Kaipara District Council

Asset Management Plan 2015

Wastewater

June 2015

Status: Final

Kaipara te Oranganui
KAIPARA DISTRICT
Two Oceans Two Harbours

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5	June15	Final – Revised after LTP	RS	GR	PC	CM

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Executive Summary

Introduction

KDC operates six community wastewater schemes for Dargaville, Glinks Gully, Kaiwaka, Te Kopuru, Mangawhai and Maungaturoto.

The wastewater systems focus on protecting public and environmental health by collecting and treating wastewater prior to release into receiving environments.

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

The AMP provides discussion of the key elements affecting management of Council's wastewater assets, 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 wastewater systems requires all those connected to take on a degree of responsibility towards various aspects of the system operation. Just because a public system exists does not mean those connected can have a flush and forget mentality.

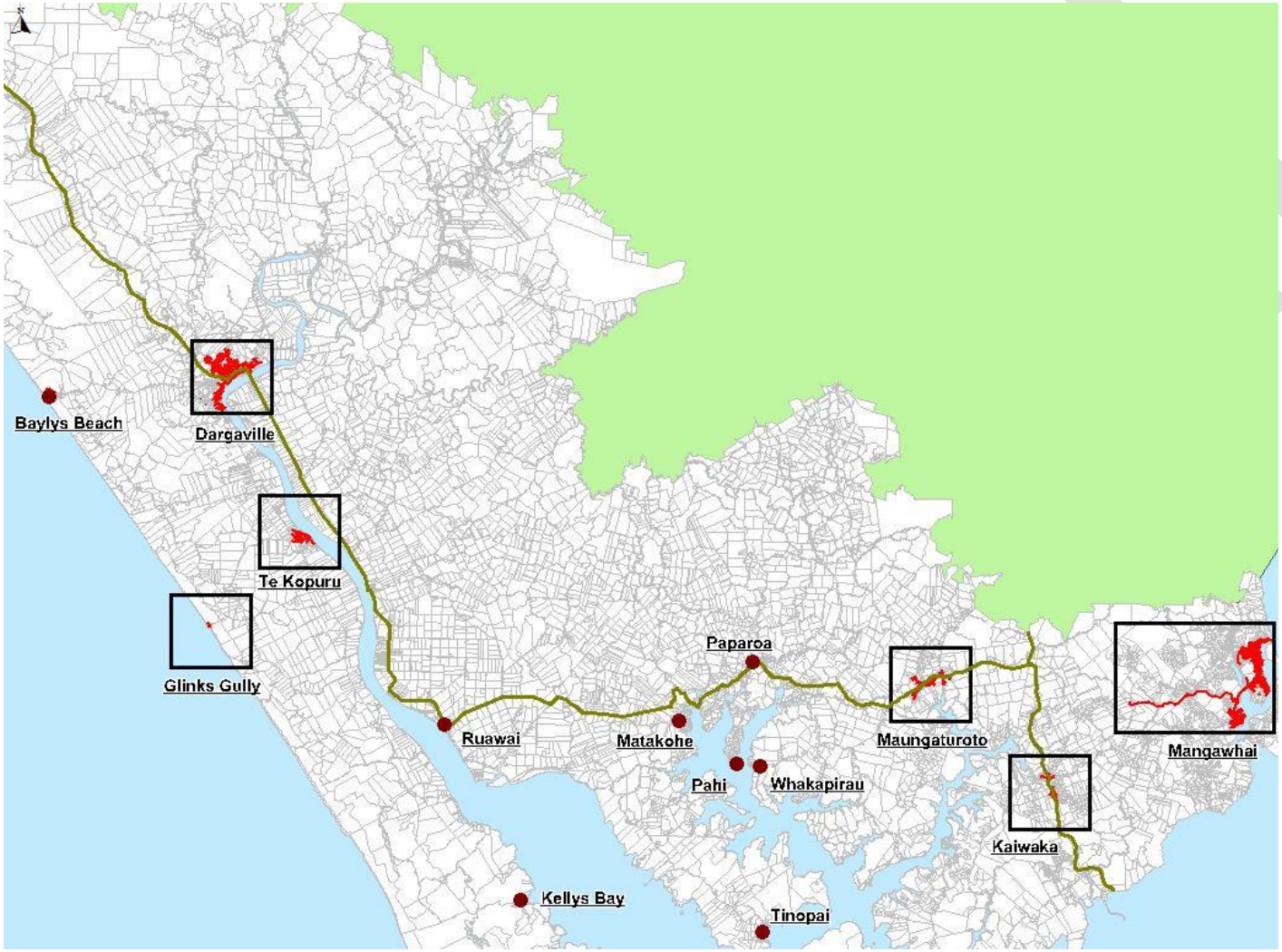
In Wastewater systems certain sanitary wastes should not be flushed down toilets as they cause blockages in pipes and pumps and this leads to system overflows which adversely affect the environment. Costs are incurred when maintenance staff responds to such incidents which are ultimately passed back to the users who have concerns regarding rising costs.

Allowing surface water to access the wastewater system causes overflows from the wastewater system in rain events. System providers are required to prevent such overflows which can require huge storage facilities for wet weather events. These come at significant cost and the preferred solution is to prevent entry of surface water in the first place. Again individuals can assist with this by taking on board a degree of responsibility and noting where surface water flooding may be entering their house wastewater system and preventing this, also not allowing roof water down pipes to be directed into the wastewater gully traps is another area that causes system overflows.

Council looks forward to working with the Community in the provision of sustainable wastewater systems.

The Assets

Council operates six community wastewater schemes for Dargaville, Glinks Gully, Kaiwaka, Maungaturoto, Te Kopuru and Mangawhai in order to protect public health by providing Kaipara District with reliable wastewater service in a manner that minimises adverse effects on the environment. The location of each of these communities within Kaipara District is illustrated in the figure below.



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

Asset Overview Summary

Community	Treatment Plants	Pump Stations	Rising Mains (km)	Gravity lines (km)	Manhole	Connections	Condition
Dargaville	1	15	5.8	39.2	717	1,960	Assessment programme commenced 2013/14
Glinks Gully	1	1	0.3	0.15	8	24	Assessment programme commenced 2013/14
Kaiwaka	1	1	1.3	4	71	163	Assessment programme commenced 2013/14
Maungaturoto	1	3	1.3	11.16	197	369	Assessment programme commenced 2013/14
Te Kopuru	1	0		6.4	85	190	Assessment programme commenced 2013/14
Mangawhai	1	12	22.3	46	487	1,617	Assessment programme commenced 2013/14

Summary of Wastewater Revaluation *(Source 2014 Waste Water Revaluation)*

Community	Replacement Costs (including 2013/14 Reconciliation)	Depreciated Replacement Cost
Dargaville	$18,663,775	$7,581,385
Glinks Gully	$257,034	$157,503
Kaiwaka	$1,797,113	$807,643
Maungaturoto	$5,793,851	$3,310,426
Te Kopuru	$1,956,388	$785,089
Mangawhai	$41,578,230	$36,122,371
Total	**$70,046,391**	**$48,764,418**

Key Issues

Key matters requiring attention for the wastewater service are summarised in the table below.

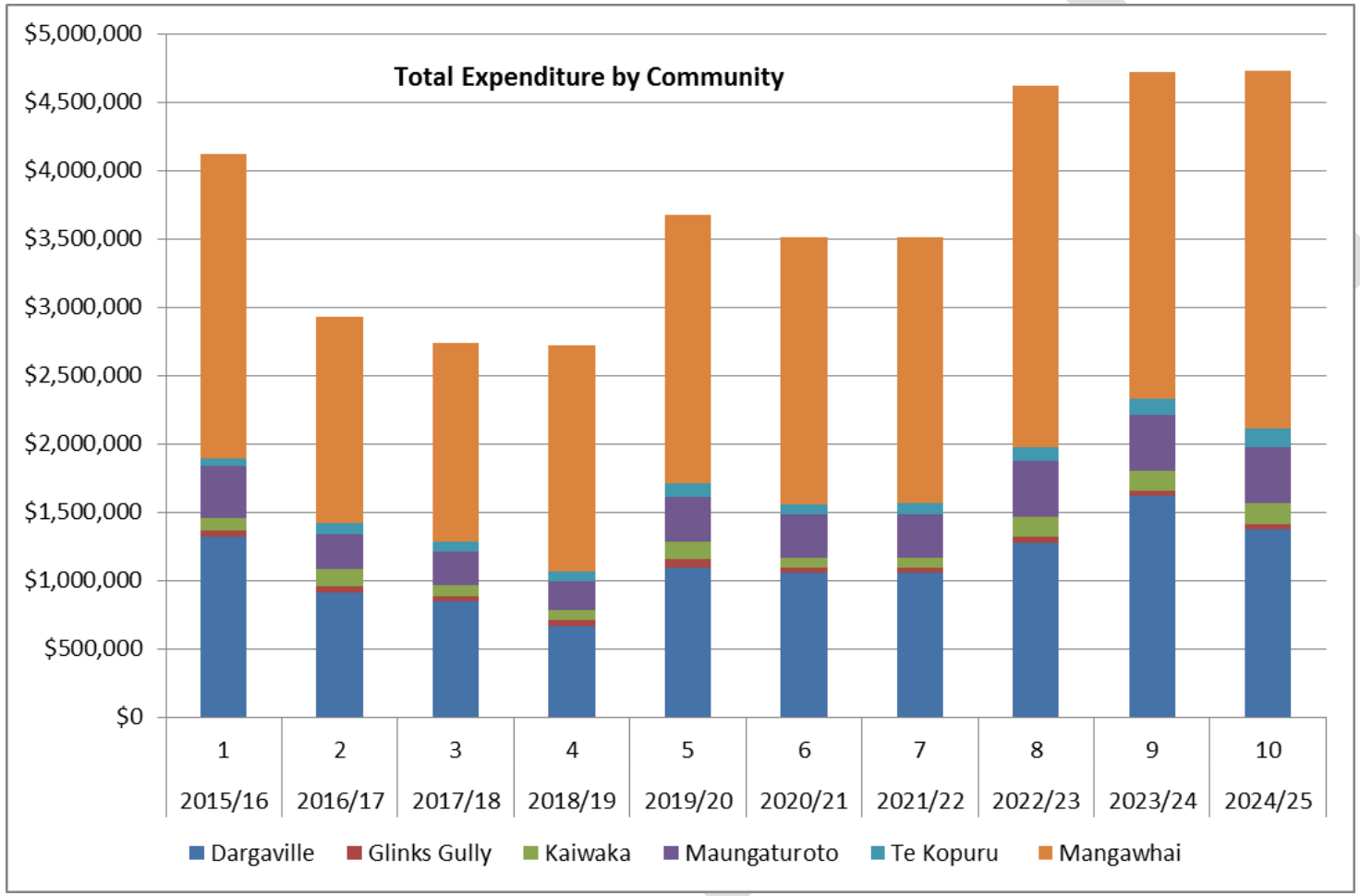
Issue	Location
Stormwater inflow and infiltration	Dargaville, Kaiwaka, Maungaturoto
Trade waste consenting	Dargaville
Unplanned discharges	Dargaville, Kaiwaka, Maungaturoto
Review of reticulation boundaries	Kaiwaka, Maungaturoto, Glinks Gully
Treatment plant capacity	Kaiwaka, Maungaturoto
Instances of discharge consent non-compliance	Kaiwaka, Te Kopuru
Significant deferred renewals	Dargaville
Asset Information • Inventory – accuracy, completeness • Criticality – definition • Condition • Performance • Asset Lives • Lack of maintenance history	All

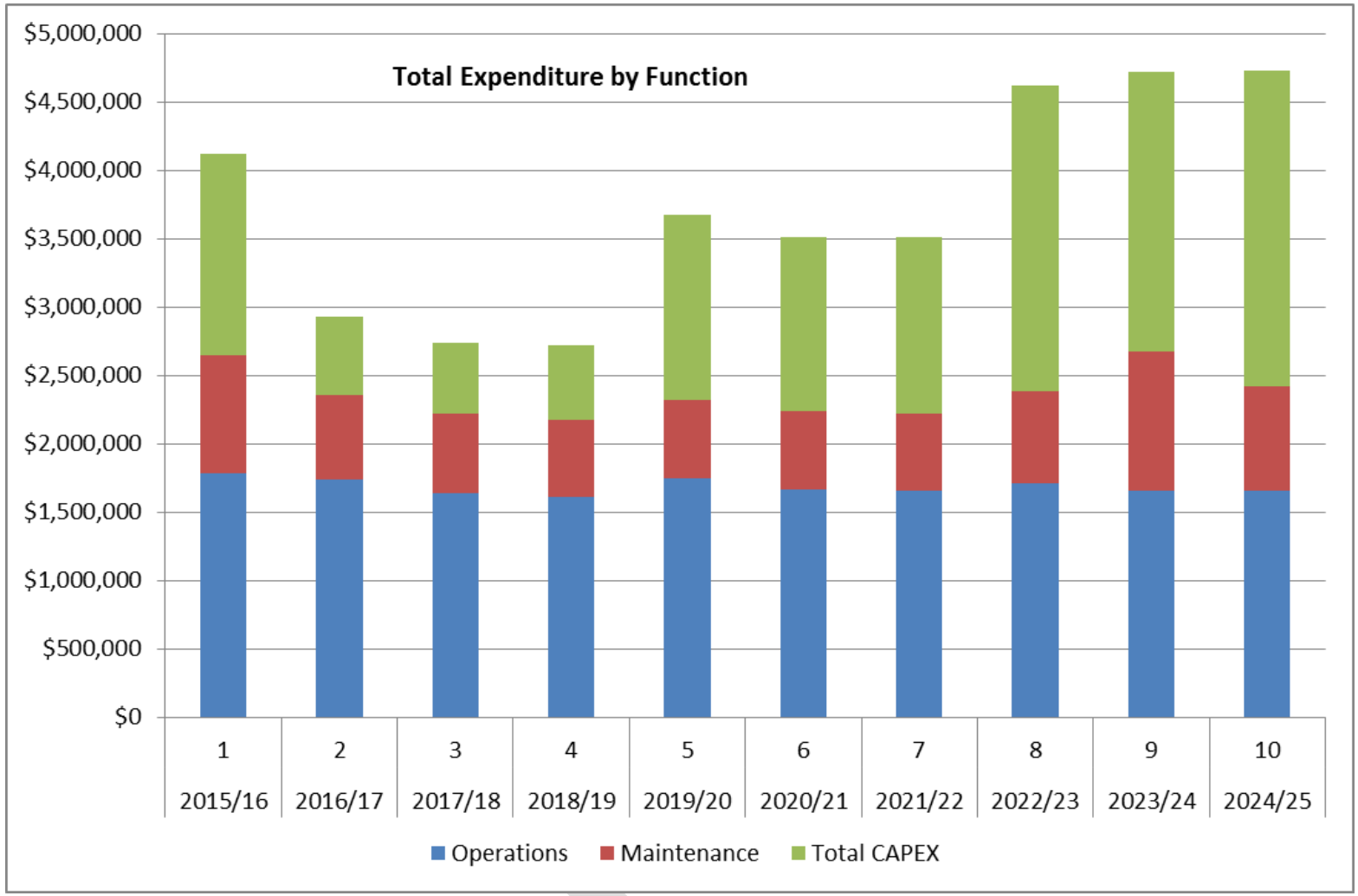
Council have also identified the following gaps (and strategies to resolve them) between the current service provided and the target standards.

- GAP 1: Protocol to Eliminate Spills
- **GAP 2: Discharge to Land Policy**
- GAP 3: Risk Management Framework

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.




Total Expenditure by Function
$5,000,000
$4,500,000
$4,000,000
$3,500,000
$3,000,000
$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
$0
1
2015/16
2
2016/17
3
2017/18
4
2018/19
5
2019/20
6
2020/21
7
2021/22
8
2022/23
9
2023/24
10
2024/25
Operations
Maintenance
Total CAPEX

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 wastewater 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's priorities. This may result in re-prioritisation of activities from year to year, while maintaining bottom-line budgets.

The key improvements to be achieved over this AMP period (2015/16 – 2024/25) to facilitate achievement of core asset management and delivery of the Wastewater collection / treatment service are:

- Review and define appropriate Levels of Service
- Negotiate Trade Waste Agreement (including future demand) with Silver Fern Farms and other commercial users
- Review the Asset Register to ensure all known assets are properly recorded
- Complete the data cleansing project to reduce the number of unknown asset attributes (including asset lives to aid renewal planning)
- Review adequacy of developer's hand over requirements contained within Engineering Standards. Identify a program to enhance by including asset schedules and capital cost recording for each asset created
- Wastewater Modelling (Dargaville) – Scoping exercise to determine needs and level of detail required for development of hydraulic model for Dargaville
- Wastewater Modelling (Dargaville) – Development of hydraulic model for Dargaville to identify capacity issues, optimisation of pumping stations, and to manage growth
- Review and update Council's overall risk management framework and implement outcomes of this update into the AMP and other Council and contract documents
- Produce a methodology for asset renewal requirements from which a renewal programme can be developed based on performance and condition ratings. Prioritise renewals based on a combination of criticality and condition/performance. Development and prioritisation of the renewals programme to be repeated annually.
- Identify Consent conditions and ensure compliance in performance and reporting.

1 Strategic Context

1.1 Purpose

The purpose of this Asset Management Plan (AMP) is to summarise in one place Kaipara District Council's (Council) strategic and long-term management approach for the provision and maintenance of its wastewater 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 Levels of Service required by customers are 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 wastewater services. One such responsibility is the duty under the Health Act 1956 to provide 'sanitary works for villages, towns and cities', which amongst other things are defined as 'drainage works, sewerage works, and works for the disposal of sewage'. This implies that, in the case of the provision of wastewater services, Councils have the obligation to identify where such a service is required, and to provide it either directly themselves, or to maintain an overview of the service if it is provided by others.

This AMP outlines and summarises the Council's strategic and long-term management approach for the provision and maintenance of wastewater collection and treatment infrastructure throughout the District (excluding properties serviced by septic tanks).

A list of the acronyms used in this document is included in Appendix F.

1.2 Service Description and Scope

Kaipara District Council (KDC) operates six community wastewater schemes for Dargaville, Glinks Gully, Kaiwaka, Maungaturoto, Te Kopuru and Mangawhai in order to protect public health by providing Kaipara District with reliable wastewater service in a manner that minimises adverse effects on the environment.

In addition to these community schemes, there are a number of smaller wastewater treatment facilities owned, operated or managed by Kaipara District Council. These facilities generally service campgrounds and other community facilities:

- Taharoa Domain – Kai Iwi Lakes Campground.
- Pahi Domain Campground.
- Tinopai Campground.
- Ruawai Public Toilet Wastewater system.

The above facilities are not included in this AMP as the costs related to the operations and maintenance of these assets are funded from the Community Facilities budgets and they are managed under separate service agreements.

Extension of connections, disconnections to Council systems and exit from a scheme will be progressed where a business case shows benefits are in line with costs.

The key objectives of this AMP are to determine Standards, Levels of Service and Funding levels for KDC to maintain sustainable and affordable wastewater schemes. The AMP is used to manage and plan throughout the year, and is a living document requiring progressive updating to reflect the changing situation.

The wastewater activity focuses on protecting public and environmental health by collecting and treating wastewater prior to release into receiving environments. Growth and the need to provide for visitors in peak periods, especially in coastal communities, have resulted in Council's ongoing commitment to significant wastewater infrastructure development. The increasing cost of wastewater infrastructure and environmental compliance is placing a considerable amount of pressure on smaller communities. However, ensuring waste does not threaten people or the environment they live in is of high importance to communities.

1.3 Key Issues

Key matters requiring attention for the wastewater service are summarised in Table 1-1 below. These matters are further addressed in sections 2.1 (Asset Details) and 5 (Continuous Improvement) of this AMP.

Table 1-1: Key Matters Requiring Attention

Issue	Location
Stormwater inflow and infiltration	Dargaville, Kaiwaka, Maungaturoto
Trade waste consenting	Dargaville
Unplanned discharges	Dargaville, Kaiwaka, Maungaturoto
Review of reticulation boundaries	Kaiwaka, Maungaturoto, Glinks Gully
Treatment plant capacity	Kaiwaka, Maungaturoto
Instances of discharge consent non-compliance	Kaiwaka, Te Kopuru
Treatment pond de-sludging	Dargaville, Kaiwaka, Maungaturoto, Te Kopuru

Issue	Location
Significant deferred renewals	Dargaville
Telemetry control system	All
Asset Information • Inventory – accuracy, completeness • Criticality – definition • Condition • Performance • Asset Lives • Lack of maintenance history	All

1.4 Assumptions

Council has made a number of assumptions in preparing this AMP, which are described in Table 1-2 below.

Table 1-2: Key Assumptions

Assumption Type	Assumption	Discussion
Financial assumptions.	That all expenditure has been stated in 1 July 2015 dollar values 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, but 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	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.

Assumption Type	Assumption	Discussion
	they continue to be a reliable indicator of likely future trends.	
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 Council will be granted the necessary resource consents for key projects.	If these consents are not granted, Council will need to consider alternative arrangements for these projects which may impact the budget and timeframe of the projects. If existing consents are not renewed, a new asset may be required to replace the existing asset, through a new capital project.

1.5 Relationship to Community Outcomes, Council Policies & Strategies

Council's mission is to ensure that the District's wastewater is collected, treated and disposed off in a cost effective, sustainable and environmentally friendly manner.

The Long Term Plan (LTP) for Kaipara District sets out the community's vision for how the District should look and develop as well as providing a vision for the type of lifestyle and opportunities that may be available in the District.

This vision varies with different geographical areas, for example:

- West Coast: Increasingly attractive to tourism and lifestyle. An area with high ecological, historical, environmental and cultural values
- Dargaville: An attractive place to shop, visit, live and works. A service and tourist centre
- Kaipara Harbour: A taonga preserved for all to enjoy, retaining a rural atmosphere. Balancing the competing demands of commercial and recreational activities

- Mangawhai: Fully serviced urban centre located in an outstanding coastal environment.

This overall vision for the District provides a broad initial direction for the development of wastewater priorities and how those assets may be managed. This information, along with community consultation and discussion with other interested parties contribute to the development of the community outcomes identified in the LTP. These outcomes have a direct influence on the management of the various wastewater schemes.

The community outcomes that the wastewater activity contributes to most are shown in Table 1-3 below.

Table 1-3: Wastewater Services and Community Outcomes

Wastewater Services contribute to the following Community Outcomes	How this service contributes
Safety and good quality of life	**To maintain a good standard of health**
Strong communities	**Treatment of pollutants to reduce the impact on the environment**
Sustainable economy	**To process the wastewater generated from industry and commercial activities**

Council's annual plan identifies Council's purpose in relation to wastewater collection and treatment as "To protect public and environmental health through economic and environmentally sustainable treatment and disposal of wastewater."

Furthermore the annual plan identifies the following goals in relation to wastewater services:

- To collect and treat wastewater in a cost effective manner
- To dispose of treated effluent in an environmentally sustainable manner
- To prevent wastewater spills.

In order to achieve this purpose KDC undertake the following:

- Customer Services
- Network Operations and Maintenance
- Capital and Refurbishment Programme
- Consent Monitoring

1.6 Stakeholders and Consultation

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

External

- The Kaipara District community, including citizens and ratepayers
- Government agencies (e.g. Department. of Health, Ministry for the Environment, Audit NZ)
- Local Iwi
- Northland Regional Council
- Service Contractors
- Industry
- Environmental Groups
- Visitors to the District
- Developers

Internal

- Councillors / Commissioners
- Council's Chief Executive Officer
- Policy Manager
- Regulatory Manager
- Asset Manager and AM staff
- Finance Manager
- Information Services Manager
- Records & 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 that better meets the community's needs.

The Council's knowledge of customer expectations and preferences is based on:

- feedback from surveys
- public meetings
- feedback from elected members, advisory groups and working parties
- analysis of customer service requests and complaints
- consultation via the Annual Plan and LTP process.

Council commissions customer surveys on a regular basis, from the National Research Bureau Ltd[1]. These Communitrak™ surveys assess the levels of satisfaction with key services, including wastewater services, and the willingness across the community to pay to improve services.

1.7 Legislative Framework and Linkages

This AMP is related to a range of national and local legislation, regulatory and policy documents as listed in Table 1-4 through Table 1-7.
The legislation and guidelines below are listed by their original title for simplicity. Amendment Acts have not been detailed in this document, but are still considered in the planning process. For the latest Act information refer to http://www.legislation.govt.nz/

Table 1-4: Relevant Legislation

National Policies, Regulation, Standards and Strategies
The Health Act 1956
The Local Government Act 2002
The Climate Change Response Act 2002
The Civil Defence Emergency Management Act 2002 (Lifelines)

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

National Policies, Regulation, Standards and Strategies
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 1-5: Relevant Regulatory Requirements

National Policies, Regulation, Standards and Strategies
The Government's Sustainable Development Action Plan
Code of Practice for Urban Sub-division
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 1-6: Relevant KDC Planning and Policy Documents

Local Policies, Regulations, Standards and Strategies
KDC District Plan
Northland Regional Plan
KDC Engineering Standards and Policies 2011
KDC Procurement Strategy

Table 1-7: Relevant KDC Bylaws

Council Bylaws
Wastewater Drainage Bylaw 2009

Preparation and implementation of this AMP and associated long-term financial strategies aids Council compliance with these requirements.

Local Government Act 2002 requires local authorities to:

- Identify community outcomes and priorities, at least every 6 years. These must cover social, cultural, economic and environmental dimensions, and indicators will need to be developed which assess the contribution of wastewater services to these outcomes.
- Prepare a range of policies, including Significance, Funding and Financial Policies.
- Prepare a Long Term Plan (LTP, formerly the Long Term Council Community Plan or LTCCP), at least every 3 years or as required due to significant changes in asset management practices or budget. The LTP 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.

Regarding 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 these are significant.

Schedule 10 of the Act provides further detail for the LTP, which is relevant to this plan. This Act supersedes the 1996 Local Government Amendment Act, which required the adoption of a Long Term Financial Strategy, prudent asset management, and formal accounting for the "loss of service potential" of assets.

The new legislation puts a stronger emphasis on strategic planning (S.121) that encompasses:

- 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)).

The definition of "Wastewater services" includes sewerage, sewage treatment and disposal.

As set out in Councils 2009 – 2019 Significance Policy wastewater assets discussed within the AMP are deemed Strategic Assets and come under Council ownership.

Section 261B now includes non-financial performance measures rules 2013.

These come into effect on 30 July 2014 and affect Wastewater, Water and Stormwater. The measures have been incorporated into this plan.

Trade Waste Bylaw

Following public consultation under the special consultative procedures of the Local Government Act 2002, Council adopted a Policy for the Discharge and Acceptance of Wastewater and an associated Wastewater Drainage Bylaw in June 2009.

The Policy sets out the manner in which Council will address issues surrounding wastewater, including, but not limited to how applications for new connections are to be made, maintenance responsibilities and other general customer and Council roles and responsibilities. The Bylaw sets out the specific conditions and quality parameters that must be met in order to discharge into the wastewater system. The Bylaw standards are legally enforceable and breaches of these standards could lead to disconnection and/or prosecution.

Where a discharge into the wastewater system cannot meet the requirements of the bylaw, a separate Trade Waste Agreement must be entered into. This agreement identifies the maximum allowable values that establish an acceptable quality of the wastewater being discharged into the system. These parameters are based on the existing schedule contained within the Bylaw. In addition, specific conditions can be included to ensure the discharge can be more easily accommodated at Council's Wastewater Treatment plant.

Local Government (Rating) Act 2002, the funding companion to this proposed new LGA:

- Removes the prohibition on charging for domestic wastewater discharge by flow that was a feature of the Rating Powers Act 1988
- Permits councils to strike a rate or charge for any activity they choose to get involved in (Section 16).

Resource Management Act 1991 and amendments:

Governs the discharge of contaminants to the environment (Sections 15 and 107)

Building Act, 1991:

Sets the minimum standards for buildings (including the provision of sanitary appliances) necessary for public health and safety through the associated codes (G13 covers foul water).

Health Act 1956 contains:

Measures for the prevention or management of outbreaks of disease.

A requirement (Section 25) for territorial authorities to provide "Sanitary works for villages, towns and cities which amongst other things are defined as:

- Drainage works, sewerage works, and works for the disposal of sewage
- Works for the collection and disposal of refuse, night soil, and other offensive matter
- Sanitary conveniences for the use of the public
- Any other works declared by the Governor General by Order in Council to be sanitary works, and includes all lands, buildings, machinery, tanks, pipes, and appliances used in connection with any such sanitary works.
- Authority for the raising of loans to build such works (Section 27).

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 wastewater) to function to the fullest possible extent during and after an emergency and to have plans for such functioning (business continuity plans).

Crown Public Health has prepared a Response Manual for Accidental Wastewater Discharges, which is a basic set of procedures to prevent threats to public health.

Northland Regional Council (NRC) regulates the discharge of wastewater and wastewater solids 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

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: roading, drainage, sewerage and stormwater, water supply, flood control, power generated and supply, refuse disposal and public transport.

National Environmental Standards

The Resource Management Act promotes the sustainable use of resources. Its primary vehicle for addressing the discharge of effluent to the environment is via the Regional Waste and Soil Plan at Regional Level; and District Plans at District level. Given these plans are controlled at their respective jurisdictive levels, there are now varying, inconsistent standards across the Regions and Districts.

One method of ensuring consistent application across New Zealand is provided in sections 43 and 44 of the Resource Management Act. These allow the Minister for the Environment to enact regulations called National Environmental Standards. When a National Environmental Standard is enacted the same

standard must be applied regardless of jurisdiction.

The following National Environmental Standards are in force:

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

The National Environmental 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

The proposed National Environmental Standard for on-site wastewater systems has been withdrawn. These would have developed a warrant of fitness regime for on-site wastewater systems and had the potential to impose significant costs on ratepayers although it was argued that this would have benefited the environment.

This AMP has considered the impact of those National Environmental Standards that are in force at the time of the current update.

Links with Other Documents

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

1.8 Demand Management

This section of the plan analyses factors affecting demand including population growth, social and technology changes. The impact of these trends is examined and demand management strategies are recommended to address demand and ensure:

- Existing assets' performance and utilisation are optimised

- The need for new assets is reduced or deferred
- Council's strategic objectives are met
- Provision of a more sustainable service
- Council is able to respond to customer needs.

Demand forecasting for this AMP has been based on forecast population growth for each community applied to measured or theoretical per capita flow rates and has included discussion with key discharges where relevant (for example Silver Fern Farms (SFF)).

No allowance has been included for infiltration or inflow reduction.

Loading reduction refers to the reduction of raw material entering the treatment plant. This is not achieved by simply reducing the flow volume (for example by households using less water), as this results in the same amount of raw material being transported by less water and can lead to an increase in blockages with more concentrated waste. Such a scenario can also result in an increase in reticulation system odour as the more concentrated material is transported less efficiently to the treatment plant and decays in the pipes.

A more effective means of achieving loading reduction may be to eliminate food scraps entering the network via under sink waste disposal grinders, implementing a Trade Waste Bylaw, or having agreements with major dischargers requiring pre-treatment.

Demand management strategies provide alternatives to the creation of new assets in order to meet demand and look at ways of modifying customer demands so 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 1-8.

Table 1-8: Examples of Wastewater Demand Management Strategies

Demand Component	Wastewater Examples
Operation	Infiltration/inflow reduction, reduction in trade waste loads Reduction in the number of public wastewater systems
Incentives	Wastewater collection and treatment pricing
Education	Public education on water conservation and efficiency

Demand Component	Wastewater Examples
Demand Substitution	Promote grey water re-use for toilets etc.
Connection Denial	Where treatment plants are at maximum capacity it is necessary to refuse connection to new users
Low flow fixture and fittings	Promoting the installation of 6 by 3 dual flush toilet suites and low flow taps in bathrooms and kitchens.

Loading reduction principles currently practiced include:

- Infiltration / Inflow reduction – Council has developed a strategy for resolving infiltration issues previously.

Council has adopted a Wastewater Bylaw that provides greater control on wastewater discharges. Silver Fern Farms are operating under a draft Trade Waste Agreement and there effluent quality has improved significantly such that the Dargaville Wastewater Treatment Plant is receiving much lower loading.

A review of the draft Bylaw conditions and the capacity of the Wastewater Plant is now required to agree the appropriateness of the compliance standards required so that these can be confirmed and a final document prepared and monitored against.

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

- Growth will be low and restricted to certain communities
- No major changes to industrial usage

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

1.8.1 Population Growth

The last Census undertaken in 2013 recorded the population at 18,960 of the District. This is an increase of 825 or 4.5% since 2006. Prior to this there was a growth increase of 5.6% following the 2006 Census.

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 for Dargaville and Maungaturoto the populations have retracted.

The 2012/2022 LTP 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 2012/2022 LTP is presented in Table 1-9.

Table 1-9: Annual Rating Unit Growth Forecasts 2012/2022

Area	Current Population (2013)	Years 1 – 4 2012/13 –2015/16	Years 6 – 10 2016/17 – 2021/22
Dargaville	4,251	1.50%	1.50%
Glinks Gully	72	0.00%	0.00%
Kaiwaka	576	1.00%	1.50%
Maungaturoto	895	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, the District is growing in other ways as an increasing number of visitors are in the District during the summer season from October to April, particularly during the weekends. The large number of non-residential owners of holiday homes in the District is one of the main contributors to growth, especially in Mangawhai and its surrounding areas, but also Maungaturoto, Pahi, Tinopai, Baylys Beach, Kai Iwi Lakes and Paparoa.

A study of the impact of non-resident holiday home owners have on the District is listed as a future improvement in the Three Year Improvement Plan for this AMP.

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.

1.8.2 Silver Fern Farms

The Silver Fern Farms (SFF) meat processing plant in Dargaville generates effluent as a by-product of day-to-day processing activities and is the largest contributor of effluent to the Dargaville wastewater treatment plant. Excluding SFF, the current average treatment plant inflow is approximately 550m^3 per day. Water consumption figures for SFF indicate a wastewater flow rate of 750 to 1,000m^3 per day (6 days per week), or around 650m^3 per day on average over

7 days. SFF indicate that this flow is unlikely to change and that a long term planning figure for capacity assessments would be a peak of 1,000m^3 per day.

SFF currently treat their own wastewater prior to discharging it into the Dargaville Treatment Plant. Recent upgrades to their treatment process utilising Bioremediation has shown significant improvement in effluent quality which now generally conforms to the draft tradewaste bylaw issued to SFF in 2009.

Developing a final agreement with Silver Fern Farms and gaining agreement on SFF discharge quality requirements and costs for discharging to the Dargaville Treatment Plant, and enforcing this agreement, is vital to ensuring that the Dargaville Treatment Plant can be sustainably managed in the future.

1.8.3 Increase in Demand for Wastewater Services

As the population increases in the growing coastal areas such as Pahi, Tinopai, Whakapirau and Baylys, there is an increasing expectation from ratepayers for Council to provide wastewater collection and disposal services for these areas. This is being driven by the ratepayers increasing awareness of the natural environment and the desire to minimise the adverse impacts of activities upon the environment. There is also a need to monitor demand in smaller Rural Communities such as Ruawai and Paparoa due to the potential inability of the environment to cope with growth.

1.8.4 Operational Efficiencies

The cost of operating and maintaining public wastewater systems and achieving compliance with ever increasing environmental standards, needs to be considered in the overall assessment of the schemes viability to continue as a public wastewater scheme, and consideration of the financial demand on ratepayers contributing to the on-going operability of the system.

For schemes serving larger populations, the costs are shared across a larger population base. The system is usually cost effective, with a greater emphasis on health and safety via the provision of adequate treatment to ensure effluent discharges meet consent requirements and minimise impacts on the receiving environment.

For schemes serving smaller populations, the costs per ratepayer may be disproportionately larger, as the same quality standards should be provided. An example could be the Glinks Gully system, which is currently serving a population of approximately 72 people and consists of a gravity collection system, single pump station and rising main to transfer the wastewater to an evapotranspiration soakage field. The operational costs of the system may not be cost effective from a Council perspective, and it may be more cost effective to transfer the system back to a private community scheme, (similar to the Sunset West scheme at Baylys Beach) or revert back to modern septic tank arrangements, where the responsibility for ongoing maintenance and renewal becomes that of the property owner (or scheme owner in the first instance).

Careful consideration needs to be given to progressing such changes and consultation with the community should be undertaken as part of the process.

1.8.5 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 wastewater services. For example low pressure wastewater systems eliminate the need to create deep pipe systems in order to establish minimum flushing grades. The further development of membrane filtration in waste treatment process means very high treatment levels can be achieved for less cost than previously expected.

The recent improvement in the cost of membrane filtration technology has allowed its adoption at Maungaturoto as an addition to the pond treatment system. This technology produces a very high quality effluent that provides good removal of viruses. Accordingly it is ideally suited for discharges into the Kaipara Harbour where shellfish gathering is undertaken.

Monitoring of the Maungaturoto scheme should prove instructive and allow assessment of its application to both larger and smaller schemes. The key point of interest will be the running costs in terms of both power and filter unit replacement rates. In addition, the current scheme allows a staged development that is well suited to a staged scheme development due to the uncertain rate of growth in Maungaturoto. Recent developments in pipeline rehabilitation techniques such as grouting, patch lining and replacement with pipes of better material and with more water tight jointing have been shown to be valuable tools in managing the infiltration problem. Whilst the use of modern pipelines in urban growth areas are able to significantly reduce infiltration, by themselves these technologies will not prevent a long term increase in groundwater intrusion due to the deterioration of jointing in older catchments. There is also emerging evidence that achieving targets for flow reduction may not be possible without including the complete length of service laterals in rehabilitation programmes.

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

1.8.6 Economic Trends

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

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

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

1.8.7 Legislative Change

Legislative change can significantly affect the Council's ability to meet minimum Levels of Service, and may require improvements to infrastructure assets. Changes in environmental standards and the Resource Management Act 1991, may affect wastewater treatment options. In addition, changes in legislation can influence the ease at which new consents are obtained or existing consents are renewed. Experience demonstrated that consent conditions are becoming more stringent with increased monitoring requirements being commonplace and the likelihood of additional treatment necessary.

The Ministry to the Environment is promoting a series of National Environmental Standards that can be enforced as regulations under the Resource Management Act. Whilst the On-Site Wastewater Systems National Environmental Standard has been withdrawn, other standards have the potential to impose costs on ratepayers including those not connected to a Council wastewater system. One such standard is the proposed standard for Ecological Flows and Water Levels. Whilst this will have a greater impact on water supply services it has potential to impact on wastewater services by imposing conditions on receiving water quality requirements.

1.8.8 Customer Expectations

Customers are demanding a higher standard of wastewater services and will need to be kept informed as to the impact of changes in the legislative requirements for wastewater treatment and the subsequent impact on individual schemes. The cost of maintaining or improving treated wastewater quality standards will need to be clearly communicated to the communities.

This increased customer demand has been witnessed in the Far North and Whangarei Districts where tolerance for unplanned wastewater discharges, such as during storm events, has reduced. Improving the management of unplanned discharges is a Level of Service and key task under this AMP.

1.8.9 Environmental Considerations

Where the absence of a reticulated wastewater collection and treatment scheme could result in continued adverse effects on the environment, Council may be required to extend existing schemes, or provide a new scheme to mitigate such impacts. Where such issues are identified a full range of solutions will be investigated with preference given to privately managed solutions.

1.8.10 Changes in Weather Pattern

The MfE advice that climate scientists estimate Northland's temperature could increase 0.9°C by 2040, and 2.1°C by 2090[2]. This compares to a temperature increase in New Zealand during last century of about 0.7°C[3]. To put this in perspective, the 1997/98 summer, which was particularly long, hot and dry, was only about 0.9°C above New Zealand's average for the 1990s. Northland is expected to experience more frequent and intense heavy rainfall events which will increase the risk of flooding and could become up to four times as frequent by 2090.

The effects of this on the wastewater activity are that high intensity rainfalls causing overflows may occur more frequently. Also wastewater assets near sea level may be affected by higher sea levels or tidal surges.

The development of the Council's Engineering Standards 2011 provides design rainfall for Dargaville, Tinopai, Maungaturoto and Mangawhai areas of the District, being the main population centres. The rainfall depths provided in the Engineering Standards have been estimated up to the 100-year event; 72-hour duration and include adjustment for 95% confidence.

For developments in other areas the Engineering Standards acknowledges NIWA's High Intensity Rainfall Design System (HIRDS) version 2, which outlines rainfall depths + 1.65 standard error + 17% climate change allowance.

The impact of long term changes in weather patterns have not been built into this AMP given the lack of detailed information available, although development of an unplanned discharge mitigation plan has been included. Inclusion of possible risk imposed by global warming to the wastewater assets will need to be included as the AMP is developed in future.

1.8.11 Changes in Water Discharge Volumes

Changes in water consumption patterns can affect wastewater assets. This can occur by an increase in per capita usage, resulting in more wastewater, or decreases in water usage which can result in more concentrated and possibly corrosive wastewater. It is considered unlikely that there will be significant changes in per capita water use throughout the planning period of this AMP, although loss or gain of a commercial discharger is possible.

The current recession forces businesses to reconsider how and where they operate. Council works with both Fonterra in Maungaturoto and Silver Fern Farms in Dargaville to provide mutual beneficial arrangements. Fonterra takes water from Council's water supply system but discharges wastewater through its own

[2] Ministry for the Environment, Climate Change Projections for the Northland Region. 2 August 2012: http://www.mfe.govt.nz/issues/climate/about/climate-change-affectregions/northland.html
[3] NIWA, Past Climate Variations over New Zealand: http://www.niwa.co.nz/our-science/climate/information-and-resources/clivar/pastclimate

treatment system. Whereas Silver Fern Farms is supplied water by Council and discharges waste water that is partially treated into Council's system. Council is currently working with Silver Fern Farms to introduce a trade waste agreement.

Any changes to these arrangements with commercial users will have impacts on the cost structure of each scheme. If Council is to be successful in developing and growing business within the District it will be necessary to work with the existing and new businesses to provide sufficient wastewater treatment capacity. Providing economic wastewater treatment will be a key benefit to encourage business growth and development in Kaipara.

1.8.12 Summary

Table 1-10 below shows a summary of how the above issues will impact on the management of wastewater assets.

Table 1-10: Summary of Issues Affecting the Wastewater Assets

Issues	Impact on Wastewater Assets
Population Growth	Potential future new schemes for the high growth communities would have a large impact
Technical Change	Little or no impact
Economic Trends	Potential high impact for Dargaville. Little or no impact for other schemes
Legislative Changes	Unknown Impact. Resource Consent conditions could have a significant impact, particular where wastewater is discharged direct to water.
Customer Expectations	Unknown Impact, drive towards a reduction in unplanned discharges.
Environmental Considerations	Potentially high impact in reticulated communities such as Ruawai.
Weather Changes	Possibly an increasingly important impact. As weather changes are likely to be gradual, in terms of medium term asset management planning time frames, these effects are raised here and need to be reviewed as the Asset Management Plans are developed in the future.
Water Discharge Volumes	Potentially significant if large discharger leaves or enters a reticulated area. The effect of this occurrence would need to be assessed on a case by case basis

1.8.13 Impact of Trends on Infrastructure Assets

The main impact of the above trends is the expectation for Council to design, construct and operate wastewater collection, treatment and disposal systems in coastal communities to meet the growing demands of population growth and urban development, or to upgrade treatment facilities for existing serviced areas in order to discharge treated effluent to land. The immediate and long term costs associated with these possible schemes is presently unknown.

Thorough investigation of all options to provide wastewater solutions will be required and any decision for Council to become involved in the creation of additional systems would only proceed where a Business Case supports the financial sustainability of the scheme funded entirely by the users.

1.9 Environmental Management

An important aspect of the wastewater activity is ensuring that any discharge of contaminants to the District's land, air and natural water resources is managed responsibly. The statutory framework defining what activities require resource consent is the Resource Management Act (RMA) 1991. The RMA deals with:

- the control of the use of land
- structures and works in river beds and in the coastal marine area
- the control of the taking, use, damming and diversion of water, and the control of the quantity, level and flow of water in any water body, including:
    - the setting of any maximum or minimum levels or flows of water
    - the control of the range, or rate of change, of levels or flows of water.
    - the control of discharges or contaminants into water and discharges of water into water.

Council's wastewater reticulation and treatment plants (including oxidation ponds) have an essential role in ensuring that wastewater produced across the District is properly collected, treated and disposed of in ways that meet community and cultural expectations and avoid causing significant adverse effects on the environment.

The RMA requires resource consents in the form of discharge permits for all discharges of treated wastewater. Other resource consents may also be required for installation and operation of wastewater infrastructure (e.g. pipelines across rivers and streams, and in coastal areas, monitoring of water supply bores for wastewater activities). Council holds a number of resource consents for its wastewater activities. A summary of current wastewater consents held by Council is presented in Resource Consent Register is presented in Appendix D - Resource Consent Register.

Environmental and treatment plant performance monitoring is required by many of the consents held by Council. A new measure was recently introduced by NRC to limit the number of annual discharge events into local rivers or streams from Council's reticulation, to a maximum level of 5. Recent studies in the Dargaville wastewater network have identified issues with infiltration from the stormwater network. This increased loading on the wastewater system could potentially create overloading at wastewater treatment facilities, and increased discharges to the receiving environment.

Analysis of data collected by the "Aquavision" telemetry system in use at the Dargaville WWTP, along with the output of the hydraulic model of Dargaville's reticulation network will both assist with the identification of the source of the infiltration, and remedial works to rectify.

Infiltration issues have also been identified in the Maungaturoto wastewater system with flows during heavy rainfall events likely to exceed the allowed maximum daily discharge consented for Maungaturoto. A small sub-catchment within the Maungaturoto network was selected to undergo smoke testing to identify potential sources of inflow / infiltration during 2012/13. The findings of this survey identified that it was the private connections and roof guttering connections to the wastewater reticulation that were the primary sources of inflow / infiltration. These instances were to be forwarded to the regulatory department of Council to follow up to get rectified. Whilst in this instance, the public wastewater network was not found to be contributing significantly to the inflow/infiltration issue, it is still being considered to extend the exercise to the wider Maungaturoto network and possible other communities.

The development of an unplanned discharge mitigation strategy has been included as an item in the improvement plan and will seek to address the issues at Dargaville and Maungaturoto.

The oxidation pond in use at Te Kopuru is also monitored through sampling by NRC. Recent samples have indicated instances of non-compliance with consent conditions, thought to be due to sludge accumulation in the pond. De-sludging of the oxidation pond at Te Kopuru has been completed as step toward improving the performance of the system.

NRC undertakes summer monitoring at popular swimming locations in the District, two freshwater and eight coastal sites. Samples are taken weekly between December and April each year to ensure the water is safe for swimming. Each site is given a grading based on the results compared to the Ministry for the Environment's "*Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Area*" publication (2002).

The 2010/11 Annual Report states that 96% compliance was achieved during the 2010/11 summer period across all 14 sites.

The results of this monitoring programme can be used to identify non-compliant locations and instigation of investigations into possible sources of contamination which may include contamination of stormwater from the wastewater network during intense rainfall events.

There is a growing awareness of the environmental issues related to wastewater discharge on the receiving environments and its impact on our cultural, social and economic well-being.

1.10 Proposed Levels of Service and Performance Measures

A key objective of this AMP is to match the Levels of Service associated with the wastewater collection / treatment activity to agreed expectations of customers and their willingness to pay for that level of service. The Levels of Service provide the basis for the life cycle management strategies and works programmes identified in the AMP.

With wastewater assets, there are often higher levels of maintenance and renewal requirements proposed (increased Levels of Service) 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.

Levels of Service can be strategic, tactical, operational or implementation and 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 Legislation**, regulations, environmental standards and Council bylaws that impact the way assets are managed. These requirements set the minimum level of service 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 Levels of Service that the Council wishes to achieve.
- **Best Practices and Standards** Specify the design and construction requirements to meet the Levels of Service and needs of stakeholders.

Council's current Levels of Service and associated performance measures for the wastewater activity are presented in Table 1-11 below. These have now had the non-financial performance measure rules 2013 incorporated. The current Levels of Service have been developed to contribute to the achievement of the stated Community Outcomes that were developed in consultation with the community, and taking into account:

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

The Levels of Service that Council has adopted for this AMP are the Levels of Service prepared, consulted on and adopted as part of the 2012/2022 LTP consultation process, with the aim of retaining the existing Levels of Service provided to the Kaipara communities. The Levels of Service are designed by Council to represent the best Levels of Service possible for a cost that the community can afford and is willing to pay.

The LTP performance measures are reported on through the Annual Reporting process. Council's current performance measures will be reported on in the 2012/2013 Annual Report.

The Levels of Service are measured annually using the performance measures identified in Table 1-11. As an example, where the level of service measure is the percentage of satisfied residents, this relates to the number of survey respondents that are either 'Very Satisfied' or 'Fairly Satisfied' as a percentage of total respondents.

Historically, the Levels of Service in previous AMPs were found to be difficult to measure and / or were strategic objectives rather than measures of performance. The historical Levels of Service measures, performance criteria and results achieved against the criteria are presented in Appendix E for information.

The AMP Improvement Plan includes an item for Council to review its wastewater system Levels of Service to identify if there is further opportunity for improved efficiencies and / or best practice that can be incorporated into Council's level of service framework.

1.11 Service Gaps

Council's goal is to develop and implement appropriate strategies to close the gaps that occur between the current service provided and the target standards. The following gaps and actions to address them have been identified.

GAP 1: Protocol to Eliminate Spills

The Council has, through this AMP, identified where improved management of unplanned wastewater discharges is required. As yet it has not determined the best management strategy; however it is likely to be a combination of the following and particular to a given wastewater system:

- Reduction in infiltration and inflow to the wastewater system
- Provisions for alternative power supplies at key pump stations
- Improved alarm and response procedures
- Installation of emergency storage
- Provision of consented overflow points

GAP 2: Discharge to Land Policy

Council has established a policy of discharging wastewater to land. This was established for new schemes and aligns with consultation with Iwi. The consents

for Kaiwaka, Maungaturoto and Te Kopuru allow discharge to water.

To reconcile this gap Council needs to:

- Review the implementation of this policy
- Review the ability of Council to discharge to land given the nature of Kaipara's soils
- Assess the impact of this policy on the affordability of these schemes

GAP 3: Risk Management Framework

Council's current AMPs detail Risk Management processes. These need to be coordinated to facilitate a consistent Risk Management framework. Council need to:

- Consolidate the Risk Management Process in all the Asset Management Plans
- Align the overall process and develop a prioritisation regime across all Council activities
- This would allow rationalisation of service levels to address key risk.

Table 1-11: Levels of Service and Performance Measures

Performance indicator/service level	Target 2013/2014	Target 2014/2015	Target 2015/2016
(1) System and adequacy The number of dry weather sewerage overflows from the *territorial authority's sewerage system, expressed* per 1000 sewerage connections to that sewerage system.		0	0
(2) Discharge compliance Compliance with the territorial authority's resource consents for discharge from its sewerage system measured by the number of:			
(a) abatement notices	0	0	0
(b) infringement notices	0	0	0
(c) enforcement orders, and	0	0	0
(d) convictions,	0	0	0

Performance indicator/service level	Target 2013/2014	Target 2014/2015	Target 2015/2016
Appendix A received by the territorial authority in relation those resource consents.			
(3) Fault response times Where the territorial authority attends to sewerage overflows resulting from a blockage or other fault in the territorial authority's sewerage system, the following median response times measured:			
(a) attendance time: from the time that the territorial authority receives notification to the time that service personnel reach the site, and	1 Hour	1 Hour	1 Hour
(b) resolution time: from the time that the territorial authority receives notification to the time that service personnel confirm resolution of the blockage or other fault.	Unmeasurable Item	Unmeasurable Item	Unmeasurable Item
(4) Customer satisfaction The total number of complaints received by the territorial authority about any of the following:			
(a) sewage odour	16	16	16
(b) sewerage system faults	16	16	16
(c) sewerage system blockages, and	15	15	15
(d) the territorial authority's response to issues with its sewerage system,	1 hour	1 Hour	1 Hour
Total complaints for the year			

2 The Assets

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

- Asset Details – summary of Council's six wastewater schemes, their condition and performance
- Critical Assets – summary of Council's critical wastewater assets and how these will be managed
- Asset Values – summary of the wastewater asset valuation.

2.1 Asset Details

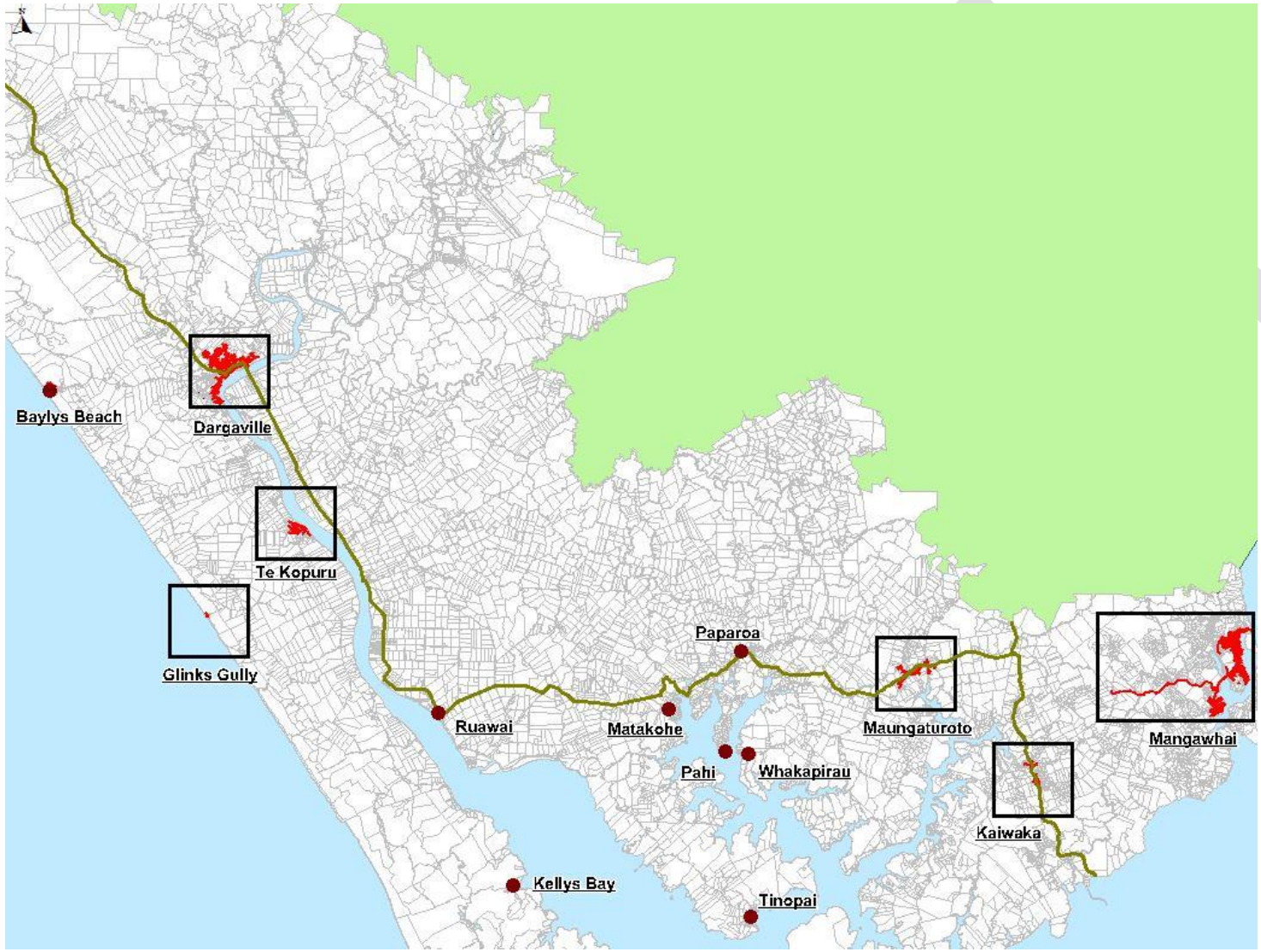
2.1.1 Overview

The wastewater assets that are within the scope of this AMP are spread throughout the District with six separate wastewater collection and treatment schemes in operation:

- Dargaville
- Glinks Gully
- Kaiwaka
- Maungaturoto
- Te Kopuru
- Mangawhai

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

Figure 2-1 : Location of Communities with Wastewater Schemes



An overview of the wastewater assets in the District is provided in Table 2-1 below. See Section 2.3 for discussion of the asset valuations.

Table 2-1: Asset Overview Summary

Community	Treatment Plants	Pump Stations	Rising Mains (km)	Gravity lines (km)	Manhole	Connections	Condition
Dargaville	1	15	5.8	39.2	717	1,960	Assessment Program commenced 2013/14
Glinks Gully	1	1	0.3	0.15	8	24	Assessment Program commenced 2013/14
Kaiwaka	1	1	1.3	4	71	163	Assessment Program commenced 2013/14
Maungaturoto	1	3	1.3	11.16	197	369	Assessment Program commenced 2013/14
Te Kopuru	1	0		6.4	85	190	Assessment Program commenced 2013/14
Mangawhai	1	12	22.3	46	487	1,617	Assessment Program commenced 2013/14

The valuation total for the District is summarised in Table 2-2 below.

Table 2-2: Summary of Wastewater Asset Revaluation (2014)

Community	Replacement Costs (including 2013/14 Reconciliation)	Depreciated Replacement Cost
Dargaville	$18,663,775	$7,581,385
Glinks Gully	$257,034	$157,503
Kaiwaka	$1,797,113	$807,643
Maungaturoto	$5,793,851	$3,310,426
Te Kopuru	$1,956,388	$785,089
Mangawhai	$41,578,230	$36,122,371
Total	**$70,046,391**	**$48,764,418**

(Source 2014 Valuation)

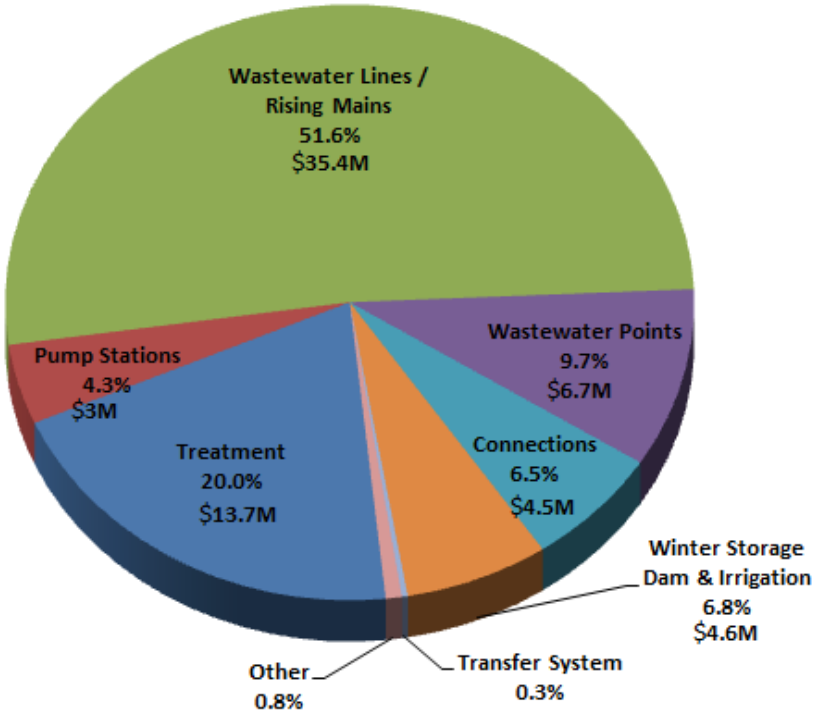
This AMP focuses on three main asset components for wastewater which are:

- Reticulation (gravity reticulation), manholes and connections
- Pumping Assets (with exception of Te Kopuru)
- Treatment and Disposal

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

Council own all land used for wastewater facilities covered by this AMP. All sites are designated for the purposes of wastewater treatment and disposal.

Figure 2-2 : Scope of Wastewater 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 wastewater business. Details of each system and its capabilities are included in Section 4.2 (Asset Management Systems and Processes).

It is recognised that the current level of condition and performance data relating to the wastewater 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 wastewater assets.

The improvement of Council's data collection and entry processes has been identified as a future 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 using 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
10	Review the Asset Register to ensure all known assets are properly recorded, especially Mangawhai Response – Commenced 2014	Complete
11	Asset Condition - Undertake the physical inspection and formal condition assessment of all critical wastewater assets (pipes, pump stations, etc.). Response – Commenced 2014	Dec-15
12	Complete the data cleansing project to reduce the number of unknown asset attributes (including asset life to aid renewal planning). Response – Commenced 2014	Complete

ID No. (Improvement Plan)	Improvement Action	Forecast Completion Date
13	Review Data Management procedures	Jun-16
14	Review adequacy of developers hand over requirements contained within Engineering Standards. Identify programme to enhance – include asset schedules and capital cost recording for each asset created.	Jun-15
15	Record the maintenance history with each works order at asset component level in Asset finda.	Dec-16

2.1.3 Dargaville

Dargaville has a population of 4470 and is serviced by 40 kilometres of pipeline, 15 pump stations, 8.5 kilometres of rising main and a single treatment plant. Wastewater is collected from the urban area, apart from a section of the Beach Road industrial area that has on-site treatment.

Most recent census data indicates Dargavilles' population has declined 4.6% from 4455 usually resident population in 2006 to 4251 in 2013.

A summary of Dargaville's wastewater assets is included in Table 2-4.

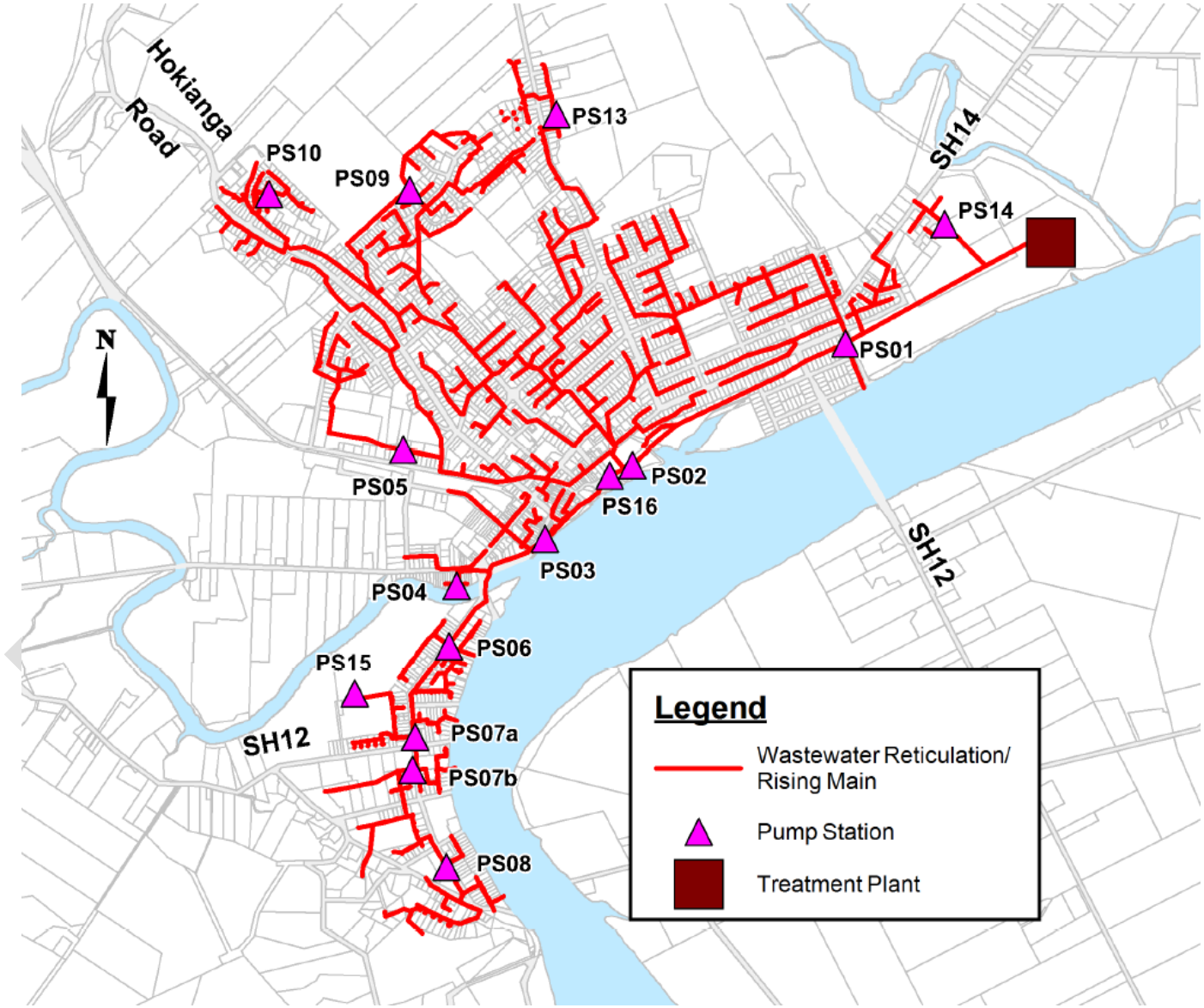
The layout and location of Dargaville's wastewater assets are illustrated in the Asset Map in

Figure 2-3.

Table 2-4: Dargaville Asset Summary

	Treatment Plants	Pump Stations	Rising Mains (km)	Gravity lines (km)	Manhole	Connections
Physical Quantity	1	15	5.8	39.2	717	1,960
Asset Condition Rating	Assessment Program commenced 2013/14	Assessment Program commenced 2013/14	Unknown at present	Assessment Program commenced 2013/14	Assessment Program commenced 2013/14	Unknown at present
Depreciated Replacement Cost	$7,581,385					

Figure 2-3: Dargaville Asset Map



The Sunset West development installed at Baylys Beach was originally to be vested to Council as a public system. Due to downturn in development and a change in the owner of the subdivision, as of June 2013, the scheme will be retained as a privately owned and operated scheme.

2.1.3.1 Reticulation

Dargaville was first reticulated in the 1940's when the major residential area of town was connected to a network that discharged directly into the river. The majority of this original network has subsequently been replaced in a series of 5 contracts that were let from 1978 to 1983.

Figure 2-4 and Figure 2-5 illustrate the breakdown of material and size of the reticulation network respectively.

Figure 2-4: Dargaville Reticulation Material Composition

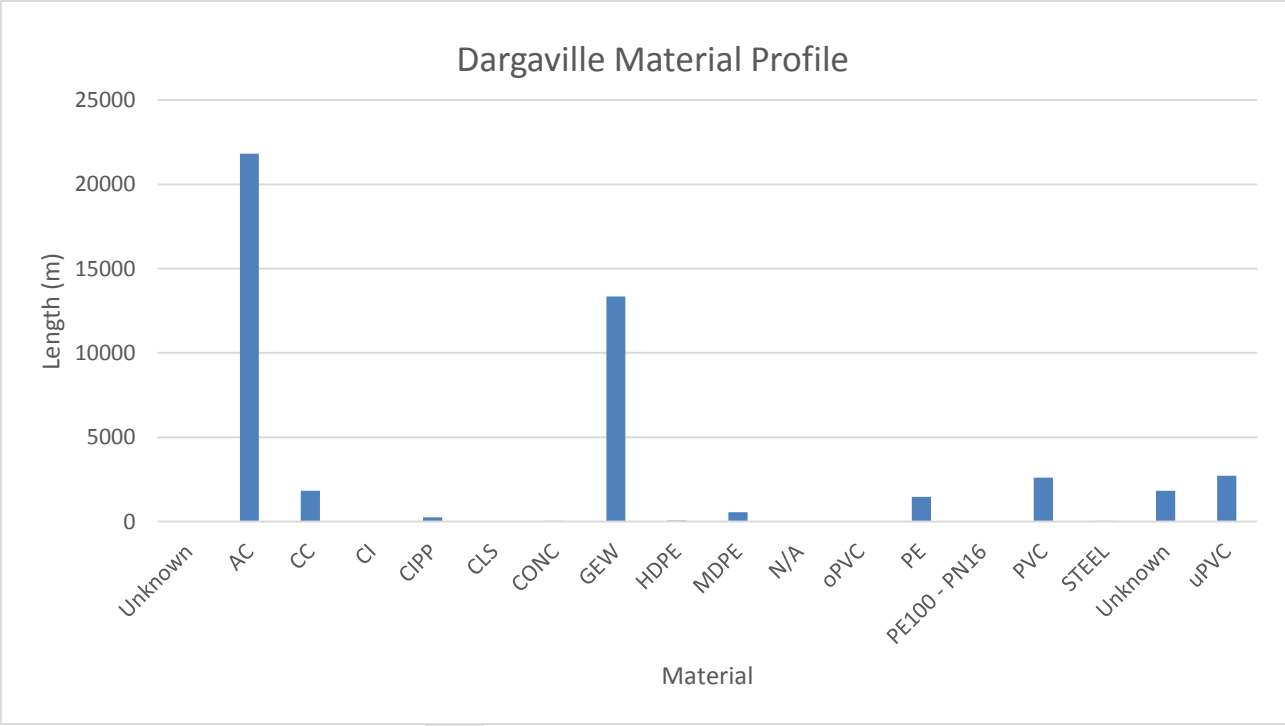
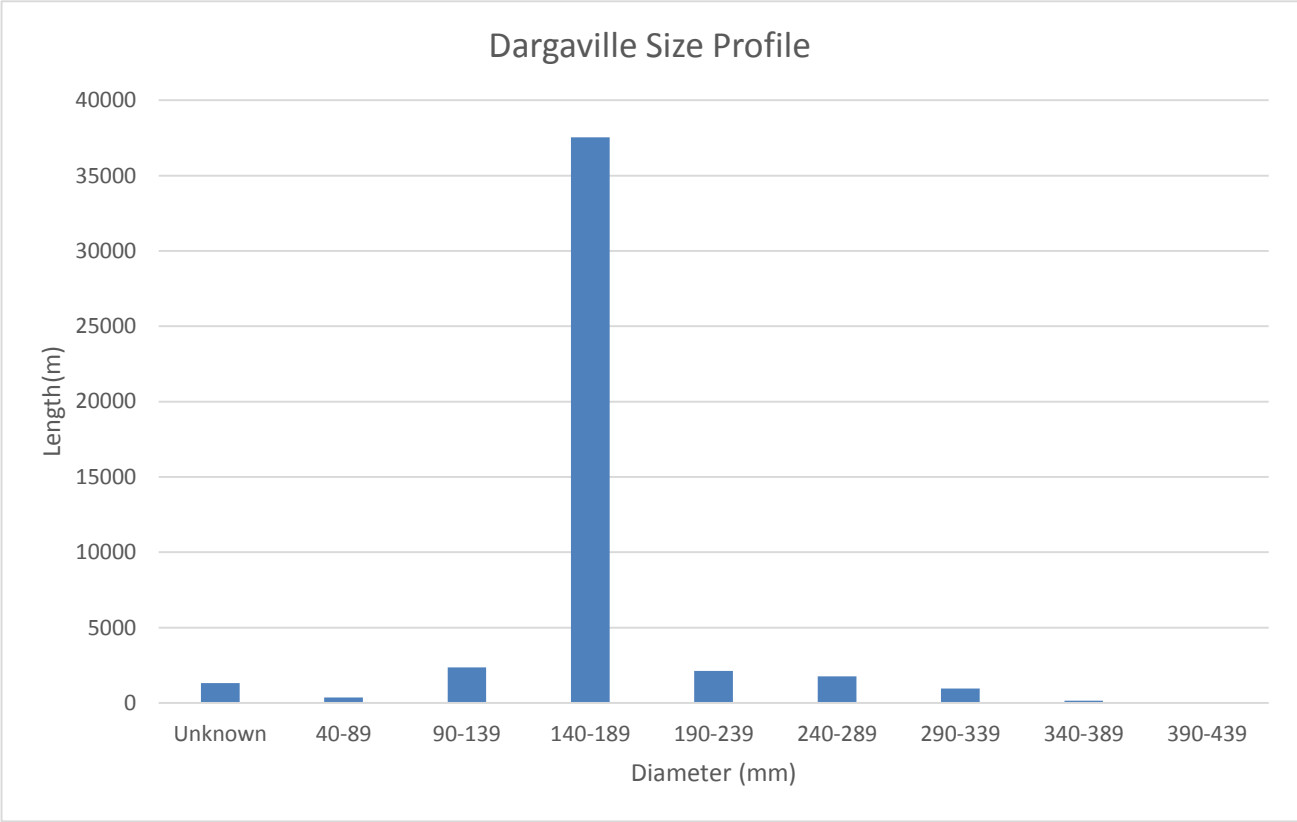


Figure 2-5: Dargaville Reticulation Diameter Breakdown



The condition of Dargaville's reticulation is generally unknown due to a lack of data. A high-level assessment was recently completed to produce a basic understanding of condition and capacity. This assessment is based on the knowledge of the Utilities Contractor and Professional Services Engineer and a limited amount of visual inspection. The high-level assessment indicated that the reticulation was in good to average condition with some sections, primarily older asbestos cement lines, in poor condition.

As discussed in Section 2.1.2, Council has committed to improving its knowledge of asset condition and condition assessments of the assets including pipelines commenced in 2014. The capacity of Dargaville's reticulation has not yet been fully assessed. Development of a hydraulic model of the reticulation network will provide a means of identifying capacity issues and options to resolve them.

Dargaville's reticulation suffers from a significant level of stormwater / groundwater infiltration. The hydraulic modelling and analysis of pump station telemetry will assist in identifying the source of the infiltration.

2.1.3.2 Pump Stations

The Dargaville wastewater scheme incorporates 15 pump stations that have been built as the network has expanded. These pump stations either pump wastewater into neighbouring catchments or other pump stations and as a result a number of stations are connected in series. For example, flow from all pump stations, with one exception, enters Pump Station 1 before being pumped to the treatment plant.

Generally, all of Dargaville's pump stations including the pumps and electronic equipment are in average to excellent condition. Most pump stations received significant upgrades in 2004. This included the installation of telemetry to aid data acquisition and remote control of pumps.

The telemetry system has proven to become increasingly unreliable and following investigations and advice from experts in this field an upgraded system is planned for implementation across the district. Upgrading the Dargaville Pumps Stations is a priority and part of the initial stage in 2014.

Recent inspections have indicated significant rags in some stations and more proactive management of the system has been proposed.

As a health and safety measure the installation of grills under the lids is also proposed.

Dargaville's pump stations are believed to have sufficient peak capacity to cater for dry weather flows. However, during rainfall events, inflow can exceed the combined pumping capacity at any station and the capacity of the station depends on the storage volume within the wet well and net inflow.

A number of investigations have been proposed to determine the best way to manage unplanned discharges, which may include additional storage, back-up power generation, increase in pumping capacity, or other methods such as overflow treatment, increase in redundancy, improved control and pipeline rehabilitation. Development of an unplanned discharge mitigation strategy has been included in the Improvement Plan and will be completed during the lifespan of this AMP.

2.1.3.3 Treatment

Dargaville is served by a single wastewater treatment plant situated adjacent to the Northern Wairoa and Awakino Rivers. The site comprises a 4.7-hectare (47,000 m2) facultative oxidation pond, with aerators, in the western part of the site and a 20,000m^2 maturation pond in the eastern part of the site. Figure 2-6 illustrates the layout of the treatment plant. A photograph of the oxidation pond is included as Figure 2-7.

Effluent enters the oxidation pond for initial treatment and is then pumped into the maturation pond where it circulates over a 7-day period (varies according to infiltration level) for further polishing of the effluent, particularly with regard to pathogen reduction. The treated effluent discharges via a spray irrigation field onto the riparian strip bordering the Northern Wairoa River.

The Dargaville treatment plant was partially upgraded in 2007 by converting the originally constructed wetlands to a maturation pond and constructing an effluent land dispersal system along the banks of the Northern Wairoa River. Then in early 2009 the maturation pond was desludged to remove an historical build-up of sludge carried over from the main oxidation pond.

Figure 2-6 : Dargaville Treatment Plant Layout ***(Source: Google Maps)***

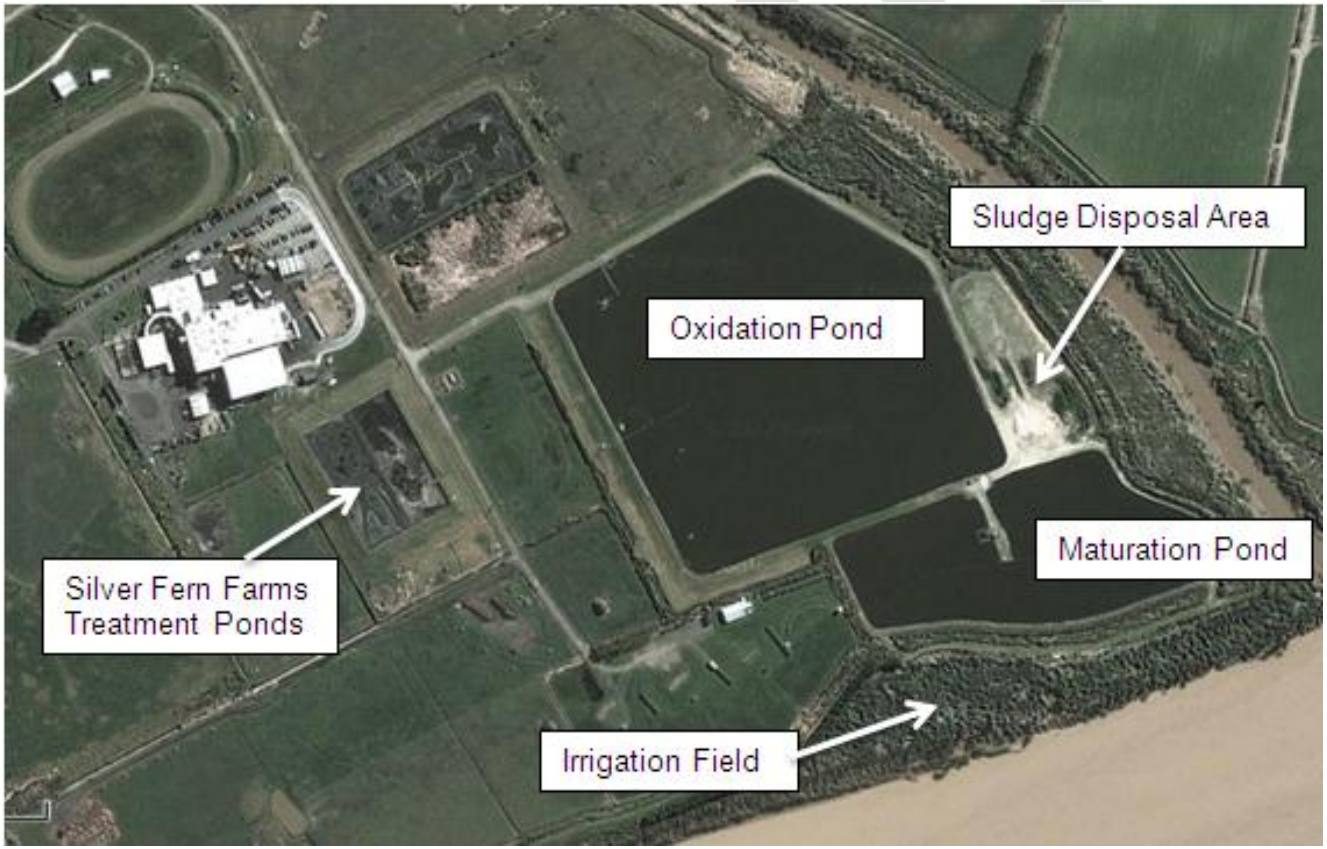


Figure 2-7 : Dargaville Treatment Plant - Oxidation Pond

Dry weather flows from Dargaville are typically in the range 600 to 1000m^3/day. However, flow from the urban area is significantly affected by stormwater infiltration, with flows well over 5000m^3/day occurring in heavy rainfall conditions. Average flows were assessed (CPG Report November 2009 "Report on Dargaville Wastewater Treatment Plant Performance and Trade Waste Review") to be around 1340m^3/day.

The Dargaville sale yards operate weekly through the year and generate stock effluent from runoff from hard standing areas. The volumes of effluent produced by the stockyards are typically low, but the effluent exhibits a high Biological Oxygen Demand (BOD) loading.

The Silver Fern Farms (SFF) meat processing plant generates effluent as a by-product of day-to-day processing activities and is the largest contributor of effluent to the Dargaville pond. The SFF plant operates seasonally, with a shutdown period during October. During the peak season the plant operates six days per week killing for 16 hours a day, with an eight hour per day wash down period. Water consumption figures for SFF indicate a wastewater flow rate of 750 to 1,000m^3 per day (Six days per week), or around 600m^3/ day on average over seven days. SFF indicate that this flow is unlikely to change and that a long term planning figure for capacity assessments would be a peak of 1,000m^3 per day. More accurate flows and load figures are currently being collected.

SFF upgraded their treatment process in 2007 to include an anaerobic lagoon and aerated basin Initial monitoring in January 2008 showed that the plant was achieving the expected outcomes. Later analysis in 2009 indicated performance had deteriorated. In 2010 Silver Fern Farms commissioned Paklink Ltd to trial a bioremediation process at the plant. This process consists of introducing bugs to improve the activity within the ponds removing the organic compounds. Results between June 2012 and February 2013 indicated:

$CBOD_5$	<50
SS	<400

KDC issued Silver Fern Farms with a draft tradewaste agreement in 2009 which included the following performabnce figures:

CBOD5 12 MONTH AVERAGE	45
TKN	100
SS	300

Now that the plants performance is consistent a review of the tradewaste performance and regular monitoring of their performance against this should occur.

The Dargaville oxidation pond was constructed in 1978/79 and was designed for a population of 5,500, the projected population of Dargaville in 2003. Dargaville's current population is approximately 4251; however the combined loading from the non-industrial wastewater and SFF effluent is equivalent to a population significantly higher than the design population.

In an assessment of treatment plant performance undertaken by Waste Solutions Ltd in 1996, it was found that the loading on the oxidation pond was high when compared with conventional design criteria; however, the system was identified as operating successfully. The capacity to treat higher flows and loads was restricted.

Pre-treatment of waste, or the use of other treatment options was identified as possibly being required to accommodate wastewater flows generated by further population or industrial growth within Dargaville's reticulated area.

In September 2002 one of the original aerators in the oxidation pond was replaced with a venturi aerator system. This new system has resulted in increased dissolved oxygen levels and reduction in Faecal Coliforms and Biological Oxygen Demand within the pond.

Since the early 2000s, however, the oxidation pond was seen to struggle at times and this lead to the staged strategy of upgrading the pond system (as outlined above) and the efforts to get SFF to upgrade their own treatment plant, prior to discharge into the Council system.

Relocation of the discharge point to the banks of the river and treatment via the converted maturation ponds has improved the quality of effluent being discharged. The wastewater system has been operating within its resource consent requirements since it was upgraded.

Now that Silver Fern Farms effluent quality is nearing the conditions of the draft Tradewaste agreement the system is considered sustainable. The remaining issue is to remove the huge quatities of sludge that have accumulated in the ponds over the years of operation.

Some 45,000 m^3 of sludge have been identified in 2013 as being present in the ponds which have a total capacity of some 65,000 m^3.

5000m^3 was removed by mechanical means in 2011 by mechanical means and placed on a prepared area at the site. A review of desludging options in 2013 identified Bioremediation as the preferred option and Parlink provided a price to trial the sludge removal. The process is designed to take two and half years and should lead to the complete system performing to a consistent high standard well into the future.

Going forward the installation of a step screen is proposed to deal with the excessive rag that the wastewater system receives.

There are a number of factors or projects currently underway that have an effect on the current and future capacity of the Dargaville treatment system. These include:

- The desludging of the oxidation pond and the potential for Bioremediation to manage sludge in the whole system continually
- The on-going performance and management of the Silver Fern Farms discharge and finalisation of a Trade Waste management system
- The effect of pipeline renewals on inflow and infiltration
- The outcome and implementation of the unplanned discharge mitigation strategy
- New connections (growth or other communities).

2.1.3.4 Summary of Issues and Remedial Actions

The issues relating to the Dargaville Wastewater Scheme as identified by Council, or in the body of this AMP, along with the remedial actions identified in the February 2013 Improvement Plan and updated to reflect 2014 status, are listed in Table 2-5.

Table 2-5: Dargaville Issues and Remedial Actions

Issue	Remedial Action Identified in Improvement Plan		Forecast Completion Date
	ID No.	Improvement Action	
Stormwater inflow and infiltration causes high flows to the treatment plant, overloading the pond and effluent dispersal systems; and the risk of transient resource consent non-conformances.	29	Develop Strategy around resolving infiltration issues, and programme infiltration assessments. Undertake cost-benefit analysis.	Dec-2015
	32	Investigate efficiency improvements at Dargaville WWTP - assess pond efficiency / need for increased aeration at Dargaville WWTP and need for / benefit of a step screen.	Jun-2017
	42	Identify Consent required improvements and timing - develop a program to rectify	Jun-2015
Commercial operations are currently discharging high loadings causing a need to de-sludge the oxidation and maturation ponds at closer intervals.	02	Negotiate final Trade Waste Agreement (including future demand) with Silver Fern Farms and other commercial users.	Jun-2015
	17	Discuss future demand requirements with significant dischargers.	Dec-2015
	19	Oxidation Pond Desludging Strategy - Investigate and develop forward strategy and programme for desludging the regions various wastewater oxidation ponds Response – Use the results of the Bioremediation process to determine whether this strategy can be utilised elsewhere and possibly on an on-going basis to manage sludge pond health and performance.	Jun-2016
	20	Dargaville Oxidation pond - sludge survey. Response- Completed in 2013 and on-going as part of the Parlink process.	Jun-2019
Dargaville operates a large number of pump stations; it is desirable to reduce the number of pump stations. A reduction in the number of pump stations would achieve greater operational efficiency and reduction in operating costs.	30	Pump stations audit - work with Pump specialists to assess the condition/suitability of the pumps at Dargaville, Glinks Gully, Kaiwaka and Maungaturoto pump stations (funded from maintenance contract).	Jun-2015

Issue	Remedial Action Identified in Improvement Plan		Forecast Completion Date
	ID No.	Improvement Action	
Frequent overflows indicate that network restrictions exist, however the capacity of the pipe network is not currently known. The investigation of the schemes capacity and development of an unplanned discharge mitigation strategy will help Council achieve its targeted Levels of Service.	24	WW Pump station Overflow Storage (17 pump stations) - review and develop programme for reducing overflow frequency from the regions Wastewater pump stations.	Jun-2015
	25	Develop unplanned discharge mitigation strategy.	Jun-2016
	38	Wastewater Modelling (Dargaville) – Scoping exercise to determine needs and level of detail required for development of hydraulic model for Dargaville.	Jun-2016
	39	Wastewater Modelling (Dargaville) – Development of hydraulic model for Dargaville to identify capacity issues, optimisation of pumping stations, manage growth.	Jun-2016
Dargaville has a high value of deferred reticulation renewals. These deferrals are relative to the age of the assets.	49	Review and assess levels of deferred maintenance and assess condition of assets to determine what renewal work may be required.	Jun-2015
Access the volume of emergency storage required.		Assess the volume of storage in the reticulation in addition to the pump station to determine the additional storage required to be constructed to comply with the Regional Water and Soil Plan.	2016

2.1.4 Glinks Gully

Glinks Gully is a small holiday community located 20km south west of Dargaville on the west coast of Northland. The wastewater scheme servicing Glinks Gully is designed to service a peak period population of 72.

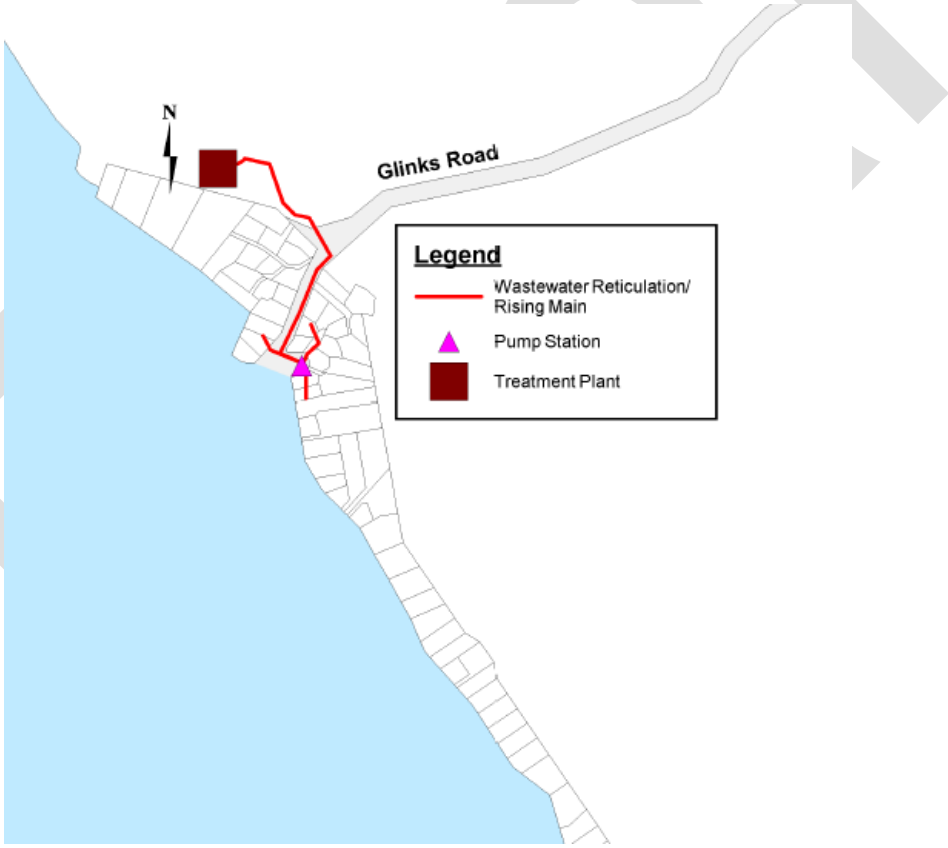
A summary of Glinks Gully's wastewater assets is included in Table 2-6.

The layout and location of Glinks Gully's wastewater assets are illustrated in the Asset Map in Figure 2-8

Table 2-6: Glinks Gully Asset Summary

	Treatment Plants	Pump Stations	Rising Mains (km)	Gravity lines (km)	Manhole	Connections
Physical Quantity	1	1	0.3	0.15	8	24
Asset Condition Rating	Assessment Program commenced 2013/14	Assessment Program commenced 2013/14	Unknown at present	Unknown at present	Unknown at present	Unknown at present
Depreciated Replacement Cost	$157,503					

Figure 2-8 : Glinks Gully Asset Map



2.1.4.1 Reticulation

Glinks Gully is serviced by 150 metres of gravity reticulation and eight manholes constructed in 1989, one pump station, 300 metres of rising main and a single treatment plant constructed in 1990.

The piped reticulation connects to 18 septic tanks serving 24 houses, located on private property but maintained by Council. Effluent from the septic tanks is gravity fed through the pipe network to the pump station before being pumped to the Treatment Plant.

The condition of Glinks Gully's reticulation is generally unknown due to a lack of data. As discussed in Section 2.1.2, Council has committed to improving its knowledge of asset condition and condition assessments commenced in 2014. Comparing average daily discharge volume with average daily rainfall indicates that flows are not significantly affected by rainfall, which is an indication that the condition of the network is reasonably good.

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

2.1.4.2 Pump Stations

The Glinks Gully pump station is a typical small pump station that includes the following components:

- A 1,200mm diameter wet well that stores incoming wastewater
- Dry mounted duty /assist progressive cavity pumps
- An additional 2,300mm diameter chamber that stores 2.7m^3 of wastewater gives a combined storage of 4.0m^3 (approximately 24 hours storage of current off-peak flow)
- Pipes and valves associated with the pump and rising main
- A large cabinet housing electrical equipment, pump control devices and telemetry
- Connections to incoming gravity pipe and outgoing riser mains

A photograph of the pump station is included in Figure 2-9.

The pump station pumps domestic wastewater from the coastal margin up to the treatment plant located near the camping ground.

Council does not have a clear picture of the pump station's capacity at times of peak flow as instantaneous peak flow information is not readily available. When data is available it will be necessary for Council to assess in detail the capacity of the pump station.

As the number of permanent residents increase in Glinks Gully, so too will the off-peak volume of wastewater and additional capacity for 12 hour storage may be required in the future.

2.1.4.3 Treatment

The Glinks Gully wastewater treatment plant is a simple 320m^3 evapotranspiration soakage field located adjacent to the Glinks Gully camp ground. The soakage fields consist of 50mm uniformly graded aggregate 225mm deep, overlain with filter cloth and sand. The field consists of two equal beds that are alternatively rested. A photograph of the effluent field is included in Figure 2-10.

The soakage fields have been assessed as performing well. Their asset life is to be revisited in the next valuation planned for 2014 and a major flushing and replacement of blocked pipes together with the installation of cleaning risers and reinstatement of media is planned for 2023.

The soakage fields were originally designed to service a total of 18 properties. There are now a total of 24 properties connecting to the system which is designed for a peak flow of 15m3 / day at a loading rate of 50mm per day.

While regular flow data has been intermittent due to issues with the telemetry system records indicate the peak flow has only been exceeded once over the past six years. Peak flow occurs at about New Year with only approximately 20 days of the year where the flow is in double digits.

The free draining soils and nature of the loading combine to reflect a low loading rate and should mean the fields life should be approximately 50 years with no justification for a substantial reserve area.

An application to renew the Discharge Resource Consent for Glinks Gully treatment was lodged with Northland Regional Council in January 2014.

A commitment to implement the conditions will be required, these include upgrading the telemetry so that appropriate flow data can be gathered and compliant reports produced.

One condition the NRC are keen to see enacted that has been identified previously is the installation of effluent filters on each septic tank.

This aspect will be consulted with the community with a view to arranging the upgrades in association with the desludging of the tanks.

2.1.4.4 Summary of Issues and Remedial Actions

The issues relating to the Glinks Gully Wastewater Scheme as identified by Council, or in the body of this AMP, along with the remedial actions identified in the February 2013 Improvement Plan and updated to reflect their current status in February 2014, are listed in Table 2-7.

Figure 2-9 : Glinks Gully Pump Station

Figure 2-10 : Glinks Gully Treatment Plant - Effluent Field

Table 2-7: Glinks Gully Issues and Remedial Actions

Issue	Remedial Action Identified in Improvement Plan		Forecast Completion Date
	ID No.	Improvement Action	
The system is small and services a community whose population fluctuates significantly over the summer.	16	Undertake a study to better understand the impact of the non-resident holiday home makers and visitors have on the District. Response – The Glinks Gully wastewater scheme has been studied extensively and the impact of non-residents is well understood from a wastewater production view. The short term high flows are attenuated by wastewater treatment systems provided they are constantly loaded. A focus on education and minimising peak flows together with appropriate maintenance regimes is planned.	Dec-2015
	3	Determine whether Glinks Gully scheme should be extended. Response -See below	Jun-2015
The decision regarding whether or not to connect the remaining un-reticulated properties to the scheme is outstanding. An assessment of treatment plant capacity is required before this decision can be made.	3	Determine whether Glinks Gully scheme should be extended. Response – The scheme has limited additional capacity and expanding it is not proposed unless such a direction may be issued by the NRC.	Jun-2015
Growth in the number of permanent residents is uncertain.	3	Determine whether Glinks Gully scheme should be extended. Response – The Glinks system was installed to mitigate adverse environmental effects from the group of houses at the bottom of the Gully. Unless there are similar issues elsewhere expanding the system is not planned. The provision of an effective low cost system fully funded by its users is Councils objective.	Jun-2015
Increases in average flows will require a review of how unplanned discharges are managed.	25	Develop unplanned discharge mitigation strategy. Response – Minimising wastewater discharges and effective documented maintenance regimes are proposed to mitigate the potential of unplanned overflows.	Jun-2016

Issue	Remedial Action Identified in Improvement Plan		Forecast Completion Date
	ID No.	Improvement Action	
The soakage field will need to be renewed. Thought needs to be given as to how this will be achieved. There is some scope to increase the size of this field.	8	Assess the capacity / condition of Glinks Gully soakage fields. Response – As part of the Discharge Consent Renewal process options for maximising the capacity of the field was undertaken: The plan going forward is to look to minimising water use by installation of low flush toilet systems. While the disposal field has no reserve area it is generally lowly loaded and this combined with the free draining soils should see the fields life extend well beyond 35 years. Cleaning and renewal of blocked pipes combined with the installation of access points is proposed for 2023.	Jun-2017
Meeting Discharge Consent conditions will be critical over the period of this new consent.		Ensure conditions are met including flow monitoring and reporting, installation of effluent filters, preparation of and implementation of Maintenance plans.	
Effective operational maintenance inspections are required to minimise over flows.		Operational inspections need to include reacting to obvious problems like increasing amps on pumps pointing to a potential blockage and resulting overflow and damage to pumps.	

2.1.5 Kaiwaka

Kaiwaka is a small community located on State Highway 1 in the southern part of the Kaipara District. The current population is 565. Kaiwaka is serviced by 4 kilometres of gravity pipeline, 69 manholes, 1 pump station and a single treatment plant.

Most recent census data indicates Kaiwakas' population has growth of 7.2% from 537 usually resident population in 2006 to 576 in 2013.

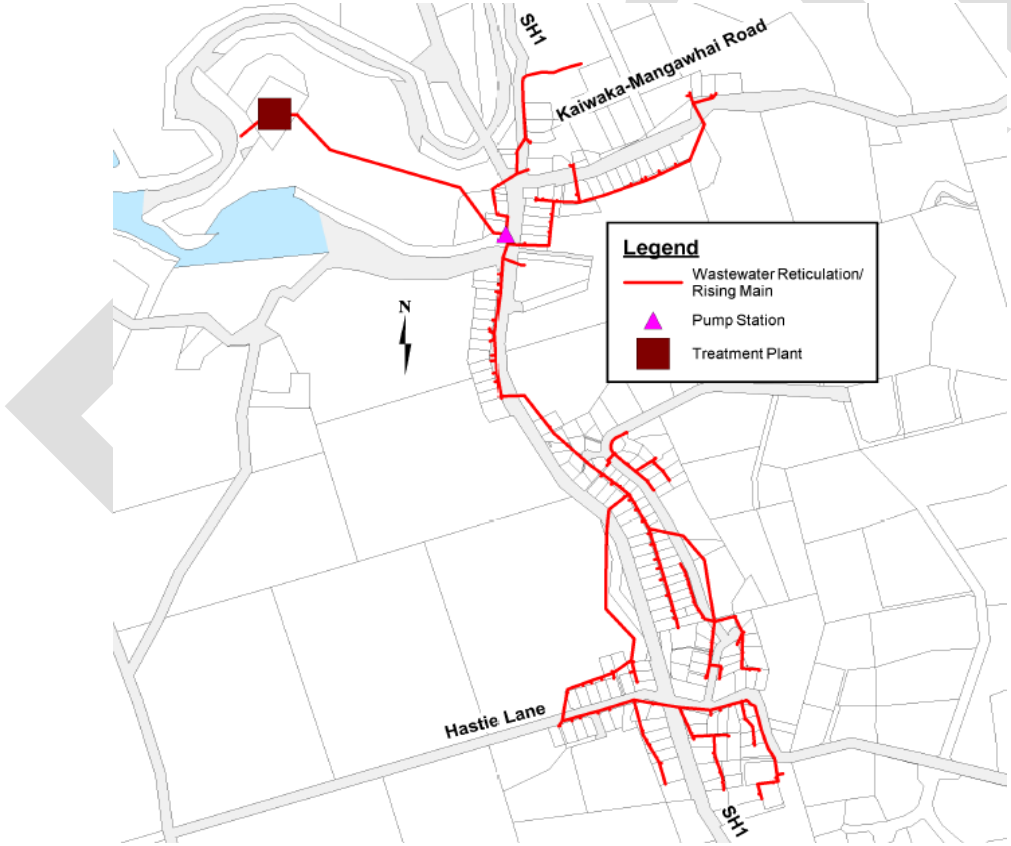
A summary of Kaiwaka's wastewater assets is included in Table 2-8.

The layout and location of Kaiwaka's wastewater assets are illustrated in the Asset Map in Figure 2-11.

Table 2-8: Kaiwaka Asset Summary

	Treatment Plants	Pump Stations	Rising Mains (km)	Gravity lines (km)	Manhole	Connections
Physical Quantity	1	1	1.3	4	71	163
Asset Condition Rating	Unknown at present	Unknown at present	Unknown at present	Unknown at present	Unknown at present	Unknown at present
Depreciated Replacement Cost	$807,643					

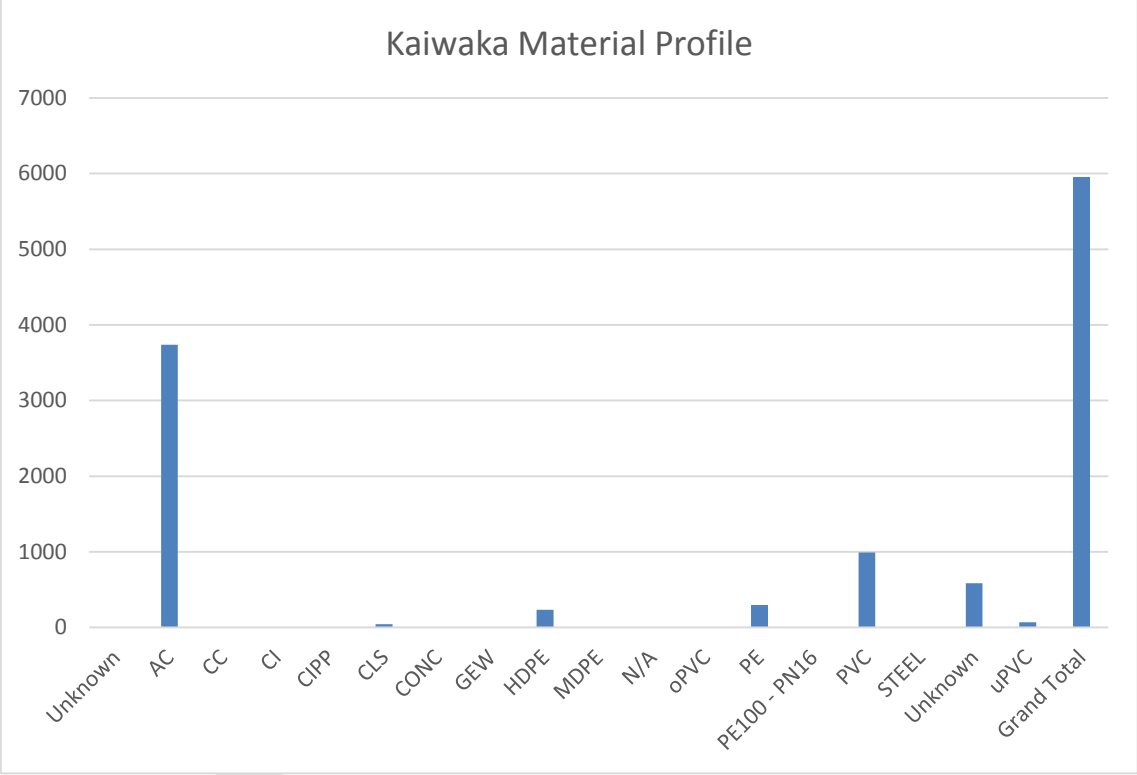
Figure 2-11 : Kaiwaka Asset Map



2.1.5.1 Reticulation

Kaiwaka's wastewater scheme was constructed in one contract let in 1990 and the original network is still in place. A breakdown of the reticulation by material is shown in Figure 2-12.

Figure 2-12: Kaiwaka Reticulation Material Breakdown



The condition of Kaiwaka's reticulation is generally unknown due to a lack of data. As discussed in Section 2.1.2, Council has committed to improving its knowledge of asset condition and a strategy for data capture and assessment will be developed during the lifespan of this AMP.

Appendix G shows the age and size profiles of the Kaiwaka reticulation.

2.1.5.2 Pump Stations

The Kaiwaka pump station is a typical small pump station that includes the following components:

- A wet well that stores incoming wastewater
- One duty and one standby pump
- Pipes and valves associated with the pump and rising main
- A large cabinet housing electrical equipment, pump control devices and telemetry
- Connections to incoming gravity pipe and outgoing rising main.

The pump station pumps domestic wastewater from the lowest point in the network up to the treatment plant located northwest of the township.

The electrical and control components of the Kaiwaka pump station were replaced in 2005 and are in good condition. Mechanical and civil/structure components are of average condition.

An estimate of capacity has been based on run hours and comparison with rainfall for 2008. The maximum pump run time in 2008 was 15 hours per day, with a median run time of 1.1 hours. Although the diurnal pump pattern is not available this data indicates that the pumps have more than sufficient capacity to pump the average daily flows and have spare capacity. It is unknown if the pumps have sufficient capacity to meet peak wet weather flows experienced at the station.

An assessment of pump station emergency storage was undertaken for compliance with the Regional Water and Soil Plan.

The investigation findings need to be considered with an assessment of the storage volume available in the reticulation before the final additional storage volume allowance for compliance is identified. It is likely that some additional storage will be required and an allowance of 25m^3 has been included in future budgets.

The installation of safety grills under all pump station lids is proposed across the District and this sum is included in the maintenance budgets.

2.1.5.3 Treatment

The Kaiwaka Treatment Plant consists of a single 6,500m^3 oxidation pond constructed in 1988 with aerator, and a 2,600m^2 wetland constructed in 1995. The wetland discharges into a diffused discharge trench via a v-notch weir before final release into the upper reaches of the Kaipara Harbour. A photograph of the treatment plant is included in Figure 2-13.

The quality of effluent being discharged from the Kaiwaka system is generally of good quality for a treatment plant of this type however the discharge quality can be variable, with levels of faecal coliforms exceeding consent limits. A report undertaken in 2013 has identified that short circuiting is contributing to this based on theoretical analysis using first order kinetic equations.

A proposal to install a curtain across the pond is suggested as a means to address this.

Sludge levels have been identified as low.

The wetland is considered to be in generally good condition and has had recent maintenance works undertaken.

Questions around whether wildlife is contributing to the raised fc levels shall be investigated with brief testing regime.

Figure 2-13: Kaiwaka Treatment Plant

2.1.5.4 Summary of Issues and Remedial Actions

The issues relating to the Kaiwaka Wastewater Scheme as identified by Council, or in the body of this AMP, along with the remedial actions identified in the February 2013 Improvement Plan and updated to represent current status in February 2014, are listed in Table 2-9.

Table 2-9: Kaiwaka Issues and Remedial Actions

Issue	Remedial Action Identified in Improvement Plan		Forecast Completion Date
	ID No.	Improvement Action	
Growth in the community is occurring and the current scheme cannot allow further connections.	4	Assess the need for additional capacity at Kaiwaka WWTP, including assessment of supply pump station capacity (acts as flow restriction). Response – Recent reports have indicated the Plant capacity is adequate for current population and current growth for the next 10 years. Any major developments or wet industries will need to contribute to pump station and WWTP capacity up grades.	Dec-2015
Council need to assess unplanned discharge mitigation at the pump station to reduce the risk of raw wastewater discharges.	25	Develop unplanned discharge mitigation strategy. Response – Minimising wastewater discharges and effective documented maintenance regimes are proposed to mitigate the potential of unplanned overflows.	Jun-2016
Council needs to review the serviced area with input from the community. Extensions to the boundary will impact on the scheme's capacity, yet this has not been investigated.	4	Assess the need for additional capacity at Kawaka WWTP, including assessment of supply pump station capacity (acts as flow restriction).	Dec-2016
Additional treatment capacity will be required at the treatment plant to cater for growth.	4	Assess the need for additional capacity at Kaiwaka WWTP, including assessment of supply pump station capacity (acts as flow restriction). Response – Growth of the past 7 years has averaged 1% per year, over the previous census period the growth averaged 0.11%	Dec-2015

Issue	Remedial Action Identified in Improvement Plan		Forecast Completion Date
	ID No.	Improvement Action	
The current discharge quality is exceeding consent criteria for faecal coliforms.	-	An investigation of possible short-circuiting in Kaiwaka WWTP is required to be undertaken. Response – A report has been completed and recommends the installation of a curtain to prevent short circuiting.	Jun-2015
The current discharge of effluent is not consistent with Council goal for land discharge or re-use.	42	Identify Consent required improvements and timing - develop a program to rectify. Response – Discharge is via wet land which is a good first step and is adequate for the life of the Discharge consent that was issued in 2010. Focus must be on compliance with current consent conditions.	Jun-2015
Determine if wild life in wet land contributing to raised contamination levels.		Carryout fc and ecoli tests at current discharge point and at discharge point in main pond to access contamination by wild life in wet land.	2016
Access the volume of emergency storage required		Assess the volume of storage in the reticulation in addition to the pump station to determine the additional storage required to be constructed to comply with the Regional Water and Soil Plan	2016

2.1.6 Maungaturoto

Maungaturoto and the Maungaturoto Rail Village have a population of 895 and are situated on State Highway 12, approximately 10km west of the intersection between State Highways 1 and 12. The main township straddles the ridgelines which fall towards the fringes of the Kaipara Harbour and the Wairau River.

Maungaturoto is serviced by 11 kilometres of gravity reticulation pipelines, 3 pump stations and 1.2 kilometres of rising main and a single treatment plant constructed in 1992.

Most recent census data indicates Maungatoros' population has growth 7.2% from 537 resident population in 2006 to 576 in 2013.

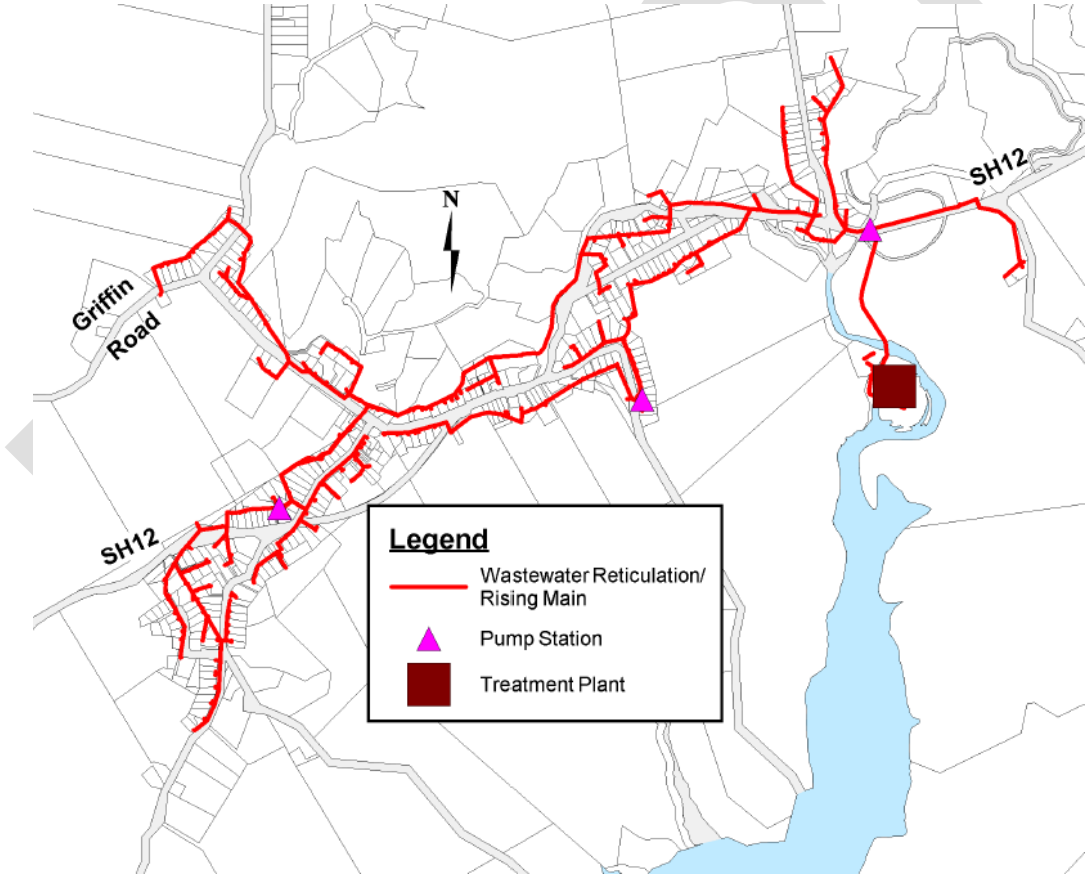
A summary of Maungaturoto's wastewater assets is included in Table 2-10.

The layout and location of Maungaturoto's wastewater assets are illustrated in the Asset Map in Figure 2-14.

Table 2-10: Maungaturoto Asset Summary

	Treatment Plants	Pump Stations	Rising Mains (km)	Gravity lines (km)	Manhole	Connections
Physical Quantity	1	3	1.3	11.16	197	369
Asset Condition Rating	Assessment Program commenced 2013/14	Assessment Program commenced 2013/14	Unknown at present	Unknown at present	Unknown at present	Unknown at present
Depreciated Replacement Cost	$3,310,426					

Figure 2-14 : Maungaturoto Asset Map



2.1.6.1 Reticulation

The condition of Maungaturoto's reticulation is generally unknown due to a lack of data. As discussed in Section 2.1.2, Council has committed to improving its knowledge of asset condition and condition assessment have commenced in 2014.

Little is known on the capacity of Maungaturoto's wastewater pipe network. It is necessary to identify the capacity of the reticulated pipe network in order to aid decision making processes and identify growth constraints. With the current level of growth in Maungaturoto this has become a pressing issue.

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

2.1.6.2 Pump Stations

Maungaturoto has 3 pump stations that are typical small pump stations and include the following components:

- A wet well that stores incoming wastewater
- Submersible pumps (1 duty, 1 standby)
- Pipes and valves associated with the pump and rising main
- A cabinet housing electrical equipment, pump control devices and telemetry
- Connections to incoming gravity pipe and outgoing rising mains
- Lifting gantries.

The pump stations pump domestic wastewater from the low points of each catchment area over to the next catchment or in the case of pump station 1 to the treatment plant located on Council land adjacent to the Country Club.

From discussion with the operators all components of the Maungaturoto pump stations have been assessed as being of average to very good condition. The pumps in Pump Station 1 were replaced in 2009 and the pumps in Pump Station 3 are also reasonably new. Pumps station 2 still has the old Flygt pumps, installed in 1980. These were reconditioned in 2007. All pumps stations had new electrical components installed circa 2005.

The recent upgrade of the pumps at Pump Station 1 has resolved a historical overflow issue. This indicates that pump capacity was an issue prior to the upgrade.

2.1.6.3 Treatment

The Maungaturoto Treatment Plant consists of a single 8,300m^3 oxidation pond constructed in 1980 and located adjacent to the Maungaturoto Country Club. The oxidation pond is protected by a waveband and dissolved oxygen levels are maintained by an aerator. Photographs of the oxidation pond / membrane building and the aerator and included in Figure 2-15 and Figure 2-16 respectively.

The treatment plant was upgraded in 2009 to provide a higher level of effluent treatment to comply with new resource consent conditions. This work included:

Installation of an influent Step-screen, new membrane filtration plant, and construction of a new 650m^3 treated effluent storage pond and new rock discharge structure into the Wairau River.As per the previous consent requirement, wastewater is discharged into the upper reaches of the Wairau River via a tidal discharge immediately after high tide.

Stormwater infiltration into the Maungaturoto wastewater system is a significant issue. Present dry weather flows are around 180 – 250m^3 per day. In heavy rainfall conditions inflows to the treatment plant have exceeded 2500m^3 per day, and with rainfall on the pond reached a total daily flow of nearly 3500m^3 per day. As the resource consent provides for a maximum daily discharge of only 1200m^{3}per day (which is the design flow for the new membrane filtration plant), excess flows are taken into storage in the pond and released over subsequent days. The treated effluent storage pond also helps with flow buffering. The flow buffering facilities at the treatment plant are however pushed to their limits during heavy rainfall events and could well be exceeded without further work completed to reduce stormwater infiltration within the reticulation system.

Since commissioning of the membrane plant in mid-2009 algal levels in the pond have tended to be higher than historically observed. This could be aggravated by dryer summers but could be related to the backwash return from the membrane plant. The main effect higher algal populations have is an increased cleaning requirement of the membrane plant, which has caused maintenance costs to be significantly higher than expected. Further work is required to understand the operation efficiency and a capacity study has been budgeted for in 2014/15.

2.1.6.4 Summary of Issues and Remedial Actions

The issues relating to the Maungaturoto Wastewater Scheme as identified by Council, or in the body of this AMP, along with the remedial actions identified in the February 2013 Improvement Plan and up dated to reflect their status in February 2014, are listed in Table 2-11.

Figure 2-15 : Maungaturoto Treatment Plant – Oxidation Pond and Membrane Building

Figure 2-16 : Maungaturoto Treatment Plant – Aerator

Table 2-11: Maungaturoto Issues and Remedial Actions

Issue	Remedial Action Identified in Improvement Plan		Forecast Completion Date
	ID No.	Improvement Action	
The impact of anticipated growth on the reticulation network is unknown.	16	Undertake a study to better understand the impact of the non-resident holiday home makers and visitors have on the District. Response – The population of Maungatoroto has dropped over the most recent census by 1.3% per year.	Dec-2015
	17	Discuss future demand requirements with significant dischargers and investigate infiltration issues.	Dec-2015
Council is due to review the boundary of the serviced area. Any extension in the boundary will have significant impacts on the capacity of the scheme.	5	Assess operational efficiency and capacity of the Maungaturoto Membrane Filtration Plant. This should also consider the effects of increasing the serviced area. Response – With a reducing population trend at present Council needs to look at minimising costs such as dealing with the algae problem and high infiltration.	Jun-2015
Inflow/Infiltration into the wastewater network and inadequate pump station storage capacity may result in unplanned discharges of raw wastewater.	24	WW Pump Station Overflow Storage (17 pump stations) - review and develop a programme for reducing overflow frequency from the regions wastewater pump stations.	Jun-2015
	25	Develop unplanned discharge mitigation strategy. Response – Minimising wastewater discharges and effective documented maintenance regimes are proposed to mitigate the potential of unplanned overflows.	Jun-2016
	35	Assess the suitability/condition of the overflow tank at PS1 in Maungaturoto for compliance with the Regional Water and Soil Plan.	Jun-2017

Issue	Remedial Action Identified in Improvement Plan		Forecast Completion Date
	ID No.	Improvement Action	
The capacity of the new treatment system needs to be assessed and its operational efficiency reviewed.	5	Assess operational efficiency and capacity of the Maungaturoto Membrane Filtration Plant. This should also consider the effects of increasing the serviced area.	Jun-2015
Investigation into opportunities for discharge to land or re-use of treated effluent.	9	Investigate options for discharge to land or treated effluent re-use at Maungaturoto WWTP.	Jun-2018

2.1.7 Te Kopuru

Te Kopuru lies 10 km south of Dargaville on the Pouto Peninsula. The township has been built on a revetment above the Northern Wairoa River. The Wastewater system uses the benefit of the elevation of the revetment to develop a reticulation network that discharges to the treatment plant without the need for pump stations or rising mains.

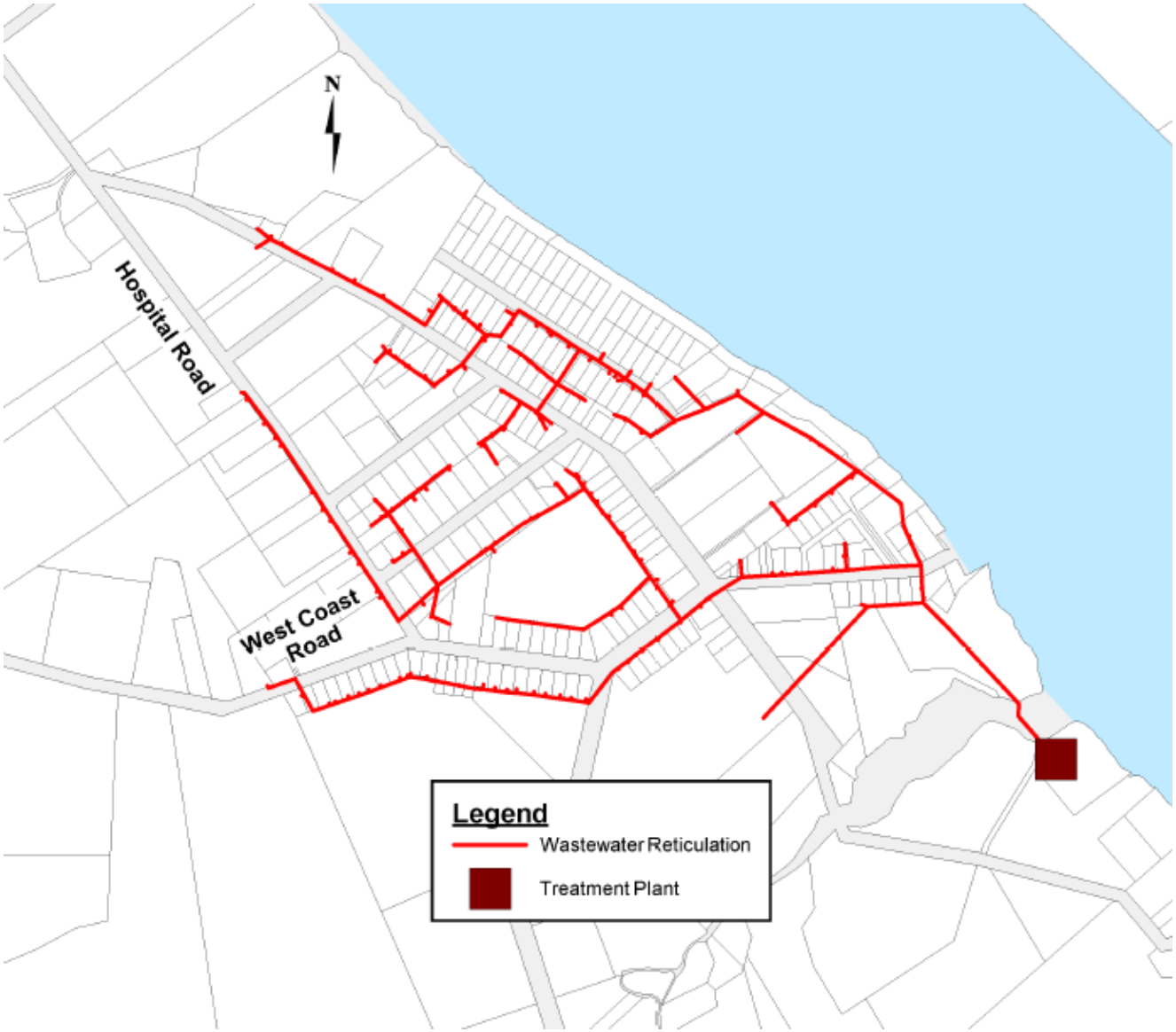
A summary of Te Kopuru's wastewater assets is included in Table 2-12.

The layout and location of Te Kopuru's wastewater assets are illustrated in the Asset Map in Figure 2-17.

Table 2-12: Te Kopuru Asset Summary

	Treatment Plants	Pump Stations	Rising Mains (km)	Gravity lines (km)	Manhole	Connections
Physical Quantity	1	0	0	6.4	85	190
Asset Condition Rating	Assessment Program commenced 2013/14	Not Applicable	Not applicable	Unknown at present	Unknown at present	Unknown at present
Depreciated Replacement Cost	$785,089					

Figure 2-17 : Te Kopuru Asset Map



2.1.7.1 Reticulation

Te Kopuru is serviced by 6,300 metres of gravity wastewater pipelines constructed in 1981, and a single oxidation pond constructed in 1980. A wetland was constructed in 2001 to provide additional treatment to effluent before it is discharged.

The condition of Te Kopuru's reticulation is generally unknown due to a lack of data. As discussed in Section 2.1.2, Council has committed to improving its knowledge of asset condition and condition assessments of assets is commencing in 2014.

The network is located in an area with sandstone close to the surface which provides a stable platform for the network, although there is a tendency for tree roots to grow along pipe trenches and into manholes. Some pipe fractures have occurred at the joints as a result.

Information on the Te Kopuru network indicates that the system was designed for an equivalent population (adjusting for school attendees) of 570 people, producing 140 litres per person per day. With the current population of Te Kopuru area at approximately 500 (and not all connected to the scheme), the system will be at 88% of its capacity. No capacity issues relating to the reticulation network have been experienced to date.

Recent census data indicates the population of Te Kopuru increased 2.65% from a usually resident population in 2006 of 453 to 465 in 2013.

Appendix G shows the age, material and size profiles of the Te Kopuru reticulation

2.1.7.2 Pump Stations

There are no pump stations in Te Kopuru.

2.1.7.3 Treatment

The Te Kopuru wastewater treatment plant consists of a single stage oxidation pond and wetlands area located immediately adjacent to the Northern Wairoa River, south of Makaka Creek. The oxidation pond has a surface area of 0.52 hectares and a nominal depth of 1 metre and is protected by a concrete waveband. The wetlands have a surface area of 1.5 hectares. A photograph of the oxidation pond is included in Figure 2-18.

The Te Kopuru network was originally designed to service a total population of 570. The Environmental Effects prepared for the Resource Consent renewal assessed the current population of the Te Kopuru area discharging to the scheme as 487 (including the school). This is less than the design capacity and it is considered that the scheme has sufficient capacity for the next 20 year period.

Both the oxidation pond waveband and wetland plantings are considered to be in average condition. Sampling of the effluent has indicated that there are instances of non-compliance with consent conditions. The cause of the breaches was understood to be the high level of accumulated sludge in the oxidation pond and De-sludging of the pond has been completed in 2013.

2.1.7.4 Summary of Issues and Remedial Actions

The issues relating to the Te Kopuru Wastewater Scheme as identified by Council, or in the body of this AMP, along with the remedial actions identified February 2013 Improvement Plan and updated to reflect current status in 2014, are listed in
Table 2-13.

Figure 2-18: Te Kopuru Treatment Plant - Oxidation Pond

Table 2-13: Te Kopuru Issues and Remedial Actions

Issue	Remedial Action Identified in Improvement Plan		Forecast Completion Date
	ID No.	Improvement Action	
There have been instances of non-compliance with the conditions of the discharge consent.	-	*Te Kopuru treatment pond is scheduled for de-sludging in 2012/13.*	Completed
	42	Identify Consent required improvements and timing - develop program.	Dec-2015
The majority of Te Kopuru reticulation is due for renewal from 2021.	33	Produce a methodology for determining asset renewal requirements. Develop a renewal programme based on performance and condition ratings. Prioritise based on a combination of criticality and condition/performance. The assessment of the renewal programme should be repeated annually. Response – The Te Kopuru system was installed in 1981. The life expectancy for AC is up 40 years, although depending on the nature of the installation this can be extended, i.e. ground conditions chemistry, the liquid conveyed, the pressure the pipe operates under etc. The most venerable areas for pipelines are rising mains partial filled and the immediate downstream network. Te Kopuru has no rising mains and seems to be installed in free draining trenches on sandstone. Its life needs to be assessed as part of the condition assessment project.	Dec-2015

2.1.8 Mangawhai

The majority of the wastewater scheme in Mangawhai is operated by the Water Infrastructure Group (WIG) under a Build Operate Transfer procurement scheme (named 'EcoCare') that commenced operation in the 2010 financial year. Operation and maintenance of the Mangawhai will transfer to Council in 2025.

Recent census data indicates the usually resident population of Mangawhai increased 36.2% from 1,773 in 2006 to 2,415 in 2013.

This AMP does not include the EcoCare Wastewater scheme other than to present the financial forecasts, as the scheme is operated and maintained by WIG under the Mangawhai Community Wastewater Scheme O&M Project Management Plan.

A small portion of the Mangawhai wastewater assets (sections of the original gravity wastewater reticulation) are not part of the EcoCare scheme. These assets are maintained by WIG under a separate arrangement with Council.

A summary of Mangawhai's wastewater assets is included in Table 2-14.

The layout and location of Mangawhai's wastewater assets are illustrated in the Asset Maps in

Figure 2-19 and Figure 2-20.

Table 2-14: Mangawhai Asset Summary

	Treatment Plants	Pump Stations	Rising Mains (km)	Gravity lines (km)	Manhole	Connections
Physical Quantity	1	12	22.3	46	487	1,617
Asset Condition Rating	Unknown at present	Unknown at present	Unknown at present	Unknown at present	Unknown at present	Unknown at present
Depreciated Replacement Cost	$36,122,372					

Mangawhai Wastewater System

The Mangawhai Community Wastewater System is a state of the art collection treatment and reuse system.

The collection system is a mix of low pressure and traditional gravity system built to minimise the potential for infiltration.

As at December 2012 the Mangawhai Wastewater system had 1,581 properties connected and 519 properties capable of connecting. In addition there were 30 connected special rating units and 14 connectable special rating units.

The new District Plan published in 2013 identified a new urban boundary and a study was under taken to identify what network extensions were required to maximise the number of properties classed as connectable for Mangawhai.

The treatment plant utilises a CASS system with 2 CASS tanks followed by pressure filtration and disinfection. Sludge is dewatered via belt press and disposed of the landfill.

The treated wastewater is sent to a Council owned farm in Browns Road some 10 kilometres from the plant where the water is stored in a buffer Dam and irrigated to a portion of the farm land. The farm runs dry stock and the grass is managed by a contractor.

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

Reuse system expansion options

As the connected population grows expansion of the irrigation system at the farm will be required. Experience gained in operating the system has highlighted practical constraints combining irrigation and stock and also the conservative loading rate that the consent imposes. Before committing additional funds to

extending the irrigation system a review of options was undertaken to develop a sustainable wastewater reuse strategy going forward.

This included looking at alternative reuse options to local golf course, farm land, other developments and to water as well as renegotiating the application rate at the farm.

Reticulation system extensions

To maximise the return on the investment made establishing the MCWWS a reticulation expansion plan has been developed that maximise the number of properties classed as serviceable and also encourage developers to connect.

A supporting policy to encourage connections and provide a level playing field for all irrespective of what type of connection a property was also developed.

The ultimate yield from the DP defined urban area is estimated to be in the order of 4,500 properties.

Assessment of growth projections was undertaken and high and low growth projections were developed which indicated up take of the 4,500 properties between 2045 and 2058.

The system extensions were presented as 2 projects with a combined value of $3 million.An investment of $2 million would however see the majority of land classed as serviceable.

In addition upgrades to the WWTP, pump stations and land application area are estimated to cost a further $1million.

A prioritisation assessment for the extensions combining an economic, environmental, social, strategic and cultural assessment criteria was prepared and the community consulted for feedback.

In addition financial modelling was undertaken to align with LTP programs.

Table 2 -15: Mangawhai Issues and Remedial Actions

Issue	Remedial Action Identified for Improvement Plan		Forecast Completion Date
	ID No.	Improvement Action	
Water tightness of wastewater system	-	It is critical that the wastewater system remain watertight and the direct inflow from surface water in particular is addressed. With limited Stormwater systems great reliance is placed on ground soakage and ponding can occur. A process of ensuring sealed gully traps and raised access points in areas know to flood is required.	Jun-2017
High nitrogen levels in influent		Experience with the system is indicating wastewater production is lower than [predicted and effluent strength is higher resulting in higher Nitrogen levels. While the plant is able to maintain compliance this will need to be watched in the future and a strategy developed to manage this.	Jun-2017

Figure 2-19 : Mangawhai Asset Map – Mangawhai Heads

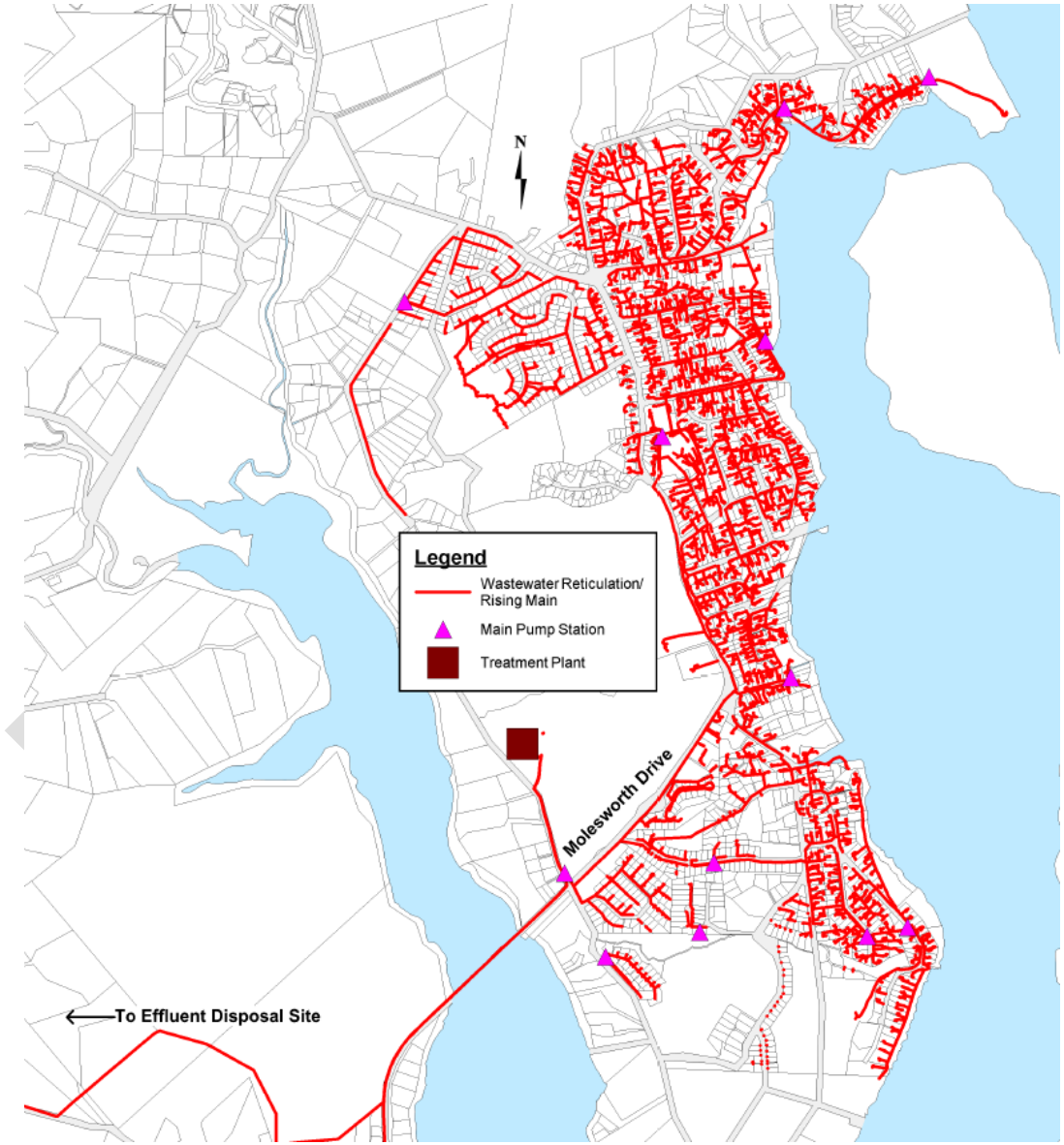
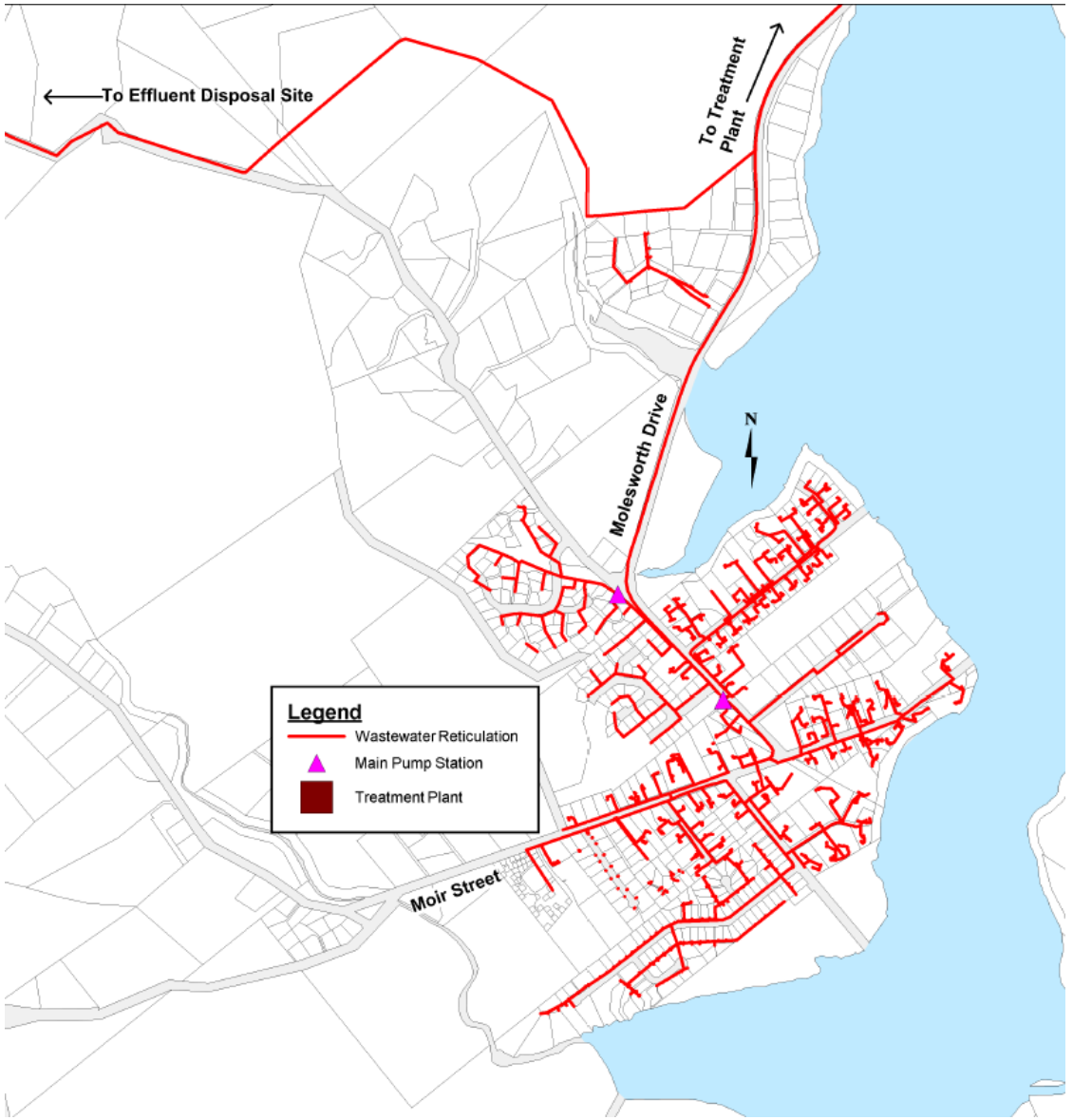


Figure 2-20 : Mangawhai Asset Map – Mangawhai Village



2.2 Critical Assets

Critical assets have been defined by the NAMS Group as being 'assets with a high consequence of failure'.[4] 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 Kaipara's wastewater assets. This has been recorded in the Improvement Plan for action in 2012/13.

An assessment based on local knowledge has identified the assets listed in Table 2-15 as being "critical". Failures of the items on this list would lead to serious impacts on the ability of Council to meet its Customer Level of Service. 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 2-15: Critical Wastewater Assets

Asset	Potential Consequences of Failure	How Critical Asset Will Be Managed
Large Diameter Reticulation Pipes	Surcharge of reticulation network causing overland flow of wastewater. Potential discharge of wastewater to ground and pollution of groundwater.	See section 3 for Maintenance and Operating, Renewal and New Capital strategies. Monitor maintenance records for increased activities, especially structural failures / leakage.
Pumping Stations	Discharge of wastewater to environment (overflow spills to rivers, other receiving waters).	
Rising Mains	Discharge of wastewater to environment (overflow spills from pumping stations to rivers and other receiving waters).	

[4] 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), page 3.39

Asset	Potential Consequences of Failure	How Critical Asset Will Be Managed
	Potential discharge of wastewater to ground and pollution of groundwater.	
Treatment Plants	Major discharge of wastewater to local environment. Causes spills from pumping stations or surcharge of reticulation network (see above).	See section 3 for Maintenance and Operating, Renewal and New Capital strategies. Monitor discharge quality for fluctuations.

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.

2.3.2 Declaration of Valuation

Kaipara District Council (KDC) commissioned MWH New Zealand Ltd (MWH) to revalue its wastewater utility assets as at 30 June 2014. MWH certify that the revaluations summarised below have been completed in accordance with the following standards and are suitable for inclusion in the financial statements for the year ended 30 June 2014.

- New Zealand Equivalent to International Accounting Standard 16; Property, Plant and Equipment (NZ IAS 16) and IAS 36 (Impairment of Assets).
- New Zealand Infrastructure Asset Valuation and Depreciation Guidelines (NZIAVDG)– Edition 2.0.

The valuations are based on accurate and substantially complete asset registers and appropriate replacement costs and useful lives. The basis of the data inputs used is described in detail in the attached report.

a) The lives are generally based upon New Zealand Infrastructure Asset Valuation and Depreciation Guidelines – Edition 2. In specific cases these have been modified where in our, and Council's, opinion a different life is appropriate. The changes are justified in the valuation report.

b) The component level of the data used for the valuation is sufficient to calculate depreciation separately for those assets that have different useful lives.

Table 2-16 presents the total revaluation for all wastewater assets.

Table 2-16: Summary of Asset Values at 30 June 2014

Asset Group	Replacement Cost ($)	Depreciated Replacement Cost ($)	Accumulated Depreciation ($)	Annual Depreciation ($/yr)
Wastewater Lines	$29,537,703	$19,264,426	$10,273,276	$453,441
Wastewater Plant	$24,783,126	$19,601,896	$5,181,232	$654,004
Wastewater Points	$15,725,562	$9,898,096	$5,827,466	$223,309
Total 2014	**$70,046,391**	**$48,764,418**	**$21,281,974**	**$1,330,754**

This compares with a total replacement cost valuation in the 2010 valuations (including Ecocare) of $74,751,026. The annual depreciation was $1,234,559 in 2010.

2.3.3 Background

This section shows the summary comparison between the 30 June 2010 CPG valuations and the 30 June 2014 wastewater valuations and comparisons by asset group and community with explanations for the differences.

Table 3-1 shows the results from the 30 June 2010 valuation for the wastewater assets. The wastewater total is based on the 2010 CPG valuation under "Contract 536 Roading, 3 Waters and Resource Consent Processing Asset valuation 2010" (CPG, May 2011) which excluded the Ecocare scheme.

The Ecocare scheme refers to the Mangawhai wastewater assets which were valued separately. MWH New Zealand Ltd was commissioned by Kaipara District Council (KDC) to value its Mangawhai Ecocare Wastewater Scheme infrastructure assets as at 1 July 2010 and the Ecocare scheme values in Table 2-17: are based on the MWH valuation.

Table 2-17: Summary of 30 June 2010 Asset Valuation

Asset Type	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Wastewater (CPG report)	$35,491,073	$16,882,928	$563,093
Ecocare scheme (MWH report)	$39,259,953	$38,434,603	$671,466
Total	**$74,751,026.00**	**$55,317,531.00**	**$1,234,559.00**

The CPG 2010 Asset Valuation report includes over $1 million of wastewater assets under Mangawhai. There may be some components of this $1 million which are double-counted in the separate 2010 Ecocare asset valuation.

Table 2-18 shows the results from the 30 June 2010 valuation by asset group. Note that this has been interpreted from the CPG spreadsheets as this detail was not provided in the CPG 2010 valuation report. The CPG 2010 valuation included connections and customer meters under plant instead of under points but these assets have been moved to points for the 2014 valuation. The table below shows the 2010 subtotals based on the connections and customer meters being included under points.

Table 2-188: 30 June 2010 Asset Valuation by Asset Group

Asset Type	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Wastewater Lines	$15,213,063	$6,939,358	$252,121
Wastewater Plants	$9,644,469	$5,101,951	$169,504
Wastewater Points	$9,740,900	$5,356,410	$146,262
Total from CPG spreadsheets	**$34,598,432.00**	**$17,397,719.00**	**$567,887.00**
Total from CPG Report	$35,491,073	$16,882,928	$563,093
Difference	-$892,641	-$514,791	-$4,794
Ecocare scheme (MWH report)	$39,259,953	$38,434,603	$671,466
Reported Total (incl. Ecocare)	**$74,751,026**	**$55,317,531**	**$1,234,559**

Table 2-19 shows the percentage change between the 30 June 2010 and 30 June 2014 valuations using the reported totals.

Table 2-19: 30 June 2010 and 30 June 2014 Valuation Comparison

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2010	$74,751,026	$55,317,531	$1,234,559
30 June 2014	**$70,046,391**	**$48,764,418**	**$1,330,754**
% Change	-7%	-13%	7%

2.3.4 Comparison by Asset Type

Wastewater Lines

Table 2-20: Wastewater Lines 30 June 2010 and 30 June 2014 Valuation Comparison

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2010	$30,603,798	$22,021,301	$444,505
30 June 2014	$29,537,703	$19,264,426	$453,441
% Change	-3%	-14%	1%

The decreases in Replacement Cost and Depreciated Replacement Cost are due to the following:

- A decrease in the length in the valuation of Mangawhai wastewater lines (the 2010 CPG valuation included 19km and $2.8 million of wastewater lines in Mangawhai which may have been double counted in the separate Ecocare valuation (an additional 59.6km), i.e. a total of 79km. The 2014 valuation includes 66.8km of wastewater lines in Mangawhai.
- The removal of the Baylys Beach wastewater lines assets as these passed out of Council ownership in 2013 (around $270,500 in 2014 replacement cost).
- These decreases are only partially offset by the update of unit rates by 7.2% based on the Cost Adjustment Factor, to account for increases in construction costs between 2010 and 2014.

An issue with the installation dates for AC pipe was identified, as no AC pipe should have install dates after 1984. AssetFinda data had 1.7km of AC installed after 1984. It is suspected that the pipe has been replaced but the material has not been changed in AssetFinda. In this valuation we have changed the pipe material to PVC for the AC assets installed after 1984.

Asset counts and lengths are compared by community in Table 2-21 below.

Table 2-21: Wastewater Lines 2010 and 2014 Asset Length and Count Comparison

Community	2010 Length (km)	2014 Length (km)	2010 Count of assets	2014 Count of assets
Dargaville	46.3	44.5	817	856
Glinks Gully	0.5	0.5	10	10
Kaiwaka	5.3	5.4	100	128
Mangawhai	19.0	66.8	471	1440
Maungaturoto	11.9	12.3	256	332
Te Kopuru	6.3	6.2	99	137
TOTAL	**89.3**	**135.7**	**1753**	**2903**

Wastewater Plant

Table 2-22: Wastewater Plant 30 June 2010 and 30 June 2014 Valuation Comparison

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2010	$24,920,085	$19,949,581	$597,490
30 June 2014	$24,783,126	$19,601,896	$654,004
% Change	-1%	-1%	9%

Plant includes treatment plant and pump station assets, along with associated rising main pipelines. The decreases in Replacement Cost and Depreciated Replacement Cost are due to the following:

- A decrease in the valuation totals for the Mangawhai wastewater plant assets due to a bottom-up methodology. In 2010, the Mangawhai wastewater plant assets were valued from the top-down (contract costs). In 2014, the Mangawhai wastewater plant assets were valued from the bottom-up (current replacement costs from suppliers, recent similar contracts etc).
- The removal of land from the 2014 valuation (the 2010 valuation included over $2.8million in land assets).

The decreases are partially offset by the following:

- The update of unit rates by 7.2% based on the Cost Adjustment Factor, to account for increases in construction costs between 2010 and 2014.

- The addition of approximately $60,000 in new plant and pump station assets since the 2010 valuation.
- The addition of approximately $1.5million in missing plant assets that were not included in the 2010 valuation or AssetFinda data (the Maungaturoto treatment at the railway village and the Maungaturoto membrane wastewater treatment plant).
- A change in assumption for earthworks, previously CPG depreciated these assets over 80 years. They are considered non depreciable so the DRC = RC for earthworks assets ($1.2million).
- Changes in the unit rates for rising mains (under the Dargaville treatment plant) to match appropriate unit rates from wastewater lines.

Asset counts are compared by community in Table 2-23.

Table 2-23: Wastewater Plant 2010 and 2014 Asset Count Comparison

Community	2010 Count of plant assets	2014 Count of plant assets
Dargaville	73	79
Glinks Gully	7	8
Kaiwaka	14	17
Mangawhai	n/a	328
Maungaturoto	26	47
Te Kopuru	8	7
TOTAL	**128**	**486**

Wastewater Points

Table 2-24: Wastewater Points 30 June 2010 and 30 June 2014 Valuation Comparison

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2010	$18,334,503	$13,765,334	$293,463
30 June 2014	$15,725,562	$9,898,096	$223,309
% Change	-17%	-39%	-31%

The decreases in Replacement Cost, Depreciated Replacement Cost and Annual Depreciation are due to the following:

- Decreases in the assumption for number of wastewater connections in Dargaville (resulted in a replacement cost decrease of approximately $1 million). The assumption for the number of 2010 connections was from CPG. The number of wastewater connections in 2014 was provided by Kaipara District Council staff and based on the rating database.
- Change in valuation method for the wastewater connections in Mangawhai (previously valued by service connection length, resulting in a $2 million decrease in the replacement cost).
- Grinder pumps in Mangawhai have been excluded from the 2014 valuation as they are privately owned (2010 replacement cost was $1.3 million).
- The removal of the Baylys Beach wastewater lines assets as these passed out of Council ownership in 2013 (around $92,800 in 2014 replacement cost).

These decreases have been partially offset by the increase in the Mangawhai point assets and the update of unit rates by 7.2% based on the Cost Adjustment Factor, to account for increases in construction costs between 2010 and 2014.

Asset counts are compared by community in

Table 2.25.

Table 2-25: Wastewater Points 2010 and 2014 Asset Count Comparison

Community	2010 Count of point assets	2014 Count of point assets
Dargaville	823	736
Glinks Gully	10	9
Kaiwaka	77	72
Mangawhai	566	1244
Maungaturoto	251	206
Te Kopuru	88	86
TOTAL	**1,815**	**2,353**

2.3.5 Introduction to 2014 Wastewater Valuation

MWH was requested by Kaipara District Council (KDC) to provide a revaluation for the following wastewater assets as at 30 June 2014:

- Wastewater lines
- Wastewater points
- Wastewater treatment.

The method of valuation has been conducted in terms of the New Zealand Equivalent to International Accounting Standard 16; Property, Plant and Equipment (NZ IAS 16) and IAS 36 (Impairment of Assets) and as contained in the New Zealand Asset Valuation and Depreciation Guidelines – Edition 2.0.

2.3.6 Valuation Methodology

Replacement Value

The Replacement Value is the cost of building the asset "today". In arriving at the value, it is assumed that modern construction techniques and modern equivalent materials are used but that the physical result replaces the asset as it exists.

Unit Replacement Values

Replacement values for wastewater line assets, wastewater points assets and wastewater treatment plant assets (excluding Mangwahai wastewater treatment plant) were initially based on the update of the CPG 2010 unit rates where these were comparable with other councils.

The Mangawhai wastewater treatment plant valuation was previously based on a top-down assessment from the contract costs (this assigned average useful lives to groups of like asset types under lump sum cost items). For the 2014 valuation, MWH conducted a bottom-up valuation based on specific asset data and a mix of historic contract costs and other methods. This is described in more detail in Section 0.

Included Costs

The replacement rates calculated include the following:

- Material supply and delivery
- Labour
- Plant Costs
- Contractor preliminary and general costs
- Engineering costs have been added to the estimated base rate to cover such things as detailed design, surveying, project management and construction supervision based on ACENZ guidelines.

Excluded Costs

The replacement rates used in the revaluation exclude the following:

- GST
- Council corporate overheads
- Investigation and feasibility costs
- Borrowing costs during construction (these costs generally apply to large projects having a construction period of over one year. KDC projects are generally small and have maximum construction periods of only 2 to 3 months). In addition Public Benefit Entities are given the option, under IAS 23 (borrowing costs), whether to exclude or include borrowing costs. KDC has opted to exclude borrowing costs.).

2.3.7 Cost Adjustment Factor

The cost adjustment factor has been calculated based upon the methodology defined in Appendix A of the New Zealand Standard for Conditions of Contract for Buildings and Civil Engineering Construction, NZS 3910.

The CAF is calculated using the following equation:

$$CAF = \frac{0.4(L - L')}{L'} + \frac{0.6(M - M')}{M'}$$

The June 2014 quarter will not be available until at least the middle of August 2014, so March quarters were used to calculate the CAF for each year (to ensure full year time periods).

To update 2010 dollars to 2014 dollars the following applies:

L' = Labour Cost Index; Private Sector: Industry Group – Construction: All Salary and Wage Rates: published by Statistics New Zealand. For the March 2010 quarter.

L = Labour Cost Index; Private Sector: Industry Group – Construction: All Salary and Wage Rates: published by Statistics New Zealand. For the March 2014 quarter.

M' = Producer Price Index; Inputs: Industry Group – Construction published by Statistics New Zealand for the March 2010 quarter.

M = Producer Price Index; Inputs: Industry Group – Construction published by Statistics New Zealand for the March 2014 quarter.

The applicable CAF for the March 2010 to March 2014 period is:

$$CAF = \frac{0.4(1377 - 1293)}{1293} + \frac{0.6(1806 - 1679)}{1679} = 0.072(7.2\%)$$

2.3.8 Depreciated Replacement Cost

Depreciated Replacement Cost is the estimate of the current replacement cost of assets less allowance for physical deterioration, optimisation for obsolescence and relevant surplus capacity.

The AssetFinda records for both points and lines has 100% have condition and performance data associated with them (a numerical score between 1 and 5). We have very limited confidence in this data, particularly as CCTV data is not available for the lines assets. The condition and performance data from AssetFinda has not been used in this valuation.

Where the remaining life of an asset can be assessed, the Depreciated Replacement Cost has been calculated as:

$$\frac{\text{Remaining useful life}}{\text{Total useful life}} \times \text{Replacement value}$$

Note: For assets that have exceeded or neared their Total Useful Lives (TUL) the Adjusted Total Useful Life is calculated as the age of the asset plus the Minimum Remaining Useful Life (MRUL). This applies to all assets that have a remaining useful life less than the MRUL.

The base useful life assumptions for all assets used in the previous revaluation work have been reviewed based on NZIAVDG recommendations and comparison with useful life assumptions from other councils. A summary of base useful lives adopted is provided in Section 7.2.

We are unaware of any circumstances where assets are operating at sub optimal usage apart from the Mangawhai wastewater treatment plant. The Mangawhai wastewater treatment plant is currently running around 50% of design capacity based on the peak summer load. The Mangawhai plant was designed for maximum probable development therefore the timeline for the plant to be operating at its peak day capacity is unknown as it will depend on the rate of development.

2.3.9 Depreciation

Depreciation is a systematic allocation of the depreciable amount of an asset over its estimated useful life. Thus depreciation only applies to those assets with finite lives. Assets with indefinite lives e.g. earthworks and wetlands are not depreciated. Straight-line depreciation is used in this revaluation.

2.3.10 Annual Depreciation

The Annual Depreciation is the amount the asset depreciates in a year. It is defined as the Replacement Cost divided by the adjusted total useful life for the asset.

2.3.11 Residual Value

The Residual Value is the value of the asset when it reaches the end of its life. For the purposes of this revaluation MWH has assumed that all assets (except land) have no residual value.

2.3.12 Useful Lives

Useful lives are explained and detailed in the individual component revaluations.

Useful lives were applied to individual assets based on the previous revaluation. MWH has carried out an audit of these lives and have found that in some instances there is a lack of descriptive information available to corroborate the life assigned. Recommendations to improve the data are outlined in Section 2.5.7.

2.3.13 Review of Useful Lives

The assumptions used in this valuation have also been compared against those reported as the accounting policy in the Council's Annual Reports and the 2012–2022 Long Term Plan (LTP) as shown in Table . The KDC accounting policy does not delineate the asset groups into different asset components. Most of the total useful lives in the valuation sit within the range reported in the LTP. The 2013 Asset Management Plan (AMP) did not document useful life assumptions.

Table 2-26: Comparison of the Range of Useful Life Assumptions

	2014 Valuation	KDC Accounting Policy
Wastewater	10 (resource consents) to 80 years	14 to 80 years

2.3.14 Minimum Remaining Useful Life

The Minimum Remaining Useful Life is applied to assets that are near or have past than their useful life. It recognises that although an asset is near or older than its standard useful life it may still be in service and therefore have some value. Where an asset is near or older than its standard useful life (i.e. remaining useful life is less than the minimum remaining useful life), the minimum remaining useful life is added to the age of the asset and used in the calculation of the Depreciated Replacement Cost.

Remaining useful lives are explained and detailed in the individual component revaluations.

2.4 Asset Data

2.4.1 Data Provided

Asset information was provided, based on AssetFinda data and capital reconciliation files for new and replaced assets constru cted since the 2010 revaluation. The following MS Excel spreadsheets were used:

AssetFinda spreadsheets downloaded on 30 April 2014.

Mangawhai wastewater treatment plant and pump station files:

- Mangawhai asset list for MWH.xlsx
- Mangawhai Asset Register WI Group (final) for MWH.xlsx

The 2010 Valuation reports referred to are:

- Contract 536 Roading, 3 Waters and Resource Consent Processing Asset valuation 2010 (CPG, May 2011)
- Mangawhai Ecocare Wastewater Scheme Valuation 1 July 2010 (MWH, 2010)

The data provided for each community is presented in Table 2-27 below.

Table 2-27: Asset Data by Community

Community	Wastewater Lines	Wastewater Plant	Wastewater Points
Dargaville	✓	✓	✓
Glinks Gully	✓	✓	✓
Kaiwaka	✓	✓	✓
Mangawhai	✓	✓	✓
Maungaturoto	✓	✓	✓
Te Kopuru	✓	✓	✓

2.4.2 Data Confidence

Where data was missing, assumptions were made to enable the revaluation to be completed. These assumptions are discussed further in the detailed sections of this report.

The confidence in each type of asset data has been assessed based on the *NZ Infrastructure Asset Valuation and Deprecation Guidelines – Edition 2, Table 4.3.1: Data confidence grading system.* The assigned confidence grade and comment are detailed in Table 2-28 below.

Table 2-28: Asset Data Confidence

Asset Description	Confidence	Comments
Lines	C - Uncertain	AssetFinda data provided contained all assets constructed to 30 April 2014. Assets constructed between 1 May and 30 June2014 have been manually added to the valuation. There were some data gaps in critical fields such as pipe diameter and installation year. The asset sub-type information in AssetFinda for pressure versus gravity was not reliable, e.g. the rising main from the Mangawhai wastewater treatment plant to the irrigation site is shown as a gravity main. The AssetFinda data included assets with a status of "Abandoned" or "Private" or “Database edit” and these assets were removed for the revaluation. The AssetFinda lines data also included lengths for wastewater service connections and these assets were removed for the revaluation as connections were valued separately (per connection not per length). The data was generally found to be reasonably complete, however, no information on underground infrastructure depth or surface cover type was provided.
Points	B - reliable	AssetFinda contains all points assets (manholes, valves etc) constructed to 30 April 2014 except connections which were included under plant so were moved to points (one new point asset installed between April and June 2014 was manually added to spreadsheet). Some of the points assets were removed from the revaluation e.g. “dummy nodes”. More detail provided in Section 2.5. There were no data gaps in installation year. The data had gaps in asset descriptive fields such as manhole depth therefore single unit rates were applied for most point assets.

Asset Description	Confidence	Comments
Plant	C - Uncertain	AssetFinda contains all plant assets (pump stations, treatment plants, associated pipelines) constructed to 30 June 2014. Connections and customer meters were originally included under plant so were moved to points. The asset hierarchy for plant assets is unclear. There were no data gaps in installation year. The description of most plant components is not sufficiently detailed to review the 2010 replacement cost in the AssetFinda data. The appropriateness of the costs in AssetFinda cannot be confirmed. Few of the plant assets contain detailed asset descriptions (e.g. make, model, flow rate etc.) therefore current replacement costs for most assets have been based on historic costs updated by the cost adjustment factor rather than supplier quotes.
Mangawhai wastewater treatment plant	C - Uncertain	Most of these assets are not in AssetFinda. The asset register used for this was sourced from WIG, and reconciled as best as possible against site observations from a field inspection and documents received from WIG. The asset group classifications were in some instances very broad and appeared to be duplicated across different line items. We have, where deemed appropriate excluded some line items in the WIG register to avoid duplication of values. A thorough examination of the assets for the Mangawhai WWTP, Mangawhai pump stations and the Irrigation disposal systems is needed to compile a comprehensive asset register suitable for incorporating within Assetfinda.

Based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Version 2.0, Table 4.3.1: Data confidence grading system.

A – Highly Reliable Data based on sound records, procedure, investigations and analysis which is properly documented and recognised as the best method of assessment.

B – Reliable Data based on sound records, procedures, investigations and analysis which is properly documented but has minor shortcomings.

C – Uncertain Data based on sound records, procedures, investigation and analysis which is incomplete or unsupported, or extrapolation from limited sample for which grade A or B data is available.

D – Very Uncertain Data based on unconfirmed verbal report and/or cursory inspection and analysis.

2.4.3 Assumptions

1. This revaluation has been carried out as a desk top assessment of the asset values and did not include a field verification of the assets apart from a brief site visit to the Mangawhai wastewater treatment plant.
2. The total useful lives of assets were initially determined from the previous revaluation work and reviewed against similar asset types in other councils and the guideline ranges in the NZIAVDG. For some plant and point assets there is limited attribute information available to corroborate the useful lives. For these assets, MWH have assumed that the previous lives used are appropriate. Council staff last reviewed the useful life assumptions in 2013 and these have been brought forward to the 2014 valuation.
3. Specific assumptions relating to individual calculations are explained in the relevant sections.

2.5 Wastewater Revaluation

Replacement Unit Rates

Lines Unit Rates

The lines unit rates used in the previous 2010 revaluation were based on pipe diameter and did not take into account local ground conditions, different surface restoration types etc. It is assumed that these unit rates allow for breaking open, excavation, removal of old pipes, laying, jointing and reinstatement. The 2010 unit rates include a 7.5% allowance for engineering overhead costs.

We adopted the same percentage engineering overhead costs for the 2014 valuation for all wastewater lines assets. The CPG 2010 valuation report stated that the pipe replacement costs were based on an assumed average depth of 1.5m and average of 75% in berm and 25% in road. It was assumed that future replacement will be designed such that pipes can be placed to avoid road construction. This was considered reasonable as most recent pipe have been able to be thrust with little requirement for trench reinstatement in road or berm.

The rates have been reviewed against unit rates from a sample of other councils and compared to other unit rates in MWH's cost database and were generally found to be comparable. Other councils prepare separate rates for gravity and pressure sewers, however the previous 2010 valuation had only one rate type for both gravity and pressure sewer pipes. We found that the asset sub-type information in AssetFinda for pressure versus gravity was not reliable, e.g. the rising main from the Mangawhai wastewater treatment plant to the irrigation site is shown as a gravity main. Therefore, the previous approach of one rate type for both gravity and pressure pipe has been adopted until field verification has been undertaken of the lines assets (as per the improvement plan). The

previous rates have been adopted with one modification (for 250mm diameter pipe) and updated to 2014 dollars using a CAF. The wastewater lines unit rates are tabled in Appendix A.

Where the pipe diameter is unknown, in the previous CPG 2010 valuation the pipe was assigned a unit rate that corresponded to a diameter of approximately 65mm. For this valuation, for gravity pipes with unknown diameter we have assigned a diameter that is the median of all known gravity pipe diameters, 150mm. Similarly, for rising main pipes with unknown diameter we have assigned a diameter that is the median of all known rising main pipe diameters, 100mm.

Plant Unit Rates

The replacement rates for all plant assets used in the previous 2010 revaluation (excluding Mangawhai wastewater treatment plant) were provided in AssetFinda or in the data reconciliation file for new assets. As limited information is available on the individual plant assets, the previous replacement rates have been adopted and updated to 2014 dollars using a CAF. The unit rates include a 7.5% allowance for engineering overhead costs for all but the Mangawhai plant assets. In the MWH 2010 valuation of the Mangawhai wastewater system, the 7.5% engineering overhead costs was replaced with an overhead of 15% that was calculated from actual contract and overhead costs. This 15% engineering overhead cost has been applied to Mangawhai plant assets instead of the 7.5% overhead allowance.

The plant unit rates used are not included in Appendix A as they are specific to individual assets.

The wastewater plant dataset includes 3 rising mains in Dargaville with lengths from 395m to over 2km. The unit rates in $/m from AssetFinda were reviewed against the unit rates for the relevant diameter pipes from the 2014 wastewater lines valuation and the wastewater line unit rates were adopted. There were also three rising main assets in the Maungaturoto plant asset data, however their unit rates were on a lump sum basis.

The Mangawhai wastewater treatment plant valuation was previously based on a top-down assessment from the contract costs (this assigned average useful lives to groups of like asset types under lump sum cost items).

For the 2014 valuation, the incorporation of the Mangawhai WWTP and Irrigation disposal system has been conducted in a “bottom up” manner for the first time. This included site observations from a field inspection and a review of documents supplied by WIG. The asset data was improved where possible, but is still reliant largely on the asset register and asset groupings as supplied by WIG. Within the register supplied, the grouping of assets was not always clear in terms of what was included, and it appeared to contain duplication. A lot of the construction costs were missing.

We have reviewed the register against asbuilt and design plans, tender documents and quotes supplied for various components of the facility. Some of the costing items contained grouped costs for a wider group of assets and these have been apportioned as best as possible. We have removed any duplication of assets where it seemed apparent.

Where cost information was missing from the asset register supplied, costs were generally built up from Rawlinsons.

The methodology is briefly described in Table .

Table 2-29: Mangawhai Wastewater Treatment Plant valuation methodology

Asset Types	Brief methodology description
Plant – civil assets	Based on recent contract costs for similar civil/structural assets from other Councils with a contingency added or from Rawlinsons using per unit rates.
Plant – mechanical assets	Based on the 2008 WIG contract price costs updated with CAF to 2014 dollars.
Plant – electrical assets	Based on the 2008 WIG contract price costs. The process and instrumentation drawings were used to generate a weighted list of electrical items for different process areas in the plants (weighted based on the relative cost of the electrical assets in each process area). 2008 costs were updated with CAF to 2014 dollars.
Plant – remaining assets	Based on either historic contract costs or current replacement costs provided by suppliers.
Irrigation system	Primarily based on WIG contract costs updated to 2014 dollars. Items excluded from the main contract such as the dam were estimated from unit rates for similar items.
Pump stations	Primarily based on WIG contract costs updated to 2014 dollars.

For two assets we have requested costing information from Council which was not available from WIG. This includes:

- the Pump Station Building (and the provision of power, lighting, and telecom services) at the farm, as these were noted as being supplied by “others” in WIGs tender, but was subsequently issued as a variation. WIG have not been able to supply this cost information.
- the dam intake, suction line and isolating valve at the farm was to be supplied / installed by others presumably under a separate contract to Council.

The costing information is still to be provided by Council, however in lieu of that, provisional amounts have been included.

Points Unit Rates

The AssetFinda data included some wastewater points asset types that were not considered relevant.

Table 2-30: Relevance of Wastewater Points Asset Types

Asset Types for 2014	Comment	Status for 2014 Valuation
Boundary Kit	New for 2014, Mangawhai assets, include in 2014 valuation	Valued in Points
Connection	Valued under Plant in 2010, valued in points in 2014	Valued in Points
FlushPoint	New for 2014, Mangawhai assets, include in 2014 valuation	Valued in Points
Grinder Pump	Not in 2010 valuation, Mangawhai assets, exclude from 2014 valuation as privately owned	Removed from Points valuation
Inlet	New for 2014, one only in Dargaville, assume part of pond and included in plant	Removed from Points valuation
Inspection Shaft	Valued in 2010 as "inspection chamber"	Valued in Points
Manhole	Valued in 2010	Valued in Points
Meter	New for 2014 valuation	Valued in Points
Rodding Eye	Valued in 2010	Valued in Points
Valve	120 valves (5 sub-types: isolation & scour, air, flushing, scour, heavy duty cover)	Valued in Points except for subtype – “heavy duty cover” as it is like a toby and included in costs for the valves
Valve Chamber	6 valve chambers in Dargaville listed under type "valve"	Removed from Points valuation as the valves are incorporated as part of valve installation or as part of Pump station
	3 valve chambers in Maungaturoto listed under type "valve"	Removed from Points valuation

The points unit rates used in the previous 2010 revaluation were typically based on asset type. The 2010 unit rates include a 7.5% allowance for engineering overhead costs. The wastewater points unit rates are tabled in Appendix A.

The rates have been reviewed against unit rates from a sample of other councils and compared to other unit rates in MWH's cost database and were generally found to be comparable. The previous rates have been adopted, with some minor modifications, and updated to 2014 dollars using a CAF.

Wastewater Asset Lives and Minimum Remaining Lives

The asset lives and minimum remaining lives for all wastewater assets are detailed in Tables 2-31 through to 2.34 below

Table 2-31: Wastewater Line Asset Lives

Pipe material	Base Life (years)	Minimum Remaining Useful Life (years)
AC	40	5
CC	80	5
CI	60	5
CIPP	40	5
CLS	60	5
CONC	60	5
GEW	80	5
HDPE	80	5
MDPE	80	5
oPVC	80	5
PE	80	5
PE100 - PN16	80	5
PVC	80	5
STEEL	60	5
Unknown	80	5
uPVC	80	5

The wastewater plant asset hierarchy was unclear in the AssetFinda data. To enable comparison of like assets, the asset types were reviewed and consolidated into a smaller number of asset types for pump stations (Table 2-32) and for treatment assets (Table 2-33).

Table 2-32: Wastewater Plant Asset Lives – Pump Stations, Pump assets

Adopted Asset Type	Adopted Base Life for 2014 Valuation (years)	Minimum Remaining Useful Life (years)
Control/Telemetry	20	2
Electrical	20	2
Mechanical	20	2
Structural/Civil	50	5
Pump chamber	80	5

Table 2-33: Wastewater Plant Asset Lives – Remaining Treatment Assets

Adopted Asset Type	Adopted Base Life for 2014 Valuation (years)	Minimum Remaining Useful Life (years)
Aerator	25	2
Buildings	80	5
Control/Telemetry	20	2
Earthworks	Non depreciable	Non depreciable
Electrical	20	2
Inlet/Outlet Structures	50	5
Instruments	20	2
Laboratory equipment	10	2
Magflow meter	20	2
Mechanical	20	2
Membranes	10	2
Outlet	20	2
Oxidation Pond	50	5

Adopted Asset Type	Adopted Base Life for 2014 Valuation (years)	Minimum Remaining Useful Life (years)
Pipework	60	5
Pumps	20	2
Resource consent	Resource consent duration	0
Rising Main	60	5
Rock Filter	50	2
Soakage Field	25	2
Structural/Civil	50	5
Surfacing	20	2
Tidal Discharge System	20	2
Valve	40	5
VSD & Emergency Stop	25	2
Wetland planting	20	5

Table 2-34: Wastewater Points Asset Lives

Asset Types	Adopted Base Life for 2014 Valuation (years)	Minimum Remaining Useful Life (years)
Boundary Kit	80	5
Connection	80	5
FlushPoint	80	5
Inspection Shaft	80	5
Manhole	80	5
Meter	20	5
Rodding Eye	80	5
Valve	40	5

Wastewater Specific Assumptions

Wastewater connections have been included in the 2014 valuation with a single asset line and a quantity per community. The number of connections per community is based on data provided by KDC staff from the rating database. These numbers are the number of pans that are charged at the beginning of this current financial year starting July 2014. Table compares the number of connections in 2010 and 2014. There is a significant decrease in the number of connections in Dargaville. The table also shows the assumed average installation year for the connections which was based on the average installation year for the wastewater line assets.

Table 2-35: Wastewater Connections by Community

Community	# of Connections in 2010 Valuation	# of Connections in 2014 Valuation	Assumed Installation Year in 2014 Valuation
Dargaville	2,648	1,996	1974
Glinks Gully	23	24	1989
Kaiwaka	180	193	1985
Mangawhai	(valued by service length)	2,240	2008
Maungaturoto	453	475	1984
Te Kopuru	195	192	1982

Wastewater Revaluation

The replacement value, depreciated replacement value, accumulated depreciation and annual depreciation of wastewater assets by community are provided in the tables below.

Table 2-36: Wastewater Lines Assets as at 30 June 2014

Community	Replacement Cost ($)	Depreciated Replacement Cost ($)	Accumulated Depreciation ($)	Annual Depreciation ($)
Dargaville	$8,789,268	$2,639,384	$6,149,884	$152,925
Glinks Gully	$68,923	$47,384	$21,538	$862
Kaiwaka	$881,184	$255,472	$625,712	$19,123
Mangawhai	$16,536,287	$15,387,258	$1,149,029	$206,704
Maungaturoto	$2,193,878	$709,088	$1,484,790	$48,080
Te Kopuru	$1,068,163	$225,840	$842,323	$25,747
Total 2014	**$29,537,703**	**$19,264,426**	**$10,273,276**	**$453,441**

Table 2-37: Wastewater Plant Assets as at 30 June 2014

Community	Replacement Cost ($)	Depreciated Replacement Cost ($)	Accumulated Depreciation ($)	Annual Depreciation ($)
Dargaville	$4,073,271	$2,261,727	$1,811,544	$102,934
Glinks Gully	$120,735	$63,798	$56,937	$4,207
Kaiwaka	$352,687	$204,273	$148,414	$6,999
Mangawhai	$17,822,575	$15,448,193	$2,374,382	$476,745
Maungaturoto	$2,132,135	$1,433,475	$698,661	$59,285
Te Kopuru	$281,723	$190,430	$91,294	$3,834
Total 2014	**$24,783,126**	**$19,601,896**	**$5,181,232**	**$654,004**

Table 2-38: Wastewater Points Assets as at 30 June 2014

Community	Replacement Cost ($)	Depreciated Replacement Cost ($)	Accumulated Depreciation ($)	Annual Depreciation ($)
Dargaville	$5,801,236	$2,680,274	$3,120,962	$72,515
Glinks Gully	$67,376	$46,321	$21,055	$842
Kaiwaka	$563,242	$347,898	$215,344	$7,041
Mangawhai	$7,219,368	$5,286,921	$1,932,447	$116,906
Maungaturoto	$1,467,838	$1,167,863	$299,975	$18,424
Te Kopuru	$606,502	$368,819	$237,683	$7,581
Total 2014	**$15,725,562**	**$9,898,096**	**$5,827,466**	**$223,309**

The current asset values for the all the communities i.e Dargaville, Glinks Gully, Kaiwaka, Maungaturoto, Te Kopuru and Mangawhai wastewater schemes are presented in the following Tables.

2.5.1 Dargaville

Component	Replacement Cost ($)	Depreciated Replacement Cost ($)	Accumulated Depreciation ($)	Annual Depreciation ($)
Wastewater Lines Assets	$8,789,268	$2,639,384	$6,149,884	$152,925
Wastewater Plant Assets	$4,073,271	$2,261,727	$1,811,544	$102,934
Wastewater Points Assets	$5,801,236	$2,680,274	$3,120,962	$72,515

2.5.2 Glinks Gully

Component	Replacement Cost ($)	Depreciated Replacement Cost ($)	Accumulated Depreciation ($)	Annual Depreciation ($)
Wastewater Lines Assets	$68,923	$47,384	$21,538	$862
Wastewater Plant Assets	$120,735	$63,798	$56,937	$4,207
Wastewater Points Assets	$67,376	$46,321	$21,055	$842

2.5.3 Kaiwaka

Component	Replacement Cost ($)	Depreciated Replacement Cost ($)	Accumulated Depreciation ($)	Annual Depreciation ($)
Wastewater Lines Assets	$881,184	$255,472	$625,712	$19,123
Wastewater Plant Assets	$352,687	$204,273	$148,414	$6,999
Wastewater Points Assets	$563,242	$347,898	$215,344	$7,041

2.5.4 Maungaturoto

Component	Replacement Cost ($)	Depreciated Replacement Cost ($)	Accumulated Depreciation ($)	Annual Depreciation ($)
Wastewater Lines Assets	$2,193,878	$709,088	$1,484,790	$48,080
Wastewater Plant Assets	$2,132,135	$1,433,475	$698,661	$59,285
Wastewater Points Assets	$1,467,838	$1,167,863	$299,975	$18,424

2.5.5 Te Kopuru

Component	Replacement Cost ($)	Depreciated Replacement Cost ($)	Accumulated Depreciation ($)	Annual Depreciation ($)
Wastewater Lines Assets	$1,068,163	$225,840	$842,323	$25,747
Wastewater Plant Assets	$281,723	$190,430	$91,294	$3,834
Wastewater Points Assets	$606,502	$368,819	$237,683	$7,581

2.5.6 Mangawhai

Component	Replacement Cost ($)	Depreciated Replacement Cost ($)	Accumulated Depreciation ($)	Annual Depreciation ($)
Wastewater Lines Assets	$16,536,287	$15,387,258	$1,149,029	$206,704
Wastewater Plant Assets	$17,822,575	$15,448,193	$2,374,382	$476,745
Wastewater Points Assets	$7,219,368	$5,286,921	$1,932,447	$116,906

2.5.7 Valuation Improvement Plan

While the database and processes are considered materially correct, during the course of this valuation exercise the following areas have been identified for improvement prior to the next valuation report.

1 Review the asset hierarchy for plant assets and improve so that there is a clear logical structure for asset types and asset sub-types. This is particularly important for assigning useful lives to similar asset types.

2 Validate AssetFinda data with field verification of a sample of wastewater point and plant assets and CCTV inspections for wastewater lines.

3 Develop wastewater line unit rates that delineate between gravity and pressure sewers after verification of the asset sub-type data in AssetFinda.

4 Consider whether other local factors such as surface restoration type or local ground conditions should be taken into consideration for differing wastewater line unit rates.

5 Consider developing different unit rates for points assets that have different attributes (e.g. size and depth) and replacement costs (for example wastewater manholes by depth). Data gaps in the relevant asset attributes would need to be completed in the AssetFinda data.

6 Review the treatment of service connections (connection between a private property and the public reticulation) to clarify the extent of asset which Council should be responsible for and include in future valuations, especially where private connections may pass outside the property boundary into the road reserve or other public area. Where wastewater connections are located solely within the property, they should be the responsibility of the property owner.

7 A thorough examination of the assets for the Mangawhai wastewater treatment plant, pump stations and the irrigation disposal system is needed to compile a comprehensive asset register suitable for incorporating within Assetfinda and for improving the detailed bottom up valuation. Consideration will need to be given to asset componentry and grouping to ensure an appropriate and useable asset structure is developed. Consideration also needs to be given to obtaining consistency between other wastewater plant items across the region.

Valuation Appendix-VA

Table V0-1: Unit Rates – Wastewater Lines

Diameter (mm)	2010 Unit Rate $/m (including 7.5% overhead)	2014 Unit Rates $/m (including 7.5% overhead)
40	$88	$94
50	$97	$104
63	$106	$113
75	$114	$122
80		$125
90	$123	$132
100	$130	$139
110		$146
125	$146	$156
150	$162	$174
160	$190	$204
180	$246	$264
200	$302	$324
225	$310	$332
250	$500	$400
300	$500	$536
315		$564
375	$630	$675
400	$673	$721

Note that the 2010 rate for 250mm diameter wastewater line was very high so was replaced by an interpolated rate from the two adjacent pipe diameters.

Table V0-2: Unit Rates (excluding valves) – Wastewater Points

Asset Type	2010 Unit Rate $/ea (including overhead)	2014 Unit Rates $/ea (including overhead)
Boundary Kit		
Connection	$1,620	$1,736
Flush Point		
Inspection Shaft	$1,356	$1,562
Manhole	$3,000	$3,214
Meter		$2,030
Rodding Eye	$1,700	$1,821

Table V0-3: Unit Rates (valves only) – Wastewater Points

Asset Type	2010 Unit Rate $/ea (including overhead)	2014 Unit Rates $/m (including overhead)
Air	$1,100	$1,267
Flushing		$234
Isolation & Scour	$5,500	$6,335
Scour	$5,500	$6,335

3 Financial and Lifecycle Strategy & Management

3.1 General Life Cycle Management Plan

3.1.1 Introduction

This section identifies Council's strategy for managing, maintaining and renewing its wastewater assets. The strategies described within this section have been developed to achieve the Levels of Service identified in Section 1.9 of this AMP.

Management of the life cycle of each asset should optimise performance whilst minimising the total life cycle 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 Life Cycle Management Plan are to:

- Optimise performance and
- Minimise total life
- cycle 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.

This section identifies Council's strategies and programmes for managing, maintaining and renewing assets within its wastewater schemes. The programme described within this section has been developed to deliver the Levels of Service identified in Section 1.8 of this plan.

The Life Cycle 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
- New Asset Strategies to address growth and demand
- Decommissioning / Disposal Strategies for when the asset is no longer required
- Work programmes and the associated financial forecasts for each scheme.

3.1.2 Design Parameters

The design parameters for all new Council wastewater assets are set out in the Council's Engineering Standards 2011. The key design assumptions include the following:

- Number of Persons per Household Equivalent - 4
- Average Dry Weather Flow – 210 litres / day / person
- Industrial flow and Trade Waste shall be calculated as follows:
    - When the industrial waste and Trade Waste from a particular industry are known, these shall be used for the reticulation design;
    - When this information is not available, the dry weather flow rates shown in Table 3-1 may be used as a design basis for industrial area.

Table 3-1: Default Dry Weather Flows from Industrial Areas

Minimum Design Flow	Flow Rates (l/s/ha)
Light Water Usage	0.4
Medium Water Usage	0.7
Heavy Water Usage	1.3

3.1.3 Work Categories

The lifecycle management strategies are divided into the following five work categories:

Asset Operations: These are the active processes 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 on-going day to day work activity required to keep assets serviceable and prevent premature deterioration or failure. Three categories of maintenance are carried out:

- **Planned Maintenance**: Work carried out to a predetermined schedule (e.g. pump station inspection, mains scouring) or programmed as a result of identified needs (e.g. pump overhaul)
- **Preventative Maintenance**: Work additional to scheduled inspections and maintenance identified during inspections as essential to continued operation
- **Responsive Maintenance**: Work carried out in response to reported problems or defects (e.g. repair burst rising main).

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: This section of the plan covers tactics for the creation of new assets (including those created through subdivision and other development) or works which upgrade or improve an existing asset beyond its existing capacity or performance in response to changes in supply needs or customer expectations.

Development works fall into two separate categories as follows:

- Council funded
- Developer funded as part of sub-division development or by way of contributions.

Asset Decommissioning / disposal: Decommissioning and disposal of assets when they are no longer needed. Assets may become surplus to requirements for any of the following reasons:

- Under-utilisation
- Obsolescence
- Provision exceeds required level of service
- 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 Wastewater through Contract 527 Water Supply and Wastewater Operations and Maintenance Services. This is managed by Council staff.

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 3-2.

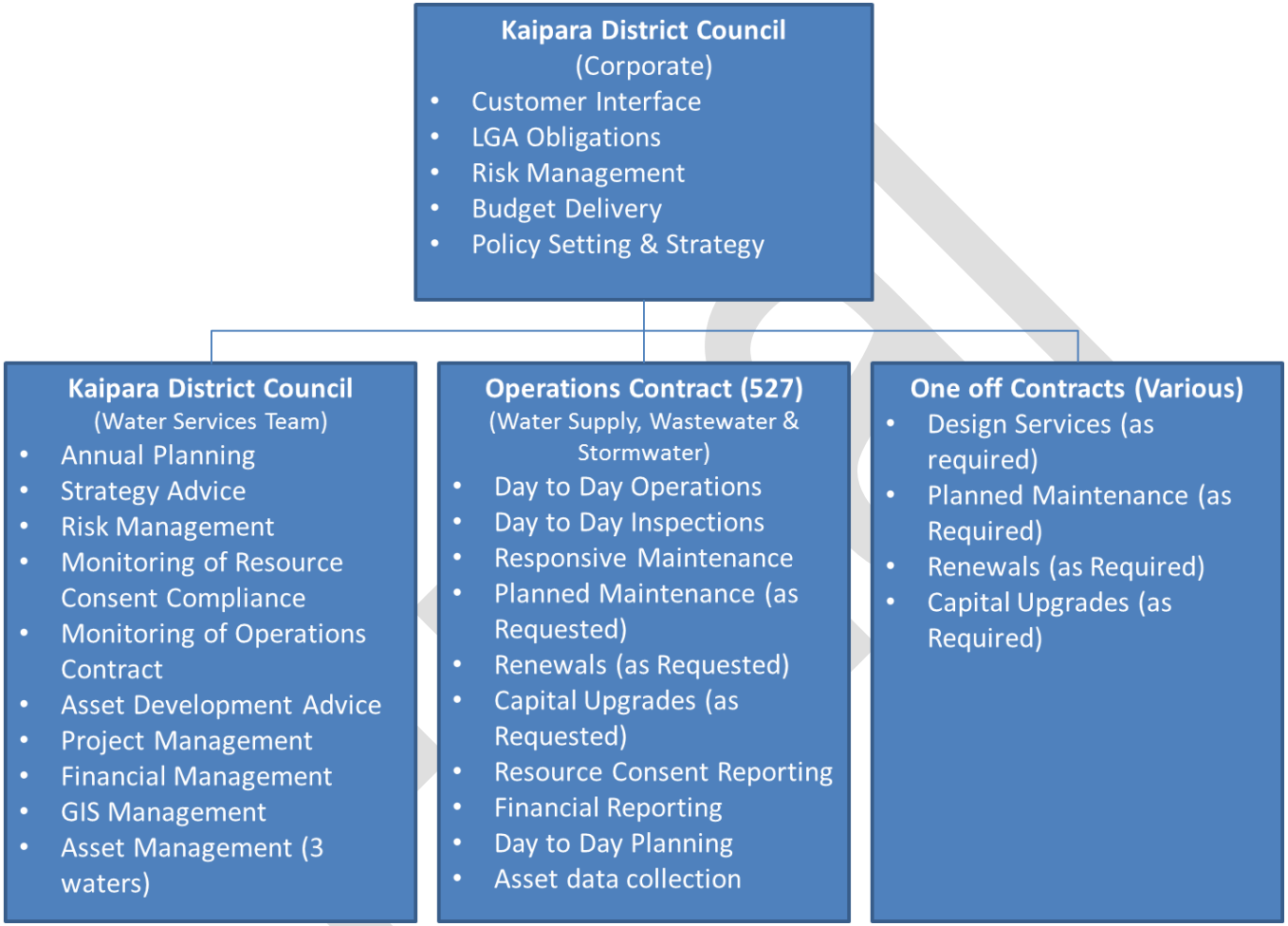
Table 3-2: Contract Work Group Relationship with Lifecycle Management Strategies

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 asset knowledge and their performance Council have recently restructured, and now undertake the wider scope of asset management functions. The field operations aspect is 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 Life Cycle 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 Help Desk 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 by 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 inspection 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, the Professional service contractor 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 meeting 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 Wastewater Treatment facilities. A list of the consents is included in Appendix D The discharges from these facilities are monitored by the Northland Regional Council (NRC). Council works closely with the NRC in monitoring the performance of Wastewater assets.

The day to day monitoring of performance of Wastewater systems is a requirement of the Operations contract. This is in turn monitored by the Professional Services contract. Where Resource Consent non-conformances are observed by either supplier, the non-compliances are reported to both NRC and Council. This will in turn be reported in the Annual Report.

3.2 Maintenance and Operating Strategy and Expenditure Forecast

3.2.1 Strategy

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

Table 3-3: Maintenance and Operating Strategies for Wastewater Assets

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 level of service Cost/Affordability	Low – Medium Increased overall costs and risk of failure.
Unplanned Maintenance Disaster i.e. climatic event, major spillage, system malfunction.	Council will maintain a suitable level of preparedness for prompt and effective response to civil emergencies or system failures by ensuring the availability of suitably trained and equipped suppliers. Specifically: electrical contractors and water/wastewater works contractors.	Responsiveness	Potential wastewater overflows to private property.
Unplanned Maintenance Pump Stations – Blockages Treatment Plant and Pump stations – 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 30 minutes in the Dargaville central business area and 1 hour for all other areas).	Medium – Wastewater overflows.

Activity	Strategy	Service Criteria	Impact
Unplanned Maintenance Pipelines – blockages, odour, pipe breaks.	Sufficient spares to be stocked (by contractor) to address regular failures.	Responsiveness (Response time for unplanned priority works is 30 minutes in the Dargaville central business area and 1 hour for all other areas)	Medium – Wastewater overflows
Planned Inspections Pump Stations, Treatment Plants, Pipelines.	Council will undertake scheduled inspections in accordance with good industry practice and as justified by the consequences of failure on Levels of Service, costs, public health, safety or corporate image.	Maintaining existing level of service Pump stations are inspected twice weekly (Dargaville PS01 daily) and oxidation ponds are inspected as follows: • Dargaville – twice weekly • Glinks Gully and Kaiwaka – weekly • Maungaturoto and Te Kopuru – twice weekly (summer) and weekly (winter)	Medium – Wastewater overflows
Planned Inspections	Modify the inspection programme as appropriate in response to maintenance trends.	Maintaining existing Level of Service	
Planned – Preventative Maintenance Pump Stations, Treatment Plants, Pipelines.	Council will undertake programme of planned asset maintenance to minimise the risk of critical equipment failure (e.g., pump overhaul) or where justified economically (e.g., access road re-seal).	Maintaining existing Level of Service Cost/Affordability	Medium – Wastewater overflows

3.2.1.1 Reticulation

The maintenance and operating strategy for wastewater reticulation is to retain the current Levels of Service and acceptable level of risk while minimising costs. The strategies designed to meet the objectives of this plan are described in Table 3-4.

Table 3-4: Pipeline Maintenance and Operating Strategies

Asset Failure Mode	Action	Service Criteria	Impact
Pipes – Blockages	Blockages to wastewater pipes cleared by rodding, root cutting or water blasting	System capacity/ reliability	Medium – Reduced network capacity, wastewater Overflows
Reduced capacity	Regular flushing by water blasting as identified by visual or video inspection.		
	Use of a suction truck to remove accumulations of material and raw wastewater.		
Stormwater Infiltration	Video and smoke testing to identify illegal connections, breakages, obstructions and infiltration		
Manholes Infiltration, degradation	All manholes inspected over a 6 year period to identify structural or infiltration problems	System capacity/ reliability	Medium – reduced capacity

3.2.1.2 Pump Stations

The operating and maintenance strategy for pump stations is that all reasonable measures will be taken to ensure a continuous service is provided. The maintenance and operating strategies are summarised in Table 3-5.

Table 3-5: Pump Station Maintenance and Operating Strategies

Asset Failure Mode	Action	Service Criteria	Impact
Pump Stations – Mechanical or electrical failure	Pump stations will be operated so that real time knowledge of flows and pumping hours can be obtained through the telemetry system.	Availability/ Reliability	Medium – Wastewater overflows
	The pump stations will be inspected twice weekly to ensure pumps are operating satisfactorily.	System Capacity	
	Annual mechanical overhaul, electrical check and general operational check of facilities	Availability/ Reliability	
Pump Stations Complaints of Odour	Check Ozone units for odour control (where applicable), twice weekly (daily for Pump Station 1) pump out wet wells and hose down grease and sludge	Customer Service	Low – Complaints on odour

The inspection requirements for pump stations required by the Contract 527 is detailed below, with the frequency noted as twice weekly, with the exception of the Dargaville Pump Station No1 which has a daily inspection frequency:

- Log book completed including pump hours and AMPs drawn while running
- Check operation of all pumps and clear blockages
- Check Ozone units and/or odour control devices
- Pump out and clean wet wells, remove all grease and sludge
- Record evidence of overflows and advise of damage or impact, advise Regional Council
- Test alarms
- Download telemetry data and record any relevant information for monthly report

This inspection programme is supplemented by more detailed annual inspection that is used to determine any renewal or upgrading requirements. The timing of the annual inspection is undertaken to enable the results of the inspection to be incorporated into the Annual Planning round.

The Annual inspection includes:

- Detailed mechanical check of all pumps, motors and valve gear
- Electrical check of all electrical equipment
- Review of all telemetry
- Maintenance of accesses, water-blasting of the wet well and removal of accumulated debris
- Preparation of a report to note maintenance, renewal and upgrading requirements
- To date maintenance of pump stations has been restricted largely to where a problem obviously exists. Diagnosis of problems other than by cursory inspection has been very restricted.
- Pump station maintenance is currently conducted only on 'essential' or 'critical' equipment on a contract basis. All maintenance work is carried out by the Utilities Contractor. Emergency work is also undertaken under this contract and is commenced upon notification received from the Help desk or SCADA-GSM alarm. Other upgrades are contracted separately in accordance with the technical demands of the work.

3.2.1.3 Treatment

Each treatment plant is operating under a resource consent approved by the Northland Regional Council. This considers the various legislative requirements along with the views of the community. During the Consent application process Council will liaise with the various affected parties and particularly the Department of Conservation and relevant Iwi groups.

The Operational Plan will be driven by Resource Consent conditions in the first instance and then the technical requirements of each system. Typical considerations include:

- Monitoring the quality of effluent discharge
- Control of the quantity of discharge
- Monitoring the operation of the plant in terms of odour or appearance
- Control of vegetation

- Amenity issues relating to operation
- Reporting performance to the Northland Regional Council

With the negotiation of trade waste agreements it will be necessary to add requirements to monitor the quality of the effluent coming into treatments plant from various commercial users.

The majority of the treatment plants in the Kaipara District are very simple operations and require only periodic inspection to ensure continuous operation. Human input is limited to:

- Cleaning and calibrating equipment
- Remove floating debris from the oxidation pond
- Regulate the operation of the aerators to achieve desired levels of dissolved oxygen
- Remove any build-up of weeds
- Testing oxidation pond parameters
- Unblocking spray system.

The exception is the Maungaturoto membrane filtration plant, which requires a number of additional operation / maintenance tasks.

The maintenance and operating strategies for treatment plants are summarised in Table 3-5.

Table 3-6: Treatment Plant Maintenance and Operating Strategies

Asset Failure Mode	Action	Key Service Criteria	Impact
Treatment Plant – treatment process not effective	Regulate dissolved oxygen levels through use of the aerators.	System effectiveness	Medium/high
	Monitor effluent pH levels		Abatement notice for non-complying discharge

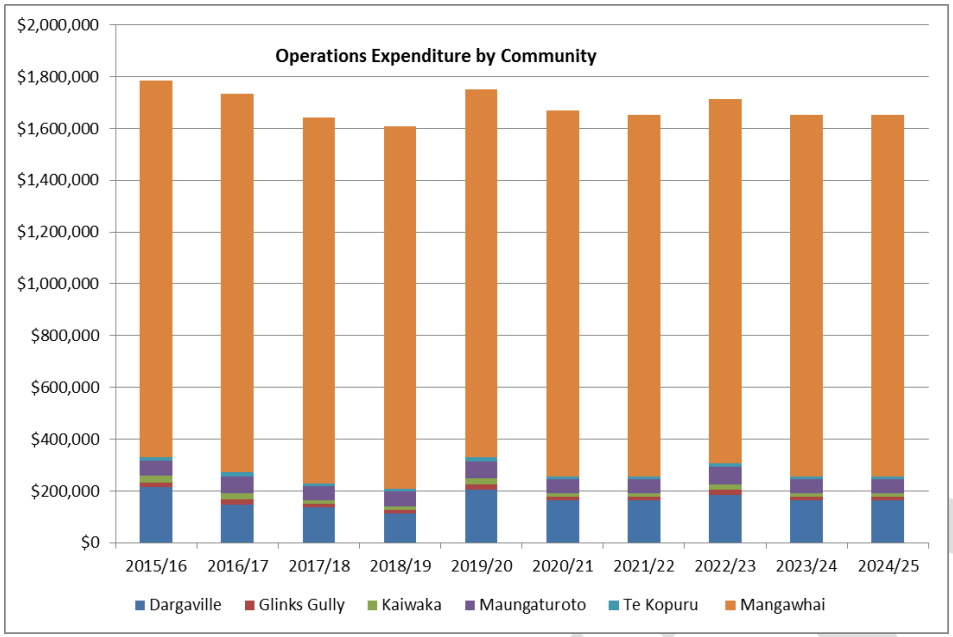
Asset Failure Mode	Action	Key Service Criteria	Impact
Cost efficiency	The plant will be operated to minimize electricity and maintenance costs while achieving effluent quality standards.	Cost/Affordability	Low – increased costs
Mechanical Equipment	Regularly check the operation of mechanical assets and on monthly basis, service the aerators and arrange repairs as required by the contract. Monitor spray irrigation system and unblock as required.	Reliability	Medium/high
Premature failure			Abatement notice for non-complying discharge

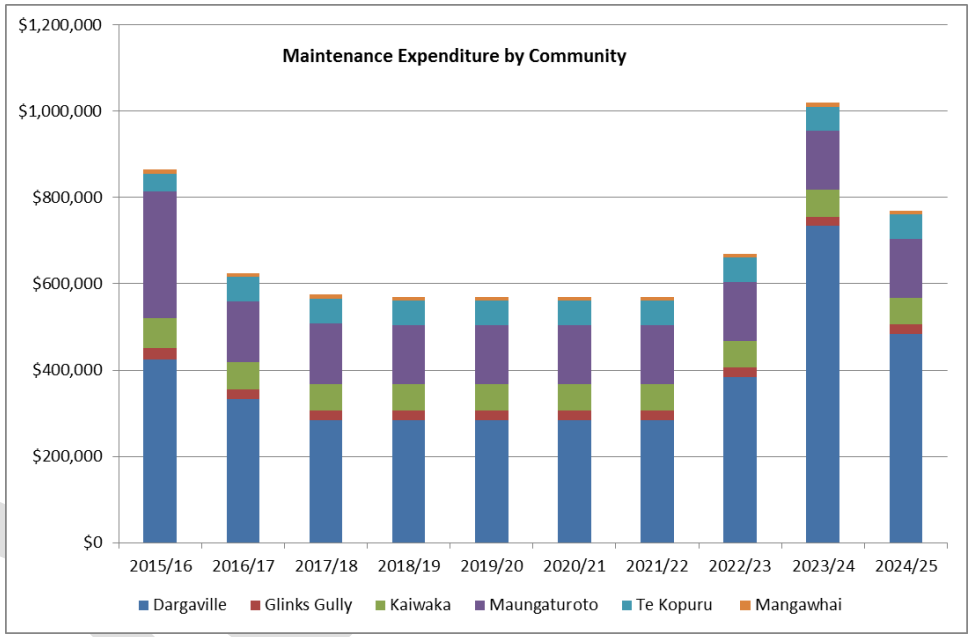
3.2.2 Expenditure Forecast

The ten year forecast for operations and maintenance costs for wastewater assets in the Kaipara District are shown in

Figure 3-2: Total Forecast Operational Expenditure

Figure 3-3: Total Forecast Maintenance Expenditure





and 3-3 .

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

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

A detailed breakdown of the financial forecast is included in Appendix A.

Figure 3-2: Total Forecast Operational Expenditure

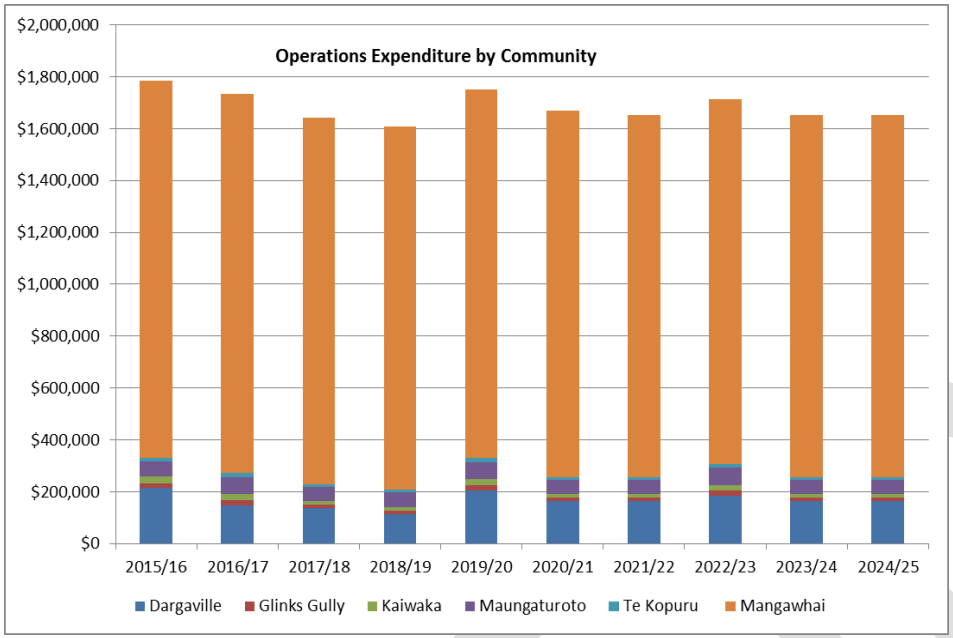
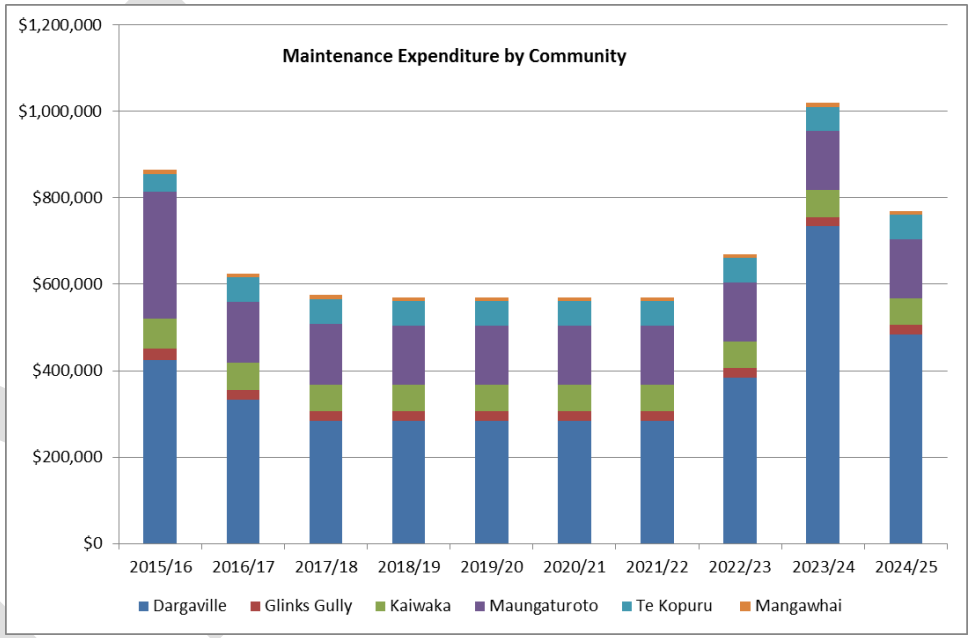


Figure 3-3: Total Forecast Maintenance Expenditure



3.3 Renewals 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 their renewal strategy during 2012/13 and are 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 asset data situation detailed 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 life, 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.

The Council 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 Level of Service. 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 coordination 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.

The most significant expenditure is related to renewal, since there is a considerable backlog to clear specially in Dargaville and Maungaturoto. As Mangawhai Scheme – ie treatment plant and the reticulation – is fairly new there will be no significant renewal at the beginning of the next ten year period. However we have to take into consideration the renewal towards the end of the first ten years; as there will be a significant accumulated depreciation ($672,000 per year) by then.

3.3.1.1 Reticulation

The renewal plan for reticulation is generated from Councils GIS system and is based on the age profile and the anticipated base life of the installed material (as shown in Table 3.7 below) to determine the renewal year. The indicative programme is then revised to consider information collected by the Operational contractor of the prevalence of breaks and inspection observations including the performance of manholes and the prevalence of infiltration within each catchment. Special studies may be undertaken where deemed necessary. If an asset reaches the end of its expected base life and its condition and performance are such that the risk of failure and therefore reactive emergency replacement is low, renewal will be deferred until the risk of failure becomes unacceptable.

Council has previously investigated the durability of Asbestos Cement (AC) pipes currently in service and has determined that the anticipated life of 40 years can be less than experienced in the field. Accordingly the renewal strategy developed within the AMP has smoothed the renewal of these assets over the next 20 years. Should AC pipes start failing at an accelerated rate, then this strategy should be reviewed. However, replacement now is likely to under-utilise the life of these assets.

With the introduction of condition assessments in 2014 a review of the life expectancy of AC across all Council pipe assets is proposed with a view to adopting a renewal strategy based on greatest risk, criticality and the nature of the installation i.e. operating pressure, ground conditions.

Table 3-7: Life Expectancy of Pipeline Assets

Asset/Material	Life Expectancy	Asset/Material	Life Expectancy
Asbestos Cement Pipes	40 - 70	Cast Iron	60
Earthenware Pipes	80	Polyethylene	80
Cast Insitu Concrete Pipes	80	uPVC	80
Concrete Lined Steel Pipes	60	High Density Polyethylene	80
Concrete Pipes	80	Unknown	80
Manholes	80	Other Nodes	80

3.3.1.2 Pump Stations

The renewal plan is developed once the reports from annual inspections have been prepared by the operational contractor. This focuses on maintaining the existing Level of Service but will incorporate any upgrading requirements where they can be undertaken at the same time as renewals.

Proactive renewal work to date has been focussed on electrical assets, with pipes and mechanical assets typically being replaced upon failure.
The lifecycle expectations for pump station assets are:

- Structural / Civil assets 50 years
- Mechanical equipment 25 years
- Electrical & Control Equipment 25 years

3.3.1.3 Treatment

Each treatment plant will have its own requirements regarding when the various components of the treatment process will be renewed. This considers the nature of the components whether mechanical or electrical and will require renewal based on experience of the long term performance of each unit. The various expected lives are similar to those of pump stations; however treatment plant assets are usually subjected to greater loads and accordingly will need to be monitored more closely to ensure renewal timeframes reflect performance and capacity.

Renewal work to date has been focused on electrical assets, with mechanical assets typically being replaced upon failure.

The lifecycle expectations for wastewater treatment plant assets are:

- Oxidation Ponds & Maturation Pond Infinite
- Oxidation Pond wave bands 50 years
- Mechanical equipment 20 years
- Electrical equipment 20 years

3.3.2 Expenditure Forecast

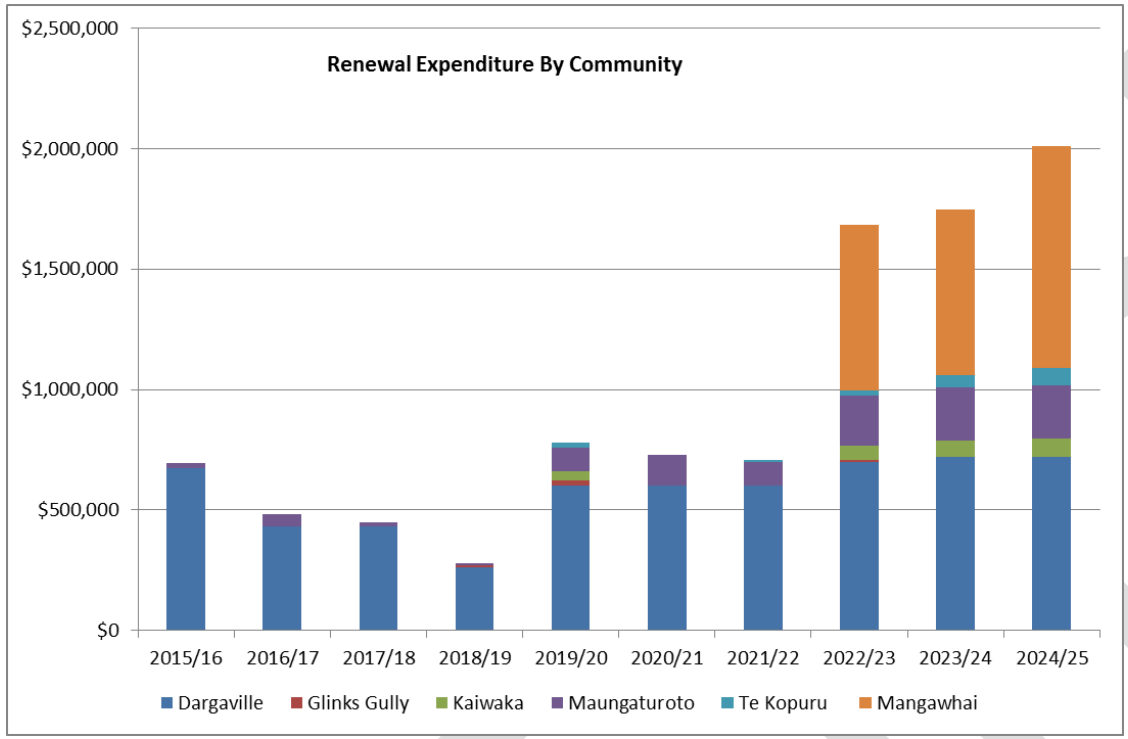
Renewal programmes have been produced based on the strategy discussed in Section 3.3.1.1

The 10 year forecast for renewal expenditure for wastewater assets in the Kaipara District is shown in Figure 3-4 below. The forecast expenditure information is based on the projected renewals discussed in the following sections of this AMP. Details of the 'AMP Improvements' are included in the Improvement Plan in Appendix B

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 Levels of Service.

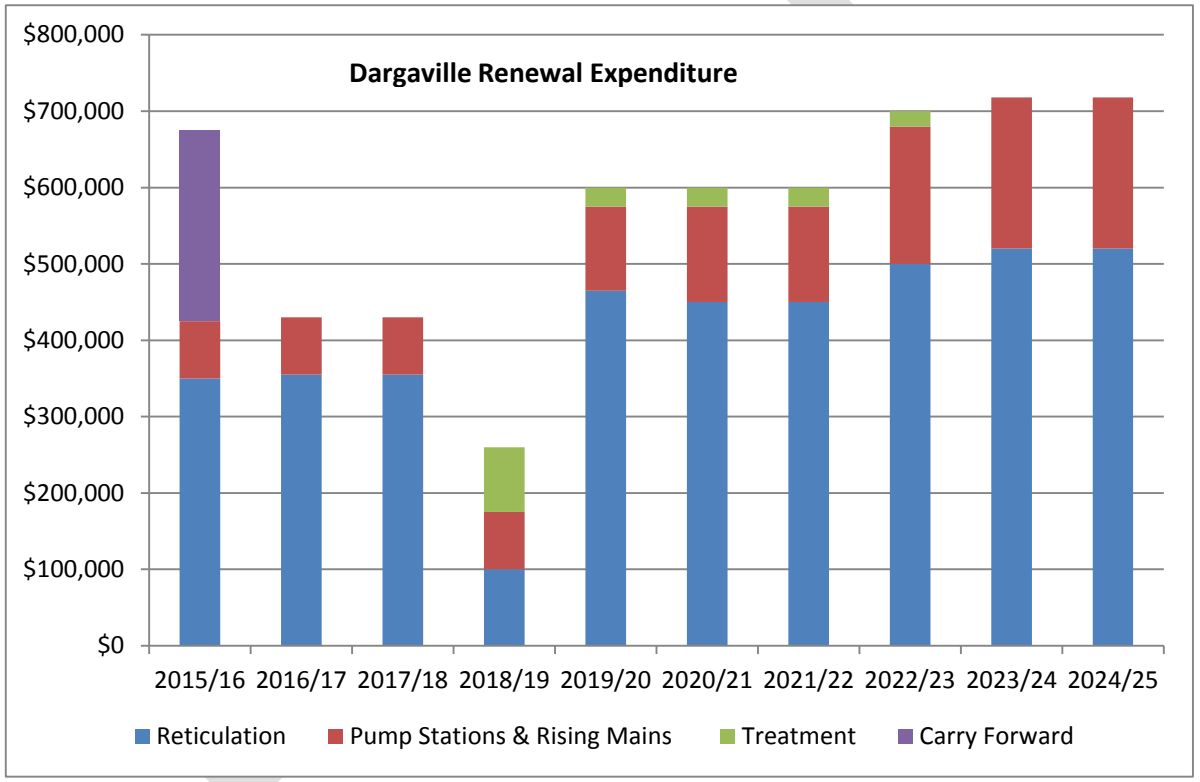
Figure 3-4: Total Forecast Renewal Expenditure



3.3.3 Expenditure Forecast – Dargaville

3.3.3.1 Overview

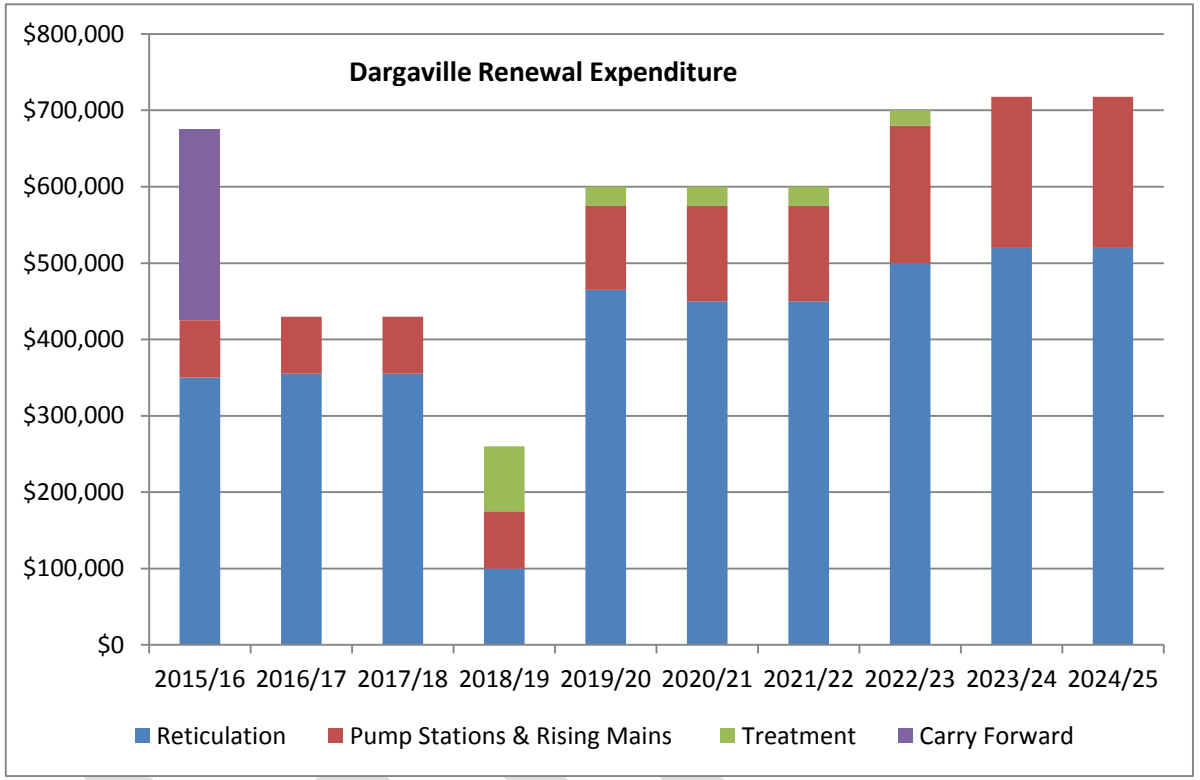
For the ten year period of 2015/16 to 2024/25, the forecast for renewal expenditure for Dargaville assets is shown in



below. This Capital Expenditure consists of:

- Renewal
- Level of Service (LOS)
- Growth.

Figure 3-5: Dargaville Forecast Renewal Expenditure



3.3.3.2 Reticulation

Dargaville's reticulation network is the oldest in the district and grew rapidly as a consequence of the Dargaville Borough decision to reticulate the community. This was largely completed with Asbestos Cement pipes that were thought to be a cost-effective alternative to concrete pipes at the time. Whilst this is true to a certain extent it has become apparent that the expected life of AC pipe as a general rule is now only 40 years.

The pipe renewals for the next 20 years are forecast based on renewing:

- AC pipes older than 40 years.
- Pipes that have realised their expected base life and present an unacceptable risk of failure.

The condition and performance of these pipes is such that their renewal will be deferred. Based on the assessed condition and performance, deferred renewals have been programmed as shown in Table 3-8. This demonstrates that the accumulated renewal backlog will be $ 4.485M (2014 dollars) by 2030.

In order to smooth out the peaks in expenditure and provide a more consistent work load to contractors, the renewals have been spread over the period 2015 to 2030. The total value of renewals for the period has been varied from $425,000 gradually to $718,000 per year which included in the renewal programme for the years 2015/16 to 2024/25, including a risk management buffer.

The fluctuation in the renewals spending in the 2018/19 financial year is created in order to comply with the overall council financial model.
This recognises that not all works can be undertaken in a 12 month period and that renewals will be deferred where the condition and performance varies from the strict installation date driven programme. This smoothing process provides Council with the flexibility to deliver the programme with the least disruption to the customers and ensures competitive tendering.

Based on the replacement value, annual depreciation across the Dargaville system including treatment and pump stations is $324,878 (as per 2014 Wastewater Valuation).

Strictly speaking a renewal expenditure of this amount on top of the deferred renewal amount should be shown, however in considering Dargaville's declining population, a strategy is required to develop an appropriate renewal expenditure program focused on assets that are both critical and determined to be significant and necessary for the town to continue to provide adequate wastewater services into the future.

Table 3-8: Dargaville Deferred Pipe Renewals

Installed	Length (m)	End of Life	Estimated Replacement Cost ($)	Accumulated Renewals ($)
1929	47.71	1969	8,000	8,000
1944	207.32	1984	34,000	42,000
1955	77.86	1995	13,000	55,000
1959	257.54	1999	42,000	97,000
1964	260.87	2004	42,000	139,000
1965	48.68	2005	8,000	147,000
1966	149.35	2006	24,000	171,000
1968	384.68	2008	62,000	233,000

Installed	Length (m)	End of Life	Estimated Replacement Cost ($)	Accumulated Renewals ($)
1970	5,834.62	2010	985,000	1,218,000
1972	211.06	2012	34,000	1,252,000
1974	1,605.93	2014	250,000	1,502,000
1975	292.25	2015	42,000	1,544,000
1976	948.09	2016	154,000	1,698,000
1977	115.00	2017	19,000	1,717,000
1978	946.08	2018	147,000	1,864,000
1979	6,866.72	2019	1,788,000	3,652,000
1980	74.24	2020	12,000	3,664,000
1981	201.84	2021	33,000	3,697,000
1982	720.57	2022	117,000	3,814,000
1983	1,429.16	2023	232,000	4,046,000
1985	402.68	2025	65,000	4,111,000
1986	84.23	2026	14,000	4,125,000
1987	163.87	2027	27,000	4,152,000
1988	104.52	2028	17,000	4,169,000
1990	628.22	2030	102,000	4,485,000

3.3.3.3 Pump Stations

Pump station renewals cover electrical/mechanical/civil assets based on the base lives listed in the renewal strategy with an additional allowance for renewal of rising mains. The total expenditure is planned at an annual amount from $75,000 in 2015/16 gradullay rising to $198,000 in 2024/25. The distribution pattern of the proposed expenditure is shown in Table 3-9.

3.3.3.4 Treatment

Treatment Plant renewals cover electrical/mechanical/civil assets based on the base lives listed in the renewal strategy. An an allowance of $85,000 is included for wetland planting in 2018/19. Annual allowance of $25,000 during 2019/20 through to 2021/22 for wave band renewal and $20,000 for aerator renewal in 2022/23 has been made.

The distribution of Capital Renewal expenditure and the project priorities for Dargaville for the 10 year period of 2015/16 to 2024/25 are summarised in Table 3-9 below

Table 3-9: Dargaville Renewals Expenditure Forecast

Asset	Planned Expenditure	Planned Date
Reticulation	$350,000 $355,000 annually $100,000 $465,000 $450,000 annually $500,000 $520,000 annually	2015/16 2016/17 – 2017/18 2018/19 2019/20 2020/21 – 2021/22 2022/23 2023/24 – 2024/25
Pump stations and rising mains	$75,000 annually $110,000 $125,000 annually $180,000 $198,000 annually	2015/16 – 2018/2019 2019/20 2020/21 – 2021/22 2022/23 2023/24 – 2024/25
Treatment Wetland replanting Wave band renewal Aerators	 $ 85,000 $ 25,000 annually $ 20,000	 2018/19 2019/20 – 2021/22 2022/23

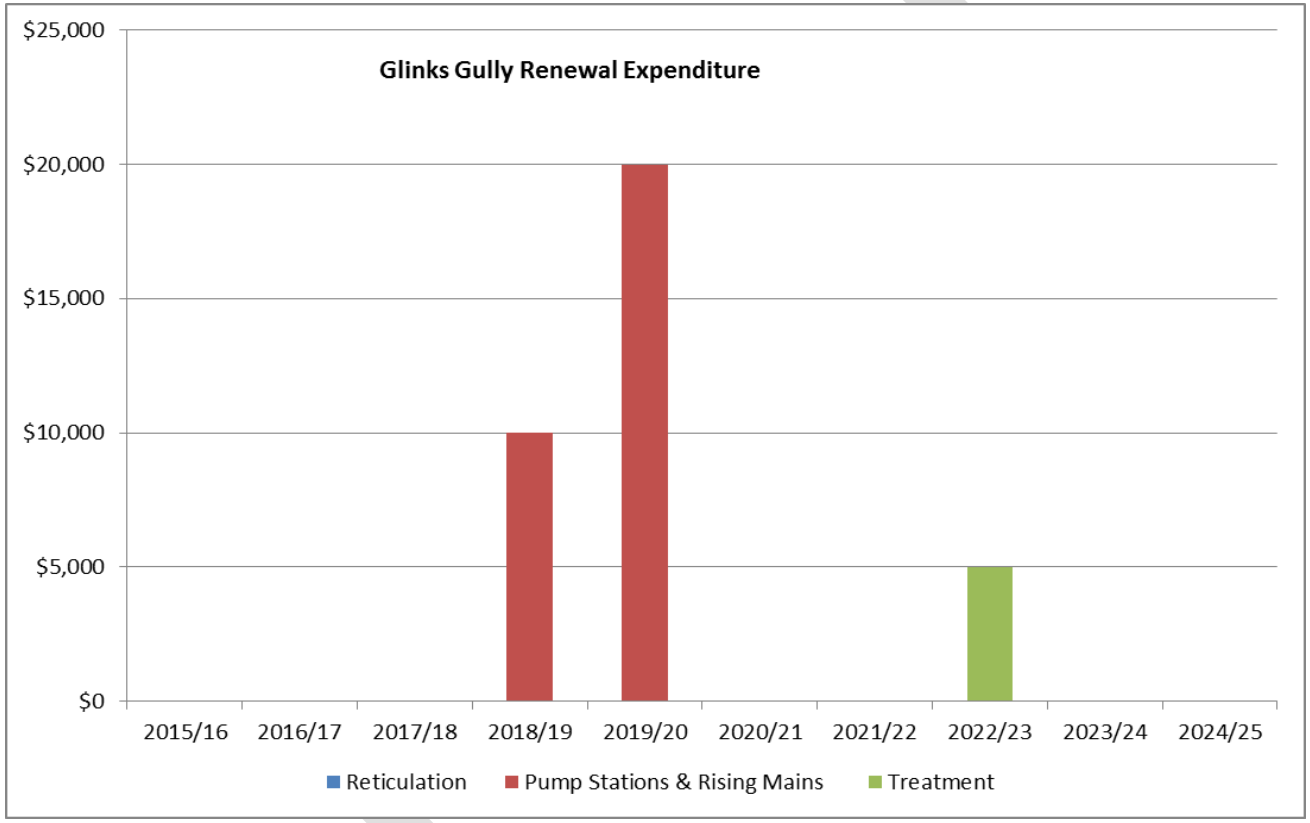
Note: Expenditure to be reviewed once condition assessment report received on plant.

3.3.4 Expenditure Forecast – Glinks Gully

For the ten year period of 2015/16 to 2024/25, the forecast for renewal expenditure for Glinks Gully assets is shown in Figure 3-6 below.

The Renewal expenditure consists of Pump station and Rising main works, treatment plant works as detailed below.

Figure 3-6: Glinks Gully Forecast Renewal Expenditure



The pumps were replaced in 2003. The next replacement is proposed for 2018/19 and 2019/20 which will include the electrical works, electrical switchboard and controls.

Cleaning out the pipe work, replacing any blocked sections, installing raised access points and topping up the media on the effluent field is planned for 2023.

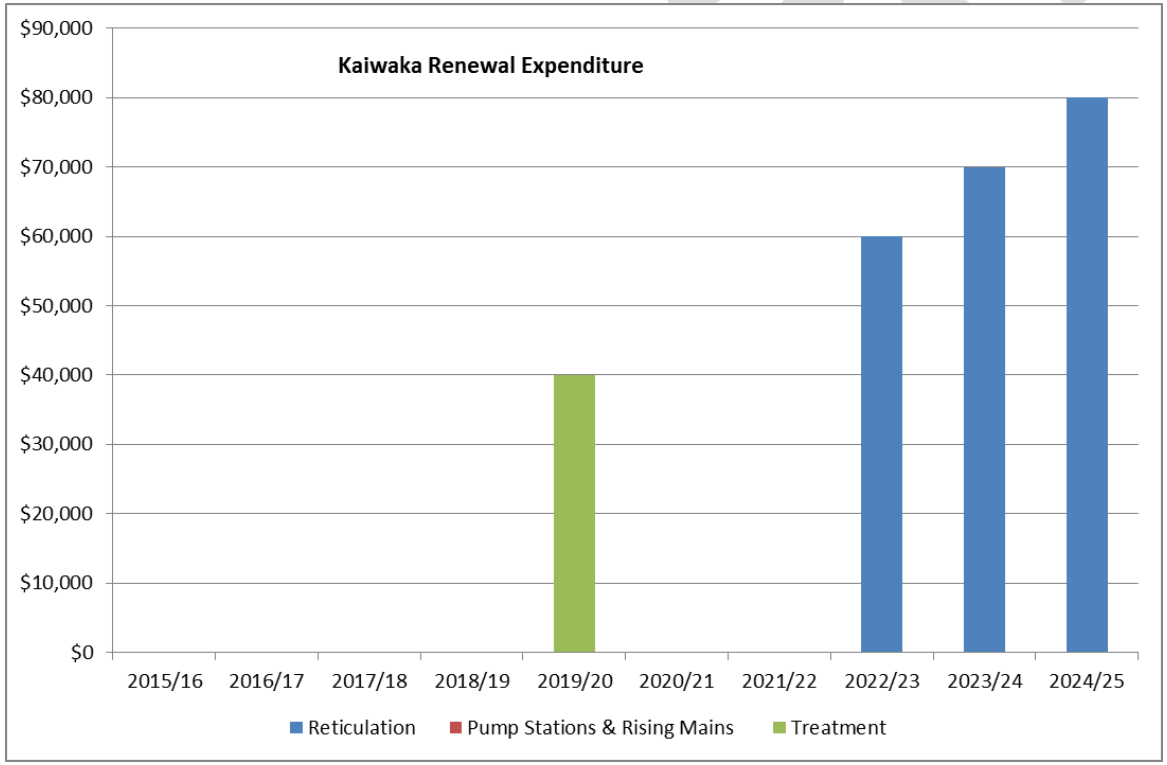
Table 3-10: Glinks Gully Renewals Expenditure Forecast

Asset	Planned Expenditure	Planned Date
Pumps and electrical	$10,000 $20,000	2018/19 2019/20
Treatment	$5,000	2022/23

3.3.5 Expenditure Forecast – Kaiwaka

For the ten year period of 2015/16 to 2024/25, the forecast for renewal expenditure for Kaiwaka assets is shown in Figure 3-7 below.

Figure 3-7: Kaiwaka Forecast Renewal Expenditure



Reticulation

To date there has been no significant renewal work undertaken on the reticulation network. Given it was installed in 1990 its condition is likely to be good with a life expectancy of 40 – 60 years.

A focus on critical assets should include trunk lines and rising mains. Some deterioration of rising mains particularly where they are not full and the immediate downstream gravity network can be expected at about 30 years. Accordingly planned reticulation works are scheduled at $60,000 in 2022/23, $70,000 in 2023/24 and $80,000 in 2024/25.

Pump Station Controls and electrical equipment were renewed in 2005 and pumps in 2013 and hence no specific allocations were made for these works.

Wastewater Treatment Plant

The renewal programme for Kaiwaka's treatment plant has been produced based on the strategy discussed in section 3.3.1.3. The pond aerator will require renewal in 2019/20 at an estimated cost of $40,000. Emergency pump station storage is planned to be addressed in 2023/24 and the rising main / gravity main section renewed in 2024/25.

The Kaiwaka project priorities are summarised in Table 3-11 below.

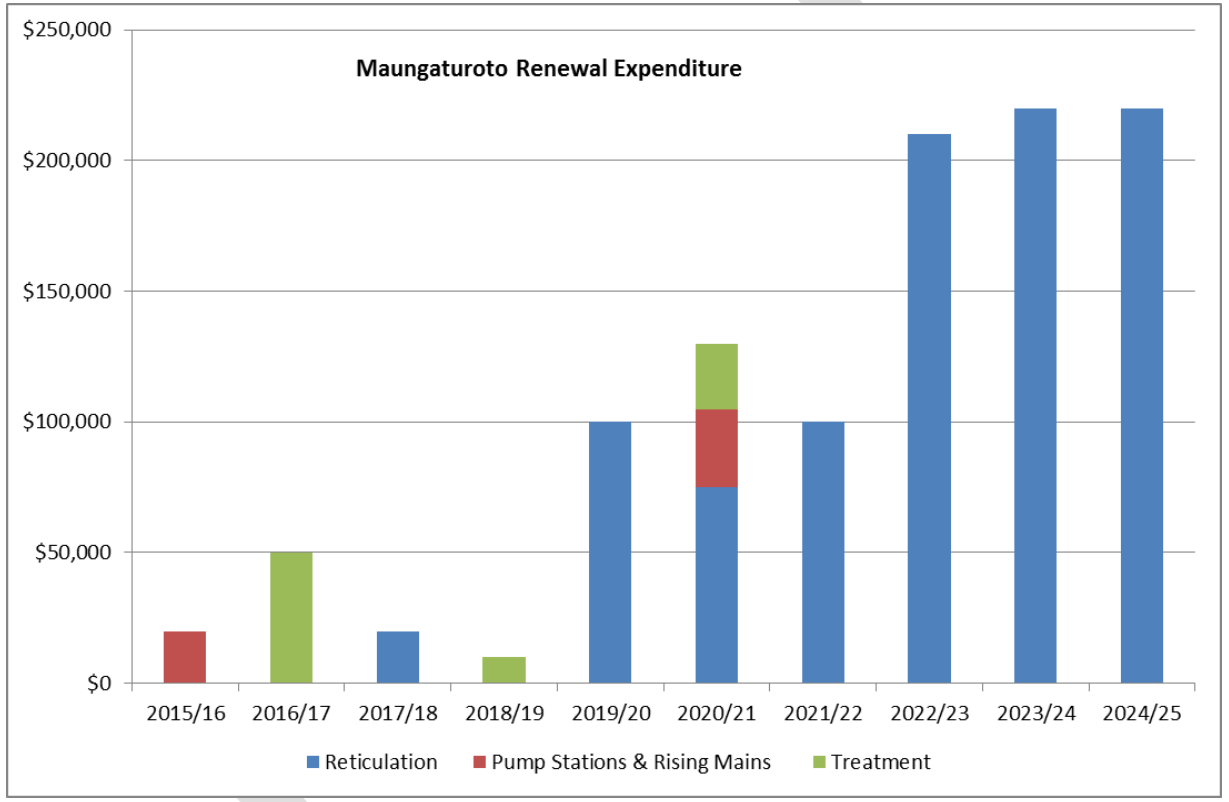
Table 3-11: Kaiwaka Renewals Expenditure Forecast

Asset	Planned Expenditure	Planned Date
Pond aerator	$40,000	2019/20
Rising main and gravity mains	$60,000	2022/23
	$70,000	2023/24
	$80,000	2024/25

3.3.6 Expenditure Forecast – Maungaturoto

For the ten year period of 2015/16 to 2024/25, the forecast for renewal expenditure for Maungaturoto assets is shown in Figure 3-8 below.

Figure 3-8: Maungaturoto Forecast Renewal Expenditure



Reticulation

To date there has been no significant renewal work undertaken on the reticulation network. Given it was installed in 1992 its condition is likely to be good with a life expectancy of 40 – 70 years.

A focus on critical assets should include trunk lines and rising mains. Some deterioration of rising mains particularly where they are not full and the immediate downstream gravity network can be expected at about 30 years.

Pumping Stations

Pumping station electrical and control equipment was replaced in early 2005. Mechanical equipment at Pump Station 2 was due for renewal in 2005 however its condition was determined to be good, and its renewal has been deferred.

Wastewater Treatment Plant

The renewal programme for Maungaturoto's treatment plant has been produced based on the strategy discussed in section 3.3.1.3. Planned renewals for the Maungaturoto treatment plant relate to the pond aerator and its associated electrics as the membrane plant was only built in 2010

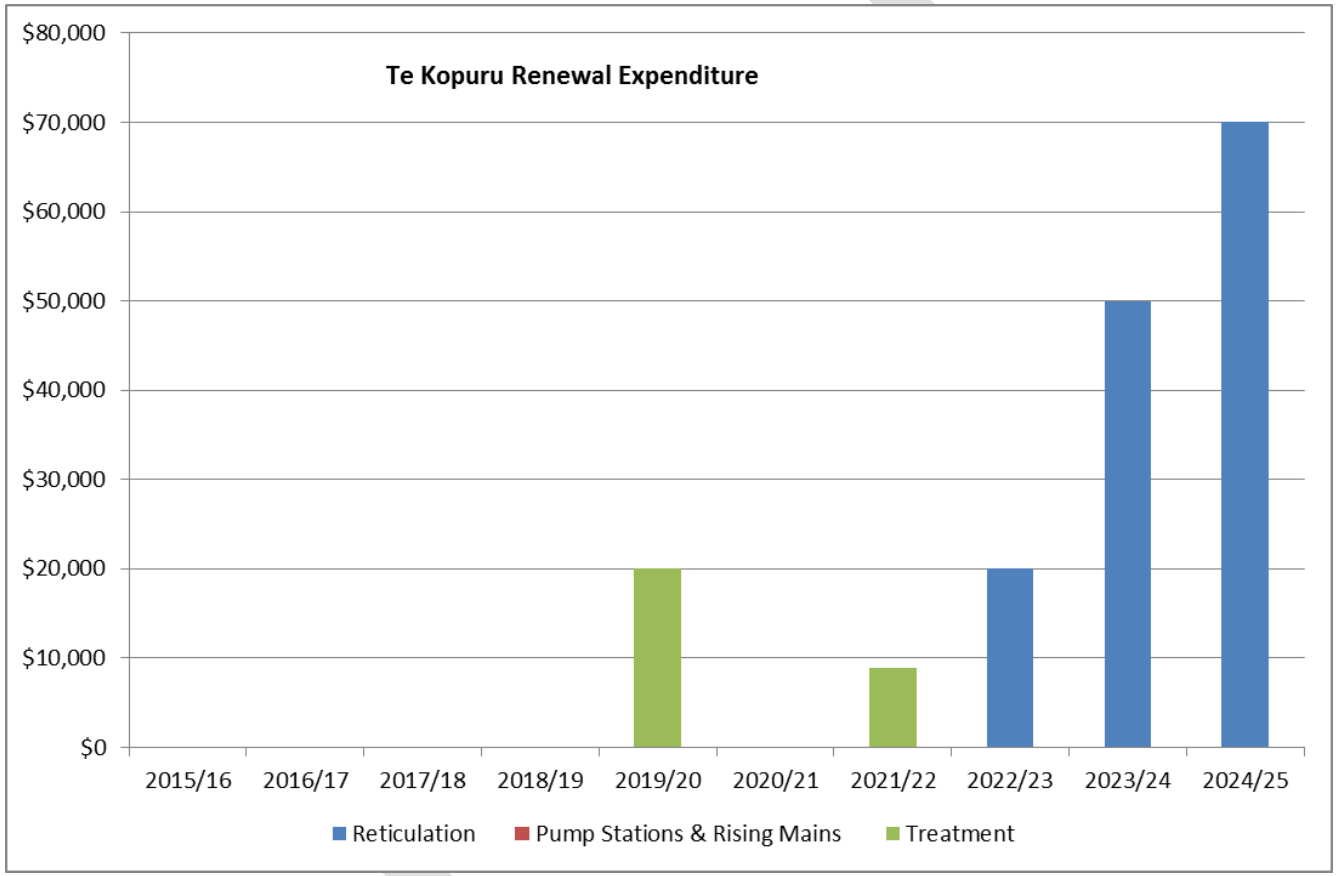
Table 3-12: Maungatoroto Renewals Expenditure Forecast

Asset	Planned Expenditure	Planned Date
Reticulation	$20,000 $100,000 $75,000 $100,000 $210,000 $220,000 $220,000	2017/18 2019/20 2020/21 2021/22 2022/23 2023/24 2024/25
Pump station pumps and mechanical	$20,000 $30,000	2015/16 2020/21
Treatment –Electrical Pond Aerator Wave band renewal	$50,000 $10,000 $25,000	2016/17 2018/19 2020/21

3.3.7 Expenditure Forecast – Te Kopuru

For the ten year period of 2015/16 to 2024/25, the forecast for renewal expenditure for Te Kopuru assets is shown in Figure 3.9 below.

Figure 3-9: Te Kopuru Forecast Renewal Expenditure



Given the network was installed in 1981 its condition is likely to be good with a life expectancy of 60 – 100 years. Renewal may need to be considered commencing in 2031.

Table 3-13: Te Kopuru Renewals Expenditure Forecast

Asset	Planned Expenditure	Planned Date
Treatment Pond aerator Wetland planting	 $20,000 $8,840	 2019/20 2021/22
Reticulation	$20,000 $50,000 $70,000	2022/23 2023/24 2024/25

3.3.8 Expenditure Forecast – Mangawhai

As Mangawhai Scheme – ie treatment plant and the reticulation – is fairly new, so no significant renewal expenditure is predicted at the beginning of the next ten year period. However we have to take into consideration the renewal towards the end of the first ten years; as there will be a significant accumulated depreciation ($672,000 per year) by then. Hence an amount of $690,000 in 2022/23, $690,000 in 2023/24 and $925,000 in 2024/25 has been allowed for reticulation renewal works as shown in Figure 3-10 below.

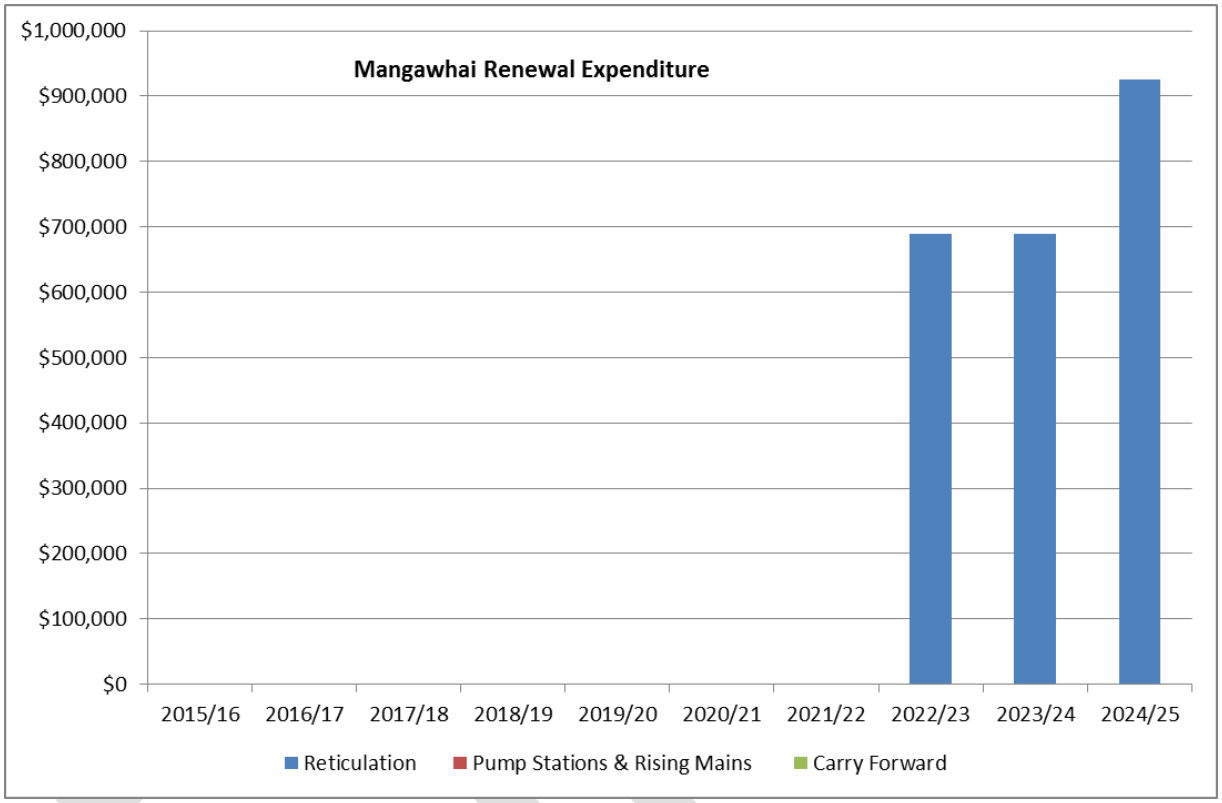


Figure 3-10: Mangawhai Forecast Renewal Expenditure

Asset	Planned Expenditure	Planned Date
Reticulation	$690,000	2022/23
	$690,000	2023/24
	$925,000	2024/25

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 Levels of Service 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).

When change within a community dictates changes to the infrastructure that services that community, Council will initiate preliminary studies to determine demand for a service or a change to the level of service provided to a community. To date the development of wastewater assets has largely been undertaken on a community by community basis.

The reported growth figures (section 1.8.1) indicate that growth within reticulated communities in the Kaipara District will be low, therefore new asset funding over the next 10 years is focussed on improving Levels of Service.

Growth

There is no significant growth related projects in the district apart from Mangawhai. It is anticipated that in the next ten years, reticulation network of Mangawahi will grow significantly to cater for the Growth.

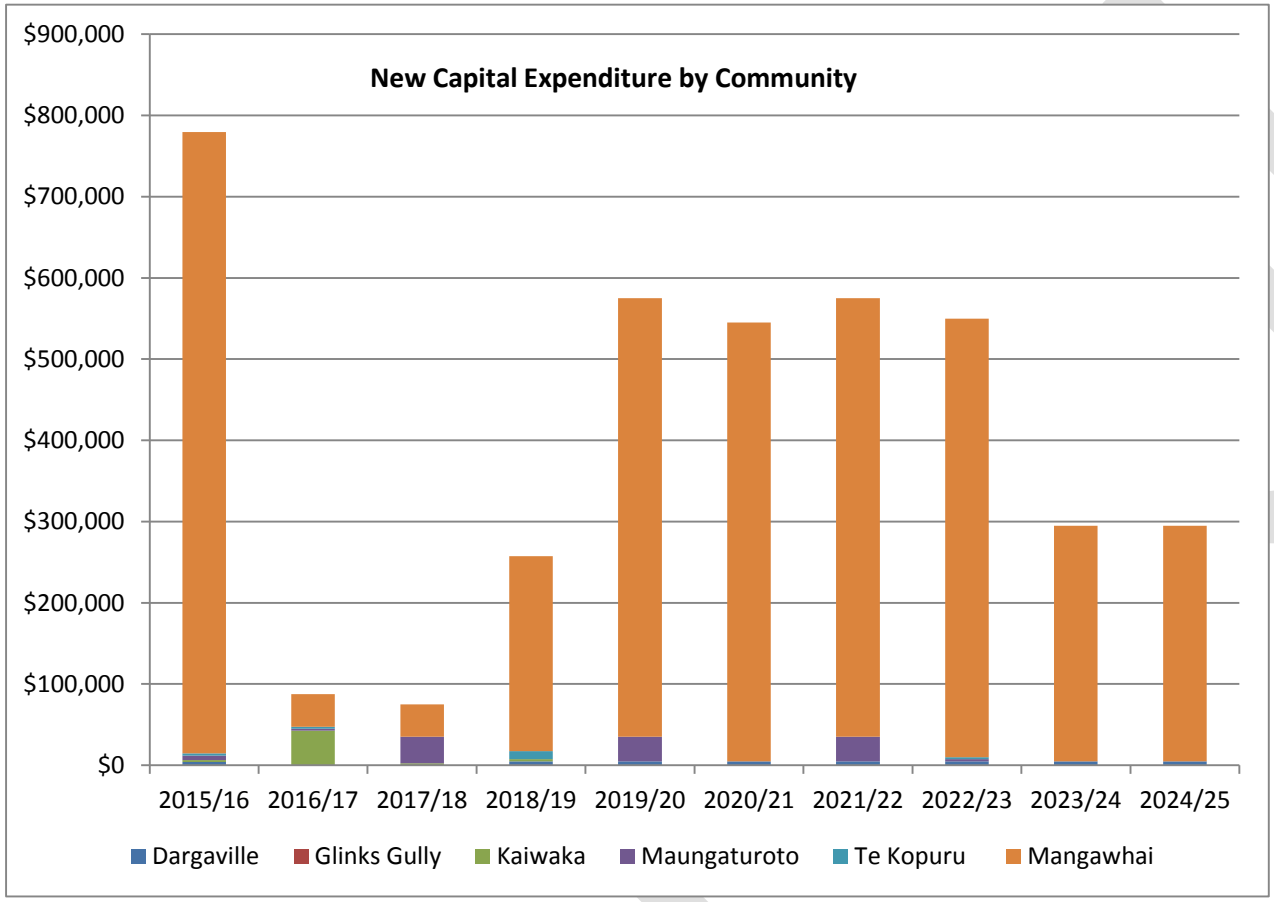
- An investigation to identify the extensions necessary to the Wastewater system to enable it to service most of the urban zoned area has been undertaken.
- These extensions have been costed and identified as 20 projects.
- Their combined value is $ 3.7m,howover these 20 projects were excluded from this 10 year plan.
- The projects have been prioritised and it is planned to model the expenditure as part of the annual plan process followed by consultation with the community prior to adopting an investment strategy to maximise connections to the Managawhai Community Wastewater scheme.
- An allowance for Council to contribute towards additional capacity for growth has been investigated. A provision of $40, 000 per year has been allocated

LOS

Level of service related projects are to bring treatment plants to comply with discharge consents in Glinks Gully, Te Kopuru and Kaiwaka and to provide an appropriate effluent discharge option in Mangawahi.

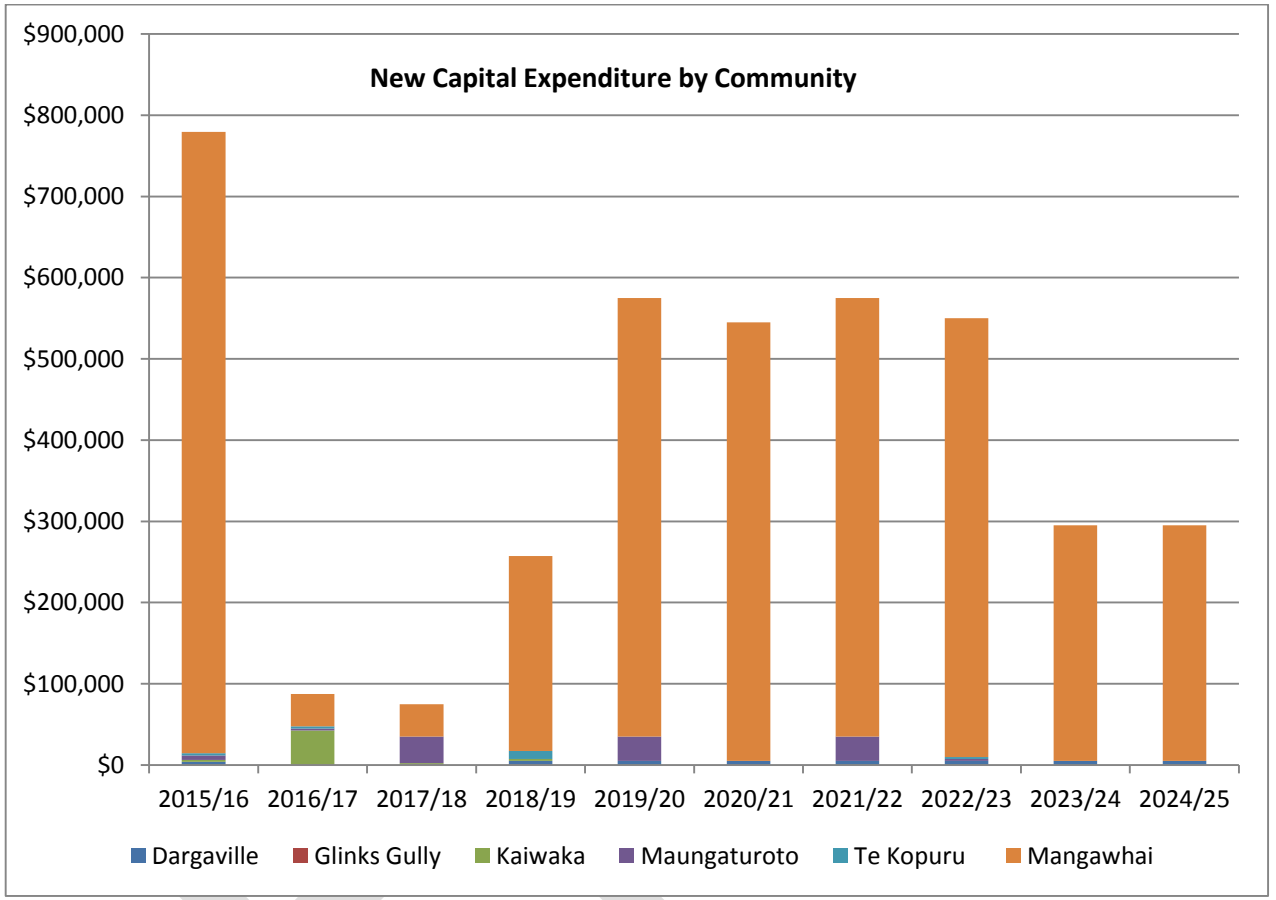
3.4.2 Expenditure Forecast – District-wide

The 10 year forecast for new capital expenditure for wastewater assets in the Kaipara District is shown in



. The forecast expenditure information is based on the projected new capital expenditure (ie growth and LOS) is discussed in the following sections of this AMP.

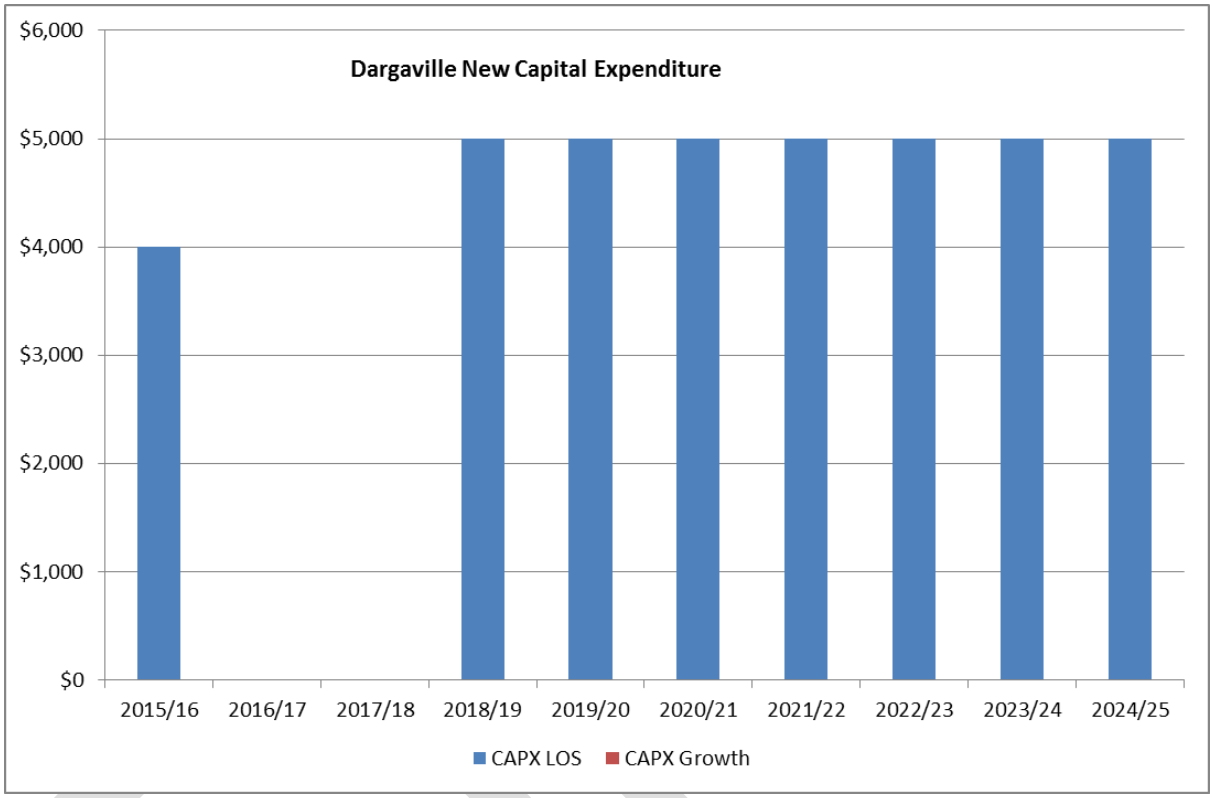
Figure 3-11: Total Forecast New Asset Expenditure



3.4.3 Expenditure Forecast – Dargaville

The ten year forecast for new capital expenditure for Dargaville is shown in Figure 3-12.

Figure 3-12: Dargaville Forecast New Capital Expenditure



For the ten years of 2015/16 to 20124/25, the forecast for Capital Works for Los and Growth for Dargaville assets is shown in Figure 3-12 . This expenditure consists of installation of safety grills on pump stations at an expenditure of $ 4000 in 2015/16.

In addition an annual allowance of $5000 has been included for environmental compliance monitoring from 2018/19 to 2024/25.

The fluctuation in the new capital spending prior to the 2018/19 financial year is created in order to comply with the overall council financial model.

Table 3.14: Dargaville Capital Works LoS and Growth Expenditure Forecast

Asset	Planned Expenditure	Planned Date
Safety grills on pump stations	$4000	2015/16

Asset	Planned Expenditure	Planned Date
Environmental Compliance	$5000	2018/19 – 2024/25

3.4.4 Expenditure Forecast – Glinks Gully

No new capital expenditure is predicted at Glinks Gully over the next 10 years due to the young age of the assets. There are currently no plans to further develop the Glinks Gully reticulation network. If Council decide to connect the balance of properties to the community scheme then additional reticulation may be required.

Under the LOS expenditure in 2015/16, an amount of $20,000 has been allocated towards allowance for Septic tank effluent filters to be installed in accordance with the discharge consent requirements. This was, however, taken off as the Council executive team decided to remain with existing LOS for Glinks Gully until investigating alternative funding and/or provision. No planned expenditure for Growth has been forecast for this duration.

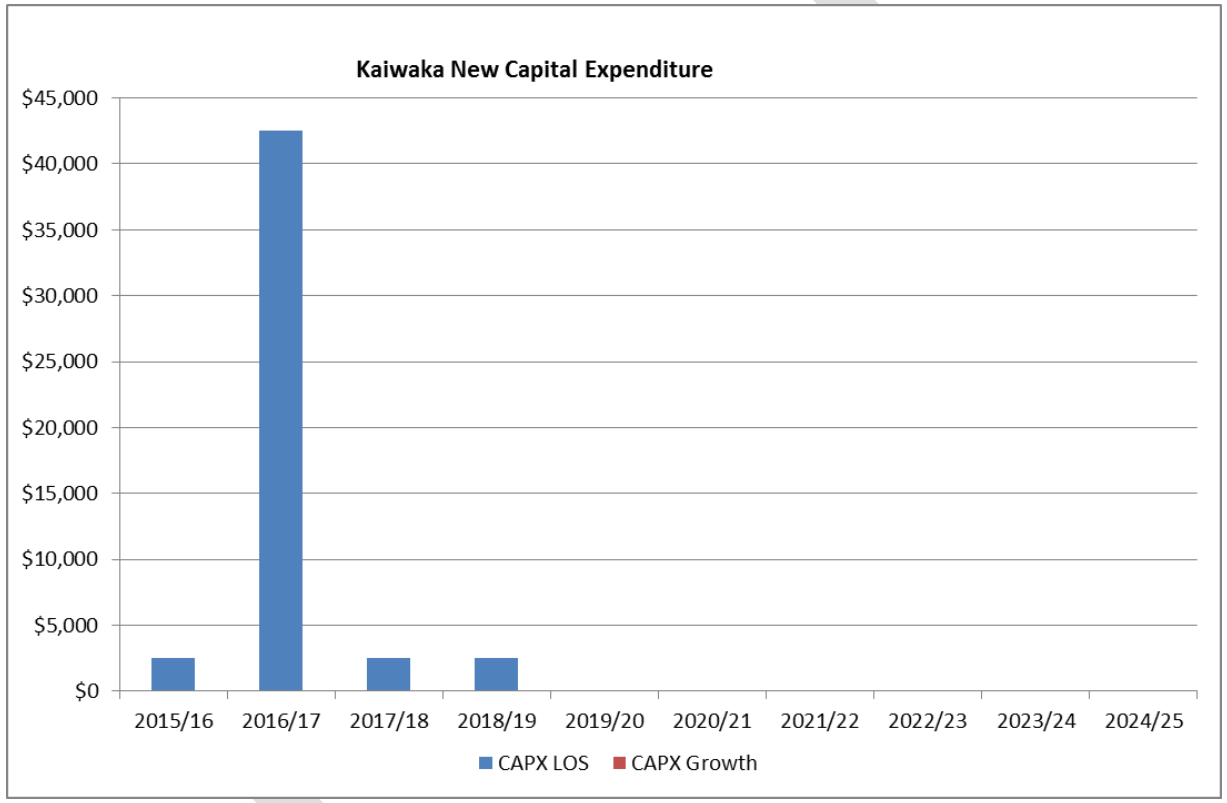
Table 3-14: Glinks Gully Capital Growth and LOS Expenditure Forecast

Asset	Planned Expenditure	Planned Date
Allowance for septic tank effluent filters to be installed in accordance with the discharge consent requirements.	$ 20,000	Deferred – Refer to Note above

3.4.5 Expenditure Forecast – Kaiwaka

The 10 year forecast for new capital expenditure for Kaiwaka is shown in Figure 3-13 below.

Figure 3-13: Kaiwaka Forecast New Capital Expenditure



At present, only growth occurring within the reticulated area boundary is able to connect to the wastewater network. Council recognises that this boundary needs to be reviewed.

Should the boundary be extended, new reticulation, pump station and treatment plant upgrades can be funded by growth althought this has not been budgeted for.

Under the LOS expenditure, an amount of $40,000 has been allocated for the installation of a pond curtain in 2016/17, to improve the effluent quality. This measure is proposed following a report prepared in 2013. A further $2,500 annually has been allocated for the period 2015/16 – 2018/19 for environmental compliance monitoring.

Asset	Planned Expenditure	Planned Date
Pond Curtain	$ 40,000	2016/17
Environmental Compliance	$2,500 Annually	from 2015/16 to 2018/19

3.4.6 Expenditure Forecast – Maungaturoto

The 10 year forecast for new capital expenditure for Maungaturoto is shown in Figure 3-14 below.

An allowance of $30,000 per annum has been made in 2017/18, 2019/20 and 2021/22 for provision of additional storage at the pumps station to manage unplanned discharges. This is to comply with the requirement of increased emergency storage at pump stations specified in the Regional Water and Soil Plan (RWSP).

In addition to the expenditure above, there is a risk that as the oxidation pond will require additional pre-treatment prior to membrane filtration to assist its performance. It is proposed that Bioremediation be investigated to solve the algae issue as this has been successful in other projects. No Allowance has been provided for this in this plan.

An allowance of $2,500 annually has been allowed for environmental compliance monitoring from 2015/16 to 2017/18 and 2022/23.

Figure 3-14: Maungaturoto Forecast New Capital Expenditure

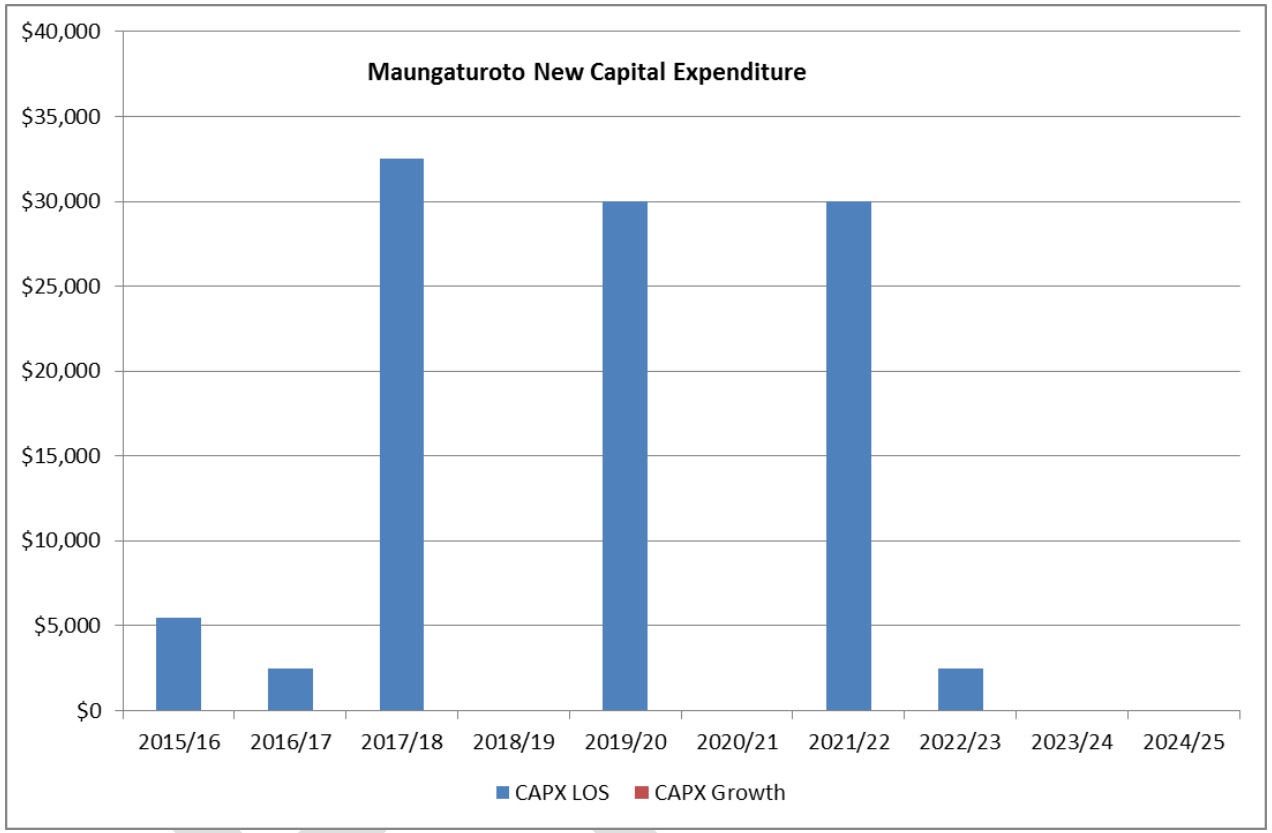


Table 3-15: Maungaturoto LOS and Growth Capital Expenditure Forecast

Asset	Planned Expenditure	Planned Date
Pumps Station emergency storage to meet RWSP.	$30,000	2017/18, 2019/20, 2021/22
Safety grills pump stations	$3,000	2015/16
Environmental Compliance	$2,500 annually	2015/16 -2017/18 and 2022/23

3.4.7 Expenditure Forecast – Te Kopuru

No new capital expenditure is predicted at Te Kopuru over the next 10 years.

Under the LOS expenditure, an amount of an allowance of $2500 annually has been made for environmental compliance monitoring from 2015/16 to 2016/17 and 2022/23. Towards a pond curtain to improve bacteria removal an amount of $10,000 is allocated in 2018/19. This is shown in Figure 3-15 below.

Figure 3-15: Te Kopuru Forecast New Capital Expenditure

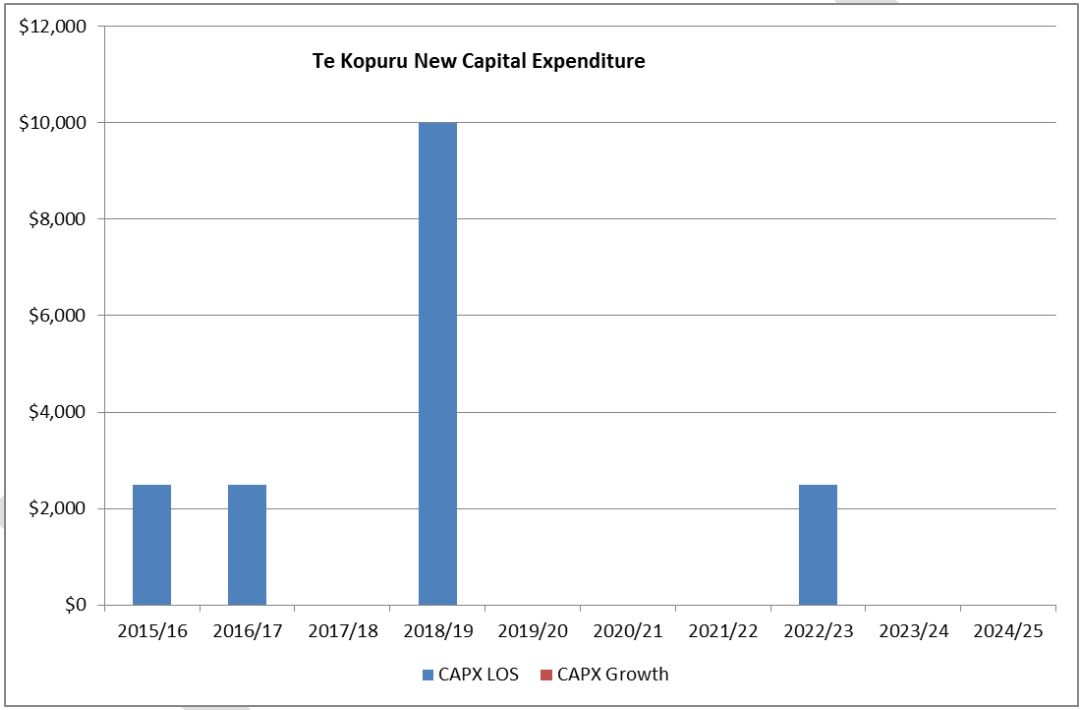


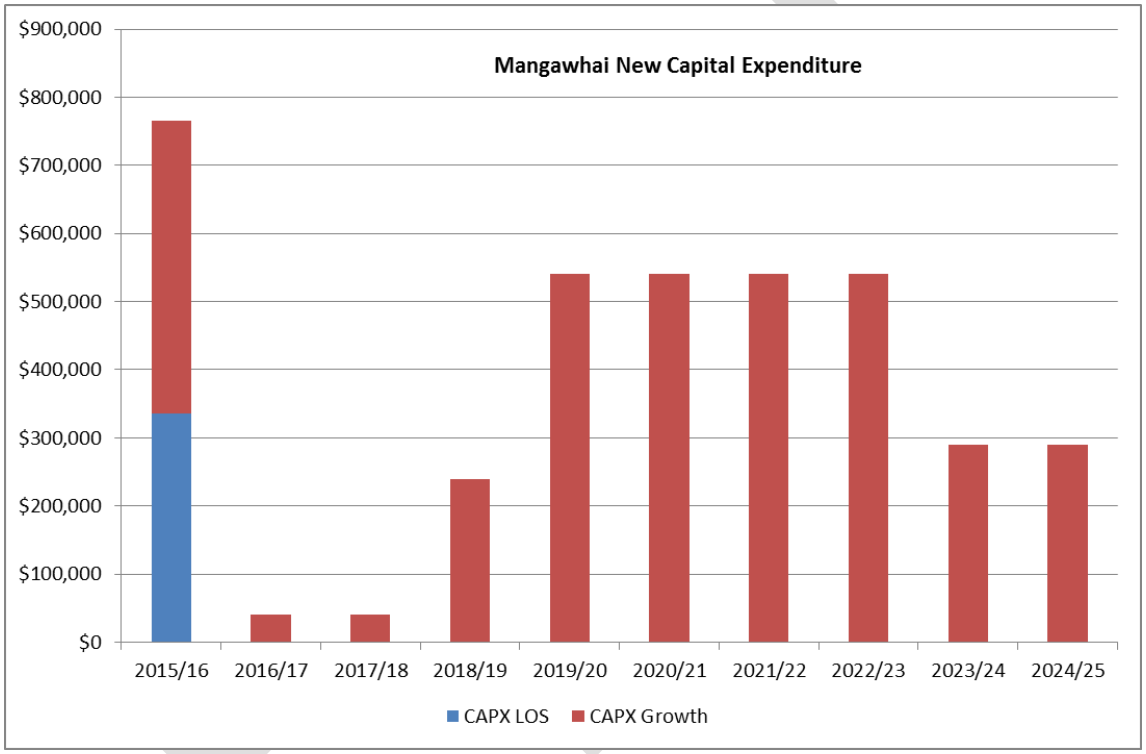
Table 3-16: Te Kopuru New Capital Expenditure Forecast

Asset	Planned Expenditure	Planned Date
Pond curtain to improve bacteria removal.	$10,000	2018/19
Environmental compliance	$2500	2015/16, 2016/17 and 2022/23

3.4.8 Expenditure Forecast – Mangawhai

The 10 year forecast for new capital expenditure for Mangawhai is shown in Figure 3-16 below.

Figure 3-16: Mangawhai Forecast New Capital Expenditure



It is anticipated that in the next ten years, reticulation network of Mangawahi will grow significantly to cater for the Growth.

- An investigation to identify the extensions necessary to the wastewater system to enable it to service most of the urban zoned area has been undertaken.
- These extensions have been costed and identified as 20 projects.
- Their combined value is $ 3.7m. Howover these 20 projects were excluded from this 10 year plan.

- The projects have been prioritised and it is planned to model the expenditure as part of the annual plan process followed by consultation with the community prior to adopting an investment strategy to maximise connections to the Managawhai Community Wastewater scheme.
- An allowance for Council to contribute towards additional capacity for growth has been investigated. A provision of $40,000 per year has been allocated.
- According to consultant's report, the lowest cost option for "Effluent Discharge Options" was $ 2.8 M, however this amount has not been included in this plan. As in the in the previous LTP, $445,000 was included in 2015/16

3.5 Financial Summary

A summary of the planned expenditure for wastewater assets over the next 10 years is shown in Figure 3-17 and Figure 3-18.

Figure 3-17: Total Forecast Expenditure by Community

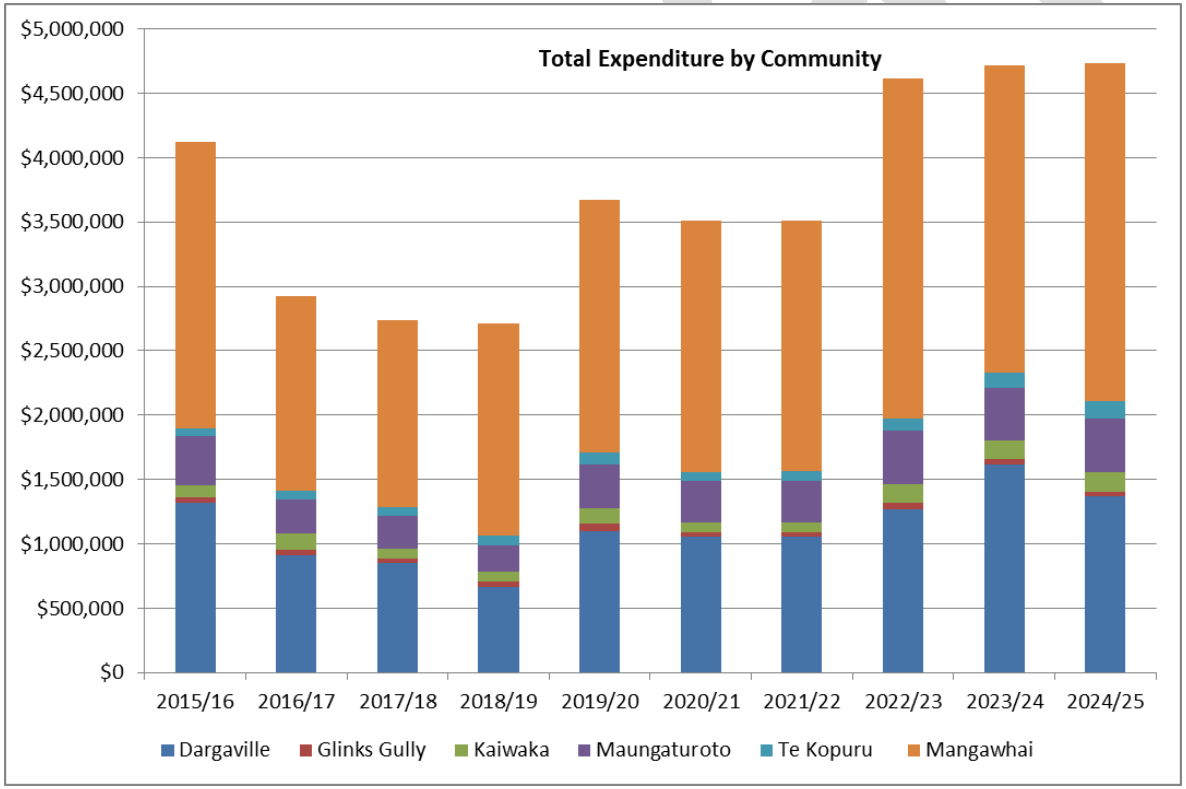
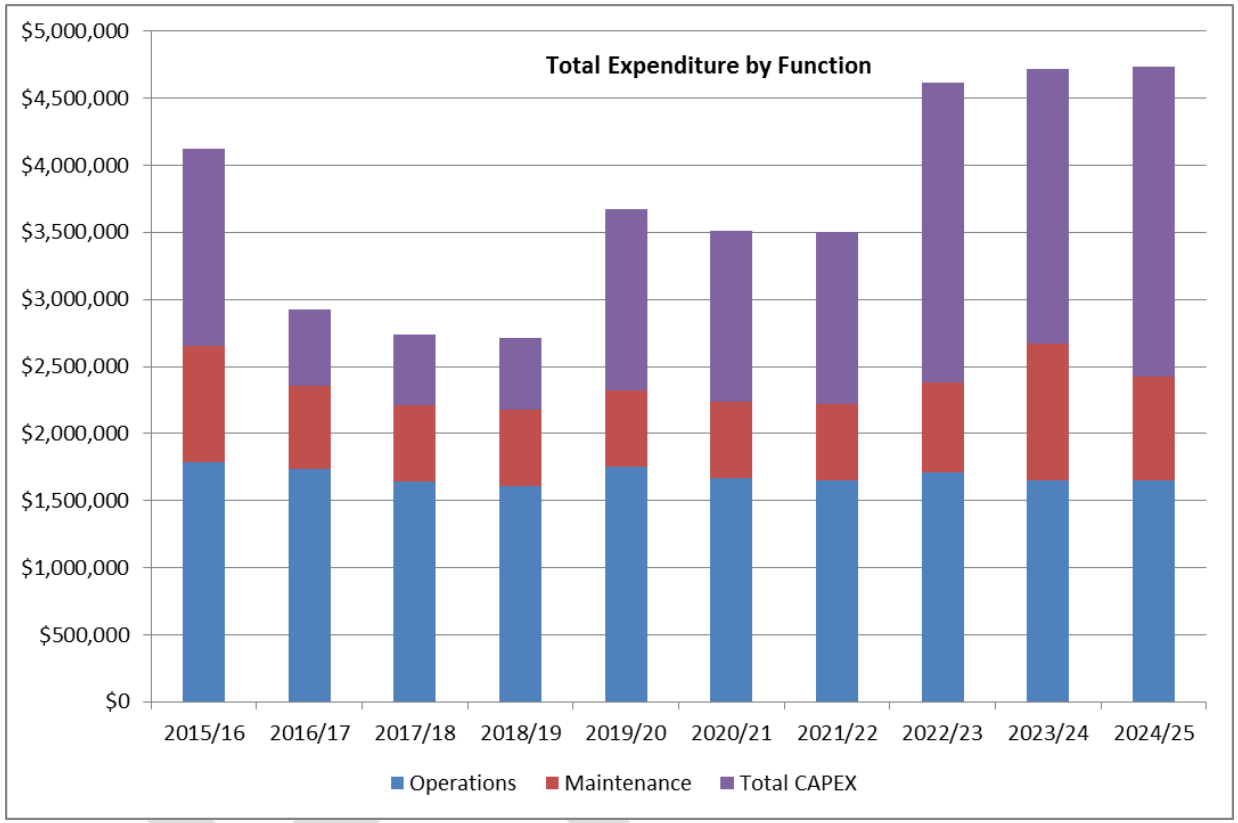


Figure 3-18: Total Forecast Expenditure for Kaipara District



3.6 Asset Decommissioning and/or Disposal Strategy and Financial Forecast

The Council does not have formal strategy documents relating to asset disposals. When any such assets reach a state where disposal needs to be considered, the Council will treat each case individually.

There are no current, or planned areas of operation that the Council wishes to divest itself of. Asset disposal therefore 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 level of service
- 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 best available return from the disposal or sale of assets within an infrastructural activity and any net income is credited to that activity.

As AC mains are replaced, they will often become an abandoned service, which then become the property of the roading authority and can be used as ducting for telecoms and other services.

Council propose to review the layout and hydraulic characteristics of the Dargaville wastewater network in order to identify opportunities to reduce the number of pump stations within the network. If any such opportunities do arise, the disposal of the pump stations will be considered at that time.

3.7 Management of Other Overheads Strategy and Financial Forecast

Allocation of Councils' costs in administering and managing the wastewater service is based on a percentage of the activity cost, employee costs and depreciation costs. The 2012/22 LTP financial statement summarises a ten year forecast of the internal charges and overheads applied for wastewater assets, which are presented in Table 3-16 below.

Table 3-16: 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
937	871	838	830	865	849	850	891	962	902

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. 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, but 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 3-19 through Figure 3-23 below show a summary of the service potential for each wastewater scheme in the Kaipara District. Cumulative depreciation since the date of the last asset evaluation (effective 1 July 2010) is plotted against cumulative planned renewal expenditure to determine the service potential of the wastewater scheme.

Actual renewal expenditure during 2010/11 was not available during preparation of this AMP, therefore no renewal expenditure is included for this year. The renewal expenditure may therefore be slightly under-represented. The 2011/12 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 2012/22 Long Term Plan, Council will continue to 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 four Council will progressively move towards a position whereby it is fully rate-funding depreciation by the end of the ten 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 3-19: Dargaville Forecast Service Potential

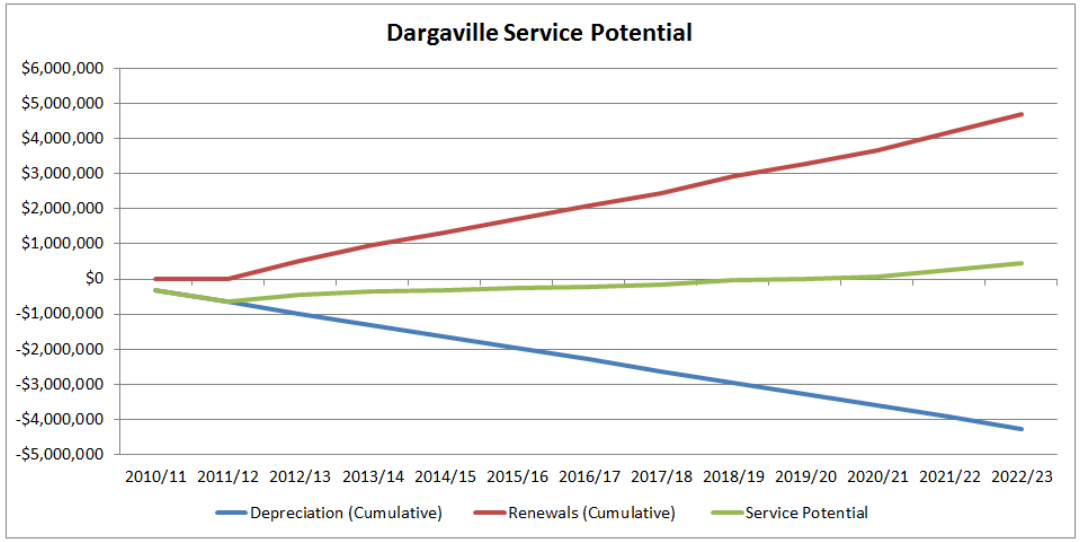


Figure 3-20: Glinks Gully Forecast Service Potential

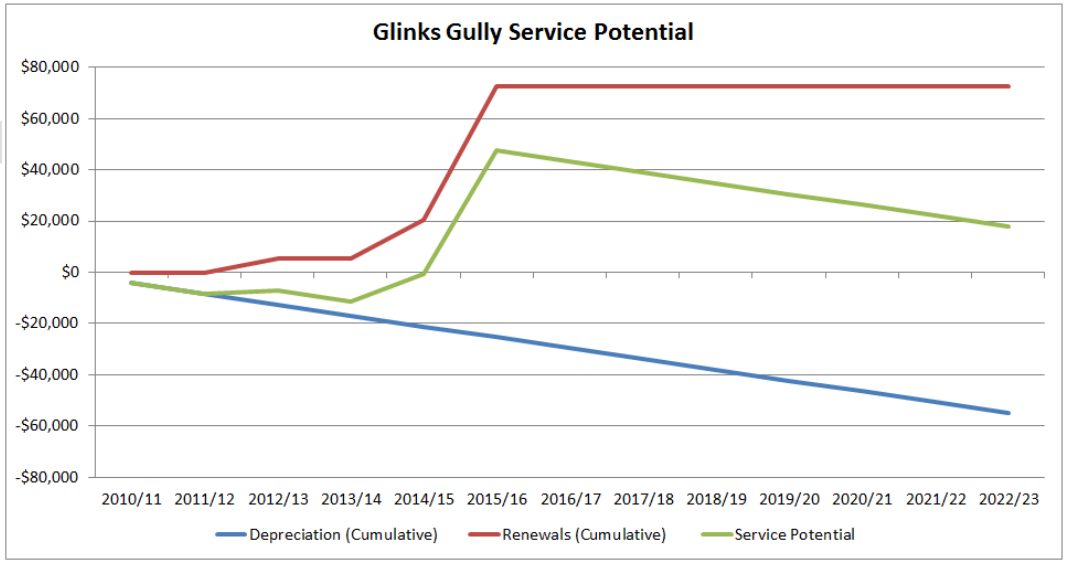


Figure 3-21: Kaiwaka Forecast Service Potential

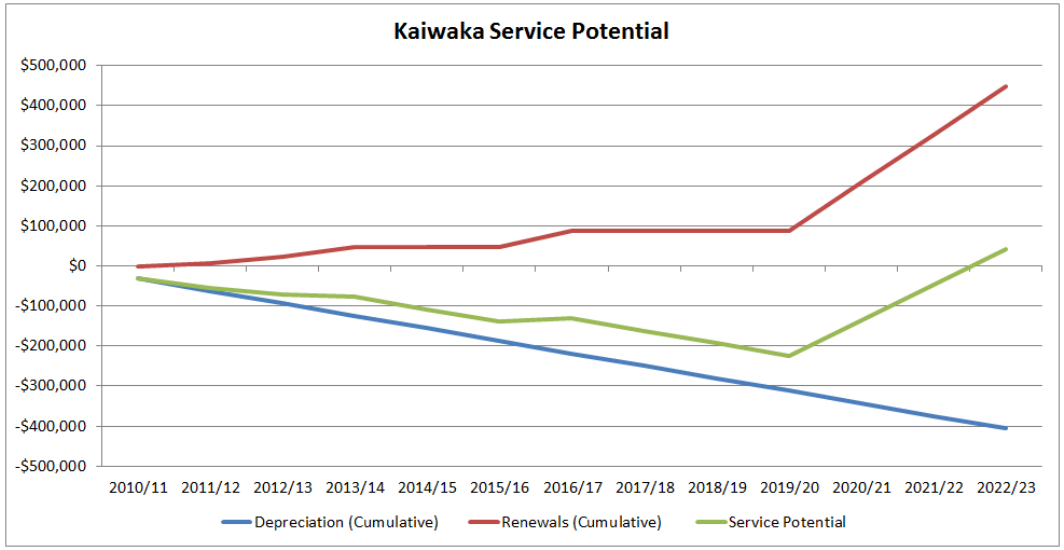


Figure 3-22: Maungaturoto Forecast Service Potential

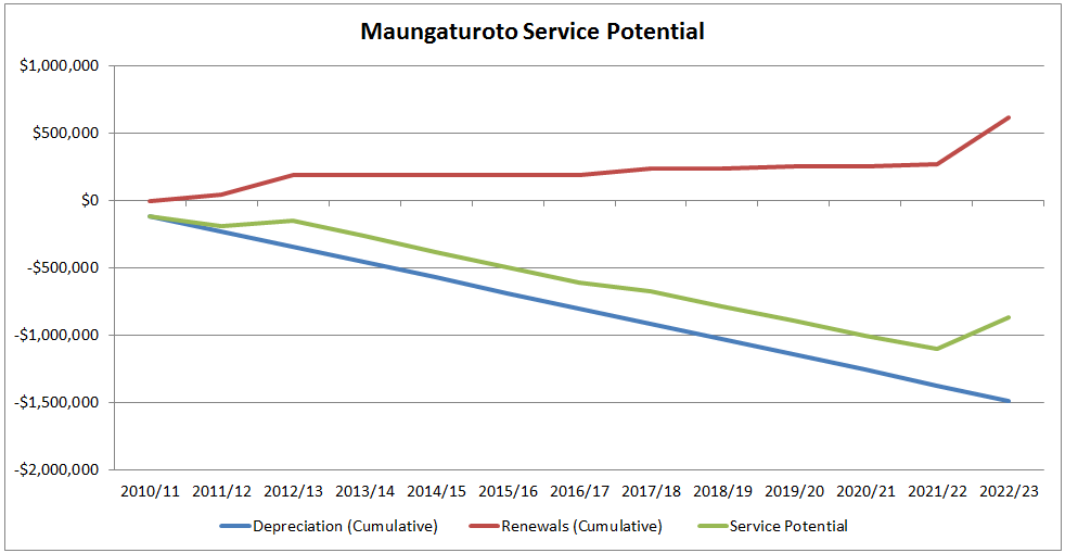
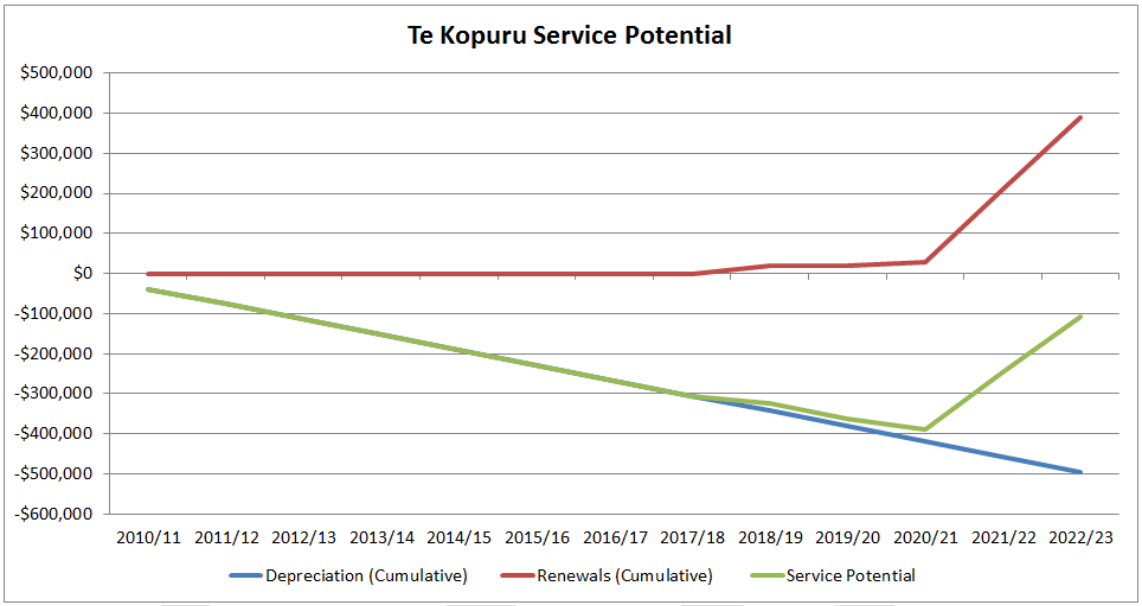


Figure 3-23: Te Kopuru Forecast Service Potential



3.9 Public Debt

The 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 Corporate Services Manager.

The Council has significant infrastructural assets with long economic lives yielding long term benefits. The 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 the Council's general ledger.

Generally, the 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.

The 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 the 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, the 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 Long Term Plan. Figure 3-24 is from the 2015/25 LTP and shows Council's projected debt level for the next 10 years.

Figure 3-24: Projected Debt Levels Compared to Council's Maximum and Preferred Debt Limits

3.10 Funding Sources

Sources of funding for planned expenditure are documented in the LTP, as decisions need to be firstly made on the role of development contributions under the Local Government Act 2002.

Current funding sources available for the wastewater assets include:

- Targeted rates
- Loans
- Reserve funds
- Development contributions

Currently, wastewater charges, rates and differentials between commercial, industrial and residential users are set as part of the overall corporate funding strategy.

The 2015/25 LTP forecasts the wastewater service to comprise 21% of Council's operating expenses and 9% of capital expenditure over the next 10 years. The proposed sources of wastewater operating income and capital funding for the next 10 years is summarised in Table 3-14 and Table 3-15 below.

Table 3-17: 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
General rates, uniform annual general charges, rate penalties	2,729	2,538	2,586	2,978	3,001	2,474	3,219	3,064	3,098	3,387
Targeted rates for wastewater	4,803	5,668	5,775	5,970	6,638	6,891	7,284	8,007	8,520	8,902
Fees and Charges	9	10	10	10	10	11	11	12	12	12
Total	**7,541**	**8,216**	**8,371**	**8,958**	**9,649**	**9,376**	**10,514**	**11,083**	**11,630**	**12,301**

Table 3-18: 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
Development and financial contributions	350	350	350	391	452	493	535	576	637	699
Increase (decrease) in debt	573	-515	-629	-1,337	-799	-367	-1,159	-1,455	-1,567	-2,180
Total	**923**	**-165**	**-279**	**-946**	**-347**	**126**	**-624**	**-879**	**-930**	**-1,481**

3.11 Potential Additional Sources of Revenue

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

3.12 Financial Challenges

The 2015/25 LTP summarises Council's financial strategy for the next 10 years, and 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.

In the past, Council has tended to keep rates low, when compared with similar local authorities, and used debt to fund a number of services. The 2012/22 LTP acknowledges that Council is aiming to build a more sustainable financial management model to change the way in which they use debt and also to ensure they repay the debt that has already been borrowed. As part of this new approach, Council is planning to maintain the existing Levels of Service for the wastewater service for the next 10 years. The challenge for Council will be;

- balancing the proposed operating budget and moving towards a more sustainable level of debt
- maintaining reasonable Levels of Service
- providing for the renewal of assets
- keeping rates affordable for ratepayers.

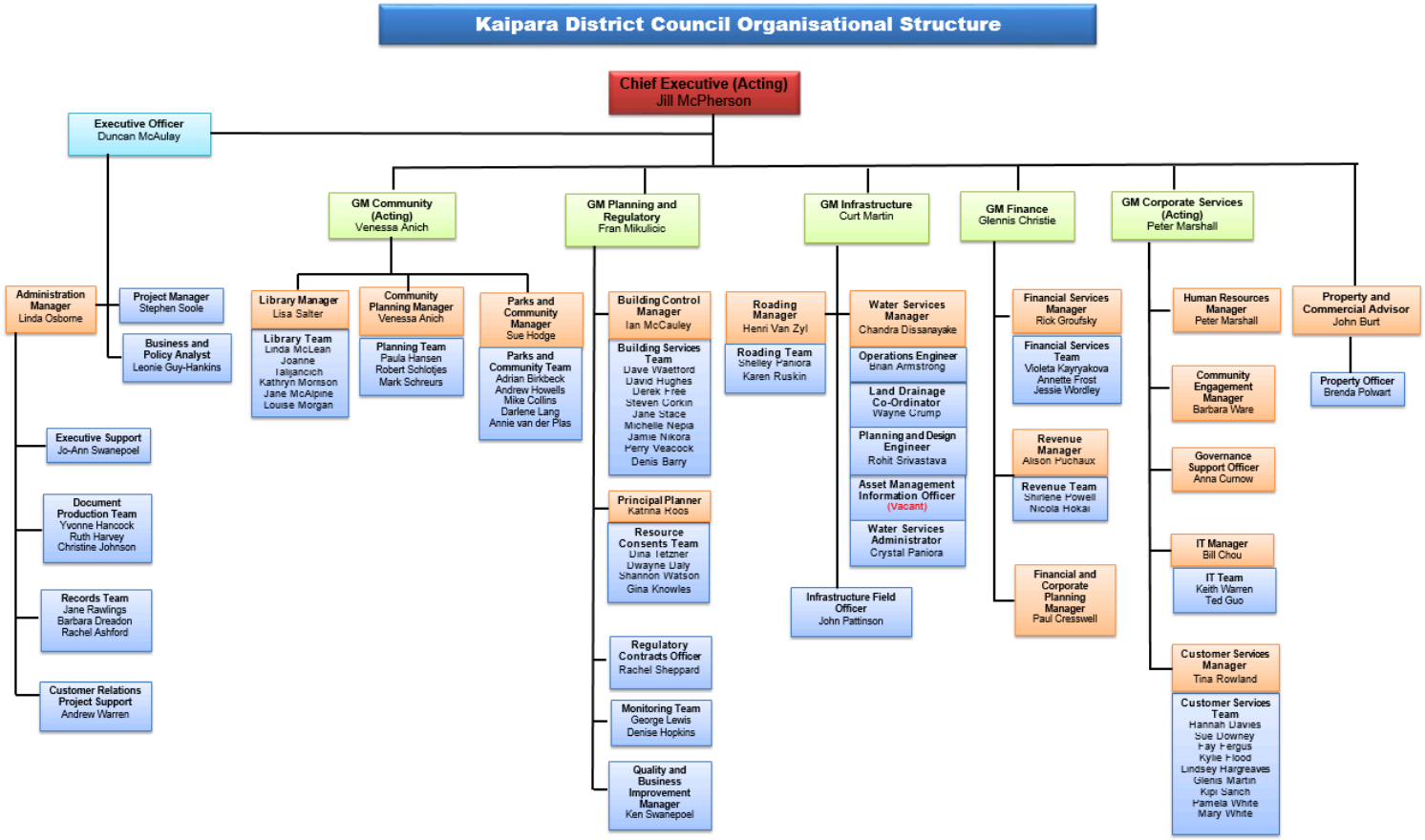
While there is risk that assets may fail before they are renewed, Council is comfortable that this approach is manageable and overall the combination of measures present a good balance among the different factors they need to consider.

4 Service Management

4.1 Organisation

Figure 4-1 illustrates Kaipara District Council's Organisational Structure.

Figure 4-1: Kaipara District Council Organisational Structure



4.2 Asset Management Systems and Processes

4.2.1 Asset management systems

Access to effective information systems is essential for asset managers 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.
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.
NCS (Napier Computer System)	Accounting	Council accounting and financial systems are based on Napier Computer Systems (NCS) software and GAAP Guidelines.
KITE (Kaipara Information Technology Environment)	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 Exponare, 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.

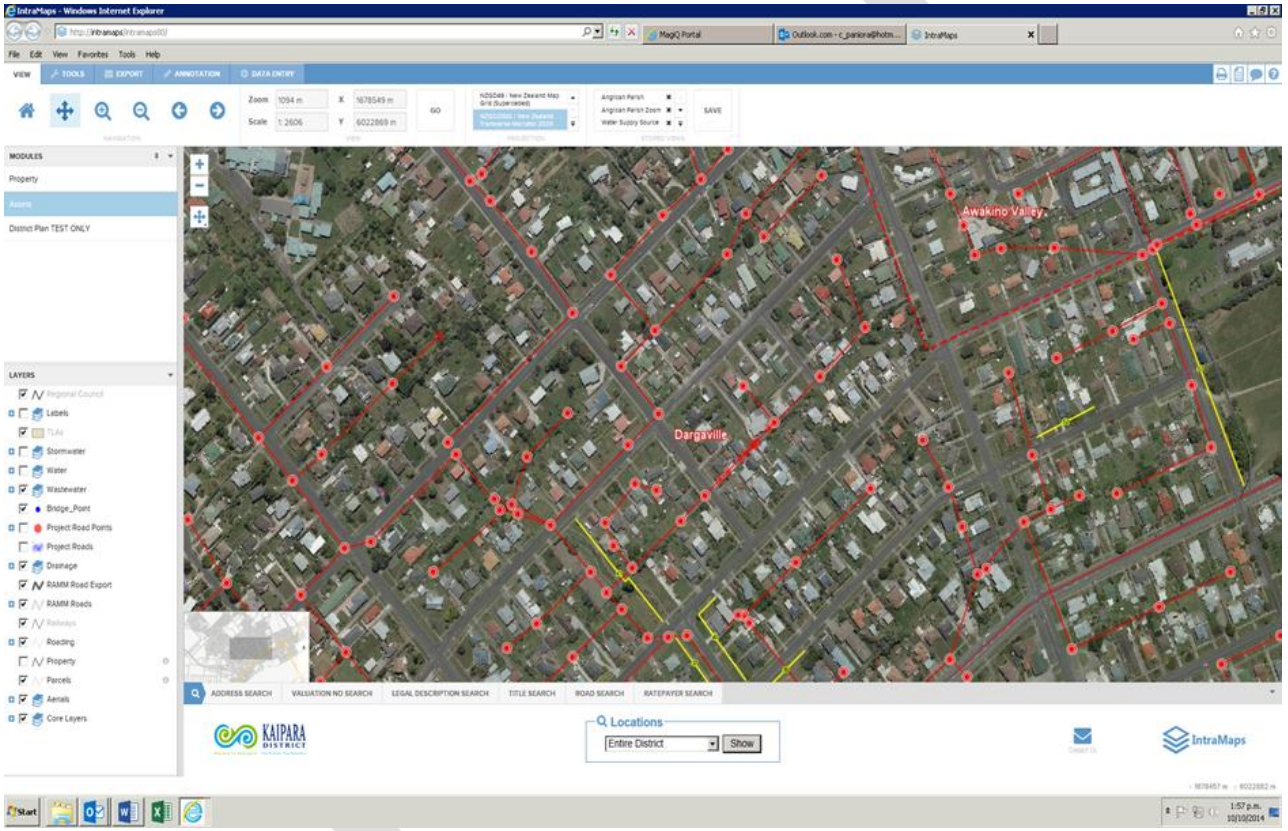
4.2.2 IntraMaps

The IntraMaps GIS system is the core system used to store and display the spatial data related to Councils 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 screen shot of the IntraMaps system is shown in Figure 4-2 below:

Figure 4-2: IntraMaps Screenshot



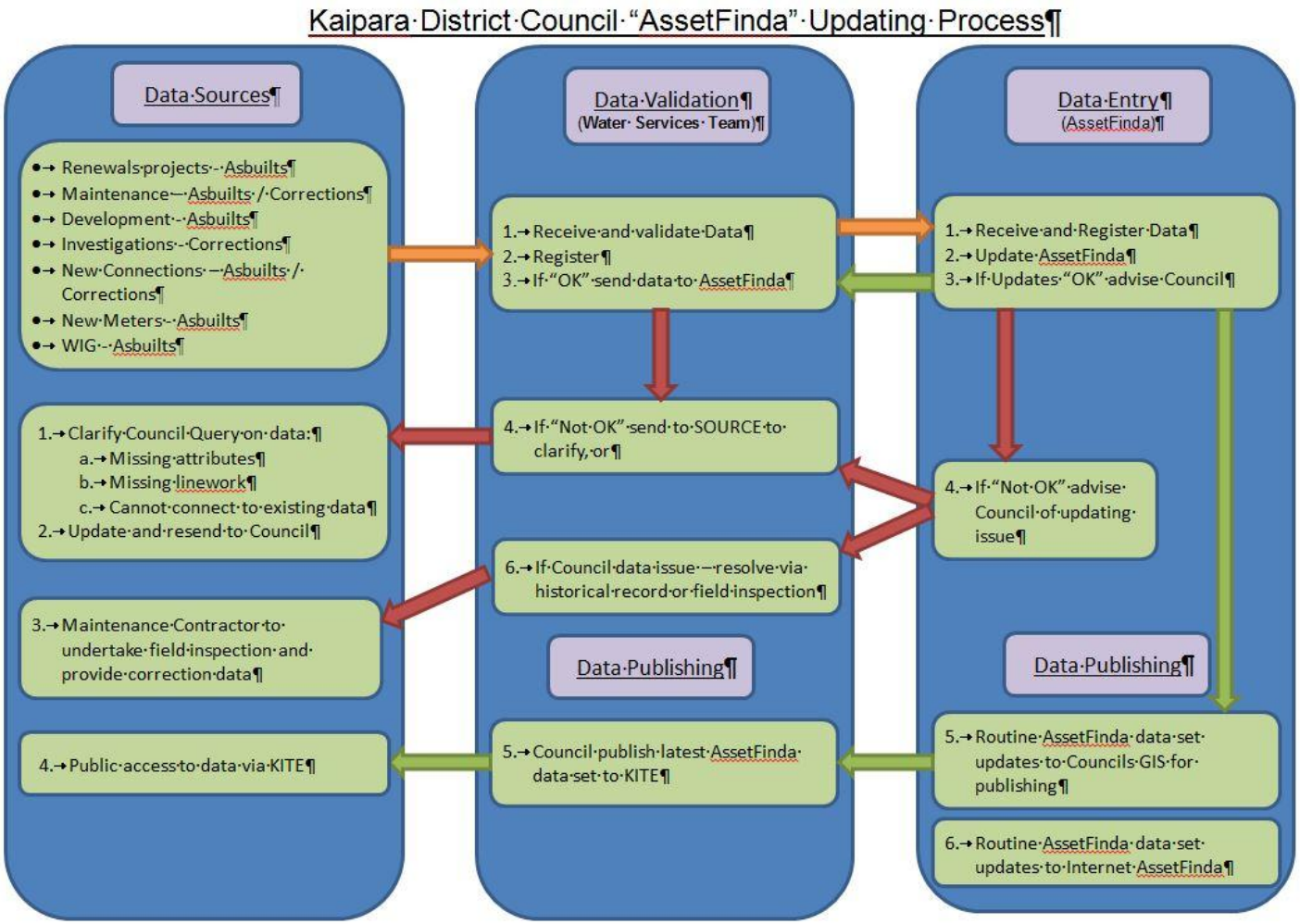
The representation of the assets within this system is believed to be reasonably comprehensive although gaps and inaccuracies in the data are known to exist. A data improvement task has been identified and included in the improvement plan to investigate and resolve the known anomalies where possible.

Ongoing data improvement and identification and resolution of data anomalies will be resolved primarily through the maintenance contract and projects as 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



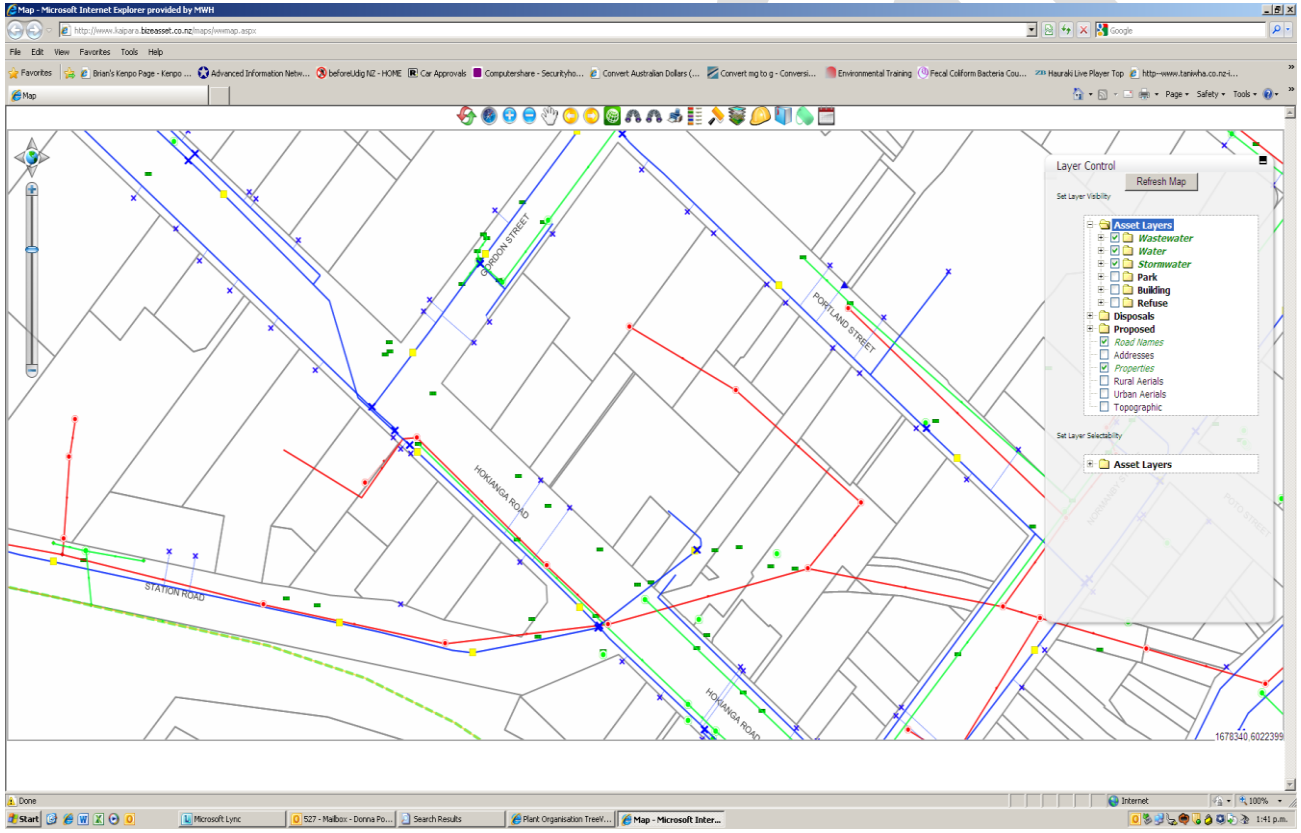
4.2.3 AssetFinda

The Assetfinda system is a MapInfo based tool used to record asset related information. This currently includes basic asset 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 web enabled. The system is externally hosted and maintained.

A screen shot of the Assetfinda system is included in Figure 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. 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.

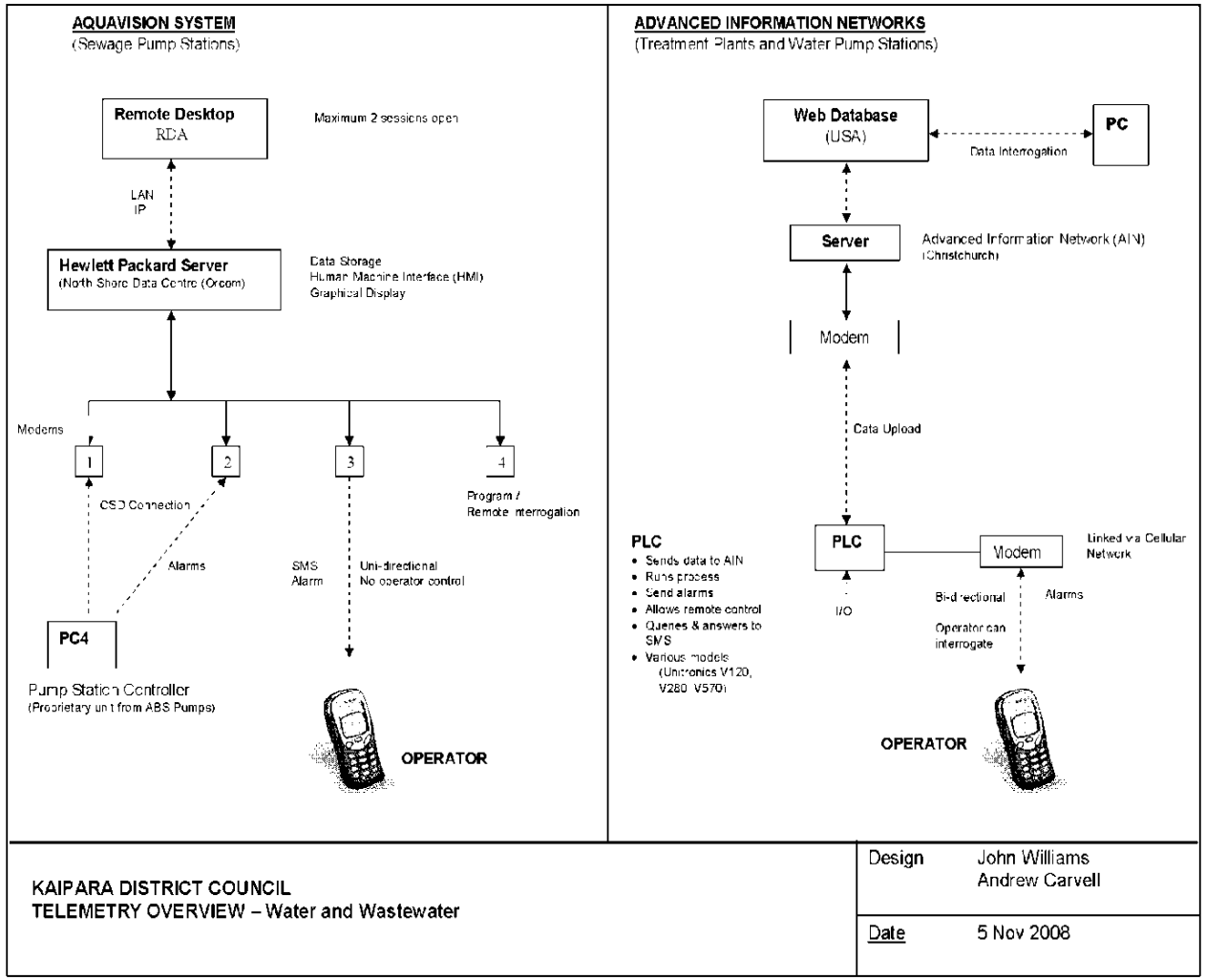
An improvement item has been identified to enable the AssetFinda system to be modified for the recording of this information.

4.2.4 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. Council is in the process of upgrading the telemetry system to a full blown SCADA system which will be rolled out to all sites progressively and will provide control, alarm notification, reporting and access to data.

An overview of the current 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 current telemetry system has developed over a number of years and whilst initially providing adequate operational assistance, the Operators are frustrated at the lack of access to the monitoring system and data to assist with operational decisions and consent reporting.

The robustness and cost effective nature of the service is now being questioned, and a more open web based system is considered necessary. The development of a telemetry upgrade and implementation plan has been undertaken in 2013 and is being implemented in 2014.

It is anticipated that the system will be upgraded in a prioritised manner over 2014 – 2016. .

4.3 Potential Negative Effects

The wastewater management activity is an essential service that we provide to our communities and the environment. Discharges from the wastewater network via system failures or pipeline breakages could result in contamination of waterways and environmental or public health risk and can impact upon cultural, social, environmental and economic wellbeing.

Guidance on the design and construction of new wastewater networks is provided in Chapter 7: Wastewater Reticulation and On-Site Treatment; Engineering Standards 2011, published by Council. Holistically the design of systems in accordance with the Standards will minimise the impacts of wastewater discharges on the receiving environment; however, it is acknowledged that differences in design standards between old and new systems can result in a disparity between Levels of Service provided throughout the network.

This AMP describes Council's wastewater 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
- Public education, including water conservation programmes

4.4 Risk Management

Council's Risk Management Policy and Framework has been 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 specific business risks associated with the ownership and management of wastewater assets and to determine the direct and indirect costs associated with these risks.

Council is familiar with the risks associated with each wastewater scheme, however it has not previously formalised a risk management strategy. Council propose to develop such a strategy in the near future 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 Wastewater network to be compared against those impacting Water Supply 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 4-2 identifies Council's high and extreme risks, together with potential impact, current controls and an action plan to mitigate, minimise or manage the risk.

Table 4-2: Summary of Extreme and High Risk for Council

Description		Potential Impact	Current Controls	Action Plan
Asset Group	Risk			
Events				
Earthquake	Earthquake causes extensive damage to reticulation	Long term loss of service due to wide spread pipe failure	Nil	Develop Emergency Response Plan identifying how impact will be dealt with
Flooding	Flooding causes erosion or failure of pond embankments	Overflow of untreated wastewater to land or water bodies		Develop Emergency Response Plan for flood events
Pump stations	External Power Failure causes shutdown	Reduction in station output, temporary loss of service, potential wastewter overflows		Provide alternative power supply at key locations and emergency storage per NRC Water and Soil Plan

Description		Potential Impact	Current Controls	Action Plan
Asset Group	**Risk**			
Infrastructure				
Pump station Rising Main Oxidation Ponds	Pipe failure over significant length of pipe	Raw wastewater overflow to public and/or private land	5 yearly inspection programme	
	Embankment failure	Raw wastewater overflow to public and/or private land		
All Reticulation	Damage caused by contractors (related or unrelated)	Premature failure of assets results in responsive maintenance 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 Standards	Assess cost and benefits of audit and acceptance testing of new assets prior to final acceptance
Operational	Operator sustains injury onsite, not able to call for help	Serious injury occurs but no one is aware of issue to respond	Contractor Health & Safety Plan	Assess need to develop radio check in procedures
Product				
Wastewater	Wastewater overflows to private property	Health and Safety Issues, operational costs to clean up and disinfect.	Nil	Reduction of Infiltration, reduce number of pump stations
Wastewater	Corrosive nature of wastewater causes premature failure of pipes	Increased renewal requirements and funding shortfall	Engineering Guidelines specify more resistant pipe materials	Implement condition assessment programme for high risk and older pipes/assets.

Description		Potential Impact	Current Controls	Action Plan
Asset Group	Risk			
Resource Consents	Unable to retain resource consent to discharge wastewater at current levels of treatment	Non-compliance with consent, possibly resulting in prosecution	Some consents in place. Assessment of Environmental Effects being prepared	Investigate alternative methods of treatment

4.5 Potential Alternative Methods of Service Delivery

KDC is trying to explore options of shared services with the neighbouring districts and 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 Council's and could also assist in providing a broader cross section of skilled in house resources to support the organisation going forward.

4.6 Health & 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 member of the public. With respect to asset management activities, it is particularly important to protect staff, contractors and the public from hazards associated with wastewater assets.

5 Continuous Improvement

The Asset Management Plans have been developed as a tool to help Council manage their assets, deliver the Levels of Service and identify the expenditure and funding requirements of the activity. Continuous improvements are necessary to ensure Council continues to achieve 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 wish to meet core requirements as defined by the Office of the Auditor General for the Wastewater AMP.

5.1 Improvement Plan

The Wastewater Improvement Plan is presented in Appendix B. Each improvement has been categorised by Asset Management Area (LOS, Data, Operations etc.), a priority level given with forecasted completion date. Responsibility has been assigned for each improvement, along with a proposed budget allowance (Capex or Opex).

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 over this AMP period (2012/13 – 2014/15) to facilitate achievement of core asset management and delivery of the wastewater collection / treatment service are:

- Review and define appropriate Levels of Service
- Negotiate Trade Waste Agreement (including future demand) with Silver Fern Farms and other commercial users
- Review the Asset Register to ensure all known assets are properly recorded
- Complete the data cleansing project to reduce the number of unknown asset attributes (including asset lives to aid renewal planning)
- Review adequacy of developers hand over requirements contained within Engineering Standards, Identify program to enhance – include for asset schedules and capital cost recording for each asset created
- Wastewater Modelling (Dargaville) – Scoping exercise to determine needs and level of detail required for development of hydraulic model
- Wastewater Modelling (Dargaville) – Development of hydraulic model to identify capacity issues, optimisation of pumping stations, manage growth
- Review and update Council's overall risk management framework and implement outcomes of this update into the AMP and other Council and contract documents
- Produce a methodology for determining asset renewal requirements. Develop a renewal programme based on performance and condition ratings. Prioritise based on a combination of criticality and condition/performance. The assessment of the renewal programme should be repeated annually.
- Identify Consent required improvements and timing. Develop an improvement programme to rectify.

Appendix A Detailed Financial Tables

Financial Summary Spreadsheets - Wastewater 2014/2025

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 (OPEX+CAPEX)	**4,123,662**	**2,925,010**	**2,740,510**	**2,715,010**	**3,675,610**	**3,512,510**	**3,506,350**	**4,617,510**	**4,715,510**	**4,730,510**
Operations	**1,784,859**	**1,732,552**	**1,640,552**	**1,607,552**	**1,750,652**	**1,667,552**	**1,652,552**	**1,712,552**	**1,652,552**	**1,652,552**
Control and Operations	1,607,888	1,607,552	1,567,552	1,567,552	1,567,552	1,567,552	1,552,552	1,552,552	1,552,552	1,552,552
AMP Improvements	176,971	65,000	73,000	40,000	123,100	100,000	100,000	100,000	100,000	100,000
Valuation of Assets	-	60,000	-	-	60,000	-	-	60,000	-	-
Maintenance	**864,303**	**624,958**	**574,958**	**569,958**	**569,958**	**569,958**	**569,958**	**669,958**	**1,019,958**	**769,958**
Reticulation	410,871	414,750	414,750	414,750	414,750	414,750	414,750	514,750	614,750	614,750
Pump Stations & Rising Mains		-	-	-	-	-	-	-	-	-
Treatment	135,119	139,773	139,773	139,773	139,773	139,773	139,773	139,773	139,773	139,773
Desludge Oxidation Pd Renew al	150,000	50,000	-	-	-	-	-	-	250,000	-
Bio remediation oxidation pond	150,000	5,000	5,000	-	-	-	-	-	-	-
Telemetry	15,435	15,435	15,435	15,435	15,435	15,435	15,435	15,435	15,435	15,435
Buildings	2,878	-	-	-	-	-	-	-	-	-
Total OPEX	**2,649,162**	**2,357,510**	**2,215,510**	**2,177,510**	**2,320,610**	**2,237,510**	**2,222,510**	**2,382,510**	**2,672,510**	**2,422,510**
Mangaw hai Planned	-	-	-	-	-	-	-	-	-	-
Mangaw hai Reactive	9,595	9,595	9,595	9,595	9,595	9,595	9,595	9,595	9,595	9,595
CAPX Renew al	**695,000**	**480,000**	**450,000**	**280,000**	**780,000**	**730,000**	**708,840**	**1,685,000**	**1,748,000**	**2,013,000**
Reticulation	350,000	355,000	375,000	100,000	565,000	525,000	550,000	1,480,000	1,550,000	1,815,000
Pump Stations & Rising Mains	95,000	75,000	75,000	85,000	130,000	155,000	125,000	180,000	198,000	198,000
Treatment	-	50,000	-	95,000	85,000	50,000	33,840	25,000	-	-
Carry Forw ard	250,000	-	-	-	-	-	-	-	-	-
CAPX LOS	**350,125**	**47,500**	**35,000**	**17,500**	**35,000**	**5,000**	**35,000**	**10,000**	**5,000**	**5,000**
Dargaville	4,000	-	-	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Glinks Gully	-	-	-	-	-	-	-	-	-	-
Kaiw aka	2,500	42,500	2,500	2,500	-	-	-	-	-	-
Maungaturoto	5,500	2,500	32,500	-	30,000	-	30,000	2,500	-	-
Te Kopuru	2,500	2,500	-	10,000	-	-	-	2,500	-	-
Mangaw hai	335,625	-	-	-	-	-	-	-	-	-
CAPX Growth	**429,375**	**40,000**	**40,000**	**240,000**	**540,000**	**540,000**	**540,000**	**540,000**	**290,000**	**290,000**
Dargaville	-	-	-	-	-	-	-	-	-	-
Mangaw hai	389,375	-	-	200,000	500,000	500,000	500,000	500,000	250,000	250,000
Developer Contribution	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Total CAPEX	**1,474,500**	**567,500**	**525,000**	**537,500**	**1,355,000**	**1,275,000**	**1,283,840**	**2,235,000**	**2,043,000**	**2,308,000**

DARGAVILLE 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	**1,318,479**	**911,167**	**849,167**	**661,167**	**1,094,267**	**1,051,167**	**1,051,167**	**1,271,167**	**1,619,167**	**1,369,167**
Operations	**214,818**	**147,732**	**135,732**	**112,732**	**205,832**	**162,732**	**162,732**	**182,732**	**162,732**	**162,732**
Control and Operations	114,818	105,832	105,832	105,832	105,832	105,832	105,832	105,832	105,832	105,832
Database Management	*9,595*	*9,214*	*9,214*	*9,214*	*9,214*	*9,214*	*9,214*	*9,214*	*9,214*	*9,214*
Engineering Cost	*5,274*	*4,608*	*4,608*	*4,608*	*4,608*	*4,608*	*4,608*	*4,608*	*4,608*	*4,608*
Insurance	*2,665*	*2,665*	*2,665*	*2,665*	*2,665*	*2,665*	*2,665*	*2,665*	*2,665*	*2,665*
NRC Resource Consent	*6,132*	*6,143*	*6,143*	*6,143*	*6,143*	*6,143*	*6,143*	*6,143*	*6,143*	*6,143*
Maintenance of Developer Sewers										
Power & Water	*91,152*	*83,202*	*83,202*	*83,202*	*83,202*	*83,202*	*83,202*	*83,202*	*83,202*	*83,202*
AMP Improvements - Opex	100,000	21,900	29,900	6,900	80,000	56,900	56,900	56,900	56,900	56,900
Valuation of Assets		20,000			20,000			20,000		
Maintenance	**424,661**	**333,435**	**283,435**	**283,435**	**283,435**	**283,435**	**283,435**	**383,435**	**733,435**	**483,435**
Reticulation	193,002	200,000	200,000	200,000	200,000	200,000	200,000	300,000	400,000	400,000
Maintenance - Reticulation	*193,002*	*200,000*	*200,000*	*200,000*	*200,000*	*200,000*	*200,000*	*300,000*	*400,000*	*400,000*
Treatment	65,846	70,500	70,500	70,500	70,500	70,500	70,500	70,500	70,500	70,500
Maintenance - Treatment	*65,846*	*70,500*	*70,500*	*70,500*	*70,500*	*70,500*	*70,500*	*70,500*	*70,500*	*70,500*
Desludge Oxidation Pd Renewal	150,000	50,000	-	-	-	-	-	-	250,000	-
Telemetry	12,935	12,935	12,935	12,935	12,935	12,935	12,935	12,935	12,935	12,935
Buildings	2,878	-	-	-	-	-	-	-	-	-
Total OPEX	**639,479**	**481,167**	**419,167**	**396,167**	**489,267**	**446,167**	**446,167**	**566,167**	**896,167**	**646,167**
CAPX Renewal	**675,000**	**430,000**	**430,000**	**260,000**	**600,000**	**600,000**	**600,000**	**700,000**	**718,000**	**718,000**
Reticulation	350,000	355,000	355,000	100,000	465,000	450,000	450,000	500,000	520,000	520,000
Pump Stations & Rising Mains	75,000	75,000	75,000	75,000	110,000	125,000	125,000	180,000	198,000	198,000
Treatment	-	-	-	85,000	25,000	25,000	25,000	20,000	-	-
Carry Forward	250,000	-	-	-	-	-	-	-	-	-
CAPX LOS	**4,000**	**-**	**-**	**5,000**	**5,000**	**5,000**	**5,000**	**5,000**	**5,000**	**5,000**
Environmental compliance	-			5,000	5,000	5,000	5,000	5,000	5,000	5,000
Carry Forward		-	-	-	-	-	-	-	-	-
Safety grills pump stations	4,000									
CAPX Growth	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Dargaville TP	-	-	-	-	-	-	-	-	-	-
Additional Capacity for Growth - Counc	-									
Total CAPEX	**679,000**	**430,000**	**430,000**	**265,000**	**605,000**	**605,000**	**605,000**	**705,000**	**723,000**	**723,000**

GLINKS GULLY Summary									
Year Ending June	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Year Number	1	2	3	4	5	6	7	8	9
TOTAL EXPENDITURE	**44,944**	**41,985**	**36,985**	**46,985**	**61,985**	**36,985**	**36,985**	**46,985**	**36,985**
Operations	**17,907**	**20,147**	**15,147**	**15,147**	**20,147**	**15,147**	**15,147**	**20,147**	**15,147**
Control and Operations	3,175	3,397	3,397	3,397	3,397	3,397	3,397	3,397	3,397
Database Management	*733*	*700*	*700*	*700*	*700*	*700*	*700*	*700*	*700*
Engineering Cost	*565*	*933*	*933*	*933*	*933*	*933*	*933*	*933*	*933*
Insurance	*213*	*213*	*213*	*213*	*213*	*213*	*213*	*213*	*213*
NRC Resource Consent	*1,233*	*1,120*	*1,120*	*1,120*	*1,120*	*1,120*	*1,120*	*1,120*	*1,120*
Power & Water	*431*	*431*	*431*	*431*	*431*	*431*	*431*	*431*	*431*
AMP Improvements	14,732	11,750	11,750	11,750	11,750	11,750	11,750	11,750	11,750
Valuation of Assets		5,000			5,000			5,000	
Maintenance	**27,037**	**21,838**	**21,838**	**21,838**	**21,838**	**21,838**	**21,838**	**21,838**	**21,838**
Reticulation	23,199	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Maintenance - Reticulation	23,199	18,000	18,000	18,000	*18,000*	*18,000*	18,000	18,000	*18,000*
	-	-	-	-	-	-	-	-	-
Treatment	3,838	3,838	3,838	3,838	3,838	3,838	3,838	3,838	3,838
Maintenance - Treatment	3,838	3,838	3,838	3,838	*3,838*	*3,838*	3,838	3,838	*3,838*
Desluding septic tanks									
Telemetry									
De-sludging Treatment Ponds									
Total OPEX	44,944	41,985	36,985	36,985	41,985	36,985	36,985	41,985	36,985
CAPX Renewal	**-**	**-**	**-**	**10,000**	**20,000**	**-**	**-**	**5,000**	**-**
Reticulation	-	-	-	-	-	-	-	-	-
Pump Stations & Rising Mains	-	-	-	10,000	20,000	-	-	-	-
Treatment	-	-	-	-	-	-	-	5,000	-
CAPX LOS	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Treatment Plant Modifications	-	-	-	-	-	-	-	-	-
Allowance for Effluent filters to be installed in accordance with WW discharge consent from NRC.		-	-	-	-	-	-	-	-
CAPX Growth	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Soakage fields - additional capacity	-	-	-	-	-	-	-	-	-
Additional Capacity for Growth - Counc	-	-	-	-	-	-	-	-	-
Total CAPEX	-	-	-	10,000	20,000	-	-	5,000	-

KAIWAKA 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	**95,174**	**126,346**	**76,346**	**76,346**	**123,846**	**73,846**	**73,846**	**143,846**	**143,846**	**153,846**
Operations	**24,904**	**21,703**	**11,703**	**11,703**	**21,703**	**11,703**	**11,703**	**21,703**	**11,703**	**11,703**
Control and Operations	11,232	8,903	8,903	8,903	8,903	8,903	8,903	8,903	8,903	8,903
Database Management	*513*	*356*	*356*	*356*	*356*	*356*	*356*	*356*	*356*	*356*
Engineering Cost	*2,960*	*570*	*570*	*570*	*570*	*570*	*570*	*570*	*570*	*570*
Insurance	*533*	*533*	*533*	*533*	*533*	*533*	*533*	*533*	*533*	*533*
NRC Resource Consent	*3,132*	*3,350*	*3,350*	*3,350*	*3,350*	*3,350*	*3,350*	*3,350*	*3,350*	*3,350*
Power & Water	*4,094*	*4,094*	*4,094*	*4,094*	*4,094*	*4,094*	*4,094*	*4,094*	*4,094*	*4,094*
Flow Measurement										
AMP Improvements	13,672	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800
Valuation of Assets		10,000			10,000			10,000		
Maintenance	**67,770**	**62,143**	**62,143**	**62,143**	**62,143**	**62,143**	**62,143**	**62,143**	**62,143**	**62,143**
Reticulation	60,627	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000	55,000
Maintenance - Reticulation	*60,627*	*55,000*	*55,000*	*55,000*	*55,000*	*55,000*	*55,000*	*55,000*	*55,000*	*55,000*
Treatment	7,143	7,143	7,143	7,143	7,143	7,143	7,143	7,143	7,143	7,143
Maintenence -Treatment	*7,143*	*7,143*	*7,143*	*7,143*	*7,143*	*7,143*	*7,143*	*7,143*	*7,143*	*7,143*
Telemetry										
De-sludging Treatment Ponds										
Total OPEX	92,674	83,846	73,846	73,846	83,846	73,846	73,846	83,846	73,846	73,846
CAPX Renewal	**-**	**-**	**-**	**-**	**40,000**	**-**	**-**	**60,000**	**70,000**	**80,000**
Reticulation		-	-	-	-			60,000	70,000	80,000
Pump Stations & Rising Mains		-	-	-	-	-		-	-	-
Treatment			-	-	40,000	-	-	-	-	-
CAPX LOS	**2,500**	**42,500**	**2,500**	**2,500**	**-**	**-**	**-**	**-**	**-**	**-**
Desludging										
Pump Station Storage						-	-	-	-	-
Pond curtain	-	40,000	-	-	-	-	-	-	-	-
Environmental compliance	2,500	2,500	2,500	2,500						
CAPX Growth	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Treatment additional capacity	-	-	-	-	-	-	-	-	-	-
Additional Capacity for Growth - Counc	-	-	-							
Total CAPEX	2,500	42,500	2,500	2,500	40,000	-	-	60,000	70,000	80,000

APPENDIX A
Status: Final

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	**377,564**	**260,682**	**250,682**	**203,182**	**333,182**	**323,182**	**323,182**	**415,682**	**413,182**	**413,182**
Operations	**58,587**	**66,932**	**56,932**	**56,932**	**66,932**	**56,932**	**56,932**	**66,932**	**56,932**	**56,932**
Control and Operations	43,220	44,132	44,132	44,132	44,132	44,132	44,132	44,132	44,132	44,132
Database Management	*1,599*	*1,599*	*1,599*	*1,599*	*1,599*	*1,599*	*1,599*	*1,599*	*1,599*	*1,599*
Engineering Cost	*2,427*	*4,000*	*4,000*	*4,000*	*4,000*	*4,000*	*4,000*	*4,000*	*4,000*	*4,000*
Insurance	*2,132*	*2,132*	*2,132*	*2,132*	*2,132*	*2,132*	*2,132*	*2,132*	*2,132*	*2,132*
NRC Resource Consent	*3,661*	*3,000*	*3,000*	*3,000*	*3,000*	*3,000*	*3,000*	*3,000*	*3,000*	*3,000*
Power & Water	*33,401*	*33,401*	*33,401*	*33,401*	*33,401*	*33,401*	*33,401*	*33,401*	*33,401*	*33,401*
AMP Improvements	15,367	12,800	12,800	12,800	12,800	12,800	12,800	12,800	12,800	12,800
Valuation of Assets		10,000			10,000			10,000		
Maintenance	**293,477**	**141,250**	**141,250**	**136,250**	**136,250**	**136,250**	**136,250**	**136,250**	**136,250**	**136,250**
Reticulation	115,227	108,000	108,000	108,000	108,000	108,000	108,000	108,000	108,000	108,000
Maintenance - Reticulation	*115,227*	*108,000*	*108,000*	*108,000*	*108,000*	*108,000*	*108,000*	*108,000*	*108,000*	*108,000*
Treatment	28,250	28,250	28,250	28,250	28,250	28,250	28,250	28,250	28,250	28,250
Maintenance - Treatment	*28,250*	*28,250*	*28,250*	*28,250*	*28,250*	*28,250*	*28,250*	*28,250*	*28,250*	*28,250*
Bio remediation oxidation pond	150,000	5,000	5,000	-	-	-	-	-	-	-
Telemetry										
De-sludging Treatment Ponds										
Total OPEX	352,064	208,182	198,182	193,182	203,182	193,182	193,182	203,182	193,182	193,182
CAPX Renewal	**20,000**	**50,000**	**20,000**	**10,000**	**100,000**	**130,000**	**100,000**	**210,000**	**220,000**	**220,000**
Reticulation	-	-	20,000	-	100,000	75,000	100,000	210,000	220,000	220,000
Pump Stations & Rising Mains	20,000	-	-	-	-	30,000	-		-	-
Treatment	-	50,000		10,000		25,000	-	-	-	-
CAPX LOS	**5,500**	**2,500**	**32,500**	**-**	**30,000**	**-**	**30,000**	**2,500**	**-**	**-**
Pump Station storage			30,000	-	30,000	-	30,000	-	-	-
Desludging										
Environmental compliance	2,500	2,500	2,500	-		-	-	2,500	-	-
Safety grills on Pump Stations	3,000	-	-	-	-	-	-	-	-	-
CAPX Growth	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Additional Capacity for Growth - Council Contribution										
Total CAPEX	25,500	52,500	52,500	10,000	130,000	130,000	130,000	212,500	220,000	220,000

TE KOPURU 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	**57,525**	**74,659**	**67,159**	**77,159**	**92,159**	**67,159**	**75,999**	**94,659**	**117,159**	**137,159**
Operations	**13,262**	**15,462**	**10,462**	**10,462**	**15,462**	**10,462**	**10,462**	**15,462**	**10,462**	**10,462**
Control and Operations	8,462	8,712	8,712	8,712	8,712	8,712	8,712	8,712	8,712	8,712
Database Management	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*	*1,066*
Engineering Cost	*1,000*	*1,250*	*1,250*	*1,250*	*1,250*	*1,250*	*1,250*	*1,250*	*1,250*	*1,250*
Insurance										
NRC Resource Consent	*6,396*	*6,396*	*6,396*	*6,396*	*6,396*	*6,396*	*6,396*	*6,396*	*6,396*	*6,396*
Power & Water										
AMP Improvements	4,800	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750
Valuation of Assets		5,000			5,000			5,000		
Maintenance	**41,763**	**56,697**	**56,697**	**56,697**	**56,697**	**56,697**	**56,697**	**56,697**	**56,697**	**56,697**
Reticulation	18,816	33,750	33,750	33,750	33,750	33,750	33,750	33,750	33,750	33,750
Maintenance - Reticulation	*18,816*	*33,750*	*33,750*	*33,750*	*33,750*	*33,750*	*33,750*	*33,750*	*33,750*	*33,750*
Treatment	20,447	20,447	20,447	20,447	20,447	20,447	20,447	20,447	20,447	20,447
Maintenance - Treatment	*20,447*	*20,447*	*20,447*	*20,447*	*20,447*	*20,447*	*20,447*	*20,447*	*20,447*	*20,447*
Telemetry	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
De-sludging Treatment Ponds										
Total OPEX	55,025	72,159	67,159	67,159	72,159	67,159	67,159	72,159	67,159	67,159
CAPX Renewal	**-**	**-**	**-**	**-**	**20,000**	**-**	**8,840**	**20,000**	**50,000**	**70,000**
Reticulation	-	-	-	-	-	-		20,000	50,000	70,000
Pump Stations & Rising Mains	-	-	-	-	-	-	-	-	-	-
Treatment	-	-	-		20,000		8,840	-	-	-
CAPX LOS	**2,500**	**2,500**	**-**	**10,000**	**-**	**-**	**-**	**2,500**	**-**	**-**
Treatment Plant Modifications	-	-		10,000		-	-	-	-	-
Pumpstation storage	-	-	-	-	-	-	-	-	-	-
Environmental compliance	2,500	2,500	-	-	-	-	-	2,500	-	-
CAPX Growth	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Additional Capacity for Growth - Counc	-	-	-	-	-	-	-	-	-	-
Total CAPEX	2,500	2,500	-	10,000	20,000	-	8,840	22,500	50,000	70,000

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	**2,229,976**	**1,510,171**	**1,460,171**	**1,650,171**	**1,970,171**	**1,960,171**	**1,945,171**	**2,645,171**	**2,385,171**	**2,620,171**
Operations	**1,455,381**	**1,460,576**	**1,410,576**	**1,400,576**	**1,420,576**	**1,410,576**	**1,395,576**	**1,405,576**	**1,395,576**	**1,395,576**
Control and Operations	1,426,981	1,436,576	1,396,576	1,396,576	1,396,576	1,396,576	1,381,576	1,381,576	1,381,576	1,381,576
Database Management										
Flow Measurement										
Engineering costs	*92,263*	*154,000*	*114,000*	*114,000*	*114,000*	*114,000*	*99,000*	*99,000*	*99,000*	*99,000*
Insurance	*41,576*	*41,576*	*41,576*	*41,576*	*41,576*	*41,576*	*41,576*	*41,576*	*41,576*	*41,576*
NRC Resource Consent										
Maintenance of Developer Sewers	*56,501*	*50,000*	*50,000*	*50,000*	*50,000*	*50,000*	*50,000*	*50,000*	*50,000*	*50,000*
Power & Water	*53,872*	*50,000*	*50,000*	*50,000*	*50,000*	*50,000*	*50,000*	*50,000*	*50,000*	*50,000*
Operating Costs	*1,182,769*	*1,141,000*	*1,141,000*	*1,141,000*	*1,141,000*	*1,141,000*	*1,141,000*	*1,141,000*	*1,141,000*	*1,141,000*
AMP Improvements	28,400	14,000	14,000	4,000	14,000	14,000	14,000	14,000	14,000	14,000
Valuation of Assets	-	10,000	-	-	10,000	-	-	10,000	-	-
Maintenance	**9,595**	**9,595**	**9,595**	**9,595**	**9,595**	**9,595**	**9,595**	**9,595**	**9,595**	**9,595**
Reticulation	-	-	-	-	-	-	-	-	-	-
Maintenance - Reticulation										
Maintenance - Trunk Sewers										
Pump Stations & Rising Mains										
Treatment	9,595	9,595	9,595	9,595	9,595	9,595	9,595	9,595	9,595	9,595
Maintenance - Building	*9,595*	*9,595*	*9,595*	*9,595*	*9,595*	*9,595*	*9,595*	*9,595*	*9,595*	*9,595*
Total OPEX	1,464,976	1,470,171	1,420,171	1,410,171	1,430,171	1,420,171	1,405,171	1,415,171	1,405,171	1,405,171
CAPX Renewal	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**690,000**	**690,000**	**925,000**
Reticulation	-	-	-	-	-	-	-	690,000	690,000	925,000
Pump Stations & Rising Mains	-	-	-	-	-	-	-	-	-	-
Carry Forward	-	-	-	-	-	-	-	-	-	-
CAPX LOS	**335,625**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Effluent Discharge Options	55,625			-	-	-	-	-	-	-
Pumpstation storage	-	-	-	-	-	-	-	-	-	-
Carry Forward	280,000	-	-	-	-	-	-	-	-	-
CAPX Growth	**429,375**	**40,000**	**40,000**	**240,000**	**540,000**	**540,000**	**540,000**	**540,000**	**290,000**	**290,000**
Additional Capacity for Growth - Counc	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Provision for Mangawhai Extension				200000	500000	500,000	500000	500000	250000	250000
Effluent Discharge Options	389375									
Total CAPEX	765,000	40,000	40,000	240,000	540,000	540,000	540,000	1,230,000	980,000	1,215,000

Appendix B Improvement Plan

ASSET MANAGEMENT IMPROVEMENT PROGRAMME

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.

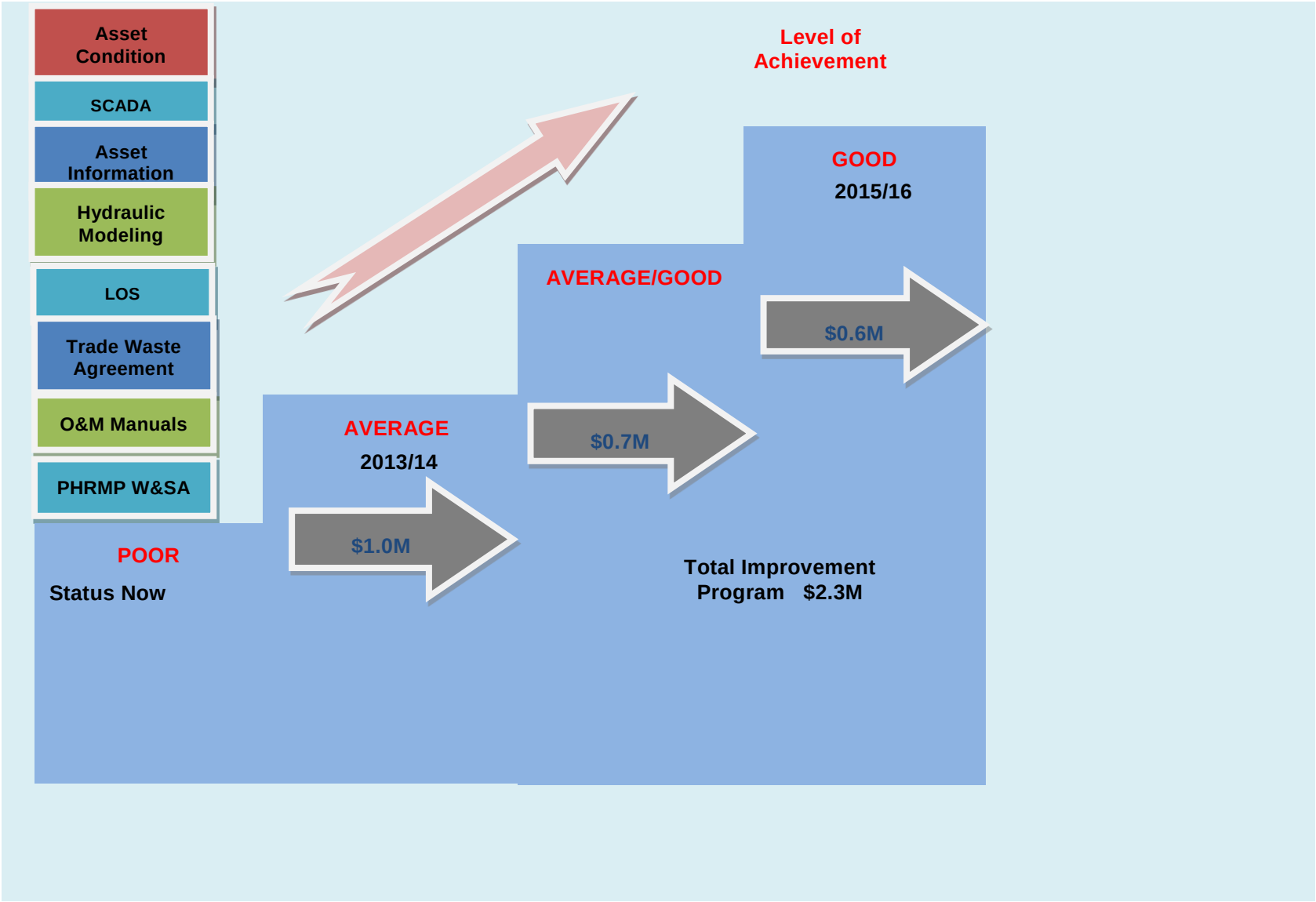
The improvement program has been developed, identifying the highest priority activities to undertake in next 1-3 years to improve level of activity management practice in three waters as follow:

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

This improvement program 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 2013/14; however they are not significant and also some excess funding is available in subsequent years. As the cost estimates were only an approximation – ie 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 program 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 PROGRAM OF THREE WATERS



IMPROVEMENT PROGRAM SUMMARY

Asset Group	*Estimated Project Cost ($)*	*Program*		
		2013/14	*2014/15*	*2015/16*
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 Modeling Water Supply	110,000	70,000	35,000	35,000
Review LOS of water supply	30,000	5,000	25,000	
O&M Manuals	20,000	20,000		
Public Health Risk Management Plan	30,000	30,000		
Update Water & 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 Modeling 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		
O&M Manual	20,000	20,000		
Update Water & Sanitary Assessment	30,000	0	0	30,000
Total for Wastewater	**761,000**	**354,000**	**218,000**	**220,000**

Asset Group	Estimated Project Cost ($)	Program		
		2013/14	2014/15	2015/16
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		30,000	30,000
Total for SW	**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 PROGRAM

Asset Group	Total Funding ($)	Program		
		2013/14	2014/15	2015/16
Total for Water	**870,500**	355,000	248,000	267,500
Total for Wastewater	**836,267**	344,375	248,796	243,096
Total for SW	**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		Program		
		2013/14	2014/15	2015/16
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

Critical Assets for Wastewater Treatment

ASSET DESCRIPTION	Quantity	RISK ASSESSEMENT		
		Consequence of Failure	Likelihood of Failure	Risk
Dargaville				
Treatment Plant/ponds	1	Major	possible	High
Treatment Plant Pumpstation	1	severe	possible	Significant
Aerators	3	minor	likely	Significant
Rising Main	8.5Km	major	likely	High
Pumpstations	15	major	likely	High
Trunk Main		major	likely	High
Reticulation	40Km	minor	possible	Low
Maungaturoto				
Treatment Plant/ponds	1	major	possible	High
Membrane Plant	1	severe	likely	High
Aerators	1	Minor	likely	Significant
Rising Main	1.2Km	major	likely	High
Pumpstations	3	major	likely	High
Trunk Main		major	likely	High
Kaiwaka				
Treatment Plant/ponds	1	Major	possible	High
Pumpstation	1	major	likely	High
Rising Main	1.3Km	major	likely	High
Trunk Main		Major	likely	High
Reticulation	4Km	minor	possible	Low
Te Kopuru				
Treatment Plant/ponds	1	major	likely	High
Aerators	1	Minor	likely	Significant
Trunk Main	400m	major	likely	High
Reticulation	6Km	minor	possible	Low

ASSET DESCRIPTION	Quantity	RISK ASSESSEMENT		
		Consequence of Failure	Likelihood of Failure	Risk
Glinks Gully				
Pumpstation	1	major	likely	High
Evapotranspiration field	1	major	likely	High
Rising Main	300m	severe	likely	High
Mangawhai				
Treatment Plant	1	catastrophic	likely	High
Rising Main	5.5Km	severe	likely	High
Pumpstations	12	severe	likely	High

Appendix D Resource Consent Register

Consent No	Details	Status	Expiry Date	Conditions / Limits Applied	Monitoring Required	Reporting Required
3666	Dargaville WWTP Discharge Consent	Current	2048	Y	Y	Y
7231	Glinks Gully WWTP Discharge Consent	Current	2024	Y	Y	Y
1116	Kaiwaka WWTP Discharge Consent	Current	2022	Y	Y	Y
1115	Maungaturoto WWTP Discharge Consent	Current	2032	Y	Y	Y
5087	Maungaturoto Railway Discharge Consent	Current	2015	Y	N	Y
1102	Te Kopuru Discharge Consent	Current	2044	Y	Y	Y
1383	Maungaturoto Backwash Discharge Consent	Current	Being Reviewed	N	Y	N
5107	Ruawai Backwash Discharge Consent	Current	2046	Y	Y	Y

Appendix E Historical Levels of Service

Performance Measures	Data Source						
	2009 AMP – 2009 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 wastewater (NRB)	40%	45%	41%	41%	41%	?	60%
Commencement of containment and clean-up of notified spills	2 hours	2 hours	2 hours	90%	2 hours	?	-
Percentage of beaches and rivers available for swimming and shellfish gathering during summer monitoring period	80%	95%	80%	96%	80%	?	-
Percentage of urgent request (emergency overflows) responded to within 1 day (Councils Helpdesk)	90%	100%	90%	100%	90%	?	-
Number of requests for service regarding odours	-	-	-	-	-	-	32
Number of requests for service regarding blockages	-	-	-	-	-	-	95
Technical Levels of Service							
Continuity of the wastewater service to KDC's customers that meets community expectations	Less than two wastewater reticulation incidents per km of public drain reported in any 12 month period.	-	-	-	-	-	-
Restore private property disturbed by wastewater service activities to a standard at least as good as before the work was carried out	No unresolved complaints 80% of contracts performed without justifiable complaints	-	-	-	-	-	-

Performance Measures	Data Source						
	2009 AMP – 2009 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
Zero wastewater overflows into habitable buildings due to faults in the public wastewater system.	Zero overflows into habitable buildings any 12 month period	-	-	-	-	-	-
Zero dry weather overflows in any 12 month period	Zero overflows in any 12 month period	-	-	-	-	-	-
KDC takes all practicable steps to ensure that no avoidable harm is suffered by any person because of any action, or any failure to act, by a worker ('Worker' as defined in HASIE Act)	All contractors to KDC are registered as Health and Safety compliant	-	-	-	-	-	-
No Abatement notices issued for any Council operated wastewater treatment facility in the district.	Zero Abatement notices in any 12 month period	-	-	-	-	-	-
All wastewater spills investigated and any necessary disinfection works completed within 24 hours of the spill occurring	90% compliance	-	-	-	-	-	-
Develop an emergency management plan for all wastewater schemes	Emergency plan developed by in 2009/2010 financial year	-	-	-	-	-	-
Compliance with outfall waste consent conditions	-	-	-	-	-	-	90%
The annual number of events where wastewater is discharged from the Council's reticulation into rivers and streams.	-	-	-	-	-	-	5

Appendix F List of Acronyms

List of Acronyms

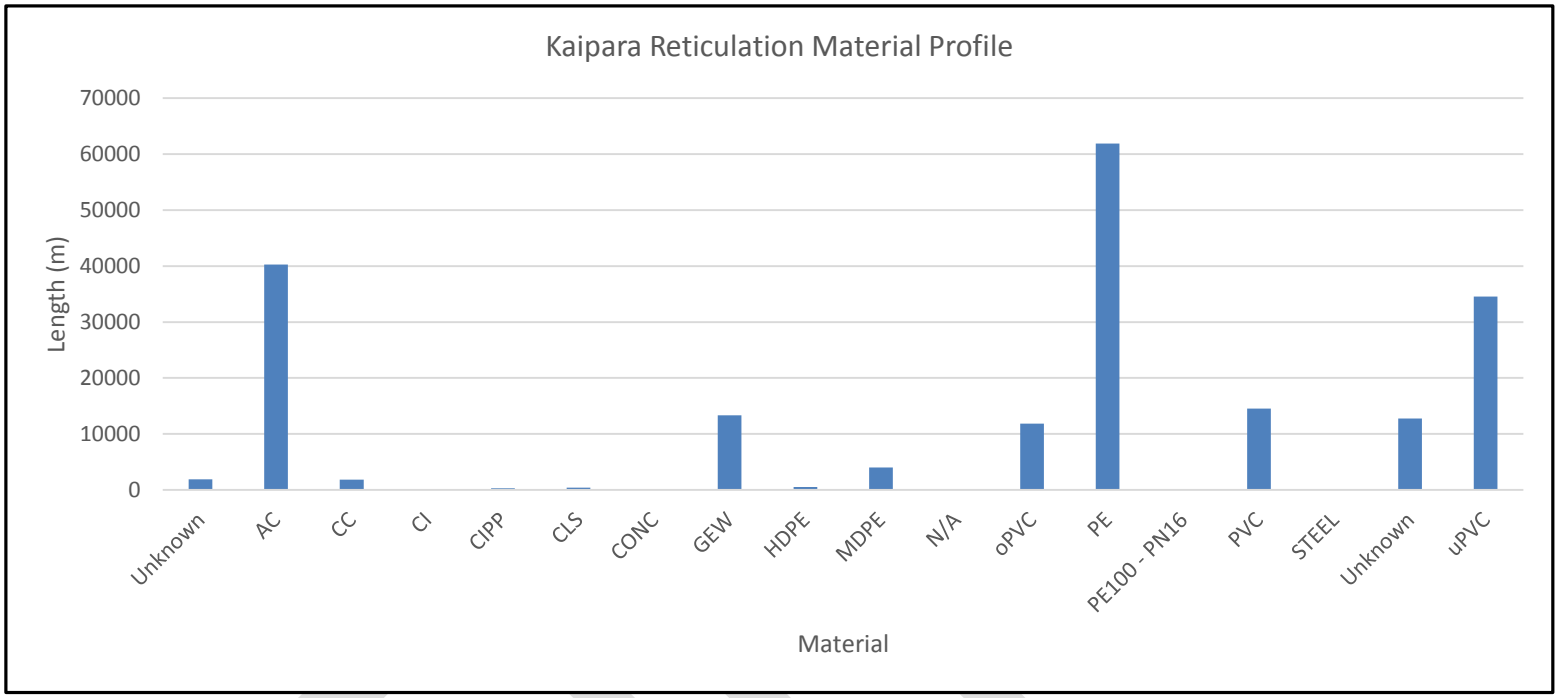
The following lists key acronyms and abbreviations used in this document:

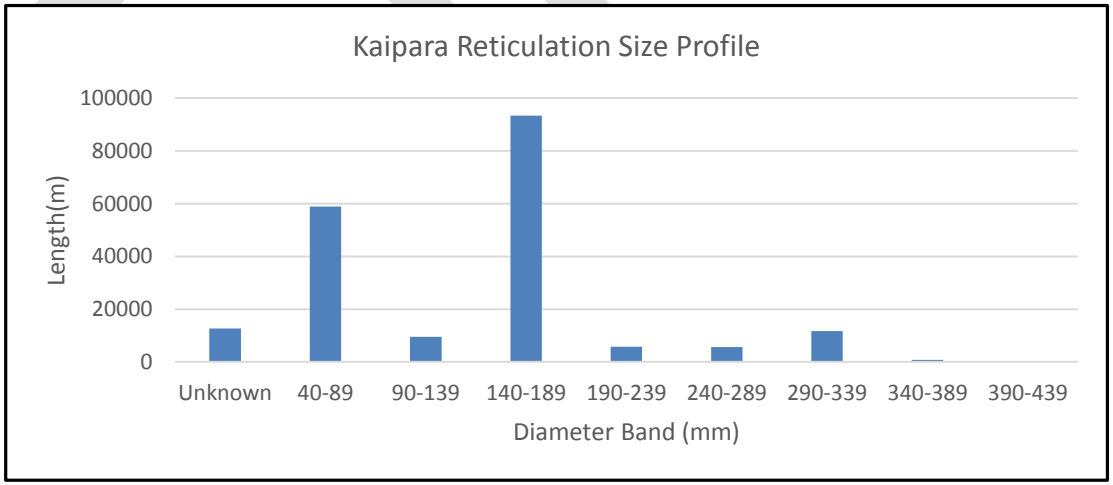
Term	Definition
AC	Asbestos concrete (pipe type)
AM	Asset Management
AMP	Asset Management Plan
AMS	Asset Management Systems
CAPEX	Capital expenditure
CCTV	Closed Circuit Television
CDEM	Civil Defence Emergency Management
CMA	Costal Marine Area
CON	Concrete (pipe type)
CORST	Corrugated steel (pipe type)
Council	Kaipara District Council
CPP	Competitive Pricing Procedures
DP	District Plan
EW	Earthenware (pipe type)
GIS	Geographical Information System
IPCC	Intergovernmental Panel on Climate Change

Term	Definition
IIMM	International Infrastructure Management Manual
KITE	Kaipara Information Technology Environment
LGA	Local Government Act 2002
LIM	Land Information Memoranda
LOS	Level of Service
LTP	Long Term Plan
NRC	Northland Regional Council
OPEX	Operational expenditure
PIM	Project Information Memoranda
PVC	Polyvinylchloride (pipe type)
RCRRJ	Reinforced concrete rubber ring joint (pipe type)
RMA	Resource Management Act 1991
UPVC	Unplasticised polyvinylchloride (pipe type)
URP	Usual Resident Population
WSSA	Water and Sanitary Services Assessment

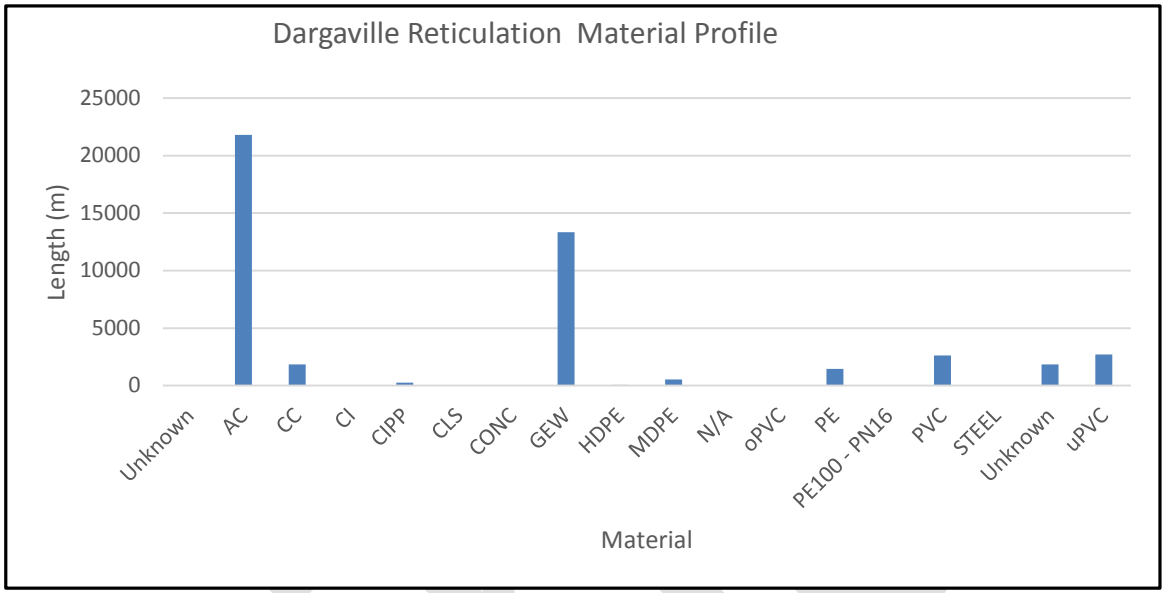
Appendix G Asset Profiles

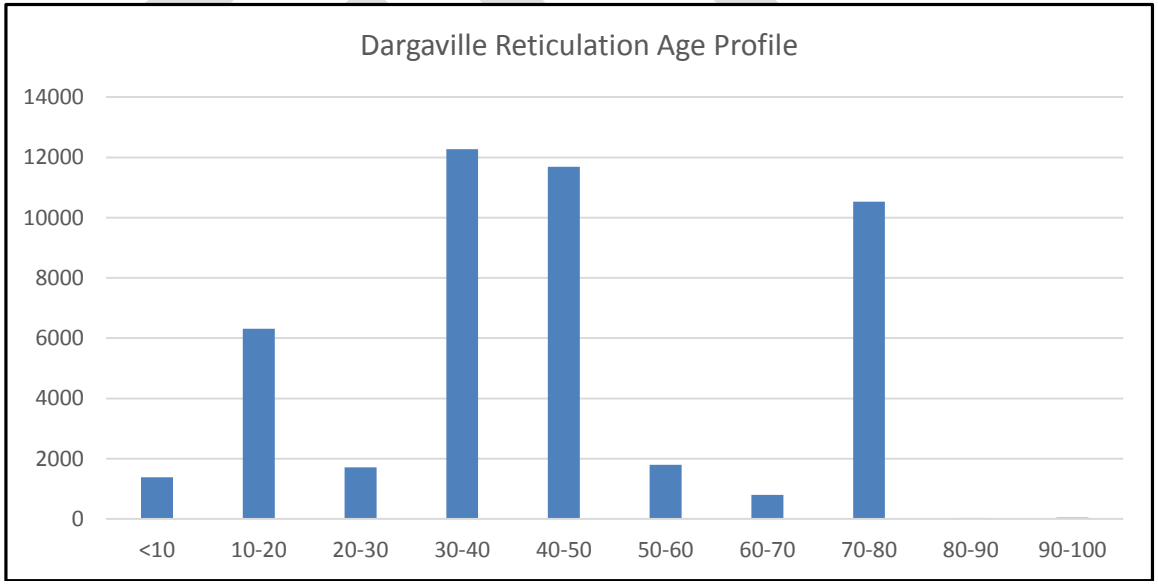
Asset Profiles – All Schemes

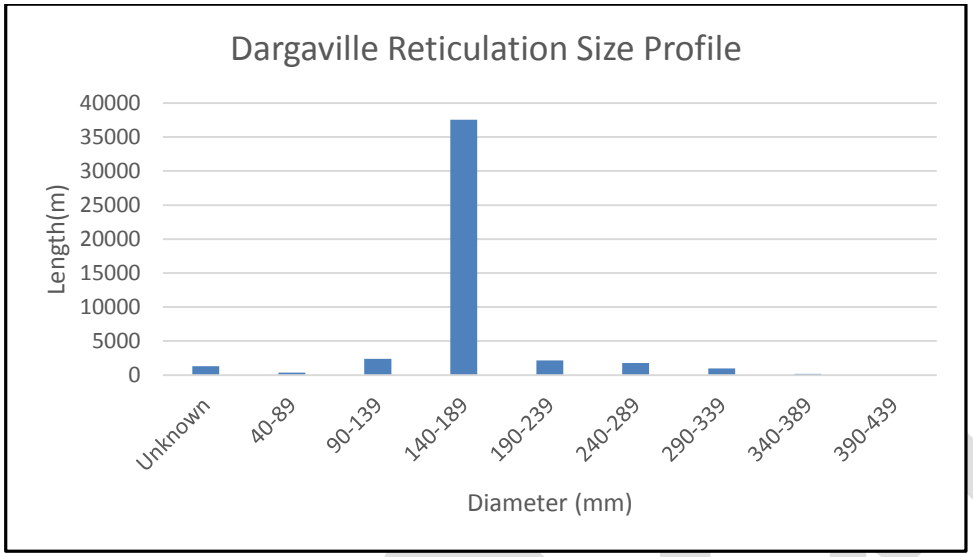




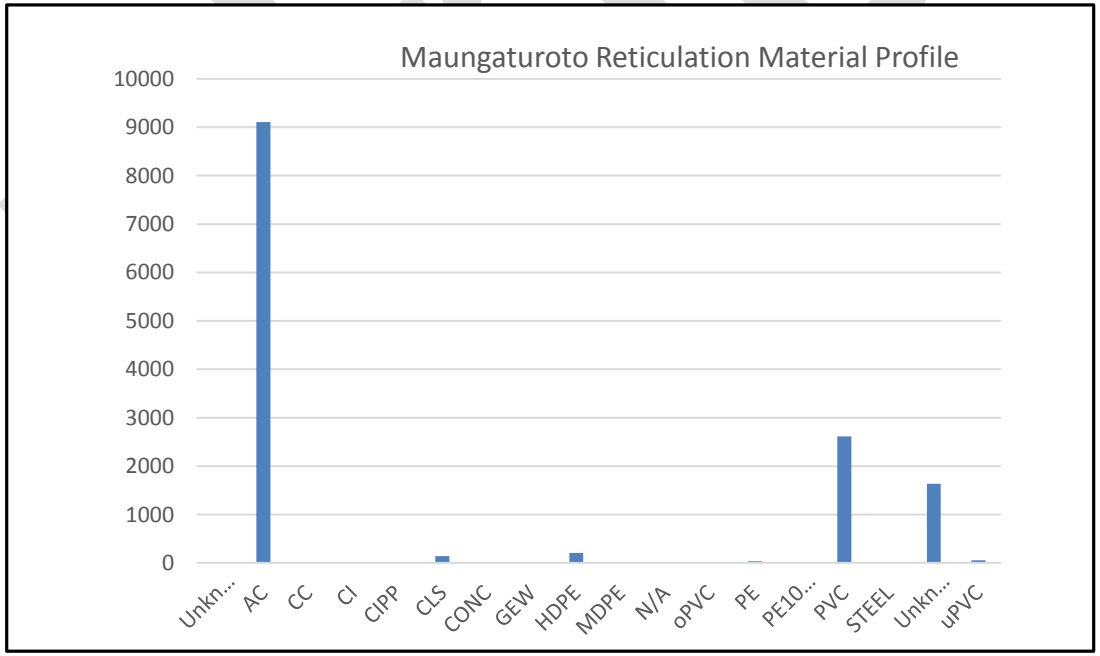
Asset Profiles – Dargaville

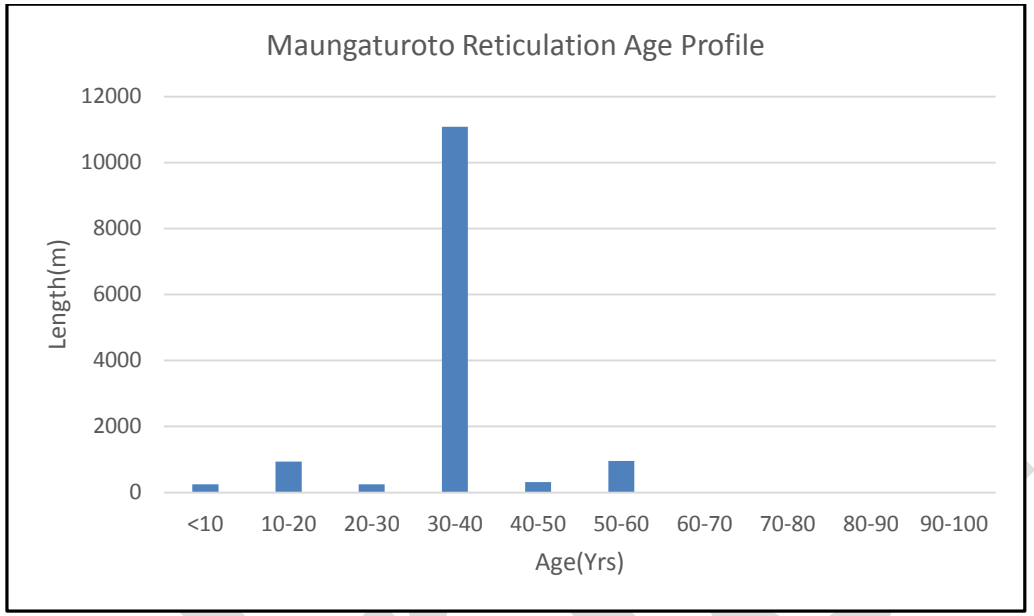






Asset Profiles – Maungaturoto

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10000
8000
6000
4000
2000
0
Length(m)
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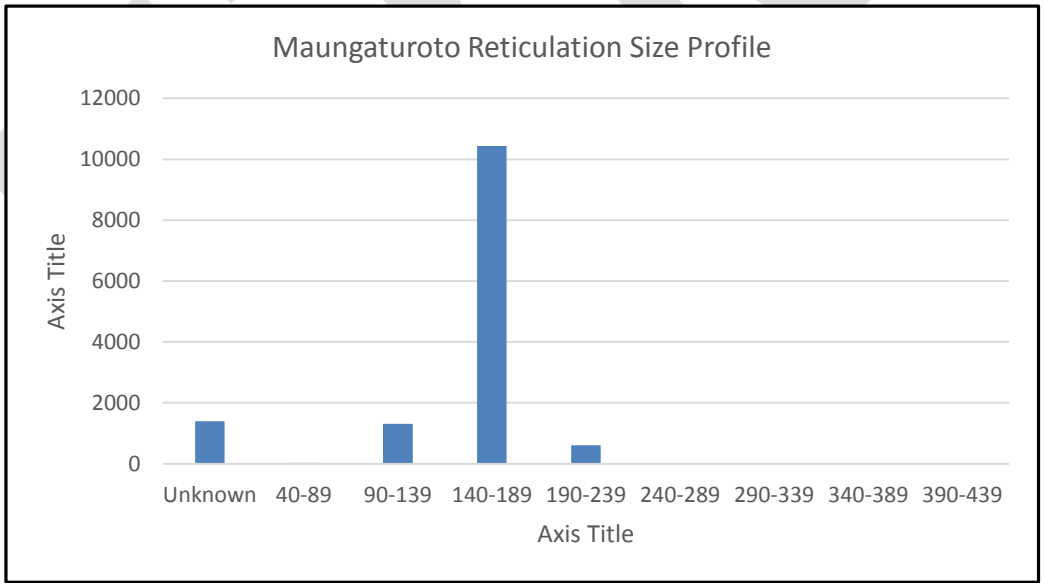
20-30
30-40
40-50
50-60
60-70
70-80
80-90
90-100
Age(Yrs)


Maungaturoto Reticulation Size Profile
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10000
8000
6000
4000
2000
0
Axis Title
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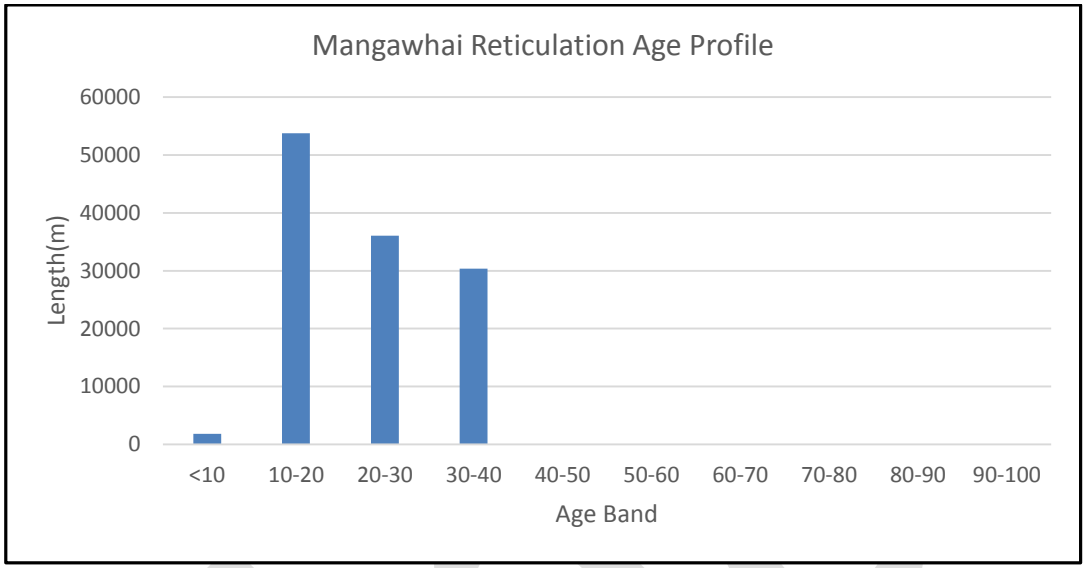
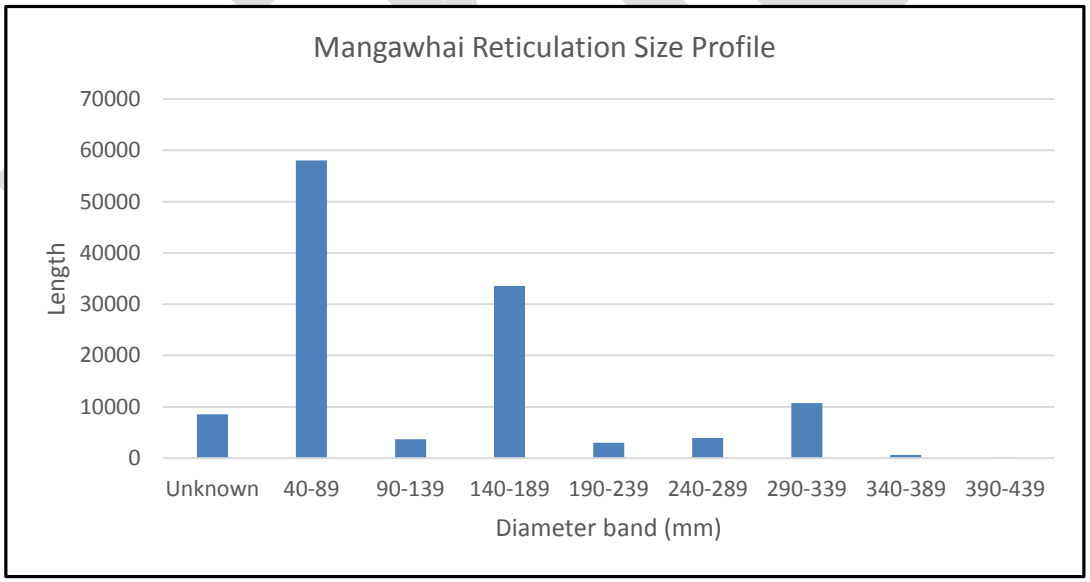
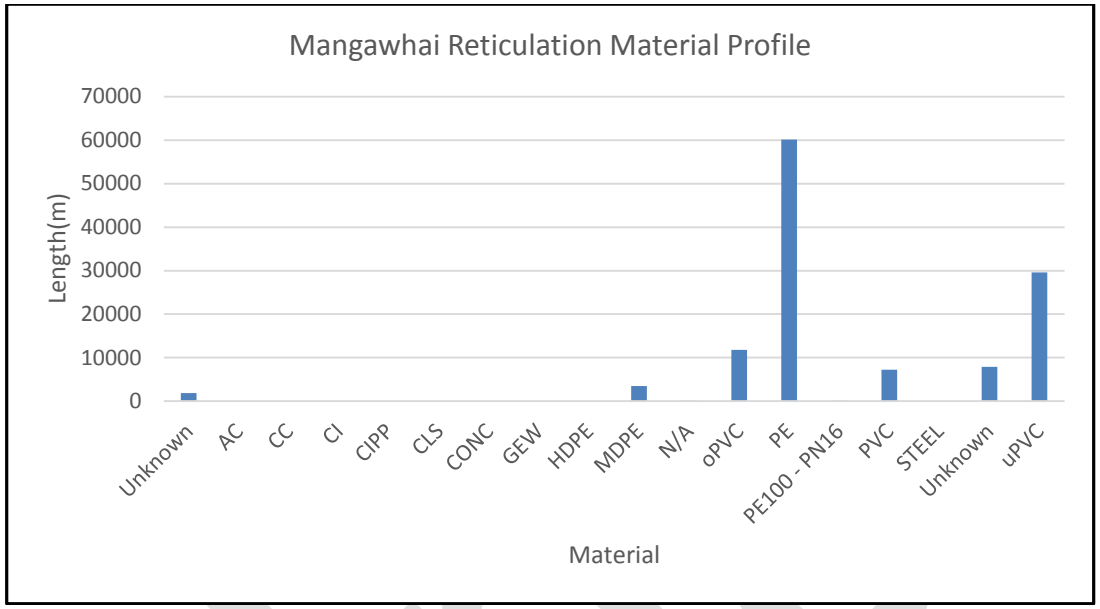
90-139
140-189
190-239
240-289
290-339
340-389
390-439
Axis Title

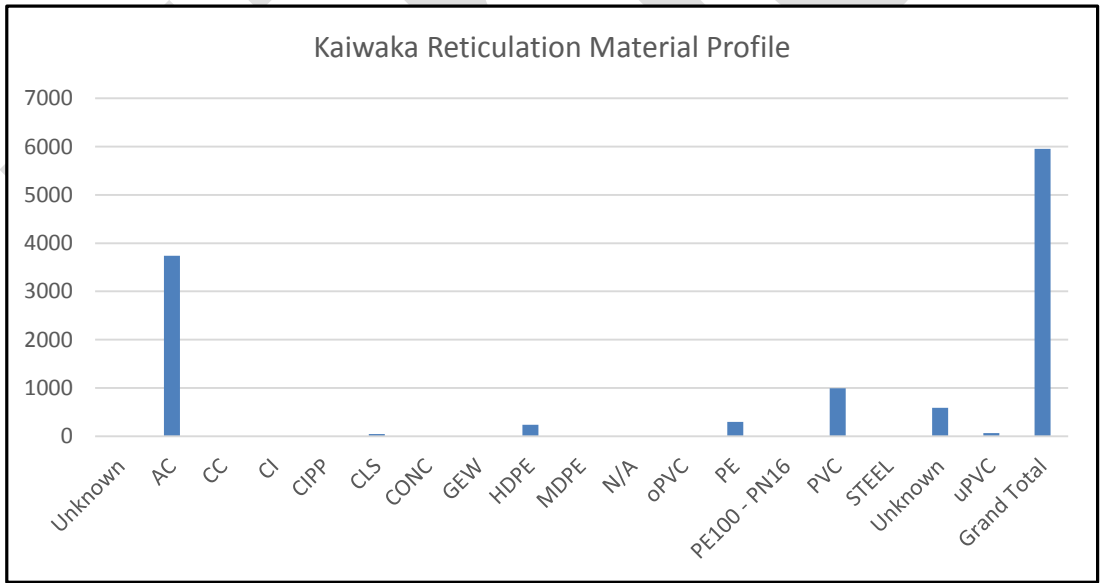
Asset Profiles – Mangawhai

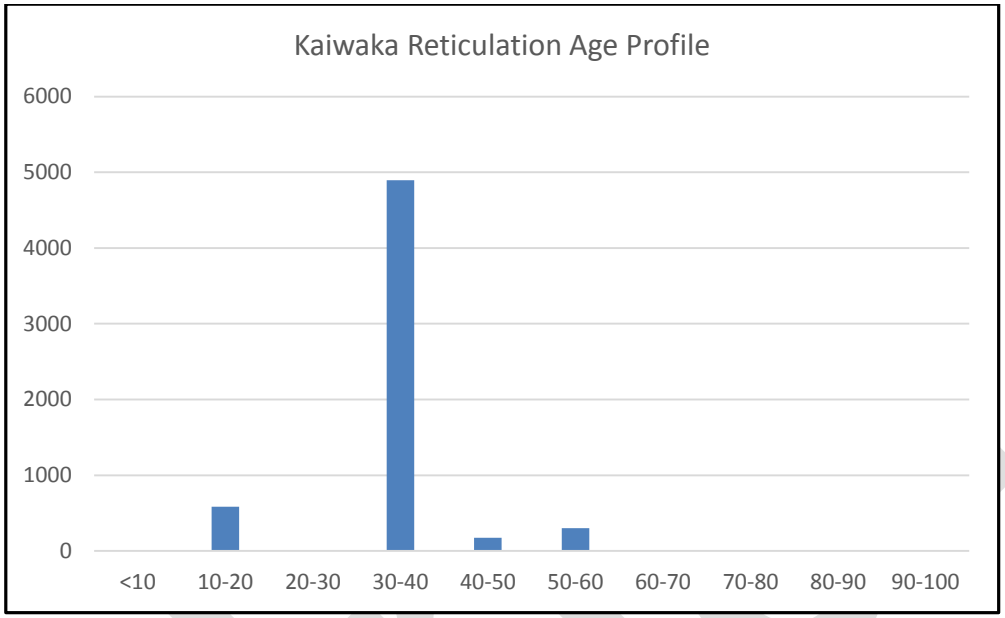






Asset Profiles – Kaiwaka




Kaiwaka Reticulation Age Profile
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5000
4000
3000
2000
1000
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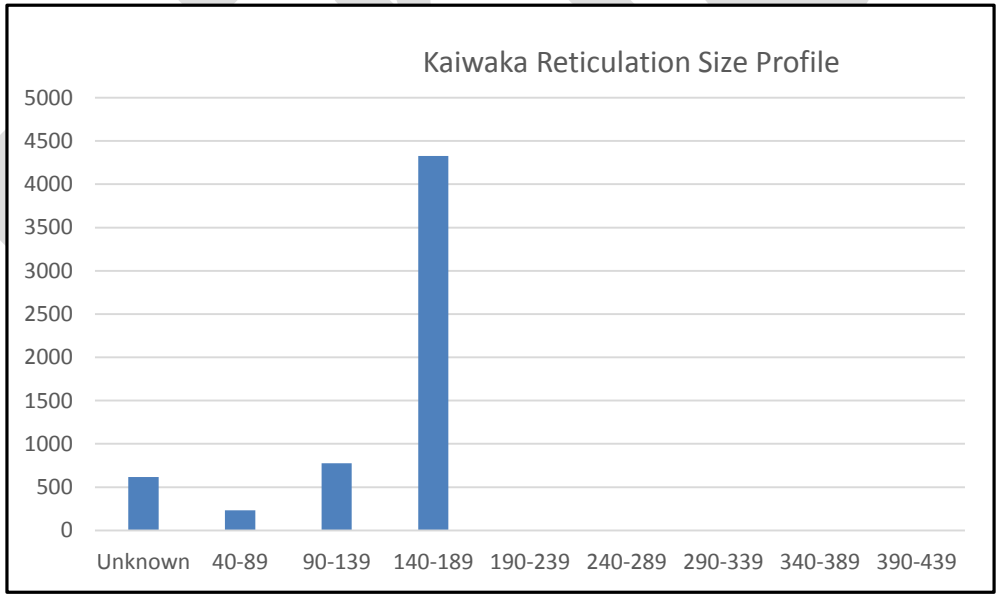
<10
10-20
20-30
30-40
40-50
50-60
60-70
70-80
80-90
90-100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3000
2500
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1500
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Unknown
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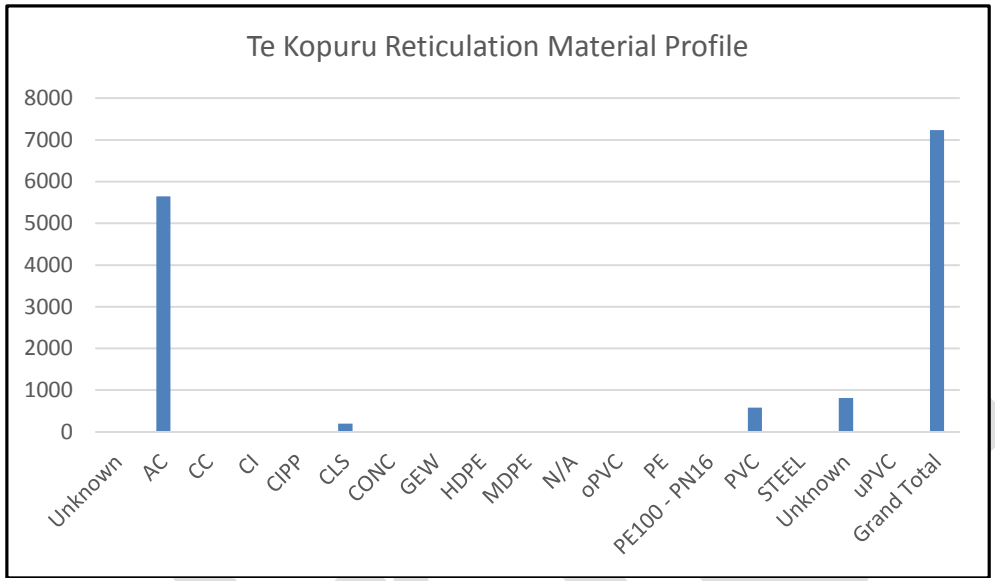
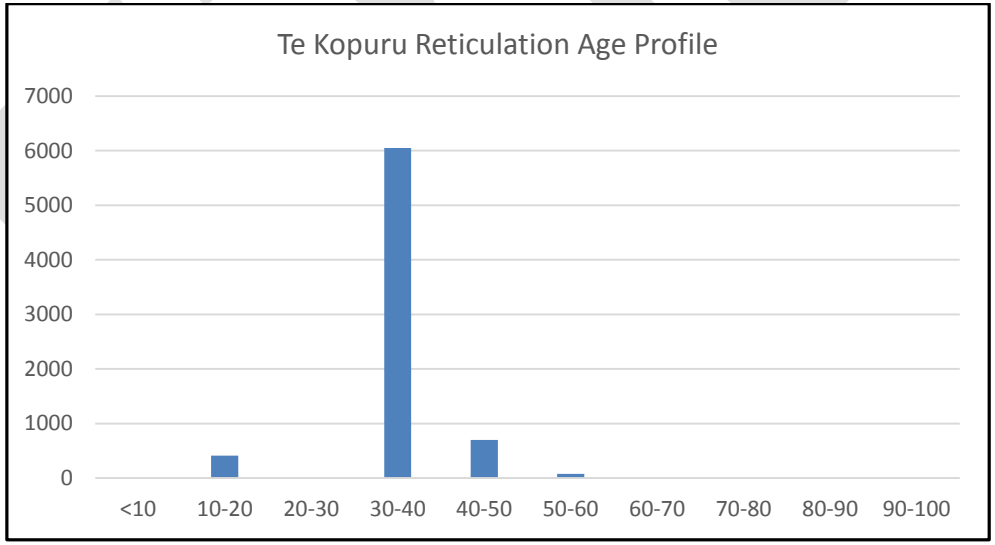
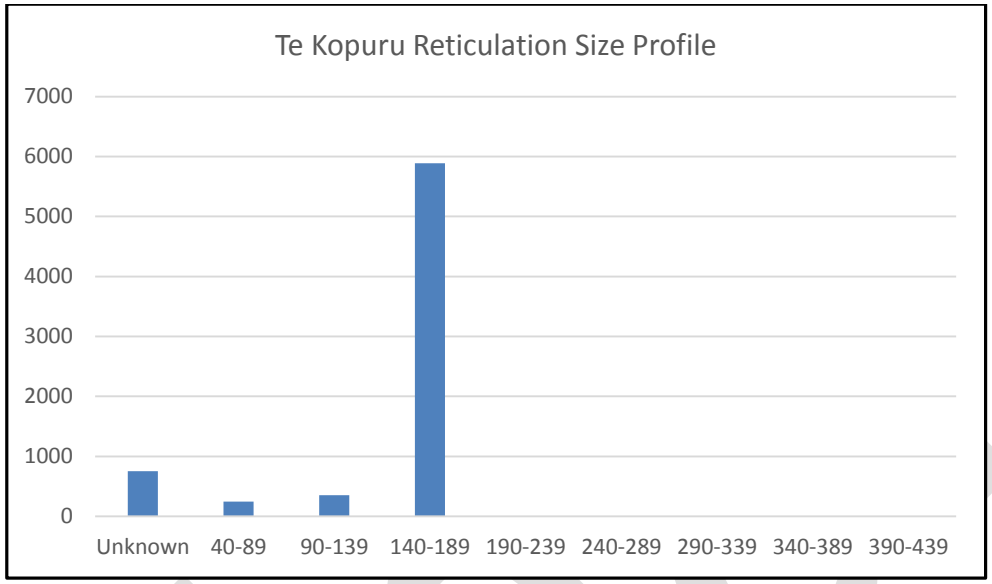
90-139
140-189
190-239
240-289
290-339
340-389
390-439

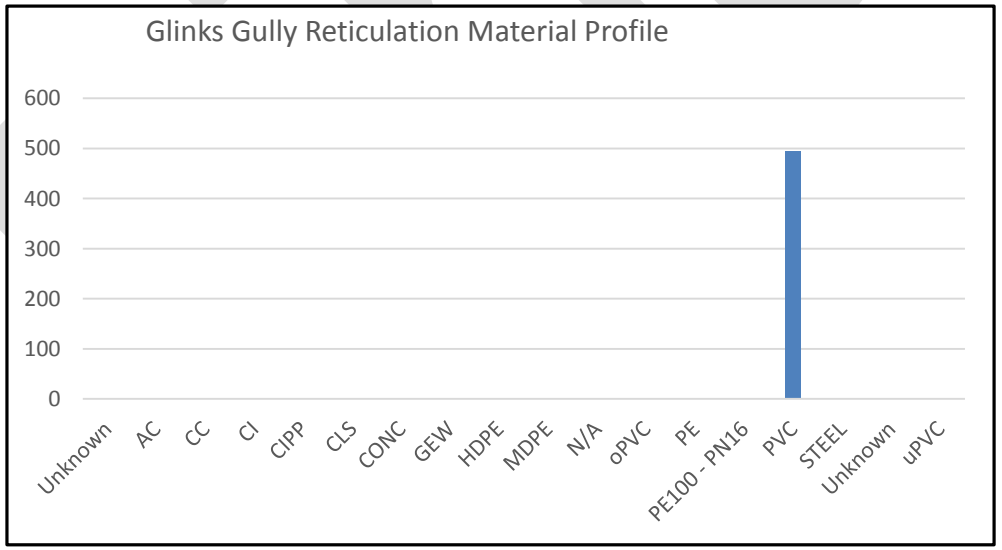
Asset Profiles – Te Kopuru

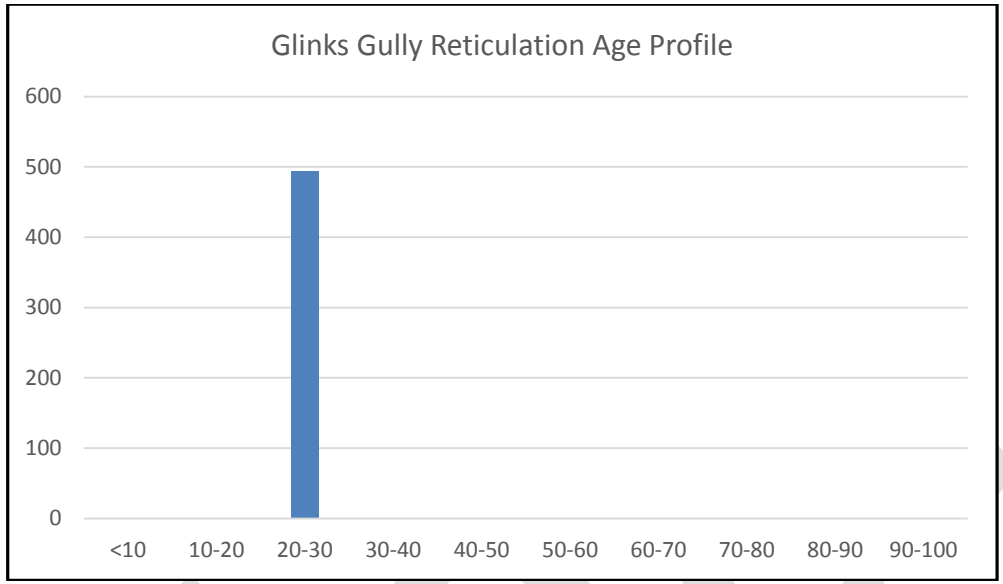






Asset Profiles – Glinks Gully




Glinks Gully Reticulation Age Profile
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500
400
300
200
100
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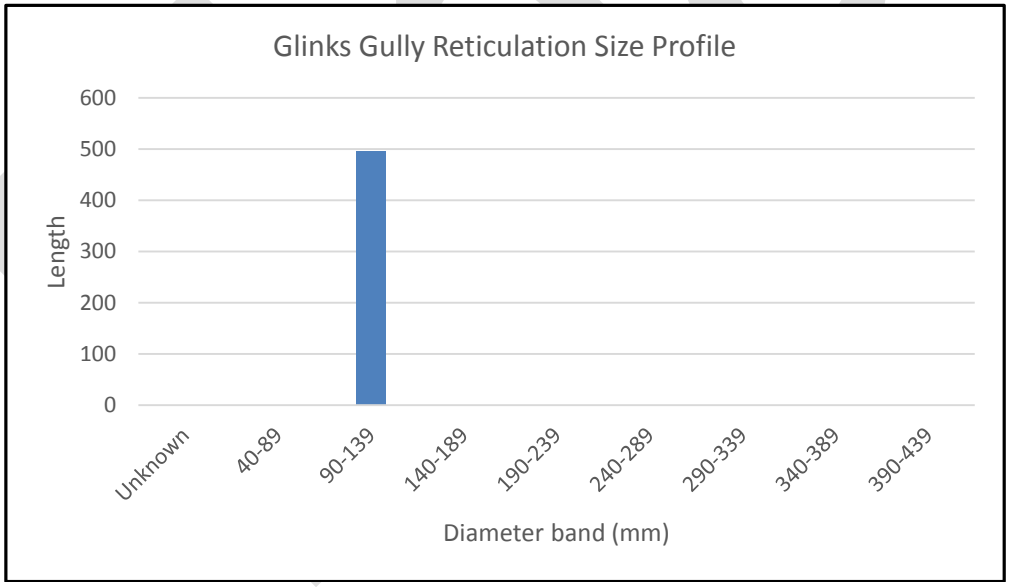
<10
10-20
20-30
30-40
40-50
50-60
60-70
70-80
80-90
90-100


Glinks Gully Reticulation Size Profile
Length
600
500
400
300
200
100
0
Unknown
40-89
90-139
140-189
190-239
240-289
290-339
340-389
390-439
Diameter band (mm)