Kaipara District Council

Asset Management Plan 2015

Water Supply

June 2015

Status: Final

Kaipara te Oranganui
KAIPARA DISTRICT
Two Oceans Two Harbours

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Introduction

Kaipara District Council (Council) operates five community water supply schemes for Dargaville and Baylys, Glinks Gully, Ruawai, Maungaturoto and Mangawhai.

The focus of the Water Supply system is to protect public health by providing potable water to the communities with reliable service.

The purpose of this Asset Management Plan (AMP) is to summarise Council's strategic and long term management approach for the provision and maintenance of water supply assets.

The AMP provides discussion of the key elements affecting management of Council's water supply asset, including the legislative framework, links to Community Outcomes, Policies and Strategy, the proposed Levels of Service and performance measures and demand, environmental and service management.

Asset performance, condition and value are examined and a Financial and Lifecycle Strategy is presented to define the investment planned to address issues and to ensure that an uninterrupted service is provided to customers now and into the future.

The provision of sustainable potable water supplies requires all those connected to the systems to take a degree of responsibility by ensuring the water supply is not wasted.

Kaipara is fortunate in having a number of long-established water sources that provide high quality water.

In dry conditions when demand is high alternative supply points are required to be used where the raw water quality is poorer which puts pressure of the treatment and supply system.

With the climatic conditions Council has experienced over the past two years restrictions on water use have had to be brought in to ensure sufficient water is available for potable use and to protect the public health. These measures have not proved to be sufficient and additional options for managing peak demand will need to be found particularly if the current climatic conditions continue.

Council looks forward to working with the community in the provision of sustainable water supply systems.

The Assets

Council operates five community water supply schemes for Dargaville and Baylys, Glinks Gully, Ruawai, Maungaturoto and Mangawhai to protect public health by providing potable water to the community with reliable service. The location of each of these communities within Kaipara District is illustrated in the figure below.

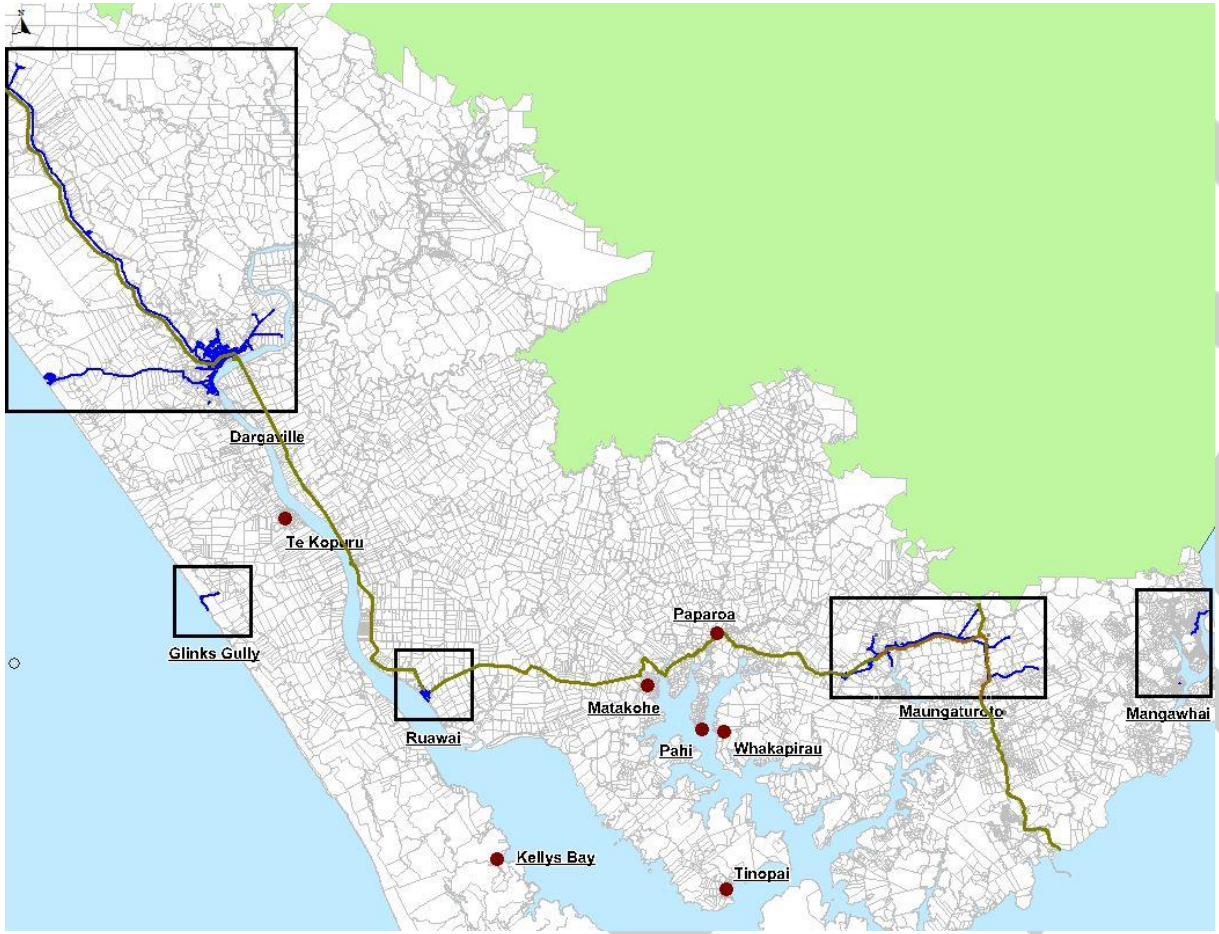


Figure ES-1: Community was supply schemes

An overview of the water supply assets in the District is provided in the Asset Overview and Asset Valuation summary tables below.

Table ES-1: Water supply asset overview summary

Community	Water Source Point	Water Treatment Plant	Pump Station	Storage	Reticulation (km)	Connection	Points (Fire hydrants, Valves, Meters)	Asset Condition
Dargaville/ Baylys	5	1	4	3	125	2,782	3,160	Assessment programme commenced 2013/2014
Maungaturoto	4	1	3	4	36.7	447	501	Assessment programme commenced 2013/2014
Ruawai	2	1	0	1	6.7	251	129	Assessment programme commenced 2013/2014
Glinks Gully	3	1	0	4	2.7	85	9	Assessment programme commenced 2013/2014
Mangawhai	1	0	0	5	3.6	18	29	Assessment programme commenced 2013/2014

Table ES-2: Summary of water supply asset valuations (2013)

Component	Replacement Costs	Depreciated Replacement Cost	Annual Depreciation
Dargaville/Baylys	$46,786,098	$15,945,127	$735,195
Maungaturoto	$17,241,373	$9,061,429	$260,037
Ruawai	$2,672,342	$1,048,715	$70,556
Glinks Gully	$755,269	$441,466	$12,380
Mangawhai	$853,733	$552,914	$14,938
Water Supply Total	**$68,308,816**	**$27,049,651**	**$1,093,104**

Key Issues

Financial Strategy

The Financial and Lifecycle Strategy defines the operational, maintenance, renewal and new capital expenditure over the next 10 years (see Appendix A). A summary of the planned expenditure by community and by category is shown in the charts below.

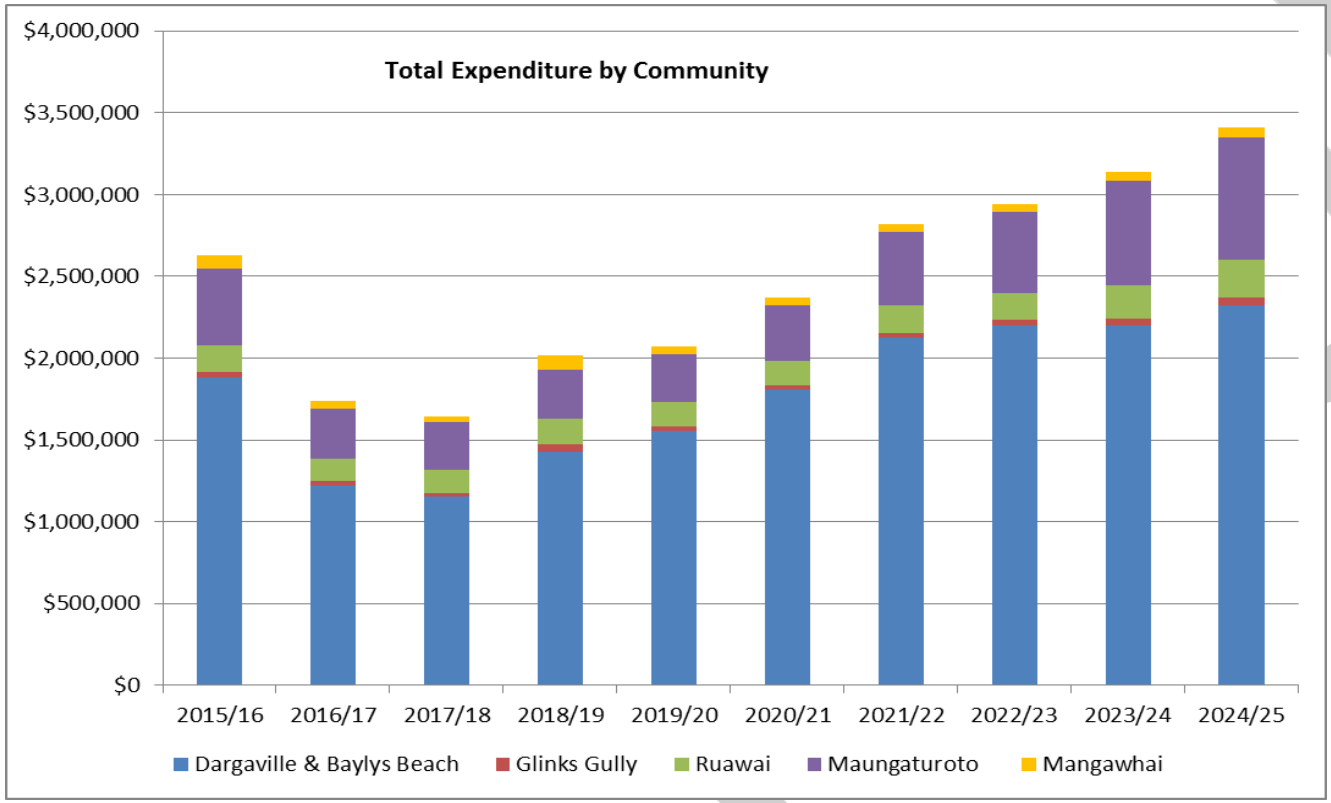


Figure ES-2: Total expenditure by community

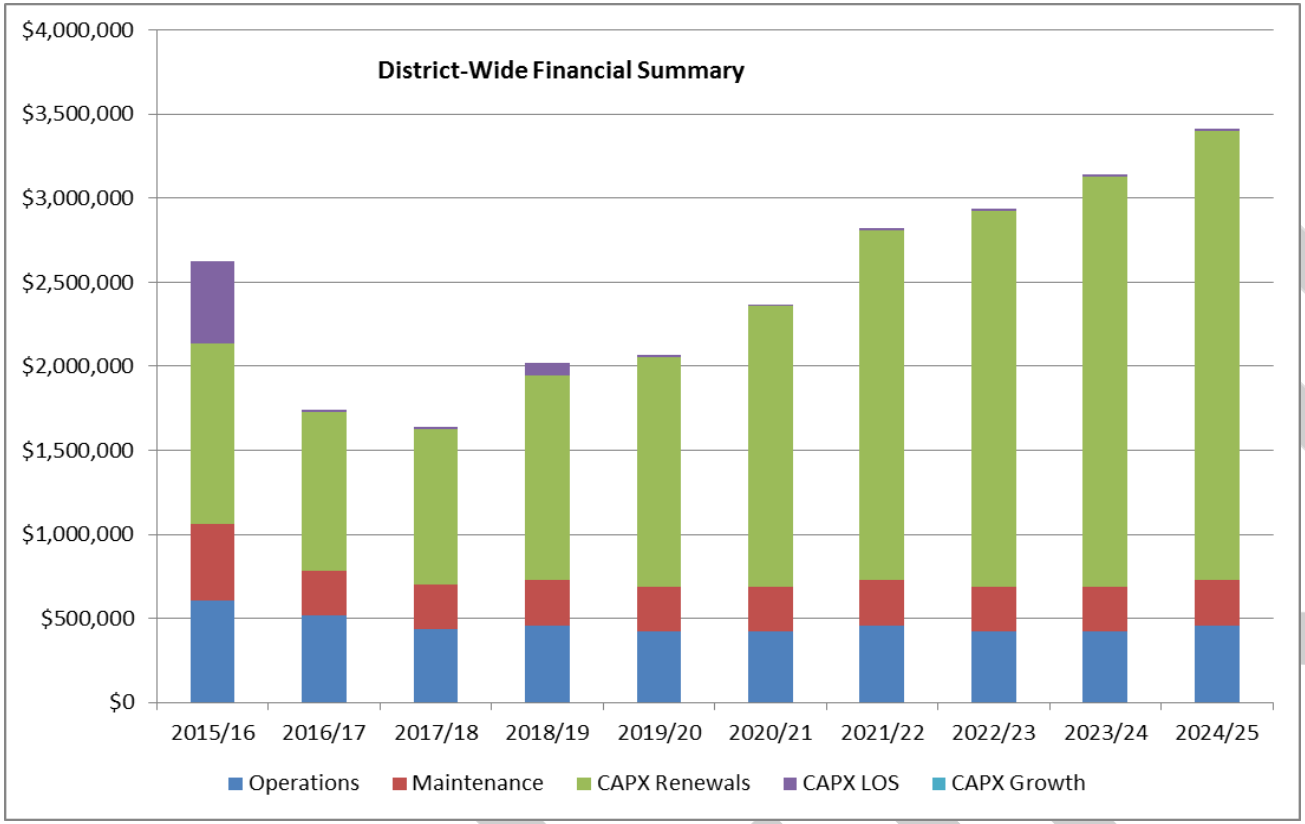


Figure ES-3: District-wide financial summary

Continuous improvement

Making the Kaipara District an excellent place to live is a key goal for Council. Council's desire to improve community well-being needs to be balanced with the need to keep rates at an affordable level and for the organisation to operate in a financially prudent manner.

Council has developed an Improvement Plan to capture issues and plan the improvements required to water supply assets and asset management practices. A copy of the Improvement Plan is included in Appendix B.

Timing for completion of the activities may vary depending on Council priorities. This may result in re-prioritisation of activities from year to year, while maintaining bottom-line budgets.

The key improvements to be achieved during the next three years to facilitate achievement of core asset management activities and delivery of the water supply service include:

- Implementation of required work to achieve DWSNZ 2005(08) compliance at all treatment plants;
- Review and update the WSPs for all five water supply schemes;
- Use the information gathered in the condition assessment of water supply assets (in alignment with wastewater and stormwater services) and feed into the Renewals programme;
- Use the hydraulic models produced for Dargaville, Maungaturoto and Ruawai water supply networks to identify information gaps, potential performance issues, and the potential for pressure and demand management within the systems;
- Review of data management procedures, including development of systems for recording maintenance and costs at asset component level in the Asset Register;
- Implementation of a new telemetry management and monitoring and reporting system.

1 Strategic context

1.1 Purpose

The purpose of this Asset Management Plan (AMP) is to outline and to summarise in one place, Kaipara District Council's (Council) strategic and management long term approach for the provision and maintenance of its water assets.

The AMP demonstrates responsible management of the District's assets on behalf of customers and stakeholders and assists with the achievement of strategic goals and statutory compliance. The AMP combines management, financial, engineering and technical practices to ensure that the LOS required by customers is provided at the lowest long term cost to the community and is delivered in a sustainable manner.

Territorial authorities have numerous responsibilities relating to the supply of water. One such responsibility is the duty under the Health Act 1956 to improve, promote, and protect public health within the districts. This implies that, in the case of the provision of potable water, councils have the obligation to identify where such a service is required, and to either provide it directly themselves, or to maintain an overview of the supply if it is provided by others.

This AMP outlines and summarises the Council's strategic and management long term approach for the provision and maintenance of potable water supplies to properties throughout the District (excluding those that service single premises that have their own rainwater tanks or bores) - whether they be provided by public or private means. For reference, a list of defined acronyms used throughout this AMP is provided at the back of this document.

1.2 Service description and scope

Council operates five community water supply schemes for Dargaville and Baylys, Maungaturoto, Ruawai, Glinks Gully and Mangawhai in order to provide the communities a constant, adequate and sustainable potable water supply. Council owns and maintains the whole water supply network which covers:

- collection of raw water;
- treatment of raw water to produce suitable quality and quantities of drinking water;
- distribution of treated water to the point of supply to the customer including the water meter, to consistently meet specific flow, pressure and quality standards. This includes water required for emergency fire-fighting services.

A snapshot of the number of connections for each of Council's water supply schemes is provided in Table 1-1 below.

Table 1-1: Connections per Council water supply scheme

Water Supply Scheme	Number of connections
Dargaville/Baylys	2,782
Maungaturoto	410 (Township) 37 (Railway)
Ruawai	251
Glinks Gully	85
Mangawhai	18

At commercial metered connections, Council owns the water meter and backflow preventer and charges for actual water used.

Council undertakes the following with assistance from its Maintenance Contractor, and other service providers as required:

- Asset Management;
- Customer services;
- Treatment plant O&M;
- Network O&M;
- Capital and Refurbishment Programme;
- Water billing;
- Consent monitoring and compliance.

The scope of this AMP is to determine water supply standards, LOS and funding levels to maintain sustainable and affordable water supplies for Council's five existing water supply schemes. The AMP should be used to drive and manage the water supply business throughout the year, and this will require progressive updating to reflect the constantly changing situation.

By providing ready accessible potable water supplies, Council is working to improve, promote and protect public health within the District. Clean, safe water is essential for communities and local economic development. The water supplies also provide water for fire-fighting capability in established urban water supply areas that provides communities with a level of protection against fire.

1.3 Key issues

Key matters requiring attention for the water supply asset are summarised in Table 1-2 below. These matters are further addressed in Section 2.1 (Asset details) and Section 5 (Improvement Plan) of this AMP.

Table 1-2: Key matters requiring attention for Council's water supply activity

Issue	Location
New Zealand Drinking Water Standard (DWSNZ) 2005(08) compliance	All – Dargaville and Baylys, Maungaturoto, Ruawai, Glinks Gully, Mangawhai
Updated Water Safety Plans (WSP) for each of the five water supply schemes	All – Dargaville and Baylys, Maungaturoto, Ruawai, Glinks Gully, Mangawhai
Waiparataniwha water take resource consent issued 2014.	Dargaville
Dargaville Water Treatment Plant backwash discharge disposal consent issued 2014.	Dargaville
Maungaturoto raw water take resource consents issued 2014	Maungaturoto
Maungaturoto water supply requires an optimisation strategy	Maungaturoto
Magflow installation for Council's treated water supplies	All – Dargaville and Baylys, Maungaturoto, Ruawai, Glinks Gully, Mangawhai
Security of supply/water source strategy - Waiatua Dam to Rotu pipeline	Dargaville
Dargaville drought management plan review	Dargaville
Ruawai reticulation booster pumps meeting New Zealand Fire Standards compliance upgrades to be completed 2014.	Ruawai
Telemetry control system upgrade commenced 2014	All – Dargaville and Baylys, Maungaturoto, Ruawai, Glinks Gully, Mangawhai
Asset Information • Inventory - accuracy, completeness - Response - completed 2014; • Criticality - definition - Response - completed 2013; • Condition - Response - commenced 2014; • Performance - Response - water models completed 2013, Water balance completed 2014;	All – Dargaville and Baylys, Maungaturoto, Ruawai, Glinks Gully, Mangawhai

Issue	Location
• Lives - Response - commenced 2014; • Lack of maintenance history - Response - Included as part of renegotiated maintenance contract.	

1.4 Assumptions

Council has made a number of assumptions in preparing the Asset Management Plan, which are described in Table 1-3 below.

Table 1-3: Key assumptions

Assumption type	Assumption	Discussion
Financial assumptions	That all expenditure has been stated in 01 July 2015 dollar values (GST exclusive) and no allowance has been made for inflation.	The LTP will incorporate inflation factors. This could have a significant impact on the affordability of the plans if inflation is higher than allowed for, however Council is using the best information practicably available from Business and Economic Research Limited (BERL).
Growth forecasts	A reasonable degree of reliability can be placed on the population and other growth projections that have been used as forecast assumptions. However, these are projections and need to be carefully tracked to ensure that they continue to be a reliable indicator of likely future trends.	If the growth is significantly different it will have a significant impact. If higher, Council may need to advance capital projects. If it is lower, Council may have to defer planned works.
Network capacity	That Council's knowledge of network capacity is sufficient enough to accurately programme capital works.	If the network capacity is lower than assumed, Council may be required to advance capital works projects to address congestion. The risk of this occurring is low; however the impact on expenditure could be large. If the network capacity is higher than assumed, Council may be able to defer works. The risk of this occurring is low and is likely to have little impact.
Changes in legislation and policy	That there will be no major changes in legislation or policy.	The risk of major change is high due to the changing nature of the government and politics. If significant changes occur it is likely to have a significant impact on the required expenditure. Council has not mitigated the effect of this.

1.5 Relationship to Community Outcomes, Council policies and strategies

Council's vision with its water supply service is *to ensure that the Kaipara communities are provided with reliable and sustainable potable water supplies.*

Council's community outcomes are spelled out in the Long Term Plan (LTP) and put forward how Council aims to achieve to maintain and improve the well-being of the District in the present and for the future. Community outcomes focus on the things that a council has the capacity and influence to achieve.

The community outcomes that the water activity contributes to most are shown in Table 1-4 below. LOS and associated performance measures to which these community outcomes are closely related to are presented in Section 1.10.

Table 1-4: Community Outcomes

Community Outcomes	How this service contributes to the Community Outcome
Sustainable Economy	Reliable and regularly available potable water supplies for residential, commercial and industrial activity.
Strong Communities	Promote community growth by providing a safe and reliable water supply.
Safety and good quality of life	Raw water is treated to a sustainable standard against waterborne diseases.

1.6 Stakeholders and consultation

There are many individuals and organisations that have an interest in the management and / or operation of Council's water supply assets. The following key external and internal stakeholders are identified for this AMP:

External

- The Kaipara District community, including residents and ratepayers;
- Residential and commercial water consumers;
- Government agencies (e.g. Department of Health, Ministry for the Environment, Audit New Zealand);
- New Zealand Fire Service;
- Local Iwi;
- Northland Regional Council;
- Service Contractor;
- Northland District Health Board;
- Visitors to the District.

Internal

- Councillors;
- Commissioners;
- Water Services Manager and Water Services staff;
- Finance Manager
- Information Services Manager
- Records and Information Manager

Council consults with the public to gain an understanding of customer expectations and preferences. This enables Council to provide a Level of Service (LOS) that better meets the community needs. The Council's knowledge of customer expectations and preferences is based on:

- feedback from public surveys;
- public meetings;
- feedback from elected members;
- analysis of customer service requests and complaints;
- consultation via the Annual Plan and LTP process.

Council undertakes customer surveys on a regular basis, usually every three years, from the National Research Bureau Ltd[1] (NRB), and more recently on an annual basis. These Communitrak Surveys assess the levels of satisfaction with key services, including water supply, and the willingness across the communities to pay to improve services.

In the 2014 Communitrak Survey, of those residents that are provided with a piped water supply, 74% are very satisfied or fairly satisfied (79% in 2013) with the water supply service.

These results are less than the LOS Statement in Council's Long Term Plan 2012/2022 which has a target of 82% of residents who are very/fairly satisfied with the water supply.

[1] Communitrak™: Public Perceptions and Interpretations of Council Services / Facilities and Representation, NRB Ltd May/June 2011.

1.7 Legislative framework and linkages

The Water Supply AMP is related to a range of national and local legislation, regulatory and policy documents as listed in Table 1-5 through Table 1-8 below. The legislation and guidelines below are listed by their original title for simplicity, however all Amendment Acts shall be considered in conjunction with the original Act, these have not been detailed in this document. For the latest Act information refer to http://www.legislation.govt.nz/.

Table 1-5: Relevant legislation

Acts
The Health Act 1956
The Health (Drinking Water) Amendment Act 2007 (an amendment of the Health Act 1956)
The Local Government Act 2002, especially: • Part 7; • Schedule 10; • the requirement to consider all options and to assess the benefits and costs of each option; • the consultation requirements.
The Climate Change Response Act 2002
The Civil Defence Emergency Management Act 2002 (Lifelines)
The Resource Management Act 1991
The Local Government (Rating) Act 2002
The Health and Safety in Employment Act 1999
The Building Act 2004
The Consumer Guarantees Act 1993
The Sale of Goods Act 1908
The Fair Trading Act 1986
Public Records Act 2005

Table 1-6: Relevant regulatory requirements

National Policies, Regulation, Standards and Strategies
Drinking Water Standards for New Zealand 2005(08) (DWSNZ)
The Government's Sustainable Development Action Plan
The National Environmental Standard Sources of Human Drinking Water
Code of Practice for Urban Sub-division
The New Zealand Fire Service Fire Fighting Water Supplies Code of Practice: SNZ PAS 4509:2008
NAMS Manuals and Guidelines http://www.nams.org.nz
Office of the Auditor General's publications http://www.oag.govt.nz
Standards New Zealand: • AS/NZS ISO 31000:2009 Risk Management Principles and Guidelines; • NZS 4404:2010 Land Development and Subdivision Infrastructure; • AS/NZS ISO 9001:2008 Quality Management Systems; • AS/NZS 4801:2001 Occupational Health and Safety Management Systems.

Table 1-7: Relevant Council planning and policy documents

Local Policies, Regulations, Standards and Strategies
Council District Plan
Northland Regional Plan
Council Engineering Standards and Policies 2011
Council Procurement Strategy and Policy Documents March 2012
Fonterra Water Supply Agreement 2009 (Maungaturoto)

Table 1-8: Relevant Council bylaws

Council Bylaws
Water Supply Bylaw 2009

The preparation and implementation of this AMP and associated long term financial strategies is a means for Council to comply with these requirements.

It is important to highlight the following recent national water policy updates:

- The Health (Drinking Water) Amendment Act 2007 (HDWAA) came into effect 01 July 2008. This means that compliance with the Drinking Water Standards for New Zealand (DWSNZ 2005) is a legal requirement for Council. These standards have been revised and Council intend to comply with the newer standards – DWSNZ 2005 (revised 2008) (DWSNZ 2005(08)).

Local Government Act 2002 requires local authorities to:

- Identify community outcomes and priorities, at least every six years. These must cover social, cultural, economic and environmental dimensions, and indicators are developed to assess the contribution of water supply services to these outcomes;
- Prepare a range of policies, including Significance, Funding and Financial Policies;
- Prepare an LTP (LTP formerly the Long Term Council Community Plan or LTCCP), at least every three years, which must identify:
  - activities and assets;
  - how the asset management implications of changes to demand and service levels will be managed;
  - what and how additional capacity will be provided, and how the costs will be met;
  - how the maintenance, renewal and replacement of assets will be undertaken and how the costs will be met;
  - revenue levels and sources.

With respect to policy on significance, all local councils must adopt a policy that sets out their approach to determining the significance of proposals or decisions relating to issues, asset or other matters, and any thresholds, criteria or procedures to be used by Council in assessing whether issues, proposals, decisions or other matters are significant.

Schedule 10 of the Act provides further detail for the LTP, which is relevant to this AMP. This Act supersedes the 1996 Local Government Amendment Act, which required the adaptation of a Long Term Financial Strategy, prudent asset management, and formal accounting for the “loss of service potential” of assets. In essence however, the intent of these requirements is still relevant as embodied in Audit New Zealand’s expectations for AMPs through its requirement for councils to conduct an “assessment of water and wastewater services within its district”.

The new legislation also puts a stronger emphasis than ever before on strategic planning (s.121) that will describe:

- the systems for supply of water and disposal of waste and storm waters (cl.3 (a));
- the quality of drinking water and wastewater (including stormwater) (cl.3 (b));
- current and future demands for water and wastewater (including stormwater) services and related effects on the quality of supply and the discharges to the environment (cl.3(c));
- options for meeting current and future demands with associated assessments of suitability (cl.3 (d)).

Local Government (Rating) Act 2002, the funding companion to this proposed new LGA: Permits councils to strike a rate or charge for any activity they choose to get involved in (Section 16).

Resource Management Act 1991 (RMA) sets out the framework for freshwater management. Freshwater is managed by regional councils who are responsible for the water bodies within their boundaries through implementation of the RMA.

The Health (Drinking Water) Amendment Act 2007 amended the Health Act 1956, requiring all water suppliers with the duty to ensure their water is safe to drink. The amended Act introduced a statutory requirement that all drinking water suppliers providing drinking water to over 500 people must develop and implement a WSP to guide the safe management of their supply. The quality assurance is complemented by **The New Zealand Drinking Water Standards (DWSNZ),** which specify the maximum acceptable concentrations of harmful contaminants in the water.[2]

National Policy Statement for Freshwater **Management 2011** reflects central government's policy and directions to local government regarding the management of the nation's freshwater resources. The freshwater objectives seek to safeguard the life-supporting capacity, ecosystem processes and indigenous species, including their associated ecosystems of fresh water. This is to be achieved quantitatively through the sustainable management of taking, damming or diverting fresh water, and qualitatively through the sustainable management of the use and development of land and the discharge of contaminants.

Northland Regional Council (NRC) regulates the water takes in the Kaipara area. Resource consents issued by NRC are a significant driver of the asset management programme. Key NRC documents are noted below:

- NRC Regional Policy Statement;
- NRC Regional Water and Soil Plan;
- NRC Regional Coastal Plan;
- NRC Regional Air Quality Plan.

[2] Ministry of Health, 2008. Drinking-water Standards for New Zealand 2005(Revised 2008).

Health and Safety in Employment Act 1992 requires the provision of safe work places for all activities by staff and contractors, and the maintenance of an audit trail to demonstrate compliance.

Civil Defence Emergency Management Act 2002 requires utility lifelines (such as water supply) to function to the fullest possible extent during and after an emergency and to have plans for such functioning (business continuity plans).

Public Records Act 2005 Council is required to create and maintain full and accurate records including all matters that are contracted out to an independent contractor. This includes records which relate to property or assets owned by and/or administered by the local authority such as contract documents, as-built of public utilities and services such as; roads, drainage, sewerage and stormwater, water supply, flood control, power generated and supply, refuse disposal and public transport.

National Environmental Standards The RMA promotes the sustainable use of resources. The main method that the Act uses to control the use of resources including the discharge of effluent to the environment is through the Regional Water and Soil Plan at Regional Level and District Plans at District level. This has resulted in varying standards for each region and district.

One method of ensuring that environmental standards are applied consistently across the country is provided in section 43 and section 44 of the RMA. These sections allow the MfE to promote regulations called National Environmental Standards (NES). When a NES is enacted it means that each regional, city or district council must enforce the same standard. In some circumstances, councils can impose stricter standards.

NES not only protect people and the environment, they also secure a consistent approach and decision-making process throughout the whole country. They create a level playing field.

The following standards are in force as regulations:

- Air quality standards;
- Sources of human drinking water standard;
- Telecommunications facilities;
- Electricity transmission;
- Assessing and managing contaminants in soil to protect human health.

The standards listed below are at various stages of development, ranging from initiating consultation to being legally drafted:

- Ecological flows and water levels;
- Future sea-level rise;
- Plantation forestry.

This AMP has considered the impact of those relevant NES that are known to be in force at the time of the current update. Future AMP updates will need to consider future Standards as the Ministry for the Environment (MfE) develops these as it is likely that they will influence how Council manages the communities water supply.

Links with other documents

This AMP is a key component in the Council's strategic planning function. Among other things, this AMP supports and justifies the financial forecasts and the objectives laid out in the LTP. It also provides a guide for the preparation of each Annual Plan and other forward work programmes.

1.8 Demand management

1.8.1 Introduction to water demand management

The objective of water demand management is to provide a framework and action plan for Council to continuously improve efficient use of water and water demand management across its water supplies, often targeting the highest demands/water loss first, to achieve a level of water demand management that is consistent with good performance in New Zealand.

Demand management strategies provide alternatives to the creation of new assets in order to meet demand and look at ways of modifying customer demands in order that the utilisation of existing assets is maximised and the need for new assets is deferred or reduced.

The components of demand management are shown in Table 1-9 below.

Table 1-9: Examples of water supply demand management strategies

Demand component	Water supply examples
Operation	Optimise treatment processes. Leak detection to reduce non-revenue water loss (i.e. pressure management). Reducing the number of public water supplies.
Incentives	Rainwater harvesting. Stepped tariffs encouraging reduced water consumption.
Education	Public education on alternative water source and water conservation. Encourage use of water efficient appliances.
Demand Substitution	Water reuse for non-potable use e.g. toilet systems and gardening.

There is uncertainty in forecasting demands. The key assumptions are:

- growth is consistent with the low percentages forecast;
- no major changes to industrial usage.

If the growth significantly exceeds that which is expected there is a risk that the capacity of the infrastructure will be exceeded sooner than anticipated. To minimise this risk Council will need to review capacity requirements based on actual demand growth as new assets are planned.

Water demand management options can be categorised into two key areas, measures and instruments.

- **Measures** – 'what to do' to achieve a reduction in water use (e.g. conversion of inefficient showers to efficient star rated showerheads).
- **Instruments** – 'how to do it' (how to ensure that the chosen 'measures' are put into place or taken up), which include the following types:
    - Economic – incentives such as rebates and retrofits for efficient fixtures and fittings or cost-reflective pricing which makes customers consider how they can reduce their water use to reduce their water bills.
    - Economic – uneconomic public water supplies are returned to private ownership or converted to a non-potable water source
    - Regulatory – the use of local development consent conditions to ensure all new properties sold achieve a specified level of water efficiency and minimum water efficiency performance standards at a national level that require all products sold to achieve a specified level of water efficiency.
    - Communicative – education and advertising / marketing to promote a water efficiency consciousness and promote behavioural changes.

In addition, the Water Services Association of Australia (WSAA) recommends identification of "foundation options" as they have often been critical elements to the success of a demand management programme. It may be difficult to analyse the costs and attribute savings to these options, however they should be considered in the full programme.

Foundation options include:

- an effective ongoing education and public awareness campaign that ensures the community understand how they use water and how they may be able to save water;
- a customer advisory service which assists in communicating to the public how to save water and participate in water efficiency programmes;
- the use of regular billing cycles including customer feedback on bills to advise how the customer is tracking with respect to previous billing cycles and typical household water consumption;
- effective user-pays cost-reflective pricing including consideration of inclining block water and wastewater tariffs and peak, drought and scarcity pricing;

- basic system management including systematic replacement of customer water meters and calibration of bulk water meters to ensure a high level of water accounting accuracy.

WSAA recommends designing both structural and behavioural changes into a demand management programme and using more than one instrument. A combination of at least two instruments is generally most effective. For example, an economic incentive for an indoor retrofit, plus communicative and educative material about water saving tips around the home, have the potential to tap into both structural and behavioural conservation.

Similarly, whenever considering changing a single measure such as a washing machine, at least two instruments are recommended to maximise effectiveness. For example, an economic incentive and communication/education that recognises both structural and behavioural changes can take place (e.g. a more efficient machine and the participant being informed that they can save both water and energy if they wait to use a full load when washing clothes, which will save them money).

1.8.2 Council's approach to demand management

Council has historically undertaken limited water demand management planning. By doing so, and planning for its use of water to be efficient, Council will be contributing to the LOS that relate to the "sustainable economy" and "strong communities" community outcomes (Section 1.5).

The recent climatic conditions affecting Dargaville in particular is highlighting the need for more appropriate proactive demand management strategies to be developed and implemented.

In addition to commencing water demand management planning, the LOS for the water activity will also be expanded, for example creating performance measures for residential water consumption and water loss will enable Council to compare its performance on these measures with other water supplies in New Zealand. The AMP signals Council's intention to undertake this work and develop a proposed staged approach for improving water demand management in the District.

The first step is to review the Dargaville Drought Management Plan and incorporate a staged water restriction methodology incorporating alternate days and limiting times for sprinklers and hosing which assists with enforcement. A community education communication plan also needs to be developed and implemented.

The following sections provide an analysis of factors affecting demand including population growth, social and technology changes and environmental considerations. The impact of these trends is examined and demand management strategies are recommended as a technique to modify demand without compromising customer expectations.

1.8.3 Population growth

Statistics NZ 2013 census data has identified Kaipara District's population to be 18,960. The last Census undertaken in 2006 recorded the population at 18,135. This represents an increase of 825 or 4.5% over seven years. Prior to this there was a growth increase of 3.9% following the 2001 Census over a five year period.

Historically, population growth figures have been much lower than currently with a 2.8% increase in population for the Kaipara District over the 10 year period from 1996 to 2006.

The focus of growth recently has been Mangawhai with most other areas experiencing little growth and indeed for Dargaville and Maungaturoto populations decreasing.

The LTP 2012/2022 predicts little or no growth in the long term. A key consideration is how this growth is split across the District, with significantly less growth in western and northern areas of the District. The predicted level of growth as set out in the LTP 2012/2022 is presented in Table 1-10 below.

Table 1-10: Annual rating unit growth forecasts 2012/2022

Area	Current population (Census 2013)	Years 1 – 4 2012/13 –2015/16	Years 6 – 10 2016/17 – 2021/22
Dargaville and Baylys	4,626	1.50%	1.50%
Glinks Gully	72	0.00%	0.00%
Kaiwaka	576	1.00%	1.50%
Maungaturoto	756	1.00%	1.50%
Te Kopuru	465	0.00%	0.00%
Mangawhai	2,415	1.60%	2.50%
District (including all other areas)	18,960	1.36%	1.69%

While the above growth predictions are relatively low or even static, the District experiences growth in other ways, such as the increasing number of visitors that move into the District during the summer season from October to April, particularly during the weekends. The large number of non-residential holiday homeowners in the District is one of the main contributors to growth, especially in Mangawhai and its surrounding areas, however also Pahi, Tinopai, Baylys, Kai Iwi Lakes.

In general, the forecasts assume that any additional demand for services created by the increased growth levels will be absorbed by the rating base growth and by more efficient delivery of services.

Growth and demand trends

Future demand for water supply services is driven by:

- extent and location of urban growth;
- changing environmental expectations;
- community expectations;
- industrial/commercial demand;
- legislation.

There is no growth driven capital projects of significance for water supply over the coming years. The focus is on ensuring security of supply by sustainable water use and adequately maintaining and renewing infrastructure. In general, the forecasts assume that any additional demand for services created by the increased growth levels will be absorbed by the rating base growth and by more efficient delivery of services.

Projections for growth in demand for water supply services must take into account new developments and existing residents in areas not yet serviced. Additionally, community expectations vary geographically and over time. Council can track the future demand for future water supply services through community consultation via the LTP and Annual Plan processes.

Although the Mangawhai community is growing, and the existing Mangawhai water supply system services approximately 18 connections, the community has previously indicated that it did not want the Council public water scheme to be expanded. Council, therefore, has not made any provision for any extension of the Mangawhai water supply system in this AMP and will look to divest as much of the scheme as is possible in the coming years.

1.8.4 Increase in demand for water supply services

As development occurs and communities expand, the need for water supply services may increase, to provide certainty in supply (of potable water) and to manage risk (fire fighting protection). The demand for such services is generally governed by the communities need and ability to pay.

1.8.5 Operational efficiencies

The cost of operating and maintaining public water supply systems and maintaining compliance with ever increasing and demanding water quality standards, needs to be considered in the overall assessment of the schemes viability to continue as a public water supply, and as a financial demand on the ratepayers contributing to the ongoing operability of the system.

For schemes serving larger populations, the costs are shared across a larger population base and the system is more than likely cost-effective, with a greater emphasis on health and safety, through the provision of a healthy potable water supply, in sufficient quantities to provide the appropriate levels of fire safety.

For schemes serving smaller populations, or a segment of a community, the costs per ratepayer may be disproportionally larger, as the same quality standards need to be provided. An example could be the Mangawhai system where a small portion of the population (18 connections) is serviced by a system needing to be upgraded to meet the current New Zealand Drinking Water Standards. The cost of upgrading the existing system needs to be assessed, however it may well eventuate that it will be more cost-effective to declassify the scheme to a non-potable source, and shift the emphasis back to those connected to install private treatment capability (i.e. cartridge filters and / or small UV treatment capability) on each of the connections, thereby removing the need for a costly upgrade to the water source to be funded by the wider community.

This could equally apply to the likes of the Glinks Gully system (serving approximately 72 people), however careful consideration needs to be given to progressing such changes and consultation with the community will be required.

1.8.6 Technological change

Changes in technology have a significant potential to alter the demand placed on the utility services and also have the potential to provide techniques and processes for the more efficient provision of water supply services. Whilst the DWSNZ drive and monitor potable water quality compliance, developments in water treatment processes and technology potentially offset the cost of increased quality compliance requirement. As such there is a need to monitor the technology aspect of water supply treatment, to potentially identify opportunities that may be developed and implemented to reduce the cost of treating water.

A constant awareness of technology changes is necessary to most effectively predict future trends and their impact on the utility infrastructure assets.

1.8.7 Economic trends

New Zealand is currently experiencing a significant growth in sectors and areas of the country. The area from Tauranga to Auckland is experiencing considerable growth and outlying areas such as Mangawhai are beginning to see the positive effects of this growth with increased interest and property sales.

Extension of the Northern Motorway to Warkworth may see more commuters prepared to settle in Mangawhai.

Certainly Mangawhai is very affordable compared to Orewa and is attracting a share of the retirees.

1.8.8 Legislative change

Legislative change can significantly affect the Council's ability to meet minimum LOS, and may require improvements to infrastructure assets. Changes in environmental standards and the Resource Management Act 1991, may affect water take requirements.

In addition, changes in legislation can influence the ease at which new consents are obtained or existing consents are renewed. Experience demonstrates that consent conditions are becoming more stringent with increased monitoring requirements being commonplace and the likelihood of better management and possible reduced volumes in water take consents.

The MfE is promoting a series of NES that can be enforced as regulations under the Resource Management Act. One such standard is the proposed standard for Ecological Flows and Water Levels, the objective of which is to facilitate the sustainable management of New Zealand's water resource. It intends to promote consistency in the way decisions are made to ensure sufficient variability and quantity of water flowing in rivers, groundwater systems, lakes and wetlands.

1.8.9 Customer expectations

Kaipara District residents are becoming more aware of the cost and implications of providing and maintaining potable water supplies. Whilst seen as a necessity, the increased costs of providing a reticulated potable water system can be prohibitive. Community expectations such as in Mangawhai are clear that an extensive public water supply system to service the community is not required, and as such are unlikely to be willing to pay for a scheme to be implemented. The motivation behind such sentiment could be attributed to the funding issues associated with the Mangawhai wastewater system, or seen as a means to stifle development in the area. Regardless, such sentiment indicates that in this particular area, rainwater tanks will remain the preferred source of water for many years to come. It is Council's intention to monitor areas where potable water supply schemes are not available and to consult with the respective communities to gauge the future level of interest in the installation of potable water supply schemes.

1.8.10 Environmental considerations

The taking of water for subsequent treatment and use in a potable water supply scheme has until recently not been subject to much resistance. These days, with increasing demands for river and groundwater sources, unless well managed, the demand for that water may be greater than the ability of the source to supply. Recognising this, changes to the way in which river and groundwater takes are managed and the volume of water available to be taken, are likely to be more stringently controlled, with strict consent conditions around monitoring and reporting.

1.8.11 Changes in weather pattern

The MfE advises that climate scientists estimate that Northland's temperature could be up to 3°C warmer over the next 70-100 years. This compares to a temperature increase in New Zealand during last century of about 0.7°C. To put this in perspective, the 1997/1998 summer, which many New Zealanders remember as particularly long, hot and dry, was only about 0.9°C above New Zealand's average for the 1990s. Northland could be up to 10% drier with more varied rainfall patterns, and flooding could become up to four times as frequent by 2070. The effects of this on water supply are that high intensity rainfalls create an increased flooding frequency and may contribute to poorer raw water quality and increased treatment requirements and costs.

The impact of long term changes in weather patterns on the existing systems have not been built into this AMP given the lack of detailed information available.

Certainly Dargaville in particular has experienced two dry years in a row with 2012 river levels of the source water dropping to 20 year lows. In 2014 the base flows appeared lower than the previous year indicating the catchment was still suffering the effects from the previous dry year. These compounding effects require consideration in developing appropriate mitigation strategies.

Inclusion of possible risks imposed by global warming to the water supply assets will need to be included as appropriate as the AMP is developed in the future.

1.8.12 Summary

Table 1-11 below shows a summary of how the above demands will impact on the management of water supply assets.

Table 1-11: Summary of demands affecting the water supply asset

Demands	Impact on water supply asset
Population growth	Potential future new systems or extensions to existing system to provide the desired levels of water volume / protection may have a large impact if the community has the appetite to contribute towards funding the scheme.
Technical change	Alternative water treatment practices may have little impact, and may result in more cost-effective options
Economic trends	In times of recession, growth and development will slow, impacting on potential development contributions and new connections to fund new schemes.
Legislative changes	Unknown Impact. NES may result in stricter monitoring and reduced water take volumes.
Customer expectations	Unknown Impact. The communities willingness to pay for new schemes, scheme extensions and higher quality water may impact on the extent and quality of water provided.
Environmental considerations	Potentially high impact with stricter controls around the volume of water available to be sourced from ground / river supplies.
Climate change	Possibly an increasingly important impact with potential reduced security of supply and contamination of supply. As weather changes are likely to be gradual, in terms of medium term asset management planning timeframes, these effects are raised here only and will need to be reviewed in the development of mitigation measures included in Drought management plans and as the AMPs are developed in future.

1.8.13 Impact of trends on infrastructure assets

The main impact of the above trends is the potential future restrictions on river and groundwater sources, the volumes of water able to be extracted, and the additional costs to source additional supplies to meet demand.

1.9 Environmental management

An important aspect of the water supply activity is ensuring the responsible management of water takes, whether from surface waters (such as streams, rivers or dams) or from groundwater. While the extraction and supply of water for domestic and stock drinking water needs is essential to the social and economic well-being of the community, there is an important need to protect the natural environment and function of the water resource.

The key environmental issues, as identified in the Regional Water and Soil Plan for Northland (RWSP), that are relevant to taking water from surface water sources include:

- *"The taking, damming or diversion of surface water can adversely affect the life supporting capacity, the natural character and intrinsic and amenity values of rivers, lakes and wetlands.*
- *The cumulative effects of taking, damming or diversion of surface water on the availability of water for domestic needs, stock and water demanding land uses.*
- *The lack of surface water adversely affects the social, cultural and economic well-being of the community.*
- *The demand on river water resources may exceed the availability of water during low flow periods in some areas."*

When taking water from groundwater sources, the following are the potential environmental issues as identified in the RWSP:

- *"Groundwater "mining" can occur when groundwater is taken at a greater rate than it is recharged, with the consequent lowering of groundwater levels, and in the long term, loss of the aquifer as a viable source of water.*
- *The reduction of water levels and flows in springs, streams, lakes and wetlands as a result of taking fresh water from an aquifer, and the potential adverse effects on another user's water supply, the habitat of aquatic flora and fauna, cultural and spiritual values and any other values which may be associated with the resource.*
- *The potential for ground settlement to occur when taking groundwater from soft clays or peats or other settlement prone materials, with consequent flooding or drainage problems.*
- *The potential contamination of groundwater from:*
    - *Poor bore construction allowing movement of poor quality groundwater between aquifers;*
    - *Inappropriate bore location on flood plains, near sewage disposal sites or chemical storage sites;*
    - *Excessive pumping of coastal aquifers allowing the freshwater/saltwater interface to move inland."*

It is recognised in the RWSP that these potential adverse effects are dependent on the size of the resource, the significance of the aquatic habitats it supports, other existing authorised users and the existing quality of the water resources. For example, larger rivers are better buffered from potentially adverse flow related habitat and water quality effects than are smaller rivers.

Where the existing water source is inadequate to meet demand, alternative water sources such as dams and reservoirs may have to be developed. More effective ways of utilising existing water sources will need to be considered, including strategies to harvest water at high river flows for use during periods of high demand and low availability. Avoiding wastage will also be an important consideration.

The controls for surface water and groundwater use are provided under Section 14 of the Resource Management Act (RMA) 1991 and through the RWSP. The RMA requires resource consents for all activities relating to water (other than taking water for an individual's reasonable domestic or stock drinking water needs). Other resource consents may also be required for the installation and operation of water supply infrastructure (e.g. pipelines across rivers and streams). Council holds a number of resource consents for its water take activities. A summary of current water take consents held by Council is presented in Appendix D.

On the other hand, the water treatment process can also impact on the environment as a result of backwash water discharge. The control of discharge of contaminants to the environment (land, air and water) is also controlled under Section 70 of the RMA and through the RWSP. The current list of backwash discharge consents held by Council is provided in Appendix D.

1.10 Proposed Levels of Service and performance measures

Levels of Service (LOS) are attributes that Council expects of its assets to deliver the required services to stakeholders. A key objective of an AMP is to match the LOS provided by the water supply asset with agreed expectations of customers and their willingness to pay for that LOS.

The LOS provide the basis for the lifecycle management strategies and works programmes identified in the AMP. With water assets, there are often higher levels of maintenance and renewal requirements proposed (increased LOS) than the resources allow for. Trade-offs then have to be made as to what impacts on the ability of an asset to provide a service against the 'nice to have' aspects.

LOS can be strategic, tactical, operational and implementation should reflect the current industry standards and be based on:

- **Customer Research and Expectation.** Information gained from stakeholders on expected types and quality of service provided;
- **Statutory Requirements.** Legislation, regulations, environmental standards and Council bylaws that impact the way assets are managed. These requirements set the minimum LOS to be provided;
- **Strategic and Corporate Goals.** Guidelines for the scope of current and future services offered and manner of service delivery, and define specific LOS that the Council wishes to achieve;
- **Best Practices and Standards.** Specify the design and construction requirements to meet the LOS and needs of stakeholders.

The LOS for water supply have been developed to contribute to the achievement of the stated Community Outcomes that were developed in consultation with the community (Section 1.4) and taking into account:

- Council's statutory and legal obligations;
- Council's policies and objectives;
- Council's understanding of what the community is able to fund.

The LOS included in this AMP are the LOS prepared, consulted on and adopted as part of the LTP 2012/2022 consultation process. Table 1-12 below details the LOS and associated performance measures for the water activity. These now include non-financial performance measures rules 2013 in accordance with section 261B of the local Government Act which came into force on 30 July 2014.

The LTP performance measures are reported on through the Annual Reporting process. Council's current actual performance will be reported in the Annual Report 2014/2015.

The AMP Improvement Plan includes an action for Council to review its water supply LOS to identify if there is further opportunity for improved efficiencies and/or best practice that can be incorporated into the service framework. Currently the LOS reported in Table 1-12 are customer focused and those that are included in the LTP. An extension of the LOS and performance measures to include the more technical measures associated with the management of the activity has commenced with the inclusion of the non-financial performance measures.

Table 1-12: Levels of service and performance measures

Performance indicator/ service level	Target 2013/2014	Target 2014/2015	Target 2015/2016
1. Safety of drinking water. The extent to which Council's drinking water supply complies with: (a) part 4 of the drinking-water standards (bacteria compliance criteria), and	Dargaville, Maungaturoto, Ruawai,Glinks Gully.	Dargaville, Maungaturoto, Ruawai, Glinks Gully.	Dargaville, Maungaturoto, Ruawai, Glinks Gully, Mangawhai.
(b) part 5 of the drinking-water standards (protozoa compliance criteria).	–	Dargaville, Maungaturoto, Ruawai.	Dargaville, Maungaturoto, Ruawai, Glinks Gully, Mangawhai.
2. Maintenance of the reticulation network. The percentage of real water loss from Council's networked reticulation system (including a description of the methodology used to calculate this).	Dargaville 28% Maungaturoto 33% Ruawai 33% Mangawhai 65%	Dargaville 25% Maungaturoto 30% Ruawai 30% Mangawhai 30%	Dargaville 20% Maungaturoto 25% Ruawai 25% Mangawhai 25%

Performance indicator/ service level	Target 2013/2014	Target 2014/2015	Target 2015/2016
3. Fault response times Where Council attends a call-out in response to a fault or unplanned interruption to its networked reticulation system, the following median response times measured:			
(a) attendance for urgent call-outs: from the time that the local authority receives notification to the time that service personnel reach the site; and	1 hour	1 hour	1 hour
(b) resolution of urgent call-outs: from the time that the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption;	2 hours	2 hours	2 hours
(c) attendance for non-urgent call-outs: from the time that the local authority receives notification to the time that service personnel reach the site; and	2 hours	2 hours	2 hours
(d) resolution of non-urgent call-outs: from the time that the local authority receives notification to the time that service personnel confirm resolution of the fault or interruption.	3 days	3 days	3 days
4. Customer satisfaction. The total number of complaints received by Council about any of the following (See Appendix A for total complaints for the year):			
(a) drinking water clarity	5	5	5
(a) drinking water taste	6	6	6
(b) drinking water odour	4	4	4
(c) drinking water pressure or flow	18	18	18
(d) continuity of supply, and	8	8	8
(e) the local authority's response to any of these issues	24 hours	24 hours	24 hours

Performance indicator/ service level	Target 2013/2014	Target 2014/2015	Target 2015/2016
5. Demand management. The average consumption of drinking water per day per resident within Council (l/p/d) Source: Water Balance and Review for Kaipara District Council dated January 2013 =Billed Metered Consumption (m^3) x 1000 No of connections x 365 x 3600	Dargaville 278 Maungaturoto 340 Ruawai 129 Glinks Gully 52 Mangawhai 234	Dargaville 275 Maungaturoto 340 Ruawai 130 Glinks Gully 52 Mangawhai 230	Dargaville 275 Maungaturoto 340 Ruawai 130 Glinks Gully 52 Mangawhai 230

2 The Assets

The Assets section of the AMP is set out as follows:

- Asset details – summary of Council's five water supply schemes and related assets.
- Critical assets – summary of Council's critical assets for water supply and how these will be managed.
- Asset values – summary of the water supply asset valuation.

2.1 Asset details

2.1.1 Overview

Council operates five community-based water supply schemes, which are each separately funded per community. These five water supply schemes are:

- Dargaville/Baylys;
- Maungaturoto;
- Ruawai;
- Glinks Gully;
- Mangawhai.

The location of each of these communities within Kaipara District is illustrated in figure 2.1.

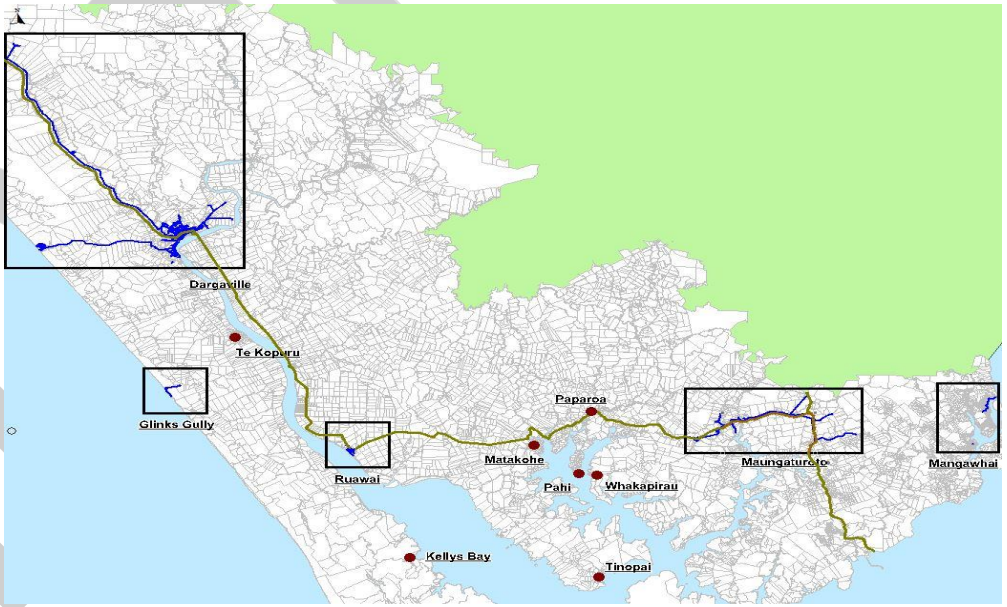


Figure 2-1: Location of communities with water supply schemes

An overview of the water supply assets in the District is provided in Table 2-1 below. Asset details for these schemes are described below in Sections 2.1.3 - 2.1.7

Table 2-1: Asset overview summary (based on information used in 2013 valuation)

Community	Water source point	Water treatment plant	Pump stations	Storage	Reticulation (km)	Connections	Points (fire hydrants, valves, meters)	Condition
Dargaville/ Baylys	5	1	4	3	125	2,782	3,160	Assessments commenced 2014
Maungaturoto	4	1	3	4	36.7	447	501	Assessments commenced 2014
Ruawai	2	1	0	1	6.7	251	129	Assessments commenced 2014
Glinks Gully	3	1	0	4	2.7	85	9	Assessments commenced 2014
Mangawhai	1	0	0	5	3.6	18	29	Assessments commenced 2014

The asset valuation totals for the District is summarised in Table 2-2 below. See Section 2.3 for discussion of the asset valuations.

Table 2-2: Summary of water supply asset valuations

Component	Replacement costs	Depreciated replacement cost	Annual depreciation
Dargaville/Baylys	$46,786,098	$15,945,127	$735,195
Maungaturoto	$17,241,373	$9,061,429	$260,037
Ruawai	$2,672,342	$1,048,715	$70,556
Glinks Gully	$755,269	$441,466	$12,380
Mangawhai	$853,733	$552,914	$14,938
Water Supply Total	**$68,308,816**	**$27,049,651**	**$1,093,104**

This AMP focuses on three main asset components for water supply, which are:

- headworks;
- treatment; and
- storage and distribution.

The scope of the water assets (proportion of optimised replacement cost for all water assets) by type is illustrated in Figure 2-2.

Council owns all land used for water treatment facilities covered by this AMP. All treatment sites are designated for the purposes of water treatment.

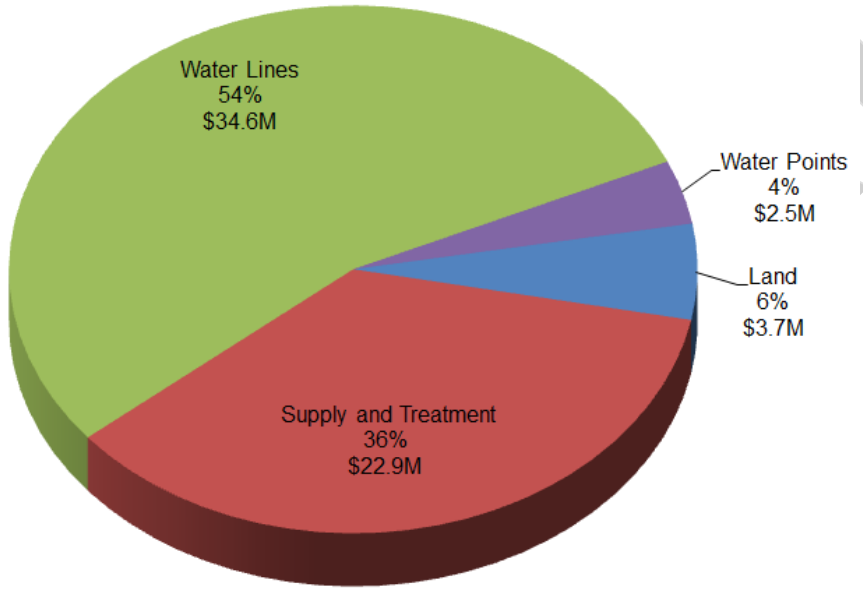


Figure 2-2: Scope of water assets by type

2.1.2 Asset data

Council has a number of systems and processes in place where they are able to store and analyse asset information data to assist with management of the water supply business. Details of each system and its capabilities are included in Section 4.1 (Asset Management Systems and Processes).

It is recognised that the current level of condition and performance data relating to the water supply assets is not well documented. The current asset register contains a number of unknown, incomplete and incorrectly-coded asset attributes. This affects Council's asset knowledge, asset valuations and data confidence, and does not provide a sound basis for determining maintenance needs and forecasting renewals of water supply assets.

The improvement of Council's data collection and entry processes has been identified as a current activity to be completed within the Improvement Plan, along with a "data cleansing" project to reduce the number of unknown / incorrect asset attributes currently in the Asset Register.

Following completion of the above activities, Council will move towards making use of previously un-utilised functions of their support tools, such as the recording of maintenance history at asset component level in AssetFinda each time a works order is completed.

As more information is recorded, an initial assessment and listing of renewal needs will be able to be created from AssetFinda. This could create a risk of significant changes to the level of expenditure required, and will need to be reviewed and assessed by Council in line with Council's Renewals Policy.

The data improvement actions included in the Improvement Plan are listed in Table 2.3.

Table 2-3: Improvement Plan actions – data management

ID Nº (Improvement Plan)	Improvement action	Forecast completion date
5	Review the Asset Register to ensure all known assets are properly recorded. Response - This has been undertaken in 2013 and a number of as-built drawings have been located and are being incorporated into the Asset Register	Dec-2015
6	Asset Condition - Undertake the physical inspection and formal condition assessment of all critical water supply assets (pipes, booster pump stations, treatment plants, reservoirs etcetera). Response - Conditions assessments incorporating the confirming the location of critical assets commenced in 2014	Dec-2015
7	Complete the data cleansing project to reduce the number of unknown asset attributes. Response - This work is continuing in 2014/2015.	Jun-2015
8	Review Data Management procedures. Response - The appointment of a GIS officer is enabling the shortcomings of the current systems to be identified.	Jun-2015

ID Nº (Improvement Plan)	Improvement action	Forecast completion date
9	Review adequacy of developers handover requirements contained within Engineering Standards, Identify programme to enhance. (including the provision of asset schedules and capital cost recording for each asset created as part of the as-built / handover requirements).	Jun-2015
10	Record the maintenance history with each works order at asset component level in AssetFinda.	Dec-2015
11	Investigate potential water loss in the Glinks Gully system by comparing water supplied versus water consumed.	Jun-2016
12	Investigate what backflow prevention exists for Glinks Gully residents that use water tanks.	Jun-2015
13	Undertake a condition assessment of the Maungaturoto raw water supply bridge crossings. Response – underway in 2014	Jun-2016

2.1.3 Dargaville/Baylys

2.1.3.1 Overview

The Dargaville/Baylys water supply system services about 4,683 people. There are in total 2,782 connections including those from the raw water lines, Baylys and Awakino in the scheme.

The primary raw water supply is sourced from the Waiparataniwha Stream at the southern end of the Kaihu forest. Water is collected via three coarse screen filter intakes built in the stream. An additional take is located on the Kaihu River at Rotu and is used to boost water supply in dry periods. Under the current consent any volume of water abstracted from the Rotu take must be supplemented by an equal amount discharged from the Waiatua dam. Water is pumped from these intakes to the Dargaville Water Treatment Plant (WTP), located on Hokianga Road, where it is treated to a potable standard prior to distribution to individual consumers in Dargaville and Baylys. Silver Fern Farms is a key commercial water consumer in this network. A photograph of the WTP showing the clarifier is included as Figure 2-3.

Figure 2-3: Dargaville/Baylys water treatment plant - clarifier

Council is working with the Ministry of Health to upgrade the Dargaville WTP to meet the DWSNZ 2005(08), which was required to be completed by June 2014.

The work includes the installation of a UV plant which ensures a 4 log removal of bacteria from the water.

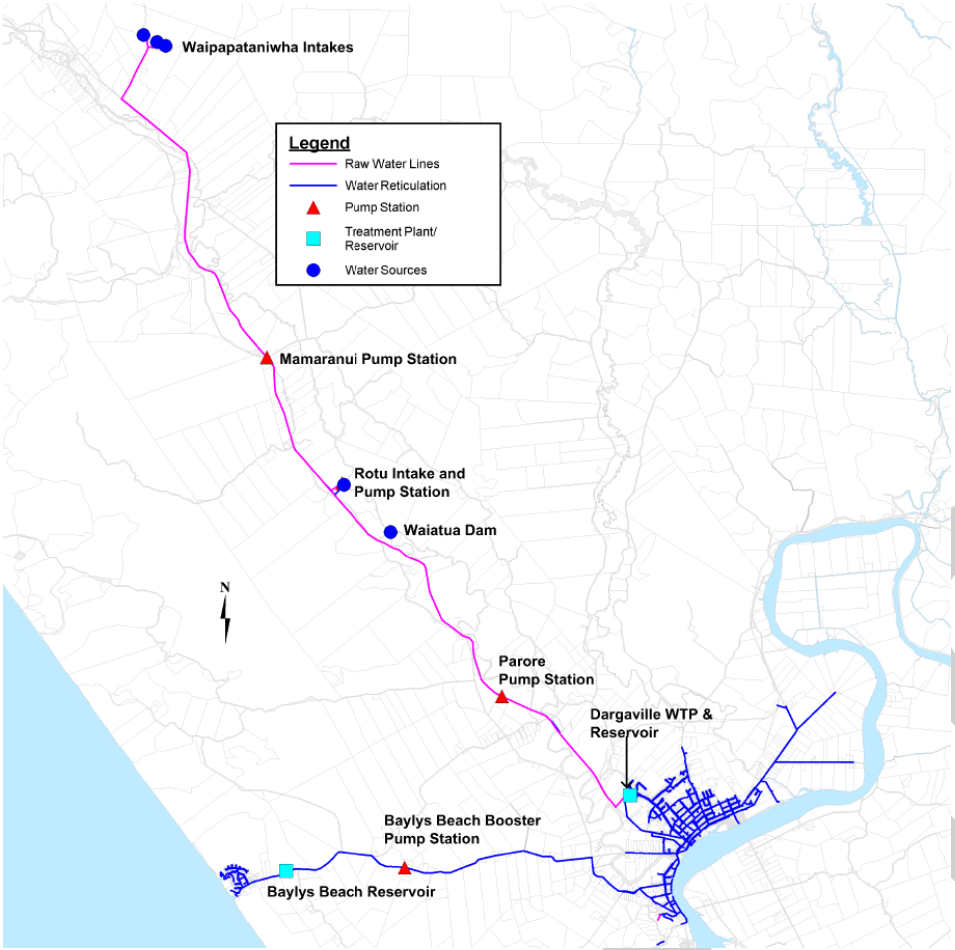
Two booster stations are incorporated into the distribution network to ensure adequate levels of pressure and volume are provided. The Baylys (Seaview Road) pump station pressurises water from the Dargaville WTP for distribution to the Baylys community. The Hokianga Road booster station ensures an acceptable pressure is provided to the customers at the upper section of Hokianga Road.

The Dargaville reticulation system operates on a dual feed with a 250mm pipe connection to the network to the east of the WTP and a 300mm pipe connecting to the network to the southwest (and downhill) of the plant. The Baylys water supply network is fed from Dargaville via 8.2kms of 100mm diameter asbestos cement pipeline, posing a potential risk to consumers within the Baylys area as there is no alternative supply to the area if the pipeline fails. Storage for Baylys is provided by a 225m^3 reinforced concrete reservoir located behind Seaview Road.

An overview of the Dargaville/Baylys water supply system is provided below and shown in Figure 2-4.

Headworks

- Three coarse screen filter intakes on the Waiparataniwha Stream supply raw water to the Dargaville WTP via a 25kms concrete lined steel pipeline.
- Additional intakes on the Kaihu River at Rotu to boost water take in dry periods with water from the Waiatua Dam supplementing the Kaihu River to allow continued take from Rotu during low flows.
- Two raw water booster pumps.
- There are 22 bridges which the raw water pipeline crosses from the intake to the WTP.



Treatment

- Coagulation;
- Pre pH correction (soda ash);
- Polyelectrolyte dosing;
- Clarifier (x2);
- Rapid sand filter (x4);
- Post pH correction (soda ash);
- Chlorine disinfection (gas).

Storage and distribution

- Three reservoirs (two at WTP and one at Baylys) with a total storage capacity of 5,895m^3;
- 136km pipeline;
- Majority of supply by gravity;
- Two booster pumps: One at Hokianga Road and one to boost supply to Baylys area;
- Baylys water supply via two main pipes.

Figure 2-4: Dargaville/Baylys asset map

2.1.3.2 Asset Information

Based on the available and known information, the scheme assets are in moderate condition. Historic valuation information is reported to be based on individuals' knowledge of the network. Going forward, Council is committed to maintaining its asset register with up-to-date performance and condition data to help inform future valuations with system based knowledge (that can back up individuals' knowledge). For example, hydraulic modelling of the Dargaville network has been undertaken which has enabled asset performance information to be entered into the Council database (AssetFinda), and the recent condition assessments carried out address actions in the AMP Improvement Plan and enables condition recording information in AssetFinda.

The collection of maintenance information into AssetFinda at the asset component level is partly being addressed through a renegotiated maintenance contract and will form part of the new maintenance contract if or when Kaipara becomes part of the newly amalgamated Council in the future.

Appendix G shows the age, material and size profiles of the Dargaville reticulation.

Headworks

- The condition of all headwork assets was assessed by the Utilities Contractor as part of a 2007 asset revaluation exercise and all were found to be in average to above average condition. It is unknown the basis for this condition rating and a condition assessment of these assets was undertaken in 2014 with the results feeding into a proactive renewal strategy.
- To date, Council only monitors the volume of water taken at the Rotu source however the new Waiparataniwha resource consent requires additional metering at a number of locations to comply with increasing environmental standards.
- All connections from the raw water line have a backflow installed and Council includes a note on their billing account reminding consumers of the public health risks associated with non-potable water. It is unknown what backflow prevention exists for treated water users. An AMP Improvement Plan item has been added for Council to undertake an audit of all current major consumers to check if appropriate backflow protection is in place.
- Council's Engineering consultants, BECA, undertook a safety review of the Waiatua Dam in October 2008, which concluded there were no critical deficiencies that would render the dam an immediate risk. However, several minor deficiencies were confirmed during the review. The AMP Improvement Plan (Section 5) includes for Council to produce a Dam Safety Review plan that sets out a long term inspection schedule for the Waiatua Dam.
- Council undertook intrusive sampling to assess the condition of the raw water supply line in November 2008. Results indicated the pipe was in relatively good condition and that it would probably not need replacing in its entirety within the next 30 years. Specific sections of this pipeline were highlighted as may be needing additional work within this time including:
    - Sections of raw water pipe that crosses the Kaihu River on pipe bridges and exposed to accelerated degradation and harsh weather.

- Sections of raw water pipe that run close to the surface (possibly in a bund), which are at risk of damage from stock or grading of stock races.
- Where the raw water pipe is close to or under the State Highway, where it is subject to increased loads and stresses.

- The raw water line is subject to an annual inspection by the Maintenance Contractor and the 2014 condition assessment project focused on critical aspects of the raw water pipeline and treated water pipeline to Baylys, including pipe bridges, air and scour values.
- The updated WSP undertaken in 2014 will confirm any risks to public health from the source. The previous Duffill Watts and King (DWK) report prepared in 2008 identified risks of pipeline failure, contamination of water supply from farmland. Iwi have also raised concerns due to recreational use upstream of the Rotu intake.

Treatment

- In 2004, Duffill Watts Limited completed a desktop study into the future capacity requirements and the design capacity for the Dargaville WTP. The study found that the sand filter capacity to be sufficient to cater for future growth, and was unclear on what future capacity the clarifier was able to provide for. The AMP Improvement Plan programmes for an investigation to gain an accurate measure of the clarifier flow capacity to determine the WTP's ability to meet future demands.
- The Dargaville WTP currently complies with the NZDWS 2000, and it is required to comply with NZDWS 2005(08) by 2014/2015. The installation of a UV plant in 2014 will enable compliance with NZDWS 2005 to be achieved.
- The Dargaville WSP was prepared in 2014. The document was based on the earlier DWK report. This report identified issues of the clarifiers being exposed to the open air, shortfalls in water quality and a lack of qualification of the operators.

Storage and distribution

- It was reported in the June 2011 AMP that the Dargaville/Baylys scheme was estimated to experience a network loss of treated water of approximately 31%. The hydraulic model of the Dargaville/Baylys network prepared in 2013 included an indication of what losses there are and response recommendations. The most recent water balance undertaken by Thomas Civil and Environmental Consultants Ltd indicated non-revenue water at 27.6%
- Sampling of the Baylys water supply line in November 2008 indicated that the line was in poor condition and at risk of failure at some point between 2010 and 2014. The 2011/2012 budget was set for this renewal with a budget value of $900,000. No faults or breaks have been recorded for the Baylys supply line and a decision has been made to defer the renewal and to spread the costs of the renewal over four years (2014/2015 through 2017/2018) in the Dargaville/Baylys renewal programme. It will be important that monitoring and recording of any fault is implemented to ensure a sudden increase in breaks does not go unnoticed and sections can be renewed as required. Further deferrals may be made if the supply line continues to perform satisfactorily.

Table 2-4 below summarises the key assets for the Dargaville/Baylys water supply. Resource consents associated with any of these water supply assets are included in Appendix D.

Table 2-4: Dargaville/Baylys asset summary

	Source	Pump Stations	Water Treatment	Storage	Reticulation	Other Assets
Physical Quantity	**Waiparataniwha bores x3** Allowed take: Not to exceed an average of 4,465m³ / day as calculated each calendar month **Rotu** Allowed take: 7,200m³/day **Waiatua Dam** Allowed take: 7,200m³/day	**Raw Water x2** Parore Booster Mamaranui Booster **Treated Water x2** Baylys Booster Hokianga Road Booster	Coagulation Pre pH correction Polyelectrolyte dosing Clarifier Rapid sand filter Post pH correction Chlorine disinfection	**Dargaville WTP Storage Reservoirs x 2** 3,400m³ and 2,270m³ **Baylys Storage Reservoir** 225m³	**Water Mains** **Dargaville** 0 – 50mm 20.0km 50 – 100mm 27.0km 100 – 150mm 8.5km 150 – 200mm 4.3km 200 – 250mm 4.4km 250 – 300mm 3.7km Unknown 2.4km Raw Water 25.7km Service 13.0km **Baylys** 0 – 50mm 3.1km 50 – 100mm 11.3km 100 – 150mm 1km Service 0.2km	Fire hydrants 375 Valves 624 Water Meters 2,161
Asset Condition Rating	Assessment commenced 2014	Assessment commenced 2014	Assessment commenced 2014	Assessment commenced 2014	Assessment commenced 2014	Assessment commenced 2014. Baylys meters replaced 2014
Depreciated Replacement Cost	$15,945,127					

2.1.3.3 Summary of Issues and Remedial Actions

The key issues relating to the Dargaville/Baylys water supply scheme as identified by Council, or in this AMP, along with the potential remedial actions as identified in the February 2013 Improvement Plan, are listed in Table 2-5 below.

Table 2-5: Dargaville/Baylys water supply scheme issues and remedial actions

Issue	Remedial Action Identified in Improvement Plan		
	ID No.	Improvement Action	Forecast Completion Date
The main water source from Waiparataniwha Stream is prone to drought, hence the risk of supply for the Dargaville raw water supply pipeline.	16	Undertake a Water Source Strategy and investigate Dargaville's available water sources to understand what realistic and viable options exist, likely costs and potential issues for each option. Response -Review commenced in 2014.	Dec – 2015
	41	Dargaville Alternative Water Supply - Investigation and Report Response – Review commenced in 2014	Complete
	42	Water Supply Modelling – Dargaville - review model, update and identify “at risk“ areas due to lack of capacity / pressure.	Sep - 2016
There are a number of raw water connections between the Waiparataniwha Stream and Dargaville treatment plant. The raw water is not suitable for potable purposes.	52	Communicate with property owners so they are regularly made aware of the potential health risks associated with raw water use – This communication has commenced for Dargaville.	Jun – 2016
Council currently does not have appropriate information to measure or calculate the capacity of booster stations.	--	A hydraulic model of the Dargaville and Baylys reticulation system has been developed (MWH) and will identify any potential low pressure areas within the network. Response – Model completed late 2013	Complete
Risk of supply for the Baylys water supply pipeline.	18	Undertake a cost/benefit analysis of installing additional storage at Baylys versus the cost of trucking in water as required, to determine the best cost effective option for meeting both demand and fire-fighting provisions.	Complete

2.1.4 Maungaturoto

2.1.4.1 Overview

The Maungaturoto water supply system services approximately 895 people. There are in total 447 connections including 410 from the Maungaturoto Township and 37 from the Railway Village.

The primary raw water source is sourced from the Brynderwyn Ranges catchment area, collected by three gravity intakes at Cattlemount and Boar Hill. Secondary intakes are located on the Piroa and Brynderwyn streams. In 2010, the Baldrock dam pump station was completed. This enables a further water source to be available to Council via a water use agreement with the private dam owner.

There are a number of takes from the raw water line, the most significant of which supplies the Fonterra factory in Maungaturoto with an average take of approximately 1,500m^3/day. Council manages the water use of Fonterra through a Water Supply Agreement, which expires in 2034 with a 25 year contract term. Under this Agreement, Fonterra is classified as a bulk water consumer. The raw water from these connections is not potable and is unable to be used for domestic purposes. Fonterra manages its own onsite treatment to prepare the raw water for production purposes.

Approximately 8kms of 200mm pipeline transfers the raw water to the Maungaturoto WTP. The basic plant was constructed in 1979, while the clarifiers, dosing and control equipment were added in 1997. The plant was upgraded in July 2011 with new filters, an upgrade to the clarifier to increase the capacity, new dosing, switchboard and controls and the addition of UV reactors. The upgraded Maungaturoto WTP is anticipated to be compliant with the DWSNZ 2005(08) and Council is in the process of collecting monitoring data to support this compliance. A photograph of the WTP and treated water reservoir is included as the Figure 2-5 below.

Figure 2-5: Maungaturoto water treatment plant

The Maungaturoto community is serviced by approximately 13kms of pipeline, fed by a single 150mm diameter watermain. Council operates one booster station in Maungaturoto at Griffin Road.

An overview of the Maungaturoto Water Supply system is provided below and shown in Figure 2-6.

Headworks

- Primary supply from three gravity intakes at Cattlemount and Boar Hill;
- Additional intakes at Piroa to boost water take in dry periods;
- Raw water is pumped from the Piroa Stream and then gravity fed until it joins with the pipeline from the Brynderwyn Ranges, near the Brynderwyn Intake;
- The Brynderwyn Intake draws water from the Brynderwyn Stream using a pump and discharges to the gravity line at the junction of the two pipelines. This is used as emergency supply only and was relinquished as part of the take resource consent renewal in 2014 as it was considered that with the Baldrock Dam supply now operating there was sufficient raw water available from existing sources and the costs associated with maintaining this take that had not been used for a number of years was not justified;
- Supplementary supply from Brooklands Dam (privately owned) during drought conditions is possible;
- The approximately 10kms of raw water pipeline conveys water to the 910m^3 raw water reservoir at the Maungaturoto WTP.

Treatment

- Clarifier;
- Rapid sand pressure filters;
- Chemical dosing
  - Polyelectrolyte
  - Chlorine
  - pH correction;
- UV disinfection.

Storage and distribution

- One x 920m3 raw water reservoir;
- Three x treated water reservoirs providing a total of 690m^3 treated storage;
- Two x booster pumps at Griffin Road.

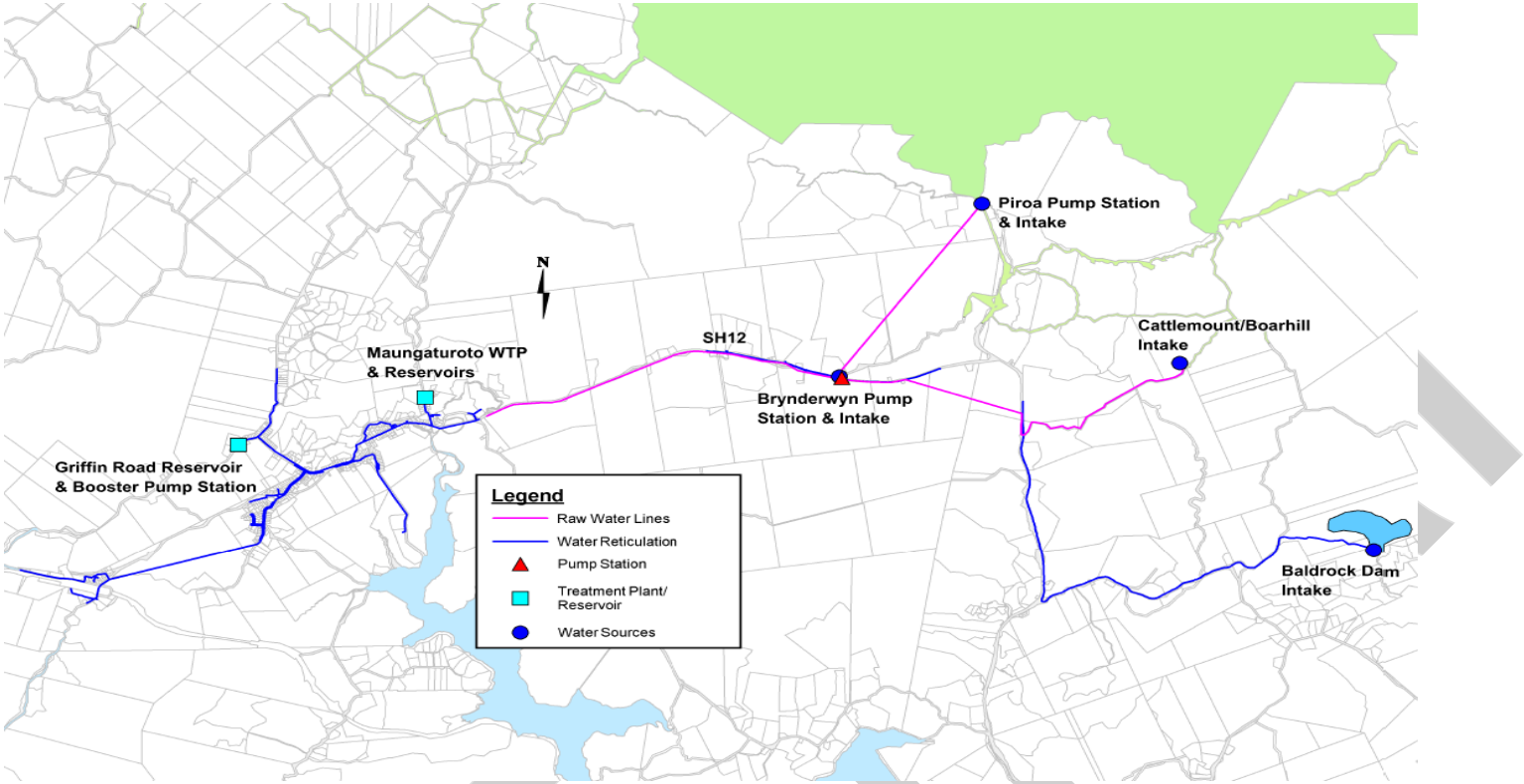


Figure 2-6: Maungaturoto asset map

2.1.4.2 Asset information

Based on the available and known information, the scheme assets are in moderate condition. Historic valuation information is reported to be based on individuals' knowledge of the network. Going forward, Council is committed to maintaining its Asset Register with up-to-date performance and condition data to help inform future valuations with system based knowledge (that can back up individuals' knowledge). For example, the hydraulic modelling of the Maungaturoto network has identified asset performance information that can be entered into the Council database (AssetFinda), and the AMP Improvement Plan includes for recording maintenance information in AssetFinda at the asset component level.

A condition assessment project commenced in 2014 that will assist in developing renewal programmes with greater confidence going forward.

Appendix G shows the age, material and size profiles of the Maungaturoto reticulation.

Headworks

- Council currently does not monitor the volume of water taken at all sources. The resource consents for the three Council owned water takes have been renewed and a condition of these is the requirement to monitor raw water take volumes;
- Council has negotiated to delay the commencement of this metering to alignment with the upgraded telemetry system necessary to enable regular flow data to be gathered and reported in compliance with consent conditions;
- There is limited information available to make an accurate condition assessment of the Maungaturoto raw water supply line. Sections of this line have been renewed over the past four years and this information has been captured in the Council asset system. The 2014 condition assessment programme includes critical assets including raw water trunk pipelines and associated structures;
- The condition of all head work assets was assessed by the Utilities Contractor as part of the 2007 asset revaluation exercise. Both Brynderwyn Stream and the Cattlemount/Boar Hill intakes were reported to be in below average condition. The basis for this condition rating is unknown and therefore the condition assessment of these assets is also included in the 2014 assessment project.
- NRC has raised concerns regarding potential back flow of water from the Brooklands Dam system through the Cattlemount balance tank/ reservoir.
- A proposal was agreed as part of the take consent renewal process to install a non-return valve in the system to prevent this occurring plus the addition of a pressure relief valve adjacent the Fonterra plant.
- NRC was keen to see the intakes able to be closed to prevent the overflow through the reservoir/ balance tank when demand is less than the intakes supply. It was argued that the intakes could not be valved at the balance tank/reservoir as this could over pressure either the tank and or the pipelines. It was suggested that once the condition assessment is undertaken consideration could be given to enabling the connections to be isolated when necessary as part of the renewal of that part of the system in the future.
- It is unknown whether all the connections from the raw water line have backflow prevention installed, and whether Council undertakes any community engagement with these raw water users in terms of potential public health risks.
- Pipe testing of the raw water line in November 2008 indicated a failure may be expected between 2017 and 2029 (Opus AC08-78). Council will continue to monitor the condition of this asset and build in renewals, as required.
- Renewal of critical assets to ensure security of supply is a priority for Council and renewals of this trunk have been occurring between Maungaturoto and the Railway settlement in 2013 and 2014.

Treatment

- The Maungaturoto WTP was upgraded in July 2011 to meet the requirements of the DWSNZ 2005(08) and increase the WTP's capacity for future growth after receiving funding from the Ministry of Health.
- The Maungaturoto WSP is scheduled to be undertaken in the renewals programme and will be updated to reflect the upgraded WTP and the water quality monitoring plan updated to reflect DWSNZ 2005(08) requirements.

Storage and distribution

- It was reported in the June 2011 AMP that the Maungaturoto scheme was estimated to experience a network loss of treated water of approximately 60%. An hydraulic model of the Maungaturoto network completed in 2013 gives an indication of what losses there are and response recommendations.
- A water balance study was prepared in January 2014 by Thomas Civil and Environmental Consultants Ltd and the results of this indicated that while the Maungaturoto scheme was too small to accurately develop an Infrastructure Leakage Index the indicative value of 4.6 is only marginally above the 4 which is considered acceptable as an economic level of leakage. This report also indicated that non-revenue water was 32.6%. Recommendations in light of the report are in the Improvement Plans.

Table 2-6 below summarises the key assets for the Maungaturoto water supply. Resource consents associated with any of these water supply assets are included in Appendix D.

Table 2-6: Maungaturoto asset summary

	Source	Pump Stations	Water Treatment	Storage	Reticulation	Other Assets
Physical Quantity	**Cattlemount/Boar Hill** Allowed take: 1,650m^3/day **Piroa** Allowed take: 1,000m^3/day **Brooklands(Baldrock) Dam (privately owned)** Allowed take: 270,000m^3/year	**Raw Water x2** Piroa Pump Brynderwyn Pump Station-(Disestablished 2014) **Treated Water x1** Griffin Road Booster	Coagulation Polyelectrolyte dosing Clarifier Pressure sand filters UV disinfection Post pH correction	**Maungaturoto WTP Storage Reservoirs x1** 920m^3 **Maungaturoto Storage Reservoirs x3** 690m^3 total	**Water Mains** 0 – 50mm 2.5km 51 – 100mm 12.7km 101 – 150mm 4.0km 151 – 200mm 0.9km Unknown 0.3km Raw Water 16.8km Service 3.2km	Fire hydrants 58 Valves 74 Water meters 369

	Source	Pump Stations	Water Treatment	Storage	Reticulation	Other Assets
Asset Condition Rating	Assessments commenced 2014	Assessment commenced 2014	Assessments commenced 2014	Assessments commenced 2014	Assessments commenced 2014	Assessments commenced 2014. Meters replaced 2013/2014
Depreciated Replacement Cost			$9,061,429			

2.1.4.3 Summary of issues and remedial actions

The key issues relating to the Maungaturoto water supply scheme as identified by Council, or in this AMP, along with the potential remedial actions as identified in the February 2013 Improvement Plan, are listed in Table 2.7 below.

Table 2-7: Maungaturoto water supply scheme issues and remedial actions

Issue	Remedial action identified in Improvement Plan		
	ID No.	Improvement action	Forecast completion date
The main water source (Cattlemount/Boar Hill) is prone to drought.	51	Develop a Drought Management Plan.	Completed
	49	Understand, for all schemes, what emergency response planning has been undertaken and what the emergency response plans contain (if they exist).	Jun – 2016
Potential water quality issues with the Piroa water supply because of the relative location of the quarry to the Piroa water take.	52	Communicate with property owners so they are continuously made aware of the potential health risks associated with raw water use, specifically at Maungaturoto.	Jun – 2016
The Maungaturoto WTP capacity is unknown.	19	Assess the capacity of treated water storage at Maungaturoto to meet peak daily demand, including both the current situation and projected growth scenarios.	Jun – 2015
	43	Water Supply Modelling – Maungaturoto, Ruawai - develop models, identify “at risk” areas due to lack of capacity / pressure. Response – completed 2013 upgraded pumps installed 2014 to address fire fighting flow.	Completed

Issue	Remedial action identified in Improvement Plan		
	ID No.	Improvement action	Forecast completion date
The raw water main from the Maungaturoto water sources is a single water main and water supply is at risk in times of significant failure of the water main.	33	Install an alarm for pump failure at the Maungaturoto, Brynderwyn and Piroa water takes.	Jun – 2016
	34	Install a generator interface at Maungaturoto so a back-up generator can be installed.	Jun – 2016
	35	Develop framework and undertake a formal criticality assessment of the water supply network. Response – Critical assets identified 2013 condition assessment commenced 2014.	Dec - 2015
	49	Understand, for all schemes, what emergency response planning has been undertaken and what the emergency response plans contain (if they exist).	Jun – 2016
Draft consent conditions issued March 2014	46	Identify consent required improvements and timing - develop programme. Response – Draft consent conditions received and included in implementation report March 2014.	Completed
Fonterra prefers taking water from the Baldrock Dam supply as the quality of water is better and easier to treat for production. The use of water from Baldrock Dam is subject to a supply agreement between Council and the dam owners and allows a fixed volume 270,000m^3/year supply for an annual fee. Council is required to monitor water use as exceeding this amount will breach contract.	4	Review the optimal utilisation of all three Maungaturoto water supply sources to identify Council's two preferred water sources. Upgrade monitoring/telemetry requirements at these sites aligning with consent conditions.	Jun – 2016
	73	Source and review the Maungaturoto, Baldrock Dam water use agreement and confirm if it is being implemented properly. Response – A review was undertaken in 2014 and presented to Fonterra for agreement.	Jun – 2016
The Maungaturoto raw water pipeline is known to over-pressurise when Fonterra stops using the Baldrock	45	Backflow prevention – how well is this defined and managed. Review current practise and identify improvement programme	Dec – 2015

Issue	Remedial action identified in Improvement Plan		
	ID No.	Improvement action	Forecast completion date
Dam water source, causing overflows at the other Council owned takes and causing the mixing of water from different catchments.	46	Identify consent required improvements and timing - develop programme. Response – Issue addressed as part of consent conditions for which an implementation plan was prepared in March 2014	Jun – 2015

2.1.5 Ruawai

2.1.5.1 Overview

The Ruawai water supply system services approximately 500 people. There are in total 251 connections to the scheme.

Raw water is drawn from two bores of varying depths located beside the Wairoa River on Stopbank Road and Westlake Street.

The original Ruawai WTP was constructed in 1970. Filters, aerators, pumps and electrical equipment at the plant were renewed in 1995. The plant was upgraded again in November 2011 to work towards meeting the DWSNZ 2005(08) and risks identified in the Ruawai WSP (April 2008).

Ruawai has one treated water reservoir located at the Ruawai WTP with a total capacity of 350m^3, constructed in 1970. It is designed to ensure a constant supply of water to both the water treatment facilities and the residents of Ruawai. A photograph of the WTP and treated water reservoir is included as Figure 2-7.

Figure 2-7: Ruawai water treatment plant

Ruawai is serviced by approximately 6.5km of pipeline network, which is fed by a single 150mm diameter pipeline from the WTP. The reticulation network was constructed in 1996. Treated water is boosted from the WTP reservoir to the consumers via one of two pumps, operating in a duty/standby manner.

An overview of the Ruawai water supply system is provided below and shown in Figure 2-8.

Figure 2-8: Ruawai asset map

Headworks

- Five bores on the banks of the Northern Wairoa River (two of which are actively used);
- Borehole 3 was abandoned and sealed in September 2012 following the collapse of the borehole lining.

Treatment

- Oxidation using chlorine;
- Aeration and filtration;
- Cartridge filtration;
- Chlorination

Storage and distribution

- Pumped to a 350m3 treated water reservoir adjacent to the Ruawai WTP;
- Two pressure pumps, one with Variable Speed Drive;
- Approximately 6.5kms of pipeline reticulation.

2.1.5.2 Asset information

Based on the available and known information, the scheme assets are in moderate condition (with the recent Borehole 3 casing failure an exception). Historic valuation information is reported to be based on individuals' knowledge of the network. Going forward, Council is committed to maintaining its Asset Register with up-to-date performance and condition data to help inform future valuations with system based knowledge (that can back up individuals' knowledge). For example, the hydraulic modelling of the Ruawai network identified asset performance information that was able to be entered into the Council database (AssetFinda), and identify the upgrade for the pumps to address low flow during fire fighting draw off.

The AMP Improvement Plan includes recording maintenance information in AssetFinda at the asset component level.

The condition assessment project commenced in 2014 and will provide information that will improve the confidence in developing renewal programmes going forward.

Appendix G shows the age, material and size profiles of the Ruawai reticulation.

Headworks

- The three boreholes have historically been reported in below average condition. Borehole 1 was refurbished and pump upgraded in August 2011. Borehole 2 was refurbished and pump upgraded in September 2012. After the refurbishments, both Boreholes 1 and 2 are considered to be in good condition. During the September 2012 inspection, the casing of Borehole 3 was found to have collapsed, which rendered the borehole unusable, and consequently Borehole 3 has been abandoned. Based on the recent discovery of the collapsed casing in Borehole 3, Council has included an AMP Improvement Plan action to undertake five yearly borehole inspections for the Ruawai scheme, with the next inspection scheduled for 2016/2017;
- A telemetry control issue between the bores and the WTP is currently problematic. This relates to the control of the extraction of water from the bores and the volume required at the WTP. Investigations have been undertaken however no solution has been identified to-date. A temporary solution is currently in place to ensure that no raw water is extracted when the WTP treated water reservoir has sufficient volume to meet the demand. Investigation into this issue is ongoing. A concept for a new district-wide telemetry system was developed in 2014 and following tenders being invited the new system is being implemented in a staged manner across the District. This will address the historic issues that have plagued Ruawai and other schemes.

Treatment

- The Ruawai WTP was upgraded in November 2011 to meet DWSNZ 2005(08), and therefore no immediate condition issues are reported. Council will continue to monitor the performance and condition of the WTP through routine operations and maintenance and scheduled condition assessments;
- The Ruawai WSP is scheduled to be undertaken in the Council renewals programme and will be updated to reflect the upgraded WTP and the water quality monitoring plan updated to reflect DWSNZ 2005(08) requirements.

Storage and distribution

- As described in the issues above, the Ruawai pump system is unable to meet fire flow requirements within the network. A new pump system to address this issue was being installed in 2014;
- The June 2011 AMP reports the condition of the Ruawai storage reservoir was assessed in October 2008 by Duffill Watts Limited and reported to be structurally sound and expected to last 'many years'. Council has included an action in the Improvement Plan to undertake a structural inspection of all water supply storage facilities to assess condition. This is part of the assessment project commencing 2014;
- It was reported in the June 2011 AMP that the Ruawai scheme was estimated to experience a network loss of treated water of approximately 32%. The hydraulic model of the Ruawai network includes an indication of what losses there are and response recommendations.

- A water balance study was prepared in January 2014 by Thomas Civil and Environmental Consultants Ltd and the results of this indicated that while the Ruawai Scheme was too small to accurately develop an Infrastructure Leakage Index the indicative value of 2.7 is acceptable as an economic level of leakage. This report also indicated that non-revenue water was 32.9%. Recommendations in light of the report are in the Improvement Plans.

Table 2-8 below summarises the key assets for the Ruawai water supply scheme. Resource consents associated with any of these assets are included in Appendix D.

Table 2-8: Ruawai asset summary

	Source	Pump stations	Water treatment	Storage	Reticulation	Other assets
Physical Quantity	**Northern Wairoa River x2 active bores** Allowed take: 450m^3/day, 73,000m^3/year	**Raw Water** The two bores have one pump in each bore **Treated Water** WTP contains two booster pumps to boost pressure in the network	Oxidation using chlorine Aeration and filtration Cartridge filtration Chlorination	**WTP Storage Reservoir** 350m^3	**Water Mains** 0 – 50mm 2.2km 50 – 100mm 1.4km 100 – 150mm 2.3km Unknown 0.12km Raw Water 0.66km	Fire hydrants 32 Valves 49 Water Meters 48
Asset Condition Rating	Bores and pumps replaced 2011 and 2012	New pumps installed 2014	Assessment commenced 2014	Assessment commenced 2014	Assessment commenced 2014	Assessment commenced 2014
Depreciated Replacement Cost			$1,048,715			

2.1.5.3 Summary of issues and remedial actions

The key issues relating to the Ruawai water supply scheme as identified by Council, or in this AMP, along with the potential remedial actions as identified in the February 2013 Improvement Plan, are listed in Table 2-9 below.

Table 2-9: Ruawai water supply scheme issues and remedial actions

Issue	Remedial action identified in Improvement Plan		
	ID No.	Improvement action	Forecast completion date
The pump system is unable to meet the demand and pressure requirements for fire flow requirements. The reticulation pumps also cause pressure fluctuations	--	The cause of the failure was because the existing pumps do not have sufficient capacity to provide the necessary pressure to meet the fire-fighting requirements at the hydrants. Investigations to determine the required pump capacity and the upgrades required to meet the capacity are to be progressed. This is anticipated during the 2013/2014	Completed

Issue	Remedial action identified in Improvement Plan		
	ID No.	Improvement action	Forecast completion date
when tankers are being filled. Hydrant testing was undertaken in September 2012 and the results did not meet the New Zealand Fire Service hydrant flow requirements.		financial year. Response – Pumps replaced 2014 A potential issue that could occur when the Ruawai booster pumps are renewed is that the increased pressure in the system may increase the number of leaks and main breaks throughout the reticulation system. Response – New pumps ramp up and down to manage risk of over pressure.	
	40	Fire fighting requirements – there is a need to understand how well these are defined and tested for compliance. Response – performance of system to be reviewed for compliance with standards as part of commissioning new pump installation.	Completed
	43	Water Supply Modelling for Ruawai - develop models, identify “at risk “areas due to lack of capacity/pressure. Response – completed 2014	Completed
During scheduled borehole pump maintenance in September 2012, the casing in Borehole 3 was found collapsed rendering the borehole unusable.	--	Borehole 2 pump has been upgraded to offset the loss of supply from Borehole 3.	Completed
	29	Undertake routine, five-yearly, inspections of groundwater Ruawai bores (next due 2017/2018).	June - 2018
Water in the Ruawai bores can be high in iron and manganese.	27	Review the Ruawai borehole management plan with specific focus on the futures of Boreholes 4 and 5.	June – 2016
	39	Water Safety Plans - Update for Dargaville/Baylys, Maungaturoto and Ruawai and develop for Glinks Gully and Mangawhai (2015)	Completed
	--	In 2010, groundwater investigations were undertaken to support the installation of Borehole 5 as a new groundwater bore to replace Borehole 1. Concerns around the increasing electrical conductivity levels (indicating saltwater intrusion) at Borehole 5 put the plans on hold and Borehole 1 has since been renewed for ongoing use.	Completed

2.1.6 Glinks Gully

2.1.6.1 Overview

The Glinks Gully water supply system gets raw water from three groundwater springs located inland from the community and supplies treated water to approximately 72 people. Historically, Glinks Gully had a secondary water source from a stream adjacent to the Glinks Gully community; however this is no longer in use, due to the potential for contamination from an adjacent landfill.

The raw water is gravity fed to the Glinks Gully WTP where it is received in a raw water reservoir fitted with a lime column to raise the pH. The treatment process consists of pressure sand filtration, four cartridge filters (two x 5 micron and two x 1 micron), two UV sterilizers (as of November 2008), pulse dosing pH correction and chlorine disinfection. The storage of treated water is provided by four x 23m^3 concrete reservoirs. The water supply reticulation network is comprised of approximately 1.4kms of alkathene water main servicing up to 85 connections including a camp ground.

An overview of the Glinks Gully Water Supply system is provided below and shown in Figure 2-9.

Headworks

- Three spring fed intakes near the intersection of Glinks and Redhill Roads.

Treatment

- Coarse screens at inlet;
- Multimedia sand filters;
- Micro filtration;
- UV disinfection;
- Chlorine dosing;
- Water acidity correction.

Storage and distribution

- Four x 23m^3 concrete treated water storage reservoirs;
- Approximately 1.4km of pipeline reticulation.

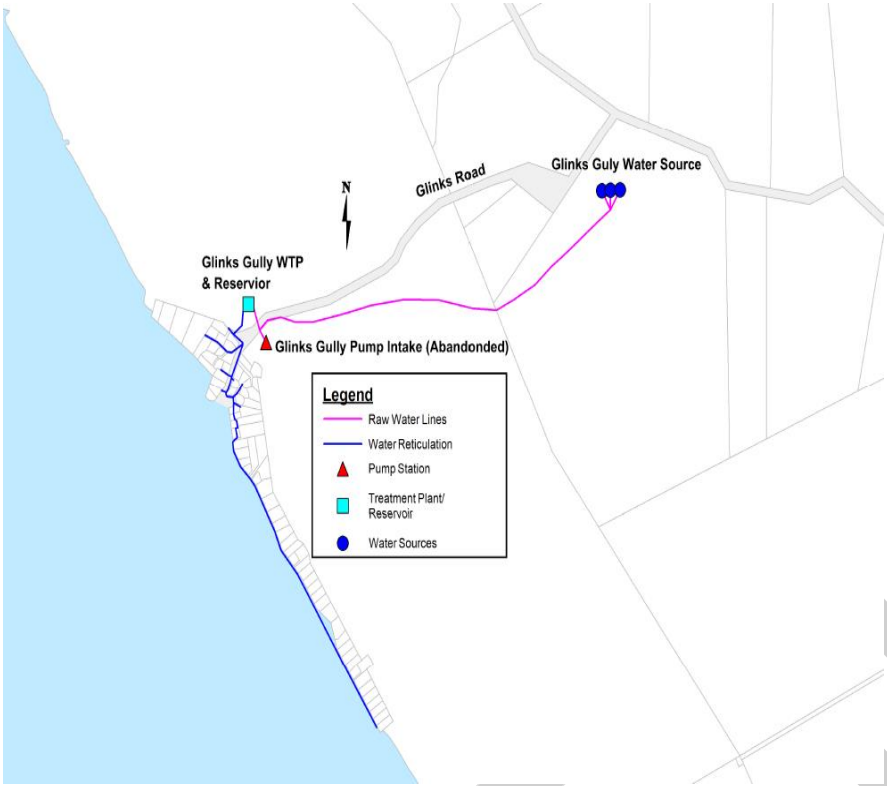


Figure 2-9: Glinks Gully asset map

2.1.6.2 Asset information

Based on the available and known information, the scheme assets are in moderate condition. Historic valuation information is reported to be based on individuals' knowledge of the network. Going forward, Council is committed to maintaining its asset register with up-to-date performance and condition data to help inform future valuations with system based knowledge (that can back up individuals' knowledge). For example, the AMP Improvement Plan includes for recording maintenance information in AssetFinda at the asset component level.

Appendix G shows the age, material and size profiles of the Glinks Gully reticulation.

Headworks

- While the water quality from the upstream source is good, the size of the raw water main transporting this water to the Glinks Gully WTP limits extraction capacity. As a result, in peak periods, water must be supplemented by tank supply. The AMP Improvement Plan includes an action for Council to undertake a cost/benefit analysis of using tankers to supply water to Glinks Gully during peak demand to understand what is the most efficient and effective option for Council.

Treatment

- Drafting of the Glinks Gully WSP is scheduled to be undertaken in the Council renewals programme. This will identify health risks to water supply, develop ways of addressing these risks and ensure contingency plans are in place to protect the public, should an adverse event occur.

Storage and distribution

- The June 2011 AMP reports the reticulation pipeline to be relatively new and considered to be in good condition. Given that Glinks Gully is a coastal settlement, metal fittings were eliminated from the network to reduce the chance for corrosion and increased maintenance requirements.
- It is unknown what backflow prevention exists, if any, within the reticulation scheme. An investigation to understand what backflow prevention is present is included in the AMP Improvement Plan and the 2012/2013 renewals programme.

Table 2-10 below summarises the key assets for the Glinks Gully water supply. Resource consents associated with any of these assets are included in Appendix D.

Table 2-10: Glinks Gully asset summary

	Source	Pump Stations	Water Treatment	Storage	Reticulation	Other Assets
Physical Quantity	**Glinks Gully Stream Extraction/ Gallery x3** Allowed take: 100m^3/day	**Raw Water** No pumps – gravity fed system **Treated Water** No pumps – gravity fed system	Coarse screens Multimedia sand filters Micro filtration UV disinfection Chlorine dosing Water acidity correction	**Glinks Gully Storage Reservoirs x4** 23m^3 each, 92m^3 total	**Water Mains** 0 – 50mm 0.9km 50 – 100mm 0.5km Unknown 1.3km	Fire hydrants 1 Valves 8 Water Meters 0
Asset Condition Rating	Assessment commenced 2014	Assessment commenced 2014	Assessment commenced 2014	Assessment commenced 2014	Assessment commenced 2014	Assessment commenced 2014
Depreciated Replacement Cost			$441,466			

2.1.6.3 Summary of issues and remedial actions

The key issues relating to the Glinks Gully water supply scheme as identified by Council, or in this AMP, along with the potential remedial actions as identified in the February 2013 Improvement Plan, are listed in Table 2-11.

Table 2-11: Glinks Gully water supply scheme issues and remedial actions

Issue	Remedial action identified in Improvement Plan		
	ID No.	Improvement action	Forecast completion date
The raw water supply to the treatment plant is insufficient to meet peak demand periods; however this is for a short period of around two to three weeks per year and can be supplemented by tanker as needed.	14	Undertake a study to better understand the impact of the non-resident holiday home owners and visitors have on the District.	Dec – 2015
	18	Assess the Glinks Gully water supply capacity requirements needed to service the current community and future growth levels so Council can plan accordingly, including a cost/benefit analysis of additional storage for both raw and treated water.	Jun – 2015

Issue	Remedial action identified in Improvement Plan		
	ID No.	Improvement action	Forecast completion date
Current treated water storage is not sufficient to provide for current peak water demand.	18	Assess the Glinks Gully water supply capacity requirements needed to service the current community and future growth levels so Council can plan accordingly, including a cost/benefit analysis of additional storage for both raw and treated water.	Jun – 2015
The presence of backflow prevention devices on the Glinks Gully consumers is unknown and requires understanding.	12	Investigate what backflow prevention exists for Glinks Gully residents that use water tanks.	Jun – 2015

2.1.7 Mangawhai

Mangawhai has a small water supply scheme with 18 connections. The scheme primarily provides potable water source to the Mangawhai Heads Camp Ground, Wood Street shops, public toilets and for community housing. The Mangawhai community has previously indicated that it did not want a public water scheme which Council accepted at the time.

Mangawhai's water is drawn from a bore and pumped to a single reservoir where simple chlorination is undertaken by the addition of chlorine tablets prior to reticulation to the various customers. Work undertaken by Downer EDI Limited on the Mangawhai network has historically been additional to the services included in the operations and maintenance contract. Council now has allocated specific funds for operations and maintenance of the Mangawhai system. An AMP Improvement Plan item has been added for Council to review the Maintenance Contract to update the contract scope to include operations and maintenance of the Mangawhai water supply system.

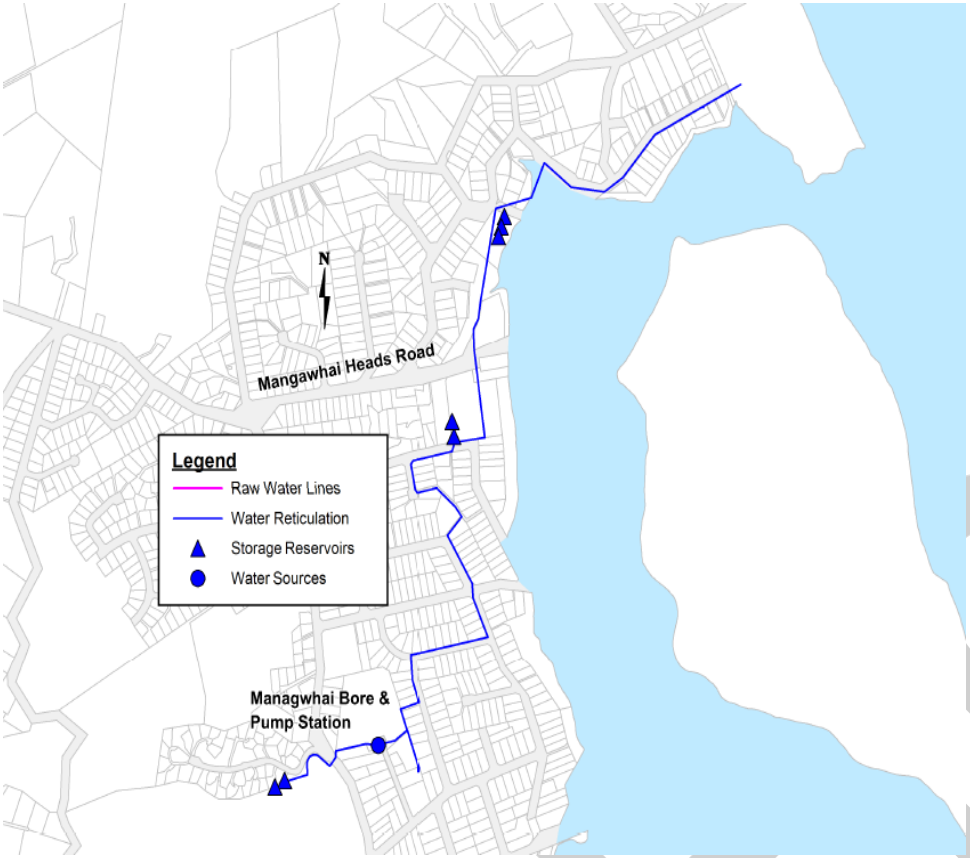
An overview of the Mangawhai Water Supply system is provided below and shown in Figure 2-10.

Headworks

- A single groundwater bore is located near the dead end road, Fagan Place.

Treatment

- Chlorine tablet disinfection at two timber reservoirs with total storage of 135m^3 located near Greenview Drive.



Storage and distribution

- Two concrete reservoirs with total storage of 20m^3 located at the southern Mangawhai camp ground and three concrete reservoirs with total storage of 73m^3 located at the northern Mangawhai camp ground.
- Reticulation pump at the northern Mangawhai camp ground
- Approximately 2.9kms of pipeline reticulation

2.1.7.1 Asset information

Based on the available and known information, the scheme assets are in moderate condition. Going forward, Council is committed to maintaining its Asset Register with up-to-date performance and condition data to help inform future valuations with system based knowledge (that can back up individuals' knowledge). For example, the AMP Improvement Plan includes for recording maintenance information in AssetFinda at the asset component level.

Appendix G shows the age, material and size profiles of the Mangawhai reticulation.

Figure 2-10: Mangawhai asset map

Headworks

- The water take is from a single bore that was deemed too shallow to secure when attempted in 2012 (less than 10m depth). According to the DWSNZ 2005(08), the level of treatment may need to be increased to account for the unsecure bore conditions;
- Council shares the bore with six other private water users. It is included in the Mangawhai water take consent that if Council's water use results in groundwater no longer being available for the six other users, the Council must provide the users with an alternative supply of water at similar quantity and quality;
- The AMP Improvement Plan includes an action for Council to undertake five yearly inspections of the Mangawhai bores. The most recent inspection was undertaken in 2011/2012 therefore the next scheduled inspection is in 2015/2016.

Treatment

- The water treatment at Mangawhai currently consists of chlorine tablets prior to distribution. The AMP Improvement Plan includes an action for Council to understand what upgrades are required at Mangawhai to make the water treatment method compliant with the DWSNZ 2005(08);
- No WSP exists for Mangawhai. The Mangawhai WSP is scheduled to be undertaken in the Council renewals programme and will identify health risks to water supply, develop ways of reducing these risks and ensure contingency plans are in place to protect the public, should an adverse event occur.

Storage and distribution

- Council has completed renewal of a section of pipeline past the northern Mangawhai camp ground. As-built drawings will be entered into the AssetFinda database system.

Table 2.12 below summarises the key assets for the Mangawhai water supply. Resource consents associated with any of these assets are included in Appendix D.

Table 2.12: Mangawhai asset summary

	Source	Pump Stations	Water Treatment	Storage	Reticulation	Other Assets
Physical Quantity	**Bore** Allowed take: 125m^3/day in summer, 90m^3/day in winter	No stand-alone pump station; the raw water bore includes a pump.	Chlorine tablet dosing at two timber tanks (total storage of 135m^3) near Greenview Drive. Additional chlorine tablet dosing at the storage tanks, if required.	Northern Mangawhai camp ground – 3 tanks with a total storage of 73m^3 Southern Mangawhai camp ground at Olsen Avenue – 2 tanks with a total storage of 20m^3	**Water Mains** 0 – 50mm 0.84km 50 – 100mm 2.2km Unknown 0.27km Rising Main 0.21km Service 0.04km	Fire hydrants 2 Valves 17 Water meters 10
Asset Condition Rating	Assessments commenced 2014	Assessments commenced 2014	Assessments commenced 2014	Assessments commenced 2014	Assessments commenced 2014	Assessments commenced 2014
Depreciated Replacement Cost			$552,914			

2.1.7.2 Summary of Issues and Remedial Actions

The key issues relating to the Mangawhai water supply scheme as identified by Council, or in this AMP, along with the potential remedial actions as identified in the February 2013 Improvement Plan, are listed in Table 2-13 below.

Table 2-13: Mangawhai water supply scheme issues and remedial actions

Issue	Remedial action identified in Improvement Plan		
	ID No.	Improvement action	Forecast completion date
The water take consent (#8032) prescribes seasonal water use limits for winter and summer. The take allowance decreases from 125m^3/day during summer to 90m^3/day in winter. It is reported that this change over can cause water supply issues when Easter falls in late April.	14	Undertake a study to better understand the impact of the non-resident holiday home owners and visitors have on the District. Response – The study of water use for the Mangawhai wastewater disposal options study has related actual wastewater production during peak and off peak periods at Mangawhai which can be used across the District for water tank schemes.	Dec – 2015
The high summer population at the Mangawhai camp grounds may impact on the water supply classification under the DWSNZ 2005(08) and treatment upgrades are likely to be required to comply.	72	Investigate and understand what will be required at the Mangawhai scheme for it to be compliant with NZDWS 2005(08).	Jun – 2015
	29	Undertake routine, five-yearly, inspections of groundwater bores for Mangawhai (next due 2016/2017)	Jun - 2017
	39	Water Safety Plan – to be developed for Mangawhai	Completed

2.2 Critical assets

Critical assets have been defined by the National Asset Management Steering Group (NAMS) as being assets with a high consequence of failure[3]. They are often found as part of a network, in which, for example, their failure would compromise the performance of the entire network.

A formal criticality assessment has not yet been undertaken for the majority of the existing water supply assets, and this has been recorded in the Improvement Plan for action.

[3] National Asset Management Steering Group, Association of Local Government Engineering NZ Inc. (2006) 3rd edition (Version 3.0), *International Infrastructure Management Manual*, National Asset Management Steering Group, Association of Local Government Engineering NZ Inc. (INGENIUM)

Historical evidence and local knowledge has identified the below assets in Table 2-14 as being "critical", in that failure of these assets could compromise the water supply activity. A greater level of management should be applied to these assets, and this will be determined through the criticality assessment proposed in the Improvement Plan and Council's proposed update to the risk management framework.

Table 2-14: Critical water supply assets

Critical asset	Potential consequence of failure	How critical asset will be managed
Dargaville/Baylys raw water supply line	Temporary loss of water supply High cost of reactive repairs	Annual Inspection Monitor maintenance records for increased activities, especially mains breaks/leaks Condition assessment
Baylys water reticulation line	Temporary loss of water supply High cost of reactive repairs	Monitor maintenance records for increased activities, especially mains breaks/leaks Condition assessment
Maungaturoto raw water supply line	Temporary loss of water supply High cost of reactive repairs	Monitor maintenance records for increased activities, especially mains breaks/leaks
Water Treatment Plants – all	Reduction in plant output Affects quality of water being discharged to customers; the water may not be suitable for consumption Loss of water supply High costs of reactive repairs	Planned inspections as per Maintenance Contract Condition assessment

2.3 Asset values

2.3.1 Overview

The purpose of valuations is for reporting asset values in Council's financial statements. The Local Government Act 1974 and subsequent amendments contain a general requirement for local authorities to comply with Generally Accepted Accounting Practices (GAAP). The Financial Reporting Act 1993 sets out a process by which GAAP is established for all reporting entities and groups, including all local authorities. Compliance with the New Zealand Equivalent to International Accounting Standard 16; Property, Plant and Equipment (NZ IAS 16) and IAS 36; Impairment of Assets, is one of the current requirements for meeting GAAP.

The most recent Council asset valuation exercise was undertaken in 2013. The valuation process is summarised in the report, *Water Supply and Stormwater Utility Asset Revaluation 30 June 2013*. The following key points should be noted when reviewing the asset valuation data presented in this Section:

- The valuation was carried out in accordance with the procedures set out in the NAMS Group Infrastructure Asset Valuation and Depreciation Guidelines (Edition 2, 2006) and based on straight line depreciation;
- Other standards the asset valuations have been completed in accordance with include:
  - ICANZ – New Zealand equivalent to International Accounting Standard 16 – Property Plant and Equipment (NZ IAS 16).
  - NZPI Standards;
- The valuation relied on the accuracy of Council's asset database information and assumed it to be correct;
- The adopted valuation treatment for Council's infrastructure assets (including water) was Optimised Depreciated Replacement Cost (ODRC);
- The rates for replacement costs of assets were largely determined by operational personnel that were familiar with the day to day contract monitoring;
- The replacement costs include an allowance for administration, including design and construction monitoring using a 7.5% addition to unit replacement costs for all asset types;
- Land drainage assets are excluded from water assets.

The valuation was based on substantially complete asset registers, appropriate replacement costs and useful lives, providing a relative degree of confidence in the valuation data

Asset values for each of Council's five water supply schemes are presented in this section in terms of current replacement value and depreciated replacement value. Depreciated replacement value is the current replacement cost less allowance for physical deterioration and optimisation for obsolescence and relevant surplus capacity.

2.3.2 Depreciation

Depreciation of assets must be charged over their useful life.

- *Depreciated Replacement Cost* is the current replacement cost less allowance for physical deterioration and optimisation for obsolescence and relevant surplus capacity. The *Depreciated Replacement Cost* has been calculated as:

$$\frac{\text{remaining useful life}}{\text{total useful life}} \times \text{replacement cost}$$

- *Depreciation* is a measure of the consumption of the economic benefits embodied in an asset. It distributes the cost or value of an asset over its estimated useful life. Straight-line depreciation is used in this valuation;

- *Total Depreciation to Date* is the total amount of the asset's economic benefits consumed since the asset was constructed or installed;
- The *Annual Depreciation* is the amount the asset depreciates in a year. It is defined as the replacement cost minus the residual value divided by the estimated total useful life for the asset;
- The *Minimum Remaining Useful Life* is applied to assets which are older than their useful life. It recognises that although an asset is older than its useful life it may still be in service and therefore have some value. Where an asset is older than its standard useful life, the minimum remaining useful life is added to the standard useful life and used in the calculation of the depreciated replacement value.

2.3.3 Dargaville/Baylys

Table 2-15 and Table 2-16 below present the current replacement value and depreciated replacement value for the Dargaville/Baylys water supply assets, as per the 2013 valuation.

Table 2-15: Dargaville/Baylys assets current replacement value

Component	Replacement Costs	Average Useful Life (years)	Average Remaining Life (years)
Baylys Lines	$2,455,023	63	40
Baylys Points	$494,792	63	36
Baylys Treatment	0		0
Baylys Total	**$2,949,815**	--	--
Dargaville Lines	$27,004,354	61	15
Dargaville Points	$4,982,966	37	20
Dargaville Treatment	$11,848,963	36	17
Dargaville Total	**$43,836,283**	--	--
Dargaville/Baylys Total	**$46,786,098**	--	--

Table 2-16: Dargaville/Baylys assets depreciated replacement value

Component	Depreciated Replacement Cost	Annual Depreciation Based On Value
Baylys Lines	$555,673	$56,439
Baylys Points	$282,888	$8,690
Baylys Treatment	0	0
Baylys Total	**$838,561**	**$65,129**
Dargaville Lines	$9,090,628	$383,682
Dargaville Points	$2,129,689	$95,009
Dargaville Treatment	$3,886,249	$191,375
Dargaville Total	**$15,106,566**	**$670,066**
Dargaville/Baylys Total	**$15,945,127**	**$735,195**

2.3.4 Maungaturoto

Table 2-17 and Table 2-18 below present the current replacement value and depreciated replacement value for the Maungaturoto water supply assets, as per the 2013 valuation.

Table 2-17: Maungaturoto assets current replacement value

Component	Replacement costs	Average useful life (years)	Average remaining life (years)
Lines	$7,300,526	62	19
Points	$820,644	34	21
Treatment	$9,120,203	48	19
Maungaturoto Total	**$17,241,373**	--	--

Table 2-18: Maungaturoto assets depreciated replacement value

Component	Depreciated replacement cost	Annual depreciation based on value
Lines	$2,747,687	$125,852
Points	$414,578	$16,213
Treatment	$5,899,164	$117,972
Maungaturoto Total	**$9,061,429**	**$260,037**

2.3.5 Ruawai

Table 2-19 below present the current replacement value and depreciated replacement value for the Ruawai water supply assets, as per the 2013 valuation.

Table 2-19: Ruawai assets current replacement value

Component	Replacement costs	Average useful life (years)	Average remaining life (years)
Lines	$1,088,621	58	23
Points	$463,349	53	32
Treatment	$1,120,372	31	6
Ruawai Total	**$2,672,342**	--	--

Table 2-20: Ruawai assets depreciated replacement value

Component	Depreciated replacement cost	Annual depreciation based on value
Lines	$173,154	$23,787
Points	$192,854	$8,914
Treatment	$682,707	$37,855
Ruawai Total	**$1,048,715**	**$70,556**

2.3.6 Glinks Gully

Table 2-21 and Table 2-22 below present the current replacement value and depreciated replacement value for the Glinks Gully water supply assets, as per the 2013 valuation.

Table 2-21: Glinks Gully assets current replacement value

Component	Replacement costs	Average useful life (years)	Average remaining life (years)
Lines	$375,184	78	64
Points	$125,416	70	53
Treatment	$254,669	33	15
Glinks Gully Total	**$755,269**	--	--

Table 2-22: Glinks Gully assets depreciated replacement value

Component	Depreciated replacement cost	Annual depreciation based on value
Lines	$290,461	$4,792
Points	$79,488	$2,395
Treatment	$71,517	$5,193
Glinks Gully Total	**$441,466**	**$12,380**

2.3.7 Mangawhai

Table 2-23 and Table 2-24 below present the current replacement value and depreciated replacement value for the Mangawhai water supply assets, as per the 2013 valuation.

Table 2-23: Mangawhai assets current replacement value

Component	Replacement costs	Average useful life (years)	Average remaining life (years)
Lines	$358,353	69	56
Points	$49,899	66	54
Treatment	$445,481	39	23
Mangawhai Total	**$853,733**	--	--

Table 2-24: Mangawhai assets depreciated replacement value

Component	Depreciated replacement cost	Annual depreciation based on value
Lines	$294,599	$4,826
Points	$35,314	$836
Treatment	$223,001	$9,276
Mangawhai Total	**$552,914**	**$14,938**

3 Financial and lifecycle strategy and management

3.1 General Lifecycle Management Plan

3.1.1 Introduction

This section identifies Council's strategy and programme for managing, maintaining and renewing assets within its water scheme. The programmes described within this section have been developed to achieve the LOS identified in Section 1.10 of this AMP.

Management of the lifecycle of each asset should optimise performance whilst minimising the total lifecycle costs of both the reticulation and treatment systems. The management process balances the various competing demands and investigates the capacity and performance constraints of each component to establish a regime to achieve the overall objectives.

The objectives of each Lifecycle Management Plan are to:

- Optimise performance; and
- Minimise total lifecycle costs.

Whilst this section notes the generic strategies used by Council, it is supplemented by specific strategies for each scheme detailed in the sections that follow. The Lifecycle Management Plan for each asset component incorporates the following Strategies:

- Operations and Maintenance Strategies to keep the assets operational;
- Renewal Strategies to replace assets as they reach the end of their useful life;
- Development Strategies to address growth and demand;
- Disposal Strategies for when the asset is no longer required;
- Work programmes and the associated financial forecasts, which are developed later for each scheme.

3.1.2 Design parameters

Design parameters for all new Council water supply assets are set out in Council's Engineering Standards and Guidelines (2011). In summary these requirements include the following:

- That full supply is available during a 20 year drought;
- Be adequate for fire fighting purposes;

- Normal residential demand shall be taken as 300 litres per person per day;
- Peak flow shall be taken to be 2.5 times the average daily demand;
- Fire hydrant specifications;
- Service connection requirements, including compliance with the NZ Building Code requirements for backflow prevention;
- Requirements for pipe size, material and depth of construction;
- Pipe installation, disinfection and testing requirements for new water assets.

3.1.3 Work categories

Council's lifecycle asset management strategies are divided into the following five work categories:

Asset Operations: The active process of utilising an asset which will consume resources such as manpower, energy, chemicals and materials. The Operations category also incorporates funding to address the AMP Improvement Plan actions and the provision of professional services. The AMP Improvement Plan is generally focussed on a three year timeframe (covering the lifespan of this AMP) with a nominal allowance for years 4 - 10. As the actions in the programme are addressed, and the AMP reviewed, new initiatives will be identified and added to the programme and budgets will be revised accordingly.

Asset Maintenance: The ongoing day-to-day work activity required to keep assets serviceable and prevent premature deterioration or failure. Three categories of maintenance are carried out:

- **Unplanned maintenance** – work carried out in response to reported problems or defects;
- **Preventative maintenance** – work additional to scheduled inspections and maintenance identified during inspections as essential to continued operation;
- **Planned maintenance** – work carried out to a predetermined schedule or programmed as a result of identified needs.

Asset Renewal: Major work that restores an asset to its original capacity or the required condition. This includes both planned and reactive renewals.

New Capital: Creation of new assets (including those created through subdivision and other development) or works which upgrade or improve an existing asset beyond its existing capability or performance in response to changes in supply needs or customer expectations.

Development works falls into two separate categories:

- Council funded;
- Developer funded as part of subdivision development or by way of contributions.

Asset decommissioning/disposal: Any of the activities associated with the disposal of a decommissioned asset. Assets may become surplus to requirements for any of the following reasons:

- Under-utilisation;
- Obsolescence;
- Provision exceeds required LOS;
- Uneconomic to upgrade or operate;
- Policy change;
- Service provided by other means (e.g. private sector involvement);
- Potential risk of ownership (financial, environmental, legal, social, vandalism).

Council currently obtains the day to day operational services for water supply through Contract 527 Water Supply and Wastewater Operations and Maintenance Services. The day to day operation work categories include:

- Routine work;
- Ordered work;
- Priority work;
- Emergency work.

The relationship of each of these categories to the lifecycle management strategies together with a description of the work involved is shown in Table 3-1.

Table 3-1: Contract work group relationship with lifecycle management strategies

Contract work category	Description of works	Planned maintenance	Preventative maintenance	Responsive maintenance	Asset renewals reactive
Routine work	Work carried out on cyclical basis	X			
Ordered work	Specific order issued by Engineer		X	X	X
Priority work	Urgent routine or ordered work to address operational issues	X	X	X	X
Emergency work	System malfunction, service disrupted			X	X

3.1.4 Contractual setting

Council had previously procured the various Asset Management functions through two key contracts (Professional Services Contract 666 and Water Supply and Wastewater Operations and Maintenance Services Contract 527) whilst maintaining the core Asset Management responsibilities in-house. Recognising the importance of retaining in-house knowledge of the assets and their performance, Council has recently restructured, and introduced the Water Services Team to undertake the wider scope of asset management functions in-house, with the field operations aspect being retained within Contract 527. Additional services to support the Water Services Team will be procured on an as required basis and may include investigation and design services. The various functions are noted in Figure 3-1 below.

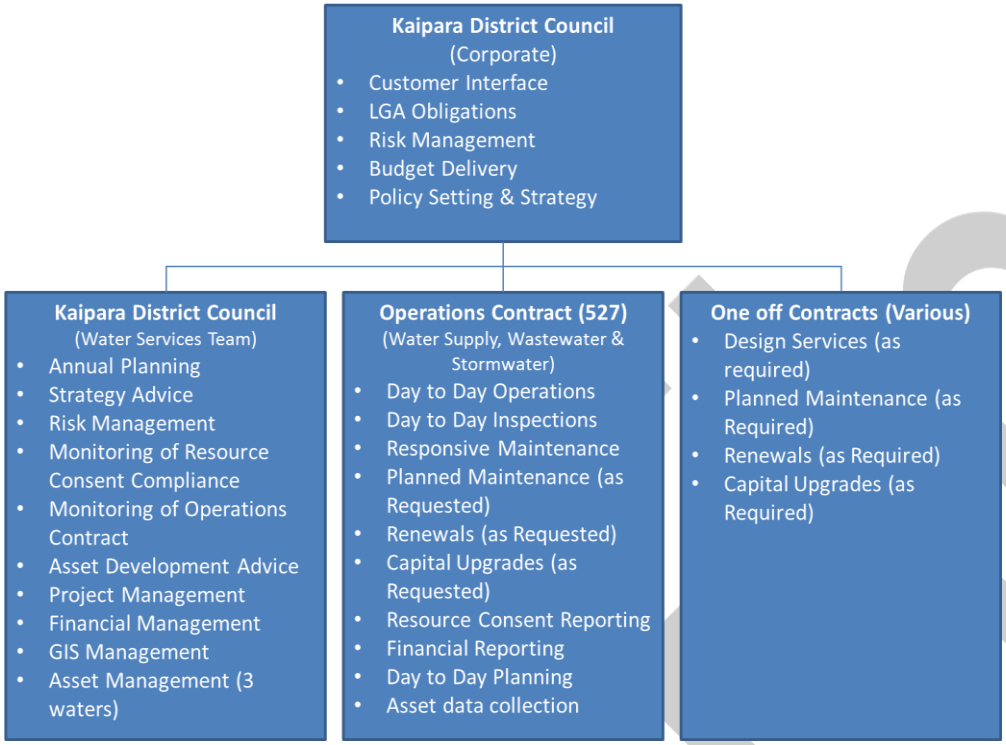


Figure 3-1: Contractual setting

The Operations contract delivers the lifecycle management outcomes on a day-to-day basis. The specification of the Operations contract incorporates the various inspections that monitor asset condition/capacity and provide the basis for programmed maintenance. The frequency of the programmed inspections regime is established in the specification of the Operations contract. This is supplemented as required by inspections generated from Council's customer Helpdesk system.

When programmed inspections are undertaken by the Operations contractor, the act of inspection may initiate a series of responses based on the observations of the contractor. These could include:

- programmed maintenance tasks, based on usage or time;
- responsive maintenance based on condition or capacity;
- planning of a Preventative Maintenance Response based on a prediction of future failure;
- reporting for upgrading or renewal through to the Professional services provider. This occurs when the scope of the intervention is not covered with the Operations contact and requires consideration of alternatives (upgrades) or prioritisation within existing budgets (renewals);
- ad hoc inspections of breaks or infrastructure that allow an opportunity to inspect reticulation when responding to an incident;
- collection of data from inspections and interventions for incorporation into Council's GIS system.

The inspections are recorded either on site logs or in the monthly report that is forwarded to Council. Any key actions are discussed at monthly contract meetings between Council and the Operations contractor.

These monthly meetings are also supplemented with quarterly Utility Improvement meetings where the performance of the system is reviewed and a more strategic review of performance is undertaken to aid the Annual Planning process for the next financial year. These meetings will review issues that have arisen over the past period and assess current programmes and budgets. This may lead to the re-evaluation of the following years Annual Plan or, in extreme cases, initiate a review within the current financial year to address critical infrastructure issues.

3.1.5 Environmental compliance

Council holds Resource Consents for all its water supply sources (Waiparataniwha consent was granted on 05 February 2014). A list of the consents is included in Appendix D. The compliance with these consents is monitored by NRC. Council works closely with NRC in monitoring the performance of water supply assets.

The day to day monitoring of performance of water supply systems is a requirement of the Operations contract, which in turn is monitored by Council staff. Where resource consent non-compliance is observed, the non-compliances are reported to NRC. It is also reported in the Annual Report.

3.2 Maintenance and operating strategy and expenditure forecast

3.2.1 Strategy

Table 3-2 shows the Council maintenance and operating strategies to ensure that the defined LOS are provided. The table shows the key service criteria affected and mode and impact of failure if the action is not carried out.

Table 3-2: Maintenance and operating strategies

Activity	Strategy	Service criteria	Impact
General maintenance	Council will maintain assets in a manner that minimises the long term overall total cost while ensuring efficient day to day management.	Maintaining existing LOS Cost/affordability	Low – Medium Increased costs and risk of failure
Unplanned maintenance – All assets, disaster	Council will maintain a suitable level of preparedness for prompt and effective response to civil emergencies and system failures by ensuring the availability of suitably trained and equipped staff and service delivery contractors. Council will provide a 24-hour repair service and respond to and repair or overcome broken or leaking pipes, power outages and equipment or system failures.	Responsiveness (Response time for unplanned priority works is 1 hour for system malfunction or rupture and 2 hours for all other unplanned priority works, apart from service restoration)	Medium No water to parts of schemes. Potential flooding of private property and damage to public roads and utilities.
Unplanned maintenance – Pump stations, treatment plants – mechanical or electrical failure	Provide a 24-hour repair service and respond to and repair or overcome broken or leaking pipes, power outages, and equipment or system failures.	Responsiveness (Response time for unplanned priority works is 1 hour for all scheme areas)	Medium No water to parts of schemes Flooding, low water pressure
Unplanned maintenance – pipelines break	Sufficient spares to be stocked (by contractor) to address regular failures.	Responsiveness (Response time for unplanned priority works is 1 hour for all scheme areas)	Medium No water to parts of schemes Flooding, low pressure
Planned inspections pump stations, treatment plant and pipelines	Council will undertake scheduled inspections in accordance with good industry practice and as justified by the consequences of failure on LOS, costs, public health, safety or corporate image. Council will modify the inspection programme as appropriate in response to unplanned maintenance trends.	Maintaining existing LOS	Medium Potential lowering of water pressure

Activity	Strategy	Service criteria	Impact
Planned inspections monitoring equipment calibration	Council will undertake annual inspection of monitoring equipment	Maintaining existing LOS	Medium
Planned – preventative maintenance pump stations, treatment plants, pipelines	Council will undertake a programme of planned asset maintenance to minimise the risk of critical equipment failure or where justified economically.	Maintaining existing LOS Cost/affordability	Medium No water to parts of schemes Flooding, low pressure

3.2.2 Operations and Maintenance activities

Current operation and maintenance activities undertaken across the water supply activity include:

- normal routine maintenance to ensure that natural water sources are kept functioning;
- maintaining the raw water pipelines which convey raw water to the local WTPs;
- inspection of the raw water pipelines annually;
- maintaining and operating the local WTPs;
- maintaining and repairing the water storage reservoirs and pump systems;
- repairing any broken pipes or other related equipment;
- recording faults and maintenance undertaken (a future improvement has been identified to begin recording maintenance history and costs at asset component level in AssetFinda).

3.2.3 Expenditure forecast

The 10 year forecast for operations and maintenance expenditure (comprising all five Council water supply schemes) are shown in Figure 3-2 and Figure 3-3 below. The forecast expenditure information is based on the LTP 2015/2025 financial forecast and the AMP Improvement Plan, which provides a relative degree of confidence in the values reported.

The Operational Expenditure forecast covers:

- all control and operation activities, as described in Section 3.2.1;

- actions resulting from improvement planning during preparation of this AMP – see the Improvement Plan in Appendix B; and
- the Professional Services Contract.

The Maintenance Expenditure forecast covers all planned and reactive maintenance activities, as described in Section 3.2.1.

A detailed breakdown of the forecasts is included in Appendix A.

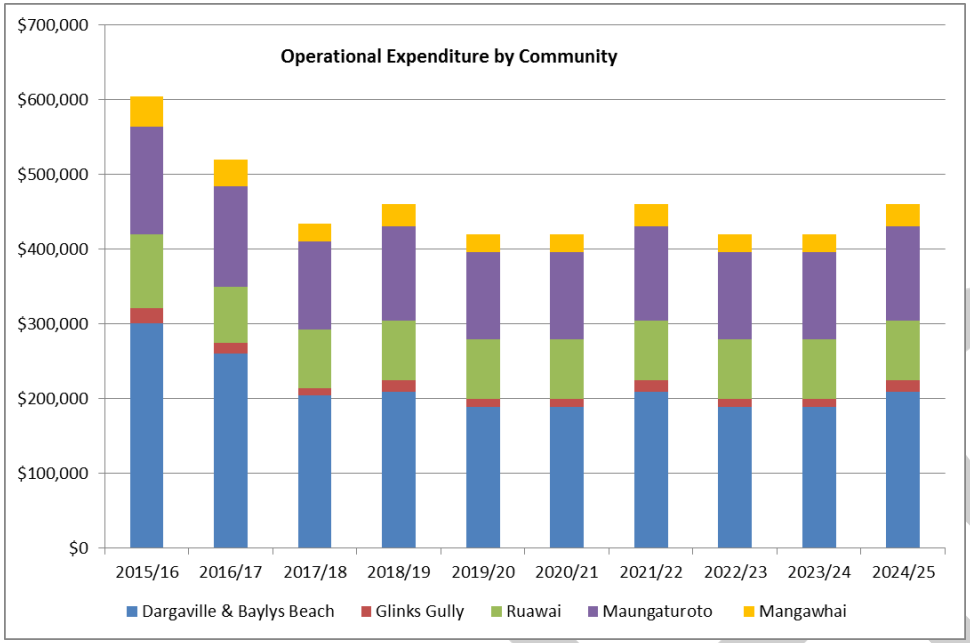


Figure 3-2: Kaipara total water supply 10 year forecast operating expenditure

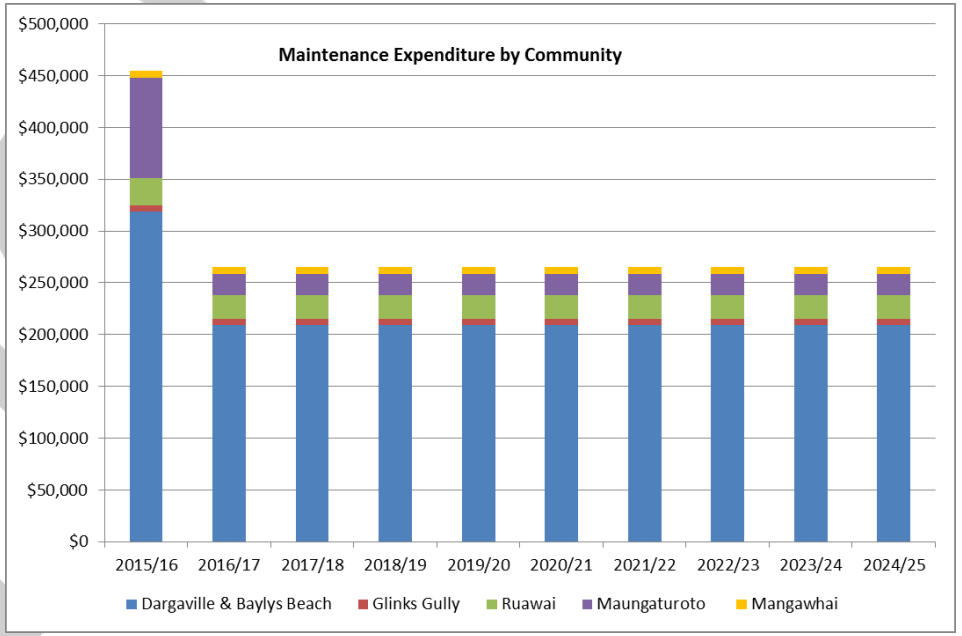


Figure 3-3: Kaipara total water supply 10 year forecast maintenance expenditure

3.3 Renewal Strategy and expenditure forecast

3.3.1 Strategy

Renewal expenditure is major work that does not increase asset design capacity but restores, rehabilitates, replaces or renews an existing asset to its original capacity. Work over and above restoring an asset to original capacity is 'new works' expenditure.

Council reviewed its renewal strategy during 2012/2013 and is moving towards a "just in time" approach - to rehabilitate or replace assets when justified by condition and where there is a significant reduction in performance.

The current asset data situation, as discussed in Section 2.1.2, affects Council's ability to accurately forecast necessary renewals. The current lack of data relating to asset condition, performance and/or maintenance history prevents Council from developing a renewal strategy based on these criteria. Consequently the current renewals programme is broadly based on asset lives, further modified through local knowledge and experience gained from the maintenance contract staff and local resources on asset performance. Council's risk management and criticality assessment procedures are currently being reviewed, the outcome of which may affect Council's renewal strategy. Council's current renewal strategy is presented below.

Assets are considered for renewal as they near the end of their effective working life or where the cost of maintenance becomes uneconomical and when the risk of failure of critical assets is sufficiently high.

Council's renewal programme has been developed by:

- taking asset age and remaining life predictions from the valuation database, calculating when the remaining life expires and converting that into a programme of replacements based on valuation replacement costs;
- Reviewing and justifying the renewals forecasts using the accumulated knowledge and experience of asset operations and asset management staff. This incorporates the knowledge gained from tracking asset failures through the customer services system, known location of pipe breaks and overflows, and contractor knowledge.

When justifying renewals the following factors are considered:

- **Asset Performance**: Renewal of an asset when it fails to meet the required LOS. The monitoring of asset reliability, capacity and efficiency during planned maintenance inspections and operational activity identifies non-performing assets. Indicators of non-performing assets include repeated and/or premature asset failure, inefficient energy consumption, and inappropriate or obsolete components.
- **Risk:** The risk of failure and associated financial and social impact justifies action (e.g. probable extent of damage, safety risk, community disruption).
- **Economics**: It is no longer economic to continue repairing the asset (i.e. the annual cost of repairs exceeds the annualised cost of renewal). An economic consideration is the co-ordination of renewal works with other planned works such as road reconstruction.
- **Efficiency:** New technology and management practices relating to increased efficiencies and savings will be actively researched, evaluated and, where applicable, implemented.

The renewal programme is reviewed in detail at each AMP update (three yearly) and every year the annual renewal programme is reviewed and planned with the input of the maintenance contractor.

If work is deferred for any reason, this work will be re-prioritised alongside the next year's renewal projects and a revised programme established.

Renewal works identified by way of the above renewal strategies may be deferred if the cost is beyond the community's ability to fund it. This situation may arise if higher priority works are required on other infrastructure assets; short term peaks occur in expenditure or if an inadequate rating base exists.

When renewal works are deferred, the impact of the deferral on economic inefficiencies and the scheme's ability to achieve the defined service standards will be assessed. Although the deferral of some renewal works may not impact significantly on the short term operation of assets, repeated deferral will create a liability in the longer term.

3.3.2 Renewal expenditure forecast

The 10 year (2015/2016 to 2024/2025) forecast for renewals costs (comprising all five Council water supply schemes) are shown in Figure 3-4 below. The forecast expenditure information is based on the LTP 2015/2025 financial forecast, which provides a relative degree of confidence in the values reported. The renewal forecasts are presented in terms of reticulation and facilities and the AMP Improvement Plan items as detailed in Appendix B.

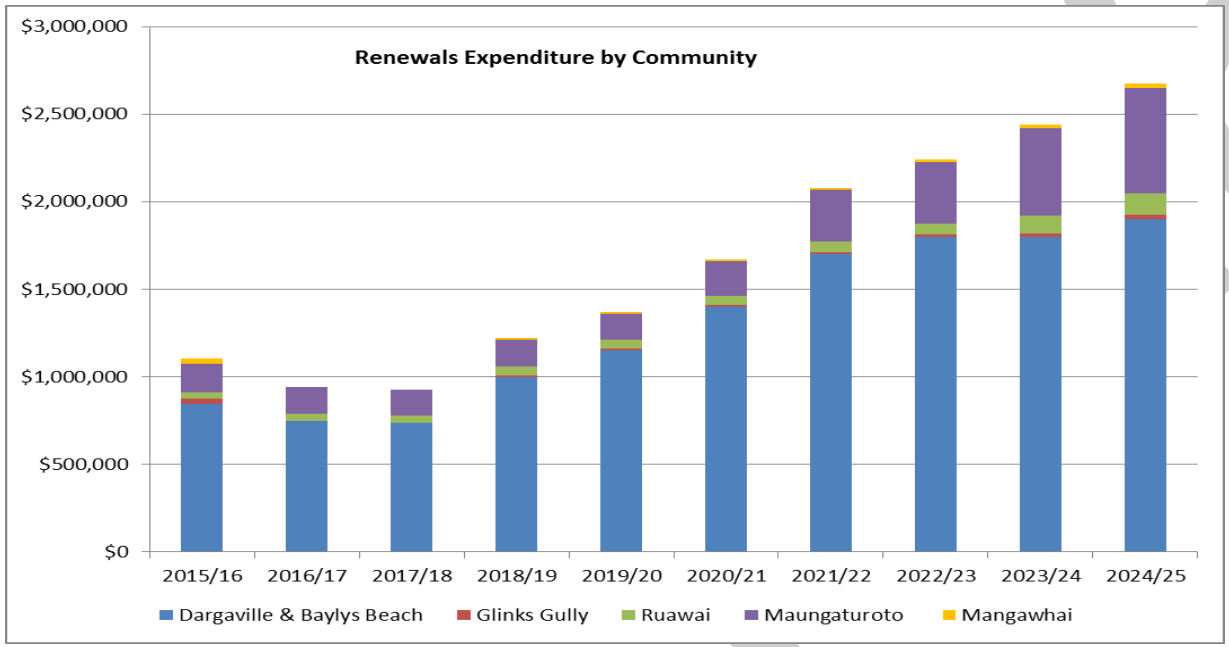


Figure 3-4: Kaipara overall water supply 10 year forecast renewal expenditure

Scheme specific renewal forecast costs are presented in Sections 3.3.3 to 3.3.7 below. A detailed breakdown of the financial forecast is included in Appendix A.

As outlined in Section 2.1.2 (Asset data), the current level of condition and/or performance data relating to the wastewater network is not accurately documented in Council's systems. This lack of data and knowledge affects Council's ability to adequately forecast required renewals to meet the proposed LOS.

Renewal

Most significant expenditure is related to renewal, since there is a considerable backlog to clear especially in Dargaville and Maungaturoto.

3.3.3 Renewal expenditure forecast - Dargaville/Baylys

The forecast for renewal expenditure for the Dargaville/Baylys water supply assets for the next 10 years is shown in Figure 3-5 below.

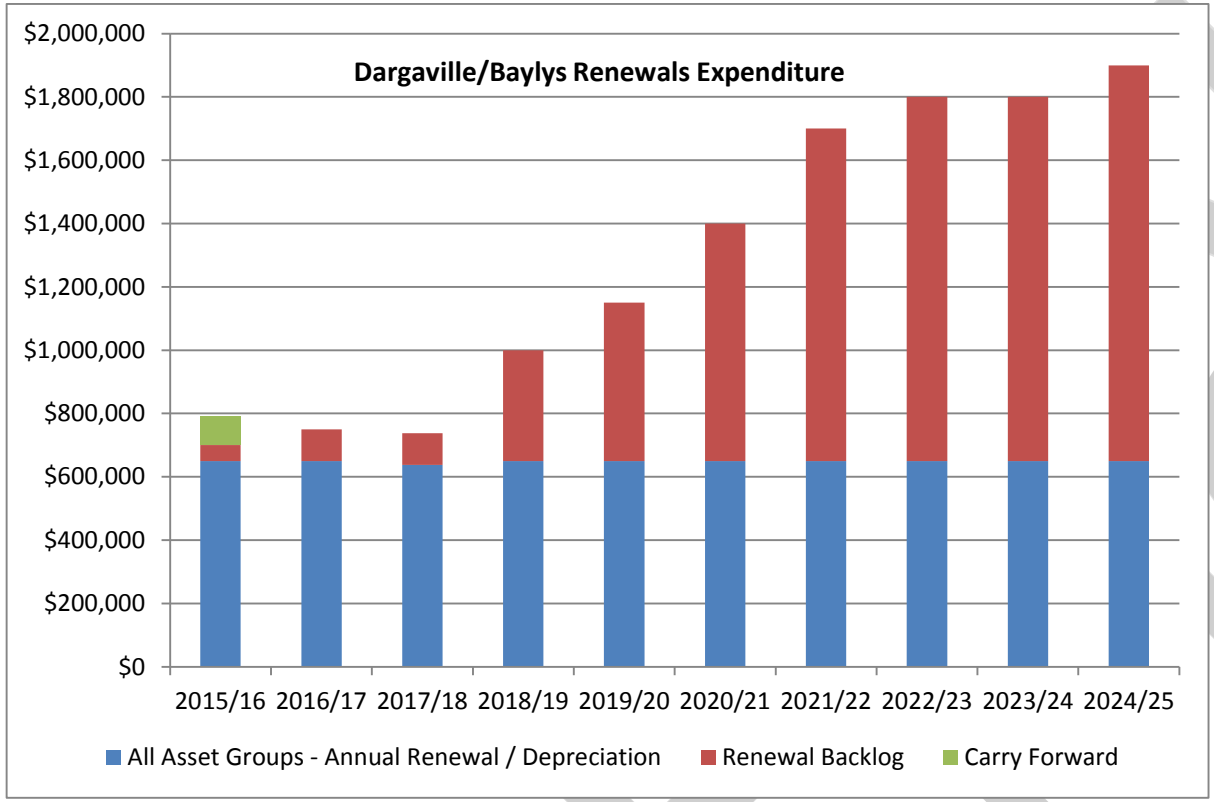


Figure 3-5: Dargaville/Baylys 10 year forecast renewal expenditure

Table 3-3 below summarises the renewal projects.

Table 3-3: Dargaville/Baylys renewals expenditure forecast

Project	Planned expenditure	Planned date
Water main renewals	$638,000	2017/2018
All Asset Groups - Annual renewal / depreciation	$650,000	All other years
Renewal backlog	$50,000	2015/2016
	$100,000	2016/2017– 2017/2018
	$350,000	2018/2019
	$500,000	2019/2020
	$750,000	2020/2021
	$1,050,000	2021/2022
	$1,150,000	2022/2023– 2023/2024
	$1,250,000	2024/2025
Deferred backlog from 2014/2015	$53,000	2015/2016

3.3.4 Renewal expenditure forecast - Maungaturoto

The forecast for renewal expenditure for the Maungaturoto water supply assets for the next 10 years is shown in Figure 3-6 below.

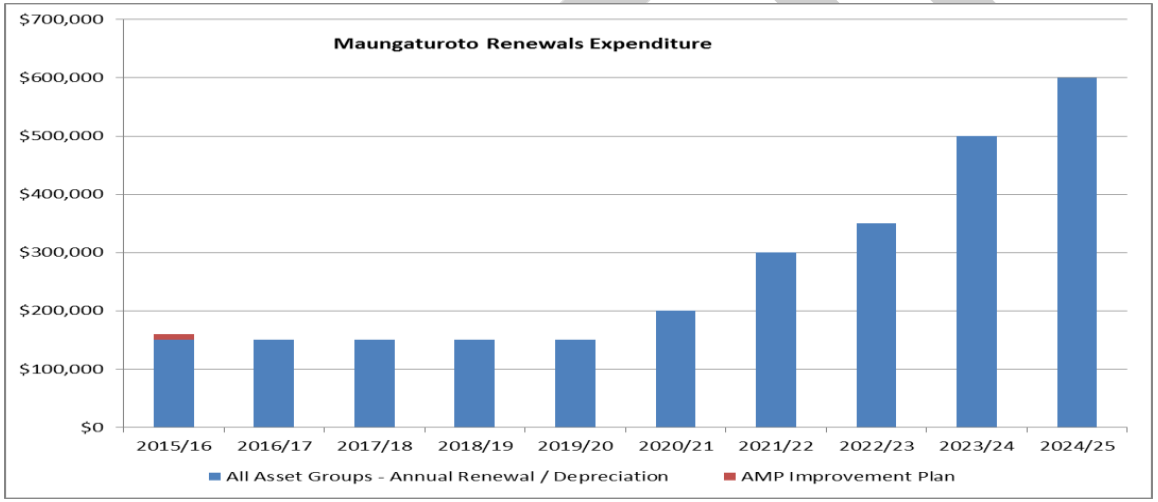


Figure 3-6: Maungaturoto 10 year forecast renewal expenditure

The Maungaturoto renewal projects are summarised in Table 3-4 below.

Table 3-4: Maungaturoto renewals 3-year expenditure forecast

Project	Planned expenditure	Planned date
Water main renewals (projects identified from condition assessment) project	$150,000	2015/2016 - 2019/2020
	$200,000	2020/2021
	$300,000	2021/2022
	$350,000	2022/2023
	$500,000	2023/2024
	$600,000	2024/2025
AMP Improvement Plan	$10,000	2015/2016

3.3.5 Renewal expenditure forecast - Ruawai

The forecast renewal expenditure for the Ruawai water supply assets for the next 10 years is shown in Figure 3-7 below

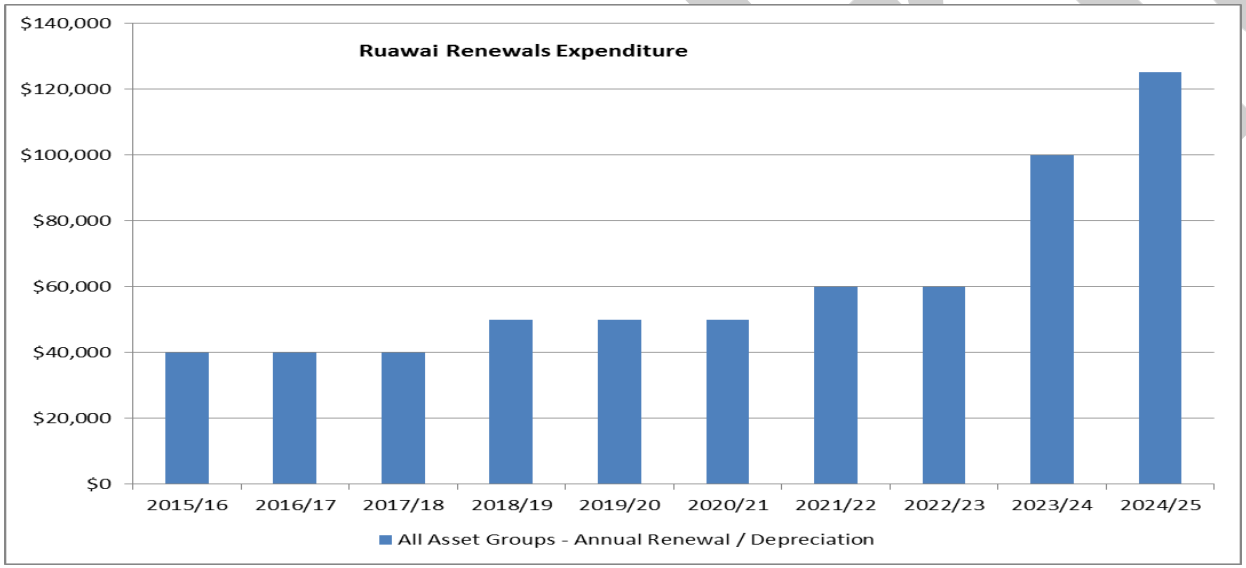


Figure 3-7: Ruawai 10 year forecast renewal expenditure

The Ruawai priorities are summarised in Table 3-5 below.

Table 3-5: Ruawai renewals expenditure forecast

Project	Planned expenditure	Planned date
AC pipe renewals	$40,000	2015/2016-2017/2018
	$50,000	2018/2019-2020/2021
	$60,000	2021/2022-2022/2023
	$100,000	2023/2024
	$125,000	2024/2025

3.3.6 Renewal expenditure forecast - Glinks Gully

The forecast for renewal expenditure for the Glinks Gully water supply assets for the next 10 years is shown in Figure 3-8 below.

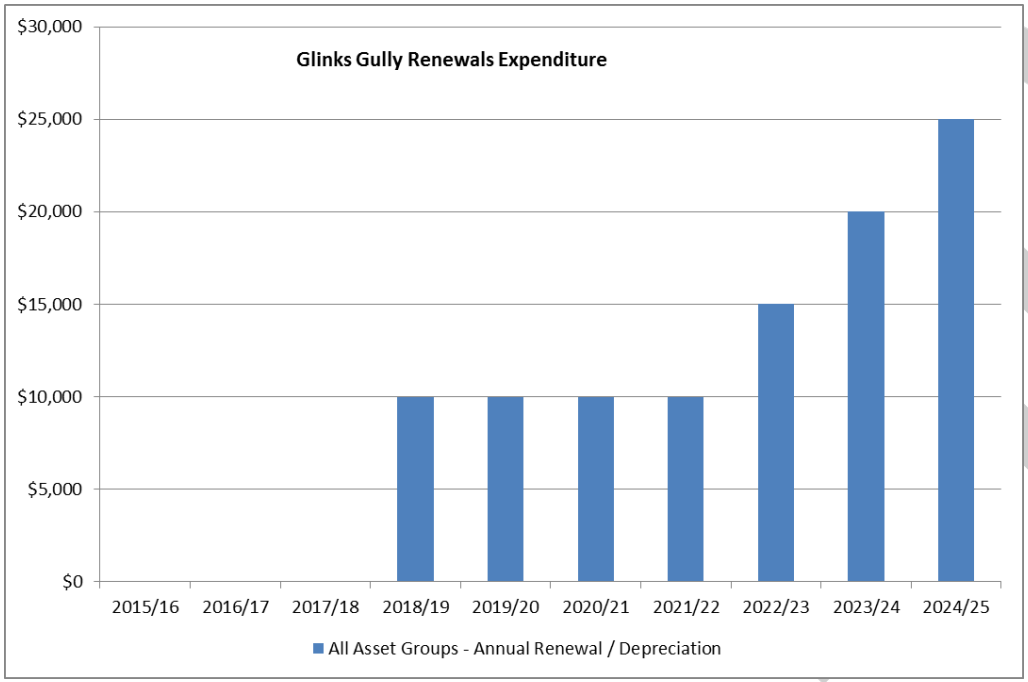


Figure 3-8: Glinks Gully 10 year forecast renewal expenditure

The Glinks Gully priorities are summarised in Table 3-6 below.

Table 3-6: Glinks Gully renewals expenditure forecast

Project	Planned expenditure	Planned date
AMP Improvements (also see Section 5 of AMP)		
Renewal projects identified from condition assessment project	$10,000 $15,000 $20,000 $25,000	2018/2019-2021/2022 2022/2023 2023/2024 2024/2025

3.3.7 Renewal Expenditure Forecast - Mangawhai

The forecast for renewal expenditure for the Mangawhai water supply assets for the next 10 years is shown in Figure 3-9 below.

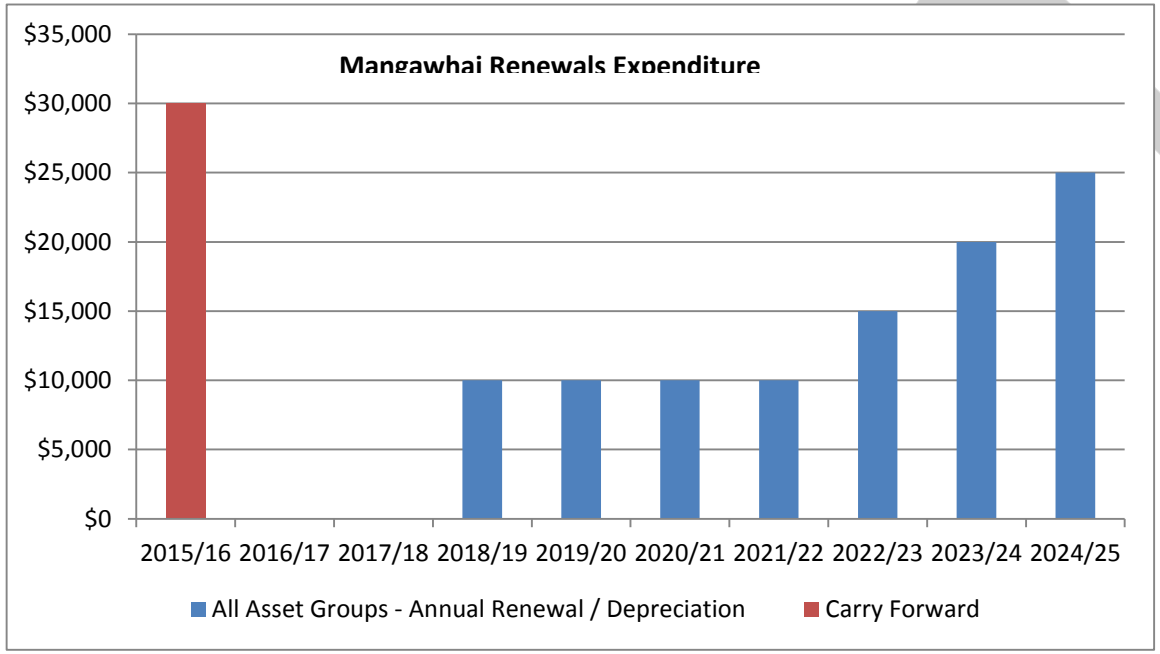


Figure 3-9: Mangawhai 10 year forecast renewal expenditure

The Mangawhai project priorities are summarised in Table 3-7 below.

Table 3-7: Mangawhai renewals expenditure forecast

Project	Planned expenditure	Planned date
Renewals (estimated)	$10,000	2018/2019- 2021/2022
	$15,000	2022/2023
	$20,000	2023/2024
	$25,000	2024/2025

3.4 New Capital (asset creation, acquisition, enhancement) strategy and expenditure forecast

3.4.1 Strategy

New Capital works are planned in response to identified service gaps, growth and demand issues, risk issues and economic considerations.

When evaluating significant development proposals, the following issues will be considered:

- The contribution the new or improved assets will make to the current and anticipated future LOS and Community Outcomes;
- The risks and benefits anticipated to be made from the investment;
- The risks faced by not proceeding with the development works. These could include safety risks, social risks and political risks;
- Ability and willingness of the community to fund the works;
- Future operating and maintenance cost implications.

Significant development works will be prioritised and programmed with contributions from:

- Targeted user groups (e.g. special interest groups, industry groups, adjacent residents);
- The general community (through public consultation);
- Council staff and consultants that may be engaged to provide advice to the Council;
- The LTP/Annual Plan process;
- The elected Council. (Significant proposals are subject to Council decision and available funding).

To date the development of water supply assets has largely been undertaken on a community by community basis. The reported growth figures (Section 1.8.3) indicate that all five communities based water supply schemes are not anticipating levels of growth over the next 10 years that will require a significant amount of new capital to be invested. Hence, the new asset funding over the next 10 years is focused on improving LOS.

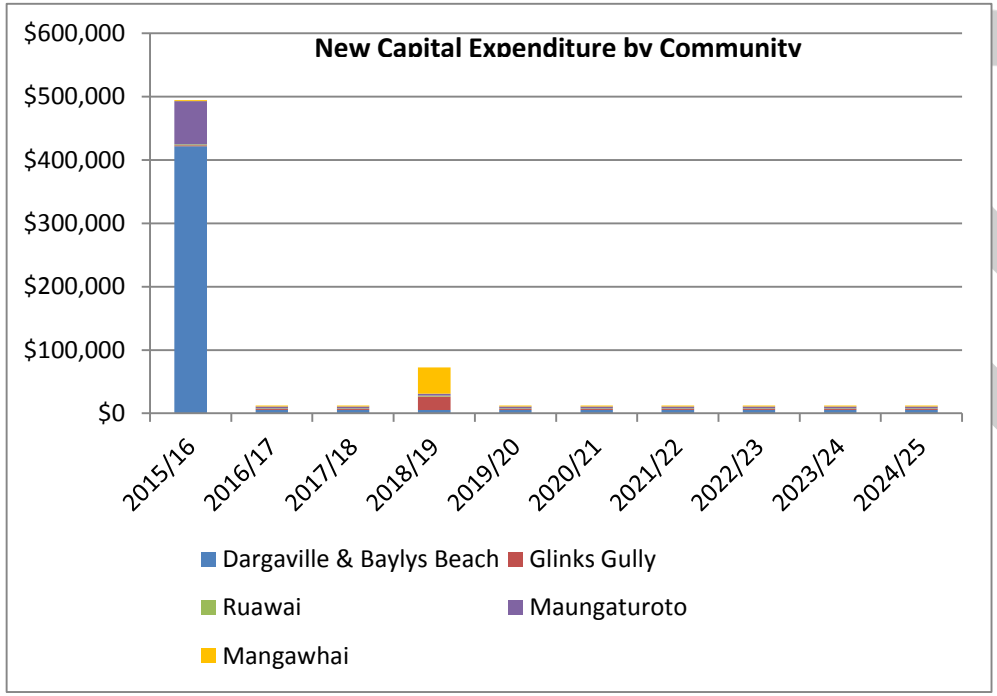
Growth

There is no significant growth related projects in the District. Mangawhai may have some growth however Council has no intention to provide reticulated water for future growth.

LOS

LOS related projects are to bring treatment plants and reticulation to comply with Drinking Water Standards. However there will be no significant projects.

3.4.2 New (Growth + LOS) Capital expenditure forecast – district-wide



The district-wide 10 year forecast for capital expenditure (comprising all five Council water supply schemes) are shown in Figure 3-10 below. The forecast expenditure information is based on the LTP 2015/2025 financial forecast, which provides a relative degree of confidence in the values reported.

Scheme specific new (Growth + LOS) capital forecasts expenditures are presented in Sections 3.4.3 to 3.4.7 below. A detailed breakdown of the financial forecast is included in Appendix A.

Figure 3-10: Kaipara overall water supply 10 year forecast capital expenditure

3.4.3 Growth and LOS expenditure forecast - Dargaville/Baylys

The forecast for new capital expenditure for the Dargaville/Baylys water supply assets for the next 10 years is shown in Figure 3-11 below.

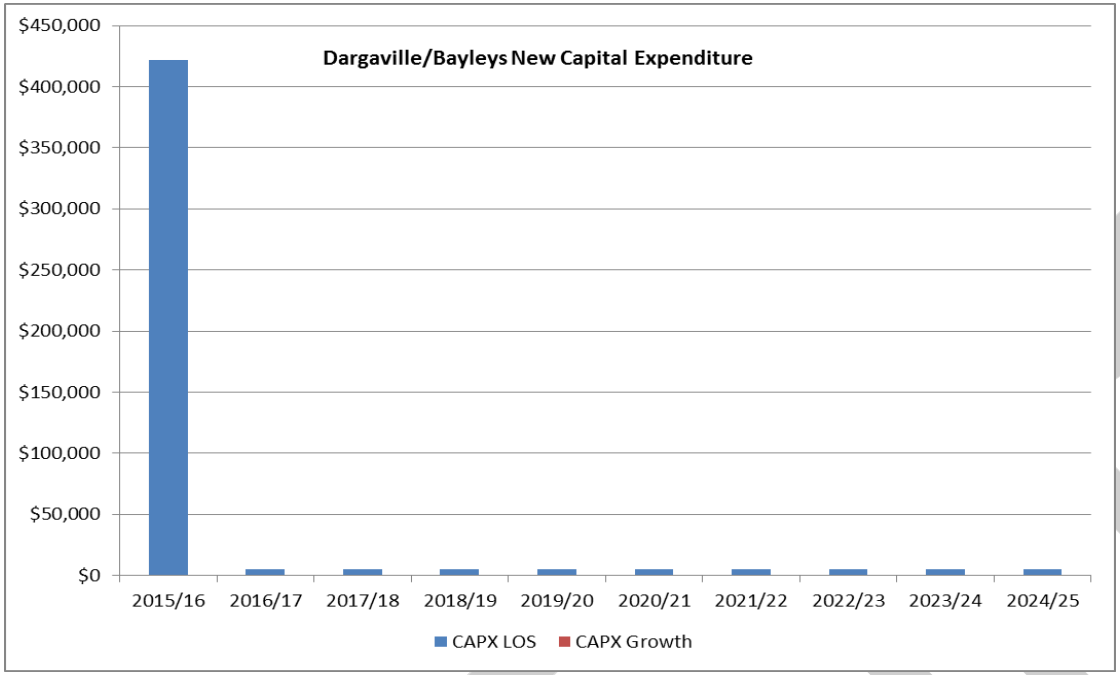


Figure 3-11: Dargaville/Baylys 10 year forecast growth and LOS capital expenditure

There is currently no growth driven capital projects for Dargaville/Baylys over the next 10 years based on the declining population data from the 2013 census. The key LOS projects included are shown in Table 3-8 and include the following:

An allocation of $2,500 has been made annually for the water take consents, and a further $2,500 has been allocated annually to meet the requirements of the Drinking Water Standards.

An allowance of $207,000 has been allocated in 2015/2016 for managing the existing water sources including Ahikiwi, Rotu, Waiatua Dam and Waiparataniwha and a further $210,000 allocated in 2015/2016 to undertake some of the LOS projects deferred from 2014/2015.

An allowance for upgrading the Ahikiwi water source was initially made, however subsequently removed while the Council investigates alternative options. The infrastructure has been in place since 1987, however largely unused since 2000. No resource consent exists for taking of water. The source of water is fed from the same catchment as the Waiparataniwha source. The infrastructure was tested, made ready and utilised for a short period of time during the 2013 drought.

The Ahikiwi option required the water take, pumps, telemetry and reticulation to be upgraded, a magflow meter to be installed and a resource consent obtained for the taking of water. An allowance of $430,000 was initially allocated which comprised the de-coupling of Rotu and Waiatua Dam consents, and the installation of a new pump station at Ahikiwi. The costs were to have included preliminary investigation, design, consenting etcetera.

The pipeline from Waiatua Dam to Rotu was also planned for and subsequently deferred while Council investigates alternatives for funding and/or options: This project was to include the installation of 4kms of 250mm diameter pipeline, connecting pipework, valves at each end, and a booster pump station at the Waiatua Dam to ensure the water could be pumped to Dargaville at the required rate. The project included preliminary design and project cost estimation ($100,000 and $122,000 respectively), detailed design ($300,000), and construction cost in two phases ($1,000,000 and 1,300,000).

Table 3-8: Dargaville/Baylys Growth + LOS Expenditure Forecast

Project	Planned expenditure	Planned date
Compliance with drinking water standards	$2,500 annually	2015/2016 – 2024/25
Compliance with water take consent	$2,500 annually	2015/16 – 2024/25
Upgrading the Ahikiwi water source take. This project is now deferred while Council investigates alternatives for funding and/or options	$207,000 $430,000	(2015/2016) deferred (2016/2017) deferred
Pipeline Waiatua Dam to Rotu PS. This project is now deferred while Council investigates alternatives for funding and/or options	$100,000 $122,000 $300,000 $1,000,000 $1,300,000	(2016/2017) deferred (2017/2018) deferred (2018/2019) deferred (2019/2020) deferred (2020/2021) deferred
Manage existing water sources	$207,000	2015/2016
Deferred LOS projects from 2014/2015	$210,000	2015/2016

3.4.4 Growth and LOS expenditure forecast - Maungaturoto

The forecast for new capital expenditure for the Maungaturoto water supply assets for the next 10 years is shown in Figure 3-12 below.

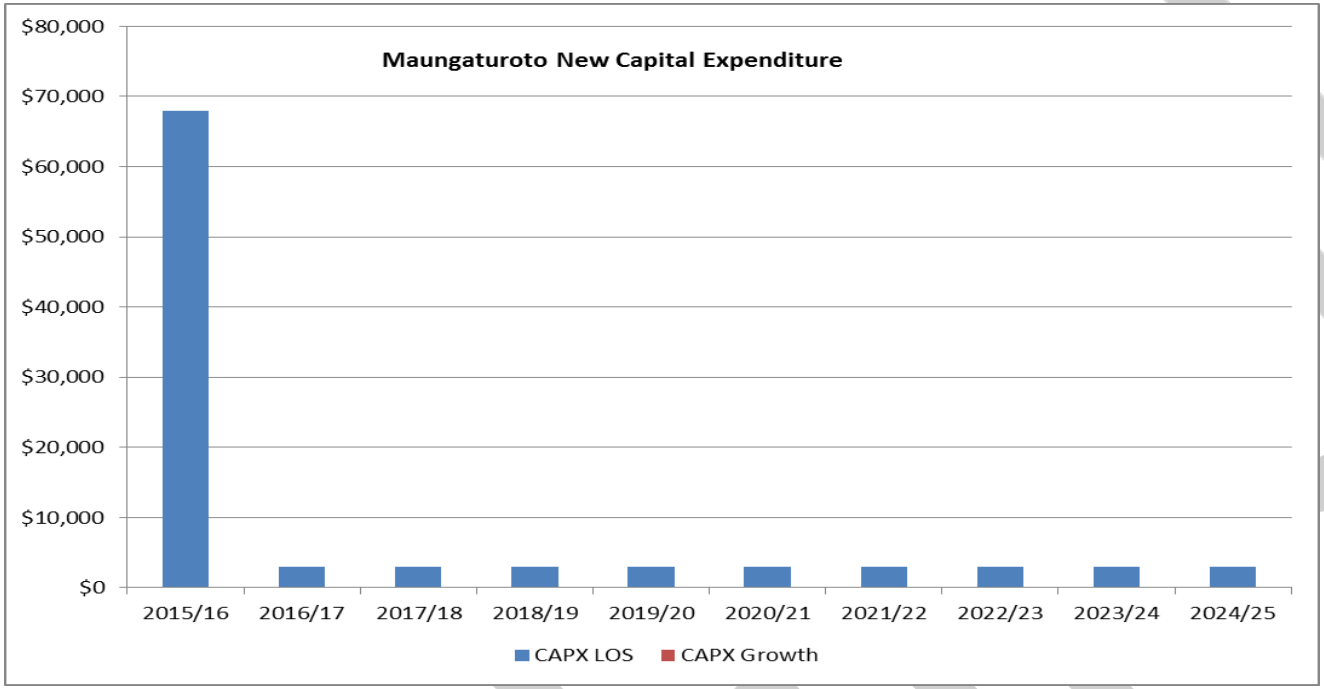


Figure 3-12: Maungaturoto 10 year forecast growth and LOS capital expenditure

There is currently no growth driven capital projects for Maungaturoto over the next 10 years based on the declining population data from the 2013 census.

The following LOS projects have been included:

An allowance of $1,500 per year has been provided to ensure compliance with consent conditions and drinking water standards. A further $1,500 per year allocated to the water take consent, and $25,000 allocated in 2015/2016 to install meters to comply with the consent conditions. A further $10,000 is allocated in 2015/2016 to install an alarm to notify of pump failure, and a backup generator at the Brynderwyn / Piroa water takes and a further $30,000 in 2015/2016 for new backflow prevention.

Table 3-9: Specific LOS Capital projects:

Project	Planned Expenditure	Planned Date
Compliance with drinking water standards	$1,500 annually	2015/2016 – 2024/2025
Compliance with water take consent	$1,500 annually	2015/2016 – 2024/2025
Water meters to comply with consent conditions	$25,000	2015/2016
Install an alarm for pump failure at the Brynderwyn and Piroa water takes and Install a generator interface so a back-up generator can be installed.	$10,000	2015/2016
New backflow prevention for water takes	$30,000	2015/2016

3.4.5 Growth and LOS expenditure forecast - Ruawai

The forecast for new capital expenditure for the Ruawai water supply assets for the next 10 years is shown in Figure 3-13 below.

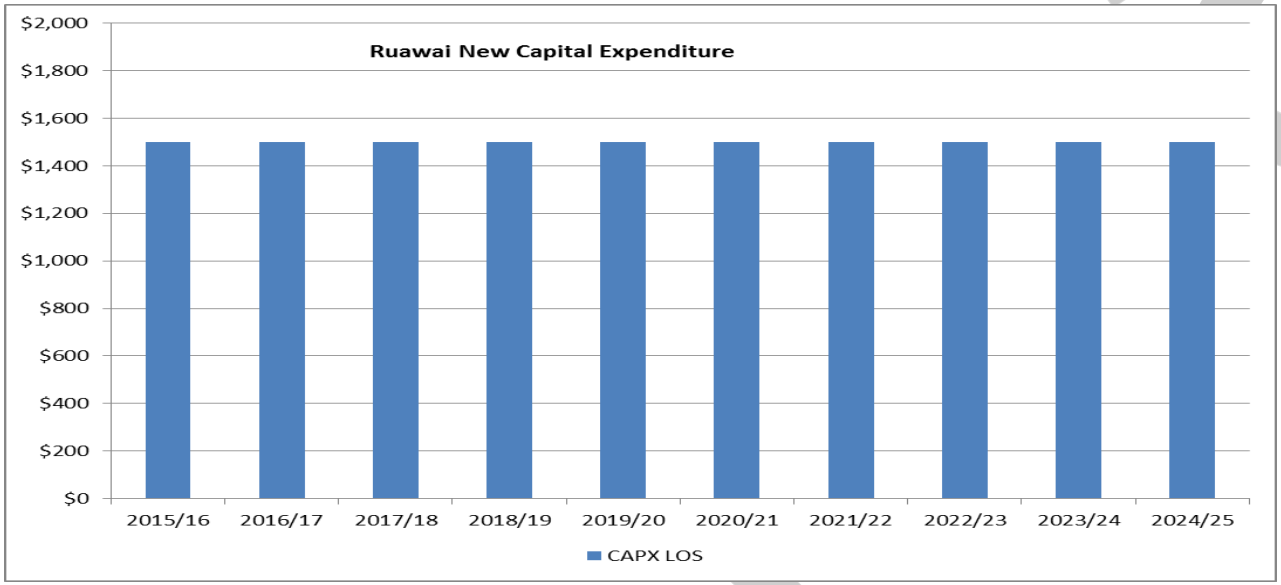


Figure 3-13: Ruawai 10 year forecast growth and LOS capital expenditure

There are currently no identified growth driven capital projects planned. There is an annual allowance of $1,500 made for Council to contribute towards compliance with resource consents and with drinking water standards.

3.4.6 Growth and LOS expenditure forecast - Glinks Gully

The forecast for new capital expenditure for the Glinks Gully water supply assets for the next 10 years is shown in Figure 3-14 below.

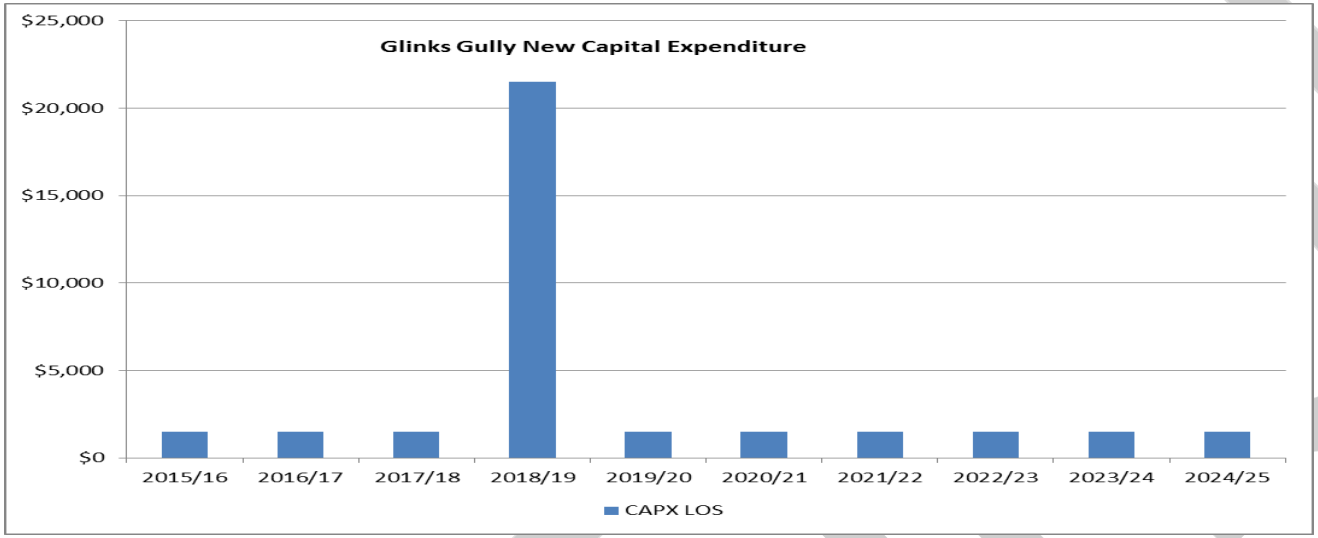


Figure 3-14: Glinks Gully 10 year forecast growth and LOS capital expenditure

An allowance of $20,000 has been included for DWSNZ compliance for Glinks Gully. This project is now deferred until 2018/2019 while the Council investigates alternatives for funding and/or options. A $1,500 LOS allowance has also been made to ensure compliance with resource consent requirements.

Table 3-10: Prospective project water supply Glinks Gully

Project	Planned expenditure	Planned date
If required for DWSNZ compliance, install chlorine residual monitoring, FAC, caustic soda dosing alarms and flow alarms in order for the WTP to be compliant with DWSNZ 2005(08). This project is now deferred until 2018/2019 while Council investigates alternatives for funding and/or options	$20,000	(2015/2016) deferred to 2018/2019
Compliance with water take consent.	$1,500 annually	2015/2016 – 2024/2025

3.4.7 Growth and LOS expenditure forecast - Mangawhai

The forecast for new capital expenditure for the Mangawhai water supply assets for the next 10 years is shown in Figure 3-15 below.

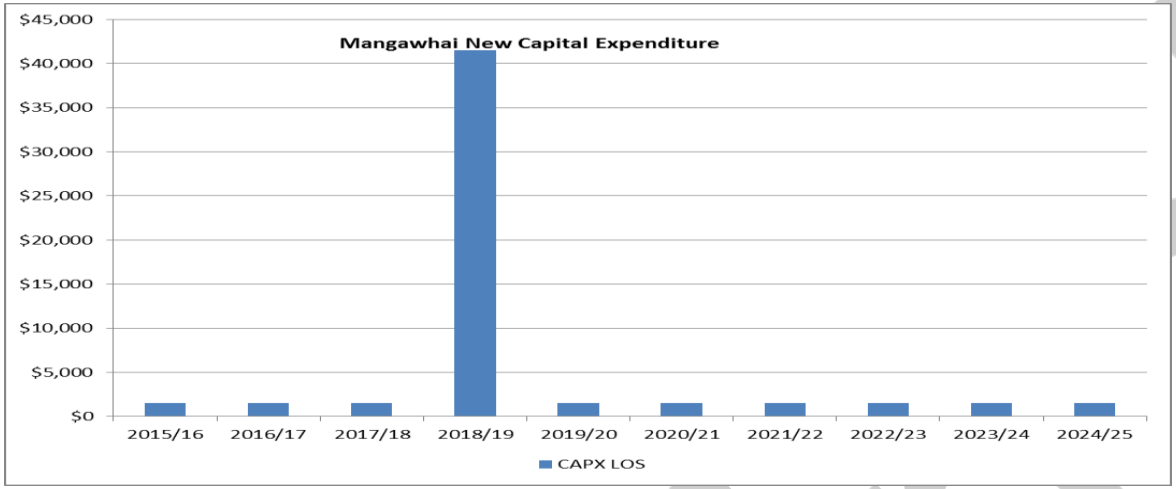


Figure 3-15: Mangawhai 10 year forecast growth and LOS capital expenditure

There are currently no identified growth driven capital projects for Mangawhai. LOS improvements were scheduled for 2015/2016 and 2016/2017 for improvements related to bringing the Mangawhai WTP up to DWSNZ 2005(08) compliance requirements. This project is now deferred until 2018/19 while the council investigates alternatives for funding and/or options. A $1,500 per year allowance has also been included for NZDWS compliance monitoring.

Table 3-11: Prospective project water supply Mangawhai

Project	Planned Expenditure	Planned Date
If required for DWSNZ compliance, install chlorine residual monitoring, FAC, caustic soda dosing alarms and flow alarms in order for the WTP to be compliant with DWSNZ 2005(08). This project is now deferred until 2018/2019 while Council investigates alternatives for funding and/or options	$40,000	(2015/2016) Deferred to 2018/2019
Compliance with drinking water standards	$1,500 annually	2015/2016 – 2024/2025

3.5 Financial summary

A summary of the planned expenditure for water supply assets by community and by category is shown in the charts below.

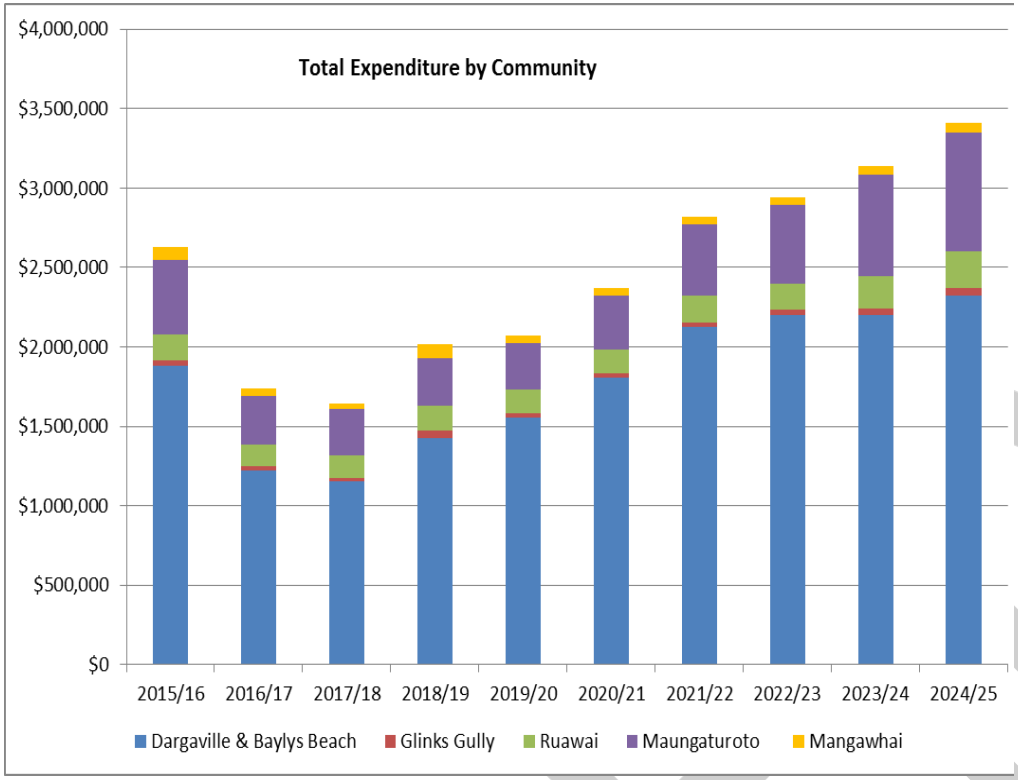


Figure 3-16: Total forecast expenditure by community

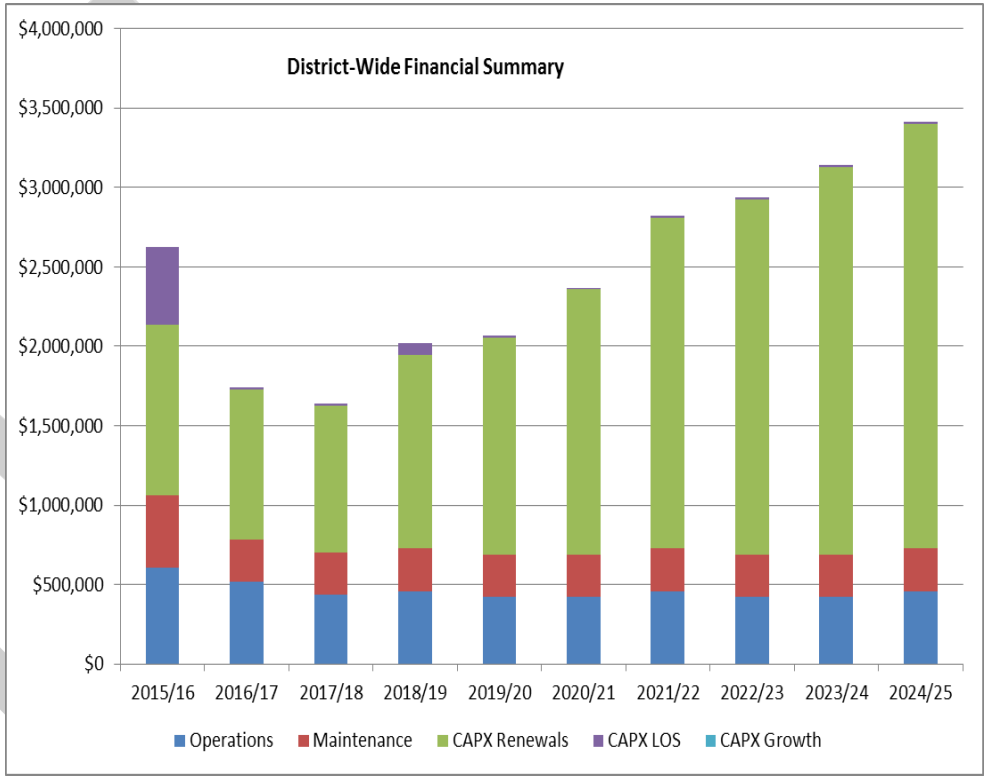


Figure 3-17: Total forecast expenditure for Kaipara District

3.6 Asset decommissioning and/or disposal strategy and financial forecast

Council does not have formal strategy documents relating to asset disposals. When disposal of an asset needs to be considered, Council will address this case by case.

There are no areas of operation that Council plans to abort therefore asset disposal is a by-product of renewal or upgrade decisions that involve the replacement of assets.

Assets may also become surplus to requirements for any of the following reasons:

- under-utilisation;
- obsolescence;
- provision exceeds required LOS;
- uneconomic to upgrade or operate;
- policy change;
- service provided by another means (e.g. private sector involvement);
- potential risk of ownership (financial, environmental, legal, social, vandalism).

Depending on the nature and value of the assets they are either:

- made safe and left in place;
- removed and disposed to landfill;
- removed and sold.

Council follows a practice of obtaining the best available return from disposal or sale of assets within an infrastructural activity. Any net income is credited to that activity.

3.7 Management of other overheads strategy and financial forecast

Allocation of Council's costs in administrating and managing the water supply activity is based on a percentage of the activity cost, employee costs and depreciation costs. The LTP 2015/25 financial statement summarises a 10 year forecast of the internal charges and overheads applied for the water supply activity, which are presented in Table 3-12 below.

Table 3-12: 10 year forecast of internal charges and overheads ($'000)

2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
516	453	433	439	430	430	440	430	430	440

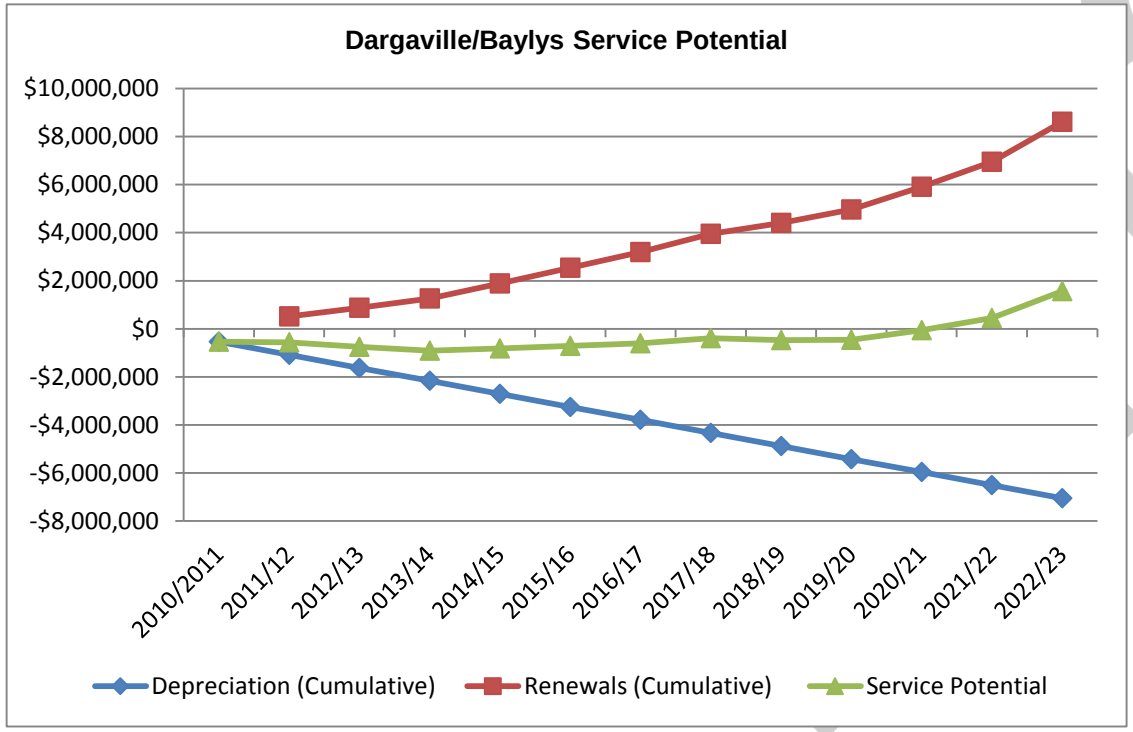
3.8 Depreciation (Loss of Service potential)

Service potential is defined as the economic benefit embodied in assets that over time declines as the assets age and deteriorate. Depreciation is charged annually to recover from the users of services the equivalent annual decline in service potential and renewals are undertaken to restore it. The loss (or gain) in service potential over time can therefore be described as the difference between the annual renewal and depreciation provisions.

If this figure is negative, the renewals undertaken in that year are lower than the financial depreciation. This would be expected when assets are young, however over the life of all assets the accumulated figure would be expected to be close to zero if the assets were being sustained indefinitely. Service potential is restored through renewals, and is effectively funded through the annual depreciation charge.

Figure 3-18 through Figure 3-22 below show a summary of the service potential for each of the five water supply schemes. Cumulative depreciation from 2010/2011 through 2022/2023 is plotted against cumulative renewals and a service potential is calculated as the sum of these two factors. The figures are based on the depreciation values reported in the 2010 valuations (effective 01 July 2010) and assume completion of the programmes within the costs and timeframes shown.

Actual renewal expenditure during 2010/2011 was not available during preparation of this AMP; therefore no renewal expenditure is included for this year. The renewal expenditure may be under-represented. The 2011/2012 renewal expenditure is based on the 2012 asset value reconciliation data.



Previously, Kaipara District rates have not included a component for depreciation, meaning users of the asset were not contributing to the asset's upkeep or replacement costs. As outlined in the LTP 2012/2022, Council will fund renewals during years 1 to 4 where the level of renewals is less than depreciation in order to assist with affordability for ratepayers. After year 4, Council will progressively move towards a position whereby rates will fund depreciation by the end of the 10 year period. By funding the depreciation, a reserve is set up that can be used to fund the renewal expenditure when it is required.

Figure 3-18: Dargaville/Baylys service potential

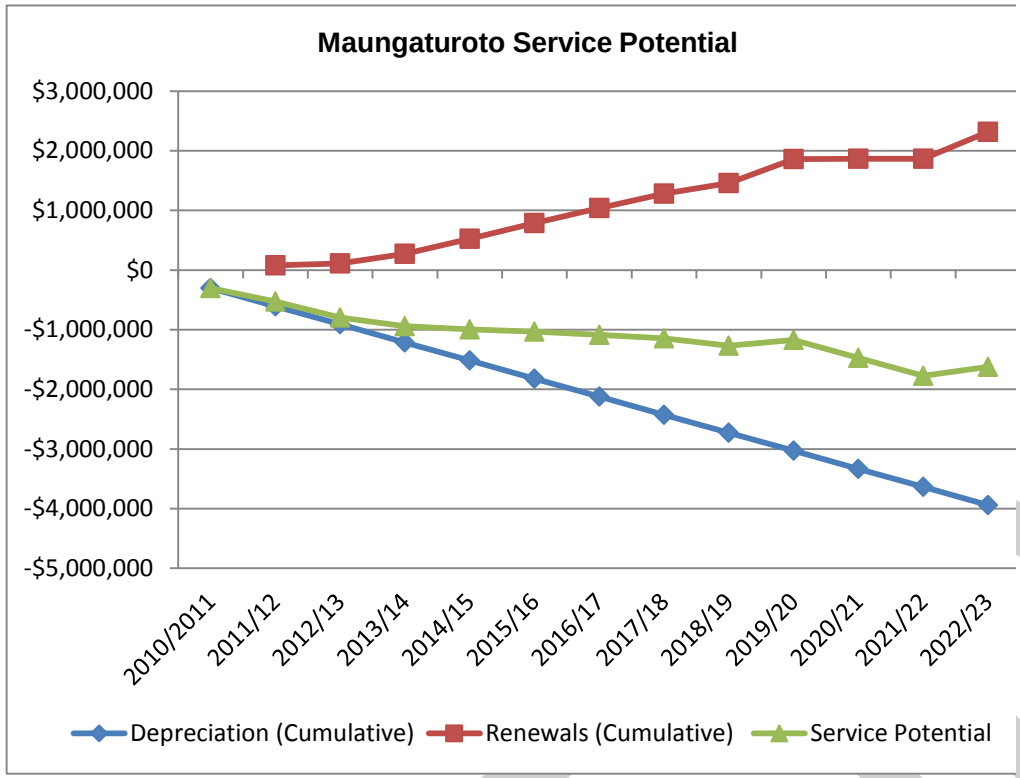


Figure 3-19: Maungaturoto service potential

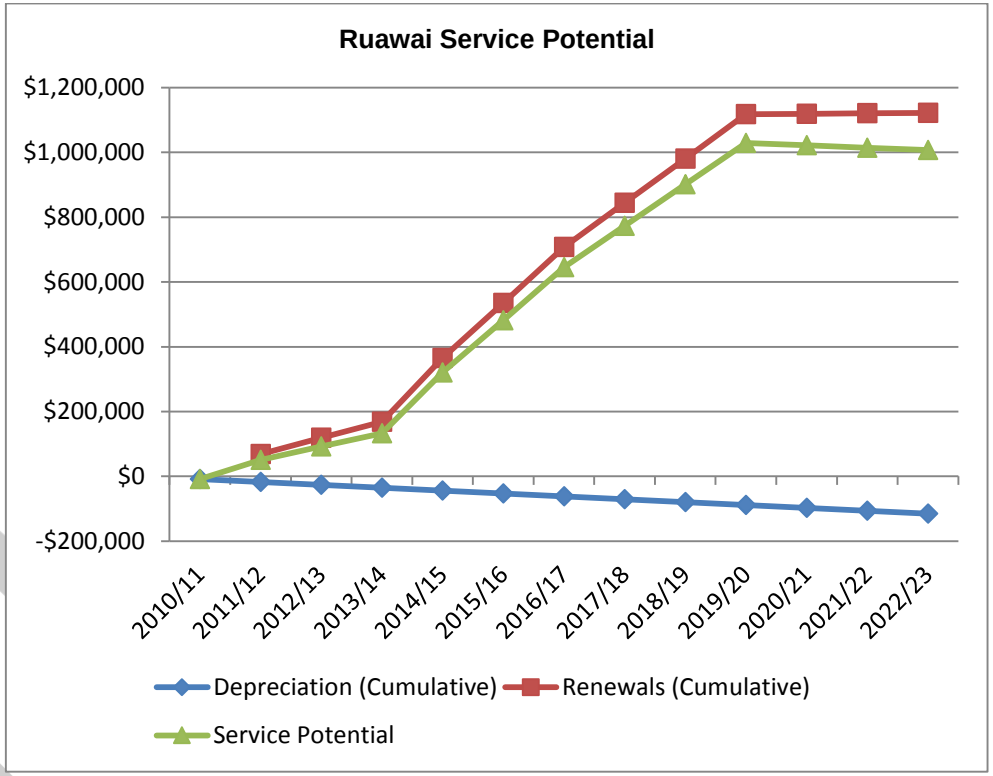


Figure 3-20: Ruawai service potential

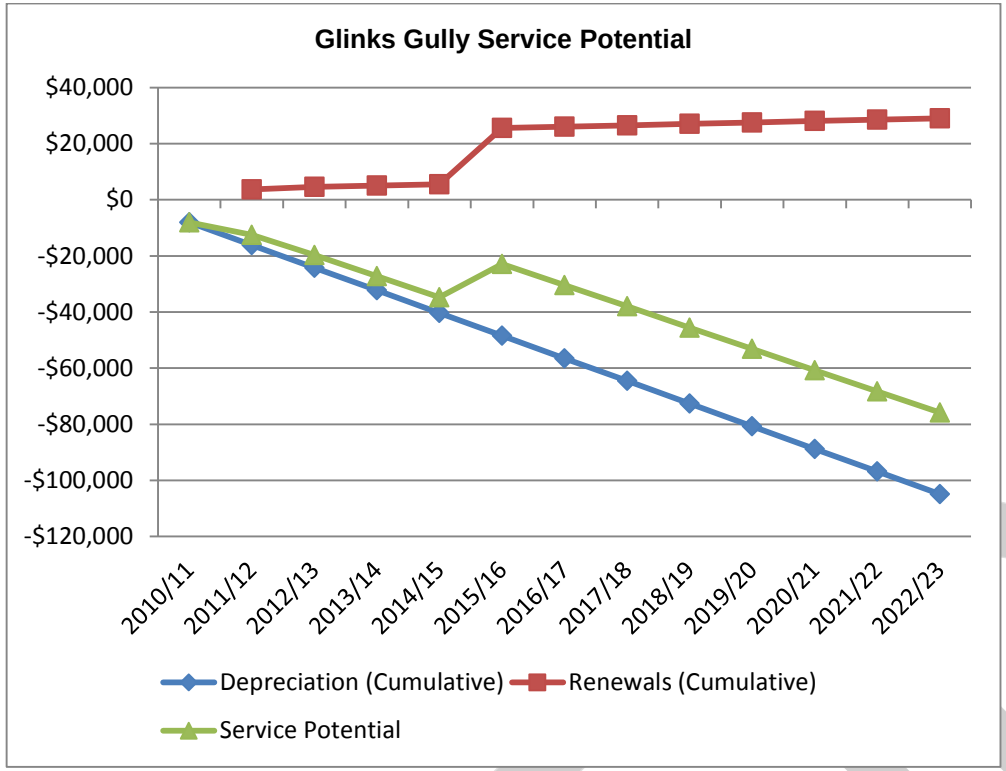


Figure 3-21: Glinks Gully service potential

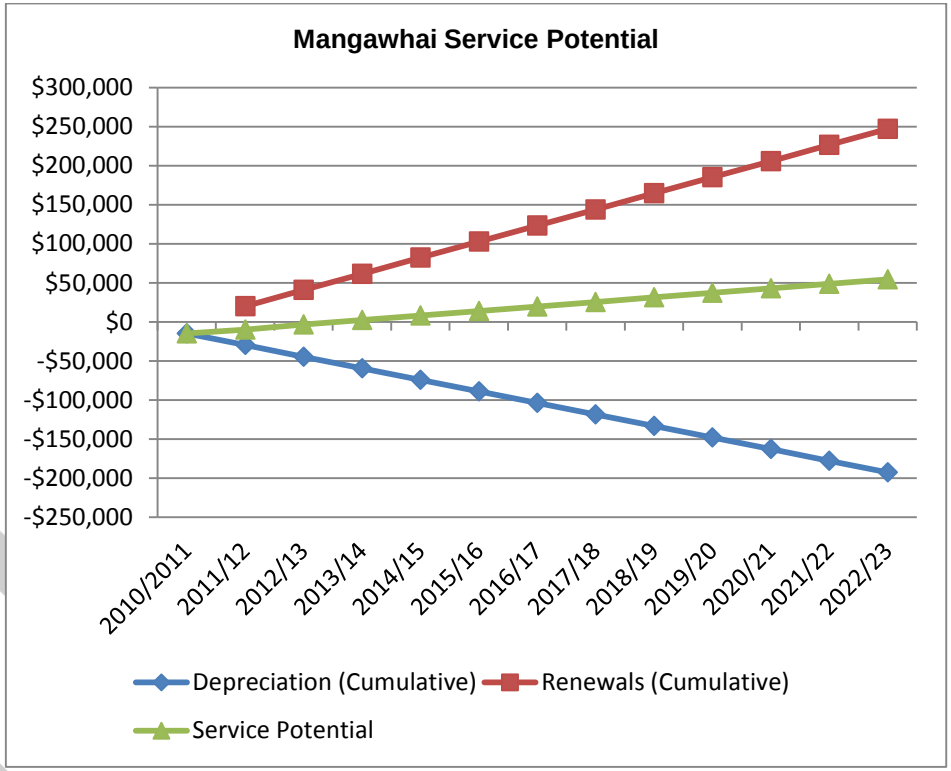


Figure 3-22: Mangawhai service potential

3.9 Public debt

Council borrows as it considers prudent and appropriate and exercises its flexible and diversified funding powers pursuant to the Local Government Act 2002. The Council approves, by resolution, the borrowing requirement for each financial year during the annual planning process. The arrangement of precise terms and conditions of borrowing is delegated to the General Manager Finance.

Council has significant infrastructural assets with long economic lives yielding long term benefits. Council also has a significant strategic investment holding. The use of debt is seen as an appropriate and efficient mechanism for promoting intergenerational equity between current and future ratepayers in relation to the Council's assets and investments. Debt in the context of this policy refers to the Council's net external public debt, which is derived from the Council's gross external public debt adjusted for reserves as recorded in Council's general ledger.

Generally, Council's capital expenditure projects with their long term benefits are debt funded. The Council's other District responsibilities have policy and social objectives and are generally revenue funded.

Council raises debt for the following primary purposes:

- Capital to fund development of infrastructural assets;
- Short term debt to manage timing differences between cash inflows and outflows and to maintain Council's liquidity;
- Debt associated with specific projects as approved in the Annual Plan or LTP. The specific debt can also result from finance which has been packaged into a particular project;

In approving new debt, Council considers the impact on its borrowing limits as well as the size and the economic life of the asset that is being funded and its consistency with Council's long term financial strategy.

The Borrowing Policy is found in Volume 2 of Council's LTP. Figure 3-23 is from the LTP 2015/2025 and shows the projected debt level of Council for the next 10 years.

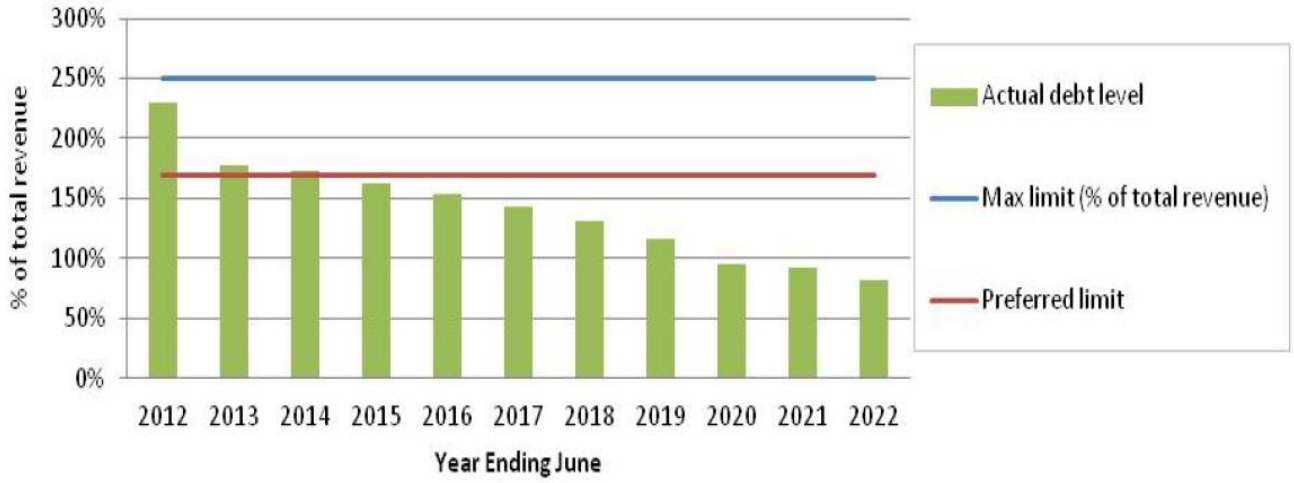


Figure 3-23: Projected debt levels compared to Council's maximum and preferred debt limits

3.10 Funding sources

The forecasts the water supply activity to comprise 5% of Council's operating expenses and 11% of capital expenditure over the next 10 years. The proposed sources of water supply operating income and capital are summarised in Table 3-13 and Table below.

Table 3-13: Forecast sources of operating income ($'000)

	2015/ 16	2016/ 17	2017/ 18	2018/ 19	2019/ 20	2020/ 21	2021/ 22	2022/ 23	2023/24	2024/25
Fees, charges and targeted rates for water supply	3,173	2,940	2,885	2,995	3,068	3,190	3,481	3,622	3,716	3,894
Total	**3,173**	**2,940**	**2,885**	**2,995**	**3,068**	**3,190**	**3,481**	**3,622**	**3,716**	**3,894**

Table 3-14: Forecast sources of capital funding income ($'000)

	2015/ 16	2016/ 17	2017/ 18	2018/ 19	2019/ 20	2020/ 21	2021/ 22	2022/ 23	2023/24	2024/25
Increase (decrease) in debt	269	-334	-352	-2	89	433	834	-412	-417	-430
Total	**269**	**-334**	**-352**	**-2**	**89**	**433**	**834**	**-412**	**-417**	**-430**

3.11 Potential additional sources of revenue

There are no forecast subsidies or grants, or local authority fuel tax, fines and infringement fees forecast for the water supply activity over the next 10 years.

3.12 Financial challenges

The LTP 2015/2025 summarises Council's financial strategy for the next 10 years. Making the Kaipara District an excellent place to live is a key goal for Council. Council's desire to improve community well-being needs to be balanced with keeping rates at an affordable level and in a financially prudent manner.

In the past, Council has tended to keep rates low, compared with similar local authorities, and used debt to fund a number of services. The LTP acknowledges that Council is aiming to build a more sustainable financial management model to change the way they use debt and also ensure repayment of the debt that has already been borrowed. As part of this new approach, Council is planning to maintain the existing LOS for water supply for the LTP period. The key challenges for Council will be:

- balancing the proposed operating budget towards a more sustainable level of debt;
- maintaining reasonable LOS;
- providing for the renewal of assets;

- keeping rates affordable for ratepayers.

While there is risk that assets may fail before they are renewed, Council is comfortable that this approach is manageable and overall the combination of measures present a good balance among the different factors they need to consider.

4 Service management

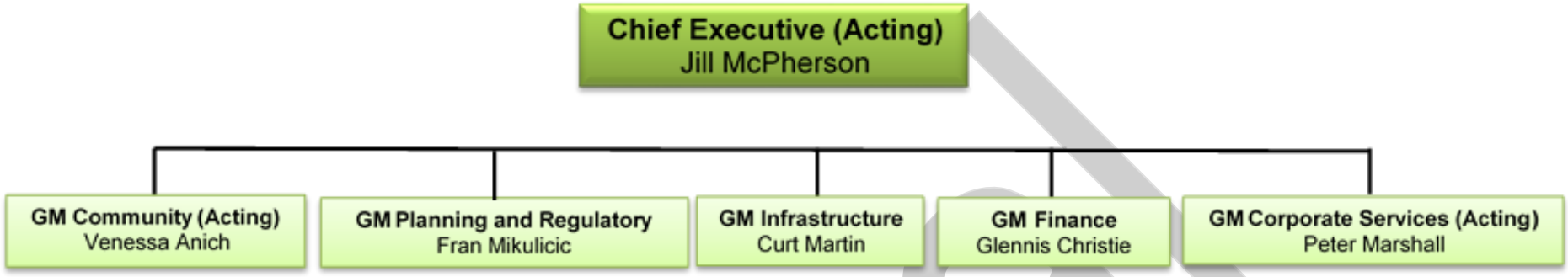


Figure 4.1: Kaipara District Council organisational structure executive team

4.1 Asset management systems and processes

4.1.1 Asset management systems

Access to effective information systems is essential for the Water Services Team to help them store and analyse asset information to make good asset management decisions. Council uses the support tools listed in Table 4-1 to manage the wastewater business:

Table 4-1: Asset management support tools

System Name	System purpose	Purpose
MapInfo (GIS)	Asset Location	The location of assets are stored within tables and represented spatially via a series of points, lines or regions. Asset information from AssetFinda is exported to MapInfo.
AssetFinda	Asset Register	Details on the assets size, material, date of installation and other related information for water supply, wastewater and stormwater assets are recorded within AssetFinda.
IntraMaps	Enquiring and viewing asset information	Web based GIS Viewer enabling viewing and enquiry of assets.
NCS (Napier Computer System)	Accounting	Council accounting and financial systems are based on Napier Computer Systems (NCS) software and GAAP Guidelines.

System Name	System purpose	Purpose
IntraMaps	Customer service tracking	To record customer enquiries and to register and track tasks allocated to the Maintenance Contractor for follow up investigation and resolution within appropriate timeframes. Also includes IntraMaps, an inquiry tool into GIS to enable easy viewing of asset information.
Aquavision	Telemetry	The performance of the wastewater pumping stations is monitored via the Aquavision telemetry system.
Advanced information	Telemetry	The performance of the treatment plants and water supply pumping stations is monitored via the advanced information telemetry system.

4.1.2 IntraMaps

The MapInfo GIS system is the core GIS system used to store and display the spatial data related to Council's water services assets i.e. water supply, wastewater and stormwater.

The MapInfo system provides the information supporting the IntraMaps system, which is widely used within Council as a user friendly interface to the GIS asset data, enabling quick access to asset location and asset attribute information.

A screenshot of the IntraMaps GIS web viewer is shown in Figure 4-2 below:

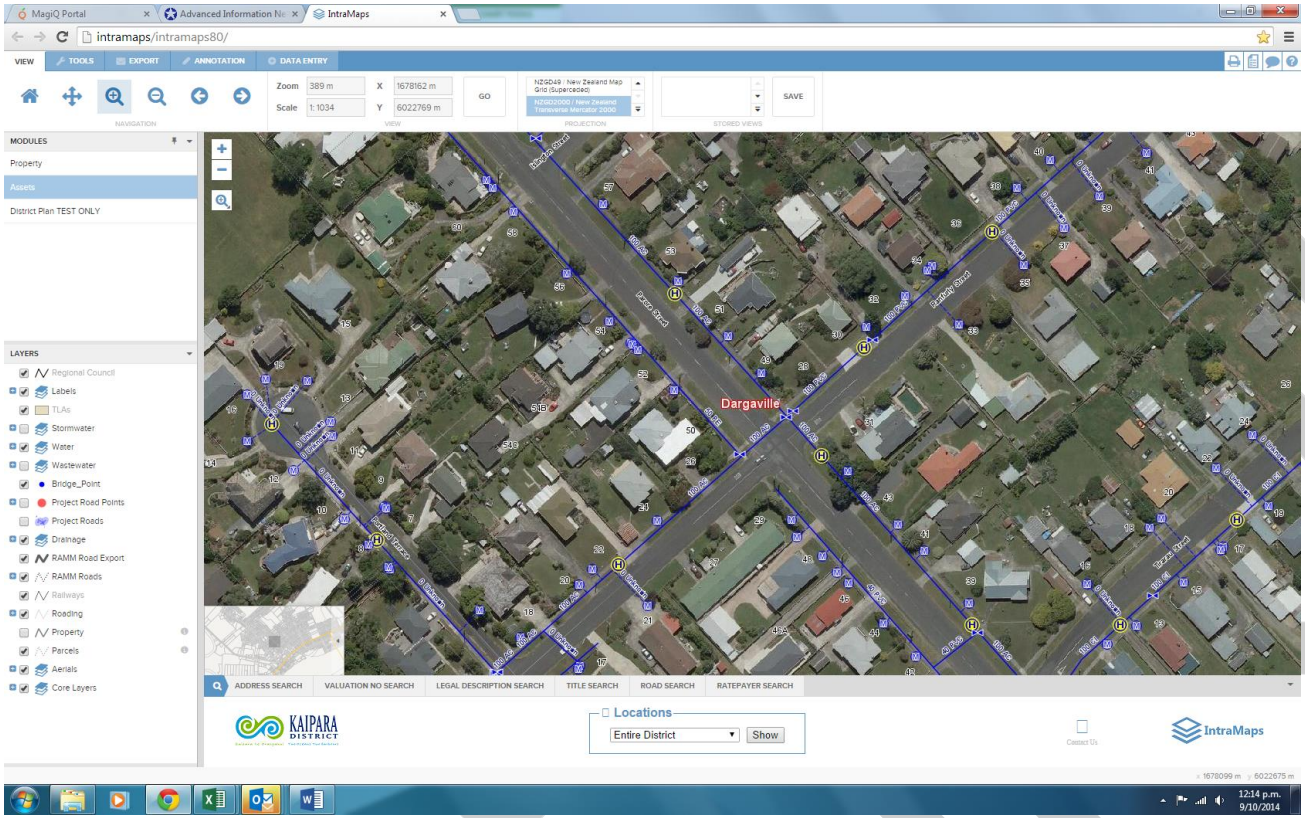


Figure 4-2: IntraMaps screenshot

The representation of the assets within this system is believed to be reasonably comprehensive, although gaps and inaccuracies in the data are known to exist. A data improvement task has been identified and included in the improvement plan to investigate and resolve the known anomalies where possible.

Improvements to data quality and identification/resolution of data anomalies will be resolved primarily through the maintenance contract and projects, when works are completed on the network.

The MapInfo system is externally hosted and is updated as as-built information is received, and passed on via the data maintenance process. As-built data is sourced from new development, capital works projects and from the Maintenance Contractor.

The data maintenance process is represented in Figure 4-3 below.

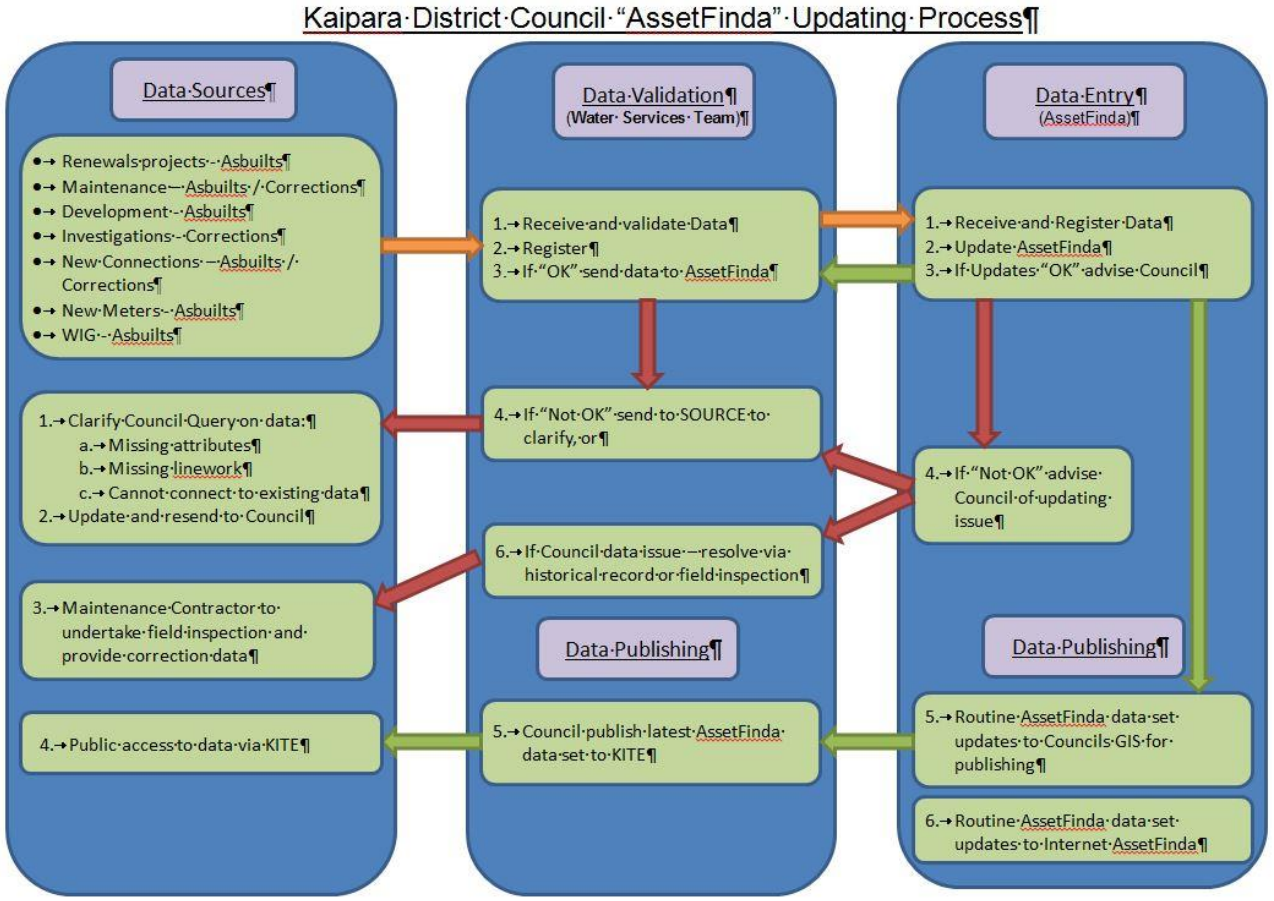


Figure 4-3: Data maintenance process

4.1.3 AssetFinda

The AssetFinda system is a MapInfo based tool used to record asset related information. This currently includes basic assed descriptors including; asset name, size, material, install date, invert levels, condition, and performance. The completeness of the data within these fields is highly variable and the accuracy cannot be currently qualified.

The system was recently upgraded from a table based system to be web enabled. The system is externally hosted and maintained.

A screenshot of the AssetFinda system is included in 4-4 below:

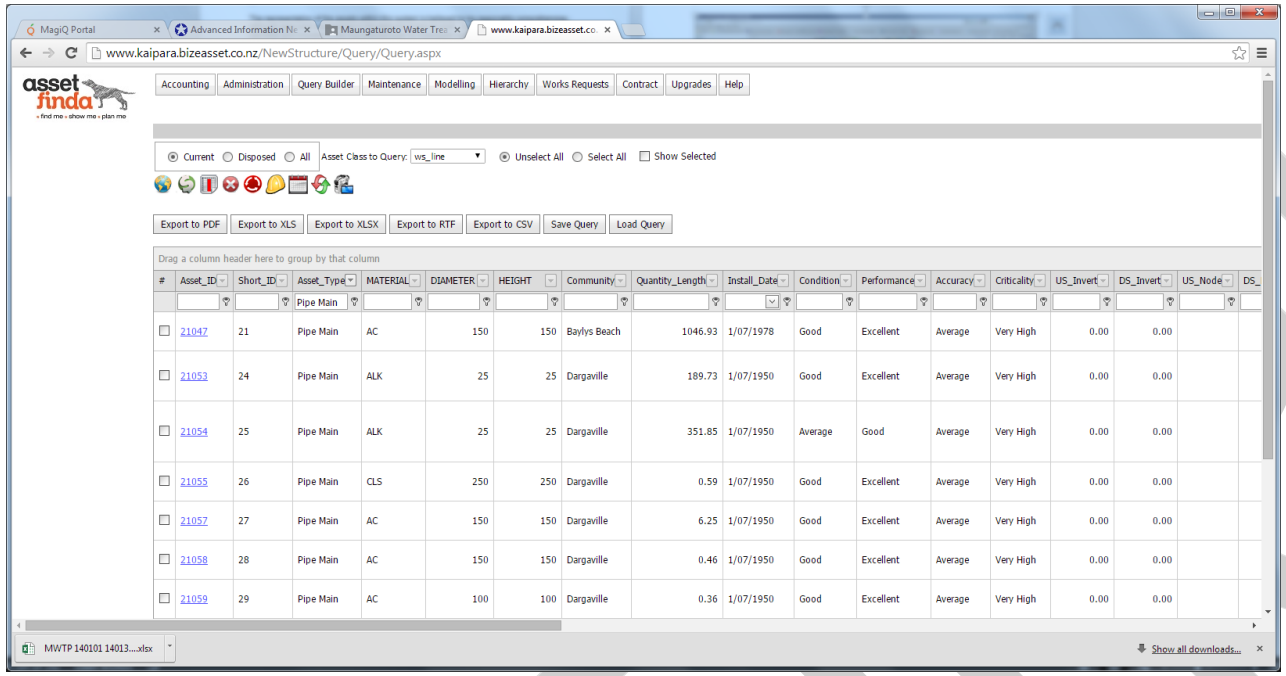


Figure 4-4: AssetFinda screenshot

The system has the ability to:

- undertake asset valuations and depreciation calculations for the water supply, wastewater and stormwater assets, however this functionality has yet to be implemented on Council's data;
- record various maintenance activities against the asset; however this capability has yet to be fully defined and implemented.

There is a need for this system to be further enabled and the supporting processes implemented to ensure appropriate maintenance activity data and condition and performance data collected from the field, can be uploaded in the system and used for monitoring the decline in asset serviceability and determination of timing for asset renewal.

An improvement item has been identified to enable the AssetFinda system to be modified for the recording of this information.

4.1.4 Telemetry

Council operates a GSM telemetry system that monitors various characteristics (flows, levels, pH, and turbidity) via daily email and SMS texts to operator's mobile phones. An overview of this system is provided in Figure 4-5 below.

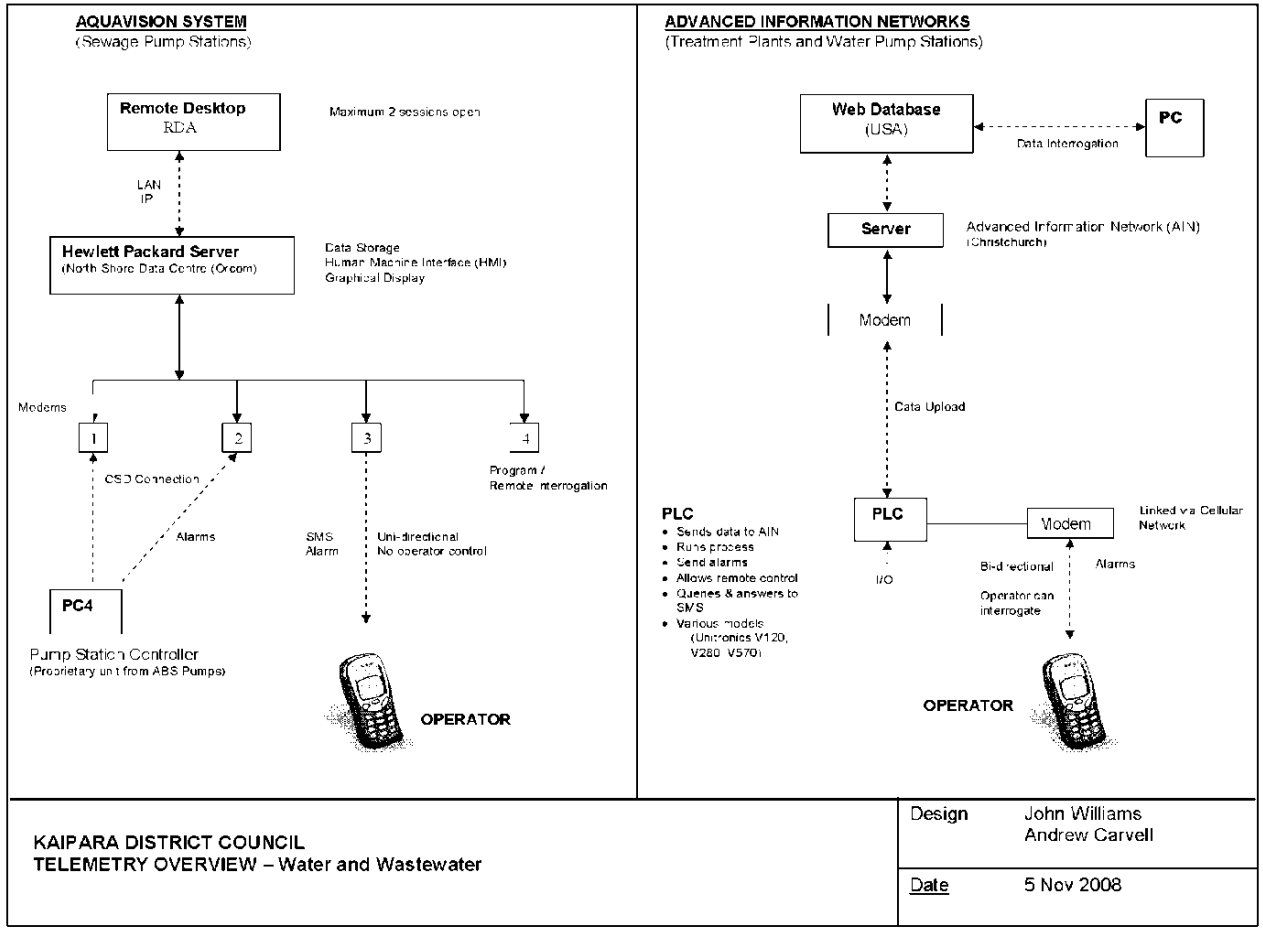


Figure 4-5: Aquavision telemetry system overview

Data generated through telemetry monitoring is used to demonstrate compliance of treatment plants with the NZDWS, resource consent compliance and to monitor the performance of the treatment systems, reservoir levels and pumping station levels.

The previous telemetry system was managed by an external consultant separate to the Maintenance Contractor which created ownership and responsibility issues.

The system also had reached the end of its economic life with numerous components not being supported.

The development of a telemetry upgrade and Implementation Plan was completed in 2014 with expert advice from Horizon Technology who provided a road map for implementation of a new system. Following a public tender process a new system was chosen, the new system will be implemented during 2013/2014 and 2014/2015.

4.2 Potential negative effects

The potential significant negative effects on the community of undertaking the water supply activity are detailed in Table 4-2 below. This AMP describes Council's water assets and details the practices used to manage those assets which helps to reduce possible negative effects and risks. Council mitigates these potential negative effects by a mix of asset management planning activities including; Asset development work, monitoring and testing, demand management initiatives and public education, including water conservation programmes.

Table 4-2: Potential significant negative effects

Activity	Effect on community well-being	Current controls
Malfunction of water assets	**Social** - Can cause disruption to supply. This can pose a public health risk and is frustrating to the local community. **Economic** - If the business relies on a water supply and has no built-in storage, then loss of water is a major inconvenience.	Council relies on the operation and maintenance contractor responding quickly to any malfunction.
Water sources	**Social** - Water is abstracted from surface water and groundwater sources. The removal of water from the natural environment results in the water being unavailable for other uses such as irrigation or recreational. **Economic** - Water is abstracted from surface water and groundwater sources. The removal of water from the natural environment results in the water being unavailable for other uses such as irrigation or recreational. **Environmental** - Water abstracted from surface water, may add strain on a river system which is already very low.	Council has drought management plans in place to guide water management during times of drought. Investigating new water sources and educating the public on water usage. Resource consents are and will be in place, so Council cannot exceed a certain limit.

Activity	Effect on community well-being	Current controls
The cost of providing the services	**Economic** – The cost of providing services is resulting in increases in rates	Council uses competitive tendering processes to achieve best value for money for works it undertakes.
Spillage of chemicals stored at water treatment plants	**Social** - The ratepayer expects Council to handle all chemicals in the correct manner. **Economic** - Businesses which rely on nearby watercourses may not be able to operate until any chemical spill is resolved. **Environmental** - Northland region is an environmentally sensitive area, any chemical spill will have a notable effect on the environment.	Appropriately trained staff and contractors. All chemicals are stored in the correct manner.
Climate change effects on water supply activity **Reduced rainfall, extreme rainfall events and increased temperature**	**Social** – Reduced security of supply (depending on water source) **Environmental** – Contamination of water supply.	

4.3 Risk management (including health and safety)

Council's Risk Management Policy and Framework has been recently updated and the latest version dated December 2012 is approved and supported by the Commissioners and the Executive Team.

Risk Management is undertaken to identify the specific business risks associated with the ownership and management of wastewater assets and determine the direct and indirect costs associated with these risks.

Council is familiar with the risks associated with each water supply scheme, however it has not previously formalised a risk management strategy. Council propose to generate such a strategy during the 2012/2013 financial year to systematically identify, assess and manage asset risks. The risk management strategy should hold a pivotal role in the prioritisation of asset funding.

A Council-wide approach to risk management would be valuable, to allow comparison of risk across different asset types. This would allow risks that impact on the water supply network to be compared against those impacting wastewater and roading assets for example. It would then be possible to balance all of Council's risks in a way that optimises expenditure and minimises Council's total risk exposure.

Council uses risk registers and action plans to monitor and control specific key risks. An example of the risk register template is included as Appendix C.

Table 4-3 identifies Council high and extreme risks, together with potential impact, current controls and an action plan to mitigate, minimise or manage the risk.

Table 4-3: Water supply high risks

Description		Potential impact	Current controls	Action plan
Asset group	**Risk**			
Events				
Reticulation	Earthquake causes extensive damage to reticulation.	Loss of stored, treated water due to large diameter pipe failure.	Nil	Fit emergency shut off valves to reservoirs.
Dargaville water sources	Drought causes insufficient water at intakes.	Water restrictions to loss of supply.	Waiatua Dam Rotu Intake	Investigate alternative, more secure source.
Dargaville raw water pipeline	Flooding causes erosion or debris build up at inlets.	Damage to intakes or pumping facilities rendering them inoperative.	Routine Inspections	Undertake inspections immediately after event.
	Flooding causes extensive damage at multiple bridge crossings.	Long term loss of water, very high cost to repair in reactive manner.	Nil	Investigate alternative, more secure source, check all bridge to water level clearances.
Glinks Gully raw water pipeline	Landslide damages raw water pipeline.	Loss of water supply to scheme for long period, high cost of reactive repairs.	Secondary intake	Investigate alternative route for pipeline.
Treatment and booster stations	External Power Failure causes shutdown of plant.	Reduction in plant/station output, temporary loss of supply.	Stored water	Provide alternative power supply (generator and external plug etcetera) at key locations.

Description		Potential impact	Current controls	Action plan
Asset group	Risk			
Infrastructure				
Dargaville raw water pipeline	Pipe failure over significant length of pipe.	Loss of water supply to scheme for long period, high cost of reactive repairs.	Annual inspection of pipeline	Investigate alternative, more secure source, provide extra cover to pipe where insufficient.
	Damage from external influences (farmers, stock etcetera) or singular pipe bridge failure.	Localised pipe failure, causes loss for supply for short period.		
Maungaturoto and Dargaville raw water pipelines	Vehicle loading on pipe, or possible damage from vehicles.	Premature catastrophic failure and resulting hazard to traffic, loss of supply.		Install pipeline markers ensure adequate cover is maintained. Investigate alternative, more secure source, undertake detailed condition assessment and failure prediction.
Maungaturoto headworks	Failure of Cattlemount intakes.	Loss of supply.	Can use Baldrock dam Supply	Renewal of infrastructure in poor condition.
Dargaville headworks	Embankment failure at Waiatua dam.	Loss of security of supply, environmental and financial impacts.	Five yearly inspection programme	Monitor bore water pressures in the embankment, ensure drawdown of water levels is possible.
All reticulation	Damage caused by contractors (related or unrelated).	Premature failure of assets results in unplanned maintenance and renewal costs.		Register for contractors working in area.
All reticulation	Poor quality of construction reduces life of network.	Increased renewal expenditure and lack of funding.	Designs are checked for compliance with Council's Engineering Quality	Assess cost and benefits of Quality Audit and acceptance testing of new assets prior to final

Description		Potential impact	Current controls	Action plan
Asset group	Risk			
			Standards.	acceptance.
All reservoirs	Leakage or failure due to deterioration.	Excessive water loss, loss of pressure or supply.	Periodic inspections	Monitor water loss levels, proactive restorative maintenance.
Operational	Operator sustains injury onsite, not able to call for help.	Serious injury occurs but no one aware of issue to respond.	Contractor Health and Safety Plan	Assess need to develop radio check in procedures.
Product				
Water sources	Contamination of source water from land use activities.	Degrading of water quality, increased treatment requirements, illness possible.		Investigate alternative, more secure source.
Raw or treated water	Malicious contamination of water supply.	Numerous cases of serious illness, medium term loss of supply.		Review security of potential contamination points, improve where possible.
Treated water	Contamination resulting from repair or incorrect commissioning of new works.	Localised illness.	Operator procedures and training.	Assess costs and benefits of audit and enforcement of procedures.
Treatment chemicals	Accidental release of chemicals (especially chlorine).	Environmental effects and health issues for operators and residents.	Some consents in place.	Assess chemical storage and handling procedures.
Resource consents	Unable to retain resource consent to extract water at current levels Discharge consent required for Maungaturoto WTP.	Loss of security of supply, reduced water quality from use of alternative sources, water restrictions Environmental effects and possible legal action from NRC.		Investigate alternative, more secure source.

4.4 Potential alternative methods of service delivery

The geographic location of Kaipara District could lend itself to shared Water Services with neighbouring Council's including Whangarei District Council (WDC) and Far North District Council (FNDC), or even Council Controlled Organisations (CCOs) such as Watercare Services Ltd in Auckland.

This could potentially reduce costs for both Kaipara District Council and Kaipara ratepayers by lowering operational and maintenance costs through consolidation of contractor staff between the two or three Councils.

Although this set-up may present cost-saving opportunities for Council, the process of amalgamating services regionally between multiple Council's, may take some time, and will likely require central government intervention to progress.

The proposed amalgamation with Far North District Council is put on hold and in the meantime, Kaipara District Council is looking for prospective shared services in the Region.

4.5 Health and Safety

Council has a Health and Safety (2007) policy aimed at providing and maintaining a safe and healthy working environment to Council employees, contractors and members of the public. With respect to asset management activities, it is particularly important to protect staff, contractors and the public from hazards associated with water supply assets.

5 Continuous improvement

The AMPs have been developed as a tool to help Council manage their assets, deliver the LOS and identify the expenditure and funding requirements of the activity.

Continuous improvements are necessary to ensure Council achieves the appropriate (and desired) level of activity management practice; delivering services in the most sustainable way while meeting the community's needs.

Council has demonstrated its commitment to asset management improvement over the last few years and wishes to meet core requirements as defined by the Office of the Auditor-General for the Water Supply AMP.

5.1 Improvement Plan

The Water Supply Improvement Plan is attached in Appendix B. Each improvement has been categorised by Asset Management Area (LOS, Data, Operations etcetera), a priority level given with forecasted completion date. Responsibility has been assigned for each improvement, along with a proposed budget allowance, identified as capital or operational expenditure.

Timing for completion of the activities may vary depending on Council priorities. This may result in re-prioritisation of activities from year to year.

The key improvements to be achieved in the next three years to facilitate achievement of core asset management activities and delivery of the water supply service are:

- understanding of required work to achieve DWSNZ 2005(08) compliance at all treatment plants;
- review and update the WSPs for all five water supply schemes;
- undertake a formal condition assessment of water supply assets (in alignment with wastewater and stormwater services) and feed into the renewals programme;
- undertake hydraulic modelling of the Dargaville, Maungaturoto and Ruawai water supply networks to identify information gaps and potential performance issues;
- review of data management procedures and including development of system for recording maintenance and costs at asset component level in the Asset Register.

Appendix A : Detailed financial tables

Financial Summary Spreadsheets - Water Supply 2014/25

TOTAL ALL SCHEMES Summary										
Year Ending June	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Year Number	1	2	3	4	5	6	7	8	9	10
TOTAL EXPENDITURE (CAPEX + OPEX)	**2,626,762**	**1,738,260**	**1,641,260**	**2,019,060**	**2,069,060**	**2,369,060**	**2,819,060**	**2,939,060**	**3,139,060**	**3,414,060**
Operations	**603,834**	**519,272**	**434,272**	**460,072**	**420,072**	**420,072**	**460,072**	**420,072**	**420,072**	**460,072**
Control and Operations	398,609	359,272	359,272	399,272	359,272	359,272	399,272	359,272	359,272	399,272
AMP Improvement Plan	205,225	160,000	75,000	60,800	60,800	60,800	60,800	60,800	60,800	60,800
Valuation of assets	0	0	0	0	0	0	0	0	0	0
Maintenance	**455,428**	**266,488**	**266,488**	**266,488**	**266,488**	**266,488**	**266,488**	**266,488**	**266,488**	**266,488**
Maintenance - Supply	0	0	0	0	0	0	0	0	0	0
Maintenance - Reticulation	447,966	259,026	259,026	259,026	259,026	259,026	259,026	259,026	259,026	259,026
Maintenance - Telemetry	0	0	0	0	0	0	0	0	0	0
Maintenance - Buildings	7,249	7,249	7,249	7,249	7,249	7,249	7,249	7,249	7,249	7,249
Maintenance - Grounds & Drains	213	213	213	213	213	213	213	213	213	213
Water Supply Agreement	83,000	83,000	83,000	83,000	83,000	83,000	83,000	83,000	83,000	83,000
Reimbursement from fonterra for agreement costs	-83,000	-83,000	-83,000	-83,000	-83,000	-83,000	-83,000	-83,000	-83,000	-83,000
Total OPEX	1,059,262	785,760	700,760	726,560	686,560	686,560	726,560	686,560	686,560	726,560
CAPX Renewals	**1,073,000**	**940,000**	**928,000**	**1,220,000**	**1,370,000**	**1,670,000**	**2,080,000**	**2,240,000**	**2,440,000**	**2,675,000**
All Asset Groups	840,000	840,000	828,000	870,000	870,000	920,000	1,030,000	1,090,000	1,290,000	1,425,000
AMP Improvement Plan	10,000	0	0	0	0	0	0	0	0	0
Renewal Backlog	50,000	100,000	100,000	350,000	500,000	750,000	1,050,000	1,150,000	1,150,000	1,250,000
Differred Renewal from 2014/15	53,000	0	0	0	0	0	0	0	0	0
Carry Forward	120,000	0	0	0	0	0	0	0	0	0
CAPX LOS	**494,500**	**12,500**	**12,500**	**72,500**	**12,500**	**12,500**	**12,500**	**12,500**	**12,500**	**12,500**
Dargaville & Baylys Beach	422,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Glinks Gully	1,500	1,500	1,500	21,500	1,500	1,500	1,500	1,500	1,500	1,500
Ruawai	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Maungaturoto	68,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Mangawhai	1,500	1,500	1,500	41,500	1,500	1,500	1,500	1,500	1,500	1,500
CAPX Growth	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
All asset groups	0	0	0	0	0	0	0	0	0	0
Total CAPEX	**1,567,500**	**952,500**	**940,500**	**1,292,500**	**1,382,500**	**1,682,500**	**2,092,500**	**2,252,500**	**2,452,500**	**2,687,500**

Dargaville & Baylys Beach Summary										
Year Ending June	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Year Number	1	2	3	4	5	6	7	8	9	10
TOTAL EXPENDITURE (CAPEX + OPEX)	**1,884,362**	**1,224,611**	**1,156,061**	**1,423,361**	**1,553,361**	**1,803,361**	**2,123,361**	**2,203,361**	**2,203,361**	**2,323,361**
Operations	**300,499**	**260,748**	**204,198**	**209,498**	**189,498**	**189,498**	**209,498**	**189,498**	**189,498**	**209,498**
Control and Operations	210,499	169,498	169,498	189,498	169,498	169,498	189,498	169,498	169,498	189,498
Database Management	*19,000*	*19,000*	*19,000*	*19,000*	*19,000*	*19,000*	*19,000*	*19,000*	*19,000*	*19,000*
Engineering Costs	*5,000*	*12,000*	*12,000*	*32,000*	*12,000*	*12,000*	*32,000*	*12,000*	*12,000*	*32,000*
Insurance	*7,462*	*7,462*	*7,462*	*7,462*	*7,462*	*7,462*	*7,462*	*7,462*	*7,462*	*7,462*
NRC Resource Consent	*4,264*	*4,264*	*4,264*	*4,264*	*4,264*	*4,264*	*4,264*	*4,264*	*4,264*	*4,264*
Power & Water	*52,148*	*52,148*	*52,148*	*52,148*	*52,148*	*52,148*	*52,148*	*52,148*	*52,148*	*52,148*
Plant Operations	*74,624*	*74,624*	*74,624*	*74,624*	*74,624*	*74,624*	*74,624*	*74,624*	*74,624*	*74,624*
Chemicals	*48,001*									
AMP Improvements - Opex	90,000	91,250	34,700	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Valuation of assets										
Maintenance	**318,863**	**208,863**	**208,863**	**208,863**	**208,863**	**208,863**	**208,863**	**208,863**	**208,863**	**208,863**
Maintenance - Supply										
Maintenance - Reticulation	313,000	203,000	203,000	203,000	203,000	203,000	203,000	203,000	203,000	203,000
Maintenance - Telemetry										
Maintenance - Buildings	5,650	5,650	5,650	5,650	5,650	5,650	5,650	5,650	5,650	5,650
Maintenance - Grounds / Drains	213	213	213	213	213	213	213	213	213	213
Water Supply Agreement	-	-	-	-	-	-	-	-		
Total OPEX	619,362	469,611	413,061	418,361	398,361	398,361	418,361	398,361	398,361	418,361
CAPX Renewals	**843,000**	**750,000**	**738,000**	**1,000,000**	**1,150,000**	**1,400,000**	**1,700,000**	**1,800,000**	**1,800,000**	**1,900,000**
All Asset Groups - Annual Renewal / Depreciation	650,000	650,000	638,000	650,000	650,000	650,000	650,000	650,000	650,000	650,000
AMP Improvement Plan	-	-	-	-	-	-	-	-	-	-
Renewal Backlog	50,000	100,000	100,000	350,000	500,000	750,000	1,050,000	1,150,000	1,150,000	1,250,000
Differred Renewal from 2014/15	53,000	0	0	0	0	0	0	0	0	0
Carry Forward	90,000	0	0	0	0	0	0	0	0	0
CAPX LOS	**422,000**	**5,000**	**5,000**	**5,000**	**5,000**	**5,000**	**5,000**	**5,000**	**5,000**	**5,000**
Pipeline Waiatua Dam to Rotu PS	-	-	-	-	-	-	-	-	-	-
Take consent compliance	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Compliance Drinking water standards	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Manage ex Water Source	207,000	0	0	0	0	0	0	0	0	0
Differred LOS from 2014/15	210,000	0	0	0	0	0	0	0	0	0
CAPX Growth	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Additional Capacity for Growth - Council Contribution										
Total CAPEX	1,265,000	755,000	743,000	1,005,000	1,155,000	1,405,000	1,705,000	1,805,000	1,805,000	1,905,000

Glinks Gully Summary										
Year Ending June	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Year Number	1	2	3	4	5	6	7	8	9	10
TOTAL EXPENDITURE (CAPEX + OPEX)	**28,341**	**21,717**	**16,967**	**52,467**	**27,467**	**27,467**	**32,467**	**32,467**	**37,467**	**47,467**
Operations	**20,978**	**14,354**	**9,604**	**15,104**	**10,104**	**10,104**	**15,104**	**10,104**	**10,104**	**15,104**
Control and Operations	8,603	8,104	8,104	13,104	8,104	8,104	13,104	8,104	8,104	13,104
Database Management	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*
Engineering Cost	-	*1,250*	*1,250*	*6,250*	*1,250*	*1,250*	*6,250*	*1,250*	*1,250*	*6,250*
Insurance	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*
NRC Resource Consent										
Plant Operations	*5,399*	*3,650*	*3,650*	*3,650*	*3,650*	*3,650*	*3,650*	*3,650*	*3,650*	*3,650*
Chemicals	*533*	*533*	*533*	*533*	*533*	*533*	*533*	*533*	*533*	*533*
Power & Energy	*539*	*539*	*539*	*539*	*539*	*539*	*539*	*539*	*539*	*539*
AMP Improvements - Opex	12,375	6,250	1,500	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Valuation of assets										
Maintenance	**5,863**	**5,863**	**5,863**	**5,863**	**5,863**	**5,863**	**5,863**	**5,863**	**5,863**	**5,863**
Maintenance - Supply										
Maintenance - Reticulation	5,863	5,863	5,863	5,863	5,863	5,863	5,863	5,863	5,863	5,863
Maintenance - Telemetry										
Maintenance - Buildings										
Maintenance - Grounds / Drains										
Water Supply Agreement	-	-	-	-	-	-	-	-	-	-
Total OPEX	26,841	20,217	15,467	20,967	15,967	15,967	20,967	15,967	15,967	20,967
CAPX Renewals	**-**	**-**	**-**	**10,000**	**10,000**	**10,000**	**10,000**	**15,000**	**20,000**	**25,000**
All Asset Groups - Annual Renewal / Depreciation	-	-	-	10,000	10,000	10,000	10,000	15,000	20,000	25,000
AMP Improvement Plan	-	-	-	-	-	-	-	-	-	-
Renewal Backlog										
CAPX LOS	**1,500**	**1,500**	**1,500**	**21,500**	**1,500**	**1,500**	**1,500**	**1,500**	**1,500**	**1,500**
NZDWS complaince	-	-	-	20,000	-	-	-	-	-	-
Water take consent conmpliance	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
CAPX Growth	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	-	-	-	-	-	-	-	-	-	-
Total CAPEX	1,500	1,500	1,500	31,500	11,500	11,500	11,500	16,500	21,500	26,500

Ruawai Summary										
Year Ending June	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Year Number	1	2	3	4	5	6	7	8	9	10
TOTAL EXPENDITURE (CAPEX + OPEX)	**165,893**	**139,001**	**143,801**	**153,801**	**153,801**	**153,801**	**163,801**	**163,801**	**203,801**	**228,801**
Operations	**98,101**	**74,501**	**79,301**	**79,301**	**79,301**	**79,301**	**79,301**	**79,301**	**79,301**	**79,301**
Control and Operations	54,501	54,501	54,501	54,501	54,501	54,501	54,501	54,501	54,501	54,501
Database Management	*8,528*	*8,528*	*8,528*	*8,528*	*8,528*	*8,528*	*8,528*	*8,528*	*8,528*	*8,528*
Engineering Cost	*1,000*	*1,000*	*1,000*	*1,000*	*1,000*	*1,000*	*1,000*	*1,000*	*1,000*	*1,000*
Insurance	*959*	*959*	*959*	*959*	*959*	*959*	*959*	*959*	*959*	*959*
NRC Resource Consent	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*
Power & Energy	*18,855*	*18,855*	*18,855*	*18,855*	*18,855*	*18,855*	*18,855*	*18,855*	*18,855*	*18,855*
Plant Operations	*21,321*	*21,321*	*21,321*	*21,321*	*21,321*	*21,321*	*21,321*	*21,321*	*21,321*	*21,321*
Chemicals	*2,772*	*2,772*	*2,772*	*2,772*	*2,772*	*2,772*	*2,772*	*2,772*	*2,772*	*2,772*
AMP Improvements - Opex	43,600	20,000	24,800	24,800	24,800	24,800	24,800	24,800	24,800	24,800
Valuation of assets										
Maintenance	**26,292**	**23,000**	**23,000**	**23,000**	**23,000**	**23,000**	**23,000**	**23,000**	**23,000**	**23,000**
Maintenance - Supply										
Maintenance - Reticulation	26,292	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000
Maintenance - Telemetry										
Maintenance - Buildings	1,066	1,066	1,066	1,066	1,066	1,066	1,066	1,066	1,066	1,066
Maintenance - Grounds / Drains										
Water Supply Agreement	-	-	-	-	-	-	-	-	-	-
Total OPEX	124,393	97,501	102,301	102,301	102,301	102,301	102,301	102,301	102,301	102,301
CAPX Renewals	**40,000**	**40,000**	**40,000**	**50,000**	**50,000**	**50,000**	**60,000**	**60,000**	**100,000**	**125,000**
All Asset Groups - Annual Renewal / Depreciation	40,000	40,000	40,000	50,000	50,000	50,000	60,000	60,000	100,000	125,000
AMP Improvement Plan	-	-	-	-	-	-	-	-	-	-
Renewal Backlog										
CAPX LOS	**1,500**	**1,500**	**1,500**	**1,500**	**1,500**	**1,500**	**1,500**	**1,500**	**1,500**	**1,500**
NZDWS compliance	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
CAPX Growth	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Additional Capacity for Growth - Council Contribution	0	-	-	-	-	-	-	-	-	-
Total CAPEX	41,500	41,500	41,500	51,500	51,500	51,500	61,500	61,500	101,500	126,500

Maungaturoto Summary										
Year Ending June	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Year Number	1	2	3	4	5	6	7	8	9	10
TOTAL EXPENDITURE (CAPEX + OPEX)	**469,300**	**308,752**	**290,952**	**300,952**	**290,952**	**340,952**	**450,952**	**490,952**	**640,952**	**750,952**
Operations	**144,619**	**134,719**	**116,919**	**126,919**	**116,919**	**116,919**	**126,919**	**116,919**	**116,919**	**126,919**
Control and Operations	99,219	104,719	104,719	114,719	104,719	104,719	114,719	104,719	104,719	114,719
Database Management	*13,859*	*13,859*	*13,859*	*13,859*	*13,859*	*13,859*	*13,859*	*13,859*	*13,859*	*13,859*
Engineering Cost	*2,000*	*7,500*	*7,500*	*17,500*	*7,500*	*7,500*	*17,500*	*7,500*	*7,500*	*17,500*
Insurance	-	-	-	-	-	-	-	-	-	-
NRC Resource Consent										
Power & Energy	*49,993*	*49,993*	*49,993*	*49,993*	*49,993*	*49,993*	*49,993*	*49,993*	*49,993*	*49,993*
Plant Operations	*21,321*	*21,321*	*21,321*	*21,321*	*21,321*	*21,321*	*21,321*	*21,321*	*21,321*	*21,321*
Chemicals	*12,046*	*12,046*	*12,046*	*12,046*	*12,046*	*12,046*	*12,046*	*12,046*	*12,046*	*12,046*
AMP Improvements - Opex	45,400	*30,000*	*12,200*	*12,200*	*12,200*	*12,200*	*12,200*	*12,200*	*12,200*	*12,200*
Valuation of assets										
Maintenance	**96,681**	**21,033**	**21,033**	**21,033**	**21,033**	**21,033**	**21,033**	**21,033**	**21,033**	**21,033**
Maintenance - Supply										
Maintenance - Reticulation	96,148	20,500	20,500	20,500	20,500	20,500	20,500	20,500	20,500	20,500
Maintenance - Telemetry										
Maintenance - Buildings	533	533	533	533	533	533	533	533	533	533
Maintenance - Grounds / Drains										
Water Supply Agreement										
Total OPEX	241,300	155,752	137,952	147,952	137,952	137,952	147,952	137,952	137,952	147,952
CAPX Renewals	**160,000**	**150,000**	**150,000**	**150,000**	**150,000**	**200,000**	**300,000**	**350,000**	**500,000**	**600,000**
All Asset Groups - Annual Renewal / Depreciation	150,000	150,000	150,000	150,000	150,000	200,000	300,000	350,000	500,000	600,000
AMP Improvement Plan	10,000	-	-	-	-	-	-	-	-	-
Renewal Backlog										
CAPX LOS	**68,000**	**3,000**	**3,000**	**3,000**	**3,000**	**3,000**	**3,000**	**3,000**	**3,000**	**3,000**
NZDWS compliance	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Water take consent compliance	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Water meters take consent compliance	25,000	-	-	-	-	-	-	-	-	-
Alarm and generator	10,000	-	-	-	-	-	-	-	-	-
New Backflow valves and backflow	30,000	0	0	0	0	0	0	0	0	0
CAPX Growth	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Additional Capacity for Growth - Council Contribution	0	0	0							
Total CAPEX	228,000	153,000	153,000	153,000	153,000	203,000	303,000	353,000	503,000	603,000

Mangawhai Summary										
Year Ending June	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Year Number	1	2	3	4	5	6	7	8	9	10
TOTAL EXPENDITURE (CAPEX + OPEX)	**77,800**	**43,113**	**32,413**	**87,413**	**42,413**	**42,413**	**47,413**	**47,413**	**52,413**	**62,413**
Operations	**39,637**	**34,950**	**24,250**	**29,250**	**24,250**	**24,250**	**29,250**	**24,250**	**24,250**	**29,250**
Control and Operations	25,787	22,450	22,450	27,450	22,450	22,450	27,450	22,450	22,450	27,450
Database Management	-	-	-	-	-	-	-	-	-	-
Engineering Cost	*539*	*5,300*	*5,300*	*10,300*	*5,300*	*5,300*	*10,300*	*5,300*	*5,300*	*10,300*
Insurance	*107*	*107*	*107*	*107*	*107*	*107*	*107*	*107*	*107*	*107*
NRC Resource Consent	-	-	-	-	-	-	-	-	-	-
Power & Energy	*10,016*	*15,793*	*15,793*	*15,793*	*15,793*	*15,793*	*15,793*	*15,793*	*15,793*	*15,793*
Plant Operations	*15,125*	*1,250*	*1,250*	*1,250*	*1,250*	*1,250*	*1,250*	*1,250*	*1,250*	*1,250*
Chemicals										
AMP Improvements - Opex	13,850	12,500	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Valuation of assets										
Maintenance	**6,663**	**6,663**	**6,663**	**6,663**	**6,663**	**6,663**	**6,663**	**6,663**	**6,663**	**6,663**
Maintenance - Supply										
Maintenance - Reticulation	6,663	6,663	6,663	6,663	6,663	6,663	6,663	6,663	6,663	6,663
Maintenance - Telemetry										
Maintenance - Buildings										
Maintenance - Grounds / Drains										
Water Supply Agreement	-	-	-	-	-	-	-	-	-	-
Total OPEX	46,300	41,613	30,913	35,913	30,913	30,913	35,913	30,913	30,913	35,913
CAPX Renewals	**30,000**	**-**	**-**	**10,000**	**10,000**	**10,000**	**10,000**	**15,000**	**20,000**	**25,000**
All Asset Groups - Annual Renewal / Depreciation	0	0	0	10,000	10,000	10,000	10,000	15,000	20,000	25,000
AMP Improvement Plan	-	-	-	-	-	-	-	-	-	-
Renewal Backlog	0	0	0	0	0	0	0	0	0	0
Carry Forward	30,000	0	0	0	0	0	0	0	0	0
CAPX LOS	**1,500**	**1,500**	**1,500**	**41,500**	**1,500**	**1,500**	**1,500**	**1,500**	**1,500**	**1,500**
Water Treatment (DWS Compliance - EST ONLY)	0	0	-	40,000	-	-	-	-	-	-
NZDWS compliance	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
CAPX Growth	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Additional Capacity for Growth - Council Contribution	-	-	-	-	-	-	-	-	-	-
Total CAPEX	31,500	1,500	1,500	51,500	11,500	11,500	11,500	16,500	21,500	26,500

Appendix B : Improvement Plan

Asset Management Improvement Plan

Executive Summary

Continuous improvements are necessary as Kaipara District Council continues to achieve the appropriate (and desired) level of activity management practice; delivering services in the most sustainable way which meeting the community's needs.

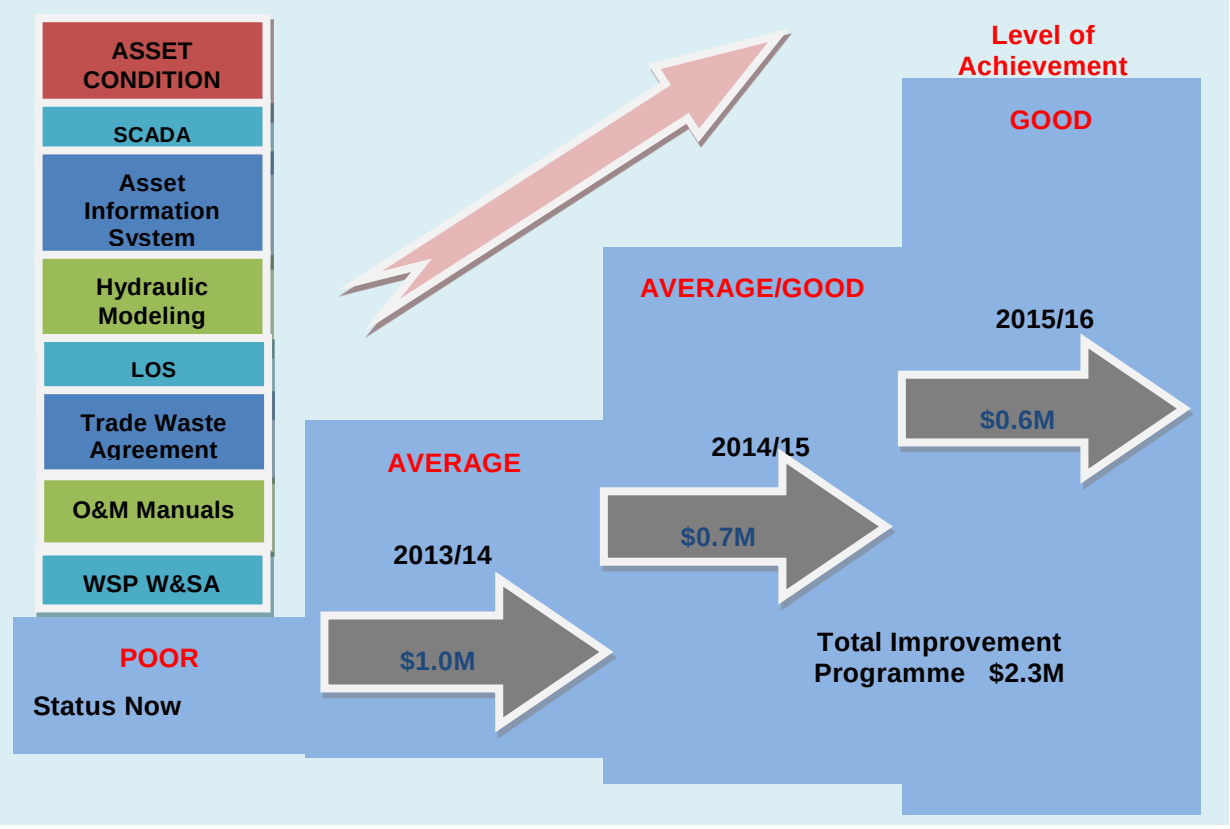
The Improvement Plan has been developed, identifying the highest priority activities to undertake in next 1-3 years to improve level of activity management practice in Three Waters as follow:

- Condition Assessment
- SCADA System
- Asset Information System(AIMS)
- Hydraulic Modeling
- Level of Service (LOS)
- Trade Waste Agreements
- O&M Manual
- Water Safety Plan (WSP)
- Water & Sanitary Assessment (W&SA)

This Improvement Plan was compared with the available funding in the budget to identify any significant funding gaps. Funding gaps were identified in Water Supply and Wastewater in 2013/2014; however they are not significant and also some excess funding is available in subsequent years. As the cost estimates were only an approximation i.e. subject to fluctuation, no efforts were made to reach an exact match of the project cost against the available funding. Most probably the costing would go up and therefore it is good to have a contingency sum in the budget.

A firm commitment is needed to deliver this Plan as it would elevate the present "Poor" status of the above activities to a "Good" status in three years' time as demonstrated in the diagram below.

Improvement Plan of Three Waters



Improvement Plan summary

Asset group	Estimated project cost ($)	Programme		
		2013/2014	2014/2015	2015/2016
Water Supply				
Condition Assessment of water supply	312,000	123,000	59,000	70,000
Establishment of Telemetry/SCADA System in water supply systems	190,000	90,000	70,000	30,000
Establishment of Asset Information System for water supply	150,000	50,000	50,000	50,000
Hydraulic Modelling Water Supply	110,000	70,000	35,000	35,000
Review LOS of water supply	30,000	5,000	25,000	0
O&M Manuals	20,000	20,000	0	0
Water Safety Plan	30,000	30,000	0	0
Update Water and Sanitary Assessment	30,000	0	0	30,000
Total for Water	**$872,000**	**$388,000**	**$239,000**	**$215,000**
Wastewater				
Condition Assessment of wastewater	231,000	79,000	73,000	80,000
Establishment of Telemetry/SCADA System in wastewater systems	155,000	80,000	50,000	25,000
Establishment of Asset Information System for wastewater	175,000	75,000	50,000	50,000
Hydraulic Modelling Wastewater	110,000	70,000	35,000	35,000
Review LOS of wastewater	20,000	10,000	10,000	0
Trade Waste Agreements	20,000	20,000	0	0
O&M Manual	20,000	20,000	0	0
Update Water and Sanitary Assessment	30,000	0	0	30,000
Total for Wastewater	**$761,000**	**$354,000**	**$218,000**	**$220,000**
Stormwater				
Condition Assessment of Stormwater	**122,800**	75,100	51,100	0
Establishment of Asset Information System for stormwater	177,000	100,000	50,000	22,000
Review LOS of stormwater including Stormwater Management Plans	270,000	115,000	90,000	65,000
Stormwater Catchment/Flood Models	60,000	0	30,000	30,000
Total for Stormwater	**$629,800**	**$290,100**	**$221,100**	**$117,000**
GRAND TOTAL	**$2,262,800**	**$1,032,100**	**$678,100**	**$552,000**

Budget/funding summary for Improvement Plan

Asset group	Total funding ($)	Programme		
		2013/2014	2014/2015	2015/2016
Total for Water	870,500	355,000	248,000	267,500
Total for Wastewater	836,267	344,375	248,796	243,096
Total for Stormwater	715,000	320,000	272,500	122,500
GRAND TOTAL	$2,421,767	**$1,019,375**	**$769,296**	**$633,096**

FUNDING GAP (-)/EXCESS

Asset Group		Programme		
		2013/2014	2014/2015	2015/2016
Water Supply		$-33,000	$9,000	$52,500
Wastewater		$-9,625	$30,796	$23,096
Stormwater		$29,900	$51,400	$5,500

Appendix C :Risk Register

ASSET DESCRIPTION	Category	Community	Quantity	Consequence of Failure	Likelihood of Failure	Risk
Dargaville		Dargaville				
Waiparataniwha Intake	Source	Dargaville	3	Severe	Unlikely	Moderate
Rotu Intake	Source	Dargaville	1	Severe	Possible	Moderate
Raw Water Line	Raw Water Line	Dargaville	25kms	Major	Likely	High
Raw Water Booster Pumps	Booster Pumps Raw Water	Dargaville	2	Severe	Moderate	Low
Waiatua Dam	Source	Dargaville	1	Minor	Unlikely	Low
Treatment Plant	Plant	Dargaville	1	Catastrophic	Likely	High
Chemical Dosing Pumps	Plant	Dargaville	6	Minor	Possible	Low
Sand Filters	Plant	Dargaville	4	Minor	Possible	Low
Clarifier	Plant	Dargaville	2	Minor	Possible	Low
Post pH/Chlorine Disinfection	Plant	Dargaville	3	Minor	Possible	Low
Telemetry/Electrical	Plant	Dargaville	1	Major	Likely	High
DWTP Reservoirs	Reservoir Treated Water	Dargaville	2	Severe	Likely	High
Baylys Reservoir	Reservoir Treated Water	Dargaville	1	Catastrophic	Moderate	High
Baylys Supply line	Treated Water Line	Dargaville	8kms	Major	Likely	High
Booster Pumpstations Treated Water	Booster Pumps Treated Water	Dargaville	one	Major	Moderate	High
(Reticulation > 50mm)	Reticulation	Dargaville	50kms	Minor	Possible	Low
Trunk Main	Trunk Main	Dargaville	2	Severe	Likely	High
Extend assessment to non-critical assets		Dargaville				
Maungaturoto		Maungaturoto				
Intake	Source	Maungaturoto	3	Minor	Possible	Low
Raw Water Line	Raw Water Line	Maungaturoto	10kms	Major	Likely	High
Baldrock Pump Station/Pipeline	Booster Pumps Raw Water	Maungaturoto	1	Minor	Possible	Low
Piroa Pump Station/Pipeline	Booster Pumps Raw Water	Maungaturoto	3kms	Minor	Possible	Low
Raw Water Reservoir	Reservoir Raw water	Maungaturoto	1	Major	Possible	High

ASSET DESCRIPTION	Category	Community	Quantity	Consequence of Failure	Likelihood of Failure	Risk
Treated Water Reservoir	Reservoir Treated Water	Maungaturoto	3	Major	Possible	High
Reticulation	Reticulation	Maungaturoto	12kms	Minor	Possible	Low
Treatment Plant	Plant	Maungaturoto	1	Catastrophic	Likely	High
Clarifier	Plant	Maungaturoto	1	Minor	Possible	Low
Filters	Plant	Maungaturoto	3	Minor	Possible	Low
Chemical Dosing	Plant	Maungaturoto	6	Minor	Possible	Low
pH correction/ Chlorine Disinfection	Plant	Maungaturoto	2	Minor	Possible	Low
UV Disinfection	Plant	Maungaturoto	2	Minor	Possible	Low
Treated Water Reservoirs	Reservoir Treated Water	Maungaturoto	3	Minor	Possible	Low
Pumps (duty assist)	Plant	Maungaturoto	5	Minor	Possible	Low
Rising Main (Griffin Road)	Rising Main	Maungaturoto	1km	Minor	Possible	Low
Trunk Main Plant to Griffin Road	Trunk Main	Maungaturoto	3kms	Severe	Likely	High
Trunk Main to Railway Village	Trunk Main	Maungaturoto	2kms	Major	Likely	High
Ruawai		Ruawai				
Bores	Source	Ruawai	2			
Rising Main	Rising Main	Ruawai	500m	Major	Likely	High
Raw Water Reservoir	Reservoir Raw water	Ruawai	1			
Treatment Plant	Plant	Ruawai	1	Catastrophic	Likely	High
Chemical Dosing	Plant	Ruawai	6	Minor	Possible	Low
Filtration	Plant	Ruawai	3	Minor	Possible	Low
Cartridge Filtration	Plant	Ruawai	2	Minor	Possible	Low
Booster Pump	Booster Pumps Treated Water	Ruawai	1	Severe	Likely	High
Reticulation	Reticulation	Ruawai	6.5kms	Minor	Possible	Low
Reservoirs	Reservoir Treated Water	Ruawai	1	Catastrophic	Possible	High
Glinks Gully (outside peak holiday period)		Glinks Gully				
Intakes	Source	Glinks Gully	3	Minor	Possible	Low
Raw Water Line	Raw Water Line	Glinks Gully	2kms	Minor	Possible	Low

ASSET DESCRIPTION	Category	Community	Quantity	Consequence of Failure	Likelihood of Failure	Risk
Raw Water Reservoir	Reservoir Raw water	Glinks Gully	1	Major	Likely	High
Treatment Plant	Plant	Glinks Gully	1	Major	Likely	High
Filters	Plant	Glinks Gully	4	Minor	Possible	Low
UV Disinfection	Plant	Glinks Gully	2	Minor	Possible	Low
Dosing	Plant	Glinks Gully	2	Minor	Possible	Low
Reservoirs	Reservoir Treated Water	Glinks Gully	4	Minor	Possible	Low
Reticulation	Reticulation	Glinks Gully	1.4kms	Minor	Possible	Low
Mangawhai (outside peak holiday period)		Mangawhai				
Bores	Source	Mangawhai	1	Severe	Moderate	Significant
Rising Main	Rising Main	Mangawhai	1kms	Severe	Moderate	Significant
Reservoirs	Reservoir Treated Water	Mangawhai	2	Severe	Moderate	Significant
Reticulation	Reticulation	Mangawhai	3kms	Severe	Moderate	Significant
Booster pump	Booster Pumps Treated Water	Mangawhai	1	Severe	Moderate	Significant

Appendix D: Resource Consent Register

Kaipara District Council Resource Consent Register – Water Supply

Consent Number	Scheme	Details	Expiry Date
8134	Dargaville/Baylys	Rotu water take	2033
8369	Dargaville/Baylys	Waiatua Dam	2033
No consent	Dargaville/Baylys	Waiparataniwha water take	Consent issued 2014 expires 2034
4702	Dargaville/Baylys	Taharoa water take	2028
7582	Maungaturoto	Piroa Stream water take	2001 Awaiting new consent conditions March 2014
3815	Maungaturoto	Brynderwyn Stream water take	2001 Relinquished consent as part of 2014 consent renewal process.
9888	Maungaturoto	Cattlemount Stream and Spring water take	2001 Awaiting new consent conditions March 2014
9889	Maungaturoto	Boar Hill Stream water take	2001 Awaiting new consent conditions March 2014
2187	Ruawai	Water take	2030
7944	Glinks Gully	Water take	2022
8032	Mangawhai	Camp ground water take	2025

Notes

Kaipara District Council Resource Consent Register – Backwash Discharge

Consent Number	Scheme	Details	Expiry Date
CON20010510701	Ruawai	To discharge backwash water from the WTP to an unnamed tributary of the Wairoa River	30 June 2046
1383	Maungaturoto	Discharge of backwash from WTP New consent application is on hold under Section 92 request. Final investigations and feedback underway March 2014.	Expired, renewal process underway
No consent	Dargaville/Baylys	Council is currently working on the consent application as part of the Waiparataniwha water take application process (see Note 1 above), and planning to have the application lodged in April/May 2013.	Consent issued 2014 expires 2034
No consent	Glinks Gully	To be applied for	--

Appendix E: Historic Levels of Service

Performance Measures	Data Source						
	2009/10 AP Target	2009/10 AR - Actual	2010/11 AP Target	2010/11 AR Actual	2011/12 AP Target	2011/12 AR Actual	2012/2022 LTP 2016/2022 Target
Customer Levels of Service							
Percentage of customers satisfied with water (NRB).	80%	Not Achieved. 79% of those surveyed were satisfied with the Water Services provided.	80%	82%	80%	91%	82%
Compliance with NZ Drinking Water Standards (2000 – 2005)							
Dargaville Plant							
E coli	C	Achieved.	C	C	C	C	C
Chemical	-	Not measured due to change in Ministry of Health reporting.	C	C	C	C	C
Glinks Gully Plant							
E coli	C	Achieved.	C	C	C	C	C
Chemical	-	Not measured due to change in Ministry of Health reporting.	C	C	C	C	C
Ruawai Plant							
E coli	C	Achieved.	C	C	C	C	C
Chemical	C	Achieved.	C	C	C	C	C
Maungaturoto Plant							
E coli	C	Achieved.	C	C	C	C	C
Chemical	-	Not measured due to change in Ministry of Health reporting.	C	C	C	C	C
Mangawhai Heads Bore							
E Coli	C	Achieved.	C	C	C	C	C
Chemical	-	Not measured due to change in Ministry of Health reporting.	C	C	C	C	C

Performance Measures	Data Source						
	2009/10 AP Target	2009/10 AR - Actual	2010/11 AP Target	2010/11 AR Actual	2011/12 AP Target	2011/12 AR Actual	2012/2022 LTP 2016/2022 Target
% of urgent request responded to within 1 day (Council Helpdesk).	90%	Achieved. All urgent requests were responded to within 1 day.	90%	90%	90%	94%	-
Number of complaints per annum regarding water quality for Council owned and controlled water supply.	-	-	-	-	-	-	<21 (New Measure)
Number of Requests for Service regarding water leaks for Council owned and controlled water supply.							100-80 (New Measure)
Key: *NRB - National Research Bureau* *N/C - Non-Compliant* *C - Compliant*							
Technical Levels of Service							
Water Quality – Drinking Water Standards Compliance: Routine water quality tests confirm safe potable water supplies.	100% compliance	-	-	-	-	-	-
Water Quality – Drinking Water Standards Compliance: No Abatement notices issued for any Council operated water supply.	100% compliance	-	-	-	-	-	-
Environmental Standards – Volume of water extracted: Compliance with resource consents.	100% compliance	-	-	-	-	-	-
Quantity – NZ Fire Service Code of Practice requirements – Percentage of fire hydrants tested provide flows in accordance with the Fire Service Code of Practice.	100% compliance within the defined water supply areas	-	-	-	-	-	-

Performance Measures	Data Source						
	2009/10 AP Target	2009/10 AR - Actual	2010/11 AP Target	2010/11 AR Actual	2011/12 AP Target	2011/12 AR Actual	2012/2022 LTP 2016/2022 Target
Efficiency – Notified partial shutdowns: Consumers notified of planned shutdown at least 48 hours in advance.	100% compliance	-	-	-	-	-	-
Efficiency – Non-notified partial shutdowns: Number of households affected by shutdowns exceeding 2 hours duration.	< 20 p.a.	-	-	-	-	-	-
Efficiency – Non-notified partial shutdowns: Unplanned water supply interruptions greater than 4 hours, in any 12 month period.	Zero	-	-	-	-	-	-
Responsiveness – Speed of Response to service requests and system failures: Percentage of complaints and requests that were adequately responded to within the allowed period of time.	Urgent service requests within 2 hours on 90% of occasions. Non-urgent within 5 working days on 95% of occasions.	-	-	-	-	-	-
Responsiveness – Speed of response to public enquires: Percentage of routine enquires adequately responded to within the allowed period	Response to written / faxed enquires made within 5 working days on at least	-	-	-	-	-	-

Performance Measures	Data Source						
	2009/10 AP Target	2009/10 AR - Actual	2010/11 AP Target	2010/11 AR Actual	2011/12 AP Target	2011/12 AR Actual	2012/2022 LTP 2016/2022 Target
	95% of occasions. Response to phone enquires made on the same working day on at least 95% of occasions						

Appendix F: List of acronyms and abbreviations

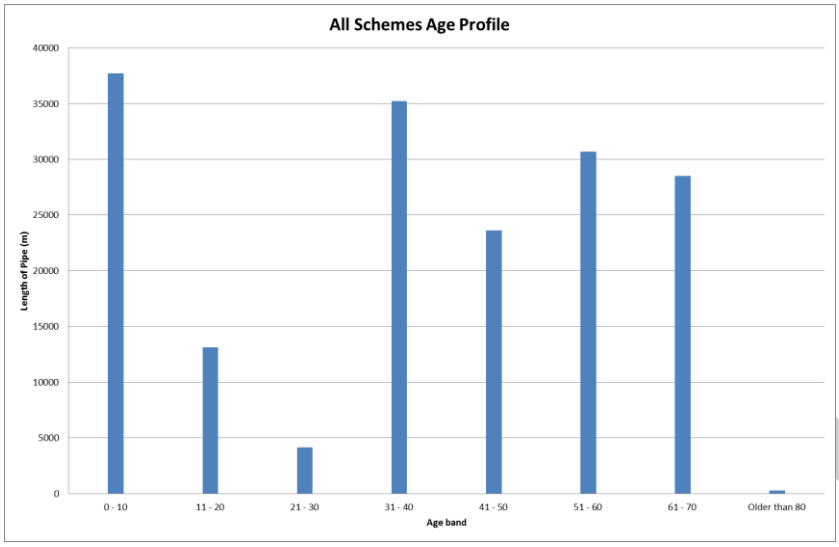
List of acronyms and abbreviations

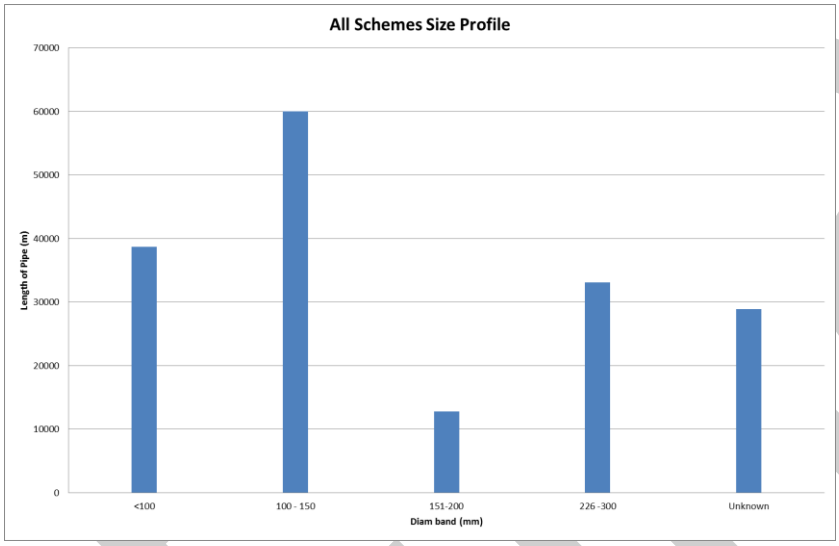
The following lists key acronyms and abbreviations used in this document:

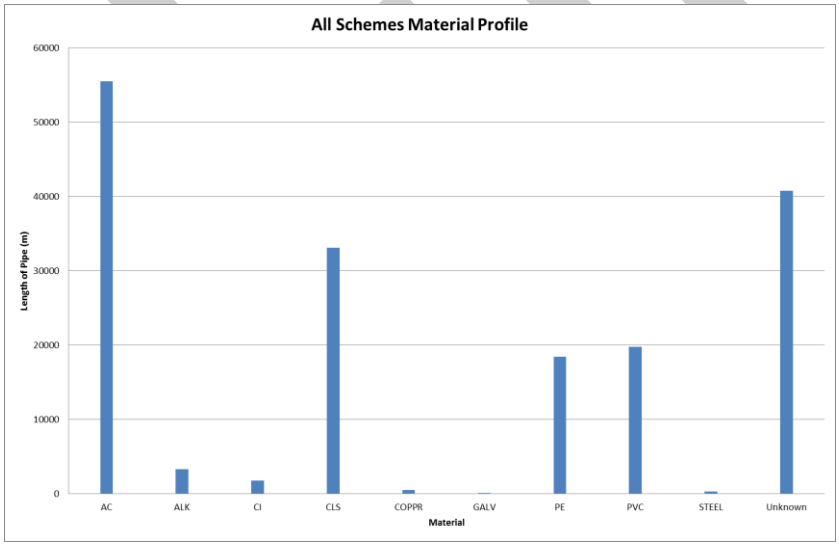
Term	Definition
AC	Asbestos concrete (pipe type)
AEP	Annual Exceedance Probability (e.g. 10% is once in 10 years)
AM	Asset Management
AMP	Asset Management Plan
AMS	Asset Management Systems
CAPEX	Capital expenditure
CDEM	Civil Defence Emergency Management
Council	Kaipara District Council
CPP	Competitive Pricing Procedures
GAAP	Generally Accepted Accounting Practices
GIS	Geographical Information System
IPCC	Intergovernmental Panel on Climate Change
IIMM	International Infrastructure Management Manual
KDC	Kaipara District Council
LGA	Local Government Act 2002

Term	Definition
LOS	Level of Service
LTP	Long Term Plan
MfE	Ministry for the Environment
NAMS	National Asset Management Steering Group
NCS	Napier Computer System
NRC	Northland Regional Council
DWSNZ	New Zealand Drinking Water Standards
O&M	Operations and Maintenance
ODRC	Optimised Depreciated Replacement Cost
OPEX	Operational expenditure
RMA	Resource Management Act 1991
URP	Usual Resident Population
WSP	Water Safety Plan
WTP	Water Treatment Plant

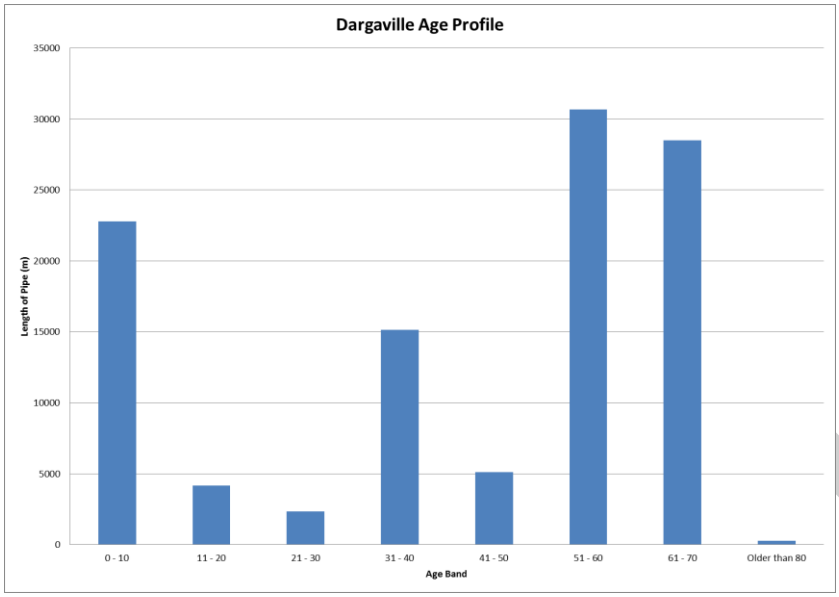
Asset profiles - all schemes

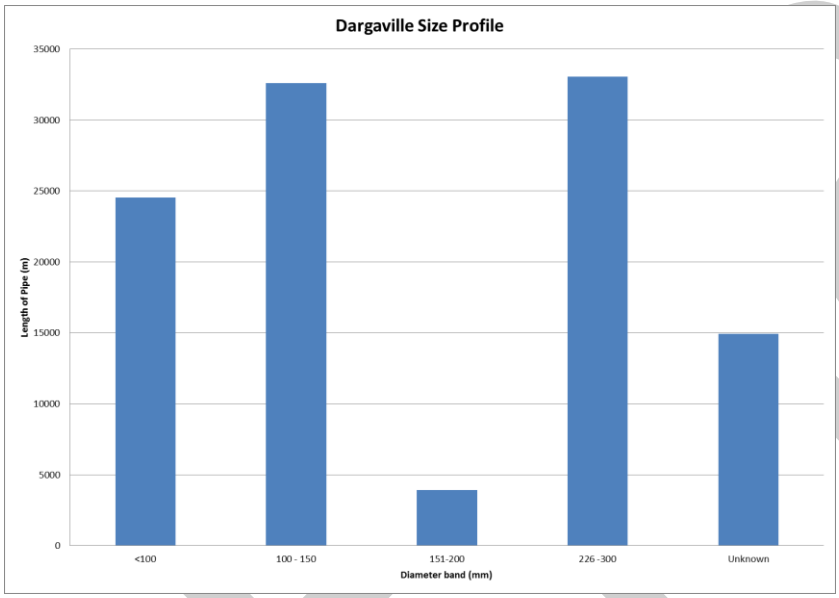


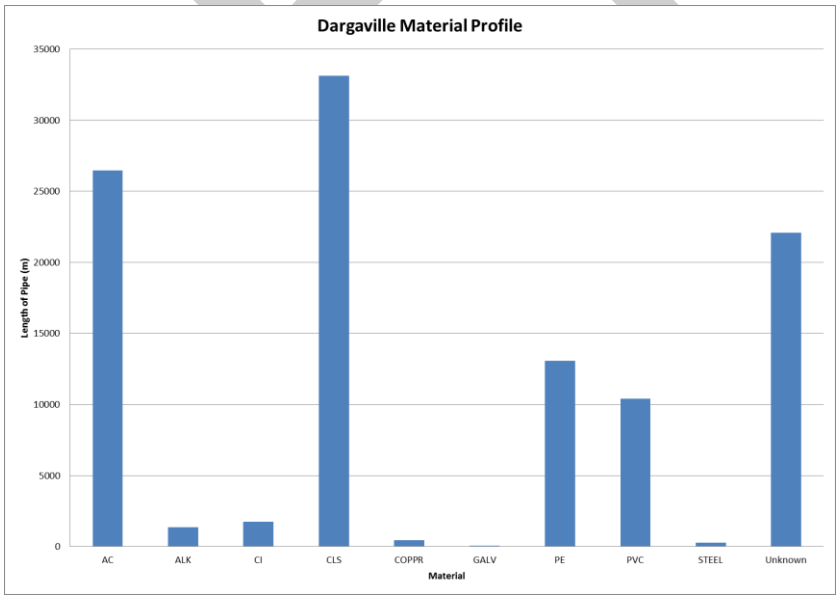




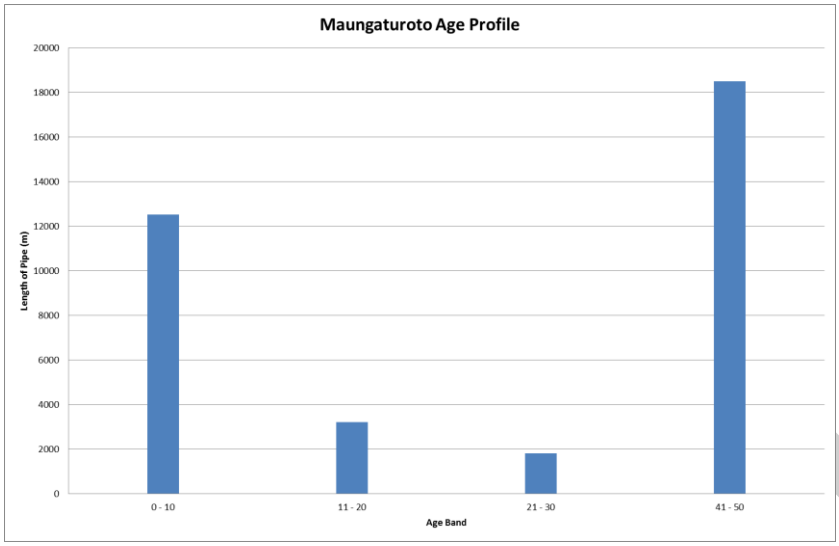
Asset profiles - Dargaville

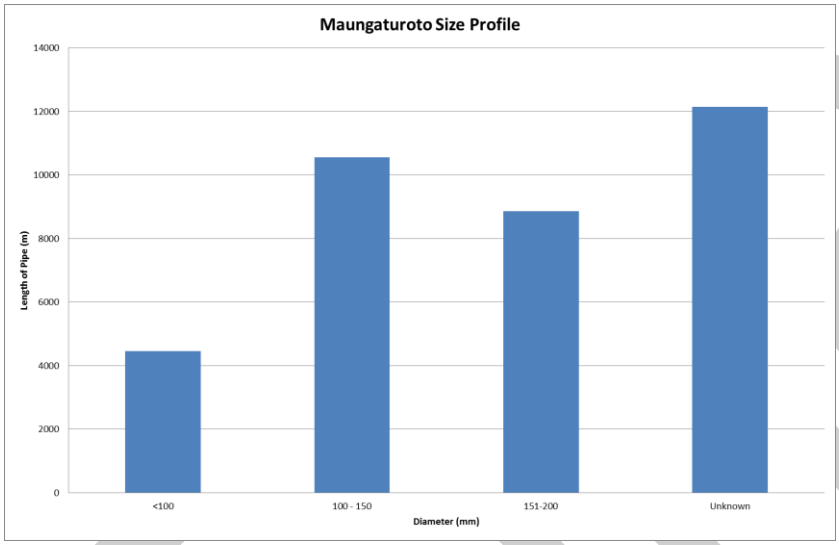


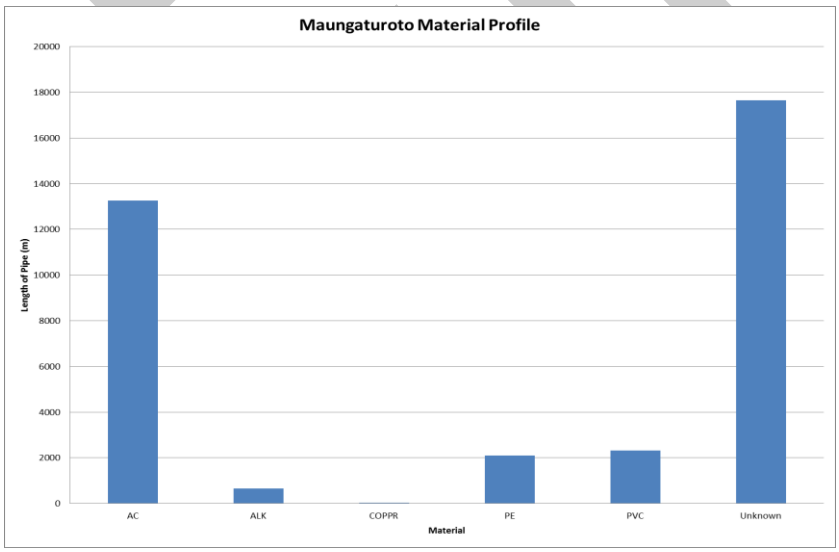




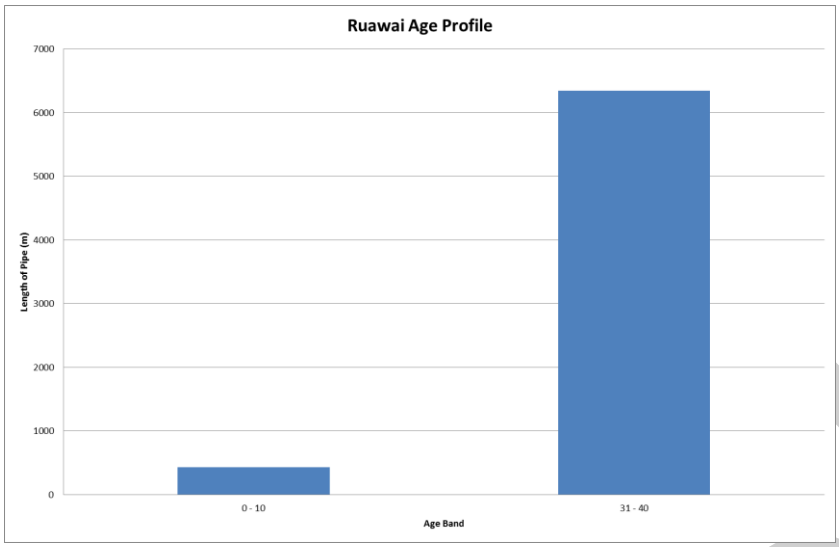
Asset profiles - Maungaturoto

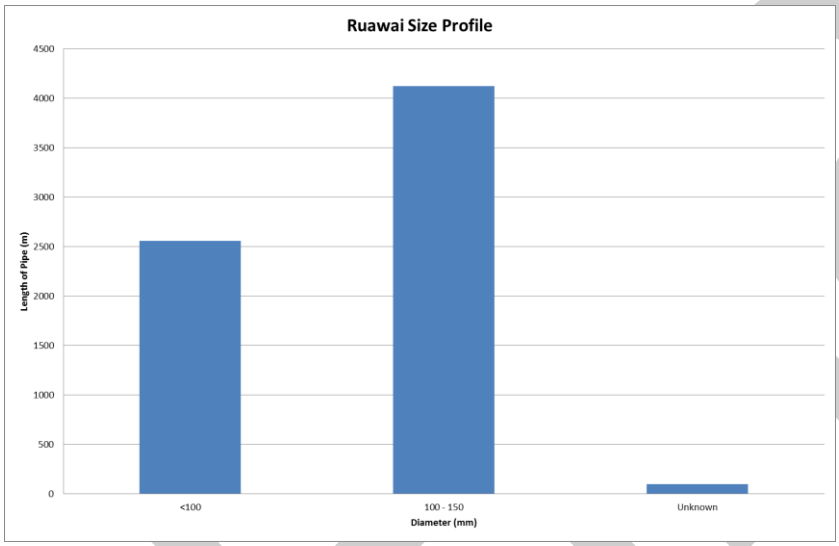


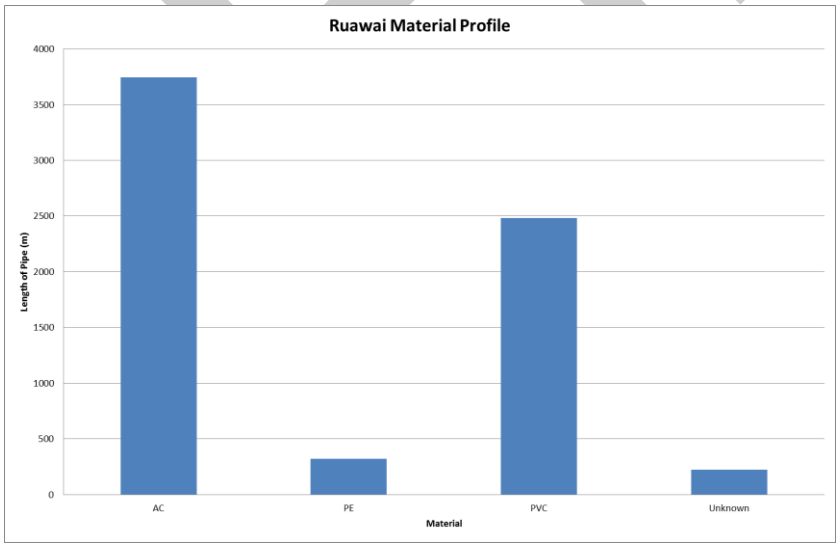




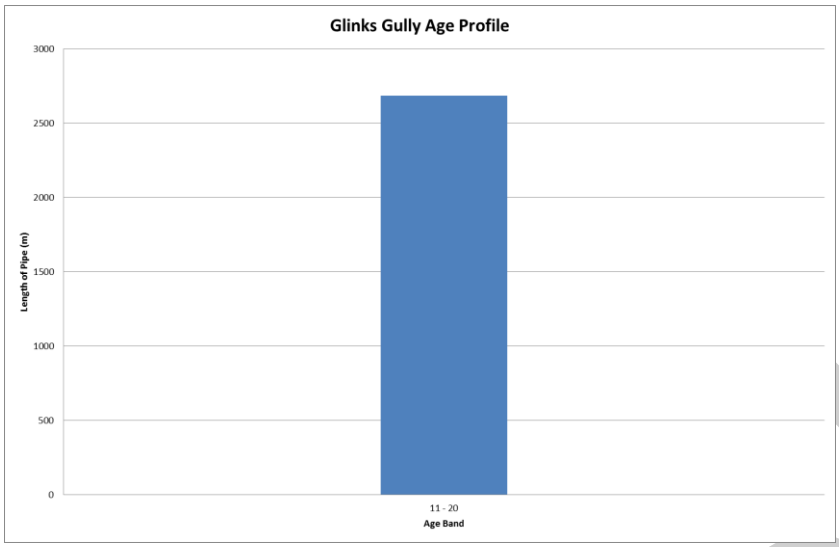
Asset profiles - Ruawai

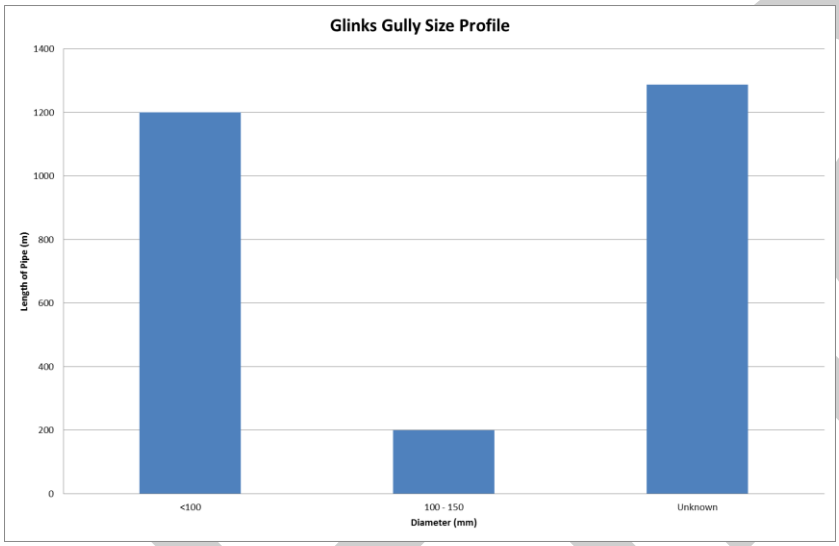


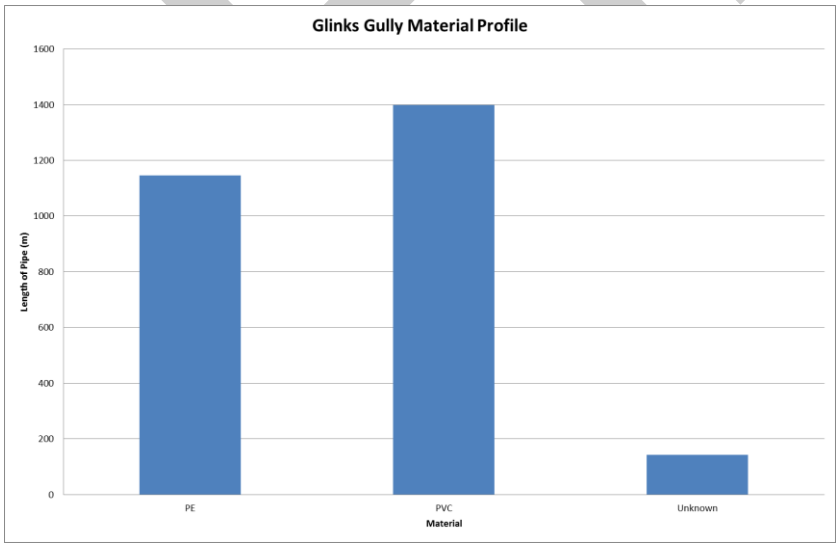




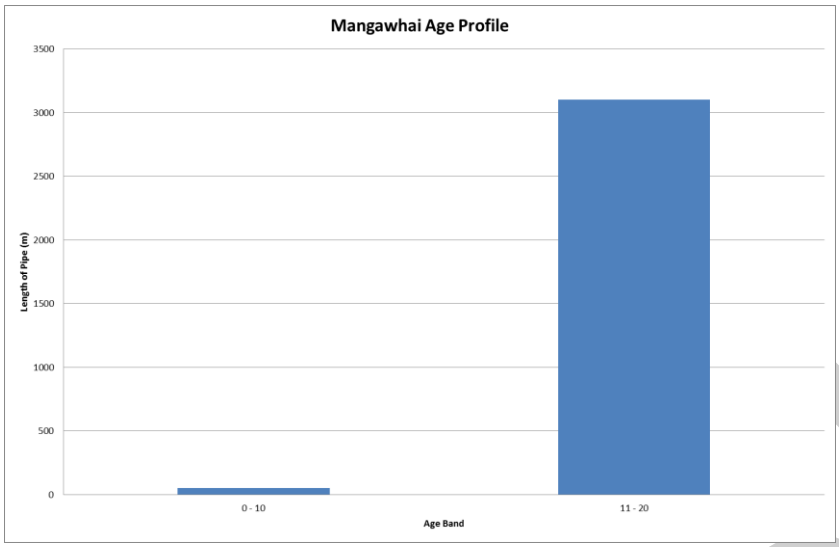
Asset Profiles – Glinks Gully

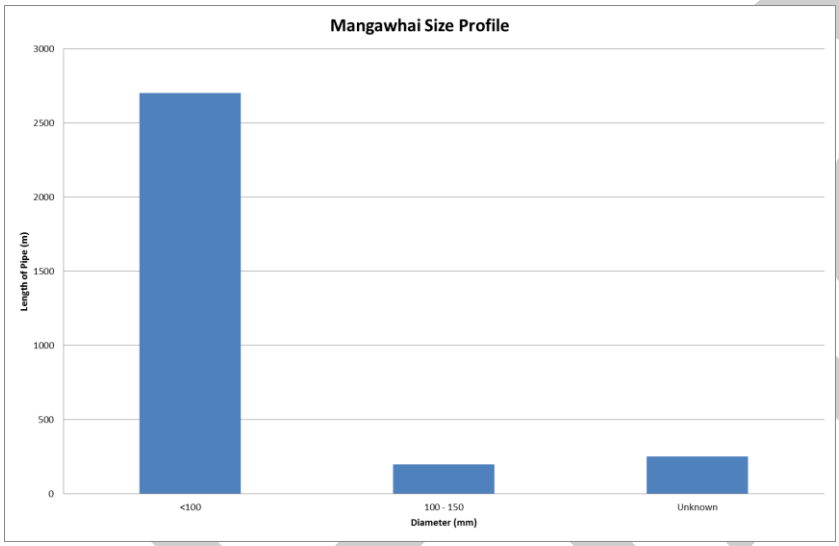


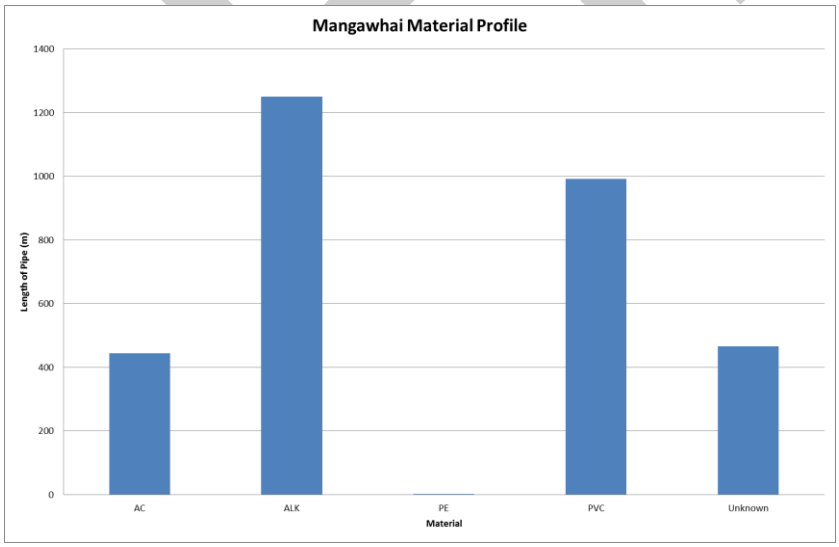




Asset Profiles - Mangawhai







Asset Profiles – Baylys