our biggest global challenge and Council is committed to considering and reducing climate change impacts.

At a local level, Council has a key role to play by reducing its corporate emissions, supporting and providing leadership on mitigation actions across the community, and managing and reducing risk by helping Nelson to adapt to climate change effects, especially in relation to:

- **Sea level rise:** sea level rise is the most significant climate challenge for Nelson as a large proportion of its urban infrastructure is coastal or low lying. These areas will become more vulnerable to coastal inundation over time.
- **Heavy rainfall and flooding events:** higher intensity rainfall events mean Nelson will experience more regular and extensive flooding from streams, rivers and stormwater overflows, which will increase the risk of landslips.
- **Droughts and high temperatures:** with a warmer climate, the temperature of the water within our rivers and streams will increase and affect habitats. Droughts will result in a higher risk of fires.

Responding to Climate Change

Mitigation

Mitigation is about reducing greenhouse gas (GHG) emissions and enhancing carbon sinks (sequestration to remove greenhouse gases from the atmosphere). Council is

committed to emissions reduction targets for its own activities in line with government targets:

Net zero emissions of all GHGs other than biogenic methane by and beyond 2050;

10% reduction below 2017 biogenic methane emissions by 2030;

24-47% reduction below 2017 biogenic methane emissions by 2050.

Adaptation

Adaptation is the process of responding to current and future climate related impacts and risks. To manage these impacts and risks, Council is following the Ministry for the Environment guidance and is using the Dynamic Adaptive Pathways Planning (DAPP) approach. This means managing our assets in a way that makes them more resilient, or in some instances, it may mean moving those assets.

What Council is doing

How Council delivers its services will play a key role in meeting emissions reduction targets and building community resilience.

Acknowledging the need for urgent action, Council declared a climate emergency in May 2019. Council adopted Te Mahere Mahi a te Āhuarangi Climate Action Plan in 2021, a living document which outlines what Council is doing to address climate change over the next decade. In 2022, Council also began developing a Climate Change Strategy, which will set the long-term direction and guide Council and community investment in climate action.

Council is working with Tasman District Council on a regional climate change risk assessment, which will build a comprehensive picture of how climate change will impact the region.

Climate change effects on the Wastewater Activity

The key climate change effects that will impact on NCC Wastewater assets are sea level rise, and more intense storm rainfall associated with a warmer climate and the higher moisture retention capacity of the atmosphere.

Sea level rise

Sea level rise is the biggest climate challenge for Nelson as a large proportion of our urban infrastructure is coastal or low lying. Over the long term, these areas will become more vulnerable to coastal inundation (flooding) as tides and storm surges extend further inland over time. Additionally, some areas are likely to become more prone to liquefaction in an earthquake due to elevated groundwater levels associated with sea level rise.

For the Nelson community, the main impacts will be the more regular inundation of areas around The Wood, the CBD (including Halifax, St Vincent, Vanguard, Gloucester and Rutherford Streets). Areas on the open coast that are more exposed to coastal swell such as the Glen, Wakefield Quay/ Rocks Road, Tahunanui and Monaco will be subject to increasing coastal inundation and coastal erosion hazard associated with sea level rise.

For the wastewater activity the impact will be felt particularly on low lying parts of the network that will be more susceptible to groundwater inflows (the groundwater will raise in response to a rise in sea level) and those assets that are located in vulnerable coastal/riverine locations.

Heavy rainfall and flooding events

Higher intensity rainfall events will result in an increase in stormwater entering the wastewater system at any given location. The implication for the community is that without mitigation of these effects, they may experience more regular and extensive wastewater overflow events.

Flooding has the potential to affect the wastewater network and the Nelson Wastewater Treatment Plant (NWWTP), resulting in wastewater overflows and contaminants discharging into the receiving environment.

Increased river flood flows are likely to increase the risk to pipe assets that cross water courses.

Droughts and extreme temperatures

With a warmer climate, the temperature of the wastewater within our network will increase. This is likely to lead to increased prevalence of odour issues and a greater incidence of corrosion of susceptible assets (particularly those made of concrete).

Wastewater Activity Mitigation

Wastewater treatment process emissions are the second highest source of emissions within Council's operational footprint (after landfill emissions). The largest source of emissions are the methane and nitrous oxide generated as a result of the operations at Bells Island and Nelson Wastewater Treatment Plants.

Full consideration of whole-of-life emissions, including embodied carbon in construction materials, can encourage non-built infrastructure solutions, less carbon-intensive infrastructure options and the use of low-carbon construction materials.

The Council Climate Action Plan brings together all the climate change projects and actions Council is funding over the next ten years, as set out in our Long Term Plan 2021- 31. The key reduction project for the wastewater activity is the Emissions Reduction Strategy, which aims to understand NWWTP GHG emissions sources and quantities to allow for a focussed reduction approach.

Areas for further investigation to aid mitigation are:

Operational emissions

- Understanding the treatment process emissions at the NWWTP and where feasible developing a plan to mitigate emissions by changing operational procedures.
- Further electricity generation through use of photovoltaics.
- Use of net zero carbon emission bulk electricity supplier(s).

- Use of more energy efficient technology and equipment at the NWWTP.
- Reduced use of petrol- and diesel-powered vehicles for operations and maintenance activities.

Embodied emissions

- Consideration of materials that allow rehabilitation of existing pipes rather than replacement.
- Opportunities for co-construction of assets with other utilities to reduce use of construction plant and bitumen-based road surfacing materials.
- Reflect the true cost of carbon in infrastructure projects.
- Incorporate the long-term cost of carbon and irreversible investment (when the cost of repurposing or replacing infrastructure is prohibitive).
- Include the cost of carbon over the life of the infrastructure. A whole-of-life approach to carbon emissions looks at embodied, operational, enabled and disposal carbon emissions over the expected life of infrastructure.
- Where feasible, consider carbon impacts at the strategic planning stage, such as when spatial plans are developed.

Wastewater Activity Adaptation

Strategies and standards are in place or in progress to identify optimal solutions for responding to the risks associated with temperature warming and sea level rise.

The following are important considerations with respect to climate change adaptation:

- Strategies are in progress, or shortly will be, that consider operation of the wastewater network under future climate conditions.
- Ensuring renewals are programmed to respond to sea level rise issues and avoid un-necessary expenditure in areas that will not require services in the long term.
- Develop network upgrades in hand with renewals to allow flexibility in establishing new residential areas across the city.
- The Nelson Tasman Land Development Manual 2019 (NTLDM) requires that new assets are designed to meet a specific level of service projected for 2090 and assuming an RCP 8.5 scenario. Generally speaking, all wastewater projects therefore contribute to climate change adaptation to some degree.

The following knowledge gaps have been identified with respect to climate change adaptation:

- What options are currently available for adapting to the impacts of climate change in the short, medium and long term.
- The effectiveness and affordability of adaptation options.

- What are the pathways to Council's Interim GHG emissions targets.

Budget has been identified for the following strategies and capital that lead or assist with climate change response:

- Climate change Emissions Reduction Strategy
- Climate Change Adaptation Strategy.
- Climate Change Vulnerability Assessment.
- NWWTP Strategic Scoping.
- Natural Hazards Risk Remediation.

The Climate Change Vulnerability Assessment will focus on understanding how the impacts of climate change are likely to manifest on the activity. In the short term this is likely to focus on asset security (issues associated with sea level rise and increased rainfall intensity) with the longer term view aiming to understand how the activity will function into the future.

The Climate Change Adaptation Strategy will utilise the findings from the Climate Change Vulnerability Assessment to determine the most effective and efficient way forward in both the short and long term.

Climate Change Planning Assumptions

In order to frame the activity response to climate change the following assumptions have been made:

- The contribution of renewable energy sources to the national grid will progressively increase over time (currently targeting 90% renewable energy by 2025). This is expected to contribute to a steady reduction in the carbon footprint of Council assets that draw on mains power.
- Where emissions cannot be reduced, a Council wide offsetting approach will be developed.
- Representative Concentration Pathway of 8.5 will be used to guide the climate change response in line with the Nelson Tasman Land Development Manual adopted by Council in 2019. This will be reviewed as climate change monitoring and assessment techniques develop over time.
- Construction materials and techniques will be available that meet net zero GHG emissions by 2050.
- The community will confirm appropriate levels of service and affordability limits.
- Council will undertake investigations of the impacts of climate change on the Nelson City geographical area.
- Funding will be available to specifically assess the potential impact of climate change on the wastewater activity.

- Defend, Retreat or Accommodate: For the purpose of planning the next 30 year programme, it is assumed at this stage that asset renewals and upgrades will continue in low-lying areas that are subject to flooding and coastal inundation.
- Nelson City Council will seek co-financing where available from Central Government towards implementation of works.

Community Engagement

Climate change is a significant issue facing the community. In order for the Council controlled wastewater activity to respond to future challenges wide community engagement is called for. This is expected to come from a number of Council led pieces of work as follows:

- Statutory consultation for the Long Term Plan and Annual Plans.
- Whakamahere Whakatū Nelson Plan consultation on natural hazards overlays (including flood maps) and provisions (Objectives, Policies, Rules and Methods).
- NWWTP Resource consent renewal consultation.
- Notification of other resource consents where required.
- Nelson Climate Adaptation: there will be ongoing engagement with the community as part of the Dynamic Adaptive Pathways Planning Process (DAPP).

Knowledge Gaps

The following knowledge gaps have been identified with respect to climate change:

- NWWTP emissions profile.
- Nelson North Wastewater Hydraulic Model.
- Council is in the early stages of the DAPP process, therefore an Adaptive Strategy and adaptation plans for specific parts of the city are still to be developed.
- Asset condition and performance data.

v. Key issues for the Wastewater Activity

Key issues for the 2024 – 2034 wastewater activity are summarised as follows:

Issue 1: The location and disposal route for Nelson’s wastewater treatment in the future.

Issue 2: Damage to the wastewater network from natural hazards (Asset resilience).

Issue 3: Planned levels of service for the wastewater network will not be met unless assets are maintained, renewed and upgraded.

Issue 4: Wastewater overflows.

Issue 5: Failures of the Atawhai Rising Main are occasionally causing untreated wastewater discharges directly into Nelson Haven.

Issue 6: Management of increased wastewater flows associated with urban intensification and growth.

Issue 1: The location and disposal route for Nelson’s wastewater treatment in the future

The current Nelson Wastewater Treatment Plant (NWWTP) – note the NRSBU Bell Island WWTP facility is the subject of its own Activity Management Plan - is in a location that may be prone to impacts from sea level rise and fluvial flooding in the long term. The NWWTP is located in an area that has been naturally reclaimed from the sea by a combination of the formation of the boulder bank and the gradual sedimentation (as is continuing today) of the estuary.

It is expected that the NWWTP will remain in this location for the medium term as Council renews its resource consent for this facility, however, work programmed as part of this Plan will be seeking to define the options available into the future and the levels of risk and cost associated with these options as well as better understanding the risks associated with climate change at the current location.

Figures ES-5 and ES-6 outline flooding at the NWWTP site, based on modelling undertaken in 2020, with the respect to extreme rainfall and tide events in 2070. From these figures it is clear that whilst causing elevated water levels in various locations around the site, the site itself is not inundated through these events.

Regardless of the lack of inundation at the site shown by the modelling in 2070 it is considered prudent, due to uncertainties related to climate change predictions, to examine the options available for the future treatment of Nelsons wastewater.

Coastal inundation mapping using a bathtub method is shown on the shape nelson webpage (<https://shape.nelson.govt.nz/coastal-hazards>); this is a conservative approach that doesn’t take into account coastal topography. Further assessment is being undertaken to update that mapping using more recent LIDAR survey information. Additionally a wave run up assessment for the district is being initiated by Council.

Figure ES-5: River Flow Flooding 2070 RCP 8.5M 1 in 100 year rainfall event

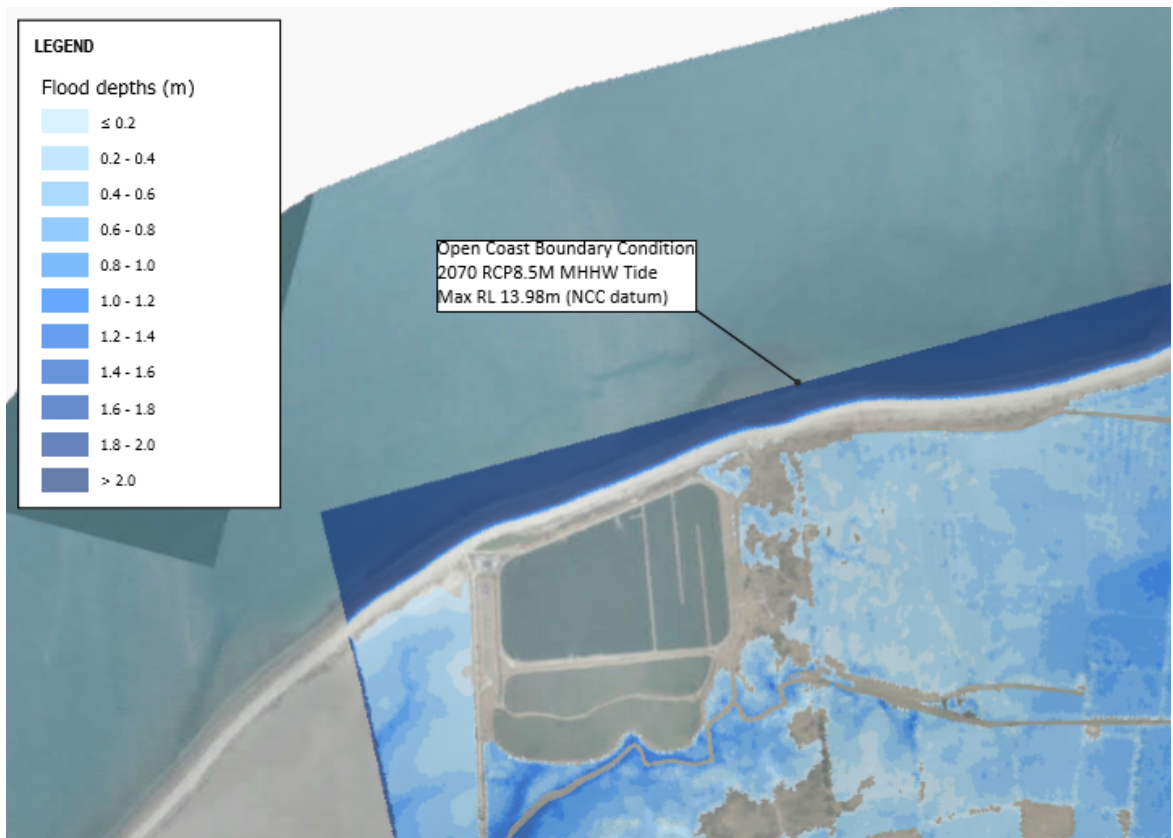
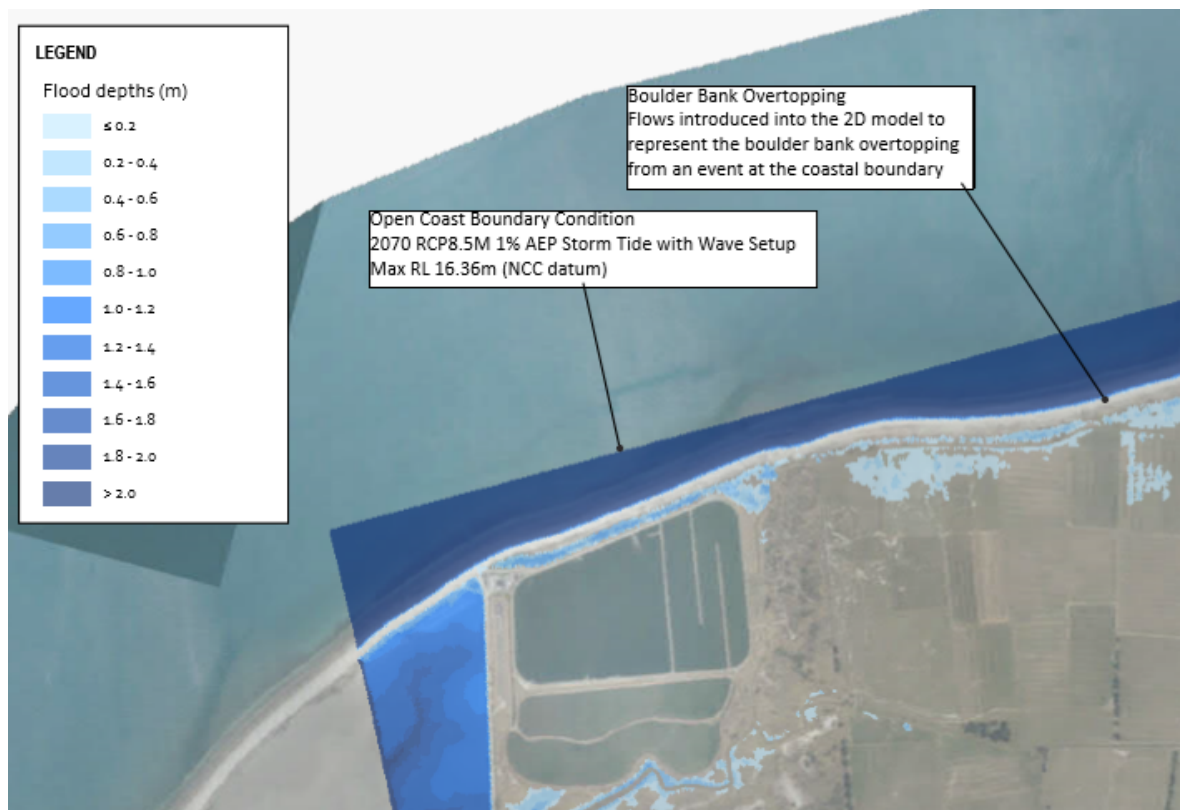


Figure ES-6: Coastal Flooding 2070 RCP 8.5M 1 in 100 year storm tide event



Issue 2: Damage to the wastewater network from natural hazards (Asset resilience)

Natural hazard events over the last decade have highlighted that parts of any utility network can be exposed to natural hazard events and that different natural hazards may impact on different parts of the network.

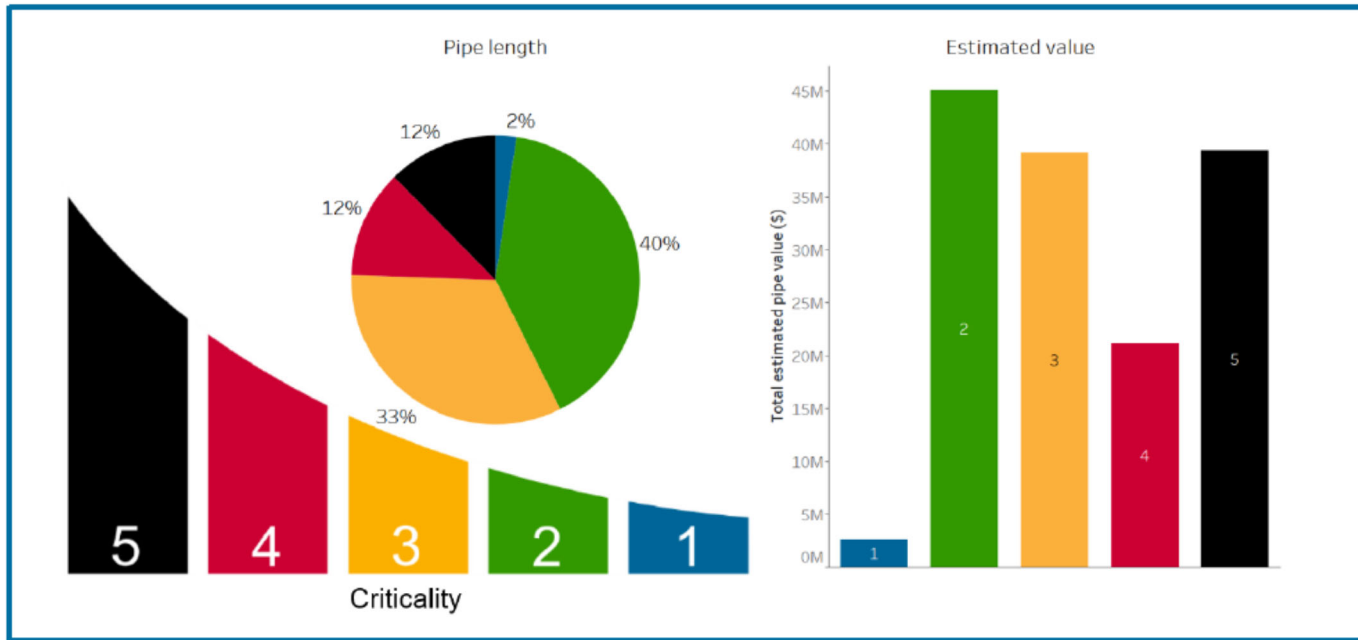
Council has recently undertaken a 3 Waters Natural Hazards study (Study) to establish the critical aspects of the 3 Waters networks and to understand what natural hazards events are likely to impact on these. A key aspect of this work is outlined in figure ES-7 that identifies the criticality of various parts of the network. Unsurprisingly a large portion of the assets identified as most critical are those at the bottom of the catchments (and hence serve a greater number of ratepayers).

The focus of increased resilience will be on assets that have a higher criticality rating. To further refine the prioritisation of assets the Study reviewed available hazard information and compared this against the criticality layer – this effectively defines critical assets that are likely to be susceptible to specific natural hazard events. The natural hazards considered as part of the Study are:

- Earthquake – ground shaking
- Earthquake – liquefaction
- Earthquake – fault rupture
- Storm inundation and coastal erosion
- Sea level rise
- Tsunami
- Wind/treefall
- Fire hazard
- Landslide hazard

This piece of work is ongoing and long term. A capital and operational budget placeholder for this work has been included within this Plan.

Figure ES-7: Criticality of the components of the wastewater network.



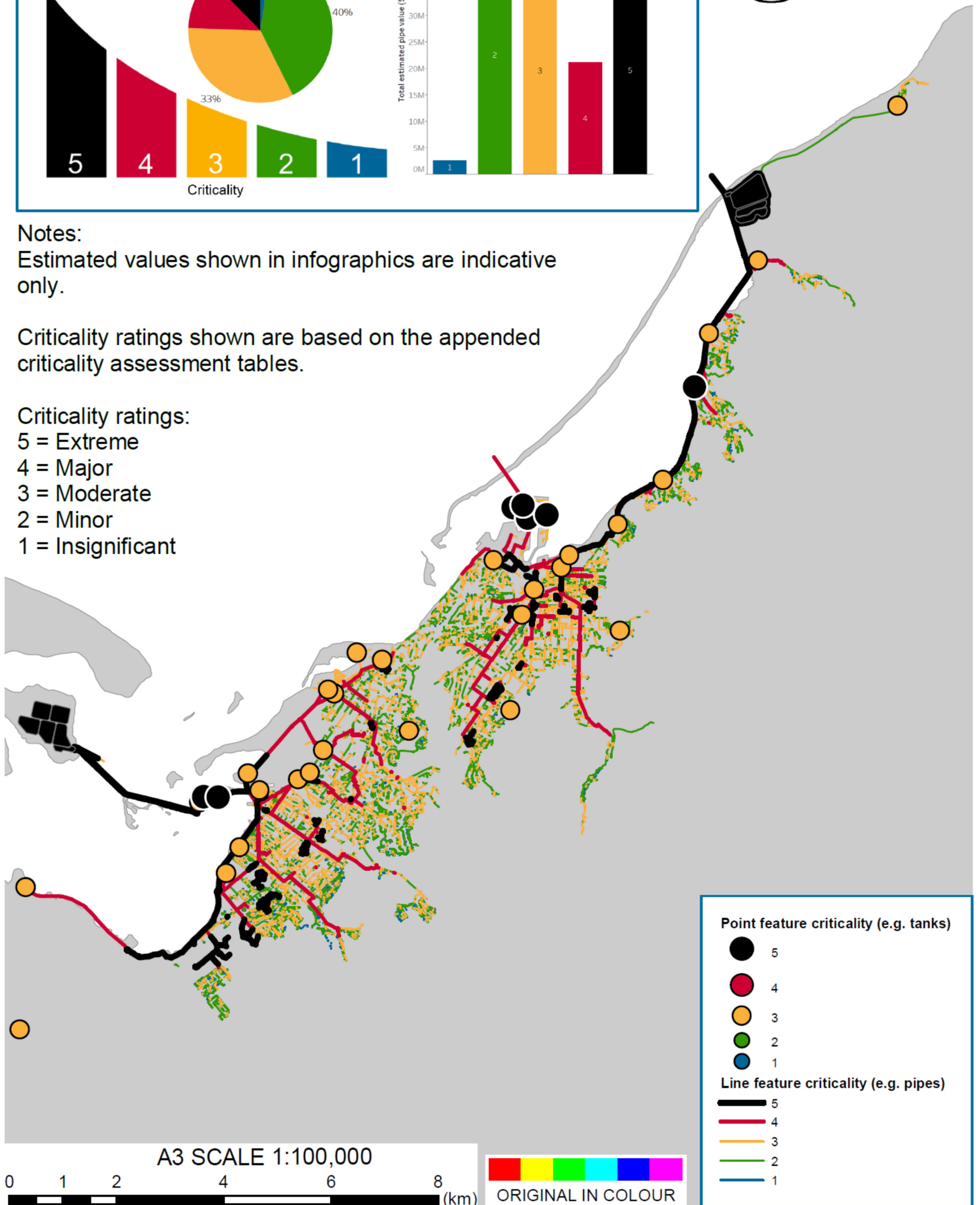
Notes:

Estimated values shown in infographics are indicative only.

Criticality ratings shown are based on the appended criticality assessment tables.

Criticality ratings:

- 5 = Extreme
- 4 = Major
- 3 = Moderate
- 2 = Minor
- 1 = Insignificant



Issue 3: Planned levels of service for the wastewater network will not be met unless assets are maintained, renewed and upgraded

Significant sections of the Nelson wastewater network were installed in the city from the 1950's -1970's as part of a surge of new developments. These earlier networks are now approximately 60-70 years old and some pipe materials have already reached the end of their service life.

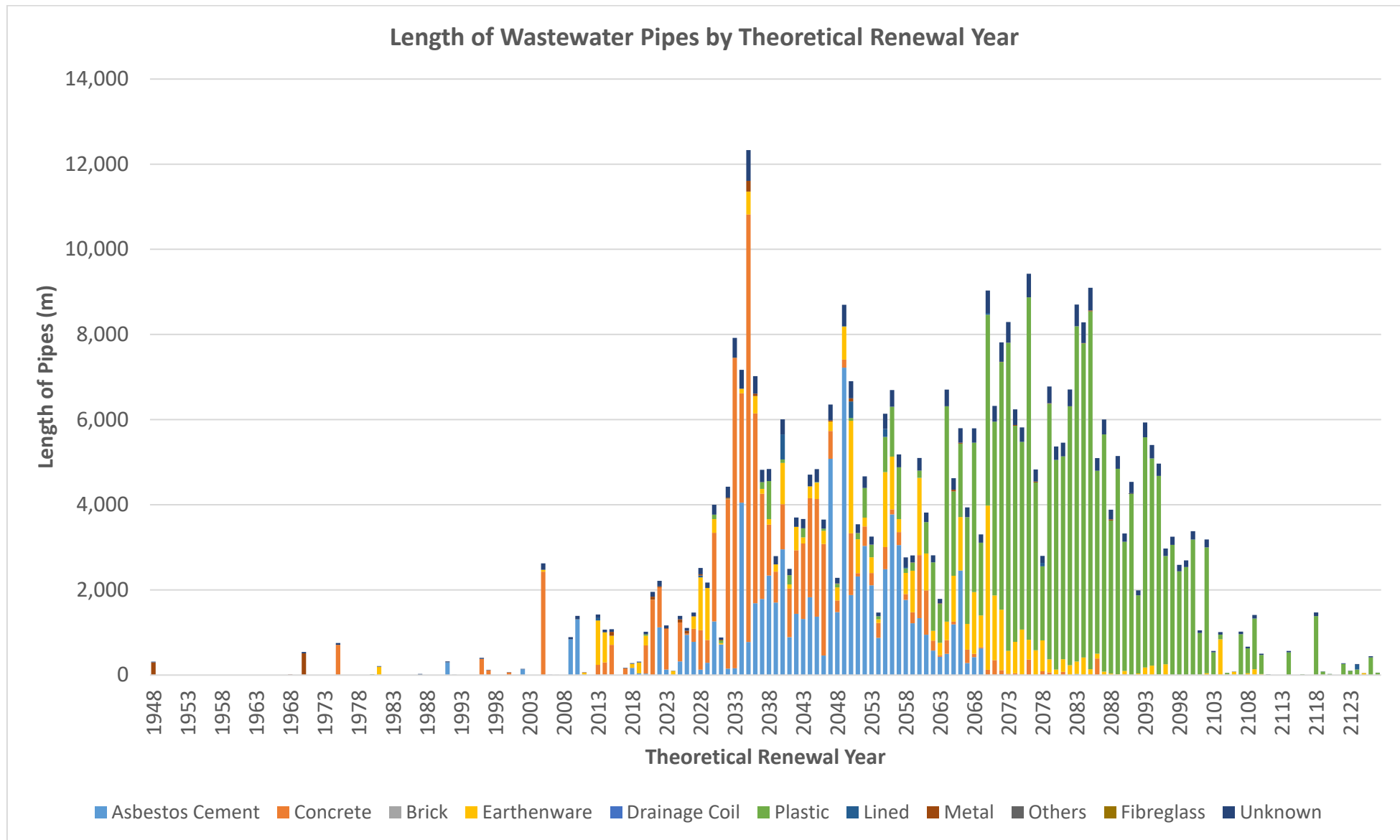
It is clear from the pipe renewals graph (Figure ES-8) that there is a significant lift in the amount of renewals required in the period from the mid 2030's onwards (a renewals "bow wave").

In order to ensure assets are able to be renewed, in terms of affordability, prior to their associated levels of service dropping then it is likely some assets will be renewed early (most likely coinciding with upgrades) and some renewals will be deferred where asset condition merits this approach.

The budget approach taken within this plan will be to ramp up spending (from approximately \$1.5 million in 2024/25 to in excess of \$10 million in 2043/44) on pipe renewals. and then maintain a degree of consistency of spend over a period of time. This will encourage efficiency and provide a degree of certainty to the market.

The Atawhai Rising Main (pumped pipe that connects the majority of the city to the NWWTP) has been excluded from Figure ES-8. The reason this has been done is that it is a significant asset that is budgeted for separately in the Plan budget programme; additionally there has been remedial work undertaken on the pipe at critical locations that have extended the base life of this asset.

Figure ES-8: Theoretical Renewal Year / Material Distribution



Issue 4: Wastewater overflows

Overflows occur in the network when, for a variety of reasons, the network is overwhelmed and excess wastewater volumes are released at “weak” points. Overflows are primarily linked to wet weather events however they are also caused by blockages and breakages within the system. A significant issue that contributes to wet weather overflows occurring is Inflow and Infiltration (I&I). In summary I&I is the entry of water (typically groundwater or stormwater) into the wastewater network, typically, unintentionally. It is an urban issue nationally and around the globe.

Above ground, inflows during rain events can happen when stormwater flows through manhole lids, low gully traps, crossed connections between stormwater pipes and sewer pipes and deliberate redirection of stormwater into sewer mains.

Below ground, infiltration occurs when groundwater enters sewer pipes through cracks in the pipes, failed joints, broken pipes, poor lateral connections and a similar range of issues associated with manholes and pump stations.

High groundwater levels arise from existing natural seepages, rain saturation, tidal and river effects and on site stormwater soakage; these exacerbate the below ground issues. As sea levels rise an increased focus on parts of the network that is susceptible to tidal inflows will be required. Addressing the issues of inflow and infiltration requires the efforts of both council and the community.

Central government regulatory and Whakamahere Whakatū Nelson Plan changes are expected to provide some degree of guidance with respect to this issue particularly in regards to the level of overflows that are acceptable.

The Ministry for the Environment's Action for Healthy Waterways has outlined the intention to consult upon and develop a National Environmental Standard – Wastewater (NES-WW). As wastewater overflows are a national issue it is expected that the NES-WW will provide guidance related to how an approach to managing wastewater overflows should be developed.

The updating and calibration/verification of the two hydraulic models is key to understanding network performance and where constraints exist. Therefore enabling better decision making and investing appropriately to reduce wastewater overflows. This work has commenced.

Misconnections to NCC's reticulation system and broken pipes on private property are challenging to resolve either through education or regulation and will be the subject of ongoing educational efforts.

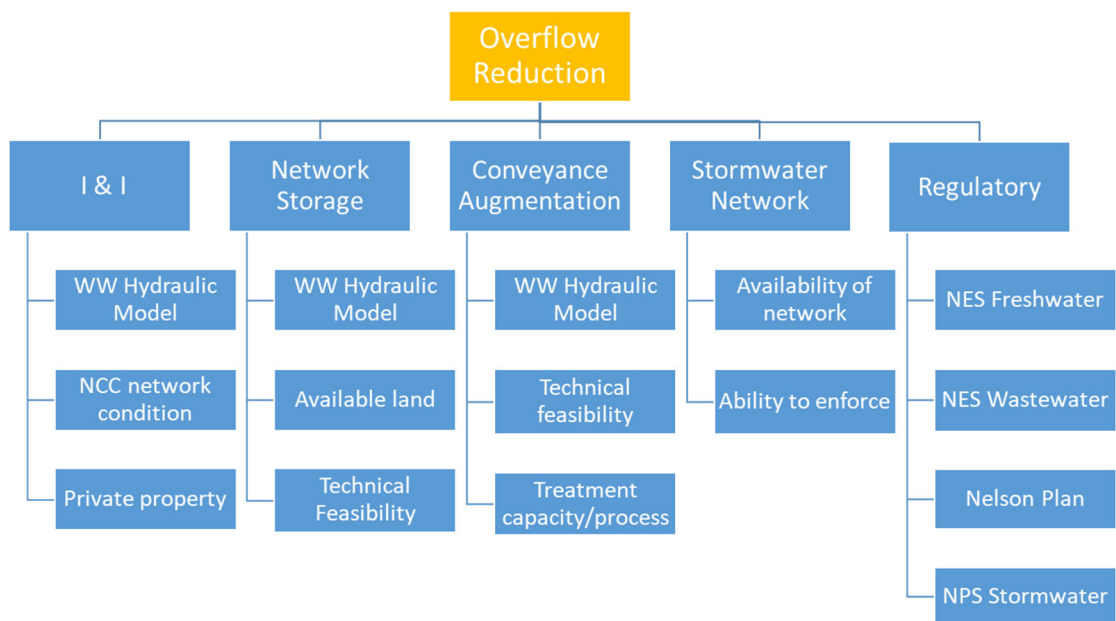
To have the best chance of completely solving the issue, Council would have to replace most of the wastewater network, including privately owned pipes and pump stations, and ensure stormwater was being disposed of appropriately across the city (which itself is a challenging piece of work particularly where there is no existing stormwater network).

One approach, and likely a part of any solution to limiting wastewater overflows, is to upgrade the system downstream (to carry flow away from areas prone to overflows) and/or provide storage to minimise overflows by:

- Developing a holistic strategy, using the hydraulic model to predict where there is a higher likelihood of overflows.
- Factoring in the entry of some stormwater and groundwater into the wastewater system by increasing network capacity, potentially including the ability to store limited amounts of wastewater.
- Continuing to investigate high E.coli readings in water samples and repair any damage in the public network with urgency (noting that the network is, in the natural order of things, constantly degrading).

Figure ES-9 Outlines the intricacies associated with the overflow reduction programme.

Figure ES-9: Overflow Reduction work streams



The Plan budgets reflect this as an ongoing area of focus and reaffirm Council’s commitment to minimise the impact of wastewater overflows on the community. Projects/programmes specifically linked to overflow reduction work include:

- Inflow and Infiltration/Overflow Reduction Programme.
- Washington Valley/Hastings St Sewer Upgrade.
- Pump Station Resilience.
- System Performance Improvements.
- Wastewater Pipeline Renewal Programme.

Issue 5: Failures of the Atawhai Rising Main are occasionally causing untreated wastewater discharges directly into Nelson Haven

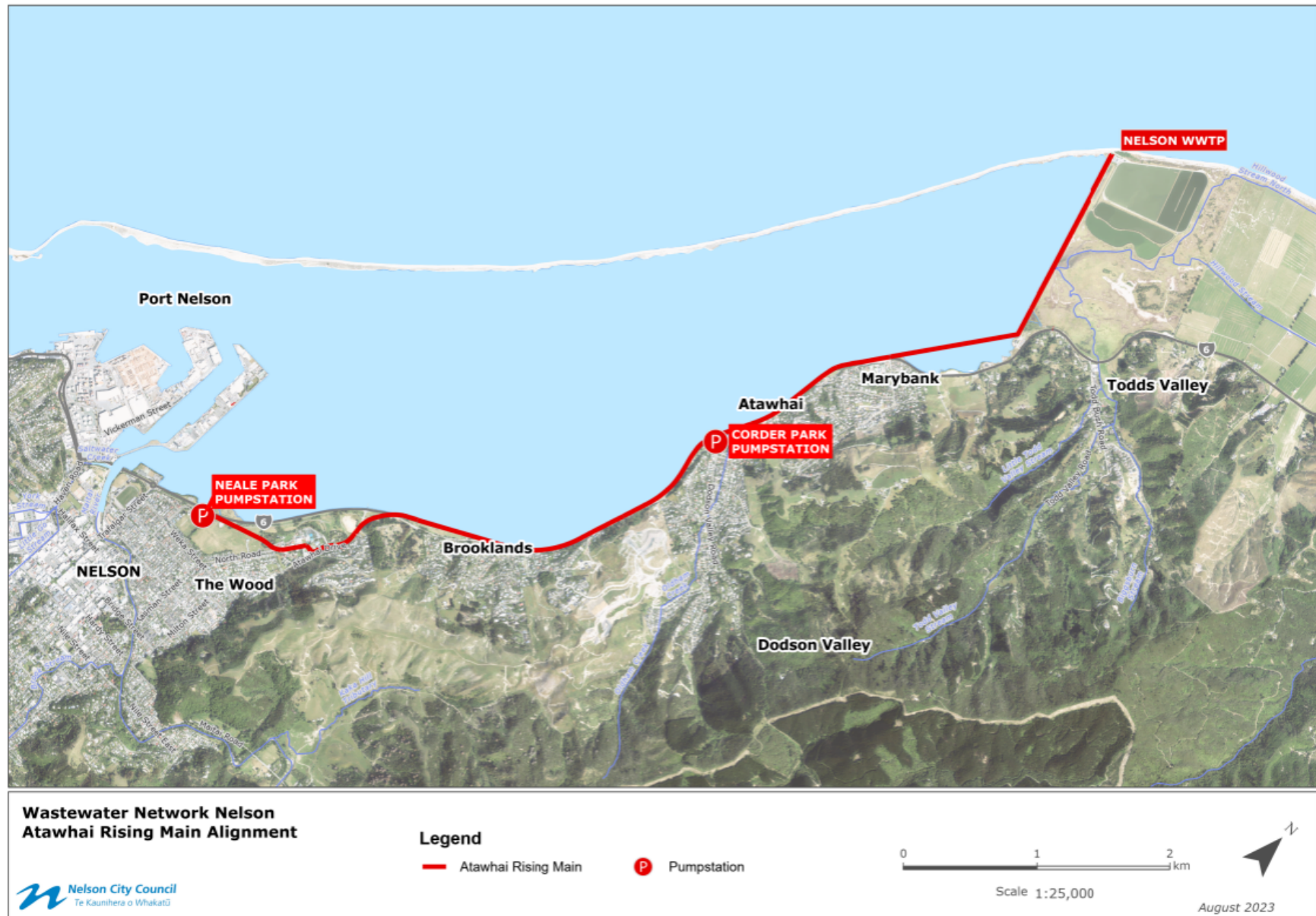
The history of this pipeline is given in section 4.1.2 of this Plan. It is a high value and fragile asset and it requires replacement in the near future. Figure ES-10 identifies the alignment of this key asset.

The pipes that make up the Atawhai Rising Main are mostly concrete. The primary issue associated with this pipe is the degradation of the concrete and reinforcing steel by sulphuric acid. Sulphuric acid is generated by the release of hydrogen sulphide gas at air pockets along the length of the pipe.

Extensive repairs were carried out in the 1990s replacing some of the concrete pipes with fibreglass, however further failures have occasionally caused small volumes of untreated wastewater to directly discharge into the Haven.

These occasional untreated wastewater discharges impact on coastal water quality, cultural values, and public perceptions of the quality of the environment. They also have the potential to affect Council's compliance with future resource consent conditions, as the regulatory environment related to discharges of wastewater to the environment is likely to become more stringent over time in particular in relation to the National Policy Statement – Fresh Water Management.

Figure ES-10: Atawhai Rising Main



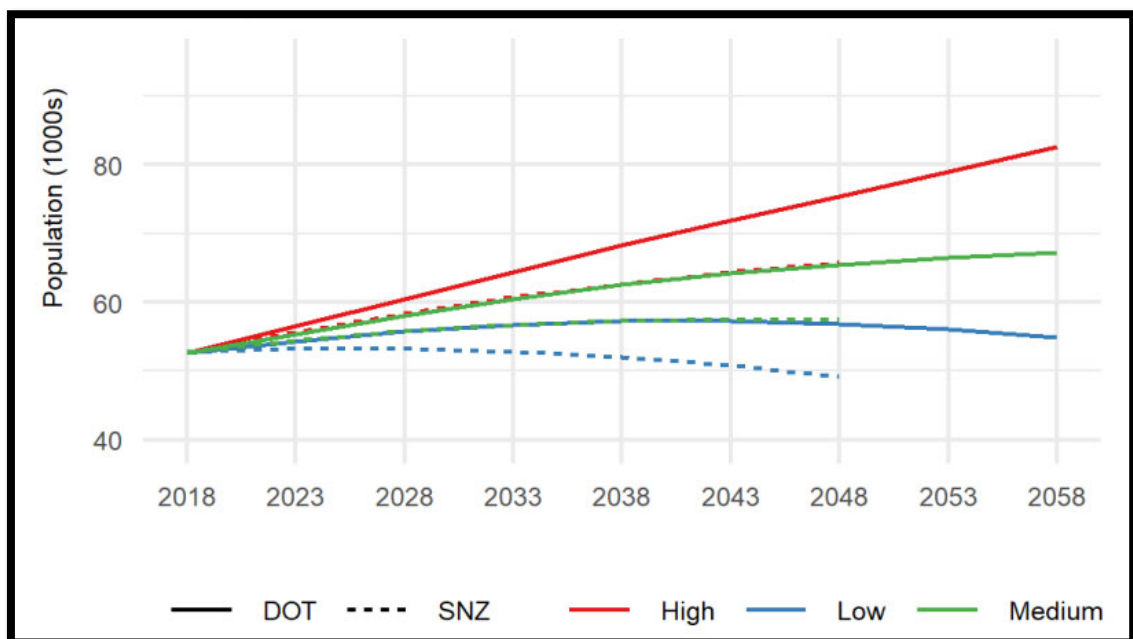
Issue 6: Management of increased wastewater flows associated with urban intensification and growth

Between 2001 and 2018 average annual growth rates ranged between 0.64% and 1.91%. Population growth rates between 2006-2018 were unusually high compared to long term patterns (approximately double the rates for 1996-2006) and it is unlikely that growth will continue at this rate for the duration of the projection period.

The rates of growth in Figure ES-11 are based on commissioned demographic analysis and reflect the medium scenario projection from the findings of this analysis. These projections are higher than those produced by Statistics New Zealand, primarily due to higher net migration assumptions used for this analysis.

Nelson’s population is expected to increase by 5,013 between 2023 and 2033 to 60,419. The projections suggest a relatively modest annual average growth rates for 2023-2033 of around 0.9%. Growth rates are likely to decline over time due to structural population ageing.

Figure ES-11: Population growth and projections, 2023-53, Nelson



The need to respond to growth/intensification is expected to be a constant into the future and that there will not always be clarity on exactly how this will unfold. As such whilst programmes will be planned/developed to support this there will be a need to be responsive and to ensure costs are apportioned appropriately.

The following documents set out the city’s future urban capacity requirements and identify where urban intensity and growth are planned to take place over the next 30 years in Nelson.

- National Policy Statement – Urban Development (2020)
- Future Development Strategy (2022)

National Policy Statement – Urban Development (2020)

The National Policy Statement on Urban Development 2020 (NPS-UD) requires local authorities to ensure there is sufficient development capacity to meet demand over the next 30 years with specific zoning and servicing requirements over different time frames:

- in the short term (within 3 years)
- medium term (3-10 years)
- long term (10-30 years)

The location of actual growth will depend on where there is capacity for residential growth (residential zoning, infrastructure servicing) and where development is feasible. Residential growth areas are provided in *section 3.5 - Asset programmes to meet demand*.

The Nelson Tasman Future Development Strategy 2022

The Nelson Tasman Future Development Strategy 2022 (FDS) provides capacity for about 24,000 houses over the next 30 years in the combined urban environment.

In Nelson, the FDS identifies capacity for about 11,500 new dwellings, with 78% of this growth to be achieved by adding new housing into existing urban areas, and the remaining 22% expected to be through new greenfield expansions. This proportion reflects community feedback supporting growth through intensification of existing urban areas rather than expansion onto rural land.

Provision of intensification infrastructure is identified for the City Centre, Stoke and Tāhunanui, where higher density and mixed-use environments will see growth consolidated. Most of the new greenfield potential identified are within the Maitai, Marsden, and Ngawhatu valleys. Parts of Nelson Central and Tāhunanui are subject to flood risks and future intensification will be guided by the outcome of a Dynamic Adaptive Planning Pathways process, which is currently underway.

Implementation of intensification projects is more complex than traditional expansion. The Council does not have full control over the location or level of uptake of intensification or urban expansion opportunities, as this is largely dependent on decisions by individual landowners and/or developers. Where the Council can take a lead include:

- Identify priority areas.
- Lead investment in urban amenity and public transport to encourage growth in specific areas, such as the City Centre.

Ensuring wastewater capacity is available to facilitate growth and intensification.

The nature of development with its market driven uncertainties relating to location and timing mean that, while some preplanning can be undertaken, there is a need to have some flexibility in relation to where work is undertaken to meet demand requirements.

Reducing inflow and infiltration and freeing up network capacity is supportive of growth and development. There is some opportunity to increase the current pipe diameters when the network is renewed.

The wastewater hydraulic model is the key tool that enables a good understanding of current constraints within the system and future constraints based on what is currently known about growth/intensification areas. This will enable key decision making when considering network renewals, upgrades and storage.

vi. Levels of service

Levels of service for the wastewater activity are shown in Table ES-2. These reflect the requirements of the Department of Internal Affairs for reporting non-financial measures. Level of service statements have been updated since the levels of service in the Long Term Plan 2021 – 2031, and two performance targets.

Table ES-2: Levels of Service 2024 - 2034

				Performance Target
Community Outcomes	Level of service	Performance measure	Previous and current performance	2024 -2034 (Year 1-10)
Our infrastructure is efficient, resilient, cost effective and meets current and future needs.	Reliability ^We provide reliable wastewater systems with a minimum of odours, overflows or disturbance to the public.	Level of compliance of treatment plant with resource consent conditions Measurement Procedure 1	100% compliance in 2022/23 100% compliance in 2021/22 100% compliance in 2020/21	Compliance with 100% of the resource consent conditions for 90% of the time.
		Number of dry weather overflows from the sewerage system, per 1,000 connections* Measurement Procedure 2 (Mandatory Performance Measure 1)	3 dry weather overflows per 1,000 connections in 2022/23. 3 dry weather overflows per 1,000 connections in 2021/22 4 dry weather overflows per 1,000 connections in 2020/21	Fewer than 15 per 1,000 connections.
Our region is supported by an innovative and sustainable economy.	Response ^We provide well built, operated and maintained wastewater systems so that any failures can be managed and reponed to quickly.	Median response times are measured for overflows resulting from a blockage or other fault in the sewerage system: a) attendance time: from when notification is received to the time service staff reach the site b) resolution time: from the time notification is received to the time service staff confirm resolution of the blockage or other fault* Measurement Procedure 2 (Mandatory Performance Measure 3)	Median response time of 20 minutes in 2022/23 Median response time of 21 minutes in 2021/22 Median response time of 25 minutes in 2020/21 Median resolution time of 163 minutes in 2022/23 Median resolution time of 191 minutes in 2021/22 Median resolution time of 195 minutes in 2020/21	a) Contractor to attend in median time of 60 minutes or less b) Contractor to resolve issue in a median time of 480 minutes or less

				Performance Target
Community Outcomes	Level of service	Performance measure	Previous and current performance	2024 -2034 (Year 1-10)
Our unique natural environment is healthy and protected.	Quality ^We provide wastewater systems that aim to have minimal adverse affect on the environment	Compliance with territorial authority's resource consents for discharge from the sewerage system measured by number of: a) abatement notices b) infringement notices c) enforcement orders d) convictions in relation to those resource consents* Measurement Procedure 1 (Mandatory Performance Measure 2)	100% compliance in 2022/23 100% compliance in 2021/22 100% compliance in 2020/21	a) ≤2 b) ≤2 c) 0 d) 0
		The total number of valid complaints received about any of the following: a) sewage odour b) sewerage system faults c) sewerage system blockages d) Council's response to issues with the sewerage system, expressed per 1,000 connections to the sewerage system* Measurement Procedure 2 (Mandatory Performance Measure 4)	17 valid complaints per 1,000 connections in 2022/23 12 valid complaints per 1000 connections in 2021/22 16 valid complaints per 1000 connections in 2020/21	No more than 20 valid complaints a year per 1000 connections

^L.O.S. included in LTP

* Performance measures with an asterisk reflect the wording of the Non-Financial Performance Measures of the Department of Internal Affairs (DIA) incorporated into sec261B Local Government Act 2002. This is to allow the DIA to compare these measures across councils. Targets have been adjusted where necessary to align.

Measurement procedures:
1. Council RMA infringement records at 1 July
2. Report from SR system at 1 July

Central Government Regulation

The event of the campylobacteriosis outbreak in Havelock North in August 2016 concluded with a Government Inquiry. The focus of the Inquiry was twofold: The security of the source, particularly subsurface bores; and the regulatory framework that applies to drinking water suppliers in New Zealand. Numerous administrative and operational recommendations were made in the two final reports. The Stage 2 report also had a section with a recommendation that the Government look at aggregating supplies of water across the country.

In response to the Inquiry Central Government introduced the following legislation:

- Taumata Arowai – the Water Services Regulator Act 2020. The Act establishes a new regulatory body – Taumata Arowai – which is to be responsible for:
 - *administering and enforcing a new drinking water regulatory system (including the management of risks to sources of drinking water); and*
 - *a small number of complementary functions relating to improving the environmental performance of wastewater and stormwater networks (developing standards and regulations then monitoring and enforcing compliance with them and providing training).*
- The Water Services Act – which aims to ensure that drinking water suppliers provide safe drinking water to consumers.

For the Wastewater Activity, NCC is well placed to respond to potential changes. The Council has been proactive in recognising and investing in reducing wastewater overflows. Furthermore, the NWWTP is currently operating under an active resource consent, and work is currently well underway to renew this consent.

vii. Future demand

Modelling of the network suggests that there is currently sufficient dry weather capacity, in the city's pipes considered to date, for at least the short-medium term; this is strongly supported by the low level of dry weather overflows that occur in the network. The hydraulic model is currently undergoing a significant upgrade; this will prove a key tool in determining restricted parts of the network and the development of associated solutions.

The demand changes related to legislative, climatic and community expectation changes mean that the future of the processes, and potentially the location of the Nelson Wastewater Treatment Plant will require significant consideration in the coming years and in particular over the period of this Plan.

Table ES-3 summarises key future demand drivers considered within this Plan whilst Figure ES-12 outlines the areas that are expected to grow and/or intensify in the coming three decades.

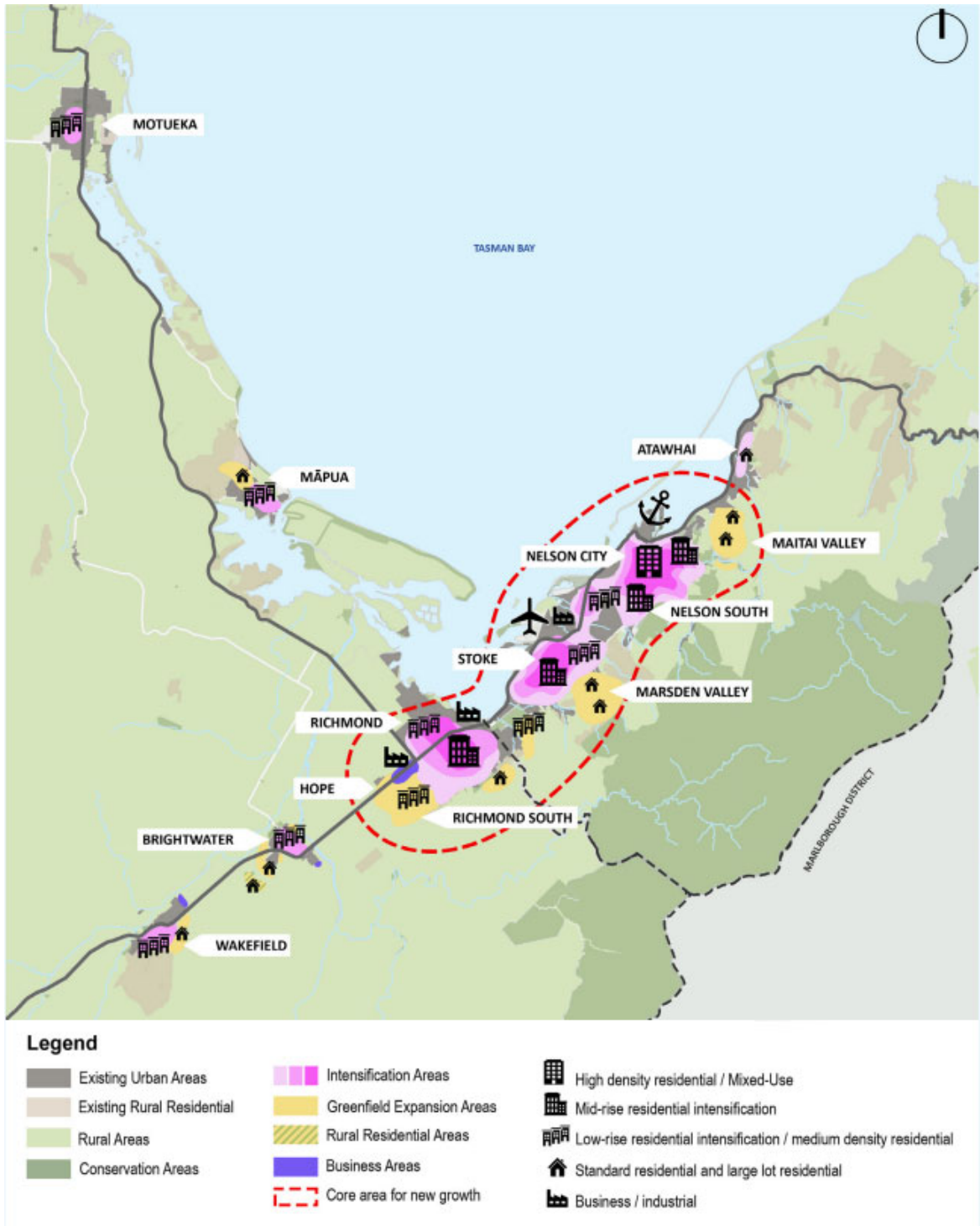
Table ES-3: Wastewater Demand Drivers

Wastewater Demand Drivers	Changes to Wastewater Activity
Significant population growth and residential expansion into greenfield areas	New development areas on the periphery of the city and increased intensification in some existing developed areas, including the city centre area, leading to increased wastewater production.
New 'wet' industries	Growth in the commercial sector that involves wet processing activities increases the demand for wastewater services.
Reduction in house occupancy	Activities such as operating washing machines and dishwashers mean that dwellings with low numbers of occupants can produce more wastewater per capita than dwellings with higher occupancy numbers.
Changes in Customer Expectations	Customer expectations are increasingly tending towards higher levels of service for reliability and response to complaints. These expectations do not always consider the additional costs associated with meeting them.
Community Expectations on Environmental Protection	Community expectations are increasingly focussed on both the reduction of extent and frequency of wastewater overflows on property and roads during and after storms, as well as enhanced wastewater discharge quality.
Climate Change	In recent years, there has been an increase in the incidence of extreme weather events around the world. The general trend for Nelson is of winters being wetter and the other seasons being drier. More frequent heavy rainfall events have been predicted which will impact negatively on wet weather overflows from the network.
Legislative/ National Policy Statements: <ul style="list-style-type: none"> • NPS Freshwater Management • NPS Urban Development • Zero Carbon Bill 	<ul style="list-style-type: none"> • NPS Freshwater Management is a cornerstone Central Government initiative to improve the quality of freshwater bodies in New Zealand. This is expected to impact on discharges to waterways and require an enhanced response to overflows from the network. This will be guided by the National Environmental Standard - Wastewater when released. • NPS Urban Development will ensure each territorial authority makes adequate provision for future population growth in their areas. This will require Council to undertake strategic growth studies and identify the impact on the demand for wastewater services. • Becoming carbon neutral for the wastewater activity will focus on understanding, improving and mitigation of greenhouse gas production at the wastewater treatment plant and ensuring that the various network components that directly or indirectly have a carbon foot print are optimised to minimise their carbon foot print and where possible eliminated.

Infrastructure Planning for Growth Projects

Figure ES-12 shows the areas identified for future growth in the FDS. As demand for development becomes clearer they will be prioritised for services upgrades.

Figure ES-12: Growth Strategy



viii. Lifecycle management plan

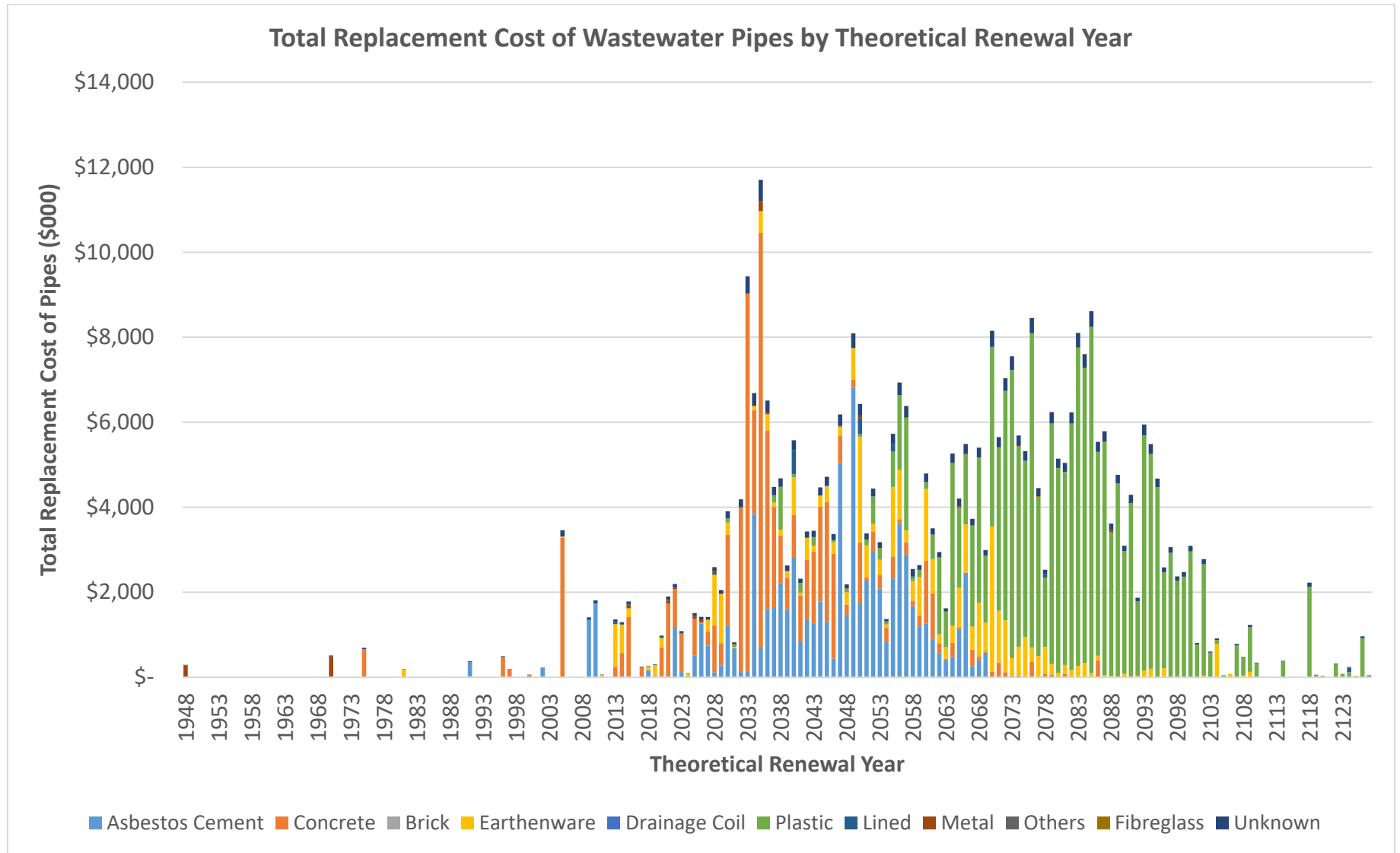
Assets have a lifecycle as they move through from the initial concept to the final disposal. Depending on the type of asset, its lifecycle may vary from 10 years to over 100 years.

As with many other urban areas across the country, much of the 3 waters network in Nelson was developed during a period of intense urbanisation and conversion to public servicing from the 1960s and 70s. The average age of Nelson's wastewater pipe assets is approximately 40 years which sits slightly above the national average at about 37 years.

An important consideration for the coming decades is a "bow wave" of renewals commencing in the period 2030 onwards. Figure ES-13 illustrates this graphically. This is identified as a key issue and is reflected in the Plan programme.

More information on lifecycle management is provided in Chapter 4 of this Plan.

Figure ES-13: Estimated Renewal Cost Year / Material Distribution



ix. Risk management plan

NCC is committed to using risk management principles and techniques to understand and appropriately manage all internal and external factors and influences which affect the achievement of its objectives. Doing this will:

- Provide a reliable basis for sound decision making.
- Increase the likelihood of achieving objectives.
- Provide an agreed basis for prudent risk taking.
- Enable the organisation to understand the level of risk associated with each decision as well as the Council's aggregate exposure to risk.
- Improve accountability and assurance of control.
- Enable the Council to avoid threats and seize opportunities.
- Foster an organisational culture based on reasonable foresight and responsible hindsight.

The Council's standardised risk assessment method explicitly follows the process part (section 5) of AS/NZS 31000:2009 Risk Management – Principles and Guidelines.

Risk analysis involves consideration of the sources of risk, their consequences and the likelihood that those consequences may occur.

The following consequences are considered:

- Health
- Safety
- Asset performance/Service Delivery
- Environmental/Historical/Cultural
- Financial
- Political/Community/Reputational
- Relationship with Iwi
- Legal compliance
- Information/Decision support

Consequences of an event are rated 1 - 5 (Insignificant to Extreme). Likelihood is then rated 1 – 5 (Rare to Almost certain) to calculate a risk level rated 1 – 5 (Very Low to Very High).

The objective of risk analysis is to separate the low impact risks from the major impact risks, and to provide data to assist in the evaluation and treatment of the risks.

The five specific Community Outcomes that guide the Wastewater Activity risk analysis are also used to inform the Wastewater Activity levels of service:

- Our unique natural environment is healthy and protected.
- Our urban and rural environments are people-friendly, well planned, accessible and sustainably managed.
- Our infrastructure is efficient, resilient, cost effective and meets current and future needs.
- Our region is supported by an innovative and sustainable economy.
- Our communities are healthy, safe, inclusive and resilient.

There is potential for future Level of Service changes around the Freshwater NPS / NES, urban growth, and implementation of a risk-based decision making framework in this area.

Table ES-4 sets out the high risks to the wastewater activity.

Table ES-4: Summary of High Risks to the Wastewater Supply Activity

Risk #	Risk Title	Control / Treatment	Treatment Description	Likelihood	Severity	Rating
R00239	Significant change in governing framework for 'Local Water Done Well'	MC00202	Respond to Three Waters Reform legislation (Water Services Act 2021, Taumata Arowai..Act etc) - commenced project 'Drinking Water Quality Initiatives', that will focus on moving to a new Water Quality IT software - establishment of a Catchment Risk Management Plan (currently underway) - reviewing Councils existing Water Quality Sampling Plan and potential updates in accordance with the new standards - Providing feedback on various Acts etc	Possible	Major	HIGH
	Significant change in governing framework for 'Local Water Done Well'	MC00215	- Processes and procedures. Promap. - Annual review of Asset Management Plans - 3 year development. - Succession plans - Handover period	Possible	Major	HIGH
	Significant change in governing framework for 'Local Water Done Well'	MC00917	- Project stages for managing organisational change	Possible	Major	HIGH
	Significant change in governing framework for 'Local Water Done Well'	MC00918	Staff training to enhance resilience for those likely to be impacted by 3-waters changes - First round of training, "Managing people through change" and "Coping with Change", rolled out in quarter three of 2021-22.	Possible	Major	HIGH
R00242	Lack of resources to complete indicative business cases	MC00211	- Review workloads - Offload to Capital Projects where they have an available PM - Pay for external resources to PM.	Likely	Major	HIGH
R00249	Decisions about asset maintenance/ development/ replacement made ignoring advice in AMPs (e.g. politicized 'pet projects')	MC00226	- Ensure elected representatives and Senior Leadership Team are well informed with regard to necessity and scope of projects and the content of AMP's. - Workshop AMP development with Council.	Likely	Moderate	HIGH
R00251	Operational - One or more operated assets do not comply with resource consents	MC00235	- Processes for RMA compliance and reporting. - Independent contractor monitoring and reporting - Alarm systems, level indicators. - External audits.	Possible	Major	HIGH
R00256	Contractors do not meet required health and safety standard	MC00268	- Contractor reports to Council - Council reviews H&S systems - Audits of H&S systems	Possible	Major	HIGH

R00587	Lifeline service (waste water) failure from natural hazards and similar events	MC00016	Civil Defence planning and management improves response systems reducing consequence	Possible	Major	HIGH
	Lifeline service (waste water) failure from natural hazards and similar events	MC00894	- Complete review and renewal of Council's underground insurances each year (placed Nov) Nb. insurance/risk sharing - provides financial resources by funding recovery. - 40% through Council's membership of the AoN South Island collective with a large deductible - 60% funded by central government (see 1991 Disaster Recovery Plan)	Possible	Major	HIGH
	Lifeline service (waste water) failure from natural hazards and similar events	MC00895	-- In progress -- Natural Hazards Risk Assessments for the three waters - including developing strategies and implementing a programme to make three water assets more resilient to natural hazards such as earthquakes, landslides, flooding, Tsunamis etc. Note Placeholder funding for implementation allowed for in the draft AMPs	Possible	Major	HIGH
	Lifeline service (waste water) failure from natural hazards and similar events	MC00896	- investigations regarding inflow and infiltration continue throughout the LTP - lifeline improvements in AMPs -- including section on / consideration for Climate Change - asset renewal plans and asset management information systems to track infrastructure condition status - network and pump station upgrades. This provides added resilience to wastewater overflows.	Possible	Major	HIGH
	Lifeline service (waste water) failure from natural hazards and similar events	MC00901	- Complete review and renewal of Council's above ground insurances each year (placed July) e.g. WTP, pump stations etc Nb. insurance/risk sharing - provides financial resources by funding recovery. - 40% through Council's membership of the AoN South Island collective with a large deductible - 60% funded by central government (see 1991 Disaster Recovery Plan)	Possible	Major	HIGH
R00692	Lack of Staff (NCC) and operator (Nelmac) experience/resilience	MC01012	- Employ experienced people where possible. - Employ appropriately qualified and skilled staff. - Competitive pay and conditions should be competitive.	Possible	Major	HIGH
R00693	Climate Change /Sea Level Rise	MC01013	- Nelson Tasman Emergency Management Plan. - Emergency procedures manual and exercises. - Programmes related to resilience/adaptation underway - Continue to develop criticality and natural hazards understanding with a view to progressing to the development of solutions (that will minimise the risk of failure due to a natural hazard event) in order of priority	Possible	Major	HIGH
R00694	Harm to operators from exposure to sewage	MC01014	- Health and Safety training. - Preventative inoculation of staff. - Use of barrier protection where possible. - Ongoing health and Safety training. - Identify hazardous areas at facilities and employ processes to minimise risk	Possible	Major	HIGH

R00695	Failure to achieve consent conditions at WWTP	MC01015	<ul style="list-style-type: none"> - Pond management team recently set up to routinely monitor pond performance in order to minimise the risk to the ponds "crashing" and causing odour issues. - Pre-treatment processes minimise loading fluctuations. - The plant is operated and maintained in a manner that minimises risk of consent breaches within the capabilities of the current processes. - Wide ranging sampling and monitoring programme. - Buffering provides a factor of safety. - Proactive de-sludging programme is being developed - Ensure and maintain adequate sampling and monitoring. - React rapidly to potential breaches or indications that breaches are coming. - Continue to invest in the pond management team. 	Possible	Major	HIGH
R00696	Atawhai Rising Main Failure.	MC01016	<ul style="list-style-type: none"> - Stock spares available to facilitate rapid repair. - Effective systems for reporting and response in place. - Staff and contractors aware of the significance of this main. - Work underway to assess the internal condition of this rising main and the risk of failure of key external components. - "Dry run" exercises on failure response undertaken from time to time. - Continue with internal and external condition assessment programme. Ensure critical spares are readily available. - Renewal planning commenced July 2021 with stage 1 construction planned for 2025/26 	Possible	Major	HIGH
R00698	Pump stations Equipment/ component Failure	MC01017	<ul style="list-style-type: none"> - Processes within pump stations have contingencies for failure (duplication of pumps) or alarm systems (Supervisory control and data acquisition) installed. - Many PS have additional storage capacity - Pump station resilience programme to identify appropriate solutions to decrease risk levels associated with critical equipment failure. - Operations team to develop a critical spares list and develop a business case to procure these. - Increase "Dry run" exercises on critical pump stations. 	Possible	Major	HIGH
R00699	Insufficient Storage Capacity at Pump stations	MC01018	<ul style="list-style-type: none"> - All pump stations have high level and overflow alarms for advance warning of an overflow event and high capacity pumps for peak flow conditions. - A programme of work associated with better understanding key risks (and developing associated solutions) related to pump stations is underway. - Investigate storage capacity of network, document, & develop mitigation strategy. Pump station resilience programme to identify appropriate solutions. 	Possible	Major	HIGH

x. Financial summary

Detailed financial statements and forecasts are provided in section 6 – Financial Summary. Tables 6-1 and 6-2 include a breakdown of projected expenditure by project.

Tables ES-5 and ES-6 below show total projected operational and capital expenditure for the wastewater activity for 2024 – 2034 by expenditure type.

The period 2024 – 34 in terms of operational expenditure is steadily increasing reflecting a need to operate and maintain an ageing network and increase the level of condition assessment; there is a peak in Y8 relating to programmed desludging of the oxidation ponds at the Nelson Wastewater Treatment Plant. Though considered operational expenditure, the desludging of the oxidation ponds in 2013/14 was loan funded, and therefore had a similar impact on rates as capital expenditure.

Capital expenditure for the period 2024 – 2034 shows an increase from year 2 onwards. The increase in capital expenditure is to service expected growth areas and a response to the direction taken to increase renewals spending (smooth out the renewals “bow wave”) – these are both key issues identified in this Plan.

Some key operational projects/programmes over the period of the AMP include:

- Wastewater Reticulation Programmed Maintenance
- NWWTP Programmed Maintenance
- Wastewater Reticulation Reactive Maintenance
- Climate change – Emissions Reduction.
- Climate Change – Vulnerability Assessment.
- Climate Change – Adaptation Strategy.
- NWWTP Strategic Scoping/Options.
- Natural Hazards Risk Assessment.
- Inflow and Infiltration (Overflow Reduction).

Some key capital projects/programmes over the period of the AMP include:

- Atawhai Rising Main - Renewal.
- Pump Station Upgrades.
- Pump Station Resilience.
- System Performance Improvements.

- Climate change – Emissions Reduction Implementation.
- Climate Change – Vulnerability Assessment Implementation.
- Climate Change – Adaptation Strategy Implementation.
- Natural Hazards Risk Remediation.
- NWWTP Upgrades.
- A number of significant trunk main and/or catchment wide renewal and upgrade programmes.

Table ES-5: Wastewater Operational Expenditure Year 1-10 of the 2024/34 Long Term Plan

Account	2024/25 AMP (2024/34)	2025/26 AMP (2024/34)	2026/27 AMP (2024/34)	2027/28 AMP (2024/34)	2028/29 AMP (2024/34)	2029/30 AMP (2024/34)	2030/31 AMP (2024/34)	2031/32 AMP (2024/34)	2032/33 AMP (2024/34)	2033/34 AMP (2024/34)
6405 Wastewater	11,034,435	11,003,703	11,434,210	12,303,090	12,874,918	12,756,525	13,826,087	16,099,043	14,453,122	14,934,379
Base Expenditure	9,705,435	9,564,703	9,850,210	10,358,090	10,779,918	10,826,525	11,458,608	11,772,751	12,202,999	12,730,405
Unprogrammed Expenses	690,000	695,000	700,000	745,000	750,000	755,000	852,479	856,292	860,123	863,974
Programmed Expenses	639,000	744,000	884,000	1,200,000	1,345,000	1,175,000	1,515,000	3,470,000	1,390,000	1,340,000

Table ES-6: Wastewater Capital Expenditure Year 1-10 of the 2024/34 Long Term Plan

Account	2024/25 AMP (2024/34)	2025/26 AMP (2024/34)	2026/27 AMP (2024/34)	2027/28 AMP (2024/34)	2028/29 AMP (2024/34)	2029/30 AMP (2024/34)	2030/31 AMP (2024/34)	2031/32 AMP (2024/34)	2032/33 AMP (2024/34)	2033/34 AMP (2024/34)
6405 Wastewater	7,881,038	14,595,673	22,874,813	22,651,823	19,912,073	20,119,073	22,664,073	24,534,073	28,392,073	22,906,073
Capital Growth	2,926,573	10,913,673	14,909,813	11,849,823	2,614,073	2,089,073	5,689,073	6,449,073	11,889,073	12,789,073
Capital Increased LOS	1,581,000	552,000	505,000	1,935,000	4,458,000	3,720,000	1,391,000	3,565,000	5,043,000	2,913,000
Renewals	3,373,465	3,130,000	7,460,000	8,867,000	12,840,000	14,310,000	15,584,000	14,520,000	11,460,000	7,204,000

xi. Monitoring and improvement programme

The Plan is a regularly revised and evolving document and will be reviewed annually and updated at least every three years to coincide with the Annual and Long Term Plans and to incorporate improved decision making techniques, updated asset information, and NCC policy changes that may impact on the levels of service.

The Plan will be improved throughout its life cycle as further information about the wastewater system assets are collected in terms of condition, performance and service delivery. NCC is committed to advanced data collection and management systems that will allow for a greater appreciation of the performance and condition of the NCC assets.

Council will report variations in the adopted annual plan budgets against the original Plan forecasts and explain the level of service implications of budget variations.

Council has been working with iwi, seeking their input into this Activity Management Plan. Some changes have been included in this Plan following their feedback, however, other matters require further thought. Council will consider the wider feedback raised as part of the review of its Asset/Activity Management Policy during 2024/25 and in work on the next iteration of the Activity Management Plans.

Table ES-7 outlines the Improvement Programme for the activity.

Internal Reviews

Internal reviews will be taken every three years to assess the effectiveness of the plan in achieving its objectives. The internal audit will also assess the adequacy of the asset management processes, systems and data.

Statutory Audit

The Local Government Act requires that an independent, annual audit of the operations of the Council be carried out.

Benchmarking

Benchmarking (trending) of the activity through Audit NZ, Local Government NZ and Water NZ benchmarking initiatives is carried out at the request of these organisations to give increased understanding of:

- The efficiency and efficiency variations of individual activities.
- Effects of any programmes instigated by the Plan.
- Operating costs over range of individual activities.

Examples of types of benchmarking that are to be considered include tracking progress, responsiveness to service calls, operation costs i.e. \$/m/year and energy costs. As data is obtained and implications understood the benchmarking can be used for additional or revised Levels of Service and can be incorporated into a graphical display.

WaterNZ annual performance reviews include benchmarking of a range of measures across all territorial and unitary authorities that are operators of 3 Waters networks.

Results for the wastewater activity in 2018/19 can be found through the following link https://www.waternz.org.nz/Attachment?Action=Download&Attachment_id=4271

The effectiveness of the Plan will be monitored by the following procedures:

- Financial expenditure projections prior to year-end.
- Resource consent monitoring as required by consents.
- The ongoing updating of the asset register of the wastewater assets when repairs are carried out and the attributes are compared with the asset register attributes.

Table ES-7: Improvement Programme

Improvement Programme
Review, clarify and add to the strategic direction of the WW Activity.
Improve iwi engagement and engagement processes in the Wastewater Activity Planning
Ensure clear links between growth forecasts and budgets exists.
Update and regularly (annually) review the WW Activity Risk Register.
Improve accuracy of asset data through review and modification of collection, storage, and auditing.
Contingency planning for critical asset failure.
Robust and succinct lifecycle decision making; clear links to strategic intent.
Improve accuracy and coverage of condition assessments.
Upgrade of WW Hydraulic Models and increased use of them (and other technological improvements) to inform decision making.
Ensure supporting suppliers (consultants and contractors) are well aligned with the WW Activity requirements.
Ensure an effective Asset Improvement Register is in place and is used to develop project scopes.
Update emergency management response plan.
Improve resourcing to ensure better scope and cost estimates for inclusion in business cases.
Ensure asset valuations reflect market value.
More trend analysis to optimise decision making.
Develop Plan content to be more usable and succinct.
Ongoing professional development for utilities staff to ensure they are up to date with best practice.

1. INTRODUCTION

1.1 Background

History of Nelson City Council Wastewater System

Nelson City Council (NCC) has been responsible for wastewater disposal in the city since the first piped disposal system was put in place. The city has since expanded by the amalgamation of adjoining areas. The Tahunanui Town Board joined the City in 1950, Stoke was transferred from Waimea County Council in 1958, Atawhai joined in 1968, Wakapuaka and Stoke rural joined in 1989.

The following details the timeline of the wastewater treatment and disposal for the Nelson area:

- 1872 First drain (sewer and stormwater) draining into Maitai River from Rutherford, Nile, Hardy and Bridge Streets.
- 1894 Stormwater and sewer separated.
- 1904 Untreated effluent discharged to Boat Harbour.
- 1960 Construction of pumping stations in preparation for pumping to Nelson North.
- 1969 Water right secured allowing discharge to take place into Tasman Bay followed by construction of Tasman Bay outfall, work completed in 1970.
- 1979 Establishment of the current 26-hectare oxidation pond at Nelson North to treat sewage discharge.
- 1984 Fisheries discharge channelled through separate outfall, diverting this flow away from the oxidation ponds.
- 2007 Existing treatment plant facility extensively upgraded.

1.1.1 Purpose of the plan

The purpose of this Wastewater Activity Management Plan (Plan) is to support the goal of the wastewater activity by ensuring that assets are operated and maintained to provide the required level of service and to meet community outcomes for present and future customers in a sustainable and cost effective manner.

The content of the Activity Management Plan further supports the purpose by:

- Demonstrating responsible, sustainable management and operation of wastewater assets which represent a significant, strategic and valuable asset belonging to Nelson City.
- Justifying funding requirements.
- Demonstrating regulatory compliance under, Section 94(1) of the Local Government Act 2002 which in summary requires the Long Term Plan to be supported by:
 - Quality information and assumptions underlying forecast information.

- Ensuring the framework for forecast information and performance measures are appropriate to assess meaningful levels of service.
- Demonstrating clear linkage to community agreed outcomes with stated levels of service.

The contribution of wastewater services to the Community Outcomes and Asset Management objectives will be seen through:

- Meaningful stakeholder consultation to establish service standards through the Long Term Plan.
- Continuing a programme of inspections and monitoring of the network to assess asset condition and performance.
- Undertaking a risk based approach to identify operational, maintenance, renewal and capital development needs, and applying multi-criteria analysis techniques to select the most cost effective and sustainable work programme.
- Ensuring services are delivered at the right price and quality.
- Achieving the appropriate level and quality of asset management practice.
- Continuing programme of capital works.
- Futureproofing and resilience.

The overall objective of Activity Management planning is to:

Deliver a defined level of service to existing and future customers in a sustainable and cost effective manner.

The key elements of infrastructure activity management are:

- Taking a whole of lifecycle approach.
- Developing cost-effective management strategies for the long-term.
- Providing a defined level of service and monitoring performance.
- Understanding and meeting the impact of growth through demand management and infrastructure investment.
- Managing risks associated with asset failures and climate change.
- Sustainable practices, including use of energy and physical resources.
- Recognising and providing for the maintenance and enhancement of freshwater.
- Continuous improvement in activity management practices.

A formal approach to the management of infrastructure assets is essential in order to demonstrate how levels of service will be achieved in the most cost effective manner for the benefit of customers, investors and other stakeholders.

This Plan focuses on ensuring the wastewater assets supporting the activity are operated and maintained to provide the desired level of service, meet statutory

requirements and to meet the current and future community outcomes in a sustainable manner.

This Plan will provide the substantiation for budget forecasts put forward in the Long Term Plan (2021-2031) for the wastewater activity.

What we do

Council collects, treats and disposes of wastewater for the Nelson region. It operates and maintains a network of pipes and pump stations across the city that carry wastewater from Stoke and Tahunanui for treatment at the regional Bell Island Wastewater Treatment Plant, and from the rest of the city to the Nelson Wastewater Treatment Plant near Wakapuaka.

Why we do it

Wastewater infrastructure is a high priority for Council. Providing a piped wastewater system and treatment is a core role of Council in order to prevent people from being exposed to diseases associated with wastewater and avoid contamination of the environment.

1.1.2 Relationship with other planning documents

Infrastructure Strategy

The strategy is expected to look at least thirty years into the future and detail the issues that the local authority can reasonably foresee.

Much of the work required for the strategy comes from the development of this Plan and in order to avoid un-necessary duplication this plan focusses on the first ten years of the thirty year strategy timeframe.

Current Nelson Resource Management Plan

The Nelson Resource Management Plan (NRMP) is the operative plan established under the Resource Management Act 1991. The NRMP is a regulatory document that covers both district and regional activities. Council seeks to operate the current network in compliance with this document. To that end Council holds a range of resource consents for both global and site specific activities.

On 1 April 2012 a global resource consent (RM105388A) was granted for unintended/accidental discharges from all parts of the network. The consent duration is 20 years. The consent considers the impact the wastewater has on the receiving environments particularly where the pump stations are located.

The resource consent for the operation of the Nelson Wastewater Treatment Plant, the marine outfall and the discharge of treated effluent expires 1 December 2024. As this is a critical operating authority, renewal planning and work began in 2019/20.

Proposed Whakamahere Whakatū Nelson Plan

By their nature wastewater activities are constructed to directly service the community and to contain wastewater within an imperfectly sealed system. The network has developed alongside centres of human habitation and commerce and has often been

constructed close to or alongside streams, rivers and the sea. Overflows from the network can enter the stormwater system and eventually be discharged to streams and rivers or the sea. Treated wastewater is also discharged to the sea via a marine outfall.

The Draft Whakamahere Whakatū Nelson Plan (the Draft Nelson Plan) will replace the Nelson Regional Policy Statement, Nelson Resource Management Plan and the Nelson Air Quality Plan, and will include transport and infrastructure, natural hazards, coastal and freshwater provisions.

While the impact of the plan on the operation of the wastewater network will become clearer as the proposed plan rules are developed it is expected that there will be an increased emphasis on water quality as the proposed plan responds to the National Policy Statement for Fresh Water Management. Any future wastewater activities will need to meet the requirements of the proposed Whakamahere Whakatū Nelson Plan when it becomes operative, with cost implications identified in future activity management plans as they develop. The proposed plan will also include Council's response to the requirements of the NZ Coastal Policy Statement (2010) and the National Policy Statement on Urban Development.

Environmental Activity Management Plans

Fresh water quality is a key component of the central government environmental programme for New Zealand. The National Policy Statement for Freshwater Management (Freshwater NPS 2020) is intended to halt the decline in fresh water quality and lead communities to the point of actively improving it. One of the outcomes of the (Freshwater NPS 2020) is expected to be a Wastewater National Environment Standard giving increased guidance to wastewater network operators on the management of wastewater discharges/overflows. As with many of council's activities there will be tension between increased cost and the desire for higher quality outcomes.

Water & Sanitary Services Assessment: Is a long-term assessment, carried out under the Local Government Act 2002, of the sanitary services provided by a local authority. These services include wastewater treatment, stormwater, public toilet facilities, disposal from wastewater disposal systems, cemeteries and crematoria and landfills. The main focus of this assessment is to ensure that public health is maintained. Council prepared this assessment in 2005. No significant change to the delivery of services has occurred in the intervening period and there are no plans to review the document in the next three years.

Standards and Policies: These tools for asset creation and subsequent management are needed to support asset management tactics and delivery of service.

Iwi Management Plans:

Iwi Management Plans are lodged by iwi authorities and received by Council under the Resource Management Act 1991. Once lodged with Council, they are planning documents that Council is required to take into account when preparing or changing Resource Management Act Plans (e.g. the Regional Policy Statement, Air Quality Plan or Nelson Resource Management Plan).

Iwi Management Plans document iwi worldview and aspirations for the management of resources, and help Councillors and staff to better understand those factors.

The following Iwi Management Plans have been lodged with Council. These are accessible on: <http://www.nelson.govt.nz/council/plans-strategies-policies/strategies-plans-policies-reports-and-studies-a-z/iwi-management-plans/>

Ngā Taonga Tuku Iho Ki Whakatū Management Plan (2004):

This is a collective initiative involving five of the six local iwi (Ngāti Rārua, Ngāti Toa Rangatira, Te Ātiawa, Ngāti Koata, Ngāti Tama) that gives a big picture approach to the management of nga taonga tuku iho (the treasured resources).

Other Iwi management Plans include:

- Pakohe Management Plan 2015: (Ngāti Kuia) – Kaupapa (purpose) of the Pakohe Management Plan He Taonga Pakohe tuku iho - Mai ngā tūpuna ki ngā mokopuna (Maintaining our whakapapa and historical connections to Pakohe for today and for future generations and for managing its sustainable use forever).
- Iwi Management Plan 2002: (Ngāti Koata) – The primary purpose of this IMP is to provide a means by which Ngāti Koata are properly and fully considered in decision-making affecting their interests in Te Tau Ihu.
- Environmental Management Plan 2018: (Ngāti Tama) – The purpose of this plan is to highlight Ngāti Tama aspirations for managing ancestral whenua, awa, wāhi tapu and wāhi taonga in the Ngāti Tama rohe (from Whangamoā in the east to Kahurangi in the west).
- Te Tau Ihu Mahi Tuna (Eel Management Plan) 2000: (All iwi) – To ensure the sustainability of the eel fishery through good management which provides for a customary, recreational and commercial harvest.
- Piopioia Te Ao Turoa Ngāti Rārua Environment Strategy 2021

Wastewater Bylaw: Councils Wastewater Bylaw became operative in 2014 and was updated in 2021. The bylaw sets out standards that must be met by customers wishing to discharge wastewater to the NCC network. This document aims to ensure that contamination of the environment is minimised; the wastewater system is protected from damage; assigned discharge volumes and characteristics are in keeping with the capacity of the system; tariffs are set at equitable levels and the necessary charges levied; forward planning is current and realistic and that discharges to the wastewater system are monitored. The Wastewater Bylaw provides a regulatory framework for Trade Waste discharges.

Overflow Reduction (Inflow and Infiltration) Strategy/Exfiltration

Unintended/accidental and wet weather discharges from the network cause wastewater to discharge to land and then to fresh water and the coastal environment.

During rain events stormwater enters the wastewater network primarily through faults in public and private pipes, incorrect use of wastewater fittings (such as gully traps being used for stormwater discharge) and as a result of cross connections between private stormwater pipes and the sewer network. Additionally there are parts of the network that are constrained or will be in the near future (through additional development/intensification). When the volume of wastewater within the reticulation

exceeds the design capacity, discharges can occur from the wastewater pump stations and some manholes throughout the network.

Managing wastewater overflows and controlling inflow and infiltration is a long term commitment and a key project in this plan.

In addition to the direct impact of inflow and infiltration is the concurrent issue of exfiltration from faults in the pipe network. Wastewater can leave the network and enter ground or surface waters and impact negatively on the quality of these water bodies. Investigating the network for sources of infiltration also provides a clearer picture of the areas where repairs or renewal programmes should be targeted.

Long Term Plan 2024-34

This activity management plan supports Council in the development of the Long Term Plan 2024-34 by providing the substantiation for budget forecasts put forward in the Draft Long Term Plan for wastewater collection, treatment and disposal.

As the Plan presents the recommendations for the future operations, maintenance and capital works necessary to meet the levels of service for the wastewater activity, the LTP consultation is the means for the community and Council to provide direction on priorities and affordability for the next ten years.

Annual Plan

On an annual basis Council reviews the work programme and budgets for the following year and when changes are required Council will prepare an Annual Plan for public submissions.

Future Development Strategy

The National Policy Statement on Urban Development (2020) impacts on the activity management plans and Infrastructure Strategy. It requires local authorities to ensure there is sufficient development capacity to meet demand in the short, medium, and long term (10 – 30 years) with projects required to be identified

The Future Development Strategy sets out how the combined (TDC and NCC) region intends to plan for its future housing capacity to accommodate projected growth in population and households, as well as the attendant business and other demands this growth will bring. The impact on the wastewater activity of these future growth areas is one of the key focuses for this Plan.

Nelson Tasman Land Development Manual

The Nelson Tasman Land Development Manual 2019 (NTLDM) is the document that sets out Council's engineering requirements for developments under the Nelson Resource Management Plan and is the basis of Council's requirements as a network utility operator under the Building Act 2004.

The wastewater section continues with the current approach of ensuring a good quality wastewater network is installed in urban development areas.

Climate Action Plan

This Action Plan shows all the resources Council has currently allocated to climate change projects over the next ten years, as set out in our Long Term Plan 2024-34. The Action Plan is a living document that will be updated as the actions are completed, or amended or new actions are added. The actions in the Plan cover a wide range of infrastructural, social, and environmental areas, demonstrating Council's commitment to meeting the urgent challenge of mitigation of and adaptation to climate change.

1.1.3 Infrastructure assets included in the plan

The Nelson City Council provides wastewater services from Glenduan in the north to Stoke in the south with approximately 20,000 connected properties. Sewage from Stoke and Tahunanui is treated at the Nelson Regional Sewerage Business Unit (NRSBU) Treatment Plant on Bell Island (details of NRSBU are shown in the Nelson Regional Sewerage Business Unit Wastewater Activity Management Plan). Fish processing water from factories at Port Nelson is screened and discharged beyond the Boulder Bank into Tasman Bay through the Fisheries Outfall. Effluent from the remainder of the city is treated at the Nelson Wastewater Treatment Plant (NWWTP) to the North of the city.

Nelson City Council is a contributor to the NRSBU for the Nelson South area and has a quantity and quality based agreement detailing Nelson City Council existing and future requirements. Sludge from the NWWTP is trucked to Bell Island for further processing.

The extent of the NCC wastewater system is detailed in the Figures 1-1 and 1-2 and discussed in the Background section of 4.

Figure 1-1: Nelson City Wastewater Network Bell Island Wastewater Treatment Plant

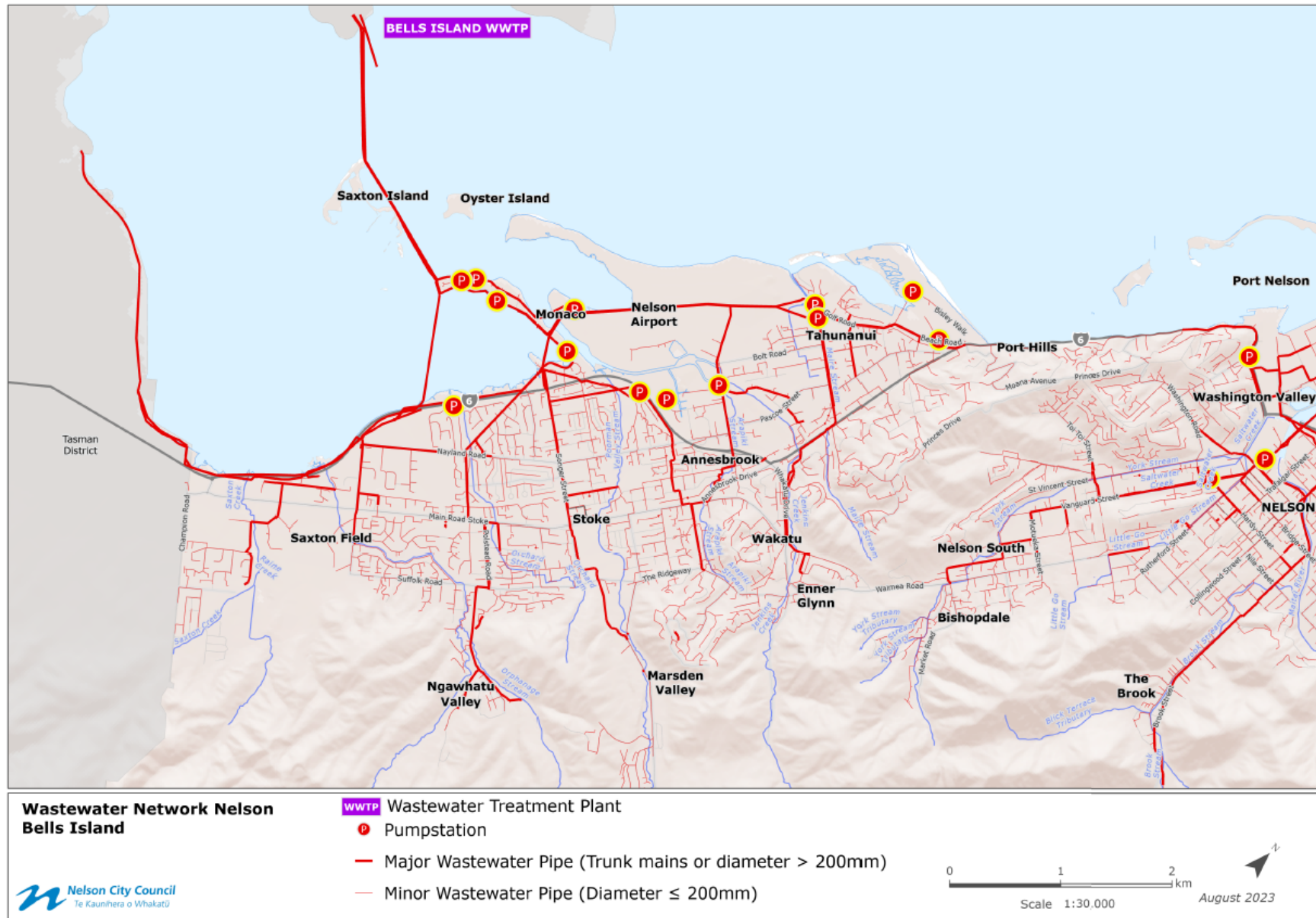
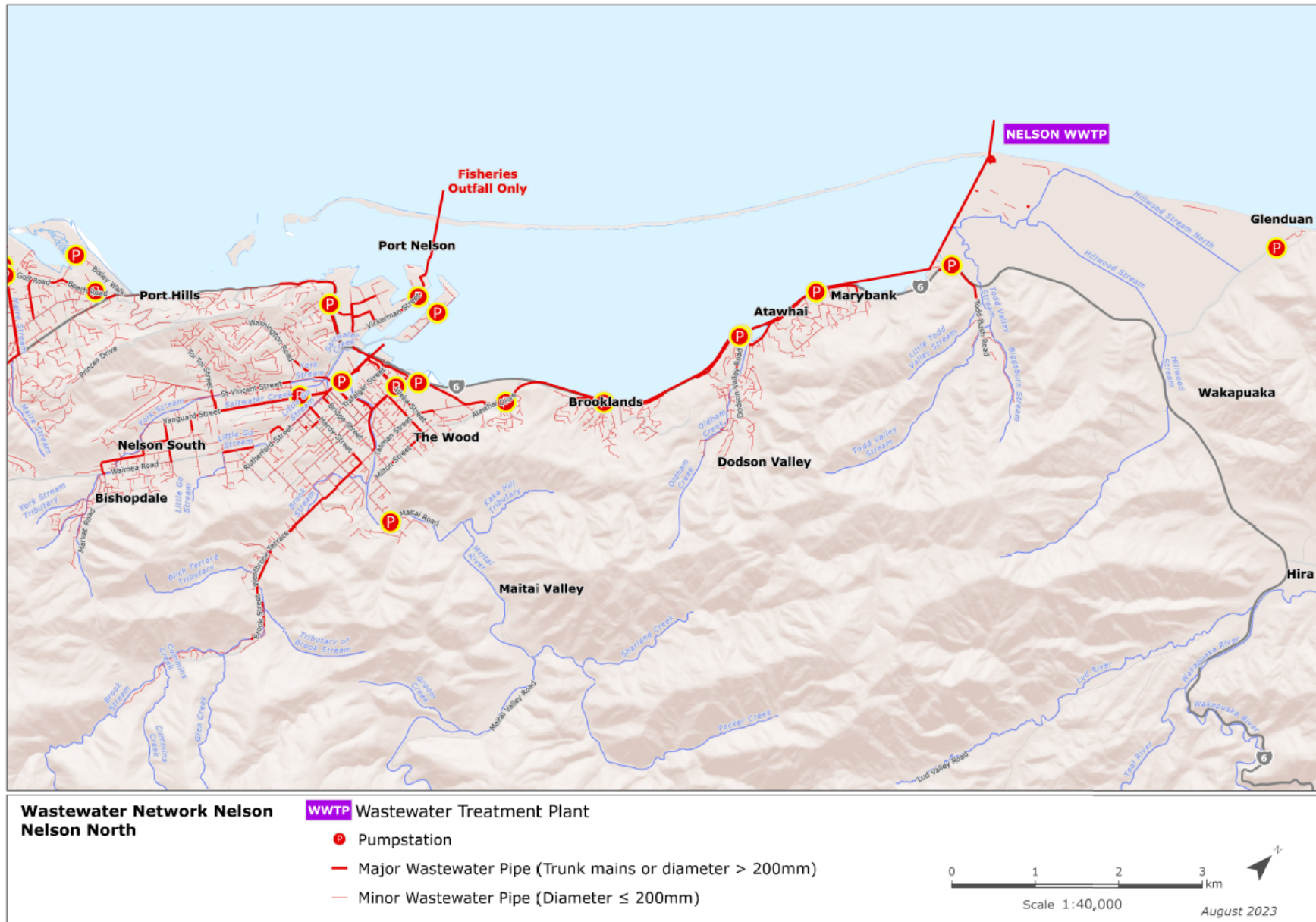


Figure 1-2: Nelson City Wastewater Network Nelson Wastewater Treatment Plant



1.1.4 Key partners and stakeholders in the plan

The Plan recognises the following external and internal key partners and stakeholders:

Table 1-1: Key Partners and Stake Holders

Key Partners and Stakeholders	Main Interests
Key Partners	
Tangata Whenua comprising of regional iwi	Environment, cultural heritage
Tasman District Council	Joint Partner in the NRSBU. Part of South Nelson development adjacent Champion Road discharges to the TDC network.
External Partners and Stakeholders	
Residents and ratepayers	Public health and safety, service reliability, environment, cost
Industrial and commercial users	Public health and safety, service reliability, environment, cost
Nelson Marlborough District Health Board	Public health and safety, environment
Government agencies (MoH, MfE, Audit NZ)	Public health and safety, service reliability, environment, cost
Consultants, Contractors and suppliers	Procurement, technical, projects/programmes
Internal Stakeholders	
Councillors	Public health and safety, service reliability, environment, cost
Staff	Public health and safety, service reliability, environment, cost
Nelson City Council (unitary authority)	Environment
Nelson City Council (unitary authority)	Roading

1.1.5 Organisation structure

Council has an activity based structure with operations & maintenance (O&M) and asset management functions for wastewater assets provided by a separate operations and asset management team with the Utilities Business Unit. The Capital Projects team supports the wastewater activity through delivery of project work by project managers who sit in a separate business unit.

The day to day operations and maintenance of the network are carried out by an external contractor managed by the Team Leader Utility Operations.

Asset management functions are undertaken by Activity Engineers.

1.2 Climate Change

Climate change is our biggest global challenge and Council is committed to considering and reducing climate change impacts.

At a local level, Council has a key role to play by reducing its corporate emissions, supporting and providing leadership on mitigation actions across the community, and managing and reducing risk by helping Nelson to adapt to climate change effects, especially in relation to:

- **Sea level rise:** sea level rise is the most significant climate challenge for Nelson as a large proportion of its urban infrastructure is coastal or low lying. These areas will become more vulnerable to coastal inundation over time.
- **Heavy rainfall and flooding events:** higher intensity rainfall events means Nelson will experience more regular and extensive flooding from streams, rivers and stormwater overflows, which will increase the risk of landslips.
- **Droughts and high temperatures:** with a warmer climate, the temperature of the water within our rivers and streams will increase and affect habitats. Droughts will result in a higher risk of fires.

Responding to Climate Change

Mitigation

Mitigation is about reducing greenhouse gas (GHG) emissions and enhancing carbon sinks (sequestration to remove greenhouse gases from the atmosphere). Council is committed to emissions reduction targets for its own activities in line with government targets:

Net zero emissions of all GHGs other than biogenic methane by and beyond 2050;

10% reduction below 2017 biogenic methane emissions by 2030;

24-47% reduction below 2017 biogenic methane emissions by 2050.

Adaptation

Adaptation is the process of responding to current and future climate related impacts and risks. To manage these impacts and risks, Council is following the Ministry for the Environment guidance and is using the Dynamic Adaptive Pathways Planning (DAPP) approach. This means managing our assets in a way that makes them more resilient, or in some instances, it may mean moving those assets.

What Council is doing

How Council delivers its services will play a key role in meeting emissions reduction targets and building community resilience.

Acknowledging the need for urgent action, Council declared a climate emergency in May 2019. Council adopted Te Mahere Mahi a te Āhuarangi Climate Action Plan in 2021, a living document which outlines what Council is doing to address climate change over the next decade. In 2022, Council also began developing a Climate Change Strategy, which will set the long-term direction and guide Council and community investment in climate action.

Council is working with Tasman District Council on a regional climate change risk assessment, which will build a comprehensive picture of how climate change will impact the region.

Climate change effects on the Wastewater Activity

The key climate change effects that will impact on NCC Wastewater assets are sea level rise, and more intense storm rainfall associated with a warmer climate and the higher moisture retention capacity of the atmosphere.

Sea level rise

Sea level rise is the biggest climate challenge for Nelson as a large proportion of our urban infrastructure is coastal or low lying. Over the long term, these areas will become more vulnerable to coastal inundation (flooding) as tides and storm surges extend further inland over time. Additionally, some areas are likely to become more prone to liquefaction in an earthquake due to elevated groundwater levels associated with sea level rise.

For the Nelson community, the main impacts will be the more regular inundation of areas around The Wood, the CBD (including Halifax, St Vincent, Vanguard, Gloucester and Rutherford Streets). Areas on the open coast that are more exposed to coastal swell such as the Glen, Wakefield Quay/ Rocks Road, Tahunanui and Monaco will be subject to increasing coastal inundation and coastal erosion hazard associated with sea level rise.

For the wastewater activity the impact will be felt particularly on low lying parts of the network that will be more susceptible to groundwater inflows (the groundwater will raise in response to a rise in sea level) and those assets that are located in vulnerable coastal/riverine locations.

Heavy rainfall and flooding events

Higher intensity rainfall events will result in an increase in stormwater entering the wastewater system at any given location. The implication for the community is that without mitigation of these effects, they may experience more regular and extensive wastewater overflow events.

Flooding has the potential to affect the wastewater network and the Nelson Wastewater Treatment Plant (NWWTP), resulting in wastewater overflows and contaminants discharging in to the receiving environment.

Increased river flood flows are likely to increase the risk to pipe assets that cross water courses.

Droughts and extreme temperatures

With a warmer climate, the temperature of the wastewater within our network will increase. This is likely to lead to increased prevalence of odour issues and a greater incidence of corrosion of susceptible assets (particularly those made of concrete).

Wastewater Activity Mitigation

Wastewater treatment process emissions are the second highest source of emissions within Council's operational footprint (after landfill emissions). The largest source of emissions are the methane and nitrous oxide generated as a result of the operations at Bells Island and Nelson Wastewater Treatment Plants.

Full consideration of whole-of-life emissions, including embodied carbon in construction materials, can encourage non-built infrastructure solutions, less carbon-intensive infrastructure options and the use of low-carbon construction materials.

The Council Climate Action Plan brings together all the climate change projects and actions Council is funding over the next ten years, as set out in our Long Term Plan 2021- 31. The key reduction project for the wastewater activity is the Emissions Reduction Strategy, which aims to understand NWWTP GHG emissions sources and quantities to allow for a focussed reduction approach.

Areas for further investigation to aid mitigation are:

Operational emissions

- Understanding the treatment process emissions at the NWWTP and where feasible developing a plan to mitigate emissions by changing operational procedures.
- Further electricity generation through use of photovoltaics.
- Use of net zero carbon emission bulk electricity supplier(s).
- Use of more energy efficient technology and equipment at the NWWTP.
- Reduced use of petrol- and diesel-powered vehicles for operations and maintenance activities.

Embodied emissions

- Consideration of materials that allow rehabilitation of existing pipes rather than replacement.
- Opportunities for co-construction of assets with other utilities to reduce use of construction plant and bitumen-based road surfacing materials.
- Reflect the true cost of carbon in infrastructure projects.
- Incorporate the long-term cost of carbon and irreversible investment (when the cost of repurposing or replacing infrastructure is prohibitive).
- Include the cost of carbon over the life of the infrastructure. A whole-of-life approach to carbon emissions looks at embodied, operational, enabled and disposal carbon emissions over the expected life of infrastructure.
- Where feasible, consider carbon impacts at the strategic planning stage, such as when spatial plans are developed.

Wastewater Activity Adaptation

Strategies and standards are in place or in progress to identify optimal solutions for responding to the risks associated with temperature warming and sea level rise.

The following are important considerations with respect to climate change adaptation:

- Strategies are in progress, or shortly will be, that consider operation of the wastewater network under future climate conditions.
- Ensuring renewals are programmed to respond to sea level rise issues and avoid un-necessary expenditure in areas that will not require services in the long term.
- Develop network upgrades in hand with renewals to allow flexibility in establishing new residential areas across the city.
- The Nelson Tasman Land Development Manual 2019 (NTLDM) requires that new assets are designed to meet a specific level of service projected for 2090 and assuming an RCP 8.5 scenario. Generally speaking, all wastewater projects therefore contribute to climate change adaptation to some degree.

The following knowledge gaps have been identified with respect to climate change adaptation:

- What options are currently available for adapting to the impacts of climate change in the short, medium and long term.

- The effectiveness and affordability of adaptation options.
- What are the pathways to Council's Interim GHG emissions targets.

Budget has been identified for the following strategies and capital that lead or assist with climate change response:

- Climate change Emissions Reduction Strategy
- Climate Change Adaptation Strategy.
- Climate Change Vulnerability Assessment.
- NWWTP Strategic Scoping.
- Natural Hazards Risk Remediation.

The Climate Change Vulnerability Assessment will focus on understanding how the impacts of climate change are likely to manifest on the activity. In the short term this is likely to focus on asset security (issues associated with sea level rise and increased rainfall intensity) with the longer term view aiming to understand how the activity will function into the future.

The Climate Change Adaptation Strategy will utilise the findings from the Climate Change Vulnerability Assessment to determine the most effective and efficient way forward in both the short and long term.

Climate Change Planning Assumptions

In order to frame the activity response to climate change the following assumptions have been made:

- The contribution of renewable energy sources to the national grid will progressively increase over time (currently targeting 90% renewable energy by 2025). This is expected to contribute to a steady reduction in the carbon footprint of Council assets that draw on mains power.
- Where emissions cannot be reduced, a Council wide offsetting approach will be developed.
- Representative Concentration Pathway of 8.5 will be used to guide the climate change response in line with the Nelson Tasman Land Development Manual adopted by Council in 2019. This will be reviewed as climate change monitoring and assessment techniques develop over time.
- Construction materials and techniques will be available that meet net zero GHG emissions by 2050.
- The community will confirm appropriate levels of service and affordability limits.
- Council will undertake investigations of the impacts of climate change on the Nelson City geographical area.
- Funding will be available to specifically assess the potential impact of climate change on the wastewater activity.
- Defend, Retreat or Accommodate: For the purpose of planning the next 30 year programme, it is assumed at this stage that asset renewals and upgrades will continue in low-lying areas that are subject to flooding and coastal inundation.
- Nelson City Council will seek co-financing where available from Central Government towards implementation of works.

Community Engagement

Climate change is a significant issue facing the community. In order for the Council controlled wastewater activity to respond to future challenges wide community engagement is called for. This is expected to come from a number of Council led pieces of work as follows:

- Statutory consultation for the Long Term Plan and Annual Plans.
- Whakamahere Whakatū Nelson Plan consultation on natural hazards overlays (including flood maps) and provisions (Objectives, Policies, Rules and Methods).
- NWWTP Resource consent renewal consultation.
- Notification of other resource consents where required.
- Nelson Climate Adaptation: there will be ongoing engagement with the community as part of the Dynamic Adaptive Pathways Planning Process (DAPP).

Knowledge Gaps

The following knowledge gaps have been identified with respect to climate change:

- NWWTP emissions profile.
- Nelson North Wastewater Hydraulic Model.
- Council is in the early stages of the DAPP process, therefore an Adaptive Strategy and adaptation plans for specific parts of the city are still to be developed.
- Asset condition and performance data.

1.3 Goals and Objectives of Asset Ownership

1.3.1 Reasons and Justifications for Asset Ownership

Council is responsible for the provision of reticulation, treatment and disposal of wastewater along with strategic planning and management functions.

Council also has a role in regulation and enforcement of the existing legislative and regulatory framework (including bylaws) to ensure members of the community act appropriately.

The Role of Council

The Nelson City Council manages the provision of the public wastewater network for the residents of Nelson City in a way that minimises adverse health impacts from waterborne disease to most urban properties, helps promote commercial and industrial development through providing a trade waste network, works to minimise overflows from the wastewater system and treats and disposes of effluent in accordance with best practice and the communities ability to pay.

The wastewater activity is influenced by the following legislative requirements.

The Local Government Act:

The Local Government Act 1974: Provides the authority for Nelson City Council to construct, operate and maintain the Wastewater, Water and Stormwater System.

The Local Government Act 2002: Defines the purpose of local authorities as enabling local decision-making by and on behalf of the community. The Nelson City Council is a local authority established under the Local Government Act 2002 (the Act) with

purpose and responsibilities set out in the Act, in particular 10(1)(b), 10(2) and 14(1)(h).

The Health Act 1956:

Places an obligation on Council to improve, promote and protect public health within the District. The provision of wastewater services helps to promote and improve public health.

1.3.2 Links to organisation vision, mission, goals and objectives

Vision

Our vision for Whakatū Nelson is a creative, prosperous, and innovative city. Our community is inclusive, resilient, and connected – we care for each other and our environment.

Community outcomes

Councils are required by the Local Government Act 2002 to have Community Outcomes – a statement of the measures of success that Council is working to achieve for the community. Council has eight current community outcomes in the Long Term Plan 2024-2034 that are summarised below.

- Our unique natural environment is healthy and protected.
- Our infrastructure is efficient, resilient, cost effective and meets current and future needs.
- Our region is supported by an innovative and sustainable economy.
- Our communities are healthy, safe, inclusive and resilient.
- Our urban and rural environments are people-friendly, well planned, accessible and sustainably managed.
- Our communities have opportunities to celebrate and explore their heritage, identity and creativity.
- Our communities have access to a range of social, cultural, educational and recreational facilities and activities.
- Our Council provides leadership and fosters partnerships, including with iwi, fosters a regional perspective, and encourages community engagement.

Of these eight the first five have direct links with the wastewater activity and are discussed in more detail in the Levels of Service section.

Council Priorities

Council has the following three priorities for the development of the city for the period covered by this activity management plan. These form the high level strategic direction for the activity:

The Three Priorities

- **Support our communities to be prosperous, connected, and inclusive**

The wastewater activity is critical to the residents and business activities in the city. Good operation and maintenance of the network plus timely renewals and upgrades are required to maintain network functionality; appropriate investment is required to ensure this happens.

- **Transform our city and commercial centres to be thriving, accessible and people-focused**

The CBD is the heart of the city and ensuring business and residential activities have adequate access to the wastewater network to be successful and grow is very important to council's long term strategy.

In order to ensure growth in the city can be sustained into the future council must ensure there is adequate wastewater capacity available to match development timeframes. Areas for likely intensification in the next 10-15 will be identified by Council and the community and will be prioritised for services.

- **Foster a healthy environment and a climate resilient, low-emissions community**

To increase the proportion of journeys made using sustainable transport options (active transport - cycling and walking, electric vehicles, micro-mobility, and public transport). The wastewater activity works with the transport activity to ensure that any network changes/upgrades/renewals are undertaken as efficiently as possible and that where possible active transportation opportunities are taken.

Methane levels are currently being monitored at NWWTP using an aqueous sensor installed in the oxidation ponds. The data will be analysed to determine seasonal variation and the impact planned and unplanned events within the ponds have on the production of methane. Once a suitable period of data has been collected and analysed, it can be used to help manage the methane emissions going forward.

The wastewater activity safely and efficiently conveys the city's wastewater treatment facilities that provide treatment to levels set through regulatory processes. Inevitably there are occasional failures within the network that allow limited discharges of raw wastewater to the environment; these are not ideal and work is constantly underway to ensure the risk of this occurring is minimal.

In addition, being mindful that the concept of a fully sealed system is relatively recent, storm and groundwater enters the wastewater network through leaky pipes and cross-connections and during periods of heavy rainfall this can lead to overflows of dilute wastewater from the network. Work in this area is also ongoing.

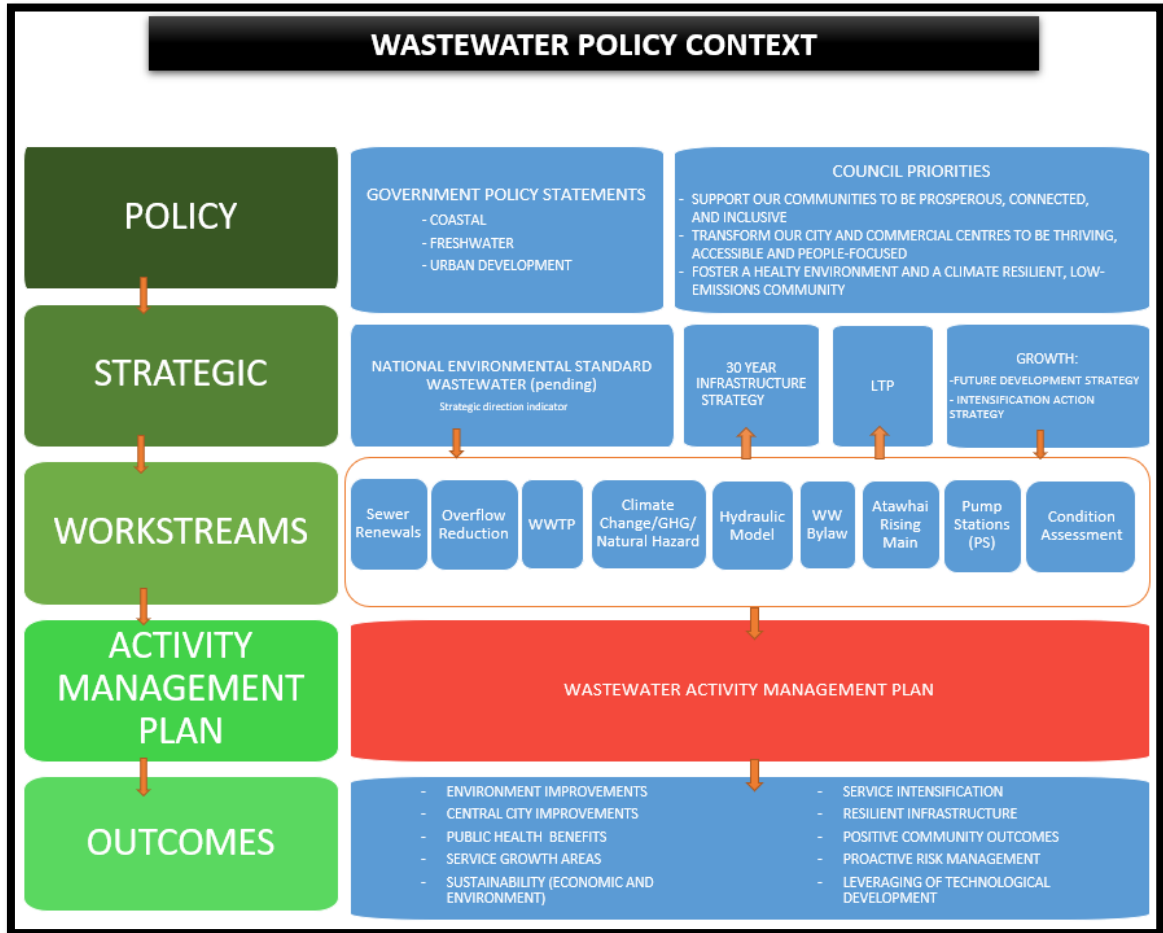
Nelson City Council Arts Strategy

Where opportunities present themselves, consideration will be given to the incorporation of artwork in the wastewater network (e.g. the Tūi mural at Neale Park Pump Station).

1.3.3 Plan framework and key elements

The framework of the Plan follows the generic layout identified in section 4.2 of the International Infrastructure Management Manual 2015. Figure 1-5 outlines the wastewater activity policy context and framework.

Figure 1-5: Wastewater Policy Context



The Plan has the following key elements:

- Why we need a Plan (Introduction).
- What we provide (Levels of service).
- Planning for the future (Future demand).
- How we provide the service (Lifecycle management).
- Dealing with uncertainty (Risk management plan).
- What it will cost and how we pay for it (Financial summary).
- What we're doing to improve (Plan improvement and monitoring).

1.4 Asset Management Maturity

Asset Management is recognised as a critical component of Infrastructure Management globally and this sector has benefited from initiatives to formalise the practice of asset management since November 1996. The Association of Local Government Engineering New Zealand (Inc.) and the Institute of Public Works Engineering of Australia have lead the development of the International Infrastructure Management Manual (IIMM) that forms the basis of Infrastructure Asset Management Practices at Nelson City Council.

The IIMM provides an AM Maturity Index. The Nelson City Council Asset Management Policy sets the level of maturity per activity. Refer to the Plan Improvement and Monitoring – Status of AM Practices section of this plan for details about this activity’s current maturity status and target levels of maturity.

2. LEVELS OF SERVICE

Activity Management Plans set out the level of service Council seeks to provide the community for the respective activity.

Levels of service are the standards Council aims to meet when providing a facility or service in support of community outcomes. They are the measurable effect or result of a Council service, described in terms of quality, quantity, reliability, timelines, cost or similar variables. These reflect the requirements of the Department of Internal Affairs for reporting non-financial measures.

It should be noted that levels of service are not intended as a formal customer contract, rather, Council's responsibility is initially to aim to achieve these levels and then to achieve them more cost effectively through a process of improvement where it can be met within current budgets.

The levels of service provision for the wastewater activity, the current performance and the performance measures and targets by which these will be assessed are defined in this section.

This section also contains information on customer research undertaken, strategic and corporate goals and the legislative requirements adhered to in arriving at the levels of service.

Changes to the levels of service may significantly change funding requirements in some instances.

Performance measures that are included in the Long Term Plan are reported on quarterly via the Infrastructure Quarterly Report and annually, through the Annual Report.

Council uses the Significance and Engagement Policy to determine the level of engagement required for a particular issue e.g. levels of service change.

Service Level Expectations and Affordability

The levels of service set in this asset management plan are subject to change as legislation changes. The community can also request increases above the minimum levels as long as there is a willingness to fund the financial implications.

2.1 Customer research and expectations

While the Long Term Plan consultation process incorporates the levels of service associated with the wastewater activity, Nelson City Council has also undertaken a range of consultation processes in the past specifically targeted at gathering information on preferred levels of service or the extent of infrastructure that Council has/will be required to install. The extent of the historical and additional proposed consultation is detailed in Table 2-1.

Table 2-1: Wastewater Consultation Processes

Consultation Processes	Date	Reasons for Consultation	Extent of Consultation	Applicable to Which Customer Value
Historical				
Water and Sanitary Services Assessments	2005	To meet sanitary services assessment criteria of Local Government Act 2002	Consultation via the Long Term Council Community Plan for acceptance of the original assessment. Consultation with Medical officer of Health and local iwi and the community for any future review.	Reliability Capacity
Residents Survey	Most years since 1998	Rate satisfaction with services provided by Council	300 - 400 residents surveyed by telephone	N/A
Treated Wastewater discharge consent*	2020 onwards	Renewal of Resource Consent 025169	In September 2020 an iwi working group was agreed to at Te Ohu Taiao hui. The first working group meeting was in October 2020. Numerous site visits and working group meetings have taken place during the application preparation. Extensive consultation with residents/property owners, Fish & Game, Department of Conservation, Te Whatu ORa Health New Zealand and numerous active groups in the area. Two public meetings were held on 17 November 2020 and 21 November 2023, plus email correspondence between these meetings.	Sustainability Capacity
Overflow Discharge Consent	Every year	Outline discharges and other network metrics over past year	Annual Compliance and Monitoring Liaison Group meeting. Includes representatives from iwi, DOC, environmental/community groups and council representatives.	Sustainability Capacity
Wastewater Bylaw	2020	Legislative requirement criteria of LGA 2002	Public, business and industry submissions requested. Advertising in local papers. Submissions heard and considered	Sustainability Capacity
Ongoing				
Long Term Plan process	Every 3 years	Legislative requirement criteria of Local Government Act 2002	Public, business and Industry submissions requested. Advertising in local papers	Sustainability Reliability Capacity Responsiveness
Annual Plan process	Each year that changes to the Long Term Plan are proposed	Legislative requirement criteria of Local Government Act 2002.	Public, business and Industry submissions requested. Advertising in local papers.	Sustainability Reliability Capacity Responsiveness

*For the Wastewater Activity Council is required to obtain consents under the Resource Management Act for the discharge of Wastewater to receiving waterways. These consents set the legal minimum level of service for values such as odour, quality and volume of water discharged. Where these applications are publicly notified the opportunity is given for any person to make a submission on the proposal.

Water and Sanitary Services Assessments

The aim of the Water and Sanitary Services Assessments is set out in section 126 of the Local Government Act 2002 as follows:

The purpose of an assessment under section 125 is to assess, from a public health perspective, the adequacy of water and other sanitary services available to communities within a territorial authority's district, in light of—

(a) the health risks to communities arising from any absence of, or deficiency in, water or other sanitary services; and

(b) the quality of services currently available to communities within the district; and

(c) the current and estimated future demands for such services; and

(d) the extent to which drinking water provided by water supply services meets applicable regulatory standards; and

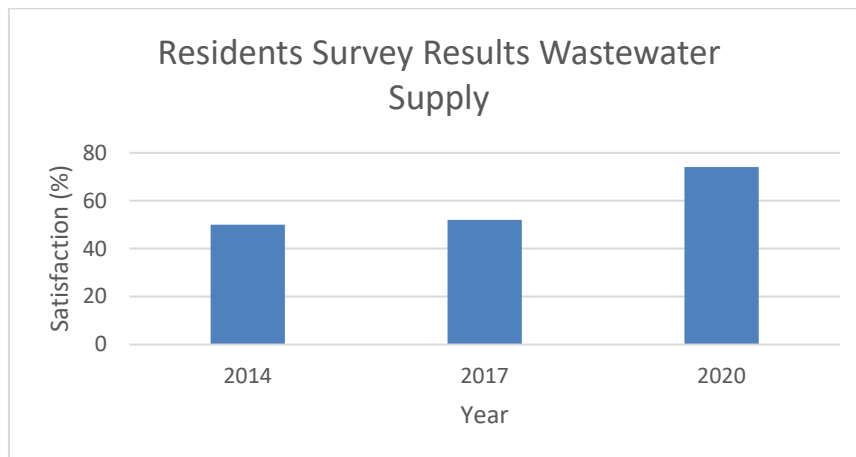
(e) the actual or potential consequences of stormwater and sewage discharges within the district.

The last comprehensive assessment was carried out in 2005 and still remains applicable for this Plan. Any changes in the regulatory environment that are initiated by the new central government water services regulator will be closely monitored and a further sanitary service assessment will be carried out if required.

Residents' Survey

NCC measures a number of its satisfaction and user targets through an annual Residents' Survey. Gathering the views of the broader resident population is important so as to engage with residents who may not normally provide feedback and the method provides for representative data by randomly interviewing Nelson residents in line with population data. Longer twenty-minute surveys are undertaken prior to Long Term Plan years to inform decision making in these Plans. Results are reported to Council annually and available on the Council's website.

Figure 2-1: Residents Survey Results for Wastewater Supply



2014 Residents' Survey

50% very satisfied or satisfied with Wastewater. Issues identified with Wastewater were: disposal, smell of wastewater, drainage and flooding.

2015 Residents' Survey

A residents' survey was not carried out in 2015.

2016 Residents' Survey

The 2016 residents' survey did not seek feedback on the Wastewater activity.

2017 Residents' Survey

52% very satisfied and satisfied with Wastewater. Issues identified with Wastewater were: smell of wastewater, disposal, drainage and flooding, leaks.

2018 & 2019 Residents' Survey

The 2018 & 2019 residents' survey did not seek feedback on the Wastewater activity.

2020 Residents' Survey

74% very satisfied and satisfied with Wastewater. A significant lift from previous years.

2021 and 2022 Residents' Surveys

The 2021 and 2022 residents' surveys did not seek feedback on the Wastewater activity.

2023 Residents' Survey

The 2023 residents' survey did not seek specific feedback on the Wastewater activity. Unlike previous years, a level of satisfaction rating combined Three Waters infrastructure services, which does not provide insight into the level of satisfaction specifically for the Wastewater activity.

Resource Consents

Through the wastewater activity Council is required to obtain consents under the Resource Management Act for the discharge of wastewater and the continued operation and maintenance of structures. These consents set the legal minimum requirements for discharge quality and volumes. Where applications for renewal of these consents are publicly notified the opportunity is given for any person to make a submission on the proposal.

Wastewater Bylaw

Council established the bylaw under the Local Government Act and set out within it the regulatory response for infringements.

The bylaw is advertised using a special consultative process under section 86 of the Local Government Act 2002.

The current bylaw came into effect on 15 September 2021.

Long Term Plan

Every three years Council sets out the proposed plans for the provision of services to the community for the next ten years. The long term plan covers the operation of the wastewater activity including the reasons for undertaking the activity, levels of service, description of major projects, financial projections and any key risks that have been identified. Members of the public can make submissions directly to Council regarding any of the areas covered in the Plan.

Annual Plan

When variations to the long term plan are proposed by Council the Local Government Act requires these be set out in an annual plan for public consultation.

2.2 Strategic and corporate goals

Community Outcomes

Councils are required by the Local Government Act 2002 to have Community Outcomes – a statement of the measures of success that Council is working to achieve for the community. Council's community outcomes are set out in the Long Term Plan 2021 - 2031. The link between the community outcomes and the wastewater activity is shown in Table 2-2.

Table 2-2: Link between Community Outcomes and the Wastewater Activity

Community outcomes	How this Council activity contributes to the outcome
Our unique natural environment is healthy and protected	The wastewater network is managed to minimise impacts on the natural environment and provide a healthy living environment for residents and visitors.
Our infrastructure is efficient, resilient, cost effective and meets current and future needs	A good quality, sustainable and affordable wastewater network that meets the needs of our current and future community.
Our region is supported by an innovative and sustainable economy	A well-managed wastewater network is essential to the functioning of our regional economy.
Our urban and rural environments are people-friendly, well planned, accessible and sustainably managed	Appropriate wastewater disposal options are important for both urban and rural environments.
Our communities are healthy, safe, inclusive and resilient	An efficient wastewater network is essential for the prevention of waterborne disease and the health and productivity of the wider community.

The community outcomes have been developed to provide a link between community issues and the current wastewater goal (see Table 2-3).

Table 2-3: Goal of the Wastewater Activity

GOAL OF THE WASTEWATER ACTIVITY
To provide a wastewater system to Nelson City that is capable of collecting, containing and treating wastewater in an efficient, safe and sustainable way whilst ensuring that the ecological, recreational and cultural interests of the community in the waterways and the marine environment are recognised and enhanced

This Plan will also be reviewed in conjunction with the Stormwater Activity Management Plan. The stormwater system can have a significant impact on the wastewater system and its ability to comply with the required levels of service, by reducing stormwater inflow and ground water infiltration into the wastewater network. This may include providing property owners with an alternative to discharging stormwater directly to the wastewater network or to the street.

2.3 Legislative requirements

Legislative requirements form the minimum level of service Council and the community are required to comply with.

The wastewater activity is influenced by the following legislative requirements.

Health and Safety at Work Act 2015

Council must ensure the safety of the public and all workers (including contractors) when carrying out works.

The Local Government Act:

- **The Local Government Act 1974:** Provides the authority for Nelson City Council to construct, operate and maintain the Wastewater, Water and Stormwater System.
- **The Local Government Act 2002:** Defines the purpose of local authorities as enabling local decision-making by and on behalf of the community.

The Nelson City Council is a local authority established under the Local Government Act 2002 (the Act) with purpose and responsibilities set out in the Act, in particular:

10 Purpose of local government

(1) The purpose of local government is-

(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.

5 Interpretations

good-quality, in relation to local infrastructure, local public services, and performance of regulatory functions, means infrastructure, services, and performance that are—

(a) efficient; and

(b) effective; and

(c) appropriate to present and anticipated future circumstances

14 Principles relating to local authorities

(1) In performing its role, a local authority must act in accordance with the following principles:

(h) in taking a sustainable development approach, a local authority should take into account-

(i) the social, economic, and cultural well-being of people and communities; and

- (ii) the need to maintain and enhance the quality of the environment; and
- (iii) the reasonably foreseeable needs of future generations.

In 2010 an amendment to the Act (sec261B) required the Secretary for Local Government to make rules specifying non-financial performance measures for local authorities to use when reporting to their communities. These have been developed for the wastewater activity and are incorporated into the levels of service.

The Act also requires that local authorities take a sustainable development approach to everything they do.

The *Local Government (Community Well-being) Amendment Act 2019* led to significant changes to sections in Part 2 - Purpose of local government, and role and powers of local authorities. A greater emphasis has been placed on democratic local decision making and the four well-beings (cultural, social, environmental and economic) whilst sections relating to core service provision have less prominence.

The Resource Management Act 1991 and its Reform

The Nelson Resource Management Plan (NRMP) is the operative plan established under the Resource Management Act 1991. Council seeks to operate the current network in compliance with this document. To that end Council holds a range of resource consents for both global and site specific activities.

The Resource Management Act sets out obligations to protect New Zealand's natural resources such as land, air, water, plants, ecology, and stream health. It includes requirements relating to resource consent processes, compliance & monitoring, and a new freshwater planning process for regional planning instruments such as Regional Policy Statements and Regional Plans. In addition, there are requirements relating to planning for climate change, including a requirement for Councils to have regard to emissions reduction plans and national adaptation plans under the Climate Change Response Act 2002.

The Resource Management (Natural and Built Environment and Spatial Planning Repeal and Interim Fast-track Consenting) Bill was given Royal Assent in December 2023. This legislation removes the previous government's Natural and Built Environments Act and the Spatial Planning Act and reinstates the Resource Management Act. Central Government have confirmed that a wider review of land use legislation will be undertaken and future changes are expected.

The Climate Action Act is intended to address complex issues associated with managed retreat and financing adaptation. The content of the proposed Climate Adaptation Act was not available to Councils prior to compiling this Activity Management Plan, therefore the implications from this legislation will need to be considered once available.

Resource Consents held for Wastewater

The resource consents associated with the wastewater activity for Nelson City Council are detailed in Table 2-4 below.

Table 2-4: Resource Consents – Wastewater

Consent Number	Consent Type	Consent Expiry Date	Consent Allowance
RM 025169	Consent for Coastal Permit to discharge treated wastewater to Tasman Bay	1 December 2024	The maximum volume shall not exceed 38,000m ³ /day in a 2 year rainfall return period and a peak 28 day average flow of 21,000m ³ per day
	Consent to use, maintain and renew a pipeline and outfall structure, and to occupy the seabed	1 December 2024	
	Consent to deposit in or on the seabed substances from the outfall pipe	1 December 2024	
	Consent to discharge wastewater onto or into land, namely the existing oxidation pond and proposed wetlands and flow buffer storage ponds	1 December 2024	
	Consent to discharge contaminants, namely wastewater treatment plant gases, to air from a wastewater treatment plant	1 December 2024	There shall be no discharges to air from the Wastewater treatment plant which are objectionable or offensive at any point on or south of SH6
RM 105388 V1 (Discharge Permit) RM 105388A V1 (Coastal Permit)	Accidental discharges from the network. Consent granted 1 April 2012 and varied in 2015.	1 April 2032	From pump station during a wet weather event there shall be no more than 10 overflow events per 12 month period, reducing to 8 overflow events per 12 month period by 31/03/22 and 5 overflow events per 12 month period by 31/03/32. From pump stations during dry weather there shall be no more than 2 overflow events per 12 month period until 31/03/23. From 01/04/23 there shall be no dry weather discharges from any pump stations.
RM 155262	Consent to discharge to air non-odorous based components resulting from an odour treatment process associated with the Corder Park pump station. Atawhai Drive, Nelson.	25 August 2050	
RM 165359	Discharge permit to discharge contaminants to air from an industrial premises and from three 400 kilo-Watt stationary internal combustion engines in relation to the upgrade of the Neale Park Pump Station.	25 January 2052	When operating for non-emergency purposes, the three 400 kilo-Watt (kW) diesel fired emergency backup generator shall only be operated: a) one at a time; b) for a duration not exceeding 30 minutes for each generator; and c) between the hours of 10 am and 4 pm.
RM 045202-1-4	To allow the fisheries outfall pipeline and diffuser to	19 December 2040	

	exclusively occupy the coastal marine area		
RM 115212 & 115212V1	Anchoring of the Fisheries Outfall Pipeline to the seabed and superseding condition 6 of RM045202	19 December 2040	

The resource consent associated with the NWWTP, for the operation of the plant, the marine outfall and the discharge of treated effluent expires 1 December 2024. As this is a critical lifeline asset, consent renewal work commenced in 2019/20. In December 2023 the application to renew the consent was submitted. At the time of writing this document, discussions are taking place with local iwi to decide the duration of the consent.

The Health Act 1956

The Health Act 1956 places an obligation on Council to improve, promote and protect public health within the District. The provision of wastewater helps to promote and improve public health.

Adequate treatment of sewage is essential for community well-being.

Water Services Act 2021

A separate Water Services Act came into effect in November 2021. The Act established the new drinking water regulatory regime that Taumata Arowai administers. Taumata Arowai have now developed provisions relating to source water protection, including Drinking Water Quality Assurance Rules and Drinking Water Aesthetic Values that have been made under the Act. The Act also includes some obligations on wastewater and stormwater network operators.

Treaty of Waitangi Land Claim Settlement Acts relevant to Te Taihū:

Council acknowledges that Treaty of Waitangi obligations rest with the Crown and seeks to uphold the mana of the Treaty of Waitangi Settlements of Te Taihū by continuing to build its relationship with iwi. There are numerous pieces of legislation under which Council operates that recognise the Treaty of Waitangi and recognise or acknowledge iwi and Māori. Council believes that by working in partnership with iwi and Māori it will create benefits for the whole community.

Settlement Acts are designed to settle historical claims for breaches of Te Tiriti o Waitangi/Treaty of Waitangi. Settlements aim to resolve these claims by providing some redress to claimants. Redress may involve:

- An historical account of the Treaty breaches and Crown acknowledgement and apology
- Cultural redress
- Commercial and financial redress.

These settlement include Statutory acknowledgment that the eight iwi will potentially be considered as affected parties under section 95E of the Resource Management Act.

The Treaty of Waitangi Land Claim Settlement Acts relevant to Te Taihira comprise:

I. The Ngāti Kōata, Ngāti Rārua, Ngāti Tama ki Te Tau Ihu, and Te Ātiawa o Te Waka-a-Māui Claims Settlement Act 2014

II. The Ngāti Apa ki te Rā Tō, Ngāti Kuia, and Rangitāne o Wairau Claims Settlement Act 2014

III. The Ngāti Toa Rangitira Claims Settlement Act 2014

Obligations under these Settlement Acts may impact works programmes in the Wastewater AMP.

The Nelson City Council Wastewater Bylaw 2021

This Bylaw is a legislative tool for fair and effective management of wastewater and trade waste entering the Council's Sewerage Systems. The current bylaw came into effect in 2021.

National Policy Statement for Freshwater Management 2020

The NPS-FM 2020 replaces the NPS-FM 2014 (amended 2017). This National Policy Statement sets out how Councils will manage water quality and quantity. The Freshwater NPS 2020 is one of several pieces of national direction for managing New Zealand's freshwater. National Environmental Standards for Freshwater and RMA Section 360 regulations for stock exclusion are also being introduced. Guidance to support the implementation of these new rules and regulations will be released as they come into force. New requirements of the NPS-FM relate to:

- Manage freshwater in a way that 'gives effect' to Te Mana o te Wai: This is a concept that refers to the fundamental importance of water and recognizes that protecting the health of freshwater protects the health and well-being of the wider environment.
- Improve degraded water bodies, and maintain or improve all others using bottom lines defined in the NPS.
- An expanded national objectives framework.
- Avoid any further loss or degradation of wetlands and streams, map existing wetlands and encourage their restoration.
- Identify and work towards target outcomes for fish abundance, diversity and fish passage over time.
- Set an aquatic life objective for fish and address in-stream barriers to fish passage over time.
- Monitor and report annually on freshwater (including the data used); publish a synthesis report every five years containing a single ecosystem health score and respond to any deterioration.

Reducing the wet weather discharge of wastewater from the network is an important part of meeting the requirements of the national policy statement.

Action for Healthy Waterways – Proposed Policy Reforms 2019/20

The Action for Healthy Waterways proposals released by the Ministry for the Environment in mid-2019 includes amendments to the Resource Management Act, an update of the above mentioned NPS for Freshwater Management, an updated National Environmental Standard for Sources of Human Drinking Water, and new National Environmental Standards for Freshwater and Wastewater.

Key proposals specific to wastewater include:

- Speed up the implementation of freshwater regulations through amendments to the RMA.
- Set minimum standards for wastewater discharges and overflows and require all operators to follow good practice risk management.
- Set targets/limits on volume/frequency of wet weather overflows.
- A requirement for wastewater network operators to prepare a risk management plan. This would address specific wastewater risks.

New Zealand Coastal Policy Statement 2010

The New Zealand Coastal Policy Statement (NZCPS 2010) guides local authorities in their day to day management of the coastal environment, including managing discharges to water in the coastal environment.

Policy 23 - Discharges of Contaminants - requires local authorities to manage discharges of human sewage in the coastal environment. This includes:

2. In managing discharge of human sewage, do not allow:
 - a. discharge of human sewage directly to water in the coastal environment without treatment; and
 - b. the discharge of treated human sewage to water in the coastal environment, unless:
 - i. there has been adequate consideration of alternative methods, sites and routes for undertaking the discharge; and
 - ii. informed by an understanding of tangata whenua values and the effects on them.
3. Objectives, policies and rules in plans which provide for the discharge of treated human sewage into waters of the coastal environment must have been subject to early and meaningful consultation with tangata whenua.

National Policy Statement on Urban Development 2020

The National Policy Statement on Urban Development 2020 (NPS-UD) requires local authorities to open up more development capacity, so more homes can be built in response to demand. One of the NPS-UDs objectives is that regional policy statements and district plans enable more people to live in, and more business and community services to be located in, areas of an urban environment near a city zone or other area with employment opportunities. In particular this includes areas well serviced by existing or planned public transport, and where there is a high housing demand. Nelson City Council has been assessed as a Tier Two Urban Environment in conjunction with the Tasman District Council which means that it must ensure there is sufficient development capacity to meet demand in the urban environment in the short term (within 3 years), medium term (3-10 years) and long term (10-30 years). Short-term capacity must be zoned and infrastructure ready, while medium-term must either be ready or have funding for adequate infrastructure identified in the Long Term Plan.

Climate Change Response Act 2002 (and Climate Change Response (Zero Carbon) Amendment Act 2019)

Puts in place a legal framework to support New Zealand to respond to climate change and meet its international obligations. It also established the New Zealand Emissions Trading Scheme.

In 2019 the Act was amended by the Climate Change Response (Zero Carbon) Amendment Act 2019, which:

- Set a new domestic greenhouse gas emissions reduction target for New Zealand to reduce net emissions of all greenhouse gases (except biogenic methane) to zero by 2050
- Established a system of emissions budgets to act as stepping stones towards the long-term target
- Required the Government to develop and implement policies for climate change adaptation and mitigation
- Established a new, independent Climate Change Commission to provide expert advice and monitoring to help keep successive governments on track to meeting long-term goals.

Acknowledging the need for urgent action, Council declared a climate emergency in May 2019. Council adopted Te Mahere Mahi a te Āhuarangi Climate Action Plan in 2021, a living document which outlines what Council is doing to address climate change over the next decade. In 2022, Council also began developing a Climate Change Strategy, which will set the long-term direction and guide Council and community investment in climate action.

Council is working with Tasman District Council on a regional climate change risk assessment, which will build a comprehensive picture of how climate change will impact the region.

Refer to section 1.2 for information on how this relates to the wastewater activity.

Outcomes from the Three Waters Review – Local Water Done Well

The Three Waters Review looked at how to improve the management of drinking water, stormwater and wastewater (three waters) to address problems identified in the Havelock North Drinking Water Inquiry, and improve overall management of our water resources.

Central Government passed the Water Services Acts Repeal Bill on 13 February 2024. The bill (Act) repeals the previous governments Three Waters legislation. This Act restores local council ownership and control of water services, and responsibility for service delivery.

Central Government also signalled that they will continue with three water reforms through a programme of legislation headed 'Local Water Done Well'. Implementation of this programme will be through two further bills to be introduced to Parliament.

The first bill (Local Government (Water Services Preliminary Arrangements) Bill) is expected to be passed by the middle of 2024 setting out '...provisions relating to council service delivery plans and transitional economic regulation. It will also provide streamlined requirements for establishing council-controlled organisations under the Local Government Act 2002, enabling councils to start shifting the delivery of water services into more financially sustainable configurations should they wish to do so.'

The second bill is expected to be introduced in December 2024 and passed by the middle of 2025. This will set out – '...provisions relating to long-term requirements for financial sustainability, provide for a complete economic regulation regime, and a new range of structural and financing tools, including a new type of financially independent council-controlled organisation.'

At this stage the second bill is also signalled to establish regulatory backstop powers, to be used when required to ensure effective delivery of financially sustainable and safe water services. Some amendments to the water regulator's legislation are also anticipated.

Central Government expect all legislation to support the implementation of Local Water Done Well will be passed by mid-2025.

On 1 March 2021, the Taumata Arowai – Water Services Regulator Act 2020 came into force. The Act implements decisions to establish a new regulatory body – Taumata Arowai – which will be responsible for:

- administering and enforcing a new drinking water regulatory system (including the management of risks to sources of drinking water); and
- a small number of complementary functions relating to improving the environmental performance of wastewater and stormwater networks (developing standards and regulations then monitoring and enforcing compliance with them, and providing training)

For the Wastewater Activity, NCC is well placed to respond to potential changes. The Council has been proactive in recognising and investing in reducing wastewater overflows. Furthermore, the NWWTP is currently operating under an active resource consent, and work is currently well underway to renew this consent.

Civil Defence Emergency Management (CDEM) Act 2002

Sections 64 and 60 of the CDEM Act (Duties of local authorities and Duties of lifeline utilities accordingly) require that a local authority must plan and provide for civil defence emergency management within its district and that a local authority and lifeline utility must ensure that it is able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency. The Risk section of this Plan provides detail of Nelson City Council's preparation and arrangements for emergency management

2.4 Current Level of Service

Significant Negative Effects

It is a requirement of the Local Government Act 2002 Amendment Act 2010 (2(1)(c)) to outline any significant negative effects that any activity within a group of activities may have on the social, economic, environmental, or cultural well-being of the local community.

Table 2-5 identifies the negative effects for the Nelson community that the wastewater activity may have. It indicates the existing approach or proposed action to address these in future.

Table 2-5: Negative Effects – The Wastewater Activity

Effect	Status of Effect		Type of Effect (existing situation)		Impact on Well-Being (existing situation)				Existing Approach or Proposed Action to Address
	Existing	Potential	Negative	Significantly Negative	Social	Economic	Environmental	Cultural	
Wastewater Treatment Plant									
Discharge of treated wastewater to the ocean	Static	Static	√		Mod	Minor	Minor	Mod	Compliance with resource consent. New consent may lead to enhanced treatment levels.
Biosolids disposed to land	Static	Static	√		Minor	Minor	Minor	Minor	High degree of sustainability
Discharge of odour	Dynamic	Increasing	√		Mod	Minor	Minor	Minor	A pond management team has been established that closely monitors the ponds health. Ongoing vigilance around potential sources of odour.
Outfall									
Curtailling of shellfish gathering in immediate area of outfall mixing zones	Static	Static	√		Minor	Nil	Minor	Mod	High degree of treatment prior to discharge and testing (both effluent and outfall environment)
Pump stations									
Discharge of odour	Static	Static	√		Minor	Minor	Minor	Minor	Reported and resolved as soon as possible. Odour nits in place at high risk sites.
Overflows	Static	Reducing		√	Mod	Minor	Mod	Mod	Pump station overflows are generally reported and resolved within a short space of time. Ongoing work to increase resilience.
Noise	Static	Static	√		Minor	Minor	Minor	Nil	High degree of noise mitigation in residential areas
Rising Mains									
Overflows	Static	Reducing		√	Mod	Mod	Mod	Mod	High awareness of risk levels. Investment in condition assessment and knowledge of asset. Future duplication/renewal of the Atawhai rising main will reduce the risks of overflows

Effect	Status of Effect		Type of Effect (existing situation)		Impact on Well-Being (existing situation)				Existing Approach or Proposed Action to Address
	Existing	Potential	Negative	Significantly Negative	Social	Economic	Environmental	Cultural	
Discharge of odour	Static	Reducing	√		Minor	Nil	Minor	Minor	Reported and resolved as soon as possible. Odour scrubbers are installed at high risk/problem locations.
Network mains									
Overflows Wet weather overflows from the piped network can have negative impacts on environmental and cultural wellbeing.	Static	Reducing		√	Mod	Mod	Mod	Mod	Overflow reduction strategy focussing on high risk areas. Use of modern technology to support understanding of network reaction to storm events. Future duplication/renewal of the Atawhai rising main will reduce the risks of overflows
Growth is constrained by lack of wastewater infrastructure	Static	Static	√		Minor	Mod	Minor	Minor	City development team on Intensification Action Plan and Future Development Strategy guide prioritisation of spending.

Table 2-6 outlines the current Levels of Service and their associated performance measures. Additionally the table sets out recent performance and outlines the performance targets for the coming LTP period.

Table 2-6: Current Levels of Service in the Long Term Plan 2021 - 2031

				Performance Target
Community Outcomes	Level of service	Performance measure	Previous and current performance	2021 - 2031 (Year 1-10)
Our infrastructure is efficient, cost effective and meets current and future needs	Reliability ^A fully operational wastewater system	Level of compliance of treatment plant with resource consent conditions 1	100% compliance in 2022/23 100% compliance in 2021/22 100% compliance in 2020/21	100% compliance
		Number of dry weather overflows from the sewerage system, per 1000 connections* 2	3 in 2022/23 3 in 2021/22 4 in 2020/21	Fewer than 15 per 1000 connections.
Our region is supported by an innovative and sustainable economy	Response ^Appropriate response to reported network issues	Median response times are measured for overflows resulting from a blockage or other fault in the sewerage system: a) attendance time: from when notification is received to the time service staff reach the site b) resolution time: from the time notification is received to the time service staff confirm resolution of the blockage or other fault* 2	Median response time of 20 minutes in 2022/23 Median response time of 21 minutes in 2021/22 Median response time of 25 minutes in 2020/21 Median resolution time of 163 minutes in 2022/23 Median resolution time of 191 minutes in 2021/22 Median resolution time of 195 minutes in 2020/21	Contractor to attend in median time of 60 minutes or less Contractor to resolve issue in a median time of 480 minutes or less
Our unique natural environment is healthy	Quality ^Environmental protection	Compliance with territorial authority’s resource consents for discharge from the sewerage system measured by number of: a) abatement notices	100% compliance in 2022/23 100% compliance in 2021/22 100% compliance in 2020/21	100% compliance

				Performance Target
Community Outcomes	Level of service	Performance measure	Previous and current performance	2021 - 2031 (Year 1-10)
and protected		b) infringement notices c) enforcement orders d) convictions in relation to those resource consents* 1		
		The total number of complaints received about any of the following: a) sewage odour b) sewerage system faults c) sewerage system blockages, and d) Council's response to issues with the sewerage system, expressed per 1000 connections to the sewerage system* 2	17 complaints per 1,000 connections in 2022/23 12 complaints per 1000 connections in 2021/22 16 complaints per 1000 connections in 2020/21	No more than 20 valid complaints a year per 1000 connections

^L.O.S. included in LTP

* Performance measures with an asterisk reflect the wording of the Non-Financial Performance Measures of the Department of Internal Affairs (DIA) incorporated into sec261B Local Government Act 2002. This is to allow the DIA to compare these measures across councils. Targets have been adjusted where necessary to align.

Measurement procedures:

1. Council RMA infringement records at 1 July
2. Report from SR system at 1 July

Appropriate response to reported network issues

Generally system failures within the reticulation system are reported by the public. Whatever the means of reporting, it is important that response to failures is prompt to maintain public health and to avoid potential damage to the environment. Table 2-7 sets out the response times for system failures that are detailed in the maintenance contract with Maintenance Contractor

Table 2-7: System Failure Response Times

Description	Investigation & Appraisal	Complete Repair
Investigations, inspections and reticulation monitoring	By arrangement	N/A
Minor leaks from fittings and connections that can be contained	2 hours	1 working day
Flow meters	1 working day	5 working days
Other non-urgent works	As soon as practicable	10 working days
Burst pipes/major leakage	30 minutes	8 hours
Pump station failure	30 minutes	8 hours
Major sewage overflow that could endanger life or property or have an adverse effect on the environment	30 minutes	8 hours
Other emergency works	30 minutes	As soon as practicable
Gravity sewer blockage	2 hours	8 hours

2.5 Proposed level of service for 2024 - 2034

Level of service statements have been updated since the levels of service in the Long Term Plan 2021 – 2031, and two performance targets.

				Performance Target
Community Outcomes	Level of service	Performance measure	Previous and current performance	2024 -2034 (Year 1-10)
Our infrastructure is efficient, resilient, cost effective and meets current and future needs.	Reliability ^We provide reliable wastewater systems with a minimum of odours, overflows or disturbance to the public.	Level of compliance of treatment plant with resource consent conditions Measurement Procedure 1	100% compliance in 2022/23 100% compliance in 2021/22 100% compliance in 2020/21	Compliance with 100% of the resource consent conditions for 90% of the time.
		Number of dry weather overflows from the sewerage system, per 1,000 connections* Measurement Procedure 2 (Mandatory Performance Measure 1)	3 dry weather overflows per 1,000 connections in 2022/23. 3 dry weather overflows per 1,000 connections in 2021/22 4 dry weather overflows per 1,000 connections in 2020/21	Fewer than 15 per 1,000 connections.
Our region is supported by an innovative and sustainable economy.	Response ^We provide well built, operated and maintained wastewater systems so that any failures can be managed and responded to quickly.	Median response times are measured for overflows resulting from a blockage or other fault in the sewerage system: a) attendance time: from when notification is received to the time service staff reach the site b) resolution time: from the time notification is received to the time service staff confirm resolution of the blockage or other fault* Measurement Procedure 2 (Mandatory Performance Measure 3)	Median response time of 20 minutes in 2022/23 Median response time of 21 minutes in 2021/22 Median response time of 25 minutes in 2020/21 Median resolution time of 163 minutes in 2022/23 Median resolution time of 191 minutes in 2021/22 Median resolution time of 195 minutes in 2020/21	a) Contractor to attend in median time of 60 minutes or less b) Contractor to resolve issue in a median time of 480 minutes or less

				Performance Target
Community Outcomes	Level of service	Performance measure	Previous and current performance	2024 -2034 (Year 1-10)
Our unique natural environment is healthy and protected.	Quality ^We provide wastewater systems that aim to have minimal adverse affect on the environment	Compliance with territorial authority's resource consents for discharge from the sewerage system measured by number of: a) abatement notices b) infringement notices c) enforcement orders d) convictions in relation to those resource consents* Measurement procedure 1 (Mandatory Performance Measure 2)	100% compliance in 2022/23 100% compliance in 2021/22 100% compliance in 2020/21	a) ≤2 b) ≤2 c) 0 d) 0
		The total number of valid complaints received about any of the following: a) sewage odour b) sewerage system faults c) sewerage system blockages d) Council's response to issues with the sewerage system, expressed per 1,000 connections to the sewerage system* Measurement Procedure 2 (Mandatory Performance Measure 4)	17 valid complaints per 1,000 connections in 2022/23 12 valid complaints per 1,000 connections in 2021/22 16 valid complaints per 1,000 connections in 2020/21	No more than 20 valid complaints a year per 1000 connections

^L.O.S. included in LTP

* Performance measures with an asterisk reflect the wording of the Non-Financial Performance Measures of the Department of Internal Affairs (DIA) incorporated into sec261B Local Government Act 2002. This is to allow the DIA to compare these measures across councils. Targets have been adjusted where necessary to align.

<p>Measurement procedures:</p> <ol style="list-style-type: none"> 1. Council RMA infringement records at 1 July 2. Report from SR system at 1 July
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3. FUTURE DEMAND

This section outlines the existing demand, demand forecasts, growth and expectations and the demand management strategies that Council utilise.

3.1 Demand drivers

The wastewater network is a complex mix of pipes, pump stations and treatment plants. It is difficult to quickly respond to changes in demand given the cost and regulatory environment it operates within. Planning for future demand is increasingly a key requirement of central government.

Table 3-1 summarises key future demand drivers within this Plan.

Table 3-1: Wastewater Demand Drivers

Wastewater Demand Drivers	Changes to Wastewater Activity
Significant population growth and residential expansion into greenfield areas	New development areas on the periphery of the city and increased intensification in some existing developed areas, including the city centre area, leading to increased wastewater production.
New 'wet' industries	Growth in the commercial sector that involves wet processing activities increases the demand for wastewater services.
Reduction in house occupancy	Activities such as operating washing machines and dishwashers mean that dwellings with low numbers of occupants can produce more wastewater per capita than dwellings with higher occupancy numbers.
Changes in Customer Expectations	Customer expectations are increasingly tending towards higher levels of service for reliability and response to complaints. These expectations do not always consider the additional costs associated with meeting them.
Community Expectation on Environmental Protection	Community expectations are increasingly focussed on both the reduction of extent and frequency of wastewater overflows on property and roads during and after storms, as well as enhanced wastewater discharge quality.
Climatic Changes	In recent years, there has been an increase in the incidence of extreme weather events around the world. The general trend for Nelson is of winters being wetter and the other seasons being drier. More frequent heavy rainfall events have been predicted which will impact negatively on wet weather overflows from the network.
Legislative/ National Policy Statements: <ul style="list-style-type: none"> • NPS Freshwater Management • NPS Urban Development • Zero Carbon Bill 	<ul style="list-style-type: none"> • NPS Freshwater Management is a cornerstone central government initiative to improve the quality of freshwater bodies in New Zealand. This is expected to impact on discharges to waterways and require an enhanced response to overflows from the network. This will be guided by the National Environmental Standard - Wastewater when released. • NPS Urban Development will ensure each territorial authority makes adequate provision for future population growth in their areas. This will require Council to undertake strategic growth studies and identify the impact on the demand for wastewater services. • Becoming carbon neutral for the wastewater activity will focus on understanding, improving and mitigation of greenhouse gas production at the wastewater treatment plant and ensuring that the various network components that directly or indirectly have a carbon foot print are optimised to minimise their carbon foot print and where possible eliminated.

Wastewater Demand Drivers	Changes to Wastewater Activity
Organisational Policies Environmental Sustainability	This includes an Emissions Inventory Report and Action Plan to Reduce Council Greenhouse Gas Emissions. Will require a focus on understanding, improving and mitigation of greenhouse gas production at the wastewater treatment plant and ensuring that the various network components that directly or indirectly have a carbon foot print are optimised to minimise their carbon foot print and where possible eliminated.

3.2 Demand forecasts

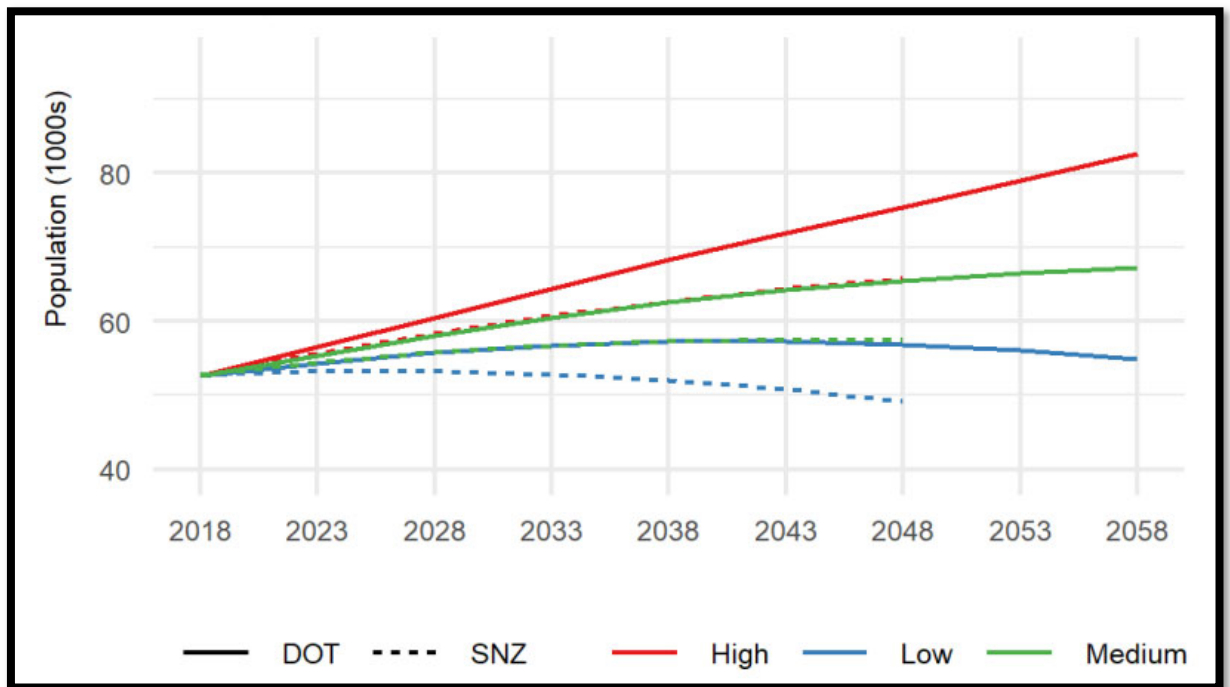
Nelson Population and Household Projections: 2023 - 2053

Between 2001 and 2018 average annual growth rates ranged between 0.64% and 1.91%. Population growth rates between 2006-2018 were unusually high compared to long term patterns (approximately double the rates for 1996-2006) and it is unlikely that growth will continue at this rate for the duration of the projection period.

The rates of growth in Figure ES-11 are based on commissioned demographic analysis and reflect the medium scenario projection from the findings of this analysis. These projections are higher than those produced by Statistics New Zealand, primarily due to higher net migration assumptions used for this analysis.

Nelson’s population is expected to increase by 5,013 between 2023 and 2033 to 60,419. The projections suggest a relatively modest annual average growth rates for 2023-2033 of around 0.9%. Growth rates are likely to decline over time due to structural population ageing.

Figure 3-1: Population growth and projections 2023 - 2053, Nelson



Projected demand under the National Policy Statement on Urban Development

The National Policy Statement on Urban Development 2020 (NPS-UD) requires local authorities to ensure there is sufficient development capacity to meet demand over the next 30 years with specific zoning and servicing requirements over different time frames:

in the short term (within 3 years)

medium term (3-10 years)

long term (10-30 years)

The location of actual growth will depend on where there is capacity for residential growth (residential zoning, infrastructure servicing) and where development is feasible. Residential growth areas are provided in *section 3.5 - Asset programmes to meet demand*.

Wastewater Discharge Trends

Trending of historical wastewater flows for the Nelson Wastewater Treatment Plant (NWWTP) and the Stoke/Tahuna (Nelson Regional Sewerage Business Unit – Bell Island WWTP) area are detailed in Figures 3-2 and 3-3. For Bell Island WWTP the trend is clearly a rising one that corresponds with the relatively high levels of development in this catchment. For the NWWTP catchment the trend is more static again reflective of levels of development within the catchment.

Some year to year variability is expected as industrial use fluctuates.

Figure 3-2: Nelson Wastewater Treatment Plant Average Daily Inflows

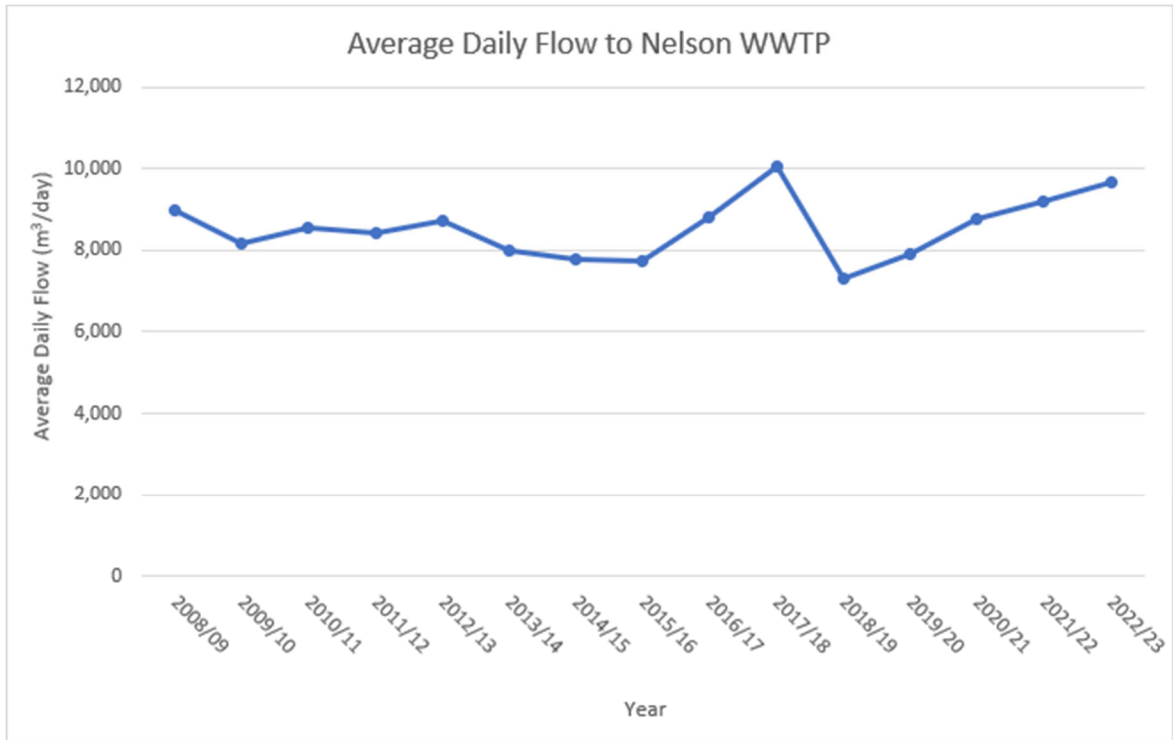
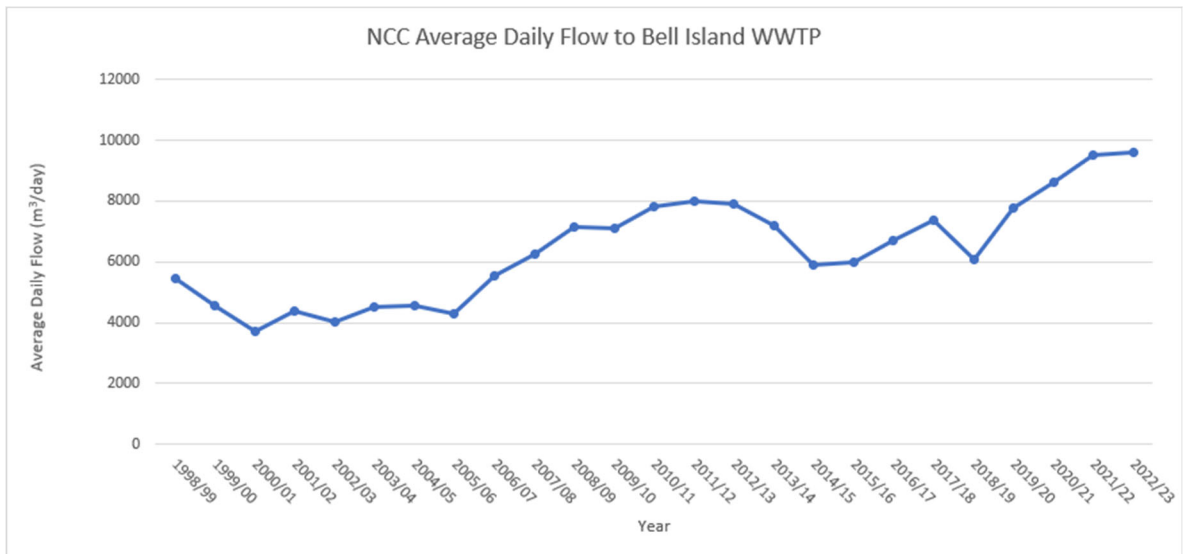


Figure 3-3: Stoke /Tahuna Average Daily flow to Bell Island



3.3 Demand impacts on assets

Modelling of the network suggests that there is currently sufficient dry weather capacity, in the city's pipes, for at least the short-medium term; this is strongly supported by the low level of dry weather overflows that occur in the network. Wet weather capacity is the greatest challenge and is covered in more detail elsewhere in this plan. The hydraulic model is currently undergoing a significant upgrade; this will prove a key tool in determining restrictions within the network and the development of associated solutions.

The demand changes related to legislative, climatic and community expectation changes mean that the future of the processes, and potentially the location of the Nelson Wastewater Treatment Plant will require significant consideration in the coming years and in particular over the period of this Plan.

3.4 Demand management plan

Demand Management strategies are used as alternatives to the creation of new assets. They are aimed at modifying system demands to achieve:

- The delivery of cost-effective services.
- Defer the need for new assets and optimise the performance/utilisation of the existing assets.
- Environmental sustainability in the wastewater activity.
- Develop ways to incorporate wider interdepartmental and community involvement.

Nelson City Council is working on a range of strategies to manage the demand for wastewater services and therefore the requirement for additional infrastructure.

Table 3-2 below details the demand management strategies that have or will be instigated:

Table 3-2: Demand Management Strategies

Strategy	Objective/ Description
Operations	<p>Reduce direct stormwater entry into the wastewater reticulation system through education, detection and control. Installation of inspection points at private property boundaries to identify inflow and infiltration into the sewer network.</p> <p>Metering of water supplies to individual properties, implemented in 1998, and has increased the awareness about the need to conserve water with subsequent flow on effect for the wastewater activity.</p> <p>The provision of adequate public stormwater systems will reduce the likelihood of flooding and therefore inflows of floodwaters into the sewer system through gully traps and manholes.</p> <p>Targeted pipe renewal programmes focussed on areas with poorer performing assets or areas where there are constraints as identified</p>

Strategy	Objective/ Description
	<p>operationally, anecdotally and through the wastewater hydraulic model.</p> <p>Use of hydraulic modelling to ascertain effects and constraints within the network.</p> <p>Increasing storage capacity at priority pump stations.</p>
Regulation	<p>The use of the Nelson Resource Management Plan to control the areas in which development can occur and the associated density that is permitted.</p> <p>Integrating growth planning with infrastructure provision via the Future Development Strategy and the associated Intensification Action Plan.</p>
Wastewater Bylaw	<p>The promotion of on-site pre-treatment for the major industrial contributors.</p> <p>Protection of Council's wastewater reticulation and treatment processes, the environment at the point of discharge and ensuring the system capacity is not compromised by high volume or high strength point discharges.</p> <p>Protection of the Council's wastewater network from high levels of inflow and infiltration.</p>
Education	<p>Continuation of the wastewater minimisation programmes aimed at increasing community awareness of the benefits of reducing direct stormwater disposal into the wastewater system.</p> <p>Encourage use of low flow devices where applicable (i.e. showers, toilets, etc.) particularly in council owned facilities.</p> <p>Promotion of the Wastewater Bylaw.</p>

3.5 Asset programmes to meet demand

The Nelson Tasman Future Development Strategy 2022

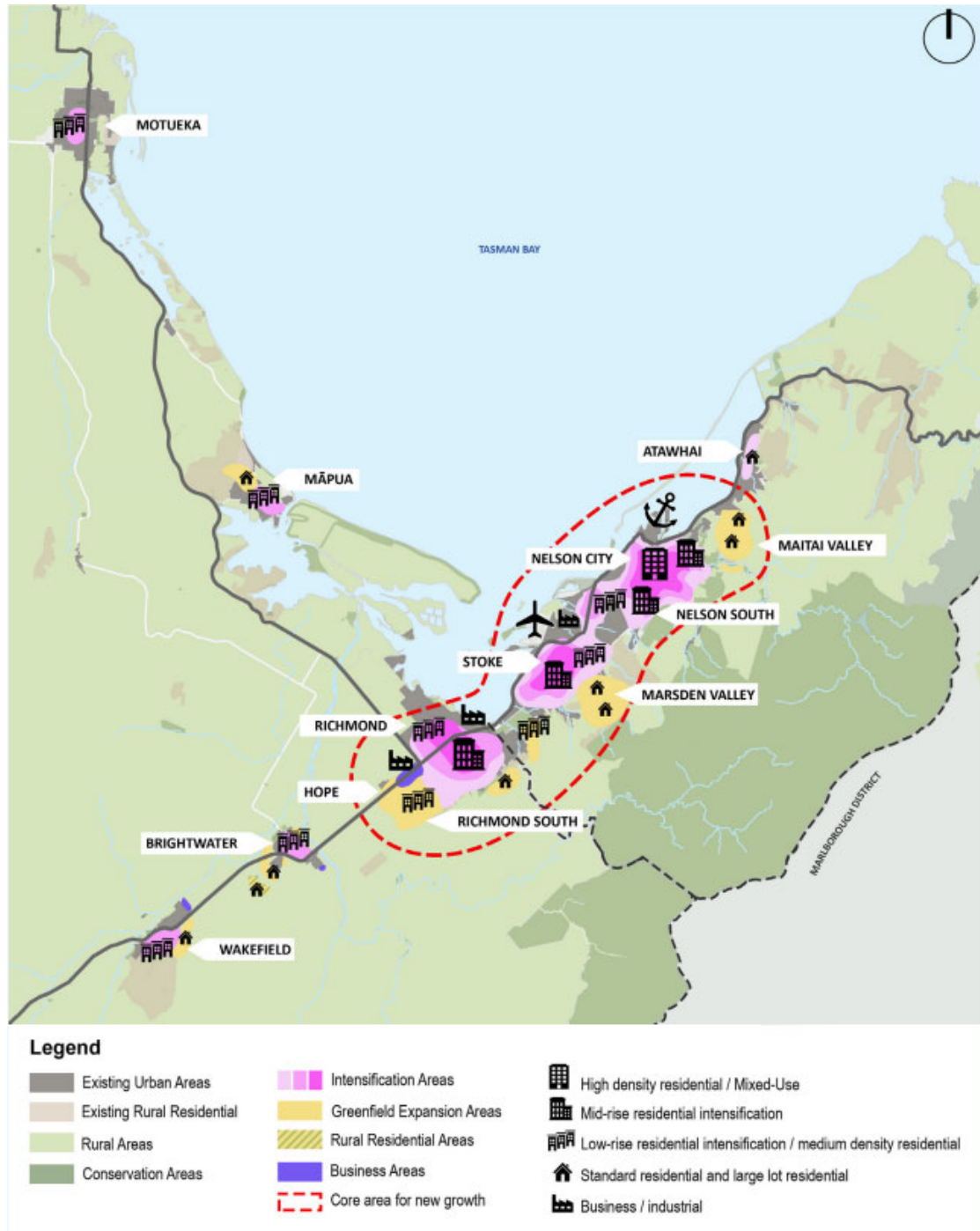
The Nelson Tasman Future Development Strategy 2022 (FDS) provides capacity for about 24,000 houses over the next 30 years in the combined urban environment.

In Nelson, the FDS identifies capacity for about 11,500 new dwellings, with 78% of this growth to be achieved by adding new housing into existing urban areas, and the remaining 22% expected to be through new greenfield expansions. This proportion reflects community feedback supporting growth through intensification of existing urban areas rather than expansion onto rural land.

Provision of intensification infrastructure is identified for the City Centre, Stoke and Tāhunanui, where higher density and mixed-use environments will see growth consolidated. Most of the new greenfield potential identified are within the Maitai, Marsden, and Ngawhatu valleys. Parts of Nelson Central and Tāhunanui are subject to flood risks and future intensification will be guided by the outcome of a Dynamic Adaptive Planning Pathways process, which is currently underway.

Figure 3-4 shows the areas that are expected to grow and/or intensify in the coming three decades and are identified for future growth in the FDS. As demand for development becomes clearer they will be prioritised for services.

Figure 3-4: Growth Strategy



Implementation of intensification projects is more complex than traditional expansion. The Council does not have full control over the location or level of uptake of intensification or urban expansion opportunities, as this is largely dependent on decisions by individual landowners and/or developers. Where the Council can take a lead include:

- Identify priority areas.
- Lead investment in urban amenity and public transport to encourage growth in specific areas, such as the City Centre.

The availability of wastewater reticulation, and treatment facilities that have capacity to service the proposed intensification will increase developers' certainty that the neighbourhoods they are investing in will be attractive to buyers.

Reticulation Capacity

Modelling of the Nelson City and Nelson South catchments has been occurring since 2004 using a computer network model based on the InfoWorks software. The hydraulic models are used widely to support a variety of programmes and projects.

Maximum flows for design are based on the current development potential of the various catchment zones in accordance with the Nelson Resource Management Plan, supported by field calibration data that accounts for inflow and infiltration.

Pump Station and Rising Main Capacities

Nelson City Council has an ongoing programme of upgrading and renewing pump stations to meet demand and component renewal requirements. Typically pump stations will have a design life horizon of 25–50 years with various componentry (such as pumps) having shorter design lives.

Future pump station and rising main upgrades will be linked to the areas/pump stations with known issues, expected flows identified in the wastewater network model, overflow prevalence and development of areas.

Nelson City Council has a rolling programme of installing and renewing flow meters at pump stations.

Treatment Capacity

Nelson Wastewater Treatment Plant: The Wastewater treatment plant was designed to the following requirements:

- Hydraulic loadings – to year 2050.
- Load (Biochemical oxygen demand, suspended solids etc.) – to year 2050 (assessments will be undertaken during the period of this Plan to determine the state of actual loadings against the design parameters).

The treatment loading and capacity and plant performance is monitored to ensure treatment capacity continues to meet demand. It is expected that future regulatory changes will increase the level of treatment required.

Bell Island Wastewater Treatment Plant

Approximately half of the city's wastewater is treated by the Nelson Regional Sewerage Business Unit facility on Bell Island. See NRSBU Activity Management Plan for current capacities.

Strategic Planning

There are a variety of strategic projects within the wastewater activity (e.g. Climate change strategies/programmes, Overflow Reduction etc.) and a variety of strategic pieces of work external to the activity that influence it (e.g. the Future Development Strategy). Over the period of this Plan these will be bought together in an overarching strategic plan that integrates internal and external strategic thinking.

4. LIFECYCLE MANAGEMENT

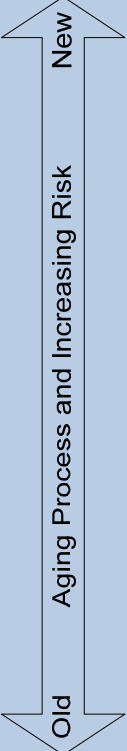
Lifecycle Management has a direct impact on the provision of the wastewater services to the residents and businesses of Nelson through the measures that need to be implemented to achieve levels of service. Lifecycle Management will allow Nelson City Council to clearly identify both the short and long term requirements of the wastewater system ensuring that a cost effective service is delivered to the community.

As with many other urban areas across the country, much of the 3 waters network in Nelson was developed during a period of intense urbanisation and conversion to public servicing from the 1960s and 70s. The average age of Nelson’s wastewater pipe assets is approximately 40 years which sits slightly above the national average at about 37 years.

Asset Lifecycle

Assets have a lifecycle as they move through from the initial concept to the final disposal. Depending on the type of asset, its lifecycle may vary from 10 years to over 100 years. Key stages in the asset lifecycle are outlined in Table 4-1.

Table 4-1: Asset Lifecycle

	Asset planning	When the new asset is designed - decisions made at this time influence the cost of operating the asset and the lifespan of the asset. Alternative, non-asset solutions, must also be considered.
	Asset creation or acquisition	When the asset is purchased - constructed or vested in NCC. Capital cost, design and construction standards, commissioning the asset, and guarantees by suppliers influence the cost of operating the asset and the lifespan of the asset.
	Asset operations and maintenance	When the asset is operated and maintained - operation relates to a number of elements including efficiency, power costs and throughput. Maintenance relates to preventative maintenance where minor work is carried out to prevent more expensive work in the future and reactive maintenance where a failure is fixed.
	Asset condition and performance monitoring	When the asset is examined and checked to ascertain the remaining life of the asset - what corrective action is required including maintenance, rehabilitation or renewal and within what timescale.
	Asset rehabilitation and renewal	When the asset is restored or replaced to ensure that the required level of service can continue to be delivered.
	Asset disposal and rationalisation	Where a failed or redundant asset is sold off, put to another use, or abandoned.

Asset Failure Modes



Generally it is assumed that physical failure is the critical failure mode for many assets. However the asset management process recognises that other modes of failure exist. The range of failure modes are outlined in Table 4-2.

Table 4-2: Asset Failure Modes

Structural	Where the physical condition of the asset is the measure of deterioration, service potential and remaining life.
Capacity	Where the level of under or over capacity of the asset is measured against the required level of service to establish the remaining life.
Level of Service Failure	Where reliability of the asset or performance targets are not achieved.
Obsolescence	Where technical change or lack of replacement parts can render assets uneconomic to operate or maintain.
Cost or Economic Impact	Includes where the cost to operate and maintain an asset is greater than the economic return.
Operator Error	Where the available skill level to operate an asset could impact on asset performance and service delivery.

The Lifecycle Management Programmes cover the four key categories of work necessary to achieve the required outcomes for the wastewater activity. These programmes are identified in Table 4-3.

Table 4-3: Lifecycle Management Programmes

<p>Management Programme: Management functions required to support the other Programmes - Developed and Implemented by Nelson City Council</p> <p>Operations and Maintenance Programme: To ensure efficient operation and serviceability of the assets so that they achieve their service potential over their useful lives - Developed, Managed and Implemented by Nelson City Council</p> <p>Renewal Programme: To provide for the progressive replacement of individual assets that have reached the end of their useful lives - Developed, Managed and Implemented by Nelson City Council</p>		<p>Maintaining the service potential of the assets and ensuring that the assets achieve that potential</p>
<p>Development Programme: To improve parts of the system currently performing below target service standards and to allow development to meet future demand requirements - Developed, Managed and Implemented by Nelson City Council</p>		<p>Closing service gaps. Meeting future demand</p>

The Operations & Maintenance and Renewal Programmes are focused on maintaining the current service potential of assets, and are primarily driven by the condition of assets although asset performance is often an indicator of asset condition.

The Development Programme is focused on closing service gaps by increasing the service potential of the wastewater system and is primarily driven by the performance of assets and the need to accommodate growth in the City and changing expectations (regulatory and community).

Community infrastructure is installed and maintained on the understanding that the assets are provided in perpetuity for the benefit of future generations. Longevity of an asset is a prime consideration when design and planning is undertaken for new or replacement components in the network. Sustainability has been reflected in the decision making process when designing and constructing the wastewater network.

4.1 Background Data

History of Nelson City Council Wastewater Systems

Nelson City Council has been responsible for wastewater disposal in the city since the first piped disposal system was put in place. The city has since expanded by the amalgamation of adjoining areas. Tahunanui Town Board joined the City in 1950, Stoke was transferred from Waimea County Council in 1958, Atawhai in 1968, Wakapuaka and Stoke rural in 1989. The following details the time line of the wastewater treatment and disposal for the Nelson north area.

- 1872 First drain (sewer and stormwater) draining into Maitai River from Rutherford, Nile, Hardy and Bridge Streets.
- 1894 Stormwater and sewer separated.
- 1904 Untreated effluent discharged to Boat Harbour.
- 1960 Construction of pumping stations in preparation for pumping to Nelson North.
- 1969 Water right secured allowing discharge to take place into Tasman Bay followed by construction of Tasman Bay outfall, work completed in 1970.
- 1979 Establishment of the current 26-hectare oxidation pond at Nelson North to treat sewage discharge.
- 1984 Fisheries discharge channelled through separate outfall, diverting this flow away from the oxidation ponds.
- 2007 Existing treatment plant facility extensively upgraded.

4.1.1 Key Issues for the Wastewater Activity

Key issues for the 2021 – 2031 wastewater activity are summarised as follows:

Issue 1: *The location and disposal route for Nelson’s wastewater treatment in the future.*

Issue 2: *Damage to the wastewater network from natural hazards (Asset resilience).*

Issue 3: *Planned levels of service for the wastewater network will not be met unless assets are maintained, renewed and upgraded.*

Issue 4: *Wastewater overflows.*

Issue 5: *Failures of the Atawhai Rising Main are occasionally causing untreated wastewater discharges directly into Nelson Haven.*

Issue 6: *Management of increased wastewater flows associated with urban intensification and growth.*

Issue 1: The location and disposal route for Nelson’s wastewater treatment in the future

The current Nelson Wastewater Treatment Plant (NWWTP) – note the NRSBU Bell Island WWTP facility is the subject of its own Activity Management Plan - is in a location that may be prone to impacts from sea level rise and fluvial flooding in the long term. The NWWTP is located in an area that has been naturally reclaimed from the sea by a combination of the formation of the boulder bank and the gradual sedimentation (as is continuing today) of the estuary.

It is expected that the NWWTP will remain in this location for the medium term as Council renews its resource consent for this facility, however, work programmed as part of this Plan will be seeking to define the options available into the future and the levels of risk and cost associated with these options as well as better understanding the risks associated with climate change at the current location.

Figures 4-1 and 4-2 outline flooding at the NWWTP site, based on modelling undertaken in 2020, with the respect to extreme rainfall and tide events in 2070. From these figures it is clear that whilst causing elevated water levels in various locations around the site, the site itself is not inundated through these events.

Regardless of the lack of inundation at the site shown by the modelling in 2070 it is considered prudent, due to uncertainties related to climate change predictions, to examine the options available for the future treatment of Nelsons wastewater.

Coastal inundation mapping using a bathtub method is shown on the shape nelson webpage (<https://shape.nelson.govt.nz/coastal-hazards>); this is a conservative approach that doesn’t take into account coastal topography. Further assessment is being undertaken to update that mapping using more recent LIDAR survey information. Additionally a wave run up assessment for the district is being initiated by Council.

Figure 4-1: River Flow Flooding 2070 RCP 8.5M 1 in 100 year rainfall event

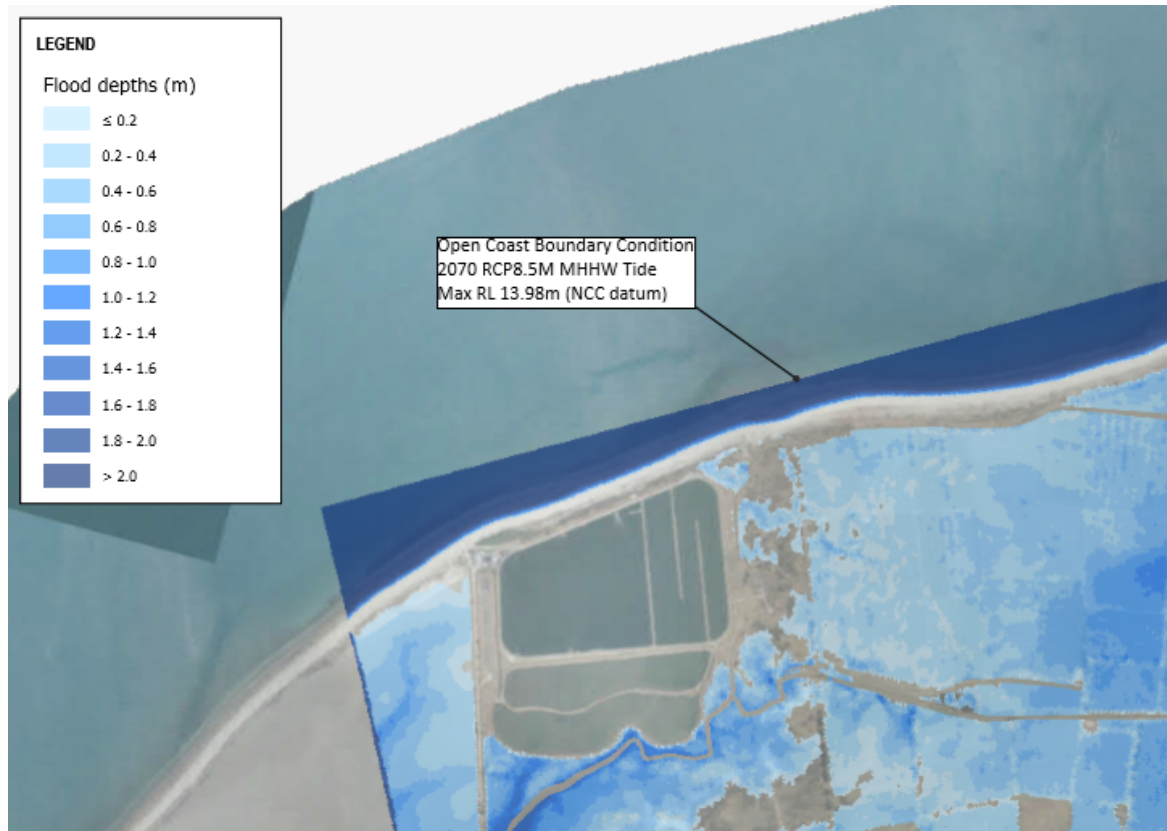
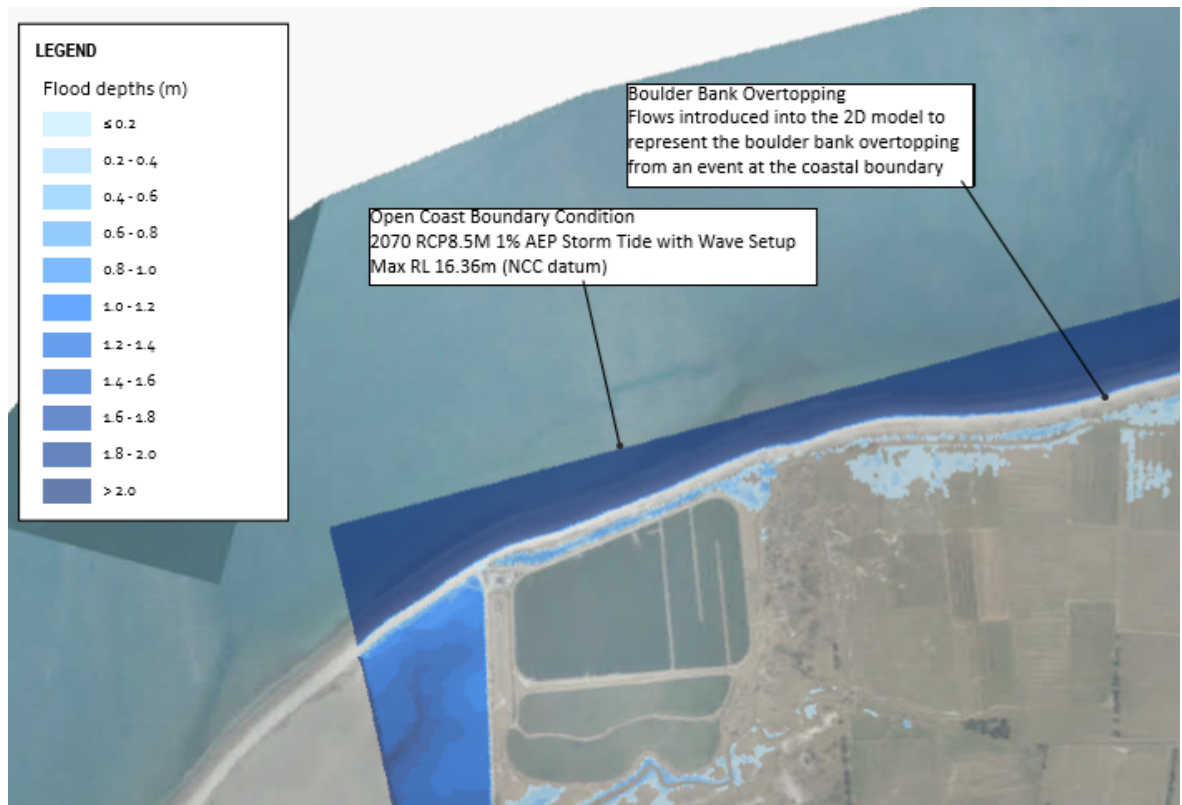


Figure 4-2: Coastal Flooding 2070 RCP 8.5M 1 in 100 year storm tide event



Issue 2: Damage to the wastewater network from natural hazards (Asset resilience)

Natural hazard events over the last decade have highlighted that parts of any utility network can be exposed to natural hazard events and that different natural hazards may impact on different parts of the network.

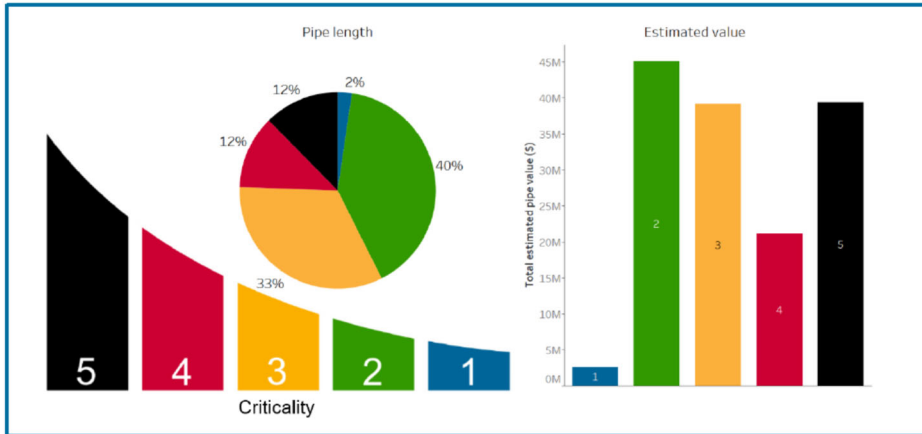
Council has recently undertaken a 3 Waters Natural Hazards study (Study) to establish the critical aspects of the 3 Waters networks and to understand what natural hazards events are likely to impact on these. A key aspect of this work is outlined in Figure 4-3 that identifies the criticality of various parts of the network. Unsurprisingly a large portion of the assets identified as most critical are those at the bottom of the catchments (and hence serve a greater number of ratepayers).

The focus of increased resilience will be on assets that have a higher criticality rating. To further refine the prioritisation of assets the Study reviewed available hazard information and compared this against the criticality layer – this effectively defines critical assets that are likely to be susceptible to specific natural hazard events. The natural hazards considered as part of the Study are:

- Earthquake – ground shaking.
- Earthquake – liquefaction.
- Earthquake – fault rupture.
- Storm inundation and coastal erosion.
- Sea level rise.
- Tsunami.
- Wind/treefall.
- Fire hazard.
- Landslide hazard.

This piece of work is ongoing and long term. A capital and operational budget placeholder for this work has been included within this Plan.

Figure 4-3: Criticality of the components of the wastewater network.



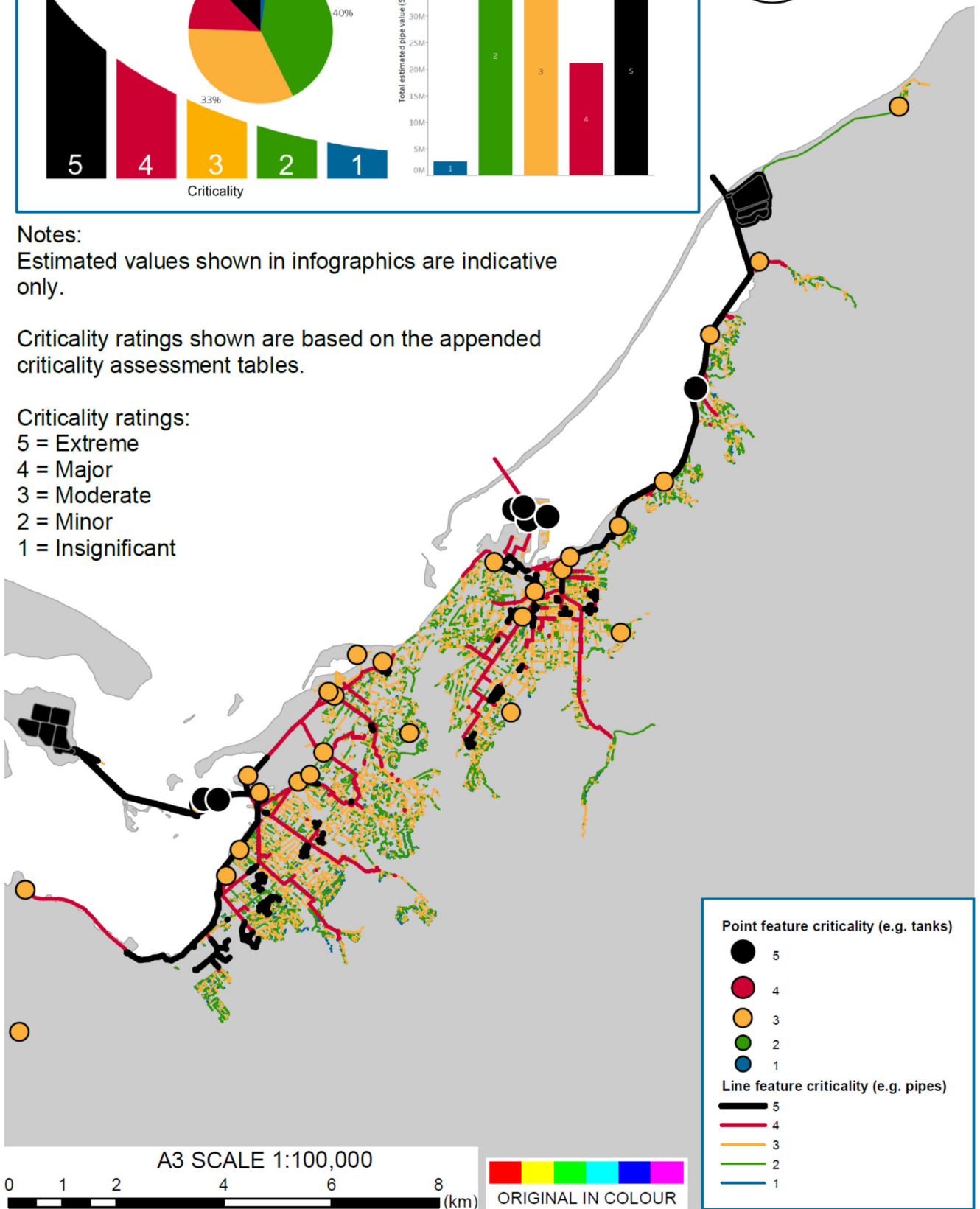
Notes:

Estimated values shown in infographics are indicative only.

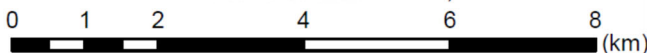
Criticality ratings shown are based on the appended criticality assessment tables.

Criticality ratings:

- 5 = Extreme
- 4 = Major
- 3 = Moderate
- 2 = Minor
- 1 = Insignificant



A3 SCALE 1:100,000



ORIGINAL IN COLOUR

Issue 3: Planned levels of service for the wastewater network will not be met unless assets are maintained, renewed and upgraded

Significant sections of the Nelson wastewater network were installed in the city from the 1950's -1970's as part of a surge of new developments. These earlier networks are now approximately 60-70 years old and some pipe materials have already reached the end of their service life.

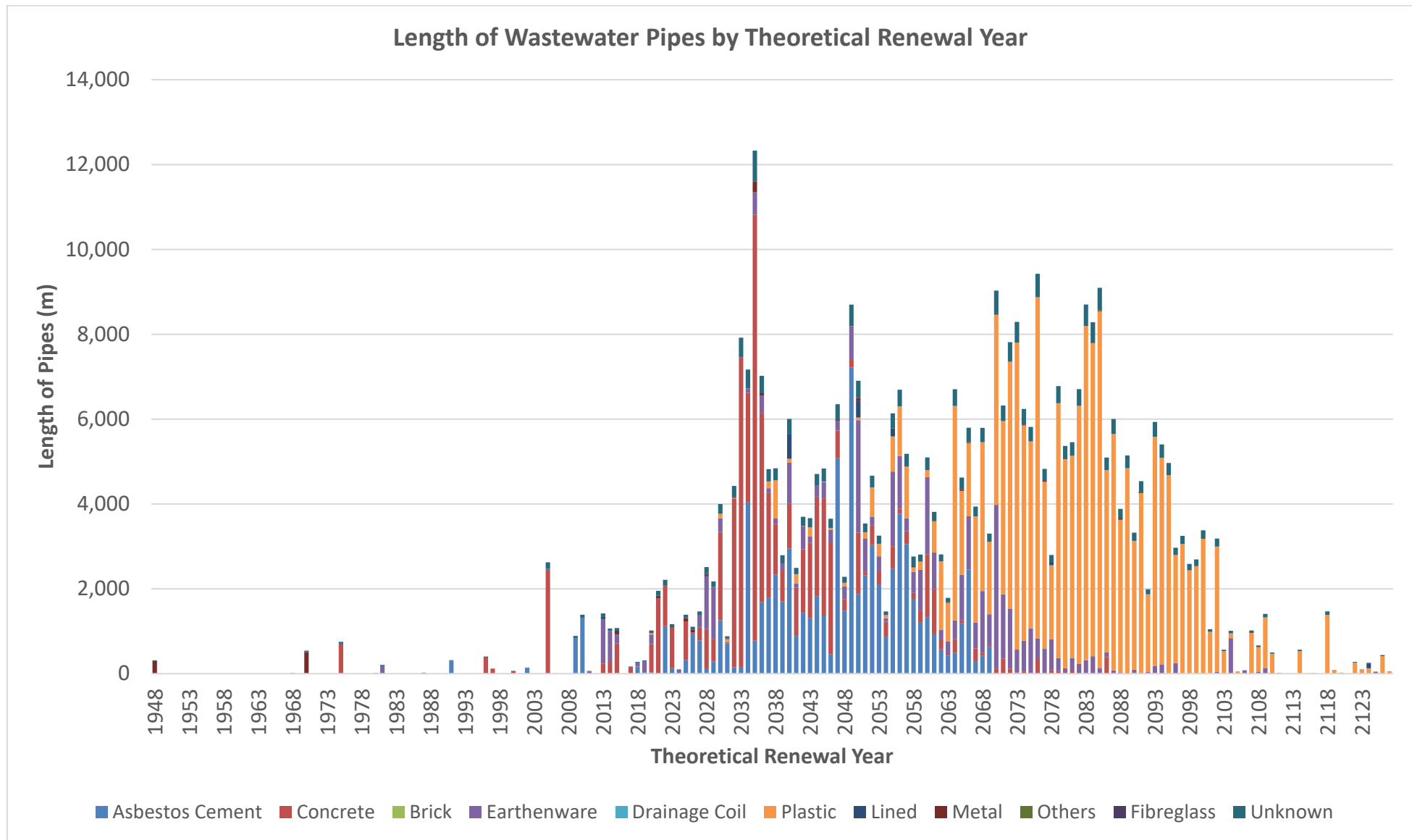
It is clear from the pipe renewals graph (Figure 4-4) that there is a significant lift in the amount of renewals required in the period from the mid 2030's onwards (a renewals "bow wave").

In order to ensure assets are able to be renewed, in terms of affordability, prior to their associated levels of service dropping then it is likely some assets will be renewed early (most likely coinciding with upgrades) and some renewals will be deferred where asset condition merits this approach.

The budget approach taken within this plan will be to ramp up spending (from approximately \$1.5 million in 2024/25 to in excess of \$10 million in 2043/44) on pipe renewals and then maintain a degree of consistency of spend over a period of time. This will encourage efficiency and provide a degree of certainty to the market.

The Atawhai Rising Main (pumped pipe that connects the majority of the city to the NWWTP) has been excluded from Figure 4-4. The reason this has been done is that it is a significant asset that is budgeted for separately in the Plan budget programme; additionally there has been remedial work undertaken on the pipe at critical locations that have extended the base life of this asset.

Figure 4-4: Theoretical Renewal Year / Material Distribution



Issue 4: Wastewater overflows

Overflows occur in the network when, for a variety of reasons, the network is overwhelmed and excess wastewater volumes are released at “weak” points. Overflows are primarily linked to wet weather events however they are also caused by blockages and breakages within the system. A significant issue that contributes to wet weather overflows occurring is Inflow and Infiltration (I&I). In summary I&I is the entry of water (typically groundwater or stormwater) into the wastewater network, typically, unintentionally. It is an urban issue nationally and around the globe.

Above ground, inflows during rain events can happen when stormwater flows through manhole lids, low gully traps, crossed connections between stormwater pipes and sewer pipes and deliberate redirection of stormwater into sewer mains.

Below ground, infiltration occurs when groundwater enters sewer pipes through cracks in the pipes, failed joints, broken pipes, poor lateral connections and a similar range of issues associated with manholes and pump stations.

High groundwater levels arise from existing natural seepages, rain saturation, tidal and river effects and on site stormwater soakage; these exacerbate the below ground issues. As sea levels rise an increased focus on parts of the network that is susceptible to tidal inflows will be required. Addressing the issues of inflow and infiltration requires the efforts of both council and the community.

Central government regulatory and Whakamahere Whakatū Nelson Plan changes are expected to provide some degree of guidance with respect to this issue particularly in regards to the level of overflows that are acceptable.

The Ministry for the Environment's *Action for Healthy Waterways* has outlined the intention to consult upon and develop a National Environmental Standard – Wastewater (NES-WW). As wastewater overflows are a national issue it is expected that the NES-WW will provide guidance related to how an approach to managing wastewater overflows should be developed.

The updating and calibration/verification of the two hydraulic models is key to understanding network performance and where constraints exist. Therefore enabling better decision making and investing appropriately to reduce wastewater overflows. This work has commenced.

Misconnections to NCC's reticulation system and broken pipes on private property are challenging to resolve either through education or regulation and will be the subject of ongoing educational efforts.

To have the best chance of completely solving the issue, Council would have to replace most of the wastewater network, including privately owned pipes and pump stations, and ensure stormwater was being disposed of appropriately across the city (which itself is a challenging piece of work particularly where there is no existing stormwater network).

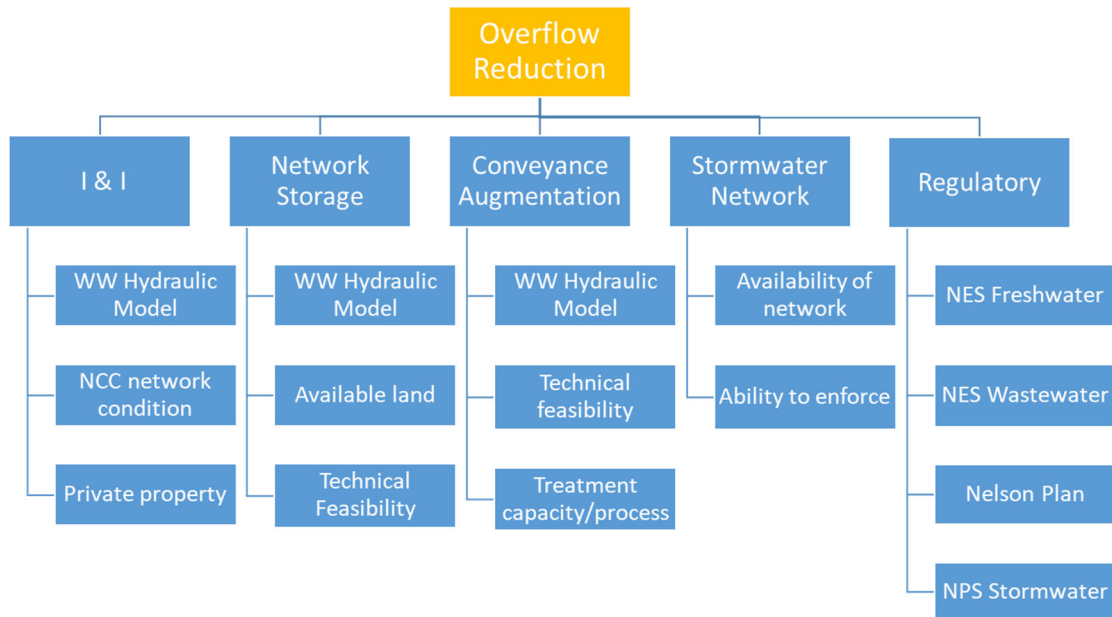
One approach, and likely a part of any solution to limiting wastewater overflows, is to upgrade the system downstream (to carry flow away from areas prone to overflows) and/or provide storage to minimise overflows by:

- Developing a holistic strategy, using the hydraulic model to predict where there is a higher likelihood of overflows.

- Factoring in the entry of some stormwater and groundwater into the wastewater system by increasing network capacity, potentially including the ability to store limited amounts of wastewater.
- Continuing to investigate high E.coli readings in water samples and repair any damage in the public network with urgency (noting that the network is, in the natural order of things, constantly degrading).

Figure 4-5 Outlines the intricacies associated with the overflow reduction programme.

Figure 4-5: Overflow Reduction work streams



The Plan budgets reflect this as an ongoing area of focus and reaffirm Council’s commitment to minimise the impact of wastewater overflows on the community. Projects/programmes specifically linked to overflow reduction work include:

- Inflow and Infiltration/Overflow Reduction Programme.
- Washington Valley/Hastings St Sewer Upgrade.
- Pump Station Resilience.
- System Performance Improvements.
- Wastewater Pipeline Renewal Programme.

Issue 5: Failures of the Atawhai Rising Main are occasionally causing untreated wastewater discharges directly into Nelson Haven

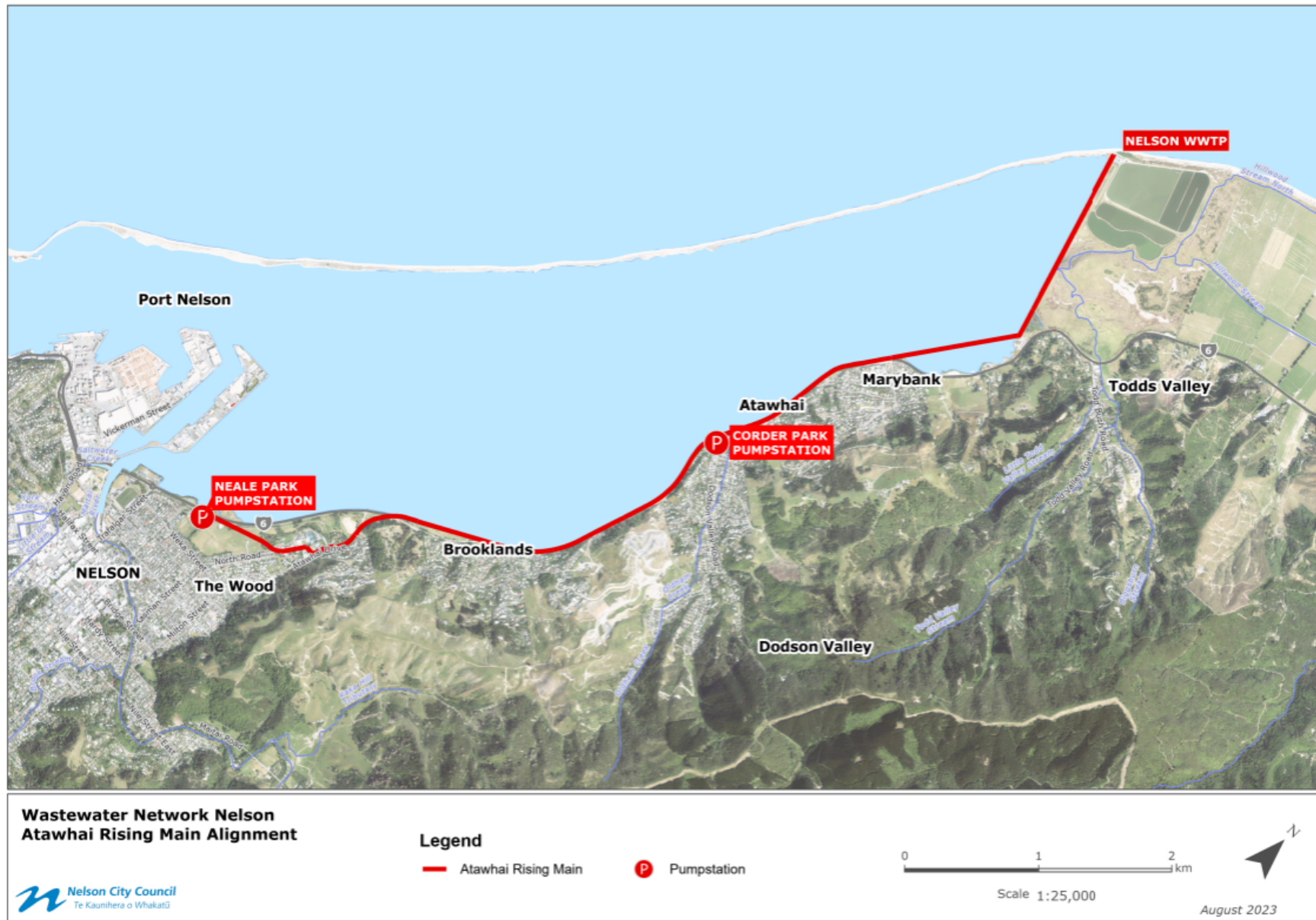
The history of this pipeline is given in section 4.1.2 of this Plan. It is a high value and fragile asset and it requires replacement in the near future. Figure 4-6 identifies the alignment of this key asset.

The pipes that make up the Atawhai Rising Main are mostly concrete. The primary issue associated with this pipe is the degradation of the concrete and reinforcing steel by sulphuric acid. Sulphuric acid is generated by the release of hydrogen sulphide gas at air pockets along the length of the pipe.

Extensive repairs were carried out in the 1990s replacing some of the concrete pipes with fibreglass, however further failures have occasionally caused small volumes of untreated wastewater to directly discharge into the Haven.

These occasional untreated wastewater discharges impact on coastal water quality, cultural values, and public perceptions of the quality of the environment. They also have the potential to affect Council's compliance with future resource consent conditions, as the regulatory environment related to discharges of wastewater to the environment is likely to become more stringent over time in particular in relation to the National Policy Statement – Fresh Water Management.

Figure 4-6: Atawhai Rising Main



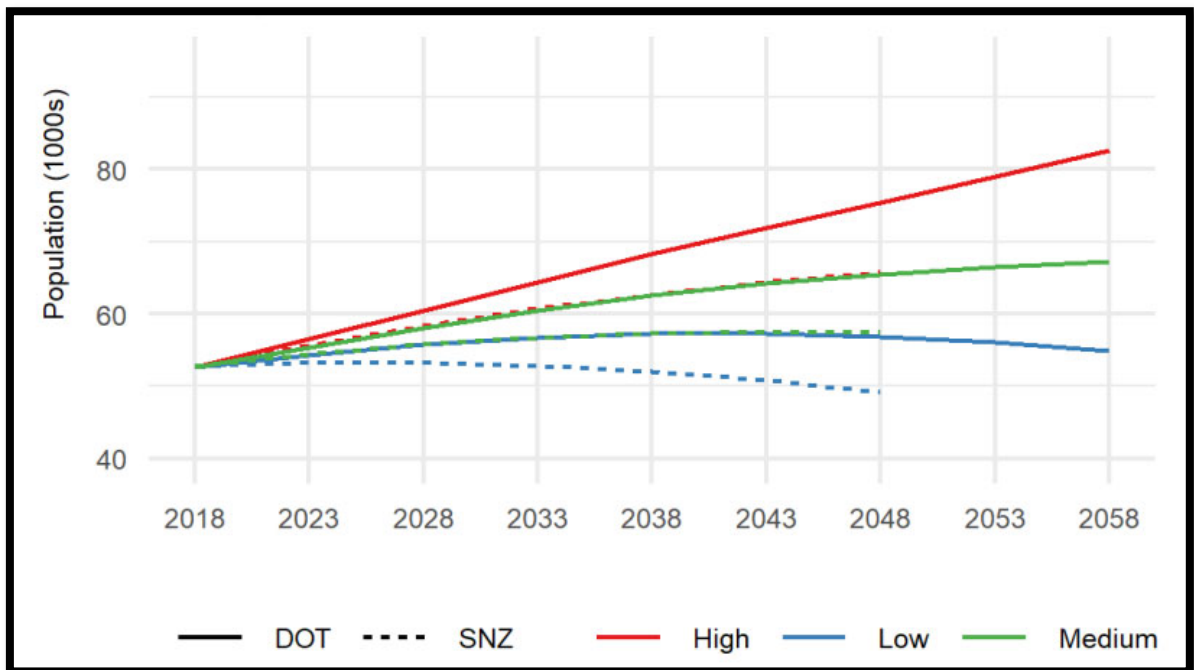
Issue 6: Management of increased wastewater flows associated with urban intensification and growth

Between 2001 and 2018 average annual growth rates ranged between 0.64% and 1.91%. Population growth rates between 2006-2018 were unusually high compared to long term patterns (approximately double the rates for 1996-2006) and it is unlikely that growth will continue at this rate for the duration of the projection period.

The rates of growth in Figure ES-11 are based on commissioned demographic analysis and reflect the medium scenario projection from the findings of this analysis. These projections are higher than those produced by Statistics New Zealand, primarily due to higher net migration assumptions used for this analysis.

Nelson’s population is expected to increase by 5,013 between 2023 and 2033 to 60,419. The projections suggest a relatively modest annual average growth rates for 2023-2033 of around 0.9%. Growth rates are likely to decline over time due to structural population ageing.

Figure 4-7: Population growth and projections, 2023-53, Nelson



The need to respond to growth/intensification is expected to be a constant into the future and that there will not always be clarity on exactly how this will unfold. As such whilst programmes will be planned/developed to support this there will be a need to be responsive and to ensure costs are apportioned appropriately.

The following documents set out the city’s future urban capacity requirements and identify where urban intensity and growth are planned to take place over the next 30 years in Nelson.

- National Policy Statement – Urban Development (2020)
- Future Development Strategy (2022)

National Policy Statement – Urban Development (2020)

The National Policy Statement on Urban Development 2020 (NPS-UD) requires local authorities to ensure there is sufficient development capacity to meet demand over the next 30 years with specific zoning and servicing requirements over different time frames:

- in the short term (within 3 years)
- medium term (3-10 years)
- long term (10-30 years)

The location of actual growth will depend on where there is capacity for residential growth (residential zoning, infrastructure servicing) and where development is feasible. Residential growth areas are provided in *section 3.5 - Asset programmes to meet demand*.

The Nelson Tasman Future Development Strategy 2022

The Nelson Tasman Future Development Strategy 2022 (FDS) provides capacity for about 24,000 houses over the next 30 years in the combined urban environment.

In Nelson, the FDS identifies capacity for about 11,500 new dwellings, with 78% of this growth to be achieved by adding new housing into existing urban areas, and the remaining 22% expected to be through new greenfield expansions. This proportion reflects community feedback supporting growth through intensification of existing urban areas rather than expansion onto rural land.

Provision of intensification infrastructure is identified for the City Centre, Stoke and Tāhunanui, where higher density and mixed-use environments will see growth consolidated. Most of the new greenfield potential identified are within the Maitai, Marsden, and Ngawhatu valleys. Parts of Nelson Central and Tāhunanui are subject to flood risks and future intensification will be guided by the outcome of a Dynamic Adaptive Planning Pathways process, which is currently underway.

Implementation of intensification projects is more complex than traditional expansion. The Council does not have full control over the location or level of uptake of intensification or urban expansion opportunities, as this is largely dependent on decisions by individual landowners and/or developers. Where the Council can take a lead include:

- Identify priority areas.
- Lead investment in urban amenity and public transport to encourage growth in specific areas, such as the City Centre.

Ensuring wastewater capacity is available to facilitate growth and intensification.

The nature of development with its market driven uncertainties relating to location and timing mean that, while some preplanning can be undertaken, there is a need to have some flexibility in relation to where work is undertaken to meet demand requirements.

Reducing inflow and infiltration and freeing up network capacity is supportive of growth and development. There is some opportunity to increase the current pipe diameters when the network is renewed.

The wastewater hydraulic model is the key tool that enables a good understanding of current constraints within the system and future constraints based on what is currently known about growth/intensification areas. This will enable key decision making when considering network renewals, upgrades and storage.

4.1.2 Physical Parameters

Summary of Assets

Nelson City Council is responsible for a wide variety of assets that constitute the Council Wastewater System. Table 4-4 shows the wastewater assets managed by Utilities as of June 2023.

Table 4-4: Summary of Assets

Asset Category	Quantity June 2023	
	km	units
Reticulation Pipes (gravity – up to 150mm diameter)	344	
Trunk Mains (gravity – 200mm diameter and above)	36.1	
Swallow Mains (pressure gravity – 200 to 525mm diameter)	5.2	
Rising Mains (pressure – 100mm to 900mm diameter)	25.3	
Access points		1,114
Manholes		7,232
Tanks (flushing and storage)		7
Valves		248
Neale Park Detention Tank		1
Pump Stations		26
Neale Park Pump Station		1
Corder Park Pump Station		1
Nelson Wastewater Treatment Plant		1

Wastewater Treatment Plant and Disposal

The Nelson Wastewater Treatment Plant (NWWTP) serves the central and northern catchments of Nelson City, comprising mainly the city commercial area, domestic residences, and a small percentage of industrial discharges. The wastewater is collected by a reticulation system then pumped from the Neale Park Pump Station (via Corder Park Pump Station) along the 9.8 kilometre, 750-900mm diameter rising main (Atawhai rising main) to the NWWTP at the northern end of the Nelson Haven. The NWWTP currently treats approximately 6,000-8,000 m³ per day of effluent that comprises trade wastes and domestic sewage.

Wastewater Treatment History

Wastewater has been discharged from the outfall at North Nelson into Tasman Bay since 1970. Initially it was untreated, but in 1979 Council constructed the present oxidation pond to treat the wastewater prior to discharge.

In 1996 the NWWTP was upgraded by constructing a bund to divide the single oxidation pond into a primary facultative pond and a secondary maturation pond. This largely achieved the intended improvement in effluent quality, particularly in regard to faecal coliform reduction.

The ponds “crashed” (caused by an imbalance between loading rates and the available algal/bacteria to process the waste) for a three month period in 1999 and it was concluded that the facultative pond was overloaded during the winter period and the dividing bund was removed in February 2000. This improved the operational capacity of the pond but returned the quality of the effluent to pre-1996 levels.

The Wastewater treatment plant has been monitored comprehensively since 1999, in terms of flow, load, pond algal condition, and other parameters.

Nelson Wastewater Treatment Plant

The Nelson Wastewater Treatment Plant (NWWTP) upgrade, substantially completed in 2008, was designed to comply with the requirements of the 2004 resource consent. The design of the new plant has allowed for better management of variable inflows and allows adjustments in operation to be made to reduce the negative effects of winter conditions on the pond operation. The treatment concept is based on:

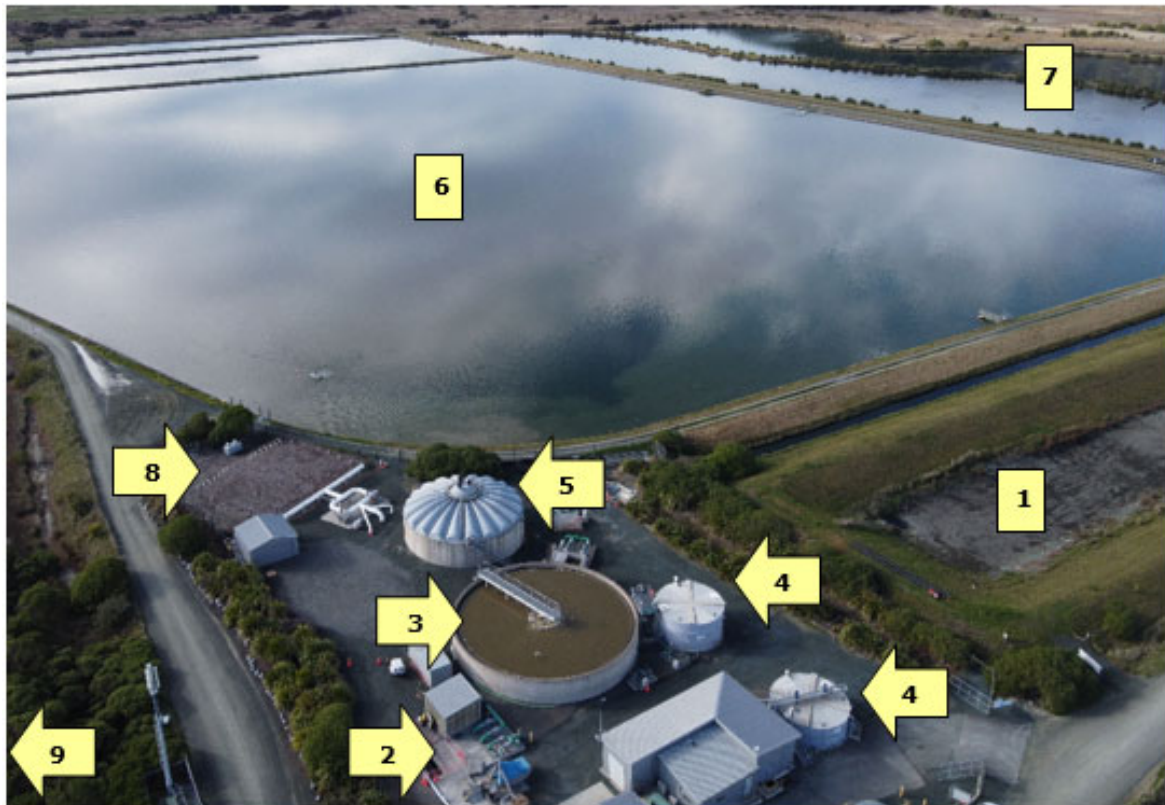


- Removing gross solids through the inlet works.
- Pre-treating the influent flow to remove Biochemical oxygen demand (BOD).
- Pond based treatment for the removal of BOD and total suspended solids to the consent criteria.
- Disinfection using the maturation ponds.
- Final “polishing” of effluent via passage through a constructed wetland.

While improvements in odour generation have been made there are still recurring odour issues that have to be addressed.

Periodically the oxidation pond compartments require desludging. Desludging was last completed in 2014.

Figure 4-8: Nelson Wastewater Treatment Plant



The main components of the NWWTP (as numbered in Figure 4-8) are:

1 – Flow Buffer

During periods of high rainfall, inflow to the plant can be directed to the flow buffer to keep the plant from being overwhelmed. Once flows have dropped off, this wastewater is returned to the plant for treatment.

2 – Screening and Grit Removal

The screening and grit removal system removes non-organic material (typically sanitary products and stone/sand) from the wastewater. This is compressed and taken to landfill for disposal.

3 – Clarifier

The clarifier removes suspended solids from the wastewater by gravity. Organic solids (sludge) settling out of the wastewater are forced to the centre of the tank by scrapers on a revolving mechanical arm inside the tank and pumped into the sludge tank.

4 – Sludge Tanks

Organic sludge from the clarifier is thickened by the mechanical removal of some of the liquid content and then stored, before being transported to Bell Island Wastewater Treatment Plant where it is further treated and sprayed as fertiliser on Rabbit Island pine forests.

5 – Trickling Filter

The trickling filter contains plastic media over which wastewater pumped from the clarifier is distributed via rotating arms. The trickling filter utilises a fixed growth process designed to further reduce the BOD of the wastewater.

6 – Oxidation Ponds

There are two oxidation ponds at the Nelson Wastewater Treatment Plant, a facultative pond and a maturation pond. The ponds use biological, natural treatment (algae, wind, sunlight and settlement) to reduce the level of BOD, suspended solids and faecal coliforms in the wastewater.

7 – Wetlands

The wetlands provide a degree of further effluent treatment (or polishing) before treated wastewater is discharged out to sea. The wetlands also meet the cultural aspirations of local iwi.

8 – Bio-filter

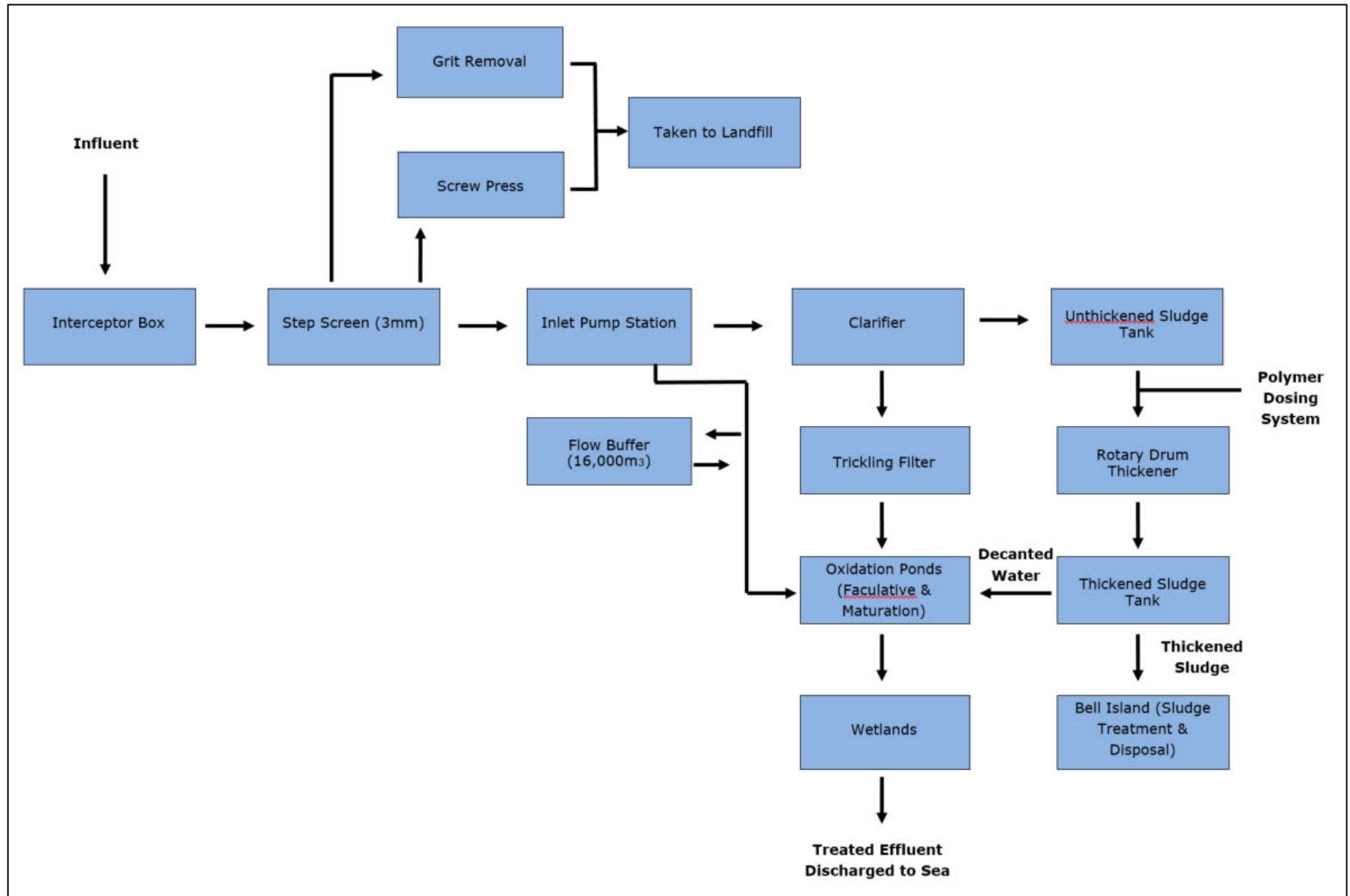
The bio-filter uses air, water and bark to neutralise odours which are extracted from the treatment plant components (excluding oxidation ponds).

9 – Outfall

The outfall pipe goes 350m into Tasman Bay

The Schematic of the treatment process is shown in Figure 4-9 and also refer to Appendix B for the process flow diagram.

Figure 4-9: Nelson Wastewater Treatment Plant Process Schematic



NWWTP Effluent Quality - Performance

The upgraded NWWTP became fully operational on 9 March 2008 and the resource consent took effect from this date. Monitoring results to date indicate the upgraded wastewater treatment plant can achieve full compliance with all effluent quality conditions of the consent.

Odour Events Originating from the NWWTP

The NWWTP has had a history of odour complaints. The majority of these complaints originated from the ponds during seasonal changes which tended to produce odours, predominantly during winter/spring months. Prior to the upgrade, treatment relied solely on the oxidation ponds which is a form of treatment that uses naturally occurring bacteria and algae to break down the products in the waste stream in an aerobic process; however this form of treatment is sometimes susceptible to seasonal climatic fluctuations.

One of the most significant challenges with this type of operation is maintaining a balance between pond loading and available algae to process the waste. When the balance is not sufficiently consistent, either through elevated waste loading or seasonal changes in algae, the ponds are susceptible to "crashes" in algal populations which can lead to odour. An additional possible source of odour is the accumulation of sludge which settles to the base of the oxidation ponds.

The 2008 upgrade to the NWWTP introduced a range of measures that allow the plant operator to manage the pond loading by removing solid waste as sludge before it enters the pond.

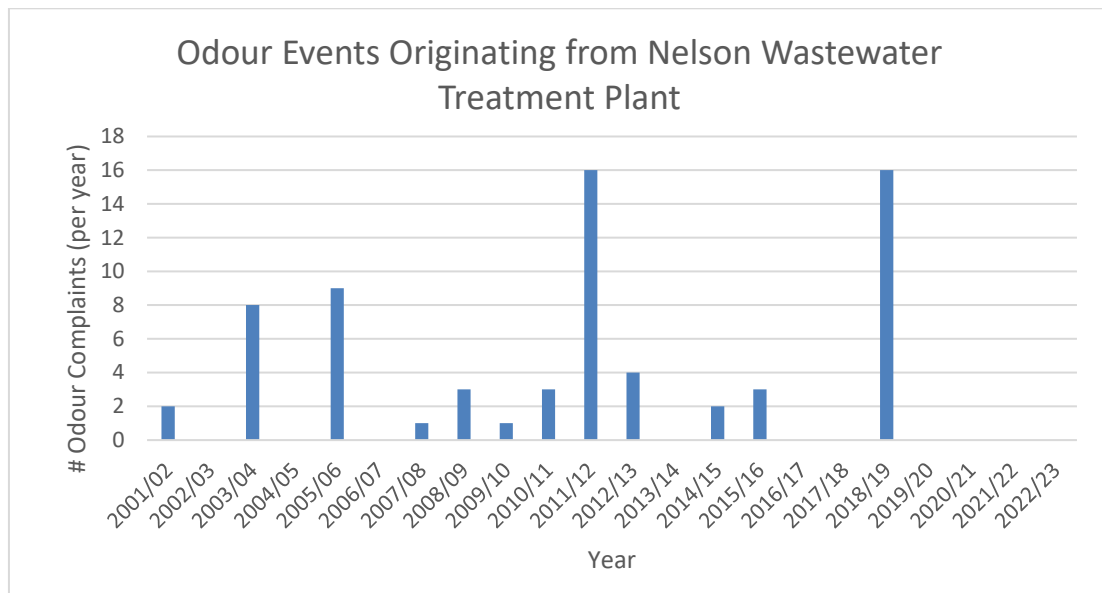
The current resource consent (expiring in 2024) has the following condition for odours: "There shall be no discharges to air from the wastewater treatment plant which are objectionable or offensive at any point on or south of SH6".

To date it has not been possible to continuously comply with this condition. A detailed investigation between Council, engineering consultants and the plant operator in 2013-14 centred on the accumulation of sludge in the oxidation pond (and the subsequent anaerobic decomposition processes) as a likely source of odour production. In 2014 Council de-sludged the ponds. A cover was also constructed over the trickling filter. Compliance with the resource consent improved.

In October 2018, an infection in the main algal population led to the ponds crashing and resulted in odour complaints. After this event, a Pond Management Team was formed (consisting of the plant operator and treatment process and algal experts) who monitor pond conditions closely (algae samples, dissolved oxygen, temperature, etc) and respond to any changes to keep the ponds in balance. This could be in the form of reducing load via the treatment plant and sludge removal process, or via algal seeding, where wastewater is recirculated between the ponds or from the wetlands back to the ponds.

Additionally minor process changes have been undertaken to enable a quicker response to changes in pond conditions. Compliance with the resource consent will continue to be closely monitored.

Figure 4-10: Odour Events Originating from Wastewater Treatment Plant



Outfalls

Nelson has two outfall structures within its territorial boundaries - the Fisheries Outfall and the Nelson Wastewater Treatment Plant Outfall.

- **Nelson Wastewater Treatment Plant Outfall:** Constructed in 1970 using 900mm diameter reinforced concrete pipes and a multi-point diffuser.

Nelson City Council is responsible for the maintenance and repair of this structure.

- **Fisheries Outfall:** The fisheries outfall is owned by the Nelson City Council. However the fish processing companies are responsible for the operating and maintenance costs of the outfall, including the pump station, and therefore it does not have any impact on Council's asset management capital expenditure.

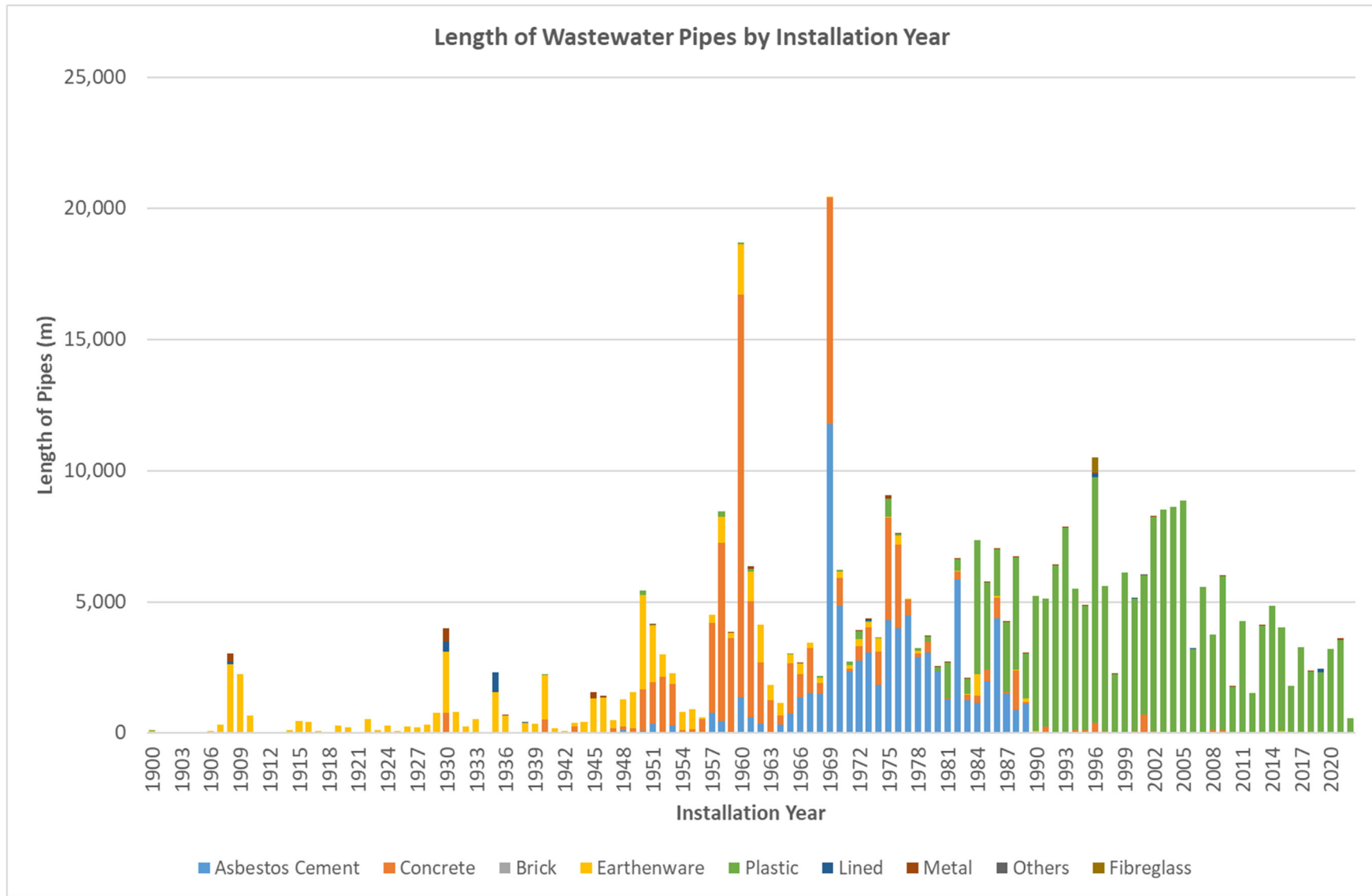
Reticulation

The main purpose of the reticulation system is to take effluent from the customer's point of discharge (Nelson City Council mains) and transport it to the treatment plant. The reticulation system consists of the following key components:

- 100mm diameter lines, typically serving 2-5 households (some of these are private, some public and some private common).
- 150mm -200mm diameter gravity reticulation mains.
- Gravity trunk mains >200mm diameter.
- Manholes/Lamp Hole Cleaning Eyes.
- Swallow mains (gravity pressure pipes).
- Rising mains (pumped pressure pipes).

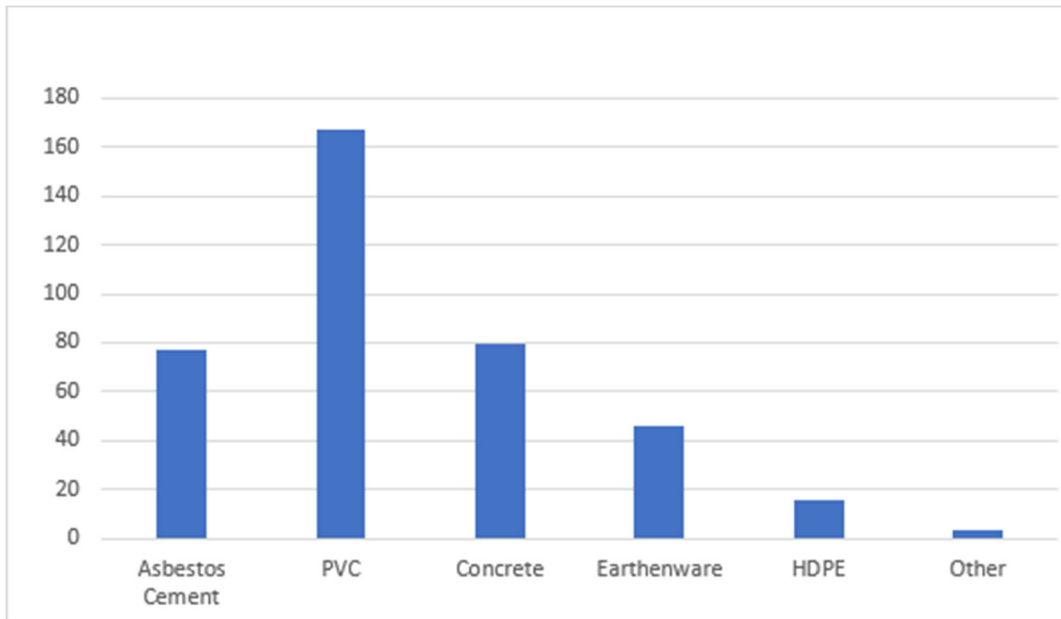
The Nelson City Council has wastewater pipe assets ranging from new to about 110 years of age. The distribution of pipe length verses age can be seen in Figure 4-11.

Figure 4-11: Year of Installation / Material Distribution



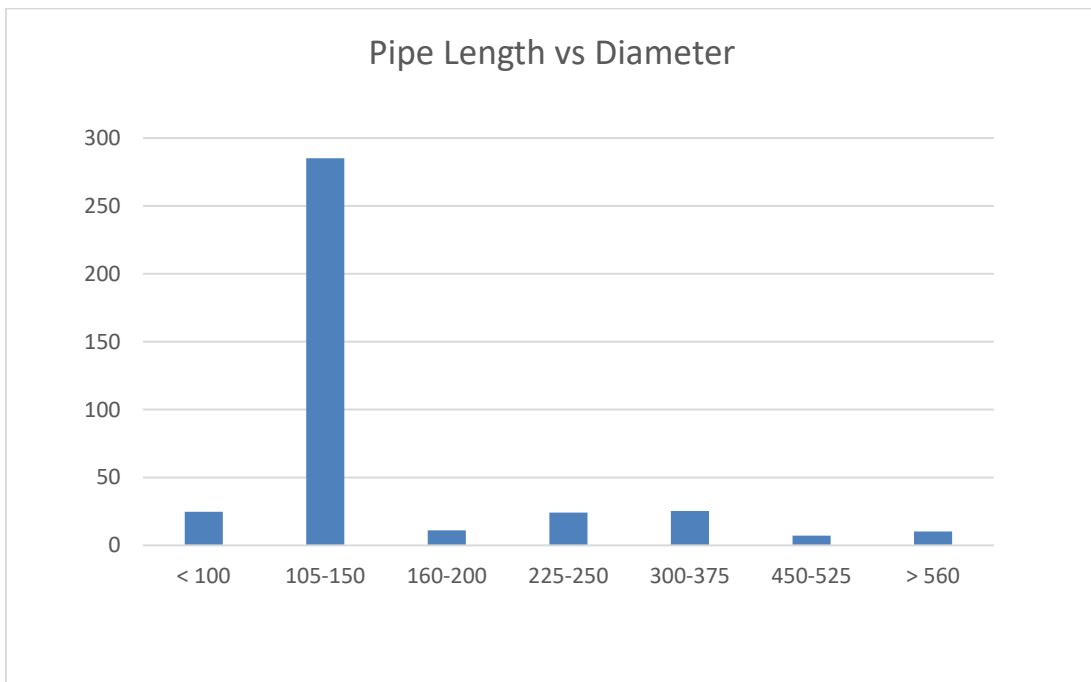
The pipe install date distribution continues at a relatively steady rate for the pipes installed from the 1950's to the present date. This is in line with the population growth in Nelson over the last 60 years and increases in Levels of Service.

Figure 4-12: Summary of Pipe Materials vs km – June 2023



PVC has been the predominant pipe material used and this can be seen in Figure 4-12 where it makes up approximately 40% of the Nelson City Council reticulation. Asbestos Cement and concrete are the next most common materials and were a popular choice for distribution mains and some trunk mains in the 1950s to 1980s.

Figure 4-13: Gravity Main Length vs Diameter – June 2023



The pipe diameter that forms the majority of Nelson City Council's pipe assets are 150mm diameter pipes as outlined in Figure 4-13. This is the default minimum for public sewers typically used in New Zealand.

Table 4-5 shows typical useful lives of network pipelines; this has been derived from industry knowledge and local performance data.

Table 4-5: Working Life of Wastewater Reticulation Assets

Material	Good Soil (Yrs)	Average Soil (Yrs)	Poor Soil (Yrs)	Pressure (Yrs)
Black Asbestos Cement	80	70	65	40
Asbestos Cement	80	70	65	40
Blue Brute Pipe	80	80	80	N/A
Ductile Cast Iron	65	55	50	40
PitCast Iron	85	75	70	40
Spun Cast Iron	90	80	75	40
Cast Iron	80	70	60	N/A
Concrete (InsituFORM lined)	70	70	70	40
Concrete	85	75	70	45
Earthenware	120	110	105	N/A
Earthenware Synthetic Lined (ESWL)	120	120	105	N/A
Fibreglass	90	90	90	60
MDPE/HDPE	105	105	105	60
PVC	80	80	80	50
Steel Concrete Lined	85	75	70	45
Unknown	85	75	70	N/A
Atawhai Rising Main Life	N/A	N/A	N/A	72
Soil condition - Poor refers to low lying sandy areas, subject to salt water infiltration. - Average soil conditions are gravel areas - Good soil condition are clay areas				

It is important to note the "bow wave" present in both Figures 4-14 and 4-15 ; also refer to section 4.1.1 Issue 3.

Figure 4-14: Estimated Renewal Cost Year / Material Distribution

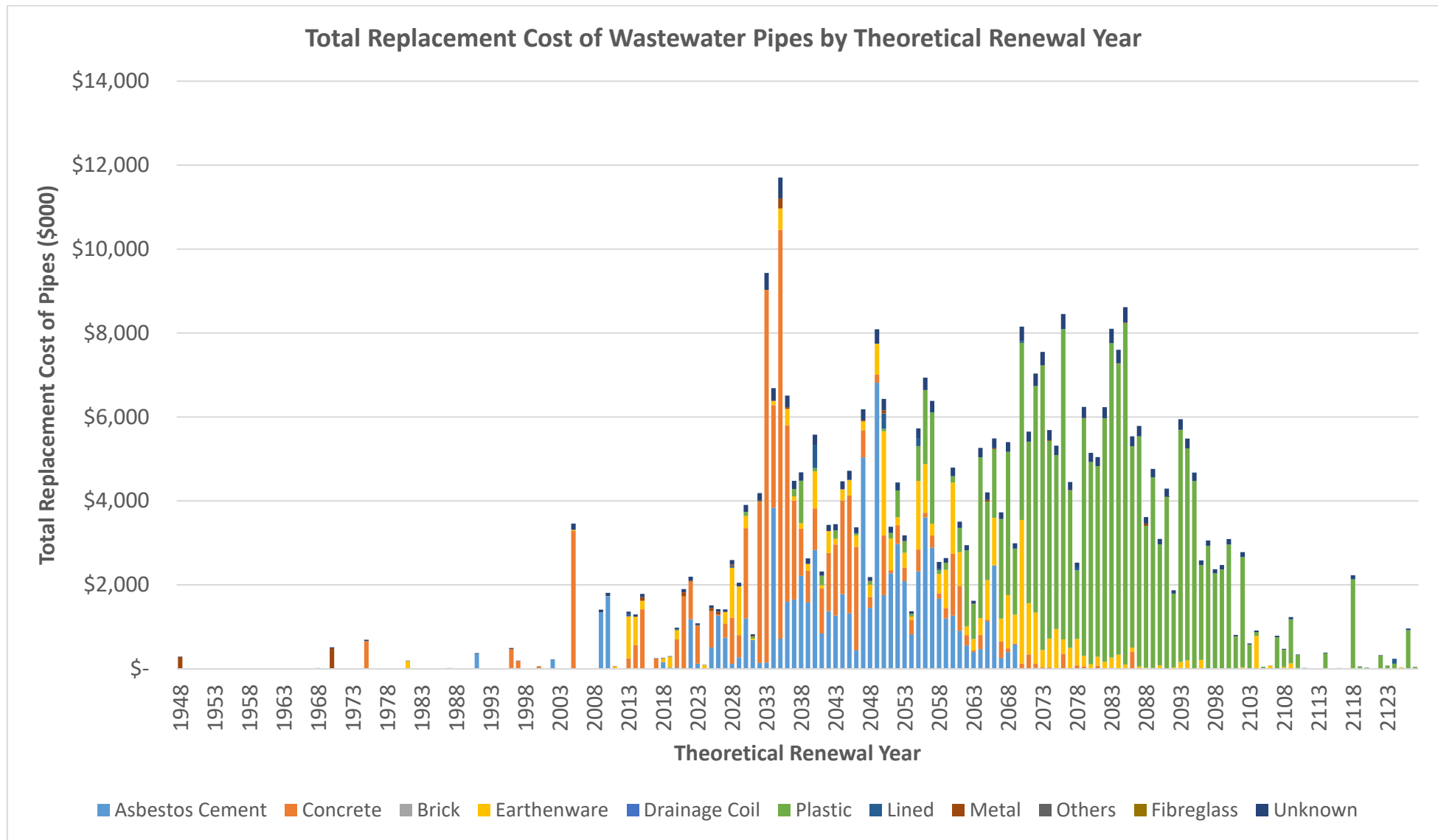
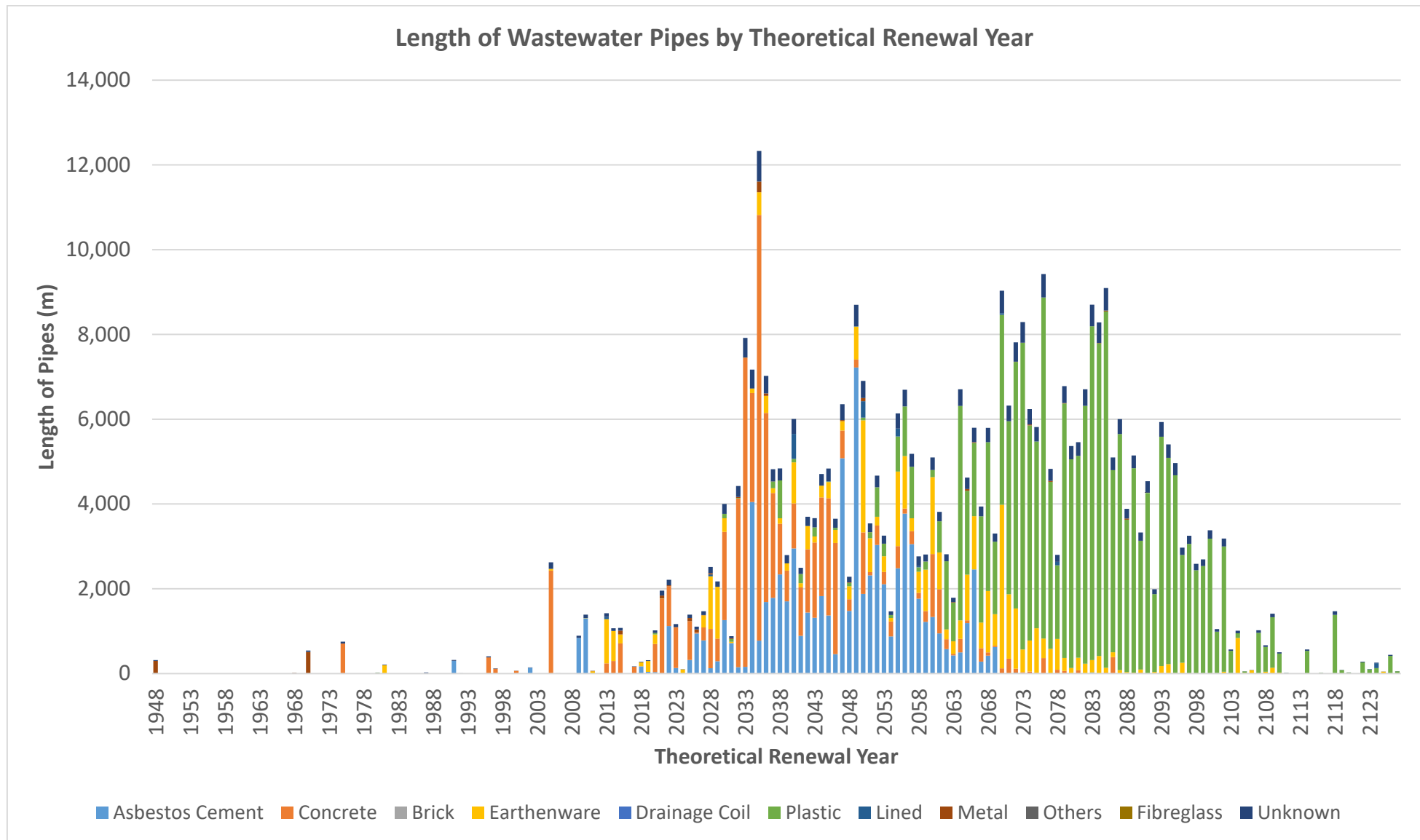


Figure 4-15: Theoretical Renewal Year / Material Distribution



Wastewater network odour issues

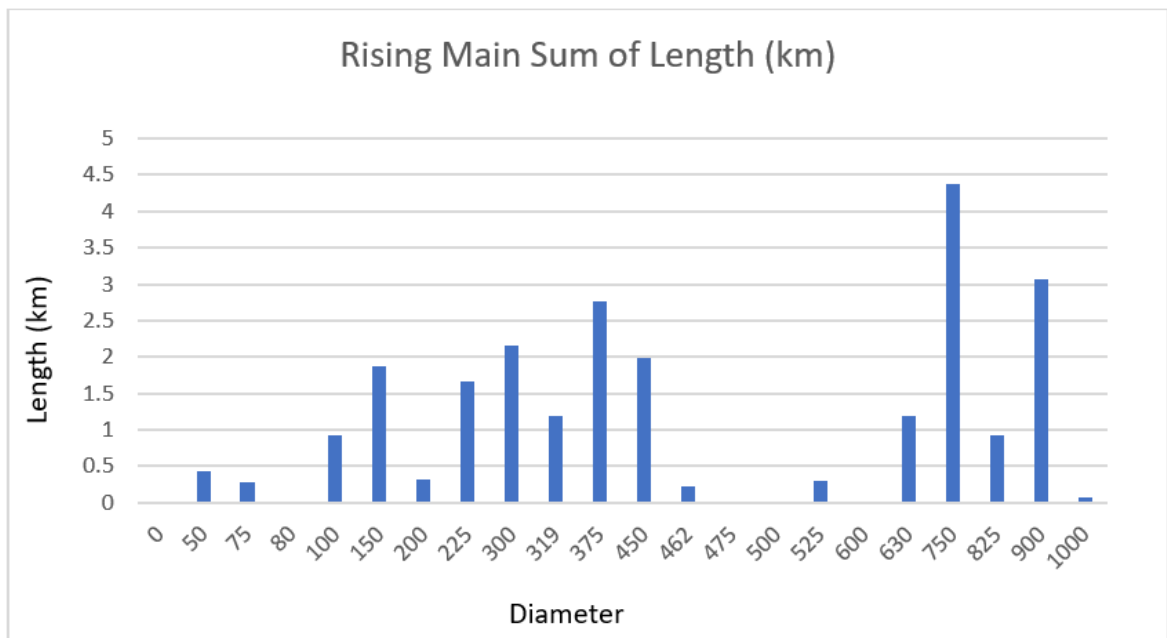
Odour complaints from different areas of the network do occur. Most complaints come from the operation of pump stations (and associated air valves) and the Nelson Wastewater Treatment Plant.

Odour complaints from pump stations and air valves have resulted in the installation of activated carbon filters which have proved to be very successful. When odour complaints are received they are investigated when identified to be more than a “one off” event with a view to developing a solution.

Rising Mains

Rising mains are the pressurised lines that transfer wastewater from a low point to a higher point within the network. For total length information see Table 4-4. Figure 4-16 outlines length vs diameter information.

Figure 4-16: Rising main length versus Diameter – June 2023



Atawhai Rising Main

The Atawhai Rising Main was constructed in the mid 1960’s from reinforced concrete pipes with approximately 50mm thick walls. Failure of sections of this pipe in the early 1990’s from sulphuric acid attack led to a comprehensive inspection and remediation project to extend the rising main’s service life. These remediation works consisted of replacing the worst affected pipes with fibreglass pipes, relining others with acid resistant fibre reinforced resin sleeves and grouting pipe joints. The remediated pipeline was expected to have a service life out to 2046.

Recent failures have prompted further investigation into the condition of the Atawhai Rising Main. Due to the complexities of access to undertake internal inspections these have only been partially conclusive and consequently the planned renewal of this pipe has been bought forward.

The renewal and upgrade of the Corder Park and Neale Park pump stations have reduced the pressure on the Atawhai Rising Main consequently reducing the risk of pipe failures.

Swallow Mains (Pressurised gravity pipes)

To minimise pumping costs, a system of gravity pressure sewers (swallows) is used to convey effluent from the higher central city areas, under the Maitai River to the Neale Park Pump Station. For total length information see Table 4-4.

Manholes/Lamp Hole Cleaning Eyes

Newer manholes in Nelson are typically concrete and 1050mm in diameter. Older manholes are constructed of bricks and of varying sizes. Most manholes installed since the 1950s are constructed of pre-cast concrete. Lamp hole cleaning eyes are used where access points are required at less than usual spacing such as on hillsides and where multiple changes in direction are needed over a short distance. Lamp hole cleaning eyes are typically constructed from small diameter pipes and do not allow person access to the reticulation.

Gravity Trunk Mains

Trunk mains are defined as all sewers greater than 150mm in diameter. They generally carry high flows (as a consequence of conveying wastewater from relatively high numbers of properties) and are the lines that discharge into the pump stations. For total length information see Table 4-4.

Pump Stations

The Nelson City Council is responsible for 27 wastewater pump stations, ranging in size from the smallest serving the Tahuna skating rink to the main pumping stations for central Nelson at Neale Park and Corder Park. All pump stations have telemetry installed.

Work is currently underway to ensure that pump stations have adequate storage or are as resilient as feasible to guard against overflow events. Table 4-6 outline typical asset lives for pump station components and figure 4-17 is a schematic identifying each of the pump stations.

Table 4-6: Asset Lives Pump Stations (Years)

Component	Structure	Steelwork	Pump	Electrical	Valves	Telemetry	Flow Meters	Biofilters
Life	50	30	30	15	30	10	10	20

The general layout of the pumping system is detailed in Figure 4-17.

Neale Park and Corder Park Pumping Station (Atawhai Rising Main Pump Stations)

Wastewater from the central city is reticulated via gravity and pumped main to the Neale Park Pump Station and then pumped to Nelson Wastewater Treatment Plant via

the Corder Park Pump Station. The route of the rising main (pressurised pipe) follows Atawhai Drive and then the State Highway. Along the length of this pipe several smaller catchments connect to the rising main through injector pump stations.

Council has undertaken a comprehensive upgrade of Neale Park and Corder Park Pump Stations in recent years which includes the installation of fixed emergency power generation. Additionally, most of the injector pump stations have also been upgraded to standardise electronic controls and install variable speed drives. These units electronically control the speed of the pumps to match the pumping rate with the flow of wastewater into the pump station. This extends the life of the pumps and reduces electricity costs. Several of the injector pump stations have also had pumps renewed in recent years.

Awatea Place – Pumping Station, Rising Main and Trunk Main upgrades

In the Stoke/Tahuna area the two pump stations in Parkers Road have been replaced with a single new pump station adjacent to Awatea Place. The new pump station will connect to the Nelson Regional Sewerage Business Unit pump station at Nelson Airport. Upgrades to the trunk mains were required to link the existing pipework with the new pump station. Installing a single larger pump station in Awatea Place will significantly reduce operating and maintenance costs. It includes modern odour control equipment and provides a level of storage in event of emergency.

Pump Station Systems and Power Failures

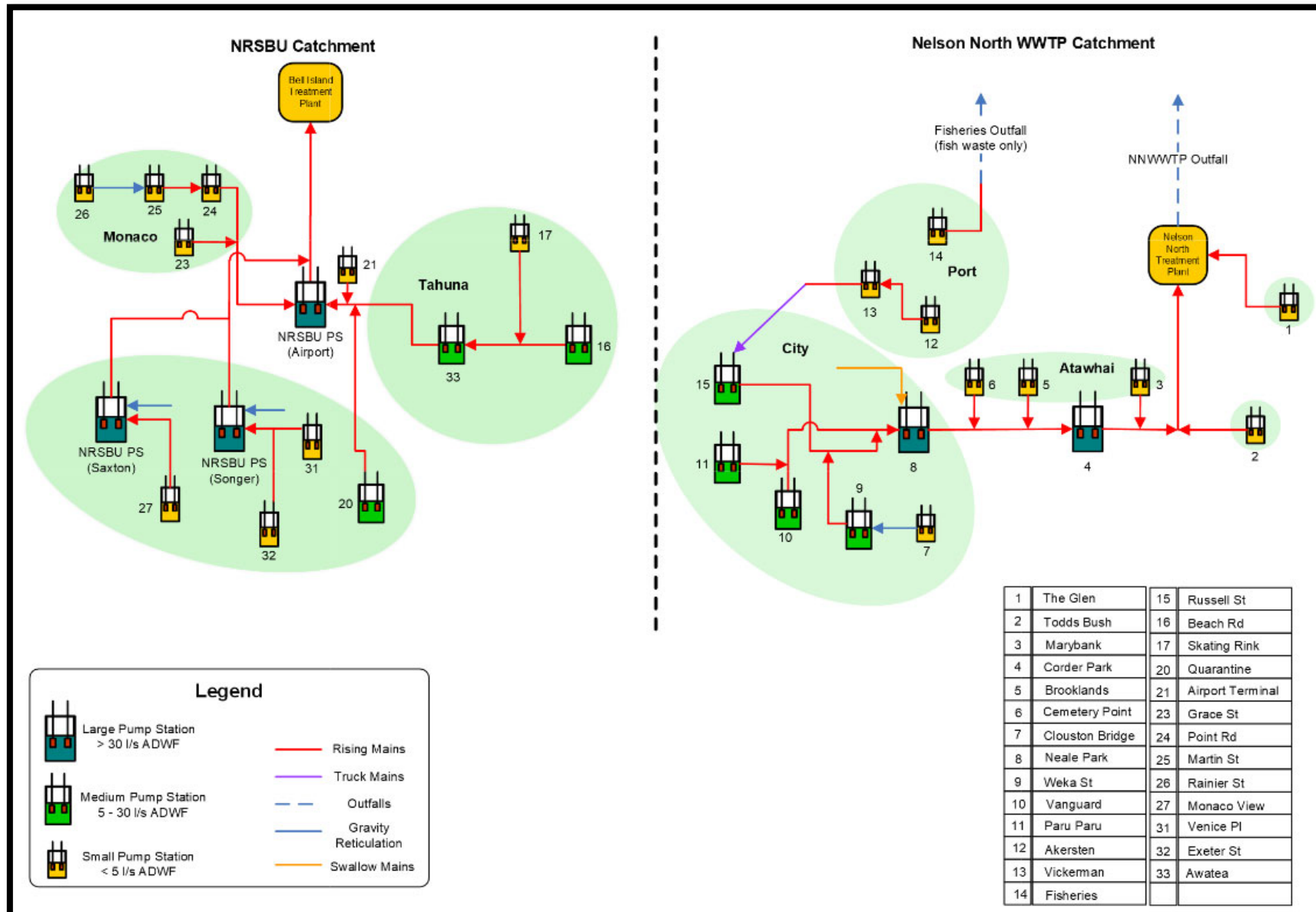
All pump stations are monitored by a Supervisory Control and Data Acquisition (SCADA) / telemetry system. In the event of a system or power failure, the system notifies on-call operators to take the necessary action.

The options available to cope with the consequences of a power failure event are standby power and emergency storage. Details of Council's standby power generators are in Appendix C.

Pump Stations and Network Storage

Both the Nelson Tasman Land Development Manual and resource consents RM105388 & RM105388A require all new pump stations to have a four hour dry weather flow storage capacity. This is seen as a key element in minimising the risk of dry weather overflows from the network.

Figure 4-17: Schematic of Nelson City Council Wastewater System

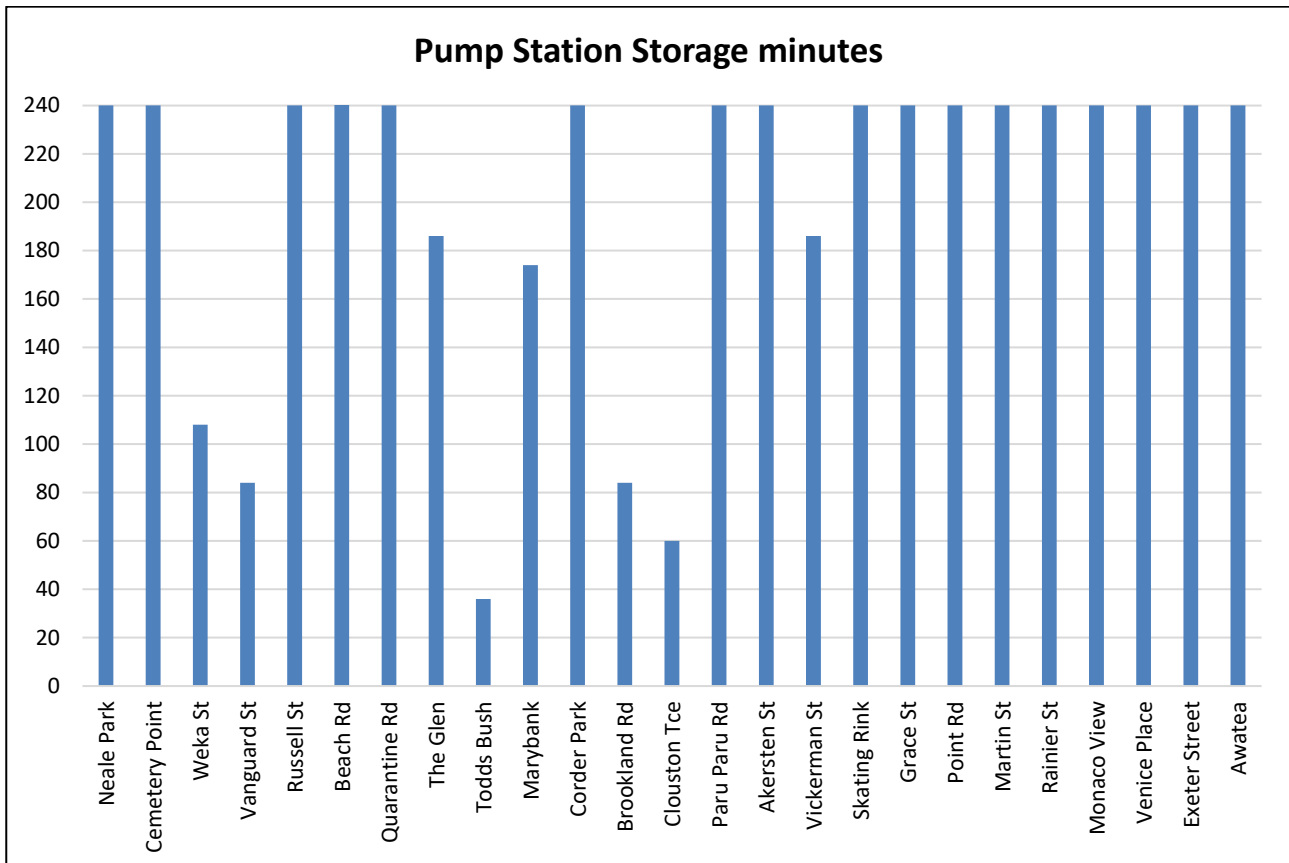


Some pump stations, for historical reasons or physical constraints, do not have this level of storage and consequently there is work underway to increase resilience of these pump stations. This work focuses on the provision of storage or the ability to continue to operate the pump station in the event of a pump failure.

Figure 4-18 below details the extent of storage capacity of the individual pump stations during dry weather flows.

As 4 hours (240mins) storage is the nationally accepted standard, Figure 4-18 is capped at that amount. Some pump stations have storage that exceeds this amount.

Figure 4-18: Pump Station Storage Capacity June 2024



The Airport Storage Pump Station has been excluded from this graph as this is primarily a storage facility. See sections 4.1.2. and 4.1.3. for all pump station performance and condition ratings.

Significant storage is also available within the reticulation network (from pipes and manholes only flowing part full most of the time).

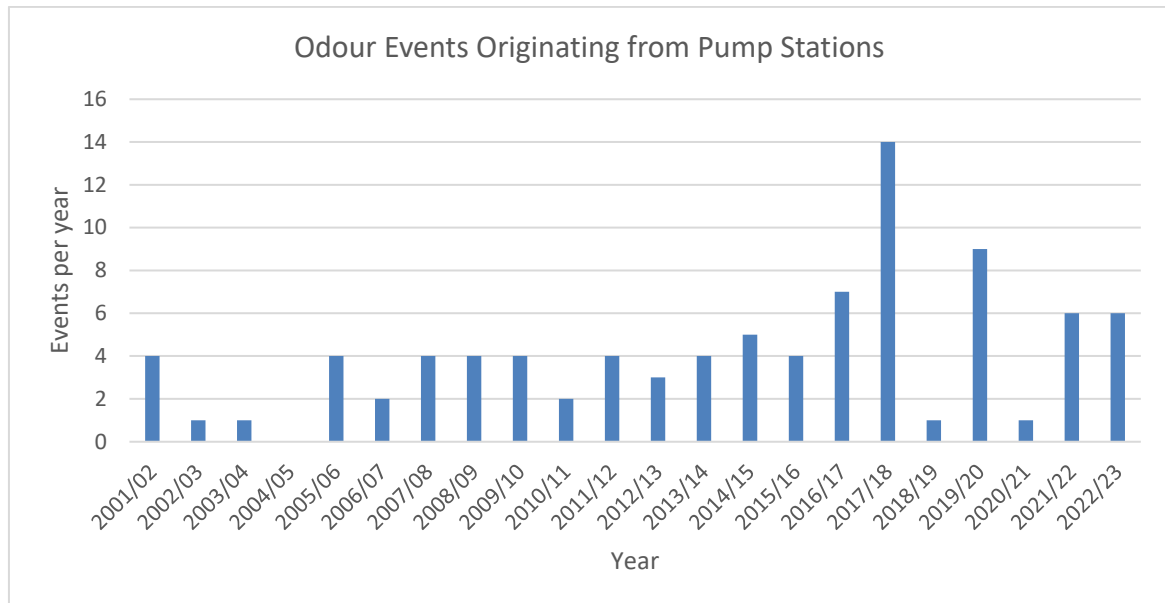
Odour Events at Pump Stations

Odours can originate from wastewater pump stations and associated manholes, air valves and fittings. The upgrade of Corder Park and Neale Park pump stations included specifically designed odour extraction and treatment systems (ozone). If complaints occur at individual pump stations investigations are carried out to determine if odour treatment measures need to be installed.

Figure 4-19 outlines the reported odour events that are attributed to Nelson’s wastewater pump stations. Of particular note is the spike in 2017/18 which was

related commissioning work at Corder Park pump station which identified a capacity issue with the odour control system; this has since been rectified.

Figure 4-19: Odour Events Originating from Wastewater Pump Stations



Private/public Connections

The landowner is responsible for maintaining the sewer lateral which is the pipe from the Council main to the dwelling. Where a sewer pipe passes through private property and serves more than one house the ownership tends to be dictated by historical circumstance. The current arrangements are under review to ensure that the fairest and most equitable outcome is maintained.

Unintended discharges

During dry weather overflows in the network can occur through a network fault (e.g. blockages caused by wet wipes, pump failure etc.).

During rain events stormwater enters the wastewater network through faults in pipes and as a result of cross connections between stormwater pipes (private and public) and the sewer network. When the volume of wastewater within the reticulation exceeds the design capacity, discharges can occur from the wastewater pump stations and some manholes in the network.

On 1 April 2012, Resource Consent (RM105388A) was granted for accidental discharges. The consent duration is 20 years.

A feature of the consent is the requirement that Council reduces overflows from pump stations over the period of the consent and establishes a compliance and liaison monitoring group with community representatives to provide a means of disseminating information. Representatives from the following organisations, identified in the resource consent, are invited to annual meetings: Nelson City Council, Department of Conservation, Te Tau Ihu Iwi representatives, Friends of Nelson Haven and Tasman Bay Inc, New Zealand Fish and Game Council, and Nelson Public Health Services.

Wet Weather Overflow Reduction/Inflow and Infiltration

Overflows occur in the network when, for a variety of reasons, the network is overwhelmed and excess wastewater volumes are released at “weak” points. A significant issue that contributes to this occurring is Inflow and infiltration (I&I). In summary I&I is the entry of water (typically groundwater or stormwater) into the wastewater network, typically, unintentionally. It is an urban issue nationally and around the globe.

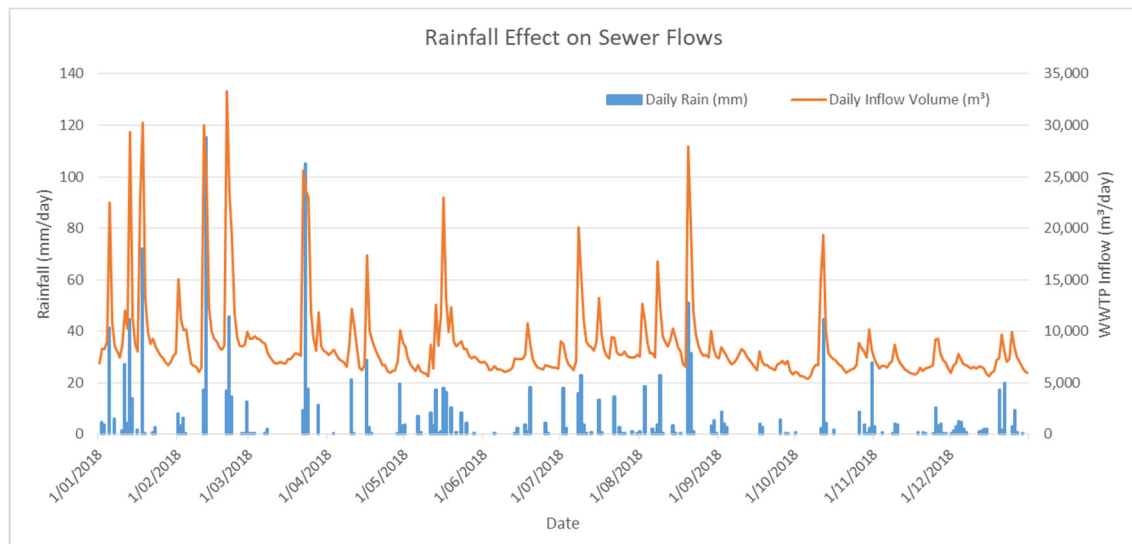
Above ground, inflow occurs during rain events when stormwater flows through manhole lids, low gully traps, emergency overflow points in pump stations, crossed connections (between stormwater pipes and sewer pipes) and deliberate redirection of stormwater into sewer pipes.

Below ground, infiltration occurs when groundwater enters sewer pipes through cracks in the pipes, failed joints, broken pipes, poor lateral connections and a similar range of issues associated with manholes and pump stations.

High groundwater levels arise from existing natural seepages, rain saturation, tidal and river effects and on site stormwater soakage; these exacerbate the below ground issues. As sea levels rise an increased focus on parts of the network that are susceptible to tidal infiltration will be required. Addressing the issues of inflow and infiltration requires the efforts of both council and the community.

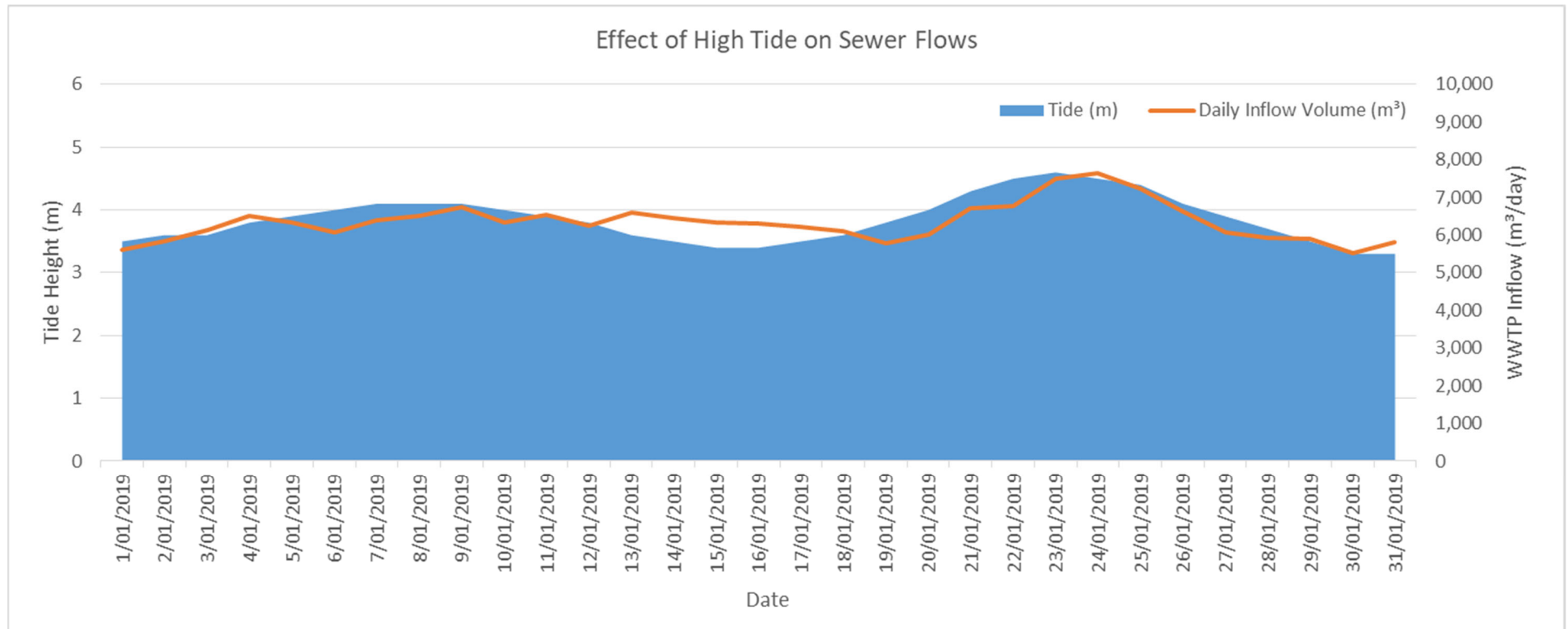
Figure 4-20 details the impact of rainfall on wastewater flows recorded at the NWWTP during the period January 2018 – December 2018. Flows increased from 6,000 m³/day to 30,000 m³/day following a significant rainfall event.

Figure 4-20: Rainfall Effects on Sewer Flows at Nelson Wastewater Treatment Plant



Tidal influences on flows to the NWWTP have also been recorded. Figure 4-21 details the high tide levels and the changing flows to the treatment plant during January 2019. This indicates the likely influence the height of the tide has on groundwater levels and associated infiltration. Daily flows increase by approximately 1,000 m³/day from a 3.4m tide to a 4.4m tide.

Figure 4-21: Effect of High Tides on Sewer Flows



The ingress of water into the sewer system through I&I requires proactive intervention to control. It is a serious issue for network utility operators and it is extremely hard to control. There are significant sustainability and operational impacts, consent compliance issues and major negative effects on Nelson City Council customers. This is a key focus of the wastewater activity and in particular the Wet Weather Overflow Reduction/Inflow and Infiltration programme.

4.1.3 Asset Capacity/Performance

Treatment Plant Capacity

Future estimated design flow parameters (Nelson City Council Wastewater Treatment Plant Upgrade – Final Report Date October 2006) for various time-related flow periods for the upgraded Wastewater treatment plant are set out in Table 4-7 below. The actual flows from 2022/23 are outlined in Table 4-8.

Table 4-7: Design Flow Parameters

Year	Population	Municipal Flow (cubic metres/day)	Industrial Flow (cubic metres/day)	Average Dry Weather Flow (cubic metres/day)	Peak Dry Weather Flow (cubic meters/hour)	Peak Wet Weather Day (cubic metres/day)	Instantaneous Flow (litres/second)
2005	26,600	7,283	2,342	9,625	992	39,283	606
2020	28,187	7,717	2,508	10,225	1,052	41,671	644
2050	33,749	9,239	2,821	12,060	1,252	49,592	760

Table 4-8: Actual Flows

Actual Flow Parameter	2022/23	Consent Capacity (discharge)
Average plant inflow	9,681 m ³ /day	38,000m ³ /day
Peak one-day pond inflow (equivalent to PWWD)	55,440 m ³ /day	

Performance of Reticulation

Reticulation performance is monitored through actual records of work/repairs undertaken and the hydraulic models.

The Nelson south and central city catchments have been modelled; an update and calibration process is currently underway. The remainder of the city can be added to the model in future years as development shows this to be desirable or demand for better information develops.

Pump Station Performance

As noted previously in this document pump stations consist of a number of different assets with differing asset lives. As such it is important to regularly monitor performance and condition. Table 4-9 outlines the latest performance assessment undertaken in 19/20.

Table 4-9: Pump Station Performance as at June 2023

Name	Electrical	Pumping
Neale Park	1	1
Cemetery Point	3	2
Weka Street	3	2
Vanguard Street	2	3
Russell Street	1	2
Beach Road	1	2
Quarantine Road	2	2
The Glen	3	3
Todds Bush	3	2
Marybank	3	2
Corder Park	1	1
Brooklands	3	2
Clouston Terrace	3	2
Paru Paru Road	3	3
Akersten Street	3	2
Vickerman Street	3	2
Skating Rink	2	3
Grace Street	3	2
Point Road	3	3
Martin Street	1	2
Rainier Street	1	2
Monaco View	3	2
Venice Place	2	2
Exeter Street	1	1
Airport Storage	3	2
Awatea**	1	1
<p>Performance rating based on Operations observations 1 = Very Good 2 = Good 3 = Moderate 4 = Poor 5 = Very Poor ** became operational in October 2024</p>		

4.1.4 Asset condition

Condition Assessment

Historically asset monitoring to determine condition has been subjective, based on local knowledge and experience. Nelson City Council now has procedures to assess and report on asset condition via closed circuit television (CCTV) and failure mode analysis.

The cost of undertaking condition assessment can be relatively expensive and is unlikely to provide a degradation curve that can be statistically supported. The need for inspection for assets with long economic lives will in the future be based on consequence of failure (criticality), remaining life and asset performance (failure modes).

As technology evolves new methods and tools are developed for condition assessment. It is important to keep in touch with technological developments that will allow optimal use of assets.

Current Position on Condition Assessment

Within the reticulation network, condition assessment is undertaken on a selective basis. Typically asset issues are identified through a variety of means, this subsequently leads to a condition assessment to determine if further steps are required. The primary condition assessment tool in the reticulation network is CCTV.

Significant assets (the NWWTP, Atawhai Rising Main etc.) require a more structured approach. In the case of these assets condition assessments tend to occur on a scheduled basis or as new technology becomes available.

Whenever the maintenance contractor is working on pipe repairs a report is made and entered into the Asset Management System. This is used to understand areas of the network with issues and allow relationships between pipe types, construction techniques, age and geology to be developed.

Table 4-10 outlines the current estimates of condition of the reticulation network.

Table 4-10: Condition of Mains Estimates

%	Very Good	Good	Moderate	Poor	Very Poor	Total
100mm diameter lines	10%	20%	20%	30%	20%	25 km
Reticulation	10%	20%	20%	20%	30%	319 km
Trunk Mains	10%	20%	20%	20%	30%	36.1 km
Rising Mains	10%	80%	10%	0%	0%	25.3 km
Swallow Mains	10%	80%	10%	0%	0%	5.2 km
Manholes	15%	35%	30%	10%	10%	7,232
Condition rating as per the NZ infrastructure Asset Grading Guidelines 1999 1 = Very Good 2 = Good 3 = Moderate 4 = Poor 5 = Very Poor						

Pump Station Condition

The condition of the pump stations are as detailed in Table 4-11 below.

The typically 'moderate' condition of the pump stations is mainly due to their age, and an extensive renewal programme is underway to replace electrical and pumping components as required.

Table 4-11: Pump Station Condition as at June 2023¹

	Name	Electrical		Pumping		Structural	
		Year Upgraded	Condition	Year Upgraded	Condition	Year Upgraded	Condition
1	The Glen	2004	3	2004	3	2004	1
2	Todds Bush	2003	3	2006	3	1985	2
3	Marybank	2023	2	2020/2007	1/3	1969	3
4	Corder Park	2016	1	2016	1	2016	1
5	Brooklands	2003	3	2019	2	1969	3
6	Cemetery Point	2003	3	2019	2	1979	2
7	Clouston Bridge	2005	3	2006	2	1985	3
8	Neale Park	2019	1	2019	1	1989	1
9	Weka St	2002	3	2004	3	1984	2
10	Vanguard St	2022	3	2022/2006	1/3	1986	2
11	Paru Paru Road	2020	3	2006	3	1995	3
12	Akersten St	2004	3	2006	3	1986	3
13	Vickerman St	2004	3	2006/2009	3	1970	3
15	Russell St	2019	1	2015	2	1980	3
16	Beach Road	2020	1	2014	2	1950	3
17	Skating Rink	2004	3	2014	2	1960	3
20	Quarantine Road	2005	3	2006	2	1981	2
23	Grace Street	2004	3	2004	3	1976	2
24	Point Road	2004	3	2004	3	1976	3
25	Martin St	2023	1	2013/2010	3	1976	3
26	Rainier St	2023	1	2010	3	1976	3
27	Monaco View	2001	3	2001/2004	2	2001	2
31	Venice Place	2013	2	2009	2	2009	1
	Exeter	2018	1	2018	1	2018	1
	Airport Storage	2001	3	2001/2004	3	2001	2
33	Awatea	Installed Oct 2024	1	Installed Oct 2024	1	Installed Oct 2024	1
Condition rating as per the NZ infrastructure Asset Grading Guidelines 1999 1 = Very Good 2 = Good 3 = Moderate 4 = Poor 5 = Very Poor							

¹ Structural Condition for the Weka St, Vanguard St, Paru Paru Rd, and Quarantine pump stations were assessed in 2022 and updated in this table, the rest are as per the 2021 - 2031 Activity Management Plan

Confidence Rating in Attributes, Condition and Performance

The Council has generally good confidence in the attributes, condition and performance data as outlined in Table 4-12 below. Where the confidence rating is required to be increased additional resources will be required. Examples of this are:

- The ongoing updating of the asset register of the pipe assets when repairs are carried out and the attributes are compared with the asset register attributes.
- The ongoing modelling of the reticulation where increased areas within the city are modelled with the associated increase in the accuracy of the performance of the network.

Table 4-12: Confidence Rating in Attributes, Condition and Performance

Attribute	All Data Estimated	Significant Data Estimated	50% Estimated	Minor Inaccuracies	Accurate	Comment
Attributes						
Retic - Size						The data was captured using photogrammetry in 1994 and progressively delivered over the following three years. Nelson City Council staff carried out accuracy checks on the co-ordinate data supplied, searched all the engineering plans and field books for information on pipe alignment, diameter, material and age and entered this information into the Geographical Information System
Retic - Depth						
Retic - Material						
Retic - Install Date						
Retic - Location						
Retic - Pipe Length						
Wastewater Treatment Plant – all components						High level of knowledge of the treatment plant through proactive ongoing monitoring. Site records (as-built drawings, asset mgmt. info, etc) could be improved upon.
Pump Stations– all components						High level of knowledge on the pump stations through proactive ongoing monitoring. Site records (as-built drawings, asset mgmt. info, etc) could be improved upon.
Condition						
Reticulation pipes (100 – 200mm dia gravity)						Huge network. Not cost effective to inspect all.
Gravity Trunk Mains						Huge network. Not cost effective to inspect all.
Rising Mains						Particular challenges associated with pressure pipes. Full physical inspection often impossible.
Swallow Mains						Particular challenges associated with pressure pipes. Full physical inspection often impossible.

Attribute	All Data Estimated	Significant Data Estimated	50% Estimated	Minor Inaccuracies	Accurate	Comment
Manholes						Huge network. Not cost effective to inspect all.
Pump Stations- all components						High level of knowledge known on the majority of pump stations due to maintenance records
Electronics- all components						
Wastewater treatment plant						Upgraded in 2008. High level of knowledge due to maintenance records
Outfall						
Performance						
Reticulation						Limited inspections to date
Trunk Mains						
Rising Mains						
Swallow Mains						
Manholes						Limited inspections to date
Pump Stations- all components						
Electronics						
Waste water treatment plant - all components						
Outfall						

4.1.5 Asset valuations

The replacement value of the wastewater assets are \$588.8m at June 2023 as detailed in Table 4-13 below. The majority of the replacement costs are the reticulation mains.

Valuation Method

Valuations are completed on a bi-annual cycle. Every second year a full revaluation is completed of all assets held by NCC, which is completed by reviewing all assets and valuing them based on recent costs for similar work within Nelson City Council's network and industry knowledge. This work is peer reviewed by WSP (Engineering Consultants). For the intervening years an Indexed revaluation is completed based on the previous years full revaluation and a factor of recognised price increase advised by WSP after allowing for known asset additions and disposals. In addition major assets, (dams, Pump stations etc.) are revalued by WSP on a replacement value basis. The Depreciated Replacement Value is used to calculate the straight line depreciation over the remaining useful life.

Table 4-13: Wastewater Asset Valuation – June 2023

Asset Category	June 2023		
	Replacement Value	Depreciated Replacement Value	Depreciation
	(\$)	(\$)	(\$)
Reticulation Mains	315,807,889.9	162,301,135.0	3,857,211.6
Trunk Mains	38,498,154.3	15,422,508.5	513,459.6
Swallow Mains	7,044,242.1	583,030.9	111,422.5
Rising Mains	47,332,662.3	12,010,191.9	799,821.9
Access points	1,707,207.1	1,186,329.7	21,352.7
Manholes	98,963,074.0	51,864,098.4	1,219,774.0
Tanks	140,013.8	66,383.4	1,750.2
Valves	780,050.0	359,403.7	15,281.7
Neale Park Retention Tank	1,066,918.4	713,615.8	13,336.5
Pump Stations	14,491,120.8	4,255,784.0	406,840.4
Neale park Pump Station	12,701,324.1	11,706,619.7	248,676.1
Corder Park Pump Station	10,825,219.4	9,749,167.8	179,341.9
Nelson Wastewater Treatment Plant	39,424,007.6	23,974,597.4	785,054.0
Total	588,781,884	294,192,866	8,173,323

4.2 Operations and maintenance

Operations and Maintenance plans set out how the wastewater activity will be operated and maintained on a day-to-day basis to consistently achieve the optimum use of assets and meet levels of service. 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 and the network is capable of meeting required levels of service. Operational plans cover activities such as energy usage, control of mechanical and electrical plant, inspections and service management.

Maintenance - Maintenance plans are designed to enable existing assets to operate to their service potential over their useful life. This is necessary to meet levels of service, achieve target standards and prevent premature asset failure or deterioration. There are two types of maintenance:

- **Programmed** - A base level of maintenance carried out to a predetermined schedule. Its objective is to maintain the service potential of the asset system, and maintenance actioned as a result of condition or performance evaluations of components of the wastewater 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.

Additional planned maintenance work is carried out on the reticulation to address faults identified through other work programmes.

4.2.1 Operations and maintenance approach

Maintenance Planning

Currently the asset maintenance is a mix of programmed and reactive. Programmed maintenance is pre-planned work determined on the basis of criticality, remaining useful life and available budget. Reactive is unplanned work related to system failures. This approach aims to maximise the useful life of an asset while minimising the consequences of unforeseen failures.

Method of Delivery

The operation and maintenance of the Nelson City Council wastewater activity is carried out using a combination of Nelson City Council staff and external contractors consisting of:

- Utilities Operations Team for design and supervision (Nelson City Council).
- Nelmac Limited for all reticulation operations and maintenance (CCTO).
- External contractors for specialist activities such as closed circuit television, PLC programming etc.

Minimise Sewer Blockages

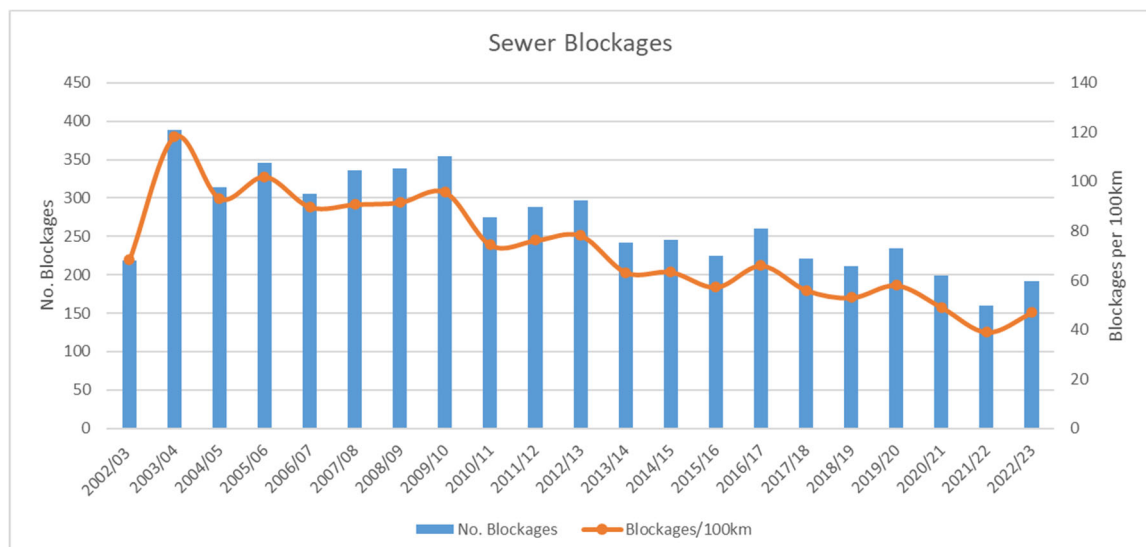
Blockages in the sewer reticulation can lead to overflows and odour complaints with associated health issues.

To address this a 24-hour callout system provides a prompt response to any sewer blockage. If the blockage is within the private section of the system and the landowner still wants the repair carried out then the Council's Maintenance Contractor will carry out the work and invoice the landowner directly.

Pipes with continual blockages are inspected via CCTV and either cleaned or replaced. Regular flushing occurs at predetermined points around the city. CCTV survey work is also carried out at regular intervals in response to persistent issues with a pipe.

Figure 4-22 indicates the historical trend of sewer blockages.

Figure 4-22: Sewer Blockages



4.2.2 Operations and Maintenance key considerations/focus areas

Day to day operation and maintenance of the network is carried out by contractors with specific requirements set out in the Maintenance of Utility Services contract.

Level of Service Implications

For the wastewater network to deliver the levels of service it must be intact and functioning. Reactive maintenance must be carried out promptly. Programmed maintenance must be carried out to ensure that downtime is minimised by carrying out maintenance before it becomes reactive.

Demand Implications

With increasing demand there will be an increase in total variable costs particularly as more wastewater is transported and pumped.

Risk Implications

Pump stations and reticulation mains, must all be maintained, kept secure and protected from natural hazards so that they can continue to function through an emergency albeit at a reduced level of service.

The Pump Station Resilience and the Natural Hazards Programmes are focussed on decreasing the operational risk to critical assets.

Lifecycle Implications

Operations and maintenance is the longest period of the asset lifecycle and ongoing maintenance is necessary to ensure that the design life of the asset is achieved.

Table 4-14 sets out the operations and maintenance key focus areas.

Table 4-14: Operations and Maintenance Key Focus Areas

Focus Area	Objective/ Description
Maintenance	
Preventative Maintenance	Routine Maintenance will be carried out in terms of defined routine maintenance programmes with predetermined triggers for these activities to be carried out.
Reactive Maintenance	Remedial maintenance will be undertaken as quickly as practically possible to restore an asset to a satisfactory condition after a failure or other another unsatisfactory condition has been detected.
Repairs	The detection and repair of faults causing failure will be undertaken as quickly as practically possible. The fault will be isolated and components repaired or replaced as appropriate and then if warranted the item will be tested to ensure that it meets the relevant standard.
Redesign and Modification	Redesign may be necessary if an asset or system does not meet its operational objective. Similarly, modifications may be necessary to improve the operating characteristics. Redesign and modifications will be undertaken in a methodical manner to ensure alternative options are considered and optimum decisions made.
Resilience	Involves identifying key assets and their critical components/modes of failures. Once identified contingency measures are determined to increase the level of resilience of that key asset. An example is to ensure adequate generators are available to increase resilience against power failure.
Operations	
Operations	Operational activities will be undertaken via Nelmac unless specialised advice is required. Staff will be responsible for the determination and optimisation of planned and unplanned works, work methods and maintenance scheduling to achieve the target service standards.
Physical Works Monitoring	Audits of work will be carried out to verify compliance with standards.
Operation of Utilities	Utilities such as treatment plants and pumping stations will be operated in terms of defined parameters and standards.
Incident management	<p>Council will effectively respond to and manage incidents to ensure system availability and service continuity, and mitigate adverse effects.</p> <p>Maintenance staff and contractors are expected to effectively manage minor incidents. Nelson City Council Infrastructural Activity Engineers will become involved in serious incidents.</p>
System control and monitoring	<p>Council will utilise Supervisory control and data acquisition (SCADA) systems to monitor operation of the wastewater facilities.</p> <p>The SCADA system provides surveillance of the operation of pumping stations in the wastewater system and provides alarms when equipment fails or when operating parameters are exceeded. The SCADA system also records operating data from the NWWTP.</p>

4.2.3 Summary of future costs

Refer to the section 6. Financial Summary for Financial Projections.

4.3 Renewal/Replacement

Capital Renewal/Replacement

Renewal is major work that does not increase the asset's design capacity but restores, rehabilitates, replaces or renews an existing component to its original capacity. This includes:

- Works that do not increase the capacity of the asset but restores them to their original size, condition capacity, etc.
- The replacement component of augmentation works which increase the capacity of the asset, i.e. that portion of the work which restores the assets to their original size, condition, capacity etc.
- Reconstruction or rehabilitation works involving improvements and realignment.
- Renewal and/or renovation of existing assets, restoring the assets to a new or fresh condition consistent with the original asset.

Work over and above restoring an asset to original capacity is creation/acquisition/augmentation expenditure. However if the additional cost is within 10% of the renewal cost then the total cost will be treated as renewal expenditure.

4.3.1 Renewal identification and strategies

Assets can fail from various modes other than the normally recognised physical failure or breakage i.e. joint displacement or root intrusion.

Condition assessment is a typical failure mode assessment activity.

To evaluate cost and obsolescence of failure modes it is necessary to capture the asset's operating and maintenance cost information, and to compare this with the lifecycle cost expectations.

As condition assessment and maintenance histories are built up, these will be used in determining renewal priorities.

Infrastructure strategy

The thirty year infrastructure strategy sets out the longer term renewal forecast for the wastewater activity. The overarching strategy is based on renewing the network just in time to avoid disruption to the service and as demands of growth or other asset renewals offer opportunities to reduce both cost and community disruption.

4.3.2 Renewal/Replacement key considerations and selection

Level of Service Implications

It is necessary to renew pipes and equipment before they impact on levels of service.

Demand Implications

Renewals will be sized to allow for future demand. Where the increase is greater than 10% then the difference will be funded from creation/acquisition/augmentation expenditure.

Risk Implications

There is a risk to life, property and business' financial income by not undertaking renewals of pipes, intakes and detention dams.

Lifecycle Implications

Pipes and equipment must be renewed before maintenance costs become excessive. Decisions made at the time of renewal impact on the whole lifecycle costs of the asset.

Renewal Prioritisation

The core renewal approach is outlined in Table 4-15.

Table 4-15: Renewal Selection Process

Aspect	Objective/ Description
Prioritise Renewals	<p>To avoid a concentration of asset renewals in a short window of time, when they all reach the end of their life, additional factors are considered including:</p> <ul style="list-style-type: none"> • Potential development in the city. • Other Council projects. • Issues identified with asset by location and or materials. • Condition reports, maintenance records (asset failure and expenditure history), wastewater infiltration studies, request for service (RFS) records, and observations from public, staff and contractors. • Capacity issues within the network. • Asset criticality. • Future asset renewal “bow waves” – the need to bring forward or defer some renewals.
Project options	<p>Decision Criteria are weighted. Then Business Case Options which consider benefits (aligned with the Decision Criteria), dis-benefits, cost, timescale and risks are compared to determine whether to proceed with a renewal or which renewal option to take.</p>
Design/ Construct	<p>Develop the design of the preferred option to a point where physical works services can be procured.</p> <p>Renewal works are designed and undertaken in accordance with the Nelson City Council Land Development Manual that stresses the use of long life materials.</p> <p>Investment is made in new technologies to rehabilitate existing reticulation where appropriate, rather than excavate and replace.</p>
Deferred Renewals	<p>The Council recognises that although the deferral of some items in the network will not impede the operation of many assets in the short term, repeated deferral will create a future liability.</p>

Reticulation (Sewer) Renewals

Council renews components of the wastewater network as they reach the end of their service life. The rate of asset renewal is intended to maintain the overall condition of the asset system at a standard which reflects its age profile, and ensures that the Community’s investment in the City’s wastewater infrastructure is maintained.

The gravity pipe network is made up of a variety of materials with different service lives. Where pipes remain in good condition it is anticipated that lives of 80-100 years can be achieved. Current renewal strategies focus on renewing pipelines that show high infiltration rates, are linked to development, show capacity issues, have a high degree of criticality, present an opportunity (by other utilities or transportation works) and/or a history of multiple repairs. A constant renewal programme is undertaken to even out the rate of renewal and avoid the need for very high expenditure in the years when the pipes reach the end of their service lives.

It is important to note the “bow wave” present in both Figures 4-14 and 4-15; also refer to section 4.1.1 Issue 3; this is an important renewal consideration.

Rising Mains and Swallows (gravity pressure main) Renewals

The main feature differentiating these pipes from reticulation is that they are constantly full of wastewater under pressure. Swallows are gravity pressure mains where the pipes are generally full, but at a lower pressure (than rising mains). It is difficult to inspect these mains and assess the condition as they are in constant use, which makes renewal programming challenging. Historically this has meant that monitoring has not been possible on a regular basis and failures are likely to be the first indication of problems; however age, material type and usage profile coupled with national experience can also indicate replacement priorities.

Atawhai Rising Main

To address the risk to the city of ongoing pipe failures the following broad strategy has been developed.

An initial phase which will focus on understanding the asset as fully as possible including the development of up to date as-built drawings, creating pressure profiles and understanding potential internal condition assessment tools. It is probable that no ideal internal condition assessment tools will be identified which will lead to subsequent phases being more reliant on physical investigation – this carries some risk considering the fragility of the Atawhai Rising Main.

If an internal condition assessment tool is identified, that is affordable, an assessment will be undertaken. In conjunction with this an external inspection of key points (e.g. fittings/mechanical joints etc.) on the rising main is programmed to take place.

The latter phases of this work will lead to a determination of how and when this pipe will be replaced.

4.3.3 Summary of Future Costs

Refer to the section 6. Financial Summary for Financial Projections.

Deferred Renewals

This plan indicates no specific deferred renewals.

4.4 Creation/Acquisition/Augmentation

Capital Creation/Upgrading

Creation/Acquisition/Augmentation (capital) works create a new asset that previously did not exist, or upgrade or improve an existing asset. They may result from growth, social or environmental needs and levels of service. This includes:

- Expenditure which purchases or creates a new asset (not a replacement) or in any way improves an asset beyond its original design capacity.
- Upgrading works which increase the capacity of the asset e.g. for future growth demand.

- Construction works designed to produce an improvement in the standard and operation of the asset beyond its present capacity.

Asset development and asset renewal can occur simultaneously. The purpose of asset renewal is to prevent a decline in the service potential of the assets whereas asset development is concerned with the service improvements, measured by asset performance.

4.4.1 Capital Creation/upgrade project identification and strategies

Capital Creation/upgrade projects are typically linked to external drivers. This means that while some projects can be predicted/planned, many are subject to factors such as market demand and availability of appropriately zoned development land which change over time. Therefore it is key that project identification is responsive to external requirements.

4.4.2 Capital Creation/upgrade key considerations

Level of Service Implication

Capital creation/upgrade works for wastewater network are to address problems with wastewater reticulation, treatment and disposal where the current arrangements do not meet required levels of service.

Demand Implications

As development occurs and the city grows or urban areas are more intensively developed the level of demand on the wastewater network is increased. Capital creation/upgrade works will be required to meet the increased level of demand. Failure to meet growth requirements will impact on Levels of Service.

Risk Implications

Capital creation/upgrade works address the need to decrease the risk to the city from inadequate response to wet weather overflows, inadequate capacity for growth and failure of the ongoing functioning of NWWTP (particularly in meeting the resource consent requirements).

Lifecycle Implications

Decisions made to construct an asset will have implications for the life of the asset, as will subsequent design decisions. Optimised decision making will therefore be used to identify and prioritise all potential solutions for wastewater projects over \$0.5million in value.

Selection Approach

Table 4-16 outlines the approach used to determine capital creation/upgrade capital works selection and priority.

Table 4-16: Capital Works Selection

Criteria	Objective/ Description
Identification of upgrade needs	Asset capital works needs are identified from analysis of: <ul style="list-style-type: none"> • Demand forecasts (development/intensification). • System performance monitoring (hydraulic models, pressure, flow, leakage rates, etc.). • Network modelling. • Risk assessments (Risk Management Plan). • Nelson Resource Management Plan. • Customer service requests. • A provisional forward capital works development programme is maintained and updated at least annually. • Changes in regulation (Freshwater NPS).
Upgrade Project Categorisation	Capital works Projects will be separated into projects to close service gaps and projects required to accommodate growth. Capital works projects to close service gaps are generally funded entirely by Nelson City Council. Capital works projects to accommodate growth may be partly or wholly funded through Development Contributions.
Prioritisation of projects	Capital works projects are justified and prioritised on the basis of levels of risk. In determining the requirement for capital or asset upgrade works the short and long-term effects on the operating and structural integrity of the system are considered, together with any forecast increase in loading upon the system. Decisions on priorities for new works and renewal of assets for the wastewater network are based on the following: <ul style="list-style-type: none"> • Known problem areas with blockages and or overflows. • New growth areas. • Criticality of asset. • Multiple network project (e.g. incorporating road work, sewer, water assets etc.).
Project Approval	A long-term programme is prepared from significant projects meeting the assessment criteria, this is communicated and approved through the Long Term Plan process. The actual timing of asset works will reflect the community's ability to meet the cost, as determined through the Annual Plan process.

4.4.3 Capital Investment Approach

Table 4-17 below sets out the strategies used for developing capital works programmes for the wastewater system. These strategies are intended to progressively close gaps between target service standards (taking account of demographic and economic growth projections) and the current service capability of the asset system.

Table 4-17: Creation/Acquisition/Augmentation Plan

Aspect	Objective/ Description
Project design	<p>All asset upgrade works will be designed and constructed in accordance with Nelson Tasman Land Development Manual.</p> <p>In determining capital or asset upgrade work requirements the short and long term effects on the operation and integrity of the system are considered, together with the demands of any forecast increase in loading upon the system.</p> <p>The design process will allow for an appropriate level of redundancy.</p> <p>The standardisation of designs and specifications will be considered in the interest of facilitating replacement and operational simplicity.</p> <p>All feasible options, including non-asset demand management options and education/media messaging, are considered.</p> <p>Low impact urban design is used where appropriate.</p> <p>Various components of the wastewater goal are considered when developing the final detailed design including:</p> <ul style="list-style-type: none"> • Economics of various options. • Efficiency of meeting the network need. • Cultural values relating to wastewater disposal to freshwater and marine environments. • Ecological values of freshwater and marine eco-systems.
Future Development	<p>Considers and allows for the development potential of the part of the network the upgrade will serve.</p>
Gifted Assets	<p>The risk, cost and benefits of accepting any new privately funded assets constructed in association with property development will be considered on a case by case basis in approval decisions.</p> <p>Such assets will be accepted into public ownership when satisfactorily completed in accordance with approvals given.</p> <p>Council will not contribute to the cost of such work unless there are exceptional service standard or equity issues.</p>

4.4.4 Summary of Future Costs

Refer to the section 6. Financial Summary for Financial Projections.

4.5 Disposal

The disposal plan recognises that there can be activities and costs associated with the decommissioning and disposal of assets which are no longer required as part of the wastewater system. In some situations there can be revenue resulting from asset disposal.

Mechanical equipment that has been replaced will be reused for parts or sold as scrap metal unless it is considered to have genuine resale value. In this case, the piece of surplus equipment will be sold with income directed to the Nelson City Council account.

Table 4-18: Disposal Approach

Aspect	Objective/ Description
Asset Disposal	<p>Assess each proposal to dispose of surplus or redundant assets on an individual basis, subject to the requirements of the relevant legislation.</p> <p>Asset disposal will comply with the requirements of the Local Government Act 2002 and in particular the requirement for Councils to retain a capability to provide wastewater services.</p> <p>Possible use of abandoned pipes for telecommunication ducts is reviewed on a case by case basis. Currently Chorus and Network Tasman lease utilise abandoned gas mains and abandoned water and wastewater pipes in some instances.</p>
Residual Value	<p>The residual value (if any) of assets, which are planned to be disposed of, will be identified and provided for in financial projections.</p> <p>Abandoned wastewater pipelines have possible future value for other purposes (such as ducting for cabling). As the extent of this value (if any) is uncertain it is not recognised in the asset valuation. Health and Safety issues associated with accessing buried asbestos pipes will potentially reduce the usage of these for other utility ducting.</p>
Record of Abandonment	<p>Assets, which are disposed of, have generally reached the end of their useful lives and have minimal or no residual value. When a wastewater asset is abandoned or replaced the Geographic Information System and fixed asset register are updated.</p>

Asset Disposal Plan

If pipes are left in the ground and cannot be reused for other services ducting, they will generally be sealed at the connections and possibly backfilled with cement grout.

5. RISK MANAGEMENT PLAN

This section describes the risk management procedures used in the wastewater activity.

Applying risk management procedures enables decisions to be made about the best use of limited resources to achieve the Council's objectives from the maintenance and development of the wastewater assets.

Threats and opportunities are assessed against wastewater objectives and levels of service.

As set out above risk management is not simply about uncertain events with a downside (such as financial loss or legal proceedings). The process can also be used to identify and decide on the merits of uncertain opportunities for the Council to do things more innovatively, sustainably and effectively.

5.1 Critical assets

5.1.1 How critical assets are identified and managed

Critical assets are defined as those which have a high consequence of failure. Similarly, critical failure modes are those which have the highest consequences. By identifying critical assets and critical failure modes, Council can target and refine investigative activities, maintenance plans and capital expenditure plans at the critical areas. Examples would include development of condition assessment programmes, and prioritisation of renewals.

Critical assets can be targeted for a more detailed risk analysis approach to understand the cause and probability of failure. Whilst they will have a high consequence of failure, they do not necessarily have a high likelihood of failure. Generally the failure of critical assets is considered to be unacceptable given the difficulty of repair and/or the strategic role they play, as this would result in a major disruption or inability to achieve one or more levels of service.

Council has undertaken a criticality assessment for physical assets under the wastewater activity as part of a wider Natural Hazards Risk Assessment for the 3 Waters Infrastructure within the city. For this assessment a criticality matrix was developed to align as closely as practical with the Council's corporate consequence matrix. The range of impacts criteria included:

- Safety.
- Health.
- Asset Performance / Service Delivery.
- Environmental / Historical / Cultural.
- Financial.
- Political / Community / Reputational.
- Proximity of Asset to other Infrastructure.

- Critical Facilities (Serviced by asset).

A robust framework for identification of critical assets and their interaction with natural hazards is currently being developed and is noted in the improvement programme. See appendix D for the wastewater network criticality assessment.

Assets that are generally considered critical within the Nelson City Council wastewater system include:

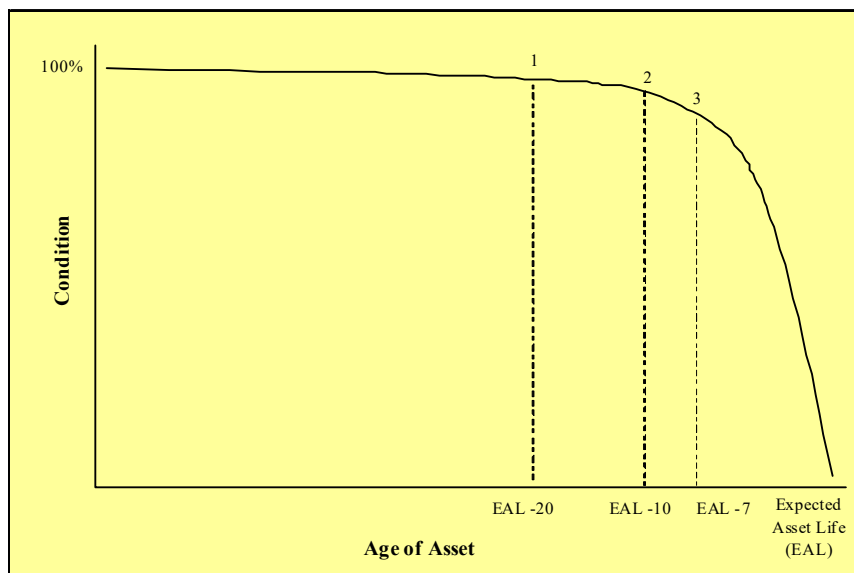
- All pump stations.
- Rising mains.
- Trunk mains.
- The wastewater treatment plant.
- Assets within an area widely prone to a specific hazard e.g. liquefaction.

By contrast non-critical assets are relatively quickly and easily repaired or replaced and their failure does not disrupt a significant number of customers.

Monitoring and intervention strategies are therefore quite different for both categories of asset. Critical assets attract a greater level of monitoring and ongoing condition assessment, with physical investigations taking place at a much earlier stage in their life. Conversely non-critical assets can be expected to undergo a higher level of repair before complete replacement is considered.

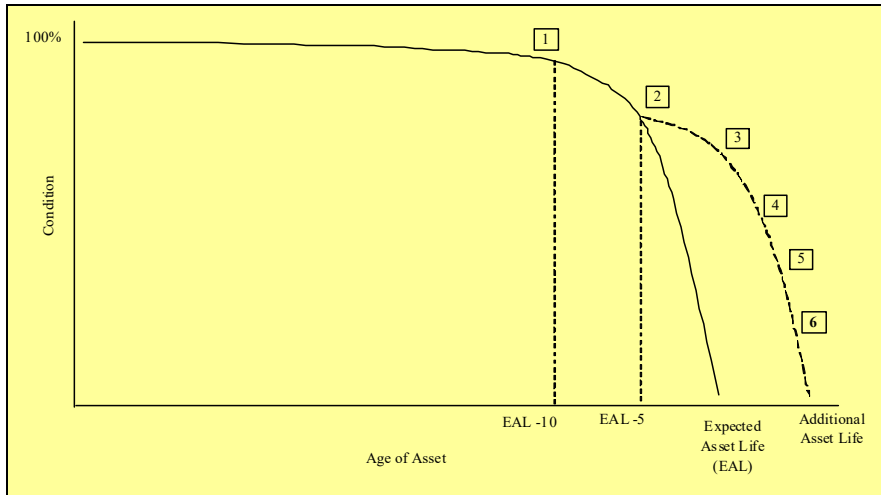
The following shows an ideal approximation of the nature and timing of interventions for both critical and non-critical assets.

Figure 5-1: Interventions for Critical Assets



Intervention: 1 Desktop review of asset and performance supported by Closed circuit television inspection/other physical inspection, 2 Physical inspection of asset and performance review (potentially repeated depending on condition). 3 Replacement initiated.

Figure 5-2: Interventions for Non-Critical Assets



Intervention: 1 Desktop review of asset and performance, 2 Physical inspection of asset with Closed circuit television/other physical inspection and decision made on extending expected asset life, 3 Repair, 4 Repair, 5 Repair, 6 Replace asset.

Criticality of an asset impacts on the following areas:

- Operation and maintenance planning.
- Proactive or scheduled maintenance.
- Priorities for collecting and determining the required level of reliability of data for asset management systems.
- Priorities for undertaking condition assessments.
- Adjusting economic lives with respect to renewal profiles.
- Prioritising/Deferring renewals.
- Prioritising expenditure.
- Prioritising levels of service reviews.

Asset criticality is currently being integrated into the ongoing operation, maintenance, renewals and capital programmes for this activity. This includes incorporation of asset criticality into the decision making framework used to prioritise renewals and level of service upgrades, as well as updating inspections and programmed maintenance schedules for assets.

5.2 Risk assessment

5.2.1 Approach for assessing risks

The Council's risk management policy provides for assessing risk by:

- Clearly identifying the objectives for which achievement may be uncertain.
- Identifying events which could make the achievement of one or more objectives uncertain.
- For each event, using best available information (including considering the quality of that information and the controls already in place to manage the risk) to estimate the scale of consequence if the event happened and estimating a corresponding likelihood. Consequences and likelihoods are estimated using the Council's agreed risk criteria. See Appendix E.
- The likelihood/consequence combination determine the level of risk associated with a particular event.

As this Plan is developed (future AMPs) it will progressively apply the criteria required by the Council's updated risk management policy to managing risks. These criteria follow principle (g) of the international standard codifying good risk management practice (ISO 31000:2009) and tailor this generic process to the Council's specific circumstances. It is the organisation's intention to progressively align the risk management practices used in asset management with Council's Policy and Criteria and to apply generally accepted good practice.

Council is committed to using risk management principles and techniques to understand and appropriately manage all internal and external factors and influences which affect the achievement of its objectives. Doing this will:

- Provide a reliable basis for sound decision making.
- Increase the likelihood of achieving objectives.
- Provide an agreed basis for prudent risk taking.
- Enable the organisation to understand the level of risk associated with each decision as well as the Council's aggregate exposure to risk.
- Improve accountability and assurance of control.
- Enable the Council to avoid threats and seize opportunities.
- Foster an organisational culture based on reasonable foresight and responsible hindsight.

Risk analysis involves consideration of the sources of risk, their consequences and the likelihood that those consequences may occur.

The following consequences are considered:

- Health.
- Safety.
- Asset performance/Service Delivery.
- Environmental/Historical/Cultural.
- Financial.
- Political/Community/Reputational.
- Relationship with Iwi.
- Legal compliance.
- Information/Decision support.

Consequences of an event are rated 1 - 5 (Insignificant to Extreme). Likelihood is then rated 1 – 5 (Rare to Almost certain) to calculate a risk level rated 1 – 5 (Very Low to Very High).

The objective of risk analysis is to separate the low impact risks from the major impact risks, and to provide data to assist in the evaluation and treatment of the risks.

The five specific Community Outcomes that guide the Wastewater Activity risk analysis are:

- Our unique natural environment is healthy and protected.
- Our urban and rural environments are people-friendly, well planned, accessible and sustainably managed.
- Our infrastructure is efficient, resilient, cost effective and meets current and future needs.
- Our region is supported by an innovative and sustainable economy.
- Our communities are healthy, safe, inclusive and resilient.

There is potential for future Level of Service changes around the Freshwater NPS / NES, urban growth, and implementation of a risk-based decision making framework in this area.

5.2.2 Top risks and how these will be managed

The level of risk established through the assessment process (formally called residual risk) is compared with the Council's residual risk tolerance as set out in Appendix E.

The table sets out priorities for action and at what level of Council decisions should be taken to either accept (tolerate) the risk or take further actions to manage the risk to achieve a more acceptable risk level.

In many cases risks have already been acted on by officers in the course of the normal work of managing the wastewater activity and no further action is required.

In other cases specific decisions may be required to either accept the current level of risk or place actions in this plan to reduce the level of risk. This is an ongoing process.

Table 5-1 provides a summary of areas of high residual risk and some information about how these are treated.

Table 5-1: Summary of High Risks to the Wastewater Supply Activity

Risk #	Risk Title	Control / Treatment	Treatment Description	Likelihood	Severity	Rating
R00239	Significant change in governing framework for 'Local Water Done Well'	MC00202	Respond to Three Waters Reform legislation (Water Services Act 2021, Taumata Arowai..Act etc) - commenced project 'Drinking Water Quality Initiatives', that will focus on moving to a new Water Quality IT software - establishment of a Catchment Risk Management Plan (currently underway) - reviewing Councils existing Water Quality Sampling Plan and potential updates in accordance with the new standards - Providing feedback on various Acts etc	Possible	Major	HIGH
	Significant change in governing framework for 'Local Water Done Well'	MC00215	- Processes and procedures. Promap. - Annual review of Asset Management Plans - 3 year development. - Succession plans - Handover period	Possible	Major	HIGH
	Significant change in governing framework for 'Local Water Done Well'	MC00917	- Project stages for managing organisational change	Possible	Major	HIGH
	Significant change in governing framework for 'Local Water Done Well'	MC00918	Staff training to enhance resilience for those likely to be impacted by 3-waters changes - First round of training, "Managing people through change" and "Coping with Change", rolled out in quarter three of 2021-22.	Possible	Major	HIGH
R00242	Lack of resources to complete indicative business cases	MC00211	- Review workloads - Offload to Capital Projects where they have an available PM - Pay for external resources to PM.	Likely	Major	HIGH
R00249	Decisions about asset maintenance/ development/ replacement made ignoring advice in AMPs (e.g. politicized 'pet projects')	MC00226	- Ensure elected representatives and Senior Leadership Team are well informed with regard to necessity and scope of projects and the content of AMP's. - Workshop AMP development with Council.	Likely	Moderate	HIGH
R00251	Operational - One or more operated assets do not comply with resource consents	MC00235	- Processes for RMA compliance and reporting. - Independent contractor monitoring and reporting - Alarm systems, level indicators. - External audits.	Possible	Major	HIGH
R00256	Contractors do not meet required health and safety standard	MC00268	- Contractor reports to Council - Council reviews H&S systems - Audits of H&S systems	Possible	Major	HIGH

R00587	Lifeline service (waste water) failure from natural hazards and similar events	MC00016	Civil Defence planning and management improves response systems reducing consequence	Possible	Major	HIGH
	Lifeline service (waste water) failure from natural hazards and similar events	MC00894	- Complete review and renewal of Council's underground insurances each year (placed Nov) Nb. insurance/risk sharing - provides financial resources by funding recovery. - 40% through Council's membership of the AoN South Island collective with a large deductible - 60% funded by central government (see 1991 Disaster Recovery Plan)	Possible	Major	HIGH
	Lifeline service (waste water) failure from natural hazards and similar events	MC00895	-- In progress -- Natural Hazards Risk Assessments for the three waters - including developing strategies and implementing a programme to make three water assets more resilient to natural hazards such as earthquakes, landslides, flooding, Tsunamis etc. Note Placeholder funding for implementation allowed for in the draft AMPs	Possible	Major	HIGH
	Lifeline service (waste water) failure from natural hazards and similar events	MC00896	- investigations regarding inflow and infiltration continue throughout the LTP - lifeline improvements in AMPs -- including section on / consideration for Climate Change - asset renewal plans and asset management information systems to track infrastructure condition status - network and pump station upgrades. This provides added resilience to wastewater overflows.	Possible	Major	HIGH
	Lifeline service (waste water) failure from natural hazards and similar events	MC00901	- Complete review and renewal of Council's above ground insurances each year (placed July) e.g. WTP, pump stations etc Nb. insurance/risk sharing - provides financial resources by funding recovery. - 40% through Council's membership of the AoN South Island collective with a large deductible - 60% funded by central government (see 1991 Disaster Recovery Plan)	Possible	Major	HIGH
R00692	Lack of Staff (NCC) and operator (Nelmac) experience/resilience	MC01012	- Employ experienced people where possible. - Employ appropriately qualified and skilled staff. - Competitive pay and conditions should be competitive.	Possible	Major	HIGH
R00693	Climate Change /Sea Level Rise	MC01013	- Nelson Tasman Emergency Management Plan. - Emergency procedures manual and exercises. - Programmes related to resilience/adaptation underway - Continue to develop criticality and natural hazards understanding with a view to progressing to the development of solutions (that will minimise the risk of failure due to a natural hazard event) in order of priority	Possible	Major	HIGH
R00694	Harm to operators from exposure to sewage	MC01014	- Health and Safety training. - Preventative inoculation of staff. - Use of barrier protection where possible. - Ongoing health and Safety training. - Identify hazardous areas at facilities and employ processes to minimise risk	Possible	Major	HIGH

R00695	Failure to achieve consent conditions at WWTP	MC01015	<ul style="list-style-type: none"> - Pond management team recently set up to routinely monitor pond performance in order to minimise the risk to the ponds "crashing" and causing odour issues. - Pre-treatment processes minimise loading fluctuations. - The plant is operated and maintained in a manner that minimises risk of consent breaches within the capabilities of the current processes. - Wide ranging sampling and monitoring programme. - Buffering provides a factor of safety. - Proactive de-sludging programme is being developed - Ensure and maintain adequate sampling and monitoring. - React rapidly to potential breaches or indications that breaches are coming. - Continue to invest in the pond management team. 	Possible	Major	HIGH
R00696	Atawhai Rising Main Failure.	MC01016	<ul style="list-style-type: none"> - Stock spares available to facilitate rapid repair. - Effective systems for reporting and response in place. - Staff and contractors aware of the significance of this main. - Work underway to assess the internal condition of this rising main and the risk of failure of key external components. - "Dry run" exercises on failure response undertaken from time to time. - Continue with internal and external condition assessment programme. Ensure critical spares are readily available. - Renewal planning commenced July 2021 with stage 1 construction planned for 2025/26 	Possible	Major	HIGH
R00698	Pump stations Equipment/ component Failure	MC01017	<ul style="list-style-type: none"> - Processes within pump stations have contingencies for failure (duplication of pumps) or alarm systems (Supervisory control and data acquisition) installed. - Many PS have additional storage capacity - Pump station resilience programme to identify appropriate solutions to decrease risk levels associated with critical equipment failure. - Operations team to develop a critical spares list and develop a business case to procure these. - Increase "Dry run" exercises on critical pump stations. 	Possible	Major	HIGH
R00699	Insufficient Storage Capacity at Pump stations	MC01018	<ul style="list-style-type: none"> - All pump stations have high level and overflow alarms for advance warning of an overflow event and high capacity pumps for peak flow conditions. - A programme of work associated with better understanding key risks (and developing associated solutions) related to pump stations is underway. - Investigate storage capacity of network, document, & develop mitigation strategy. Pump station resilience programme to identify appropriate solutions. 	Possible	Major	HIGH

5.2.3 Potential Risks

Risks can be seen to arise from many areas of the Nelson City Council, both in the physical aspect for assets and business risks. It is important to regularly review the risk register to ensure that it is current.

5.2.4 Climate Change

Climate change is expected to bring with it more extreme weather in the form of higher intensity and longer duration rain events (with associated flood damage and inflow and infiltration issues) and drought periods. The issue will be monitored and future Activity Management Plans will be adjusted to address impacts as they become better understood.

Climate change is an evolving area of research and as such involves significant assumptions with associated uncertainties. Council seeks to limit the impact of those uncertainties by relying on expert guidance from Central Government. Future upgrades of the wastewater network are based on ensuring the work is designed for demand and conditions anticipated during the service life of the asset. Refer to Section 1.2 for further details on Climate Change.

5.2.5 Natural Hazards

Recent work by Council has focussed on natural hazards that might impact on the city, in particular:

- A wider review of how hazards interact with the 3 Waters network which along with an assessment of criticality is enabling a clear establishment of priorities. This work confirmed that critical assets that are susceptible to natural hazard events include the NWWTP and Atawhai Rising Main.
- Direct damage from earthquake shaking.
- Damage from liquefaction in susceptible areas.
- Damage from tsunami.
- Damage from flooding and major storm events.
- Impact of potential climate change and sea level rise.

In February 2018 the remnants of two tropical cyclones hit the Nelson Tasman region. Both caused extensive damage. In 2019 the Pigeon Valley fire highlighted a hazard that had to date a relatively low profile. These events highlight that natural hazards occur in a variety of guises and the consequent importance of resilience within the network.

The wastewater network activity is likely to be impacted by sea level rise more than some of the other utilities because the reticulation is essentially gravity based, with pipes of varying depth, age and integrity and key assets typically being located in the coastal zone. Pump stations are set at the lowest points in a network/catchment; this inherently makes them prone to flooding and groundwater/tidal affects, particularly in the Port Nelson, The Wood and Tahunanui areas. Inflow and infiltration rates would be expected to rise, with base groundwater levels likely to become elevated and high tides enhancing this effect. Pump stations and treatment plants are mostly positioned on lower level ground with potential for direct tidal impact

Liquefaction was seen in Christchurch to be an extreme risk to the network through floating manholes and sand and silt infiltration into pipelines and manholes. This would have risk to key assets located in known liquefaction areas such as Tahunanui.

5.2.6 Ability to Maintain Adequate level of Network Renewals

From figures throughout this document it is clear that in the near future there a large quantum of asset renewals that the city will be required to undertake (see figures 4-14 & 4-15). It is unlikely to be feasible to undertake these renewals as they become due and a clear strategy needs to be developed all focussing on how this can be best managed to optimise the asset life and be financially sustainable. Refer to Section 4.3 on how this risk will be managed.

5.2.7 Risk summary

There are no extreme risks identified within the network. High risks are identified in Table 5-1.

Work is ongoing to ensure that risk levels are maintained at levels that balance the communities willingness to pay and the likelihood of a particular risk occurring.

5.3 Infrastructure resilience approach

5.3.1 Resilience

Resilience is commonly defined as the capacity for 'bouncing back faster after stress, enduring greater stresses, and being disturbed less by a given amount of stress'. However, major risks are often systemic in nature, and a system may demonstrate resilience not by returning exactly to its previous state, but instead by finding different ways to carry out essential functions. The following capabilities contribute to system resilience:

- Adapt to changing contexts.
- Withstand sudden shocks.
- Recover to a desired equilibrium, either the previous one or a new one, while preserving the continuity of its operations.

While risks tend to focus on the negative consequences from uncertainty, the concept of resilience encourages us to grasp opportunities and innovate to reduce our exposure and vulnerability to the impact from shocks and stresses as they occur.

5.3.2 Development of resilient infrastructure

As a result of geographical constraints the bulk of wastewater pump stations and the NWWTP in the network are concentrated at the bottom of the catchments close to the coast. These are vulnerable to both flooding and sea level rise. Current advice from both the Ministry for the Environment and the National Institute for Water and Atmospheric (NIWA) studies is that climate change will lead to a greater number of extreme weather events into the future with the prospect of more flooding, particularly in these lower areas of the city. All new pump stations and modifications/upgrades at the NWWTP are designed to withstand expected sea level rise predictions for the service life of the asset.

Further work is proposed in this Plan to build on the hazard and criticality studies carried out in recent years. Natural hazard resilience will include wider network hazards such as earthquake fault line rupture and liquefaction as well more specific issues such as

sea level rise. Much of this work is expected to focus on the NWWTP, Atawhai Rising Main, pump stations and key parts of the piped network across the city. The work will link with similar projects in the stormwater and water supply activities.

Within the period of this LTP budget has been allocated to undertaking work associated with further understanding levels of vulnerability across the wastewater network and creating resilient solutions to these vulnerabilities.

For temporary power outages Council's NWWTP and three largest pump stations have permanent emergency generators direct wired, and six mobile generators that can be rotated between pump stations. Arrangements have also been made with contractors to access two additional mobile generators if necessary. See Appendix C for details.

5.3.3 Climate Change Effects

There has been considerable work undertaken at a national level on the possible effects of climate change and sea level rise.

The key climate influences on the wastewater activity is more intense rainfall, higher sea level and tides, and storm surges. More water inflow and infiltration into the wastewater system increases the risk of wet weather overflow events.

5.3.4 Sea Level Rise

According to the Ministry for the Environment, the average relative sea level rise for the 100 years leading up to 2015 was around 1.8mm a year. For future sea level rise, the Ministry recommends the adoption of four New Zealand wide sea level projection scenarios for use in hazard, vulnerability/risk assessments and adaptation planning, and provides transitional minimum values for sea level rise for four broad categories of development to be used in planning:

- Avoid hazard risk for coastal subdivision, greenfield developments and major new infrastructure by using sea level rise over more than 100 years and the RCP H+ scenario (which translates to 1.5m sea level by 2130).
- Adapt to hazards by conducting risk assessment using a range of scenarios and using the pathways approach for changes in land use and redevelopment.
- 1.0m for existing coastal development and asset planning.
- 0.65m for non-habitable short-lived assets with functional need to be at the coast and either low-consequences or readily adaptable (including services).

Nelson City Council will follow this approach to factor future sea level rise into its technical assessments of climate change related hazards and to formulate minimum ground and floor level requirements for low lying sites in the proposed Whakamahere Whakatū Nelson Plan and Nelson Tasman and Land Development Manual (NTLDM). The predictions for sea level rise, flooding, and storm surges will be monitored on an ongoing basis to ensure that Council's future planning documents reflect the most up to date predictions.

5.3.5 Rainfall

Rainfall events of increased intensity are predicted for the region. Design work associated with the wastewater activity will be undertaken in accordance with the NTLDM requirements or where appropriate more up to date information.

5.3.6 Insurance

Nelson City Council has insurance cover for the Wastewater, Water & Stormwater services, staff and property as detailed in Table 5-2 below. The insurance cover is updated on a regular basis following valuations to ensure the insurance cover is appropriate for its purpose.

Table 5-2: Wastewater Insurance Provisions

Components / Items	Marsh Top of the South collective				Aon SI collective
	Public Liability	Professional Indemnity	Buildings and Contents	Motor Insurance	
Reticulation					✓
Pump Stations					
- Electrical			✓		
- Mechanical			✓		
- Structural			✓		
Staff	✓	✓			
Council Vehicles				✓	
Private property damage related to stormwater damage	✓				
✓ Indicates coverage by that particular insurance type					

Aon South Island (SI) collective

Nelson City Council is a member of an Aon South Island collective of councils.

In the event of a natural disaster, the insurance cover will generally cover 40% of the reinstatement cost of infrastructure assets that have been damaged and declared for cover by the Aon SI collective.

The Aon SI collective is a shared program limit, Council has a sub-limit of \$180 million plus AICOW – Additional Increased Cost of Working – this allows for additional costs to be paid over and above normal operating costs during a loss. 2020 insurance catastrophe modelling indicated the \$180m limit is adequate.

5.3.7 Emergency Management

Local Authority Responsibility

Section 64 of the Civil Defence Emergency Management Act 2002 requires Local Authorities to:

64 Duties of local authorities

(1) A local authority must plan and provide for civil defence emergency management within its district.

(2) A local authority must ensure that it is able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency”

Exercises are carried out approximately every six months to ensure staff are familiar with the procedures documented in the Nelson City Council Emergency Management Procedures Manual.

When a serious emergency event occurs an Incident Management Team (IMT) is activated to lead Council’s response, to ensure a clear decision making structure. The lead role of incident manager is filled by a member of Nelson City Council’s Senior Leadership Team, and the other IMT members generally include the applicable manager(s) according to the type of event. More staff are added depending on the scale and complexity of the event.

Local Emergency Management Arrangements

Nelson Tasman Emergency Management Group is a joint committee of both NCC and TDC.

The Nelson Tasman Emergency Management Group Plan provides for an ‘all hazards’ approach to emergency management planning and activity within Nelson and the Tasman District. The Nelson Tasman Emergency Management Group Plan states the Emergency Management structure and systems necessary to manage those hazards, including the arrangements for declaring a state of emergency in the Group’s area. The Group Plan is the primary instrument whereby the community identifies and assesses its hazards and risks, and decides on the acceptable level of risk to be managed and how it is to be managed.

Lifelines Responsibility

Section 60 of the Civil Defence Emergency Management Act 2002 requires Local Authorities to support lifeline utilities as follows:

60 Duties of lifeline utilities

Every lifeline utility must—

ensure that it is able to function to the fullest possible extent, even though this may be at a reduced level, during and after an emergency

Nelson City Council participated in the 2015/16 Nelson Tasman Engineering Lifelines Group project as a lifeline utility. And Nelson City Council is a member of the Nelson Tasman Emergency Management Group Lifelines committee.

Nelson Tasman Emergency Management and Nelson City Council Emergency Response Plans

The following documents are available for guidance:

- Nelson Tasman Emergency Management Group Plan.
- Nelson City Council Emergency Procedures Manual.

Table 5-3 indicates the status of the wastewater schemes in the areas of Risk Reduction, Readiness, Response and Recovery.

Table 5-3: Risk Reduction, Readiness, Response and Recovery Status

Activities Required	Description	Wastewater Status
Risk Reduction	Identifying hazards, describing risks, and taking actions to reduce the probability or consequences of potential events.	Asset Management Risk Register. Wastewater Management Strategies.
Readiness	Planning and preparation required to equip agencies and communities to respond and recover.	Emergency procedures manual and exercises.
Response	Addressing immediate problems after an emergency.	Emergency procedures manual and exercises. Operations and maintenance response by contractor (Nelmac).
Recovery	Addressing the long-term rehabilitation of the community.	Nelson-Tasman Emergency Management Group.

5.3.8 WaterNZ

Nelson City Councils membership of WaterNZ give it access to a wide pool of expertise both during times of emergency and in general.

5.3.9 Electricity Supply

The electricity lines suppliers are Network Tasman Ltd and Nelson Electricity Ltd.

Electricity supply is currently via a contract with Genesis.

5.3.10 Interconnectivity Effects

Interconnectivity or interdependence between different utilities during and after a disaster is of utmost importance. In the event of failure, access is necessary to visit a site and provide power for recovery or removal of debris. To enable effective and efficient recovery of lifelines from an event which disrupts their service, dependencies on other lifelines must be understood and where necessary, mitigated against.

Figures 5-3 and 5-4 summarise interdependencies between lifelines sectors during business-as-usual and major disaster events where disruption is expected to roads and electricity networks. The ratings presented in this section are illustrative only – obviously the extent of dependence in a response and recovery situation will depend on the specific scenario. The total dependency scores clearly illustrate the importance of electricity, roads, fuel and telecommunications to the other sectors.

Figure 5-3: Interdependency Matrix – Business As Usual

The degree to which the utilities listed to the right are dependent on the utilities listed below	Roads	Rail	Sea Transport	Air Transport	Water Supply	Wastewater	Stormwater	Electricity	Gas	Fuel Supply	Broadcasting	VHF Radio	Telecomms	Total Dependency
Electricity	1	2	3	3	3	3	2		2	2	3	3	3	30
Roads		3	3	3	2	2	2	2	2	3	2	2	2	28
Fuel	2	3	3	3	2	2	2	2	2		2	2	2	27
Tele-comms	2	2	2	2	2	2	2	2	2	2	2	3		25
Water Supply	1	1	1	2		3	1	1	1	1	1	1	2	16
VHF Radio	2	2	2	2	1	1	1	1	1	1	1		1	16
Stormwater	2	1	1	2	1	1		1	1	1	1	1	1	14
Wastewater	1	1	1	2	1		1	1	1	1	1	1	1	13
Rail	1		1	1	1	1	1	1	1	1	1	1	1	12
Sea Transport	1	1		1	1	1	1	1	1	1	1	1	1	12
Air Transport	1	1	1		1	1	1	1	1	1	1	1	1	12
Gas	1	1	1	1	1	1	1	1		1	1	1	1	12
Broadcasting	1	1	1	1	1	1	1	1	1	1		1	1	12

Figure 5-4: Interdependency Matrix – During / Post Disaster Event

The degree to which the utilities listed to the right are dependent on the utilities listed below	Roads	Rail	Sea Transport	Air Transport	Water Supply	Wastewater	Stormwater	Electricity	Gas	Fuel Supply	Broadcasting	VHF Radio	Telecomms	Total Dependency
Fuel	3	3	3	3	3	3	3	3	3		3	3	3	36
Roads		3	3	3	3	3	3	3	3	3	2	2	3	34
Tele-comms	3	2	2	2	3	3	3	3	3	2	2	3		31
Electricity	1	2	3	3	3	3	2		2	2	3	3	3	30
VHF Radio	2	2	3	3	2	2	2	2	2	2	2		2	26
Broadcasting	2	2	2	2	2	2	2	2	2	2		2	2	24
Air Transport	2	1	1		2	2	2	2	2	2	2	2	2	22
Water Supply	1	1	1	2		3	1	1	1	1	1	1	2	16
Stormwater	2	1	1	2	1	1		1	1	1	1	1	1	14
Wastewater	1	1	1	2	1		1	1	1	1	1	1	1	13
Rail	1		1	1	1	1	1	1	1	1	1	1	1	12
Sea Transport	1	1		1	1	1	1	1	1	1	1	1	1	12
Gas	1	1	1	1	1	1	1	1		1	1	1	1	12

3: Required for Service to Function, 2: Important but can partially function and/or has full backup, 1: Minimal requirement for service to function.

5.3.11 Succession Planning

Succession planning within any business is considered necessary to reduce the risk associated with staff leaving the organisation. Succession planning allows institutional knowledge to be passed on and assists in ensuring continuity of organisational culture.

Currently succession planning is largely through having separate Activity Engineers for each Three Waters Activity, the utilisation of the Activity Management Plans as a central repository for knowledge and the development of strategies associated with key work streams and/or geographical areas. In order to ensure lower risk related to succession planning there is a need to improve staff interconnectedness, staff numbers working at the long term planning/strategic level and planning/recording of strategies over the next three years.

6. FINANCIAL SUMMARY

This Section sets out financial statements, funding strategy, depreciation forecast and charges for the Wastewater Services in Nelson City.

The Local Government Act 2002 (Part 6 Subpart 3) requires local authorities to manage their finances “prudently and in a manner that promotes the current and future interests of the community. This implies compliance with applicable Financial Reporting Standards, which include Public Benefit Entity International Public Sector accounting Standards (PBE IPSAS).

This Plan provides the basis for meeting these requirements.

6.1 Financial statements and projections

6.1.1 Budget Projections

Definition of Expenditure Categories

All expenditure on infrastructure assets falls into one of the following categories:

- Capital Expenditure
 - Renewals / Replacement expenditure
 - Creation/Acquisition/Augmentation
 - Capital increased level of service
 - Capital growth
- Operations and Maintenance Expenditure
 - Base Expenditure
 - Unprogrammed expenses
 - Programmed expenses

Budget projections

Tables 6-1 and 6-2 set out the projected capital and operational expenditure for this activity over the 10 years of this Plan.

- The period 2024 – 34 in terms of operational expenditure is steadily increasing reflecting a need to operate and maintain an ageing network and increase the level of condition assessment; there is a peak in Y8 relating to programmed desludging of the oxidation ponds at the Nelson Wastewater Treatment Plant. Though considered operational expenditure, the desludging of the oxidation ponds in 2013/14 was loan funded, and therefore had a similar impact on rates as capital expenditure.
- Capital expenditure for the period 2024 – 2034 shows an increase from year 2 onwards. The increase in capital expenditure is to service expected growth areas and a response to the direction taken to increase renewals spending (smooth out the renewals “bow wave”) – these are both key issues identified in this Plan.

Some key operational projects/programmes over the period of the AMP include:

- Climate change – Emissions Reduction.
- Climate Change – Vulnerability Assessment.
- Climate Change – Adaptation Strategy.
- NWWTP Strategic Scoping/Options.
- Natural Hazards Risk Assessment.
- Inflow and Infiltration (Overflow Reduction).

Some key capital projects/programmes over the period of the AMP include:

- NWWTP Resource Consent Renewal.
- Atawhai Rising Main - Renewal.
- Pump Station Upgrades.
- Pump Station Resilience.
- System Performance Improvements.
- Climate change – Emissions Reduction Implementation.
- Climate Change – Vulnerability Assessment Implementation.
- Climate Change – Adaptation Strategy Implementation.
- Natural Hazards Risk Remediation.

Table 6-1: Wastewater Capital Expenditure Year 1-10 of the 2024/34 Long Term Plan

Account	2024/25 AMP (2024/34)	2025/26 AMP (2024/34)	2026/27 AMP (2024/34)	2027/28 AMP (2024/34)	2028/29 AMP (2024/34)	2029/30 AMP (2024/34)	2030/31 AMP (2024/34)	2031/32 AMP (2024/34)	2032/33 AMP (2024/34)	2033/34 AMP (2024/34)
6405 Wastewater	7,881,038	14,595,673	22,874,813	22,651,823	19,912,073	20,119,073	22,664,073	24,534,073	28,392,073	22,906,073
Capital Growth	2,926,573	10,913,673	14,909,813	11,849,823	2,614,073	2,089,073	5,689,073	6,449,073	11,889,073	12,789,073
640576103163. Saxton Road sewer upgrade	0	0	0	0	0	0	0	200,000	3,000,000	2,800,000
640576103666. Central City Intensification Capacity Increases	0	0	0	0	0	0	0	0	1,100,000	1,600,000
640576152876. Ngawhatu Valley TM - Stage 2	0	0	0	0	50,000	200,000	3,000,000	2,750,000	0	0
640576153328. Mahitahi Development	740,000	4,000,000	2,513,000	1,000,000	1,000,000	0	0	0	0	0
640576153329. Bayview Development	0	0	0	0	0	200,000	1,200,000	1,210,000	0	0
640576153701. IAF Wastewater Pipeline Upgrade	467,500	4,604,600	2,139,940	1,467,950	0	0	0	0	0	0
640576153702. IAF Paru Paru PS Upgrade	500,000	420,000	8,017,800	8,017,800	0	0	0	0	0	0
640576203355. Pump Station upgrades	0	50,000	250,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
640576303357. NWWTP Replacement	0	600,000	750,000	0	0	0	0	500,000	6,000,000	6,000,000
640576903368. Climate Change - Emissions Reduction Strategy Implementation	30,000	50,000	50,000	0	0	0	0	500,000	500,000	500,000
640576903369. Climate Change - Vulnerability Assessment Implementation	0	0	0	75,000	200,000	200,000	0	0	0	100,000
640576903370. Climate Change - Adaptation Strategy Implementation	0	0	0	0	75,000	200,000	200,000	0	0	500,000
64057691. Vested Assets	1,189,073	1,189,073	1,189,073	1,189,073	1,189,073	1,189,073	1,189,073	1,189,073	1,189,073	1,189,073
Capital Increased LOS	1,581,000	552,000	505,000	1,935,000	4,458,000	3,720,000	1,391,000	3,565,000	5,043,000	2,913,000
640577203147. Quarantine Rd Sewer PS/Catchment Upgrades	1,000,000	0	0	0	0	0	0	0	0	100,000
640579102054. Washington Valley Sewer Upgrade	40,000	10,000	0	0	0	0	100,000	2,000,000	2,000,000	0
640579102890. Natural Hazards Risk Remediation	0	0	0	100,000	200,000	500,000	100,000	200,000	500,000	200,000
640579103665. Overflow Reduction/I&I Capital Works	100,000	100,000	100,000	125,000	150,000	175,000	200,000	225,000	150,000	175,000
640579153359. LoS network problem/issues upgrade/renewal appraisal	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
640579153663. City Centre (gravity and pressure) network risk mitigation p	0	0	0	0	0	0	100,000	250,000	2,000,000	2,000,000
640579201716. Awatea Place Pump station	15,000	0	0	0	0	0	0	0	0	0
640579201914. Pump station resilience improvement programme	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
640579203443. Washington/Hastings to Paru Paru PS Capacity Improvements	0	0	0	500,000	1,500,000	1,500,000	0	0	0	0
640579203598. Pump Station/Network Overflow Screening	0	0	0	600,000	700,000	600,000	500,000	500,000	0	0

Account	2024/25 AMP (2024/34)	2025/26 AMP (2024/34)	2026/27 AMP (2024/34)	2027/28 AMP (2024/34)	2028/29 AMP (2024/34)	2029/30 AMP (2024/34)	2030/31 AMP (2024/34)	2031/32 AMP (2024/34)	2032/33 AMP (2024/34)	2033/34 AMP (2024/34)
640579253596. FM installs (LoS)	25,000	25,000	25,000	25,000	25,000	25,000	0	0	0	0
640579301191. NWWTP Minor Upgrades	100,000	107,000	107,000	107,000	110,000	110,000	110,000	120,000	120,000	120,000
640579303667. NWWTP Inlet Work Bypass	0	0	0	100,000	1,000,000	0	0	0	0	0
640579503230. System Performance Improvements (Overflow Reduction / I&I)	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
640579902990. SCADA Upgrade	61,000	70,000	33,000	38,000	33,000	70,000	41,000	30,000	33,000	78,000
640579903664. Storage Facility - WW spares/pipes	0	0	0	100,000	500,000	500,000	0	0	0	0
Renewals	3,373,465	3,130,000	7,460,000	8,867,000	12,840,000	14,310,000	15,584,000	14,520,000	11,460,000	7,204,000
640571403358. Data Gathering equipment	70,000	70,000	70,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000
640571901648. Wastewater model calibration	25,000	25,000	200,000	300,000	250,000	25,000	25,000	25,000	400,000	400,000
640573101564. Wastewater Pipe Renewals & upgrades	500,000	500,000	500,000	2,000,000	2,000,000	2,000,000	1,000,000	1,500,000	2,000,000	2,500,000
640573102079. Mount St and Konini St	50,000	0	0	0	100,000	800,000	0	0	0	0
640573103114. Manhole replacement	50,000	55,000	60,000	65,000	70,000	75,000	80,000	85,000	90,000	95,000
640573103597. Emano/Murphy St Wastewater pipe Renewal & Upgrades	0	0	0	0	0	0	3,000,000	3,000,000	3,000,000	3,000,000
640573103658. Awatea/Quarantine/Airport RM network - Renewal and Upgrade	0	0	0	0	0	0	0	0	0	100,000
640573103659. Halifax St East - WW pipe renewal	0	0	0	0	0	1,200,000	1,200,000	0	0	0
640573152879. Atawhai Rising Main renewal & upgrade - Stage 1	637,965	1,000,000	5,000,000	5,000,000	9,000,000	9,000,000	9,000,000	9,000,000	5,000,000	0
640573153361. Capital WW network Reactive	75,000	75,000	75,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
640573153496. Renewals & upgrades Swallow Rising Main Watercourse Crossing	200,000	500,000	500,000	0	0	0	0	0	0	0
640573201502. Renewals Pump stations	350,000	350,000	350,000	350,000	350,000	300,000	300,000	300,000	300,000	300,000
640573203662. Vangaurd PS	0	0	0	0	0	0	0	0	100,000	200,000
640573251493. Flow meter renewals	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000
640573302768. NWWTP renewals	330,000	330,000	500,000	500,000	330,000	330,000	330,000	280,000	280,000	280,000
640573303362. NWWTP Wetlands Plant renewal	200,000	20,000	20,000	20,000	100,000	20,000	20,000	20,000	20,000	100,000
640573402877. NWWTP Resource Consent Renewal	761,500	100,000	0	0	0	0	0	0	0	0
640573403410. Wastewater Overflows Resource Consent renewal	0	0	0	0	350,000	350,000	300,000	0	0	0
640573902990. SCADA renewals	24,000	5,000	5,000	347,000	5,000	5,000	24,000	5,000	65,000	24,000
640573903660. Generator Renewal	70,000	70,000	150,000	80,000	80,000	0	100,000	100,000	0	0

Table 6-2: Wastewater Operational Expenditure Year 1-10 of the 2024/34 Long Term Plan

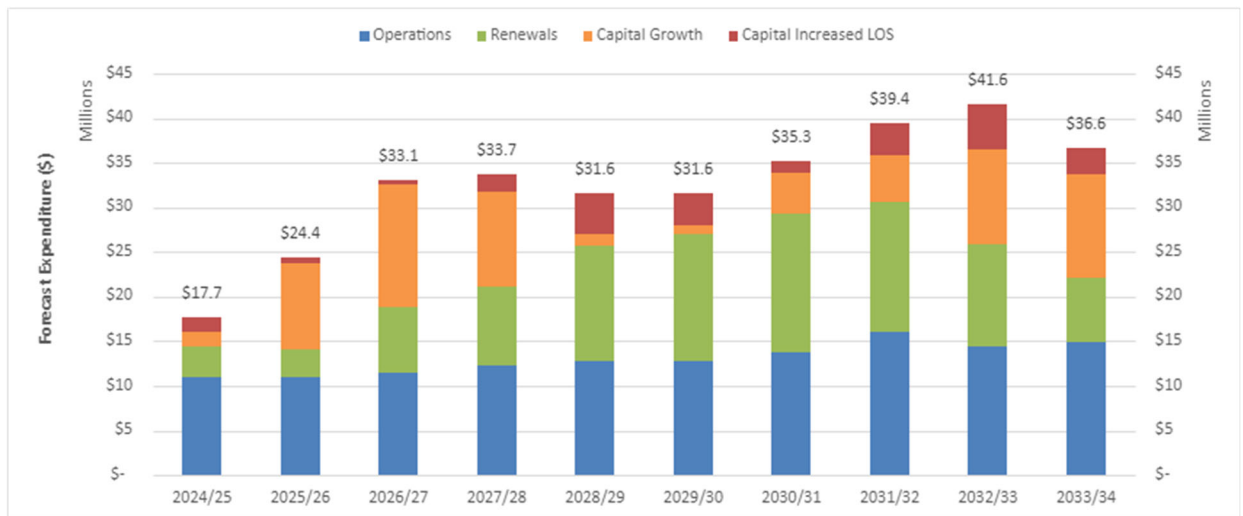
Account	2024/25 AMP (2024/34)	2025/26 AMP (2024/34)	2026/27 AMP (2024/34)	2027/28 AMP (2024/34)	2028/29 AMP (2024/34)	2029/30 AMP (2024/34)	2030/31 AMP (2024/34)	2031/32 AMP (2024/34)	2032/33 AMP (2024/34)	2033/34 AMP (2024/34)
6405 Wastewater	11,034,435	11,003,703	11,434,210	12,303,090	12,874,918	12,756,525	13,826,087	16,099,043	14,453,122	14,934,379
Base Expenditure	9,705,435	9,564,703	9,850,210	10,358,090	10,779,918	10,826,525	11,458,608	11,772,751	12,202,999	12,730,405
64052010. Wastewater Reticulation Programmed Maintenance	430,000	435,000	450,000	450,000	484,129	486,550	488,982	491,427	493,884	496,354
640520101056. Generator programmed maintenance	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
640520103827. Data aquisition, monitoring and storage strategy	0	20,000	20,000	0	0	0	0	35,000	35,000	40,000
64052017. After Hours Duty Officer	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	22,000	22,000
64052018. Mtce: NN Treatment Plant	700,000	700,000	935,000	939,211	943,907	948,627	953,370	958,136	1,262,927	1,269,242
640520303821. Odour management	75,000	75,000	75,000	100,000	150,000	150,000	150,000	150,000	150,000	150,000
640520303824. Data equipment mtce	25,000	25,000	25,000	30,000	45,000	50,000	85,000	90,000	95,000	100,000
64052310. Trade Waste Monitoring	92,000	122,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000
640523100473. Regional Sewerage: NCC Share	7,637,560	7,416,828	7,339,335	7,743,003	8,096,007	8,155,473	8,700,381	9,052,312	9,191,312	9,624,934
640523982311. Staff Contra - Inflow & Infiltration Reduction Programme	0	0	0	0	0	0	0	0	(85,000)	(85,000)
64052617. Electricity	282,075	282,075	282,075	282,075	282,075	282,075	282,075	282,075	282,075	282,075
64052621. Rates	27,304	27,304	27,304	27,304	27,304	27,304	27,304	27,304	27,304	27,304
64052625. Water by Meter	652	652	652	652	652	652	652	652	652	652
64052637. Insurance	345,844	345,844	345,844	345,844	345,844	345,844	345,844	345,844	345,844	345,844
64052699. Plant / Vehicle Operating Expense	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
64052710. Legal Expenses	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
64052720. Valuation Fees	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000
640527302929. Wastewater Risk Management Plan	5,000	25,000	25,000	30,000	45,000	50,000	50,000	50,000	50,000	50,000
640527303364. Climate Change - Emissions Reduction Strategy	15,000	15,000	20,000	100,000	20,000	20,000	100,000	20,000	20,000	100,000
640527303365. WW Activity and Growth studies	0	0	0	30,000	35,000	40,000	50,000	50,000	50,000	50,000
640527303366. Climate Change - Vulnerability Assessment	5,000	15,000	50,000	0	0	0	0	0	40,000	40,000
640527303370. Climate Change - Adaptation Strategy	10,000	10,000	30,000	50,000	50,000	50,000	0	0	20,000	20,000
640527603823. PS designations	0	0	0	10,000	30,000	0	0	0	0	0

Account	2024/25 AMP (2024/34)	2025/26 AMP (2024/34)	2026/27 AMP (2024/34)	2027/28 AMP (2024/34)	2028/29 AMP (2024/34)	2029/30 AMP (2024/34)	2030/31 AMP (2024/34)	2031/32 AMP (2024/34)	2032/33 AMP (2024/34)	2033/34 AMP (2024/34)
Unprogrammed Expenses	690,000	695,000	700,000	745,000	750,000	755,000	852,479	856,292	860,123	863,974
64053010. Wastewater Reticulation Reactive Maintenance	675,000	675,000	675,000	700,000	700,000	700,000	762,479	766,292	770,123	773,974
640530101056. Generator unprogrammed maintenance	0	0	0	5,000	5,000	5,000	15,000	15,000	15,000	15,000
640530102312. Reactive maintenance CCTV	15,000	20,000	25,000	40,000	45,000	50,000	75,000	75,000	75,000	75,000
Programmed Expenses	639,000	744,000	884,000	1,200,000	1,345,000	1,175,000	1,515,000	3,470,000	1,390,000	1,340,000
640540100493. Mtce: Flow Monitor	24,000	24,000	24,000	30,000	30,000	35,000	35,000	40,000	40,000	40,000
640540100494. Atawhai Rising Main repairs	0	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
640540101191. NWWTP Desludging	0	0	0	0	0	0	0	2,000,000	0	0
640540102047. Mtce: NWWTP Desludging	20,000	20,000	20,000	40,000	60,000	60,000	60,000	60,000	60,000	60,000
640540102311. Overflow Reduction Programme (Inflow & Infiltration)	195,000	205,000	215,000	220,000	200,000	200,000	350,000	350,000	350,000	400,000
640540102312. Mtce: CCTV Inspections	45,000	45,000	45,000	50,000	75,000	75,000	100,000	100,000	100,000	100,000
640540103826. Trunk main clearing	40,000	40,000	40,000	50,000	50,000	50,000	100,000	100,000	100,000	100,000
640540210240. Mtce: Ex-Filtrator	20,000	20,000	20,000	30,000	30,000	30,000	40,000	40,000	40,000	40,000
64054032. Performance & condition assessments	20,000	20,000	20,000	45,000	50,000	55,000	65,000	65,000	70,000	70,000
640540321563. WW Reticulation Network Condition Assessment/Investigation	30,000	35,000	40,000	45,000	50,000	55,000	65,000	65,000	70,000	70,000
640543100117. WWW - Pump Station Data Collection, storage and use	20,000	20,000	20,000	30,000	30,000	30,000	50,000	50,000	50,000	50,000
640543102446. Wastewater Bylaw review	0	10,000	25,000	0	0	0	40,000	40,000	0	0
640543102808. Network Capacity Confirmation for Growth Areas	20,000	20,000	20,000	20,000	20,000	30,000	30,000	30,000	30,000	30,000
640543102890. Natural Hazards Risk Assessment	50,000	0	0	50,000	0	0	75,000	75,000	75,000	75,000
64054372. Capex investigation, options, testing, engagement	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
640543723357. NWWTP Long Term Scoping/Options	60,000	60,000	60,000	100,000	100,000	100,000	0	0	50,000	50,000
640547103825. Easement implementation	0	10,000	15,000	15,000	20,000	20,000	20,000	20,000	20,000	20,000
640547303813. City Centre Catchment Long Term Climate Change and Resilienc	0	0	0	50,000	100,000	100,000	0	0	0	0
640547303814. Quarantine Rd PS Catchment Long Term Climate Change and Resi	0	50,000	50,000	100,000	100,000	0	0	0	0	0
640547303815. Wakatu PS Catachment Long Term Climate Change and Resilience	0	0	50,000	50,000	100,000	0	0	0	0	0

Account	2024/25 AMP (2024/34)	2025/26 AMP (2024/34)	2026/27 AMP (2024/34)	2027/28 AMP (2024/34)	2028/29 AMP (2024/34)	2029/30 AMP (2024/34)	2030/31 AMP (2024/34)	2031/32 AMP (2024/34)	2032/33 AMP (2024/34)	2033/34 AMP (2024/34)
640547303816. Saxton Rd PS Catchment Long Term Climate Change and Resilien	0	0	50,000	100,000	100,000	0	0	0	0	0
640547303817. Songer St PS Catchment Long Term Climate Change and Resilien	0	0	0	0	50,000	100,000	100,000	0	0	0
640547303818. Atawhai PS Catchments Long Term Climate Change and Resilienc	0	0	0	0	0	50,000	100,000	100,000	0	0
640547303819. Glenduan WW Long Term Climate Change and Resilience	0	0	0	0	0	0	50,000	100,000	100,000	0
640547601647. wastewater asset mgmt support	50,000	50,000	50,000	50,000	50,000	50,000	100,000	100,000	100,000	100,000
640547603822. Catchment Environmental Monitoring	0	10,000	15,000	20,000	25,000	30,000	30,000	30,000	30,000	30,000

Figure 6-1 outlines the spend profile for the various expenditure categories within the wastewater activity.

Figure 6-1: Wastewater Budgets - Ten Years



Nelson Regional Sewerage Business Unit (NRSBU)

Nelson City Council as a contributor to the NRSBU for the Nelson South area has a quota based agreement detailing Nelson City Council existing and future requirements. Table 6-3 sets out the projected Nelson Regional Sewerage Business Unit expenses to be covered by Nelson City Council.

Table 6-3: Projected Nelson Regional Sewerage Business Unit Expenses for Nelson City Council

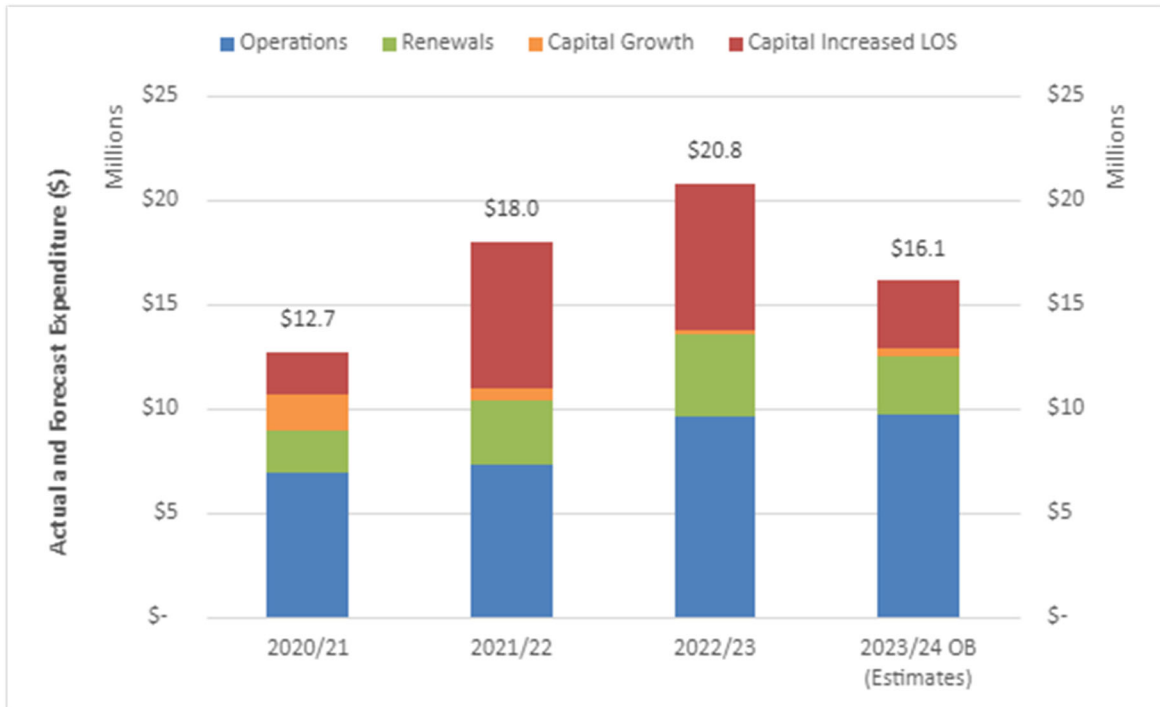
Year	Fixed (\$,000s)	Operations and Maintenance (\$,000s)
24/25	\$4,832	\$2,806
25/26	\$4,534	\$2,883
26/27	\$4,654	\$2,686
27/28	\$4,887	\$2,856
28/29	\$5,247	\$2,849
29/30	\$5,365	\$2,790
30/31	\$5,716	\$2,984
31/32	\$6,137	\$2,916
32/33	\$6,190	\$3,002
33/34	\$6,391	\$3,234

Note: Fixed and Operations and Maintenance costs are based on current contracted loads and Operations and Maintenance loads but are adjusted for projected capital spending (and associated operations and maintenance costs) by NRSBU.

6.1.2 Trends from the Previous 4 Years

Figure 6-2 outlines expenditure over recent years. Vested assets are excluded.

Figure 6-2: Recent Wastewater Expenditure



6.2 Funding strategy

In determining how activities will be funded local authorities are required to take the following into consideration:

- The contribution to the achievement of Community Outcomes (strategic alignment).
- Beneficiaries of each activity (beneficiary/user pays principles).
- The period over which benefits from the activity will occur (intergenerational equity issues).
- The extent to which identifiable individuals/organisations contribute to the need to incur expenditure (user pays principle).
- The costs and benefits of funding the activity compared to other activities (cost/benefit, prioritisation principles).
- The impact of funding the activity on the wellbeing of the community (ability to pay principles).

REVENUE AND FINANCING POLICY - WASTEWATER

Distribution of Benefits

Community Benefits:

- Contributes to community health.
- Provides recreational and environmental benefits associated with both inland and marine waters (for which there are increasing public expectations).
- Land is protected from the effects of large volumes of sewage seepage.
- Sewage treatment and disposal assists the local economy.
- Meets the community's increasing environmental standards.

Individual Benefits:

- Benefits are received by those connected to the sewage collection system.

The Costs and Benefits of Funding the Activity differ distinctly from other Activities

The benefits of wastewater system primarily accrue to those properties that are connected to the system and therefore a targeted rate is considered most appropriate way of funding this activity. Council use the Wastewater Bylaw and volume based charges to ensure industrial and commercial businesses pay for their share of waste treatment and disposal costs.

Residential Wastewater Charge

A separate targeted rate is set under section 16 of the Local Government (Rating) Act 2002 to recover the costs required for Council's wastewater and sewage disposal system. This charge is levied on all units (a unit is defined as a rating unit) to which the Council's wastewater and sewage disposal service is provided. Wastewater charges for previous three years are outlined in table 6-4.

Table 6-4: Residential Wastewater Charge

Year	\$ per unit (including GST)
2023/24	\$619.31
2022/23	\$564.72
2021/22	\$502.29
2020/21	\$477.33
2019/20	\$477.93
2018/19	\$432.30
2017/18	\$407.97

Creation/Acquisition/Augmentation

Nelson City Council will review funding requirements and strategies to achieve equitable funding of upgrade works through development contributions.

6.3 Valuation forecasts

Historically, the estimated depreciation of wastewater assets, based on expected asset life, has exceeded the value of wastewater renewals. The reason for this is that where the renewal of a wastewater asset is required, sometimes it is replaced by an asset with greater capacity which is considered as a level of service improvement, rather than a renewal. The peak in years 5 – 9 are due to increased expenditure on the Atawhai rising main renewal and upgrade.

Figure 6-3: Forecasts of depreciation

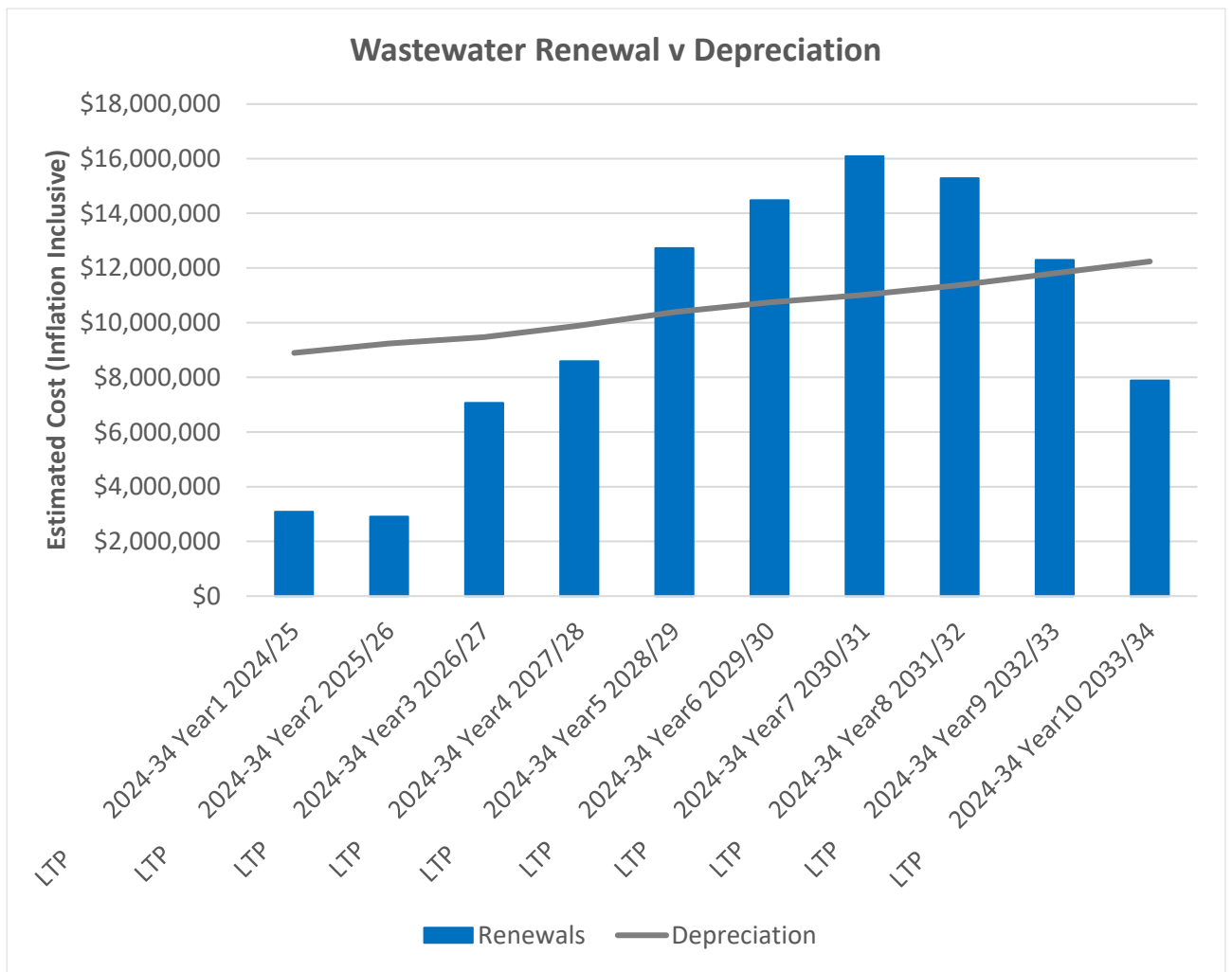
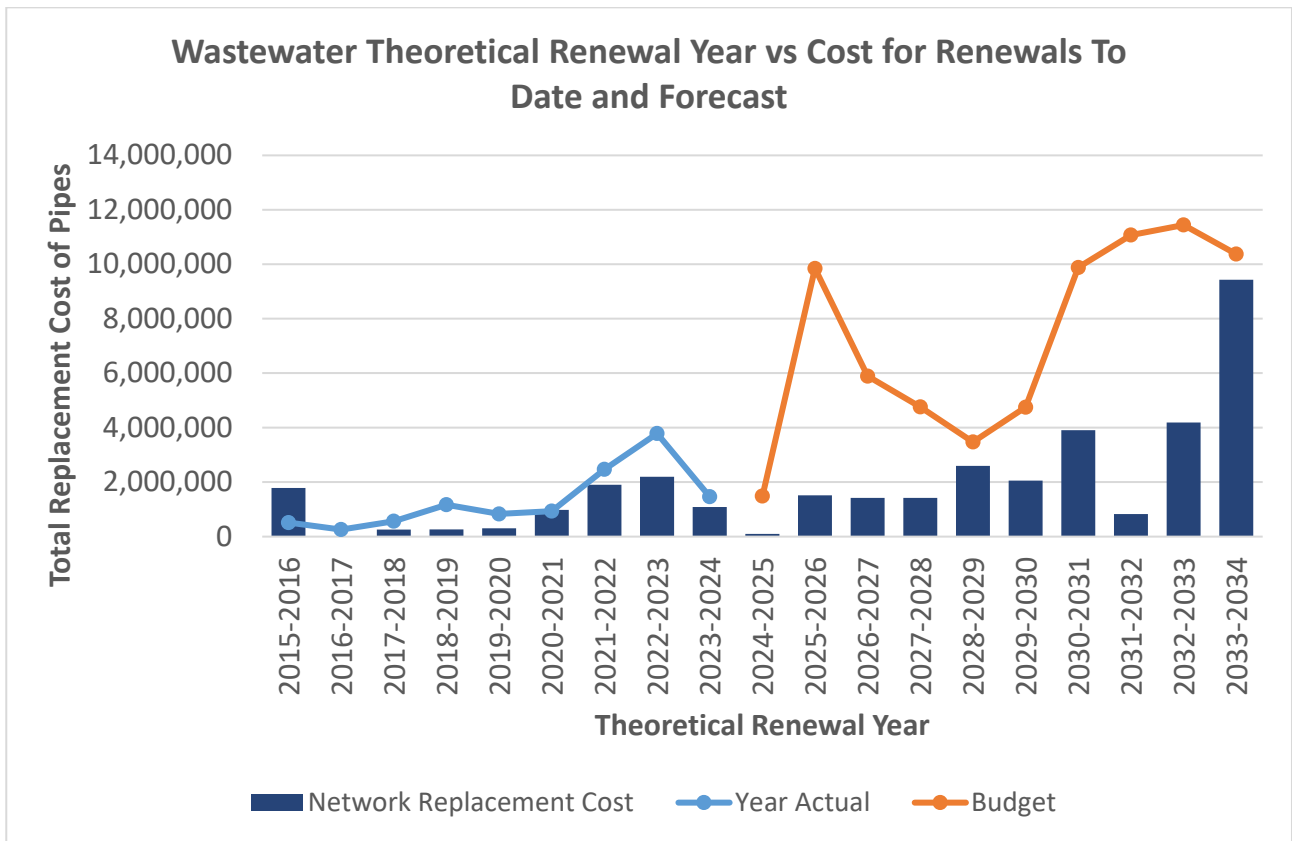


Figure 6-4: Theoretical Renewal Year vs Cost for Renewals To Date and Forecast



6.4 Key assumptions made in financial forecasts

Council is required to identify the significant forecasting assumptions it has made in preparing its ten year Long Term Plan. Assumptions are necessary to allow Council to plan for expenditure and costs over the next ten years. They are the best reasonable assessment made on the basis of currently available information.

The Nelson Long Term Plan details possible and actual significant forecasting assumptions and uncertainties relating to Nelson City Council activities. They are shown in Appendix H of this plan.

As well as the general assumptions that apply as the basis for forecasting budgets across Council’s work, some specific assumptions apply to Council’s wastewater activities:

- Typical useful lives from the NZ Infrastructure Asset Valuation and Depreciation Guidelines – Version 1.0 have been used as a guide in determining base lives. However the manual generally provides average expected life detail for asset components and Nelson City Council experience from the renewals of its assets has been used to vary these base lives where appropriate. The Lifecycle section of this plan provides detail of asset lives.
- The Atawhai rising main was installed in 1969 with an expected base life of 45 years. As a result of pipeline failures initiated by acid attack it was assessed by Duffill, Watts and Tse in 1994 and remedial work was completed in 1996 to

give it a remaining life of 45 years at that point in time. Given recent failures on the Atawhai Rising Main, the significant level of consequence associated with failures and awareness that it is a fragile asset, replacement work is scheduled to commence prior to the life determined in 1994 on the assumption that the expected life nominated in 1996 is not valid.

- Where an asset has exceeded its nominated base life, and is shown to be in good condition, a residual life of 5 years is assumed.
- Pump stations have been valued individually based on the size of the pumps and associated infrastructure. However standard component lives have been used for all pump stations.
- It is assumed that Nelson’s climate will remain substantially unchanged for the next decade. Factors such as climate change and population growth will receive increasing and evolving analysis over time and it is expected in the longer term there will be significant impacts to be dealt with – planning for this is incorporated in current work programmes.
- Wastewater activities of Council will be funded from wastewater charges and, consistent with Council’s financial policies, most of the capital expenditure will be borrowed. Development and Financial Contributions over the next 10 years will fund the increased provision of wastewater treatment due to population growth.
- The most efficient, safe and cost-effective means of disposing wastewater is a Council-provided piped system for the Nelson urban area, with treatment facilities to the north and west of the city.
- The long term future of the Nelson Wastewater Treatment Plant will be in the vicinity of its current location (north Atawhai area).
- That the “bow wave” of renewal work in commencing in approximately 2040 requires smoothing out and that this will mean bringing some renewal/replacement work forward and pushing some back (where asset condition allows).

6.5 Forecast reliability and confidence

The table below details the possible and actual significant forecasting assumptions and uncertainties relating to the Nelson City Council wastewater system.

Table 6-5: Significant Forecasting Assumptions and Uncertainties

No.	Assumption	Degree of Risk or Uncertainty	Likely Impact if the Assumption is (or is Not) Realised or is Not Acceptable
1	Interest rates for new loans raised or existing debt refinanced during the years 24 - 34 are forecasted in the range of - 4.85 - 5.21%.	Medium	Higher interest rates would increase costs for Council
2	Growth is based on commissioned demographic analysis data.	Low	If the population age profile varies from what is forecast, particularly if there is accelerated growth in the ageing population, it risks putting pressure on Council to change the type of facilities and services that it provides.
3	The actual remaining lives of assets will not deviate significantly from those contained in the asset valuation.	Medium	Changes in estimated asset lives could lead to significant changes in asset renewal projections, depreciation and renewal budgets.
4	The replacement values are a realistic cost and have taken into consideration engineering fees, resource consents etc.	High	Changes in replacement values could lead to significant changes in asset renewal projections, depreciation and renewal budgets. Replacement values have gone through a review process, however market prices have increased significantly in recent years.
5	In recent years the regional construction market has tended to price physical works above council estimates. At the time of setting the budgets it is assumed that the work will be able to be completed within the set budget.	High	Costs of upgrades are estimated without detailed project planning. If market price is above budget/estimate then there is less budget available for other works.
6	Contingency on Upgrade/capital cost estimates are as follows: Strategic Business Case: 30% Indicative Business Case : 30% Delivery/Construction: 10 - 15% Projects of unusual complexity or presenting landowner / regulatory issues that cannot be quantified and such that estimating with accuracy is difficult, may lie outside these figures.	Medium	Costs of upgrades are estimated only, and may exceed budgeted amounts.
7	Maintenance cost of service for Reticulation and Treatment will be within -5% and +10% of budget.	Low	Historically maintenance costs % variations for reticulation have been low.
8	Depreciation based on estimated useful lives not on condition of pipework.	Medium	If condition assessments indicate that Councils mains have decreased useful lives, depreciation presently taken will be less than that required for replacement.
9	That the "bow wave" of renewals commencing approximately 2040 will need to be bought forward (at a lower rate of renewal) to be sustainable/affordable.	Medium	Asset condition will deteriorate increasing the risks associated with failure and burdening future generations with a back log of asset renewal.

7. ASSET MANAGEMENT PRACTICES

The goal of infrastructure asset management is to:

“Deliver the required level of service to existing and future customers in a sustainable and cost effective manner.”

A formal approach to the management of assets is essential in order to provide services in the most cost-effective manner, and to demonstrate this to customers and other stakeholders. The benefits of improved asset management are:

- Improved governance and accountability.
- Enhanced service management and customer satisfaction.
- Improved risk management.
- Improved financial efficiency.
- More sustainable decisions.

The key elements of infrastructure asset management are as shown in Figure 7-1 below.

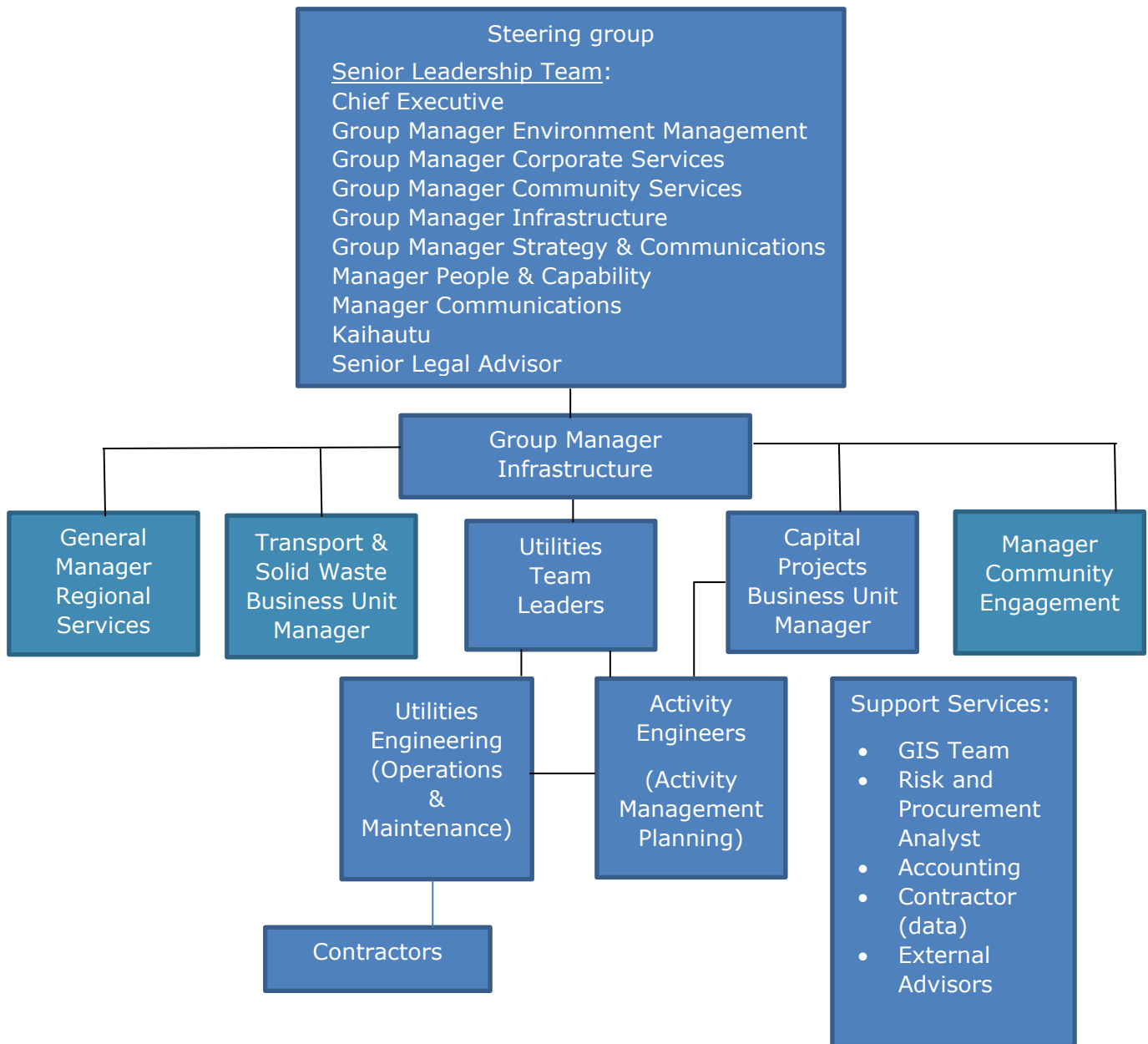
Figure 7-1: Key Elements of Infrastructure Asset Management



7.1 AM leadership and structure

Council’s infrastructure activity management structure is outlined in Figure 7-2.

Figure 7-2: Activity Management Leadership and Structure



7.2 Management systems

A management system is defined as the set of procedures an organisation needs to follow in order to meet its objectives.

Table 7-1: Management Strategies

Strategy	Objective/ Description
Strategic Planning	
Human Resources	Develop the professional skills of the staff through adequate training and experience. Personal Development Plans will be agreed with staff each year and a register maintained to record training history. Staff are encouraged to belong to appropriate professional bodies and to attend appropriate conferences, seminars and training courses.
Strategic Alignment	This Plan will support the achievement of relevant Community Outcomes for Nelson City Council, as set out in the Long Term Plan. The intended contribution of the Nelson City Council wastewater service to the achievement of Community Outcomes is shown in Section 2 of this Plan.
Service Levels	A clear statement of the wastewater services provided and standards to be achieved that directly link to, and support the stated community outcomes, are shown within this Plan.
Sustainable Management	Ensures all planning for the management, operation, maintenance, renewal and development of the wastewater activity is compatible with sustainable management principles. Nelson City Council will pursue ways of limiting the use of natural resources including energy, valued landscapes (and other natural heritage) and adverse effects on waterways. This will involve auditing the systems and materials used, and developing ways to incorporate sustainable operation and development principles into Nelson City Council activities.
Data Management and Utilisation	
Network Modelling	Continue the ongoing upgrading, updating and calibration of the two computer-based hydraulic models of the wastewater reticulation network. These enable Nelson City Council to: <ul style="list-style-type: none"> • Determine accurately the existing capacity of the network. • Identify inadequate sections of the network. • Operate the network in the most efficient and sustainable manner. • Determine the impact of further development/intensification on the network. • Identify network upgrading requirements. • Compare options for upgrading the wastewater network. • Ensure the network has appropriate capacity for the future.
Data Collection	Data collection occurs as distinct programmes (condition, performance, asset registers) and as parts of other projects. With advances in technology data is becoming easier and cheaper to access. Good data management is an essential part of being able to optimise the use of the collected data. Systematic processes are being introduced for the collection, storage and use of collected data at both an asset and network level.
Geographical Information System (GIS) Data	GIS data will be the subject of defined quality assurance processes. Nelson City Council has quality processes to ensure that all data entered to the GIS meets defined quality standards and supports asset management.
Business Processes	
Activity Management Plan Updates	This Plan remains a strategic 'living' document and will be updated as required and reviewed at three yearly intervals to coincide with the Long Term Plan. The scope of the review will be influenced by changes in Community Outcomes for Nelson City Council, service standards, improved knowledge of assets and corporate strategy/ policy and process.

Strategy	Objective/ Description
Risk Management	<p>Risk management is an essential part of asset management. Wastewater activity risks will be managed by implementing the Risk Management Register for the wastewater activity and the implementation of risk controls to maintain risk exposure at agreed levels.</p> <p>Risk controls will include maintaining appropriate insurance cover, emergency response planning, hazard identification and assessment, condition monitoring of critical assets, preventative maintenance, use of Supervisory Control and Data Acquisition (SCADA), and operations manuals, review of standards and physical works programmes.</p>
Infrastructure Asset Valuation	<p>Perform valuations in a manner that is consistent with national guidelines and Nelson City Council corporate policy for valuation cycles which are carried out every 1 – 3 years to reflect international financial activity and align with the Long Term Plan requirements.</p> <p>Asset valuations are the basis for several key asset management processes including asset renewal modelling and financial risk assessments. Valuations of the wastewater system will be carried out based on data from the Asset Management System to ensure audit ability and alignment with other processes.</p>
Monitoring	
Level of Service Standards	Continue with the monitoring procedures to ensure the wastewater activity is contributing to the community outcomes and that internal controls (service requests, operational contract requirements) are also monitored and managed.
Asset Performance	<p>The performance of the wastewater assets are monitored as an input to asset renewal and asset development programmes. The Monitoring includes:</p> <ul style="list-style-type: none"> • Customer service requests. • Asset failure records. • Asset Maintenance records. • Compliance with Resource Consents. • Critical asset audits. • SCADA. • Legislative compliance.
Financial Management	
Budgeting	<p>Expenditure programmes for the wastewater activity indicates Council funding and budgets with a 10 year projection</p> <p>Use the activity management plans to provide sufficient detail to demonstrate the decision making process for those 10 year projections.</p> <p>30 year budgets are also considered in the Infrastructure Strategy</p>
Financial Management	<p>Manage the wastewater activity budget in accordance with statutes and corporate policy. This involves:</p> <ul style="list-style-type: none"> • Economic appraisal of all capital expenditure. • Annual review of activity management plan financial programmes. • Recording of significant deferred maintenance and asset renewals. • Continuous monitoring of expenditure against budget.
Sustainable Funding	<p>Ensure the wastewater activity is managed in a financially sustainable manner over the long term</p> <p>The financial requirements for the provision of the wastewater activity, sustainable and to acceptable standards over the long term will be identified and provided for in the budgets. These financial requirements include:</p> <ul style="list-style-type: none"> • Management of the wastewater activity. • Operation and maintenance of the wastewater systems. • Asset replacement. • Asset development to ensure that the ability of the wastewater activity to deliver an acceptable level of service is not degraded by growth in Nelson City.

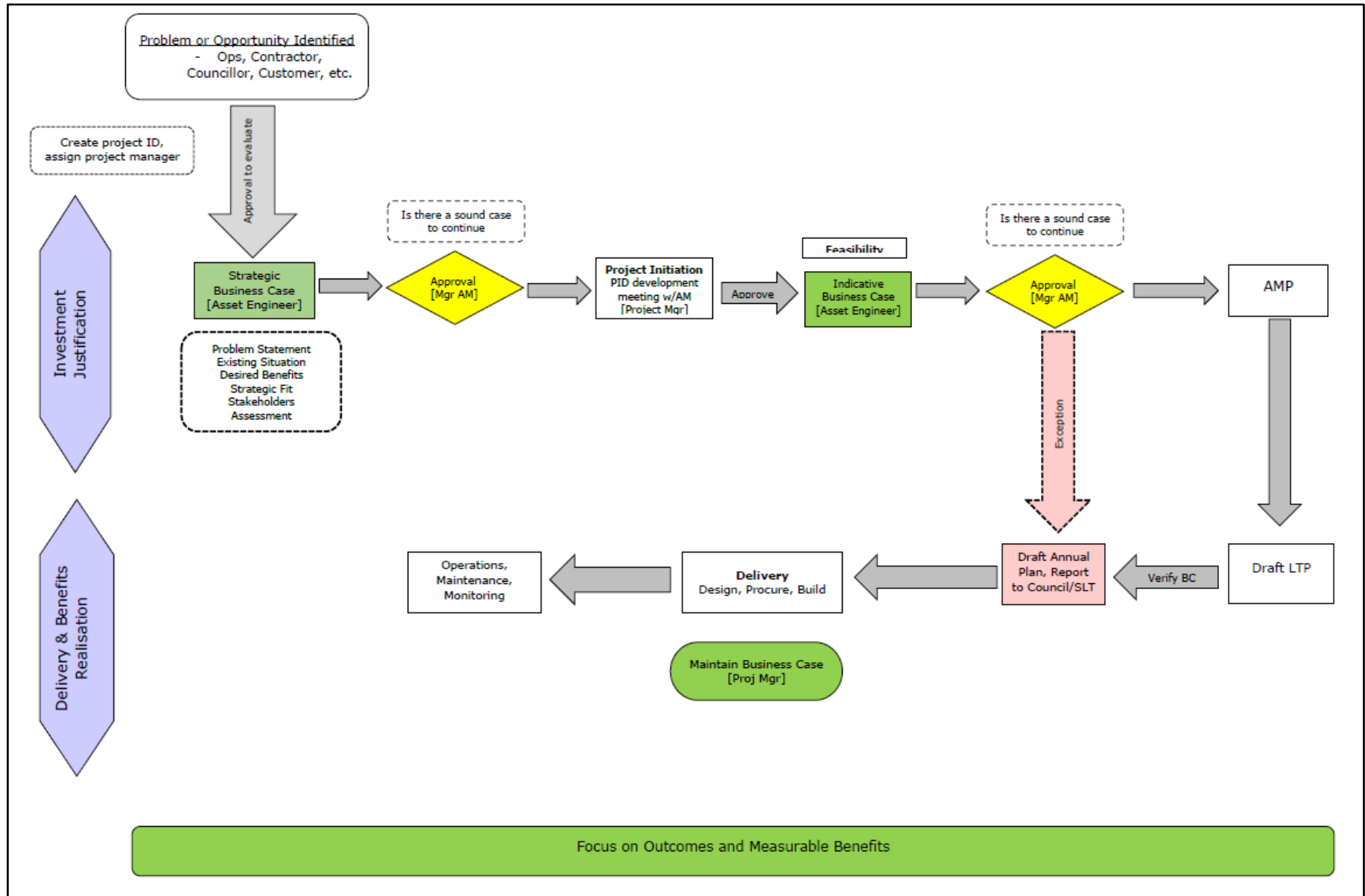
Quality Management

The quality management system is process management based on a quality management lifecycle (see appendix F). It is aligned with ISO 9000, and benchmarked against this standard each year. The focus of the quality management programme is to improve the effectiveness and efficiency with which Nelson City Council deliver services to the community; ensuring processes deliver their required outcomes, which are aligned with community outcomes and organisational goals. Required outcomes are typically defined in terms of the core key performance areas - customer satisfaction, legislative compliance, and management of resources (budget and staff time), and employee engagement.

Project management

NCC processes for project management require that time, cost, and quality/scope objectives are agreed before project delivery begins. Project management is focussed on ensuring that the desired benefits, as per the agreed business case, are delivered. Project management processes are based on the principles of the PRINCE2™ method. Fiscal approvals, and change approvals are in line with Council delegations and Officer delegated authority. See figure 7-3 for an overview.

Figure 7-3: Business case process



7.3 Information systems and tools

Asset Management Information Systems provide an understanding of assets to optimise lifecycle costs, identify required work, record completed work and cost of work. It benefits general management, long-term planning and data analysis.

All asset information is stored in Infor and linked with GIS. An overview of the asset information system is depicted below in figure 7-4. The warehousing of specific data and further development of reporting will assist in management of the assets.

The Council has a number of information systems (Infor, MagiQ, SCADA System Platform, Network Model, Azure database and closed circuit television for internal pipe inspections) that are integrated to varying degrees. The integration of these systems is considered to assist in the optimisation of operations, renewals and the ongoing development of the wastewater activity.

Asset Improvement Register (ongoing AM practice)

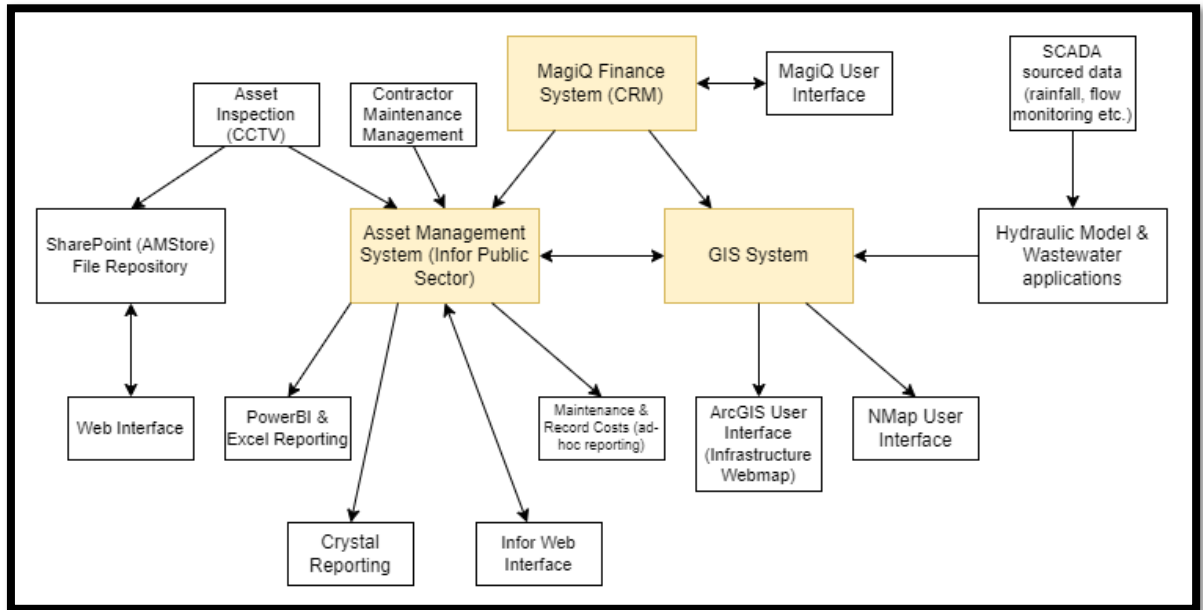
The Asset Improvement Register is used to capture, store, and share discussions, thoughts and concerns with regards to issues identified in relation to asset performance and improvement.

Integrated Accounting, Financial, Electronic Purchase Order, and Service Request Systems

Accounting is currently carried out to Generally Accepted Accounting Principles to comply with the Local Government Act 2002 and Public Benefit Entity International Public Sector Accounting Standards (PBE IPSAS). The Nelson City Council uses integrated computer software supplied by MagiQ. The General Ledger is linked to packages that run Debtors, Creditors, Banking, Rates, Fixed Assets, Invoicing, Water Billing, Job Costing, and Payroll. Internal monthly financial reports are generated by Council significant activity and sub-activity categories although real time data is available at any time. External financial reports by significant activity are published in the annual report.

Service requests record customer questions, enquiries, and complaints.

Figure 7-4: Asset Information Systems



Electronic Document and Records Management System

Nelson City Council uses Objective as its electronic document and records management system.

Geographical Information System

The Geographical information system (GIS) was initially implemented in 1994 with data captured using photogrammetry. Nelson City Council staff carry out routine checks on the accuracy of the GIS as part of day to day operational work.

GIS Accuracy Limitations

The data captured by photogrammetry was required to be accurate to within a tolerance of +/- 0.3m. In inaccessible areas, it was not considered economic to search for buried fittings. Instead, the best estimated position was entered and the accuracy limitation flagged. Similarly, only limited fieldwork has been done to confirm the pipe material and sizes. The accuracy of this information is verified through time by asset data collection procedures.

Maintenance of GIS data

Procedures are in place to bring new data (from renewed, altered or new assets) into the GIS on a regular basis.

New assets are recorded from the “as built” plans supplied by the sub-divider (for vested assets) or Council’s Capital Projects team (for capital work).

Closed Circuit Television

Currently, Closed Circuit Television (CCTV) condition inspections are carried out by an external contractor as required.

A storage and access system is currently being developed to ensure CCTV information is readily accessible and the extent of existing surveys is clear.

Asset Management Recording System – Infor

The use of the Infor system has enabled the following:

- Customer enquiries being logged directly and sent immediately to the contractor for action.
- Contractor directly enters resolution confirmation at completion of job.
- Tracking of expenditure on assets to allow assets that have a disproportionately high maintenance cost to be identified - upgrade or renewal can then be prioritised.

Nelson City Council principal contractor Nelmac has a live interface with Infor. Any work associated with unscheduled maintenance is entered into Infor work order by the contractor. Completed work orders forms the basis of the contractors' payment.

ProMapp

ProMapp is Nelson City Council's procedures library. This is constantly being updated and serves as a repository for a large amount of institutional knowledge.

Supervisory Control and Data Acquisition System

The Supervisory Control and Data Acquisition (SCADA) system provides surveillance of the operation of pumping stations in the stormwater system and provides alarms when equipment fails or when operating parameters are exceeded. The SCADA system also records operating data from the pumping stations.

All of the Nelson City Council's strategic utility components are monitored remotely, at Civic House or by duty staff using laptop computers at home.

This system has given Council the ability to ascertain faults and instigate repairs without affecting the service to the consumer and has significantly increased efficiency and reliability of the utility schemes. This function has become critical to the operation of the network and has been supported by Council's in house Information Management team up to now. There is a need to upgrade this package and at the same time consider how the technical requirements can be accommodated with the essentially office based computer network used by the majority of Council staff.

Council has a "Kingfisher" and "Intouch" system at the base station (rationalisation of system occurred in 2005). The system is used to monitor and control critical aspects of all Nelson City Council treatment plants and pump stations.

Appendix G details the over view of the SCADA system. The system is used for:

- Monitoring the operation of sites.
- Reporting, trending and analysing historical data.
- Alarm monitoring (operators are informed of alarms via text messages to mobile phones).
- Some control functions.

Monitoring of water, wastewater and stormwater systems by the Councils SCADA system has grown to the point that without the current SCADA system, maintaining the existing Levels of Service would be difficult. SCADA has given the ability for Council to ascertain faults and instigate repairs without affecting the service to the consumer and has significantly increased efficiency and reliability of the utility schemes. The SCADA system is a critical system in Council's operation.

Review and Upgrade

In 2016/17 an extensive upgrade of the SCADA system was completed.

Council's strategy for the ongoing use of SCADA is:

- Maintain SCADA system at a high level to ensure system reliability and ongoing reporting ability.
- Increase availability of information to the in-house Business Units in a format that will enable increased efficiencies in operation and management.
- Develop the reporting functions of the system.
- Develop further use of the system to control plant and equipment.

Modelling

Currently the wastewater hydraulic models cover the Stoke/Tahuna catchment and the central Nelson city catchment for the pumping and reticulation components of the wastewater system.

Upgrades of the models require repeating periodically.

Pumping: An EPANET model is used to run different pumping scenarios (especially in linked pump stations) and maximum flow rates from key pump stations. Not all pump stations are modelled on this system.

Reticulation: The modelling software package used is InfoWorks. External consultants are used to support Councils use of the models. Over time it is intended to build more in house capacity to run and maintain the models.

To provide modelling data for ongoing calibration/verification requirements the Council uses portable flow meters and permanent flow meters (installed at pump stations). Rain gauges are installed at key sites within the city and linked to the SCADA system.

7.4 Service delivery models

Maintenance contracts are in place for routine and emergency maintenance and operation of the network and key assets (pump stations and wastewater treatment plant). The methods used to procure capital projects will differ depending on the size of the project and levels of risk.

Council maintains some in-house professional services capability balanced with external consultants as required to achieve best value for money. Additional professional services are sometimes required to maintain delivery levels or where specialist skill sets are required.

8. PLAN IMPROVEMENT AND MONITORING

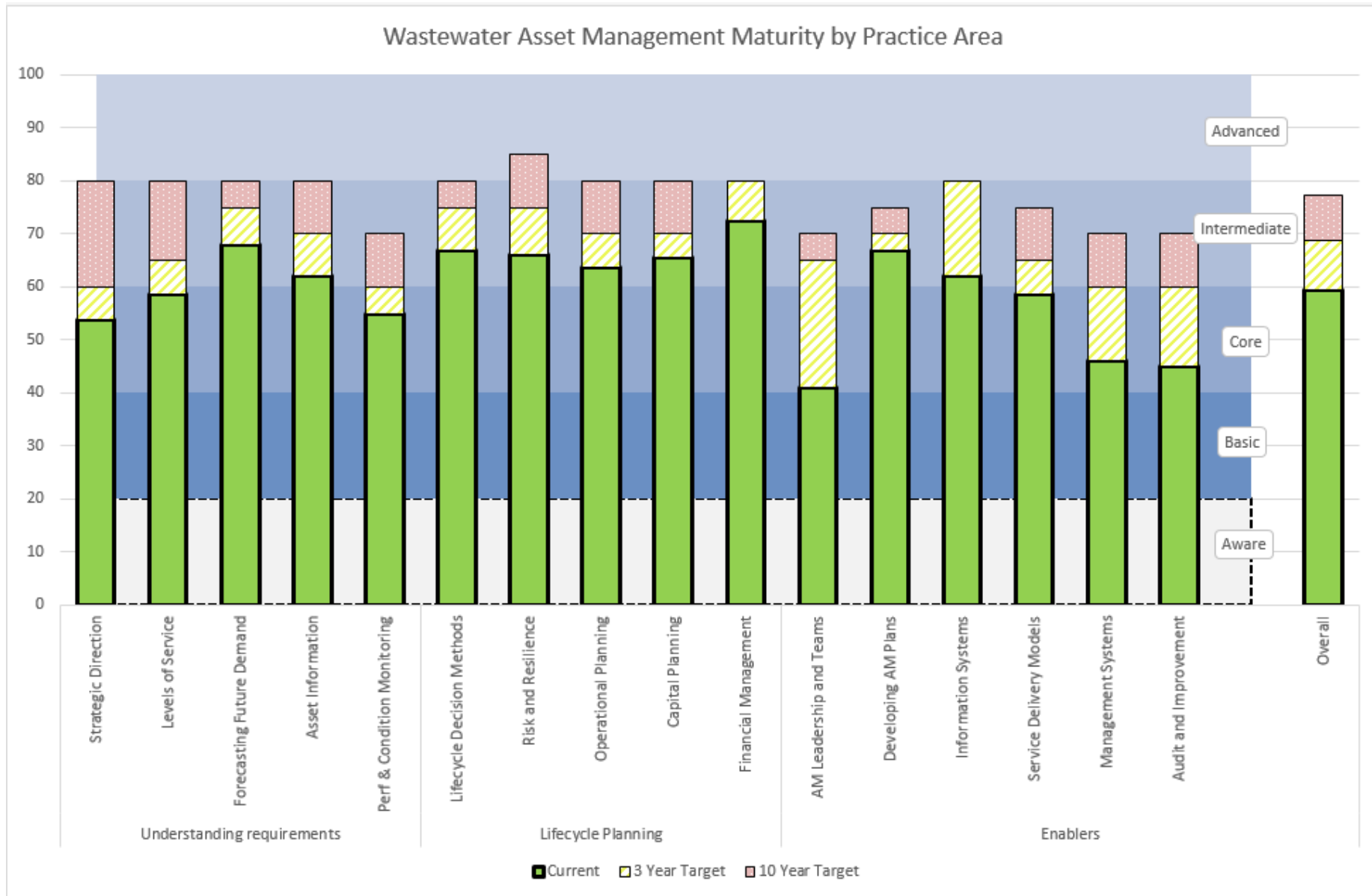
This section provides details on planning for monitoring the performance of the Asset Management Plan.

8.1 Status of AM practices

The status of asset management processes, systems and data for the Nelson City Council wastewater activity is shown in Figure 8-1. This figure is based on the grading framework given in Appendix H.

Updates to the 2021 - 31 Asset Management Plan Gap Analysis and Appropriate Practice scores have been made for this Activity management Plan.

Figure 8-1: Current and desired state of AM processes, data and systems



8.2 Improvement programme

An important component of this Plan is the recognition that it is a “live” document in need of monitoring, change and improvement over time.

Council has been working with iwi, seeking their input into this Activity Management Plan. A few changes have been included in this Plan following their feedback, however, other matters require further thought. Council will consider the wider feedback raised as part of the review of its Asset/Activity Management Policy during 2024/25 and in work on the next iteration of the Activity Management Plans.

Improvement Plan

The improvement plan required is summarised in Table 8-1 below.

Table 8-1: Improvement Programme

Improvement Action	Priority	Responsibility	Estimated cost
Review, clarify and add to the strategic direction of the WW Activity.	1	Activity Engineer	N/A
Improve cultural awareness of Te Ao Maori	1	All	TBC
Improve iwi engagement and engagement processes in the Wastewater Activity Planning	1	All	TBC
Ensure clear links between growth forecasts and budgets exists.	2	Activity Engineer	N/A
Update and regularly (annually) review the WW Activity Risk Register.	1	Activity Engineer	N/A
Improve accuracy of asset data through review and modification of collection, storage, and auditing.	3	Activity Engineer	\$100,000
Contingency planning for critical asset failure.	2	Operations Team Leader	\$10,000 pa
Robust and succinct lifecycle decision making; clear links to strategic intent.	3	Activity Engineer	In budgets
Improve accuracy and coverage of condition assessments.	3	Operations Staff	\$60,000 pa
Upgrade of WW Hydraulic Models and increased use of them (and other technological improvements) to inform decision making.	1	Activity Engineer	Average of \$60,000 pa each – ongoing

Improvement Action	Priority	Responsibility	Estimated cost
Ensure supporting suppliers (consultants and contractors) are well aligned with the WW Activity requirements.	3	All	In budgets
Ensure an effective Asset Improvement Register is in place and is used to develop project scopes.	1	Operations Team Leader	N/A
Update emergency management response plan.	2	Operations Team Leader	\$10,000
Improve resourcing to ensure better scope and cost estimates for inclusion in business cases.	1	Activity engineer	\$120,000 pa
Ensure asset valuations reflect market value.	3	Activity Engineer	Finance budget
More trend analysis to optimise decision making.	1	Activity Engineer	\$30,000 pa
Develop Plan content to be more usable and succinct.	2	Activity Engineer	\$10,000 pa
Ongoing professional development for utilities staff to ensure they are up to date with best practice.	1	Utilities Manager	\$10,000 pa

1	1 – 3 years
2	4 – 5 years
3	6 – 10 years

8.3 Monitoring and review procedures

The Plan is a regularly revised and evolving document and will be updated at least every three years to coincide with the Annual and Long Term Plans and to incorporate improved decision making techniques, updated asset information, and NCC policy changes that may impact on the levels of service. Key issues are workshopped with elected members and iwi are engaged through Council/iwi agreed processes prior to the update to discuss the direction of the Wastewater Activity and the Wastewater Activity Management Plan.

The Plan will be improved throughout its life cycle as further information about the wastewater system assets are collected in terms of condition, performance and service delivery. NCC is committed to advanced data collection and management systems that will allow for a greater appreciation of the performance and condition of the NCC assets. Additionally historic versions of the Plan will be retained to ensure information within these documents is available in the future.

Council will report variations in the adopted annual plan budgets against the original Activity Management Plan forecasts and explain the level of service implications of budget variations.

Internal Review

Internal reviews will be taken every three years to assess the effectiveness of the plan in achieving its objectives. The internal audit will also assess the adequacy of the asset management processes, systems and data.

Statutory Audit

The Local Government Act requires that an independent, annual audit of the operations of the Nelson City Council be carried out.

8.4 Performance measures

Benchmarking

Benchmarking (trending) of the activity through Audit NZ, Local Government NZ and Water NZ benchmarking initiatives is carried out at the request of these organisations to give increased understanding of:

- The efficiency and efficiency variations of individual activities.
- Effects of any programmes instigated by the Plan.
- Operating costs over range of individual activities.

Examples of types of benchmarking that are to be considered include tracking progress, responsiveness to service calls, operation costs i.e. \$/m/year and energy costs. As data is obtained and implications understood, the benchmarking can be used for additional or revised Levels of Service and can be incorporated into a graphical display.

WaterNZ annual performance reviews include benchmarking of a range of measures across all territorial and unitary authorities that are operators of 3 Waters networks.

Results for the wastewater activity in 2018/19 can be found through the following link https://www.waternz.org.nz/Attachment?Action=Download&Attachment_id=4271

This was the last time NCC participated in the National Performance Review.

How the effectiveness of the AM plan will be measured

The effectiveness of the Plan will be monitored by the following procedures:

- Financial expenditure projections prior to year-end.
- Resource consent monitoring as required by consents.
- Operations and Maintenance KPI report (monthly basis).
- The ongoing updating of the asset register of the wastewater assets when repairs/remedials are carried out and the attributes are compared with the asset register attributes.

The continued monitoring of these procedures and ongoing analysis of results will result in:

- Optimisation of expenditure through the asset lifecycle.
- Service levels actively monitored and reported on.
- Management of risk and control of failures.

GLOSSARY OF TERMS

Term	Definition
Activity	The work undertaken on an asset or group of assets to achieve a desired outcome
Annual Plan	The Annual Plan provides a statement of the direction of Council and ensures consistency and co-ordination in both making policies and decisions concerning the use of Council resources. It is a reference document for monitoring and measuring performance for the community as well as the Council itself
Annual Report	The audited report published annually (by 30 November) which provides information on how the Local Authority has performed with respect to its policies, objectives, activities, targets, budgets and funding proposals
Asset	A physical facility of value which enables services to be provided and has an economic life greater than 12 months
Asset Management	The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost effective manner
Activity Management Plan	A plan developed for the management of an Activity that combines multi-disciplinary management techniques (including technical and financial) over the lifecycle of the asset in the most cost effective manner to provide a specified level of service. A significant component of the plan is a long term cashflow projection for the activities
Asset Management Strategy	A strategy for asset management covering, the development and implementation of plans and programmes for asset creation, operation, maintenance, renewal, disposal and performance monitoring to ensure that the desired levels of service and other operational objectives are achieved at optimum cost
Asset Management System	A system (usually computerised) for collecting analysing and reporting data on the utilisation, performance, lifecycle management and funding of existing assets
Asset Management Team	The team appointed by an organisation to review and monitor the corporate asset management improvement programme and ensure the development of integrated asset management systems and plans consistent with organisational goals and objectives
Asset Register	A record of asset information considered worthy of separate identification including inventory, historical, financial, condition, construction, technical and financial information about each
Asset	A physical component of a facility which has value, enables services to be provided and has an economic life of greater than 12 months
Benefit Cost Ratio (B/C)	The sum of the present values of all benefits (including residual value, if any) over a specified period, or the life cycle of the asset or facility, divided by the sum of the present value of all costs
Business Plan	A plan produced by an organisation (or business units within it) which translate the objectives contained in an Annual Plan into detailed work plans for a particular, or range of, business activities. Activities may

Term	Definition
	include marketing, development, operations, management, personnel, technology and financial planning
Cash Flow	The stream of costs and/or benefits over time resulting from a project investment or ownership of an asset
Components	Specific parts of an asset having independent physical or functional identity and having specific attributes such as different life expectancy, maintenance regimes, risk or criticality
Condition Monitoring	Continuous or periodic inspection, assessment, measurement and interpretation of resulting data, to indicate the condition of a specific component/asset so as to determine the need for some preventive or remedial action
Consequence	The outcome of an event expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain. There may be a range of possible outcomes associated with an event
Critical Assets	An asset where failure would have significant consequences, either in the ability of the system to provide service to customers or the effect on the environment
Current Replacement Cost	The cost of replacing the service potential of an existing asset, by reference to some measure of capacity, with an appropriate modern equivalent asset
Deferred Maintenance	The shortfall in rehabilitation work required to maintain the service potential of an asset
Demand Management	The active intervention in the market to influence demand for services and assets with forecast consequences, usually to avoid or defer CAPEX expenditure. Demand management is based on the notion that as needs are satisfied expectations rise automatically and almost every action taken to satisfy demand will stimulate further demand
Depreciated Replacement Cost (DRC)	The replacement cost of an existing asset after deducting an allowance for wear or consumption to reflect the remaining economic life of the existing asset
Depreciation	The wearing out, consumption or other loss of value of an asset whether arising from use, passing of time or obsolescence through technological and market changes. It is accounted for by the allocation of the historical cost (or revalued amount) of the asset less its residual value over its useful life
Economic life	The period from the acquisition of the asset to the time when the asset, while physically able to provide a service, ceases to be the lowest cost alternative to satisfy a particular level of service. The economic life is at the maximum when equal to the physical life however obsolescence will often ensure that the economic life is less than the physical life
Facility	A complex comprising many assets (e.g. a water treatment plant, recreation complex, etc.) which represents a single management unit for financial, operational, maintenance or other purposes
Frequency	A measure of the rate of occurrence of an event expressed as the number of occurrences of an event in a given time

Term	Definition
Geographic Information System (GIS)	Software which provides a means of spatially viewing, searching, manipulating, and analysing an electronic data-base
InTouch	The brand name of a Graphical User Interface
Infrastructure Assets	Stationary structures and utilities and software systems forming a network and serving whole communities, where the system as a whole is intended to be maintained indefinitely at a particular level of service potential by the continuing replacement and refurbishment of its components.
Level of service	The defined service quality for a particular activity (i.e. wastewater) or service area (i.e. sewage disposal) against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental acceptability and cost
Life	A measure of the anticipated life of an asset or component; such as time, number of cycles, distance intervals etc
Life Cycle Cost	The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal costs
Maintenance Plan	Collated information, policies and procedures for the optimum maintenance of an asset, or group of assets
Maintenance Standards	The standards set for the maintenance service, usually contained in preventive maintenance schedules, operation and maintenance manuals, codes of practice, estimating criteria, statutory regulations and mandatory requirements, in accordance with maintenance quality objectives
Maintenance	All actions necessary for retaining an asset as near as practicable to its original condition, but excluding rehabilitation or renewal
Multi-Criteria Analysis (MCA)	Analysis technique that takes a range of criteria into account which are both qualitative and quantitative and reflect the social, cultural, economic, and environmental characteristic of the project outcomes
NZPIM	New Zealand Gravity Pipe Inspection Manual 4 th Edition 2019 - National manual for inspecting and scoring wastewater pipes. Published by WaterNZ
Operations & Maintenance Expenditure (Opex)	The cost of operating and maintaining assets. Operations and Maintenance expenditure does not alter the value of an asset and is not included in the asset valuation
Operation	The active process of utilising an asset which will consume resources such as manpower, energy, chemicals and materials.
Outcome	The end result for the community which Council hopes to achieve
Output	Services, actives or goods produced by Council which contribute to achieving an outcome
Performance Measure	A qualitative or quantitative measure of a service or activity used to compare actual performance against a standard or other target. Performance indicators commonly relate to statutory limits, safety, responsiveness, cost, comfort, asset performance, reliability, efficiency, environmental protection and customer satisfaction

Term	Definition
Performance Monitoring	Continuous or periodic quantitative and qualitative assessments of the actual performance compared with specific objectives, targets or standards
Rehabilitation	Works to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. Generally involves repairing the asset using available techniques and standards to deliver its original level of service (i.e. heavy patching of roads, slip-lining of sewer mains, etc.) without resorting to significant upgrading or replacement
Renewal	Works to upgrade, refurbish, rehabilitate or replace existing facilities with facilities of equivalent capacity or performance capability
Renewal Accounting	A method of infrastructure asset accounting which recognises that infrastructure assets are maintained at an agreed service level through regular planned maintenance, rehabilitation and renewal programmes contained in an Activity Management Plan. The system as a whole is maintained in perpetuity and therefore does not need to be depreciated. The relevant rehabilitation and renewal costs are treated as operational rather than capital expenditure and any loss in service potential is recognised as deferred maintenance
Repair	Action to restore an item to its previous condition after failure or damage
Replacement	The complete replacement of an asset that has reached the end of its life, so as to provide a similar, or agreed alternative, level of service
Risk	The chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and the likelihood of a particular risk
Risk Assessment	The overall process of risk analysis and risk evaluation
Risk Management	Risk Management is the systematic application of management policies, procedures and practices to the tasks of identifying, analysing, evaluating and monitoring those risks that could prevent a Local Authority from achieving its strategic or operational objectives or Plans or from complying with its legal obligations
Routine Maintenance	Day to day operational activities to keep the asset operating (replacement of light bulbs, cleaning of drains, repairing leaks, etc.) and which form part of the annual operating budget, including preventative maintenance
Service Potential	The total future service capacity of an asset. It is normally determined by reference to the operating capacity and economic life of an asset
Strategic Plan	Strategic planning involves making decisions about the long term goals and strategies of an organisation. Strategic plans have a strong external focus, cover major portions of the organisation and identify major targets, actions and resource allocations relating to the long term survival, value and growth of the organisation
TKN	Total Kjehldahl Nitrogen. TKN is the combination of organically bound Nitrogen and Ammonia. The combination of the organic nitrogen and the inorganic nitrogen (NH4 Ammonia, NO3 Nitrate, NO2 Nitrite) make up the total nitrogen

Term	Definition
Unplanned Maintenance	Corrective work required in the short term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity
Upgrading	The replacement of an asset or addition/ replacement of an asset component which materially improves the original service potential of the asset
Valuation	Estimated asset value which may depend on the purpose for which the valuation is required, i.e. replacement value for determining maintenance levels or market value for life cycle costing

Acronyms	
Term	Definition
AC	Asbestos cement
ADWF	Average dry weather flow
ATAD	Autothermal thermophilic aerobic digestion
AV	Average flow
BNR	Biological nutrient removal
BOD	Biochemical oxygen demand
CCTV	Close circuit television
CDEM	Civil Defence Emergency Management
COD	Chemical oxygen demand
DAF	Dissolved air floatation
FAR	Fixed asset register
FOP	Facultative oxidation ponds
GAAP	Generally Accepted Accounting Principles
KPI	Key Performance Indicators
LA	Local Authority
LAPP	Local Authority Protection Programme Disaster Fund
LHCE	Lamp Hole Cleaning Eye
LOS	Levels of Service
NAMS	National Asset Management Steering Group
NPV	Net present value
NRSBU	Nelson Regional Sewerage Business Unit
NTL	Network Tasman Limited
P/S	Pump station

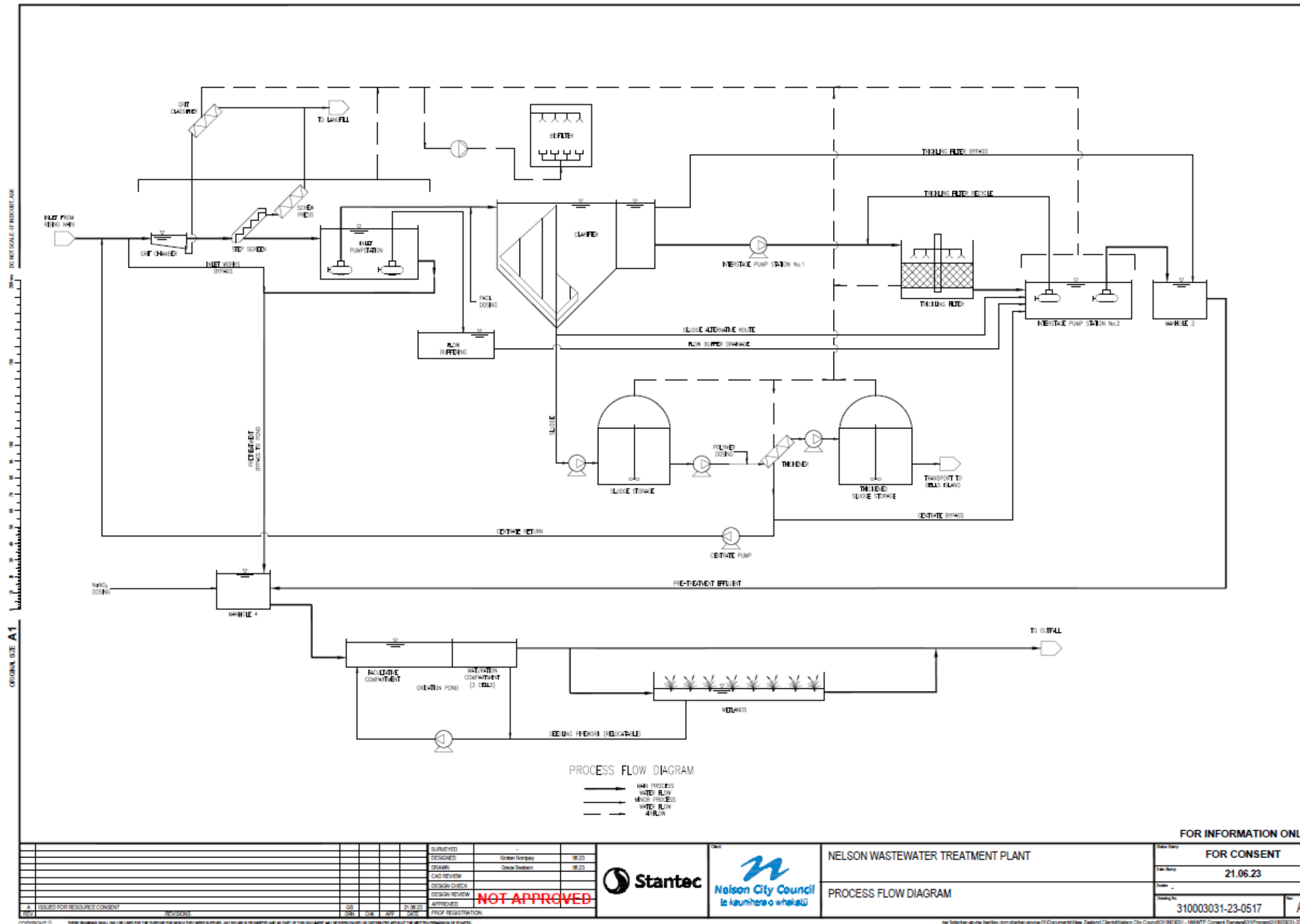
PACC	Renewal strategy based on Performance, Asset criticality, Capacity and Condition
QA/QC	Quality Assurance and Quality Control
RCRRJ	Reinforced concrete rubber ring joint pipe
RMA	Resource management act
SCADA	Supervisory control and data acquisition
SS	Suspended solids
TA	Territorial Authority
TKN	Total kjeldahl nitrogen
TP	Total potassium
TSS	Total suspended solids
uPVC	Unplasticised Polyvinyl Chloride pipe
WWTP	Wastewater treatment plant

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Title	Date	Author
Nelson City Council Wastewater Activity Management Plan	2021	Nelson City Council
New Zealand Infrastructure Assets Grading Guidelines	1999	New Zealand Water and Waste Association
Nelson City Council Long Term Plan 2021-31	2021	
Nelson City Council Trade Waste Bylaw	2021	Nelson City Council
High intensity Rainfall Analysis for Nelson Urban Area	2008	NIWA

APPENDICES

Appendix A: Nelson Wastewater Treatment Plant Process Flow Diagram



Appendix B: Emergency Generator Inventory as at June 2023

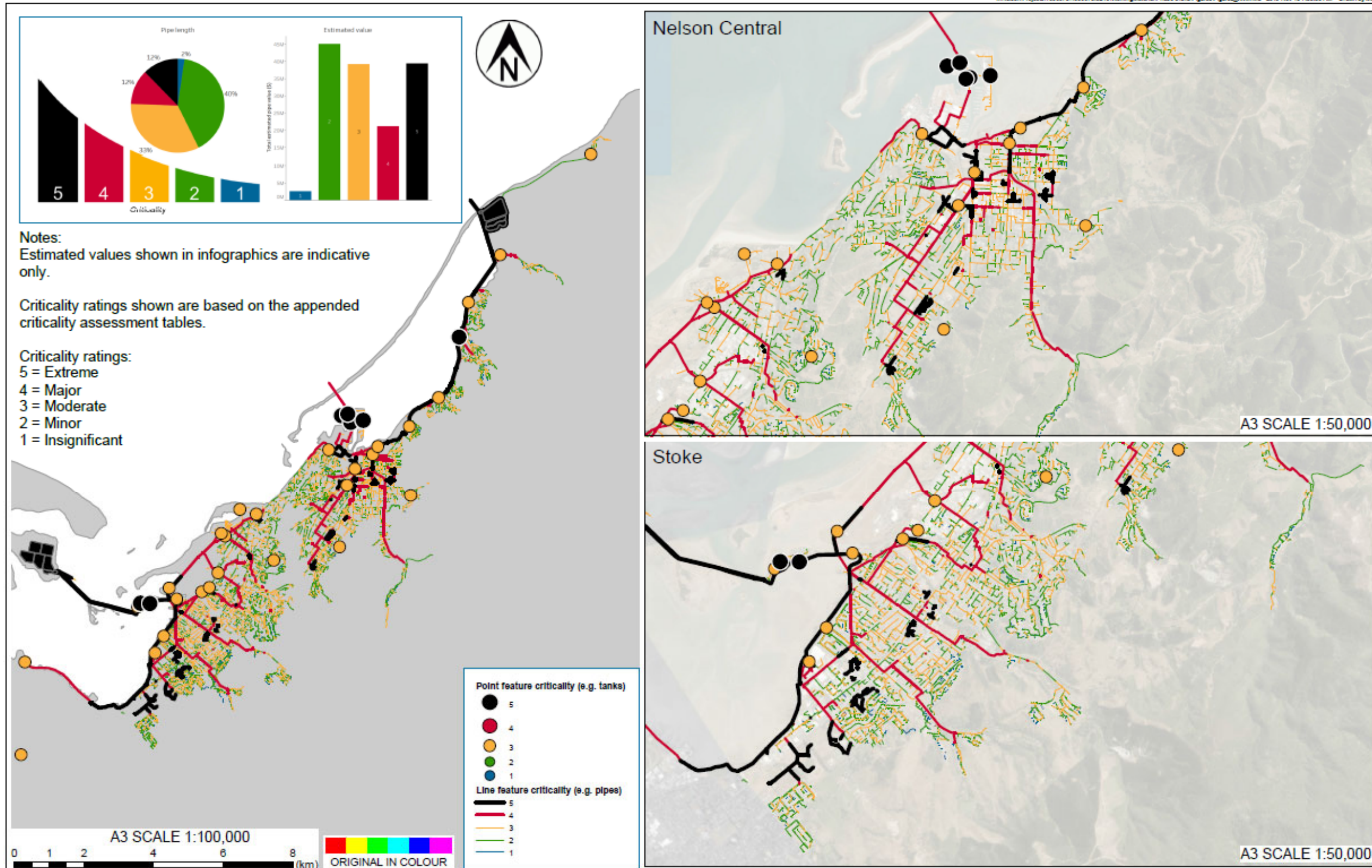
No	Generator/Location	Contact	Transport Required	Generator Connection	Comments	Pump Station
1	NCC 300kVA - NWWTP	Duty Operator 0272 268 662	NA	Permanently wired	Manual start when required on mains power failure	NWWTP
2	NCC 200kVA – Vanguard (Oxford St)	Duty Operator 0272 268 662	NA	Permanently wired	Automatic start on mains power failure	Vanguard
3	NCC 300kVA – Corder Park	Duty Operator 0272 268 662	NA	Permanently wired	Automatic start on mains power failure	Corder Park
4	NCC 3x 500kVA – Neale Park	Duty Operator 0272 268 662	NA	Permanently wired	Automatic start on mains power failure	Neale Park - also wired to run one pump at the Wood SW station
5	NCC SGEN1 - Green Baifa 50kVA – Nelmac Depot, Bullen St	Duty Operator 0272 268 662	GW 1860kg *	32 AMP 5 PIN	Runs one pump	Quarantine , Point, Grace, Martin, Rainier, Venice
6	NCC SGEN2 - White Baifa 50kVA - Trafalgar Park Storage	Duty Operator 0272 268 662	GW 1880kg *	32 AMP 5 PIN	Runs one pump	Paru Paru , Brooklands, Akersten, Vickerman
7	NCC SGEN3 – Bafa 65kVA - Trafalgar Park Storage	Duty Operator 0272 268 662	GW 1620kg *	32 AMP 5 PIN	Runs one pump	Weka , Clouston, Cemetery
8	NCC SGEN4 - Chinese 30kVA - Trafalgar Park Storage	Duty Operator 0272 268 662	GW 1220kg *	32 AMP 5 PIN	Runs one pump	Marybank , Todds Bush, The Glen
9	NCC SGEN5 - Powerlink 137kVA - Trafalgar Park Storage	Duty Operator 0272 268 662	GW 2860kg *	125 AMP 5 PIN & bolted direct lugged connection	Will run two pumps	Russell
10	NCC SGEN6 - Powerlink 80kVA - Trafalgar Park Storage	Duty Operator 0272 268 663	GW 2240kg *	32 AMP 5 PIN	Will run two pumps at most stations	Parkers #1 , Parker #2, Beach Rd, Skating Rink, Exeter, Monaco View
11	Industrial Marine Electrical (IME) – 60kVA, 110kVA	IME 03 548 5804 (24hrs)	Generator on trailers	Cables provided with generator, may need to be connected by electrician		Stations as required #
12	Hirepool Nayland Rd – 30kVA, 50kVA, 110kVA, 250kVA – check generator availability	Hirepool 03 546 9259	Check transport availability	Cables provided with generator, may need to be connected by electrician		Stations as required #

NOTES: * vehicles towing generators must have a braked tow rating greater than the GW which is stamped on the plate fixed to one of the trailer mudguards.

Pump Stations in **BOLD** indicates priority of pump down sequence but will depend on extent of power outage and other events occurring at the time e.g. storm.

only if available – generator could be prioritised for another purpose

Appendix C: Wastewater Network Criticality Assessment



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NOTES:
This map is part of the report "3 Waters Natural Hazards Risk Assessment Phases 2 and 3" prepared by T-T for NCC in 2019. Refer to the report for further detail and applicability limitations.

1	Initial Issue	MLO	DJA	18/10/19
REV	DESCRIPTION	GIS	CHK	DATE

PROJECT No. 1006675.0210			
DESIGNED	MLO	NOV.19	
DRAWN	MLO	NOV.19	
CHECKED			
APPROVED		DATE	

CLIENT	NESLON CITY COUNCIL
PROJECT	3 WATERS NATURAL HAZARD RISK ASSESSMENT
TITLE	WASTEWATER NETWORK CRITICALITY
SCALE (A3)	1:100,000
FIG No.	1006675.0210-P3-F2
REV	1

Appendix D: Risk

Consequence Rating (Impact)

Rating	Political / Community/ Reputational	Asset Performance/ Service Delivery	Relationship with Iwi	Legal risk	Safety	Health	Financial	Information/ decision support	Environmental/ Historical/cultural
Extreme (5)	Major loss of public confidence in Council (>2000 opponents via social media or other mediums) Negative international mainstream media coverage; shareholder or key stakeholder outrage; or loss of a key customer	At least 2 of the 3 outcomes apply: (i) cannot be delivered by alternative means, (ii) 20+ vulnerable persons significantly impacted, (iii) neighbouring businesses annual revenue falls > 20%	Major breakdown of relationship affecting multiple areas. Refusal to resolve without one or more major concessions from council	Adverse findings against council by court or government/regulatory agency resulting in any of the following: (i) Extreme financial penalty or liability imposed; (ii) Imprisonment of officer; (iii) Extreme harm to achieving objectives	Multiple notifiable fatalities of workers or public (MF)	Significant loss of life expectancy for multiple persons or incapacity for more than 1000 person days	Overspend, loss (i.e. spend without result) or income loss of > \$7.5m OR >100% of business unit budget	Multiple errors in information and analysis and presentation misleading (intentionally or not) or not understandable by non-specialists	Permanent environmental damage on a nationally significant scale and/or permanent loss of nationally significant building, artwork, or other valued entity
Major (4)	Significant negative public reaction likely (200-2000 opponents via social media or other mediums) Negative national mainstream media coverage; significant negative perception by shareholder or key stakeholder; or a customer disruption	Only 1 of the 3 outcomes apply: (i) cannot be delivered by alternative means, (ii) 20+ vulnerable persons significantly impacted, (iii) neighbouring businesses annual revenue falls > 20%	Significant breakdown of relationship largely in in one area. Some concessions from council sought before substantive issue considered by iwi grouping affected	Adverse findings against council by court or government/regulatory agency resulting in any of the following: (i) Major financial penalty or liability imposed; (ii) Major harm to achieving objectives, e.g., directed by court to re-make decision.	Single notifiable fatality of workers or public (SF)	Single loss of life expectancy or incapacity for between 100 and 1000 person days	Overspend, loss (i.e. spend without result) or income loss of > \$1.5m and <\$7.5m OR between 70% and 100% of business unit budget	One major error in information, analysis incomplete and presentation ambiguous	Major environmental damage with long-term recovery requiring significant investment and/or loss or permanent damage to a registered historical, cultural or archaeological site or object(s)
Moderate (3)	Some negative public reaction likely (30-200 opponents via social media or other mediums) Repeated complaints; Regulatory notification; or negative stakeholder, local media attention	At least 2 of the 3 outcomes apply: (i) partial delivery by alternative means possible, (ii) <20 vulnerable persons significantly impacted, (iii) neighbouring businesses annual revenue falls 10% to 20%	Major relationship damaged in a single area but amenable to negotiation	Risk of court action or investigation by government/regulatory agency resulting in any of the following: (i) Moderate penalty or liability exposure; (ii) Moderate harm to achieving objectives, e.g., legal challenge unsuccessful but results in moderate delay.	Notifiable injury of workers or public.	Incapacity for between 20 and 100 person days	Overspend, loss (i.e. spend without result) or income loss of > \$0.75m and <\$1.5m OR between 30% and 70% of business unit budget	Information correct but presentation/ analysis insufficient to support decision on the day	Measurable environmental harm on a nationally significant scale. Some costs in terms of money and/or loss of public access or conservation value of the site and/or restorable damage to historical, cultural or archaeological site or object(s)
Minor (2)	Minor public reaction likely (<30 active opponents via social media or other mediums) Workforce attention; limited external attention;	At least 2 of the 3 outcomes apply: (i) full delivery by alternative means possible, (i) <20 vulnerable persons moderately impacted, (i) neighbouring businesses annual revenue falls < 10%	Relationship damage resolvable through normal communication/ consultation mechanisms	Risk of court action or investigation by government/regulatory agency resulting in any of the following: (ii) Formal warning; (i) Non-binding recommendations; (iii) Minor harm to achieving objectives, e.g., minor delay while legal dispute resolved.	Serious injury on one person requiring medical treatment (MA)	Incapacity for between 1 and 20 person days	Overspend, loss (i.e. spend without result) or income loss of > \$150k and <\$750k OR between 10% and 30% of business unit budget	Information correct, analysis complete but presented in a way which could be misinterpreted	Medium term environmental impact at a local level and/or development compromise to the integrity of a registered historical, cultural or archaeological site
Insignificant (1)	Very limited negative reaction (1 or 2 active opponents via social media or other mediums) Internal attention only from staff directly working on the matter.	All of the following outcomes apply: (i) full delivery by alternative means possible, (ii) <20 vulnerable persons moderately impacted, (iii) neighbouring businesses annual revenue falls < 10%	Iwi/ tribe/ hapu public dissatisfaction resolvable through routine communication	No penalty or liability exposure and no harm to achieving objectives	Minor injury requiring only first aid or less (FA)	Incapacity for less than 1 person day	Overspend, loss (i.e. spend without result) or income loss of > \$15k and <\$150k OR between 5% and 10% of business unit budget	Small errors in information or presentation - no effect on decision	Short term and temporary impact requiring no remedial action and/or restorable loss damage to historical/ cultural record

Risk Rating Matrix

Descriptor	CONSEQUENCES				
	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Extreme (5)
Almost certain (5)	Medium (5)	Medium (20)	High (45)	Very High (80)	Very High (125)
Likely (4)	Low (4)	Medium (16)	High (36)	High (64)	Very High (100)
Possible (3)	Low (3)	Medium (12)	Medium (27)	High (48)	High (75)
Unlikely (2)	Very Low (2)	Medium (8)	Medium (18)	Medium (32)	High (50)
Rare (1)	Very Low (1)	Low (4)	Medium (9)	Medium (16)	Medium (25)

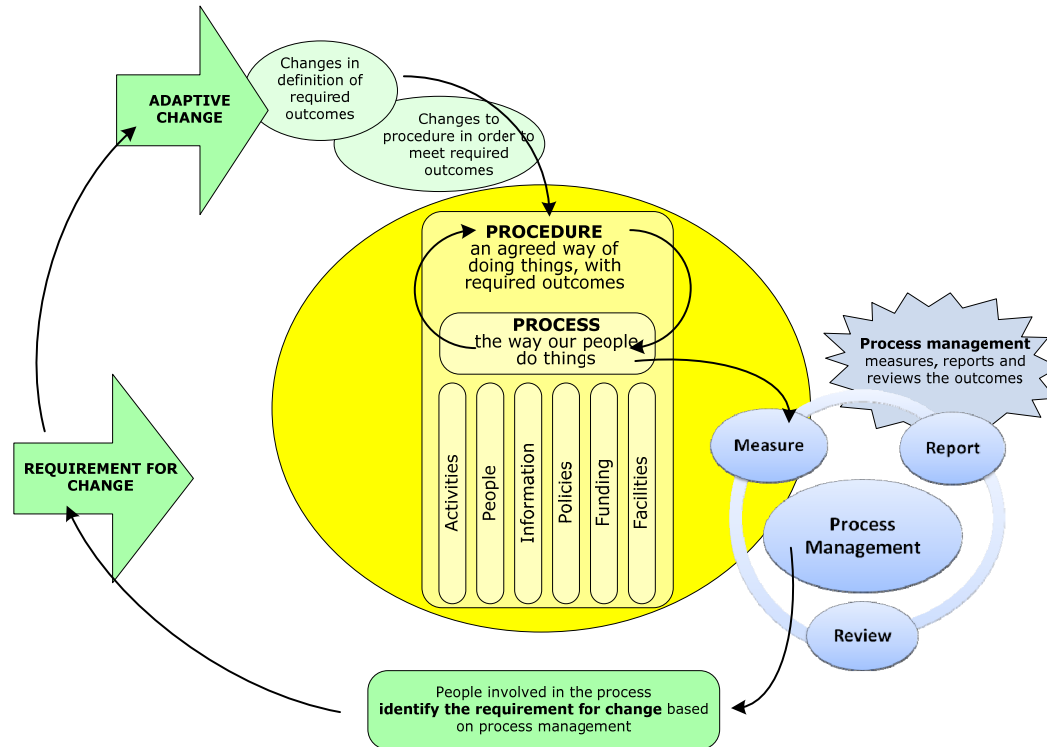
Likelihood of the given consequence occurring

Descriptor	Qualitative guidance statement	Indicative Probability range	Indicative frequency range (years)
Almost certain (5)	The consequence can be expected in most circumstances OR <i>A very low level of confidence/information</i>	>90%	>1 occurrence per year
Likely (4)	The consequence will quite commonly occur OR <i>A low level of confidence/information</i>	20% - 90%	Once per 1-5 years
Possible (3)	The consequence may occur occasionally OR <i>A moderate level of confidence/information</i>	10% - 20%	Once per 5-10 years
Unlikely (2)	The consequence may occur only infrequently OR <i>A high level of confidence/information</i>	2% - 10%	Once per 10 - 50 years
Rare (1)	The consequence may occur only in exceptional circumstances OR <i>A very high level of confidence/information</i>	<2%	Less than once per 50 years

Residual Risk Tolerance

Risk Level	Description and Action	Authority for continued tolerance	Timing for implementing action	Obligation to promptly advise including advising treatments
Very High	Not normally tolerable, immediate intervention to reduce risk	Full Council on advice from CE	Immediate if possible but no more than one month	Full Council using best practicable means
High	Not normally tolerable, initiate action as soon as practicable to reduce risk below High	SLT or Group Manager (Council at CE discretion)	As soon as practicable but no more than 2 months	SLT or accountable Group Manager (Council at CE discretion)
Medium	Normally tolerable, frequently review to look for opportunities to further reduce risk where practicable	Business Unit Manager	At least within one quarter	Accountable Group Manager
Low	Acceptable risk, routine review for low cost actions to reduce risk further	No specific authority required	Routine review period (e.g. 3- 6 monthly)	None
Very Low	Acceptable risk, no specific actions to reduce further	No specific authority required	Only if incidental to another action	None

Appendix E: Quality Management Lifecycles



1: Define the Process: Document the Procedure

NCC's Quality Management system (QMS) is a process-based approach. A process is a set of interrelated or interacting activities which transforms inputs into outcomes. Required outcomes are achieved more efficiently when activities and related resources are managed as a process.

A procedure is an agreed way to carry out a process. A procedure includes and defines:

Required outcomes from the procedure (most important)

- Definition of the required outcome forms the "quality" standard for the process
 - Agreement of the required outcomes tells us what would success look like (our KPIs)

1: Define the Process: Document the Procedure

- We need to ensure that required outcomes are recorded so that they can be measured later - not just what needs to be achieved, but when, and how many, and what exceptions

People involved in the procedure (equally important)

- Definition of all of the people involved in all aspects of the process, including the customer, those "doing stuff", those "accountable for stuff" and any suppliers directly involved in the process
- Are the people involved the most effective, most efficient way to do this?

Activities comprising the procedure

- Defining all the activities required and undertaken to achieve the required outcomes
- Are all the activities undertaken necessary, are they in the right order, are the right people doing them, is this the most effective, most efficient way to do this?

Enablers that support the procedure

- The enablers of the process include things like information (and information systems), policies (and culture), funding and facilities. These should be documented as part of the process

Documenting the procedure (activities involved, who does what when, what funding and resources are required) provides a *written procedure* to support the process.

Processes work together to form end-to-end procedures:

Managing interrelated processes improves the organisation's effectiveness and efficiency in achieving its objectives. This means consideration of how processes interrelate to form end-to-end procedures with overall outcomes. The outputs from one procedure often form the trigger for the next procedure. End-to-end procedures have their own required outcomes.

2: Manage the procedure: Measure, Report and Review

Measuring whether the procedure is being followed and whether outcomes are being met This enables us to apply a factual approach to decision making and to the need for change.

- Measure how the process is going – is the procedure being followed – are interim goals being met? Measure the outputs of the process – were these met and did these meet the required outcomes?

Reporting tells us whether procedures are being followed and outcomes being met

- We need to not just know whether outcomes are being met, but to “know that we know”
- Reporting gives us options for remediation or consequences of non-conformity

The procedures and the outcomes are subject to review by those responsible and accountable for the process

- Why did we really do this? What did we think we would gain? Did we get that result?
- Are we doing the right things? Are we doing them the right way, and are we doing this consistently? Are we getting them done well? Are we getting the benefits?
- Review provides a tool for continual improvement of the process by re-examination and change to the required outcome, or by change in the process to achieve the required outcome

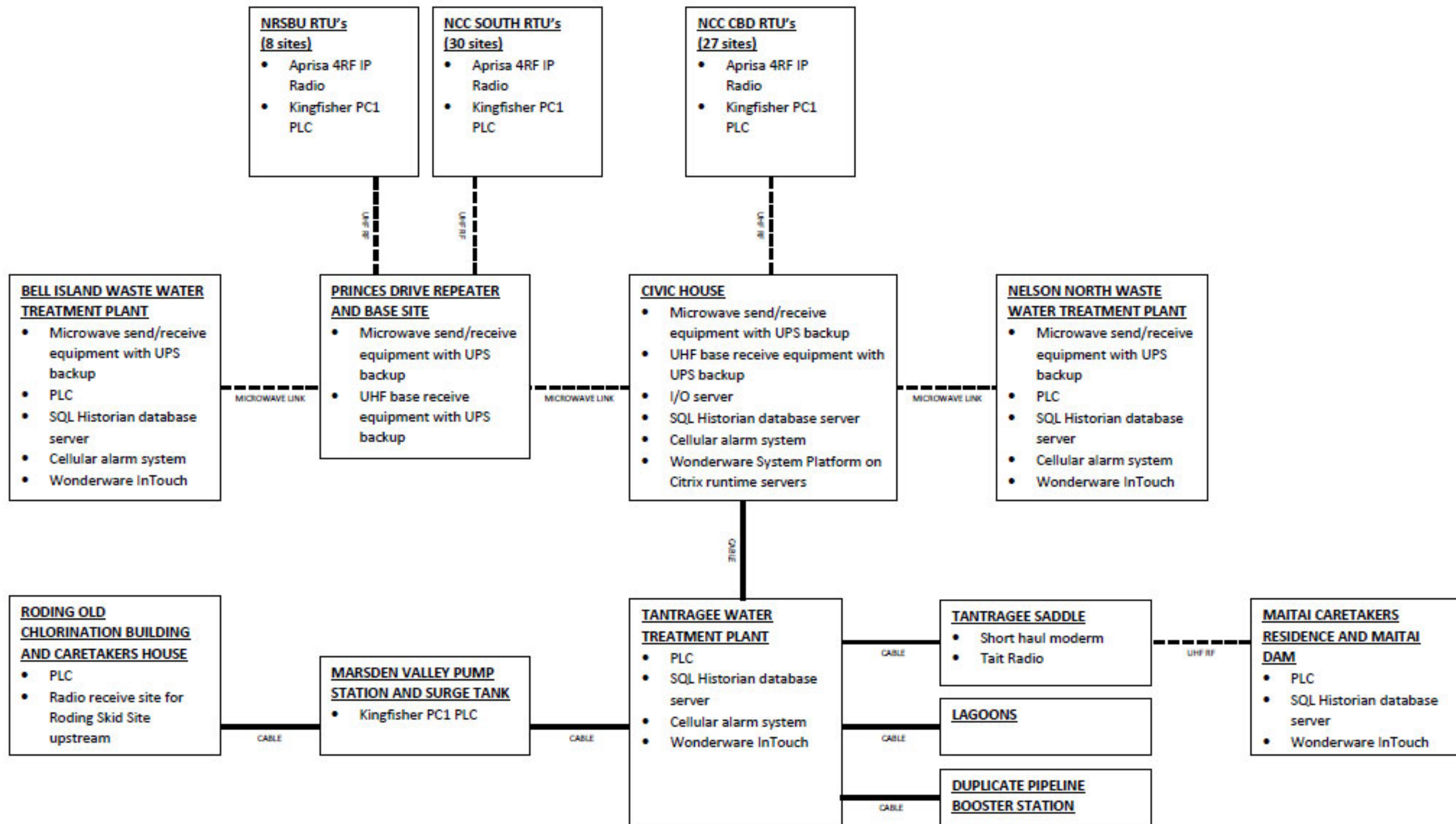
3: Improve the procedure: Requirement for Change, then Adaptive Change

Procedure are subject to adaptive improvement to the process and the required outcomes.

People involved with processes identify and initiate change:

- Are the required outcomes still required? Is there a requirement for change?
- Are the activities and people defined in this process the best way to achieve these outcomes?
- Are things being done in the right order, and by the right people, in the right places? Is the process being followed? Does everyone do it the way that we’ve agreed?
- Is there anything listed that isn’t contributing? Is there something that would contribute more?

Appendix F: Supervisory Control and Data Acquisition (SCADA) Schematic



Appendix G: Council Forecasting Assumptions 2024 – 2034

Significant Forecasting assumption 2024-2034	Description of risk 2024-2034	Impact if assumption not correct 2024-2034	Mitigation 2024-2034																												
Demographics																															
Population growth																															
<p>Nelson’s population is expected to increase by 5,431 between 2024 and 2034 to 60,837. The projections suggest a relatively modest annual average growth rate for 2023-2033 of around 0.9%. Growth rates are likely to decline over time due to structural population ageing. The rates of growth are based on commissioned demographic analysis and reflect the medium scenario projections from the findings of this analysis.</p> <p>These projections are higher than those produced by Statistics New Zealand, primarily due to higher net migration assumptions used for this analysis.</p>	<p>If Nelson’s population growth is higher than projected, it risks putting pressure on Council services and infrastructure. If it is lower than projected Council risks over investing in services.</p>	<p>Low</p>	<p>Council is careful when applying population growth estimates to its infrastructure planning, given the uncertainties, so there is generally a good margin for error should growth be higher than projected. Growth projections are reassessed for each Long Term Plan and adjustments made to Council’s work programme. New infrastructure is usually built for the medium to long term so there is the ability to draw on that future capacity if population growth is higher than projected. This limits the risk exposure.⁴²</p>																												
Ageing population																															
<p>The proportion of the population aged 65 years and over is projected to increase from 21% in 2023 to 26% in 2033.</p> <p>As the population ages, it is assumed the proportion of our population on fixed incomes will increase, with a corresponding pressure on Council to limit rates increases. An ageing population also requires a different balance of services/facilities/activities and changes in spending patterns across Council activities.</p>	<p>If the population age profile varies from what is forecast, particularly if there is accelerated growth in the ageing population, it risks putting pressure on Council to change the type of facilities and services that it provides.</p>	<p>Medium</p>	<p>Risks can be mitigated by Council working with the community to prepare for these changes, and appropriately modifying investments in assets and the provision of services.</p>																												
Growth in rating units																															
<p>It is assumed that the growth in rating units across the next ten years of the Long Term Plan is as follows:</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Growth</th> <th>Number of rating units</th> <th>Year on year increase</th> </tr> </thead> <tbody> <tr> <td>2024/2025</td> <td>0.95%</td> <td>23538</td> <td></td> </tr> <tr> <td>2025/2026</td> <td>0.94%</td> <td>23760</td> <td>222</td> </tr> <tr> <td>2026/2027</td> <td>0.93%</td> <td>23981</td> <td>221</td> </tr> <tr> <td>2027/2028</td> <td>0.93%</td> <td>24203</td> <td>222</td> </tr> <tr> <td>2028/2029</td> <td>1.71%</td> <td>24618</td> <td>415</td> </tr> <tr> <td>2029/2030</td> <td>1.69%</td> <td>25034</td> <td>416</td> </tr> </tbody> </table>	Year	Growth	Number of rating units	Year on year increase	2024/2025	0.95%	23538		2025/2026	0.94%	23760	222	2026/2027	0.93%	23981	221	2027/2028	0.93%	24203	222	2028/2029	1.71%	24618	415	2029/2030	1.69%	25034	416	<p>Economic conditions, demographic factors, and landowner/developer decisions can cause variations in rating unit growth meaning growth could be higher or lower than projected.</p>	<p>Low</p>	<p>Council has used current property information from its valuation service provider (Quotable Value) to assess the level of growth in rating units, along with an assessment of year on year increases from recent years. This information is as accurate as possible, so the risk of variation is limited.</p>
Year	Growth	Number of rating units	Year on year increase																												
2024/2025	0.95%	23538																													
2025/2026	0.94%	23760	222																												
2026/2027	0.93%	23981	221																												
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2028/2029	1.71%	24618	415																												
2029/2030	1.69%	25034	416																												

Significant Forecasting assumption 2024-2034				Description of risk 2024-2034	Impact if assumption not correct 2024-2034	Mitigation 2024-2034		
2030/2031	1.66%	25449	415					
2031/2032	1.63%	25865	416					
2032/2033	1.60%	26280	415					
2033/2034	0.69%	26462	182					
Relationship with iwi								
<p>Strengthening an authentic partnership between Council and iwi of Te Tauīhu is central to improving outcomes for iwi/Māori and the Whakatū/Nelson community.</p> <p>It is assumed that Council will resource activities to support greater opportunities for:</p> <ul style="list-style-type: none"> • Meaningful engagement between iwi and Council (i.e. regular meetings at governance, management and operational levels) • Increased iwi participation in Council decision making • Increased engagement and partnership with iwi and Council on legislative proposals and changes <p>Staff and elected members will continue to develop their understanding of iwi and Māori priorities, legislation, te reo Māori and tikanga Māori.</p>				<p>Establishing ways of working with iwi/Māori requires resources that may not be available. For example (i) iwi have limited capability and capacity to engage on the volume of Council projects; (ii) Council may not have capability and capacity to resource the needs of the relationship; (iii) staff may not have time available to attend professional development courses to improve cultural capability.</p> <p>The risk of not resourcing opportunities to strengthen an authentic Council iwi partnership are:</p> <ul style="list-style-type: none"> • It being perceived as an insincere relationship • Unrealistic expectations from both Council and iwi, leading to tensions • A competing requirement of iwi staff time that is under resourced <p>Council working reactively and inefficiently with iwi.</p>		Medium	<p>Council will focus on strengthening its relationship with iwi by:</p> <ul style="list-style-type: none"> • Funding that supports iwi capability and capacity to engage with Council • Attracting staff who are culturally competent • Developing planning tools and strategies that are reflective of a meaningful partnership with iwi/Māori <p>Supporting opportunities for staff cultural competency development.</p>	
Climate change and natural disasters								
Climate change risks and impacts								
<p>The expected risks of climate change for Nelson are based on science and projections from the Intergovernmental Panel on Climate Change, NIWA and governmental advice from the Ministry for the Environment.</p> <p>Sea-level rise projections are based on a range of global emissions scenarios developed by the Intergovernmental Panel on Climate Change and recommended by the Ministry for the Environment. Council considers a range of sea-level rise scenarios in its planning.</p> <p>It is assumed that it is not possible to reduce the mid-century warming, due to the amount of greenhouse gas emissions already accumulated in the atmosphere – i.e. that the projections for mid-century are already 'locked in'.</p> <p>Current roles and responsibilities in relation to climate change adaptation are unclear and expected to be clarified through legislative reform. It is assumed that, under any new legislation, Council will have a lead role to play in preparing Nelson for the impacts of climate change.</p>				<p>Increased numbers or severity of extreme weather events, such as heavy rainfall with flooding and slips, and dry weather resulting in drought and fire, would lead to increased costs for Council in both responding to the events and building greater resilience into infrastructure.</p> <p>There is a risk that inadequate assessment of the likelihood and impact of more frequent higher intensity natural hazard events would leave Council and the community unprepared to respond appropriately.</p> <p>Inadequate investment to reduce exposure to climate change risks would result in significantly greater costs than if proactive measures were taken. It would also lead to greater disruption to the community and essential services, and increased costs to Council. Over estimation of the impacts may result in Council having over-spent in preparing for risk factors.</p>		Medium	<p>To prepare Nelson for the impacts of climate change, Council is following the Dynamic Adaptive Pathways Planning (DAPP) process, recommended by the Ministry for the Environment in the Coastal Hazards and Climate Change Guidance for Local Government. This process enables Council to develop an adaptation plan the full extent and timing of climate change impacts is uncertain. Parts of Nelson Central are subject to flood risks and future intensification will be guided by the outcomes of the DAPP process.</p> <p>Over the period 2024-2034, Council will continue to work through the steps in the DAPP process, adapting the approach as new climate information is made available and drivers of change occur.</p> <p>Council will also closely monitor updates to ensure it is following the latest science, projections and guidance.</p> <p>Plan Change 29 (the Housing Plan Change) limits opportunities for intensification in low lying areas. Subsequent plan changes will be required to increase the resilience of the community, including regionally significant infrastructure.</p> <p>Council will continue to make allowances for increased stormwater management for areas that are identified as low lying and flood prone.</p>	
Greenhouse gas emissions								

Significant Forecasting assumption 2024-2034	Description of risk 2024-2034	Impact if assumption not correct 2024-2034	Mitigation 2024-2034
<p>It is assumed that current policies (as set out in Aotearoa New Zealand's Emissions Reduction Plan) will be implemented and New Zealand's emissions will reduce in line with emissions budgets.</p> <p>Over the next few years, there is likely to be significant further central government policy reforms changing the direction to local government and potentially creating different priorities for Council's climate change mitigation and adaptation work.</p>	<p>A change in central government direction could result in a different emissions reduction pathway and policies than what is set out in the current Emissions Reduction Plan.</p> <p>With growing legislative requirements and community expectations to respond to climate change, there needs to be a corresponding increase in resources available for the climate change work programme. If this does not occur, Council risks not meeting expectations, failing to meet its operational emissions reduction targets, and failing to implement legislative requirements.</p> <p>Council has previously made a number of statements and commitments (for example through declaring a Climate Emergency) to provide a leadership role on climate change. If this is not supported by a comprehensive work programme that is well-resourced, Council risks failing to meet community expectations.</p>	<p>Medium</p>	<p>Staff will closely monitor developments in central government policy, to anticipate possible shifts in direction and reprioritise work accordingly.</p> <p>The Long Term Plan includes appropriate allocation of financial and staffing resources for the climate change work programme, and funding to grow the resource allocation to match the growing workload over time.</p> <p>Climate change adaptation and mitigation objectives will be embedded across key Council work programmes, in particular: transport, waste management and minimisation, forestry, resource management planning and utilities.</p> <p>Engagement will be undertaken with the community to set targets that are ambitious, attainable and consistent with scientific evidence regarding the reductions needed to limit global warming to 1.5 degrees.</p> <p>Staff will report regularly to Council on progress with this work programme.</p>
New Zealand Emissions Trading Scheme (NZ ETS)			
<p>Council has assumed that the NZ ETS costs will rise in the medium to long term as a result of amendments to the Climate Change Response Act 2002, including changes in NZ ETS settings.</p> <p>NZ ETS unit pricing in the short-term is likely to fluctuate before increasing. This will impact the Regional Landfill Business Unit.</p>	<p>Rising NZ ETS costs could result in increasing costs to Council from waste emissions managed under the Regional Landfill Business Unit. This will provide greater financial incentives to reduce emissions at the landfill.</p>	<p>Medium</p>	<p>If the increase in NZ ETS costs is materially higher than assumed, Council may need to increase waste management fees and charges, increase rates to fund these costs or reduce waste minimisation funding.</p> <p>The Regional Landfill Business Unit is proposing to mitigate the increase by improving landfill gas collection and destruction, pre-purchasing units to fix the cost, and to pass the remaining cost to consumers through landfill charges.</p>
Natural disasters			
<p>It is assumed that natural disasters will occur in the Nelson area during the life of the Long Term Plan. Nelson is located on a fault line meaning a major earthquake is not a matter of "if but when".</p>	<p>Greater than anticipated magnitude or frequency of natural disaster events could result in greater costs for Council in both recovery and in building greater resilience into infrastructure.</p>	<p>High</p>	<p>A characteristic of Nelson is the concentration of lifelines infrastructure (road network, port, airport, wastewater treatment ponds etc.) on or near hazards such as fault lines, vulnerable soils, low-lying ground and the coast.</p> <p>Increasing awareness of earthquake prone buildings through legislative requirements will increase understanding of earthquake resilience in buildings and infrastructure. Priority has been given to identification (completed) and remediation of unreinforced masonry buildings in Nelson's central city. Strategic transport routes for emergency response have been identified and approved. Identification of potentially earthquake prone buildings along these routes were completed in 2022. Owners of these prioritised buildings will be required to complete seismic work within 12.5 years of identification.</p> <p>Identification of other potentially earthquake prone buildings is to be completed by 2027. Owners of these will have 25 years to complete seismic work. Plans are made through the Nelson Tasman Civil Defence Emergency Management Group which illustrate the degree of risk faced by Nelson in terms of natural disasters including earthquakes (infrequent but high consequence) and flooding (likely but lower consequence). Council has sufficient borrowing capacity above its self-imposed debt cap to be used as</p>

Significant Forecasting assumption 2024-2034	Description of risk 2024-2034	Impact if assumption not correct 2024-2034	Mitigation 2024-2034
			funding in the case of a natural disaster where costs exceed its emergency reserves.
Legislative and Regulatory Changes			
<p>There are reforms and legislative changes impacting local government that are likely to progress or come into effect during the period of the Long Term Plan.</p> <p>It is assumed that Council will be affected by other government legislation. However, as the nature of these changes is not known, it is not possible to make appropriate financial provision at this stage, except where noted elsewhere in these forecasting assumptions. It is assumed that the Council will have the opportunity to submit on legislation likely to affect it and that central government will work with councils to ensure that any legislative changes are managed appropriately.</p>	<p>Central government's proposed changes could require changes to Council's work programme and budgets and decrease work in some areas.</p> <p>The changes could create uncertainty and require re-prioritisation of work programmes.</p>	Low	<p>By working closely with central government, Council can best understand its obligations under upcoming regulatory and legislative changes. This will allow Council to move resources to respond to changes or to seek additional resources, if needed, through future Annual Plans.</p> <p>Council's work programme in this area will change as needed to respond.</p>
Amalgamation of water services – Water Services Reform			
<p>It is assumed Council will continue to manage water supply, wastewater, and stormwater for the lifetime of the Long Term Plan 2024-2034. Therefore, funding for assets, staff and contractors who deliver water services has continued to be included in the budgets.</p>	<p>There is still some uncertainty about the future management of the three waters services, due to the Government's proposed Local Waters Done Well reforms. However, these reforms are early in the policy process and it is likely that Council will continue to deliver three waters services for several years. If Council's role in managing and delivering water services changes prior to the next review of the Long Term Plan in 2027, it would mean Council's Long Term Plan would need significant adjustment and it could have impacts on Council finances, staffing, capital works programmes and operations.</p>	High	<p>Council will respond to the direction provided by the Government and engage closely with the Te Taihū councils, iwi and stakeholders as needed.</p>
Resource management reforms			
<p>The new Government has indicated an intention to reform the Resource Management Act 1991. The nature and extent of these reforms have been signalled to occur in phases but the full detail is currently unknown. Council has allocated budget in the Long Term Plan to review the Nelson Resource Management Plan or undertake other resource management policy development as required under the proposed reforms.</p> <p>It is assumed there will be obligations on Council to develop, implement and maintain strategic growth and resource management plans, in some form, and that Council will continue to have a role in the regulatory authorising environment and monitoring and compliance functions.</p>	<p>Until the reforms and associated legislative changes are finalised, it is difficult to estimate the likely impact on Council. However, the reforms may bring with them obligations for Council to fund a changed planning system.</p>	Low	<p>Council will make any adjustments necessary to respond to changes to the resource management legislation through annual plans and the Long-Term Plan 2027-2037.</p>
Future for Local Government Review			
<p>In April 2021, the Government established a Ministerial Inquiry into the Future for Local Government. The overall purpose of the review is to "identify how our system of local democracy needs to evolve over the next 30 years, to improve the wellbeing of New</p>	<p>There is potential for a gradual change to how Council works and is funded due to these reforms. This could have ramifications for work programmes, operational and capital expenditure, and budgeting.</p>	Low	<p>The Council will make any adjustments necessary to respond to any changes to local government legislation through annual plans and the Long-Term Plan 2027-2037.</p>

Significant Forecasting assumption 2024-2034	Description of risk 2024-2034	Impact if assumption not correct 2024-2034	Mitigation 2024-2034										
<p>Zealand communities and the environment, and actively embody the treaty partnership.”</p> <p>The review includes, but is not limited to, roles and functions of local government, as well as representation, governance, funding and financing.</p> <p>It is unclear whether the new Government will follow through with any of the recommendations in the review. The assumption is that any substantial change will be slow to result. Council has therefore prepared the Long Term Plan 2024-2034 assuming that its existing roles and functions (not impacted by other reforms) will continue.</p>	<p>It may also have impacts on costs for Council or changes to the way Council delivers services.</p> <p>However, until the Government has made its intentions clear it is difficult to estimate any impact on Council.</p>												
Economic environment													
Economic Forecasts													
<p>It is assumed Nelson’s economy will grow at a similar rate to the long-run average for New Zealand for most of the 10 years. Treasury expects inflation to fall to 4.6% in 2024 and drop inside the Reserve Bank’s target band of 1-3% inflation by 2025. Treasury has forecast New Zealand’s real production GDP to change as follows to 2027⁴³:</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Average Annual % Change</th> </tr> </thead> <tbody> <tr> <td>2024</td> <td>1.3</td> </tr> <tr> <td>2025</td> <td>2.0</td> </tr> <tr> <td>2026</td> <td>3.3</td> </tr> <tr> <td>2027</td> <td>3.2</td> </tr> </tbody> </table> <p>Any ongoing economic downturn will affect ratepayers’ and businesses’ ability to pay for Council services and affect people’s wellbeing. It will also have an impact on Council’s work programme and delivery of services.</p> <p>Tourism is an important component of the Nelson economy, with it contributing around 4.1%⁴⁴ to the city’s GDP and it has been affected by COVID-19 restrictions in recent years. Visitor arrivals to New Zealand are expected to grow an average of 4% each year, reaching 5.1 million visitors in 2025. Spend is forecast to grow at a slightly higher rate than the growth of visitor numbers, suggesting that spend per visitor will increase.</p>	Year	Average Annual % Change	2024	1.3	2025	2.0	2026	3.3	2027	3.2	<p>A downturn in the regional economy and higher unemployment may exacerbate affordability issues in the community, with some residents and businesses finding it more difficult to meet financial commitments including rates.</p> <p>This would also impact Council’s ability to make financial commitments.</p>	Medium	<p>A focus on affordability, value for money and continued Council investment in sustainable projects which will help reinvigorate the economy and improve economic wellbeing.</p>
Year	Average Annual % Change												
2024	1.3												
2025	2.0												
2026	3.3												
2027	3.2												
Inflation/price changes													
<p>Council has used inflation figures provided by BERL in preparing its Long Term Plan 2024-3024, along with other councils in New Zealand. BERL has provided two sets of figures – one set with water infrastructure and one set without water infrastructure. Council has used the figures that include water infrastructure for the ten years of the Long Term Plan.</p> <p>Financial year</p>	<p>Inflation higher than expected would increase costs for Council, reducing its programme to invest in and maintain infrastructure and facilities, and impacting its ability to deliver the levels of service set out in the Long Term Plan 2024-2034.</p> <p>There is still a lot of uncertainty about forecasting inflation. Previous forecasts have varied from the actual rates of inflation.</p>	Medium	<p>If inflation is higher than assumed, Council will consider increasing rates and charges, reducing its programme of investment in facilities and infrastructure, increasing debt and/or reducing levels of service.</p> <p>If inflation is lower than assumed, Council costs will be lower and Council will consider reducing rates and/or fees and charges or selectively increasing levels of service.</p>										

Significant Forecasting assumption 2024-2034	Description of risk 2024-2034	Impact if assumption not correct 2024-2034	Mitigation 2024-2034
LGCI 2024/25 – 2.9 2025/26 – 2.2 2026/27 – 2.3 2027/28 – 2.3 2028/29 – 2.2 2029/30 – 2.1 2030/31 – 2.0 2031/32 – 2.0 2032/33 – 1.9 2033/34 – 1.9			
Interest rates			
<p>In preparing the Long Term Plan 2024-2034, Council has assumed the following interest rates, based on forecasts provided by PwC, Council's Treasury Advisors.</p> <p>These interest rates include the cost of both funds already borrowed and anticipated new debt at anticipated future interest rates.</p> <p>Financial Year</p> 2024/25 – 4.85 2025/26 – 4.63 2026/27 – 4.63 2027/28 – 4.79 2028/29 – 4.9 2029/30 – 5.06 2030/31 – 5.21 2031/32 – 5.21 2032/33 – 5.21 2033/34 – 5.21	Higher interest rates would increase costs for Council.	Medium	Projected interest costs are largely hedged against changes in floating interest rates over future years. Therefore, the impact of interest rate increases over future years is low. However existing hedge commitments reduce over time (in accordance with Council's Policy) so that in the later years of the Plan the impact of changing interest rates would be greater which would be met either by increasing rates or adjusting down future borrowing requirements. Council manages interest rate exposure in accordance with its Liability Management Policy and in line with advice from Council's independent treasury advisor.
Labour market			
<p>There are ongoing labour market shortages in particular skilled areas making it difficult for Council to hire staff with appropriate technical qualifications and experience needed to deliver work programmes. Sustained labour market shortages are expected in many of the occupations that Council is likely to be recruiting for, which will be compounded by a decreasing proportion of the Nelson population being of working age. Shortages in particular skill areas are highly likely and demand for more flexible and hybrid working options will increase.</p> <p>The shrinking of our working-age population, as well as the region's average wage being the lowest in the country, will contribute to ongoing problems maintaining Council's workforce.</p>	<p>A more competitive marketplace with accompanying labour shortages would mean Council may not be able to deliver work programmes on time due to the absence of enough sufficiently qualified staff. Greater reliance on consultants to fill temporary workforce gaps may increase costs.</p>	Low	<p>Council would reconsider service delivery to manage skills shortages, and to help maintain output. Providing remote working options may increase the pool of expertise to recruit from.</p> <p>It is also expected that the proportion of older adults remaining in the workforce will continue to rise, improving incomes at older ages and somewhat mitigating against forecast workforce shortages.</p>

Significant Forecasting assumption 2024-2034	Description of risk 2024-2034	Impact if assumption not correct 2024-2034	Mitigation 2024-2034
Operational			
Useful lives of significant assets			
It is assumed triennial reassessments of the useful lives of significant assets during the ten year period covered by this Long Term Plan will continue. Significant assets will have lifespans that are consistent with initial assessments. The detail of useful lives for each asset category is covered in the Statement of Accounting Policies.	There is a risk of assets wearing out earlier than predicted and funding needs to be found for replacements. There is no extensive damage to Council's local roading network following the diversion of traffic from the State Highway during the August 2022 severe weather event.	Low	Council would make changes to underlying capital expenditure programmes to allocate funding for replacement assets.
Vested assets			
Vested Assets are engineering assets, such as roads, paid for by developers and vested to Council on completion of the subdivision. It is assumed that vested assets will remain the same over the term of the Plan as projects from the previous five years are completed. If required, additional budget can be added to the plan on account of private development agreements. However, as these agreements occur as and when private developers undertake work, this figure is largely indeterminable in advance. Council assumes that the impact of vested assets will be neutral, in that the costs associated with the additional assets will be offset by a proportionate increase in rates revenue. The impact of higher or lower growth is not considered significant.	Council has more assets vested and this could increase the depreciation and maintenance expense in subsequent years.	Low	Vested assets must be maintained by Council and depreciation provided for, therefore if growth is higher than forecast Council will increase its budget to maintain those assets and provide for the additional depreciation.
Cost to deliver capital projects			
A competitive local market means tenders are being received with prices above expectations. Furthermore, additional requirements and compliance issues that are included in contractual terms, such as carbon and freshwater requirements and waste minimisation, may increase prices further. Council will continue to work with contractors to achieve a living wage for their staff. It is assumed that this escalation of prices will continue in the medium term. It is assumed that major projects will be completed on time and within budget but acknowledges that not all projects will be completed on time as unforeseen issues will occur.	Increases in project prices resulting in higher costs would have potential upward pressure on rates and debt. Delays in project completion or additional costs may result in other major projects being reassessed in terms of both available budget and timeframes for completion. Important projects that run into significant cost increases, that are deemed essential, may require rates or borrowing increases, or reallocation of funds from other projects to offset the higher costs.	High	Increased flexibility in the capital works programme around timing of projects could help mitigate this trend. Reassessing Council's work programme to ensure adequate consultation and analysis prior to work commencing will be undertaken so that Council has the best information available.
Delivery of the capital programme			
Notwithstanding best intent to deliver the capital works programme, Council assumes that the full capital works programme will not always be able to be fully delivered for a variety of reasons including project delays, weather and a range of other constraints. Council has also made an assumption that it is unlikely to use the full amount of contingency for every project. An overall downward adjustment of approximately 10% per year to the total capital programme cost has therefore been made to avoid overfunding the activities.	There is a risk that the cost of the capital programme may be more or less than the 90% budgeted for. If more is spent Council's debt will be more than forecast with an associated increase in costs. Delays in project completion or additional costs may result in other major projects being reassessed in terms of both available budget and timeframes for completion. Important projects deemed essential that run into significant cost increases, may require	High	Increased flexibility in the capital works programme around timing of projects could help mitigate this matter. Council ensures adequate consultation and analysis prior to work commencing so that it has the best information available to adjust the work programme as needed. Council will consider the impacts on rates, debt and levels of service when making any adjustments to the work programme. Priority will be given to making adjustments which reduce rates and debt increases but which are also least likely to have a negative impact on the Long Term Plan levels of service.

Significant Forecasting assumption 2024-2034	Description of risk 2024-2034	Impact if assumption not correct 2024-2034	Mitigation 2024-2034
	rates or borrowing increases or reallocation of funds from other projects to offset the higher costs.		
Earthquake prone buildings			
It is known that Council faces future costs with regard to earthquake prone building (EPB) assets. Civic House has earthquake prone status and being a EPB Priority Building, and Council premises, has a Taskforce assigned to address the compliance requirement. Council has four assets with EPB notices and it is assumed these properties will remain Council owned. Work will need to be completed between now and 2034 on these properties. Council as a Territorial Authority is required to identify EPBs and issue EPB notices. Identification of all priority buildings was completed by 30 June 2022, and all remaining EPB notices need to be completed by 30 June 2027.	Significant additional expenditure on earthquake strengthening buildings risks not being met by assigned budgets. EPB work can initiate other compliance work as part of consenting processes, therefore there is a risk that required work could become more significant than anticipated.	Medium	Processes are underway to seek Council direction to confirm intention for each asset with EPB status – options that may be considered are whether to a) retain and strengthen, b) deconstruct, or c) dispose of asset. Not all options are available for all assets but understanding Council's preferred direction will allow for staff to manage time, target tasks to be done, and set appropriate budgets.
Pandemics			
It is assumed New Zealand will avoid significant impacts from an epidemic or pandemic including COVID-19, and that no further lockdowns or major border restrictions are required.	A pandemic or epidemic could have significant impact on New Zealand and the Nelson region resulting in restrictions and/or illness, which would have a major impact on Council's ability to deliver services.	Medium	Council will maintain its organisational understanding of managing pandemic risks in the workplace and capacity of the organisation to work remotely.
Resource consents			
It is assumed that any resource consents held by Council that are due for renewal during the life of the Long Term plan 2024-2034 will obtain consent. It is assumed, however, that the consents will be subject to a more rigorous process, given national direction in areas such as freshwater. In terms of Council's role as regulator adjusting to the new resource consent regime, it is assumed there will be more permitted standards meaning less resource consents to process but more monitoring requirements/expectations of those permitted standards. It is assumed there will not be a drop in the overall number of staff or costs but potentially a change in roles to be able to undertake monitoring as well as processing.	Conditions of resource consents could be altered and significant new compliance costs or consents may not be able to be renewed as expected. Changes to the staff roles are required when transitioning to the new resource consent regime, to be able to undertake more monitoring as well as processing.	Medium	Budgets based on current expected levels of activity. More effort may not transfer into increased recovery so Council will have to carefully monitor expenditure in the absence of more capacity.
Financials			
Loan arrangements			
It is assumed that new borrowing or renewal of existing borrowings can be obtained from financial institutions including the Local Government Funding Agency on competitive terms given Council's strong credit rating.	Access to committed loan facilities less than expected may result.	Medium	Council minimises this risk by maintaining a strong credit rating and a mix of current and non-current borrowings as per its Liability Management Policy. Council's guarantor status for the Local Government Funding Agency also minimises the risk of not being able to borrow the funds it requires. Council also prefunds upcoming borrowing maturities early to lower the risk of not being able to borrow.
Insurance costs			
It is assessed that insurance cover for Council assets will be available throughout the period of the Long Term Plan 2024-2034 and that premiums will rise faster than the rate of inflation.	There is a risk that premiums increasing above inflation and/or Council cannot obtain 100% cover.	Medium	Council may reduce other budgets or reassess levels of service to reduce costs and provide more funds for covering premiums. Council could also increase rates. Also, Council is currently looking to reduce its level of

Significant Forecasting assumption 2024-2034	Description of risk 2024-2034	Impact if assumption not correct 2024-2034	Mitigation 2024-2034
Council expects insurance base costs to rise by 15-20% plus the impact of inflation on asset values in those years.			insurance cover by Council taking more financial risk to manage the increased premiums.
Return on investments			
It is assumed that the return on investments, including dividends from Council Controlled Trading Organisations and retained earnings on subsidiaries, will continue at current levels, plus inflation.	Returns could be lower than expected.	Low	This would impact on Council's ability to fund services and would likely require an increase in rates. Alternatively, Council could consider reducing levels of service.
Revaluation of non-current assets			
<p>Council's accounting policy provides for its most significant asset classes (infrastructure assets and land, excluding land under roads) to be revalued with sufficient regularity as long as the carrying value does not differ materially from fair value.</p> <p>The revaluations for infrastructural asset classes: sewerage, water, drainage, and roads are updated annually with full valuations being completed bi-annually and an index valuation in alternate years. A registered valuer assesses asset unit rate replacement values through analysing areas such as current contract pricing, comparisons of similar councils, impacts of regional and national influences such as weather events, and CPI indexes which are then applied to a full valuation. Assets abandoned during the financial year are disposed then confirmed rates are applied to all Council's infrastructure assets generating a total asset replacement cost, depreciated replacement cost and depreciation. For intervening years, infrastructural assets are revalued by means of applying an inflation index and additional uplift where necessary to align with market rates, whilst accounting for disposals and additions at cost. Each year the valuation produced is peer reviewed by a registered valuer. The latest full valuation was the 2021-22 year and was reviewed by WSP New Zealand Ltd. The next full valuations will be taking place in the following years:</p> <p>30 June 2024 30 June 2026 30 June 2028 30 June 2030 30 June 2032 30 June 2034</p> <p>To forecast for these valuations in this Long Term Plan, we revalue Infrastructural asset classes: sewerage, water, drainage, and roads every year based on Local Government Cost Index (LGCI) Capex.</p> <p>Land is reviewed annually and revalued at market value every five years or if there is a material movement. The latest valuation was conducted as at 30 June 2021 by QV Valuation.</p>	Actual revaluation results could differ significantly from those forecast in this Long Term Plan.	Medium	Council will be maintaining best practice in accounting policies to minimise risk of assets' carrying value differing significantly from fair value.

Significant Forecasting assumption 2024-2034	Description of risk 2024-2034	Impact if assumption not correct 2024-2034	Mitigation 2024-2034
<p>We have forecast land revaluations to occur in years 3, 6 and 9 of the Long Term Plan.</p> <p>We revalue Property Plant and Equipment (PPE) every year based on Local Government Cost Index (LGCI) Capex.</p> <p>Depreciation is calculated based on revalued PPE each year – depreciation on existing assets therefore increases each year starting in Year 2 (as a result of the prior year revaluation).</p>			
NZ Transport Agency Waka Kotahi Funding			
<p>Council assumes the NZ Transport Agency Waka Kotahi Financial Assistance Rate (FAR) will remain at the same rate (51%) over the term of the Long Term Plan 2024-2034 and only programmes/projects with strong alignment with the Government Policy Statement on land transport will receive National Land Transport Funding (NLTF). It assumes that the projects included years 4 to 10 of the Long Term Plan will be approved as fitting within the new National Land Transport Funding framework when it is released.</p>	<p>Projects and programmes that do not qualify for National Land Transport Funding will need to be deferred which may impact levels of service or continued at 100% local share which is likely to impact rates and debt. If the FAR is reduced or projects no longer supported, Council will need to decide whether to increase funding (an impact of approximately \$5-20M, typically on debt over years 4 to 10) or to remove work from the plan (which may impact on services).</p>	<p>Medium to high (depending on the level of change)</p>	<p>Changes to the funding priorities of NZ Transport Agency Waka Kotahi are outside Council's control, however any significant change to the FAR or NLTF eligible works may require Council to reassess its transport work programme in order to reduce costs and/or to make up operational and/or capital shortfalls, with potential impacts on rates and debt or levels of service.</p>
Co-funding arrangements			
<p>It is assumed that for projects where other partners are contributing part of the funding, this funding will continue to be available. It is assumed that where Council could be eligible for government funding, e.g. infrastructure and community projects, Council will also seek this funding. Council will seek co-financing where available from central government towards implementation of climate change projects.</p>	<p>Partners may no longer be in a position to provide funding which may result in an increased level of funding from Council, or the termination of the project.</p>	<p>Medium</p>	<p>If co-funding arrangements changed, the viability of projects would be reviewed and Council would need to consider its ongoing commitment. Funding for projects may be sought from other sources.</p>
Sources of funds for the future replacements of assets			
<p>It is assumed that funding for the replacement of existing assets will be obtained from the appropriate sources as detailed in Council's Revenue and Financing Policy.</p>	<p>There is a risk that a particular funding source is unavailable.</p>	<p>Low</p>	<p>Depreciation is used to fund renewals and is funded mainly through rates and user charges. Should other sources of capital funding such as subsidies or development/financial contributions differ from levels forecast in a particular activity, Council is able to access borrowings through various sources as explained under Loan arrangements section.</p>

Appendix H: GAP Analysis and Appropriate Practice

Wastewater							w					
Reference	Question	IIMM Descriptors	Core	Intermediate	Advanced	Element %	Element Score (out of 100)	Current Score	Appropriate Target (3 yrs)	Target (10 years)	Reason for scores	Improvement Tasks to close gap
		Process Development and Documentation	Process components defined and documented	Process complete, optimisation developing	Optimised process in place, documentation complete.							
		Coverage (assets, people, frequency)	Often	Usually	Always							
		Section	Questions	45-60	65-80							
Understanding and Defining Requirements												
IIMM 2.1	1	Establishing Strategic Direction	To what extent has your organisation's AM Policy and AM Strategy been articulated, approved, communicated and acted on? How consistent is this policy and strategy with current government policies?	AM System scope is defined and documented. Strategic context (internal, external, customer environment) analysed and implications for the AM System documented in the Strategic AM Plan.	AM Policy and Strategy fully integrated into the organisation's business processes and subject to defined audit, review and updating procedures.			53.75	60	80	24-34: Future targets unchanged.	
			Strategic context (internal / external) analysed and AM implications understood			25%	50					
			AM Policy sets out AM expectations, objectives and accountabilities			25%	40				Assume AMP provides a lot of the policy direction. Promapp has some info though requires updating.	
			The organisation's AM System / Framework is defined			25%	60				Fairly well established though connections could be stronger.	
			Strategic, tactical and operational goals are aligned across the organisation			25%	65				Increase of 5 in 24-34 AMP due to better use and integration of data systems (Lutra/Infor)	
IIMM 2.2	2	Defining and Measuring Levels of Service	How does your organisation determine what is the appropriate level of service for its customers and then ensure that asset performance is appropriate to those service levels?	Level of service and cost relationship understood. Customers are consulted on significant service levels and options.	Customer communications plan in place. Levels of service are integral to decision making and business planning.			58.75	65	80	24-34: Future targets unchanged.	
			Customer engagement to understand level of service requirements.			25%	50				Done through LTP & Annual Plan. Don't facilitate wide customer group discussions. 24-34 AMP - this is an area where additional staff resourcing is required.	
			Levels of service and performance measures defined			25%	80				24-34: Clearly articulated, concise and stable.	
			Measurement and reporting occurs, including analysis of trends.			25%	70				24-34: Measured and targeted. Analysis done on other metrics	
			Level of service and cost relationship analysed.			25%	35				Not done for changes to L.O.S.	L.O.S. and cost linkage

IIMM 2.3	3	Forecasting Future Demand	How robust is the approach your organisation uses to forecast demand for its services and the possible impact on its asset portfolios?	forecasts based on selection of a demand factor (eg: growth) and use of historic data associated with a range broadly defined and used. Demand management considered as a key driver to major development.	A range of demand scenarios is developed (eg: high/medium/low). Demand management is considered in all strategy and project decisions.	Risk assessment of different demand scenarios with mitigation actions identified.			68	75	80	24-34: 3 year target up 10.	
			Historical demand / consumption of services recorded and trends analysed				20%	80				24-34: Data better analysed and recorded/stored. Up 5	
			Demand factors identified and analysed				20%	80				24-34: Data better analysed and recorded/stored. Up 5	
			Demand forecast models developed				20%	70				24-34: Models updated. Up 10.	24-34: More verification work on model
			Demand management strategies identified and impacts on future demand				20%	50				24-34: No change.... Somewhat linked to water usage - demand management on water will positively impact on wastewater.	Better use of model. Clearer outputs from the city development team
			Risk associated with demand uncertainty understood, scenarios are developed				20%	60				24-34: Up 10, improved data acquisition and use. Wet weather events. Tidal influences. Development	Better use of model. More investigative work in problem areas.
IIMM 2.4	4	Collecting Asset Information (Asset Knowledge)	What sort of asset-related information does the organisation collect, and how does it ensure the information has the requisite quality (accuracy, consistency, reliability)?	Information to support asset valuation, asset types, asset cost and asset condition and support of programmes. Asset hierarchy, location and attribute documented. Held as a register.	A reliable register of physical, financial and risk attributes recorded in an information system with data analysis and reporting functionality. Systematic and documented data collection process in place.	Information on work history type and cost, condition, performance, etc. recorded at asset component level. Systematic and fully optimised data collection programme with supporting metadata.			62	70	80	24-34: Future targets unchanged.	
			Asset hierarchy defined and data requirements for each level of the hierarchy				20%	40				Good pipe data, WWTP and PS data less well defined.	Establish an asset hierarchy for more complex asset groups
			Basic physical information captured against assets (age, material, type, etc)				20%	60				Good pipe data, WWTP and PS data less well defined.	Establish an asset hierarchy for more complex asset groups
			Spatial / location information recorded or links to GIS from asset register				20%	70				Good pipe data, WWTP and PS data less well defined.	Establish an asset hierarchy for more complex asset groups
			Asset age / life / replacement cost recorded at asset level (information for asset management)				20%	70				Good pipe data, WWTP and PS data less well defined.	Establish an asset hierarchy for more complex asset groups
			Asset criticality data recorded at asset level				20%	70				Natural hazard project has lifted this.	Need to test the Natural hazard/criticality outputs undertaken 19/20.

IIMM 2.5	5	Monitoring Asset Performance and Condition	How does the organisation measure and manage the condition of its assets?	Condition and performance information is suitable to be used in maintenance decisions to meet over the long term.	Future condition and performance information is modelled to assess whether AM objectives can be met in the long term. Contextual information, such as demand, is used to estimate likely performance.	The type, quality and amount of data are optimised to the decisions being made. The underlying data collection programme is adapted to reflect the assets' lifecycle stage.			55	60	70	24-34: Future targets unchanged.	
			Condition and performance monitoring programmes established				25%	65				24-34: CCTV footage now available online; clear proactive CCTV work being undertaken; reactive CCTV work captured under ops budgets. Up 10.	Need to establish an ongoing programme of condition assessments.
			Condition data captured in asset register				25%	50				24-34: CCTV data and condition grades readily available. Up 5. Not checked, no trend data analysis	Need to better use Infor
			Performance data captured in asset register (eg: service outages)				25%	55					Need to better use Infor
			Works costs recorded at asset level				25%	50				depends on piece of work. Reactive maintenance yes.	Need to better use Infor
Lifecycle Decision Making													
IIMM 3.1	6	Lifecycle Decision Methods	How does your organisation go about making decisions on the replacement or refurbishment of existing assets or investment in new ones?	Decision making techniques (MCA / BCA), are used for all major projects and programmes, where criteria are based on the assets' AM objectives.	Formal decision making and prioritisation techniques are applied to all operational and capital asset programmes within each main budget category. Critical assumptions and estimates are tested for sensitivity to results.	AM objectives/targets are set based on formal decision making techniques, supported by the estimated costs and benefits of achieving targets. The framework enables projects and programmes to be optimised across all activity areas. Formal risk-based sensitivity analysis is carried out.			67	75	80	24-34: 3 year target up 10.	
			Good information available to support AM decisions.				20%	70				24-34: Improving availability and type of data - CCTV, RM works, criticality, NH etc. Up 20.	Improve condition data
			Options developed and analysed (including 'do nothing')				20%	70				24-34: This is done for key assets. Less so for like for like renewals/upgrades. Up 10.	Refine/simplify business case process
			Agreed frameworks / techniques applied to support decision making				20%	70				24-34: Yes - typically option development, fatal flw assessment, rationalise to preferred option via MCA. Up 10	Refine/simplify business case process
			Decision frameworks are aligned to strategic objectives / levels of service				20%	65				24-34: NC	Matrix - see business case renewals
			Sensitivity analysis / scenario testing used to assess robustness of result				20%	60				24-34: Yes in some cases.	Refine/simplify business case process

IIMM 3.2	7	Managing Risk and Resilience	How does your organisation manage the interplay between business risks and asset-related risks?	Assets and high risks Documented risk strategies for assets and high risks.	Resilience level assessed and improvements identified. Systematic risk analysis to assist key decision-making. Risk register regularly monitored and reported. Risk managed and prioritised consistently across the organisation.	Resilience strategy and programme in place including defined levels of service for resilience. Formal risk management policy in place. Risk is quantified and risk mitigation options evaluated. Risk is integrated into all aspects of decision making.			66	75	85	23-34: 3 and 10 years targets up 10 each.	
			Risk policy / framework in place				20%	80					
			Risks are identified and recorded in risk register.				20%	80					
			Risk actions are identified, monitored and reported.				20%	30					Set time frames for mitigation measures; allocate mitigation measures.
			Strategy for management of critical assets in place				20%	70				24 - 34: ARM renewal; NWWTP Strategic; RM condition assessment work underway. Up 20. Key risks are fairly obvious and therefore the organisation is inherently aware of them.	Extend natural hazard assessment; develop contingencies for critical assets.
			Assessments of network resilience to major hazards				20%	70				24-34: Up 10; NH GIS/3W criticality tool developed. Building understanding of pipes crossing watercourses.	Extend natural hazard assessment; develop contingencies for critical assets.
IIMM 3.3	8	Operational Planning	How does your organisation manage the cost effective performance of its key business assets over time (e.g. in terms of utilisation, availability, fitness for purpose)?	Procedures are in place for all Operational requirements are in place	Risk and Opportunity Planning completed. Operational objectives and intervention levels defined and implemented. Alignment with Organisational Objectives can be demonstrated.	Continual Improvement can be demonstrated for all operational processes. Comparison with ISO 55001 requirements complete.			63.75	70	80	24-34: 3 and 10 year 5 up.	
			Operational programmes and processes are developed and optimised				25%	65					More effort require to align operational activities with AMP and organisational strategies
			Operational objectives and intervention criteria are defined				25%	65					More effort require to align operational activities with AMP and organisational strategies
			Emergency response arrangements are in place and tested				25%	60				24-34: Emergency response procedure and notification process well used and refined. Up 10. Some scenarios tested for critical assets. Could widen scope.	More contingency planning.
			Operational performance is monitored and improvements identified				25%	65					Improve monitoring of KPI

IIMM 3.4	9	Capital Investment Planning	What processes and practices does the organisation have in place to plan and prioritise capital expenditure?	ve been collated e range of sources d into a project pital projects for ree years are fully d estimated. A on framework is in nk the importance projects.	Formal options analysis and business case development has been completed for major projects in the 3-5 year period. Major capital projects for the next 10-20 are conceptually identified and broad cost estimates are available.	Long-term capital investment programmes are developed using advanced decision techniques such as predictive renewal modelling.			65.5	70	80	24-34: No change.....	
			Capital projects are identified and recorded in a register				20%	80				24-34: No change.....	
			Capital projects are scoped and costs estimated for inclusion in budget fo				30%	65				24-34: Key projects and areas where significant upgrade or renewal programmes are required idnetifed and included in initial budget. Final budget subject to council moderation.	Time constraints; high level at time of AMP and adjusted through the AP process.
			Capital projects are prioritised within and between activities and work an				25%	50				24-34: No change - it is clear that greater prioritisation between activities is required.Prioritised within activities.	Need to prioritise between activities.
			Renewal forecasts are modelled based on age, condition, performance				25%	70				24-34: Up 20 - this is an area where updates have been made to pipe life and greater emphasis has been placed on undertking cndition assessments. Recent analysis of valuation data indicates that this lags behind market rates.	Improve valuation data
IIMM 3.5	10	Financial Management	How does your organisation plan for the funding of its future capital expenditure and asset-related costs?	uations have a 'B' confidence 10 ncial forecasts urrent nsive AMPs with pporting ns / reliability	Asset revaluations have a 'B' grade data confidence 10 year+ financial forecasts based on current comprehensive AMPs with detailed supporting assumptions / reliability factors.	Asset revaluations have an 'A' grade data confidence. 10 year + financial forecasts based on comprehensive, advanced AM plans with detailed underlying assumptions and high confidence in accuracy. Advanced financial modelling provides sensitivity analysis, demonstrable whole of life costing and cost analysis for level of service options.			72.5	80	80	24-34: No change.....	
			Budget categorisation supports analysis of asset-specific financial require				25%	75				24-34: No change.....	
			Long term financial forecasts are developed				25%	75				24-34: Up 10; mor erigour employed in forecasting.	
			Assets are revalued in accordance with financial reporting standards				25%	70				24-34: No change.....	Wider range of tendered rates; need to confirm valuation rates are appropriate.
			Supporting assumptions and forecasting methodologies are documented				25%	70				24-34: No change.....	Wider range of reference material

Asset Management Enablers													
IIMM 4.1	11	Asset Management Leadership and Teams	What is the level of organisational commitment to asset management? How is this reflected in existing organisation structure, responsibilities and resourcing of AM competencies?	Descriptions of AM roles. AM on processes defined. Ownership and AM by leadership. of AM across the organisation.	Organisational structures support AM. Roles reflect AM resourcing requirements and reflected in position descriptions for key roles. Consistent approach to AM across the organisation. Internal communication plan established.	Roles reflect AM requirements and defined in all relevant position descriptions. Formal documented assessment of AM capability and capacity requirements to achieve AM objectives. Demonstrable alignment between AM objectives, AM systems and individual responsibilities			41	65	70	24-34: No change.....	
			Leadership supports and actively advocates investment in AM.				20%	40				24-34: No change.....Staff resources short, resilience limited.	Investment in AM team and training.
			AM roles and role interfaces are defined.				20%	40				24-34: No change.....Activity Eng role covers a very wide remit. This does not allow adequate focus.	Improve job description and organisational structure/resourcing.
			Resources (internal and external) to support an effective 'AM System' are				20%	40				24-34: No change.....Staff resources short, resilience limited	Investment in AM team and training.
			All staff understand AM and their role / contribution to the AM System.				20%	45				24-34: No change.....Activity Eng role covers a very wide remit. This does not allow adequate focus.	Improve job description and organisational structure/resourcing.
			AM capability requirements are reviewed and provided				20%	40				24-34: No change.....	
IIMM 4.2	12	Developing AM Plans	How does your organisation develop, communicate, resource and action its asset management plans?	Plans are defined in the context of the wider organisation. Approach to critical assets top-down and performance based. Description of AM processes, 10 year forecasts, 3 year improvement plan.	Analysis of asset condition and performance trends (past/future), customer engagement in setting levels of service, ODM/risk techniques applied to major programmes. Strategic context analysed with risks, issues and responses described.	Evidence of programmes driven by comprehensive decision making techniques, risk management programmes and level of service/cost trade-off analysis. Improvement programmes largely complete with focus on ongoing maintenance of current practice.			67	70	75	24-34: No change.....	
			AMP development includes relevant staff and stakeholders				20%	60				24-34: Resourcing a limiting factor; internal bureaucracy challenging. No change.....Iwi engagement happens but quite late. Staff resourcing limits ability to do more in this area.	Improve resourcing and resilience.
			AMP content in line with IIMM				20%	65				24-34: No change.....	
			AMP document is of good quality, readable for target audience				20%	65				24-34: No change..... AMPs are long documents and can be challenging to gist..	Improve use of AMP content to be more user friendly and appropriate. Make documents (including exec summary) more succinct.
			AMPs are integration with other business processes / plans				20%	55				Very difficult to do again resourcing a limiting factor.	Improve activity integration
			AMPs are communicated to / approved by Council / Executive/ key stake				20%	90				24-34: No change.....	

IIMM 4.3	15	Establishing and Maintaining Management Systems	How does your organisation ensure that its asset management processes and practices are appropriate and effective?	ty Management place that covers operational activities. Processes are defined, monitored and reviewed. AM System requirements of	Process documentation implemented in accordance with the AM System to appropriate level of detail. Internal management systems are aligned.	ISO certification to multiple standards for large asset intensive organisations, including ISO 55001. Strong integration of all management systems within the organisation.			46.25	60	70	24-34: No change.....	
			Management systems are in place to support AM.				25%	60				24-34: No change.....Some but sporadic	Better integration required. Also growing need for enhanced data management.
			AM processes are documented within a management system framework				25%	45				24-34: No change.....Business cases/PIDs/Data Analysis/Computer models, Promapp	Promapp requires updating.
			Processes are subject to review, audit and continual improvement				25%	45				24-34: No change.....	
			AM System is aligned / certified to ISO 55001				25%	35				24-34: No change.....	Need organisational support.
IIMM 4.4	13	Establishing and Maintaining Information Systems	How does your organisation meet the information needs of those responsible for various aspects of asset management?	ter enables reporting (at t to facility level). request tracking ed maintenance ty enabled. System anual reports to be for valuation, recasting.	Spatial relationship capability. More automated analysis reporting on a wider range of information.	Financial, asset and customer service systems are integrated and all advanced AM functions are enabled. Asset optimisation analysis can be completed			62	80	80	24-34: No change.....	
			IS records asset data within a hierarchy				20%	70				24-34: No change.....	
			IS enables tracking of service requests and scheduling of planned maintenance				20%	80				24-34: No change.....	
			IS supports AM analysis (performance evaluation, valuation / renewal forecasting)				20%	60				24-34: No change.....	Background capability is high, more could be done to use this capability.
			IS reporting supports management and AMP requirements				20%	50				24-34: No change.....	More to be done to formalise asset queries to ensure consistency between data outputs. Better use of infor over GIS. Reporting needs to be more focussed towards providing usable data/outputs.
			Information systems share / exchange data				20%	50				24-34: No change.....	Background capability is high, more could be done to use this capability.

IIMM 4.5	14	Service Delivery Models	How does your organisation procure asset-related services like maintenance and consumables for different classes of assets? How does the organisation exercise control over any outsourced asset management services?	ons defined. ent strategy/policy ternal service level s in place with the ternal service and contract for y external service	Risks, benefits and costs of various outsourcing options considered and determined. Competitive tendering practices applied with integrity and accountability.	All potential service delivery mechanisms reviewed and formal analysis carried out to identify best delivery mechanism.			58.75	65	75	24-34: No change.....						
														Service delivery roles / functions defined (O&M, capital project delivery, Functions allocated to roles / teams / contracts	25%	65		Documenting
														Service delivery options are evaluated and a strategy for outsourcing is in	25%	60		Documenting
														Contracts / SLAs are in place for outsourced / in house service delivery	25%	60	Nelmac contract	More robust AM staffing required.
															25%	50	External agreements well documented. Internal agreements not in place.	Formalise internal SLAs
IIMM 4.6	16	Audit and Improvement	How does your organisation ensure that it continues to develop its asset management capability towards an appropriate level of maturity?	d future AM ce assessed and to drive the ent actions. ent plans identify timeframes, is, resource nts and ities	Formal monitoring and reporting on the improvement programme to Executive Team. Project briefs developed for all key improvement actions.	Improvement plans specify key performance indicators (KPIs) for monitoring AM improvement and these are routinely reported. Improvement plans specify key performance indicators (KPIs) for monitoring AM improvement and these are routinely reported.			45	60	70	24-34: No change.....						
														Gap analysis used to identify AM improvement tasks	25%	50	Resourcing a limiting factor.	Appropriate resourcing
														Improvement tasks prioritised and developed into an AM improvement p	25%	50	Resourcing a limiting factor.	Appropriate resourcing
														Project scope / brief developed for major improvement tasks.	25%	40	Resourcing a limiting factor.	Appropriate resourcing
														Progress against the AM improvement programme is regularly monitored	25%	40	Resourcing a limiting factor.	Appropriate resourcing