Kaipara District Council

Stormwater
Strategic Activity Management Plan
2021-2031

Summarising the Scheme Plans

June 2021

Status: Final

Kaipara te Oranganui

KAIPARA DISTRICT

Two Oceans Two Harbours

This document has been prepared by Kaipara District Council.

QUALITY STATEMENT

MANAGER		PROJECT TECHNICAL LEAD
Donnick Mugutso		David Usmar
CHECKED BY Ruth Harvey		…….. ……/……/……
REVIEWED BY David Usmar, Diane Miller		…….. ……/……/……
APPROVED FOR ISSUE BY Jim Sephton		…….. ……/……/……

42 Hokianga Road, Private Bag 1001, Dargaville 0340, New Zealand

TEL +64 9 439 3123, FAX +64 0 439 6756

REVISION SCHEDULE

Rev No	Date	Description	Signature or typed name (documentation on file).			
			Prepared by	Checked by	Reviewed by	Approved by
A	April 2020	1st Draft template	D Jeffrey			
B	June 2020	2nd Draft for Elected Members	D Buttenshaw, D Jeffrey and M Smith			
C	July 2020	3rd Draft	D Buttenshaw, D Jeffrey and M Smith		M Borich	
D	Dec 2020	4th Draft	D Buttenshaw M Smith			
E	Feb 2021	Final Draft for Long Term Plan Consultation	M Smith	R Harvey	D Miller D Buttenshaw	J Sephton
F	May 2021	Final Draft for Long Term Plan 2021-31 adoption	D Usmar	R Harvey	D Miller	J Sephton

Contents

Tables

Figures

1 INTRODUCTION

1.1 PURPOSE OF PLAN

The purpose of this Strategic Asset Management Plan (SAMP) is to summarise Council's strategic and long-term management approach for the provision and maintenance of stormwater assets.

The SAMP provides discussion of the key elements affecting management of Council's stormwater assets, including the legislative framework, links to community outcomes, policies and strategy, the proposed Levels of Service (LoS) and performance measures and demand, environmental and service management. This document should be read in conjunction with Scheme plans for each scheme area, and the Kaipara District Council Activity Management Overview, which provides the background for asset management activities.

1.2 STORMWATER ACTIVITY

Stormwater drainage protects our communities, infrastructure, and public places from flooding by discharging stormwater and collecting contaminants to minimise adverse effects from rain, runoff, and high tides. Stormwater drainage on state highways is managed by NZ Transport Agency (NZTA).

The provision of sustainable stormwater systems is about finding a balance between maintaining and enhancing natural watercourses and providing piping to enable urbanisation to occur while collecting and treating stormwater runoff from the effects of urbanisation prior to it entering the receiving environment waters such that they are not detrimentally affected.

With the changing climatic conditions, potentially higher intensity storms are likely to occur and thus a conservative approach to managing stormwater is considered appropriate.

With the Kaipara Harbour bounding a large proportion of the Kaipara district, this provides a significant focus for effectively managing stormwater runoff and minimising adverse effects on that major receiving environment. This also brings to focus the requirement to prepare and plan for any expected sea level rise, in line with any reports or changes to strategy from Northland Regional Council (NRC).

In providing stormwater systems, Council's aim is to protect people, dwellings, private property and public areas from flooding by providing a stormwater system that meets the LoS set out in this SAMP, and to discharge stormwater and collect contaminants in a manner that protects the environment and public health.

Council's approach to stormwater management is to minimise the impacts on the built environments by reducing adverse effects from stormwater runoff on the environment. The stormwater network is progressively developing, and management requirements will need to be continuously reviewed to ensure the assets are maintained appropriately.

The community outcomes that the stormwater drainage activity contributes to most are largely expected to be unchanged from the Long Term Plan 2015/2025, i.e.

What We Want To See

- *To ensure that stormwater flooding and discharge to the environment is contained and managed to minimise negative impacts on people, culture, property, and the environment.*

Why We Do It

- *To protect people, dwellings, private property, and public areas from flooding by removing stormwater in a timely manner;*

- *To discharge stormwater and collect contaminants in a manner that protects the environment and public health;*
- *Council's approach to stormwater management is to minimise the impact on built environments by reducing adverse effects from stormwater runoff on the environment; and*
- *The stormwater network is subjected to high intensity rainfall events.*

The Level of Service

- *To provide s systems in urban areas with the capacity to drain water from normal rainfall events and cope with a 1 in 50-year rain event so that habitable floors are protected, and public areas drain in a timely manner.*
- *Respond in a timely manner when habitable floors are threatened;*
- *Where stormwater drainage systems exist, to comply with resource consent conditions; and*
- *Services to customers will be reliable and dependable.*

Note: *It is to be noted that Council does not manage stormwater drainage on State Highways. Stormwater drainage management does not include floodwaters from rivers or land drainage.*

1.3 WHAT WE DO

We manage five community stormwater drainage schemes for Dargaville, Baylys, Te Kopuru, Kaiwaka and Mangawhai. The level of service for the schemes is only to protect habitable floors from flooding by removing and discharging stormwater. The system collects contaminants in a way that protects our environment and public health; and responds promptly and reasonably to threats of flooding on habitable floors. We maintain the performance of the stormwater drainage systems to the expectations of the community.

Stormwater drainage systems in Whakapirau, Glinks Gully, Kelly's Bay, Pahi, Tinopai, Paparoa, Maungaturoto and Matakohe are mostly incorporated into our roads network. There are a number of open drain systems that exist throughout the district.

Council undertakes the following with assistance from their maintenance contractor, and other service providers as required:

- asset management
- customer services
- network operations and maintenance
- capital and renewal works programme; and
- consent renewal, monitoring and compliance.

1.4 BENEFITS TO THE COMMUNITY

Our stormwater drainage activities protect public health and contribute to our cultural, social, economic, and environmental wellbeing by:

- protecting habitable floors from flooding by removing and discharging stormwater
- draining water from public areas in reasonable time in normal rainfall events (as defined by LoS events up to 1:50 year or 2% annual event probability)
- manage up to the 1:50 year rain event for habitable floors above the 1:50 year flood level
- complying with resource consent conditions

- following best current practice in management of health and safety, cultural, social, environmental, and economic outcomes
- incorporating water sensitive design to promote resilient catchments
- collecting contaminants in a way that protects our environment
- planning for climate change to support resilient catchments in the future.
- we provide and maintain infrastructure that supports the economy of the area. We will ensure that people who are able to, will be connected to Council schemes; and
- we are intent on lifting Kaipara district's wellbeing by providing infrastructure where people live close together, which protects the health of both the community and the environment.

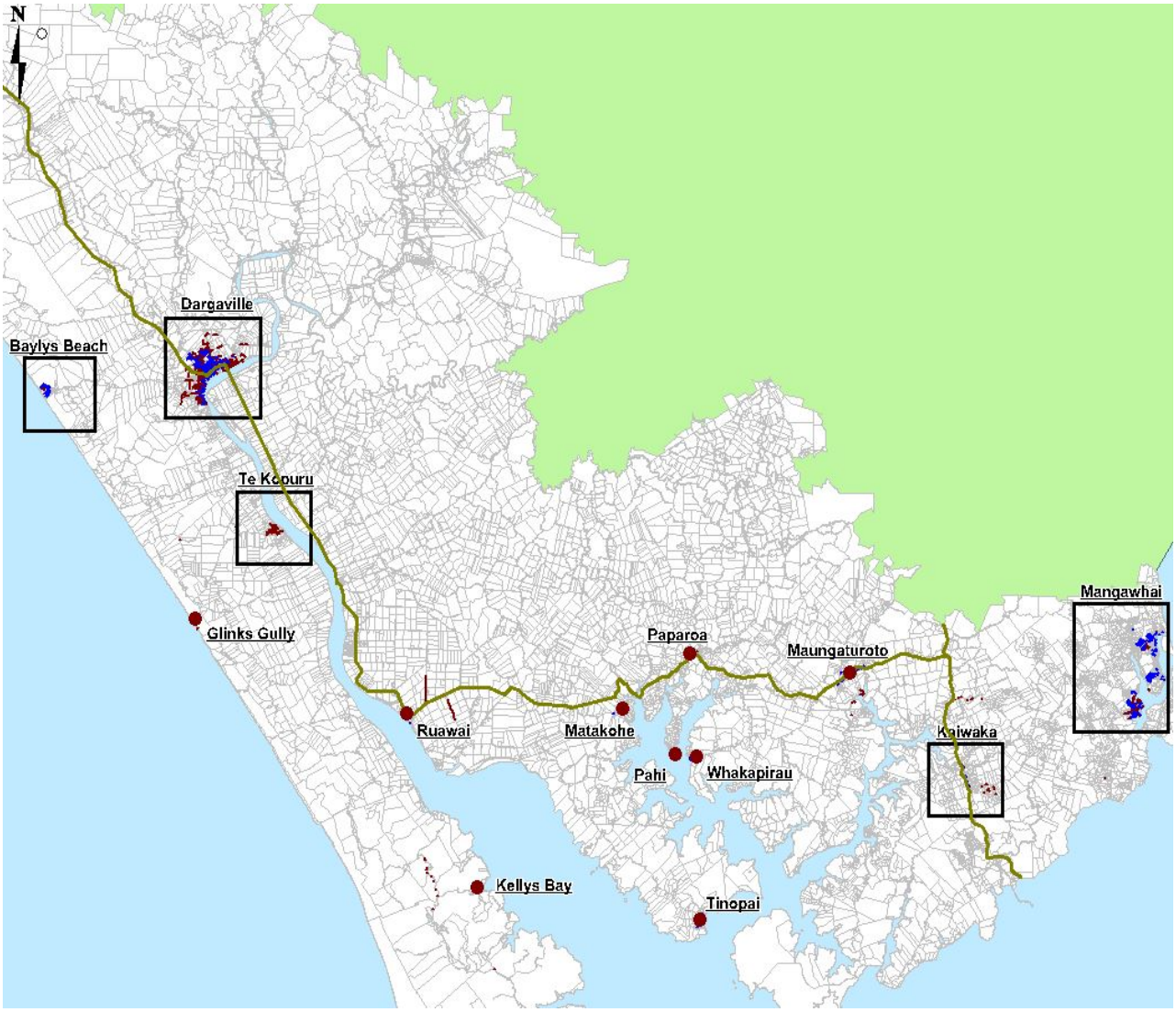
How it contributes to our community outcomes:

- Climate smart: Catchment plans and resource consents are managed to mitigate the effects of Climate change
- Vibrant communities: Stormwater is managed to support community and business activities
- Healthy environment: Investment into Infrastructure to minimize environmental effects and runoff into our waterways.

2 THE ASSETS

The five Council operated community stormwater schemes are in Baylys, Dargaville, Te Kopuru, Kaiwaka and Mangawhai. The location of each of these communities within Kaipara district is illustrated in the Figure 1. These townships all have piped urban stormwater networks of varying scales. Rural areas and the smaller townships are currently serviced primarily by the roading infrastructure department. Stormwater systems predominantly incorporated into the road network are provided in Glinks Gully, Kelly's Bay, Pahi, Whakapirau, Tinopai, Paparoa, Matakohe and Maungaturoto. The Ruawai scheme is operated under the Raupo Land Drainage scheme.

Figure 1: Location of Stormwater Schemes



An overview of the stormwater assets in the district is provided in the asset overview and asset valuation summary table below.

Table 1: Extent of assets

Community	Pipeline length (m)	Open drain(m)
Baylys Beach	4,222 (6% increase)	10 (0% increase)
Dargaville	36,479 (2% increase)	24,391 (30% decrease)
Te Kopuru	1,370 (819% increase)	3,918 (18% decrease)

Community	Pipeline length (m)	Open drain(m)
Kaiwaka	2,098 (27% increase)	262 (0% increase)
Mangawhai	29,760 (20% Increase)	7,741 (19% decrease)
Grand total	**82,833** (25% increase)	**70,652** (50% increase)

NB: Various natural assets such as overland flow paths and soft assets including riparian planting are located throughout the district. Increases in assets from the previous AMP are due to growth and active data collection projects. Decreases are mostly due to asset not being verified as existing. Baylys and Kaiwaka show no change in open drain assets, this is because data collection projects have yet to look at these assets.

Table 1: Asset valuation

Asset Type	Replacement cost ($)	Depreciated replacement cost ($)	Annual depreciation ($)
Stormwater Lines			
Gravity Main and Catchpit Leads	$23,129,493	$13,999,507	$321,773
Service Connections	$1,212,428	$959,349	$18,716
Open Drain	$2,977,271	$2,962,227	$458
Culvert	$1,067,815	$765,088	$14,404
Drain	$729,771	$721,374	$567
Other Drainage	$318,202	$294,095	$3,044
Sub Total	**$29,434,981**	**$19,701,640**	**$358,962**
Stormwater Points			
Catchpit and Soakpits	$2,639,893	$1,832,773	$29,457
Inlets and Sumps	$445,048	$396,542	$4,450
Manhole	$5,974,080	$4,426,106	$59,741
Outlet	$608,543	$538,023	$6,085
Floodgate	$2,302,111	$434,973	$43,821
Sub Total	**$11,969,674**	**$7,628,417**	**$143,554**
Stormwater Ponds and Stopbanks			
Dargaville stopbanks	$7,093,101	$6,649,558	$27,721
Dargaville detention ponds	$45,485	$45,485	$0
Mangawhai detention ponds	$195,877	$194,645	$112
Sub Total	**$7,334,464**	**$6,889,689**	**$27,833**
Total	**$48,739,119**	**$34,219,746**	**$530,349**

Source 2018 Valuation

Note * = Maungaturoto, Pahi, Paparoa and Whakapirau stormwater systems mostly form part of the Roading asset base

2.1 ASSET DATA

Council has a number of information systems that store asset data and enables various analysis to aid in the management of the activity.

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

The improvement of Council's data collection and entry processes has previously been identified as a critical project. This project is now underway with CCTV investigations and other data cleansing projects within the Kaipara district, which will improve the knowledge of our existing assets.

Following completion of improvements, Council will continue to focus more on using previously un-utilised functions of their support tools. These include recording maintenance history at asset component level in the asset management system (AssetFinda) each time a works order is completed, managing defects and requests through the works request functions and fine-tuning valuation and renewals.

As more information is recorded, an initial assessment and listing of renewal needs will 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 are listed in the Improvement Plan

2.2 PIPELINES

The known stormwater network is made up of 87.3km (56.7km in 2015 assessment) of pipeline, 83.0km is tagged as a water's asset (the remainder being transport and private assets). The increase is because of added assets to the management system, newly found and growth.

- 22% of pipe diameters are unknown (18.3km) this is compared to 37% (20.7km) in 2015;
- 32% of pipe materials are unknown (26.7km) compared to 57% (32.4km) in 2015; and
- 19% of pipes have unknown diameters and unknown materials (15.9km) this compares to 34% (19.3km) in 2015.

The majority of pipe material is concrete with small amounts of asbestos cement and PVC. 2020 data no longer shows a RCRRJ as a pipe material, this is due to the asset cleansing project which has standardised material codes based on good practice guidelines.

2.3 ASSET PROFILE

Figure 2: Asset profiles

A review of the asset register to ensure all assets have been properly recorded has been identified as an item in the Improvement Plan, along with a data cleansing project to reduce the number of unknown asset attributes in the asset register.

Asset age is based solely on the instillation date held in the asset management system. For older assets, the Infrastructure department has very low assurance of the accuracy of this date and there is no known solution to improve this accuracy. Many older assets have an age which is classed as a best guess. This is the main reason an in-depth condition assessment of the existing network is being undertaken; the age cannot be reliably used as a condition estimate for the renewal strategy.

Data on asset condition has previously been low. The default setting for condition being 'Excellent' has meant historically the data has shown a network that is in much better condition than it is. In this SAMP, renewal profiles assume that assets older than 01 January 2000 have an 'Unknown: condition (unless a condition survey is recorded) so the condition is estimated on age. Assets installed between 2000 and 2015 are considered 'Average' condition and assets installed since 2015 are considered 'Excellent'. Current Improvement Plans are working toward obtaining asset condition for the majority of the older assets with condition of the newer assets left to the estimate above.

Table 3: Data confidence rating

Scheme	Confidence rating
Dargaville	C
Kaiwaka	D
Mangawhai	C
Baylys Beach	D
Te Kopuru	B

Table 4: Confidence rating key

Grade	Confidence rating	Accuracy
A	Accurate	±5%
B	Minor inaccuracies	±15%
C	Significant data estimated	±30%
D	All data estimated	±40%

2.4 CRITICAL ASSETS

The criticality framework is documented in the KDC Asset Management Overview. The key assets and their criticality are presented below. This is based on the Project Max report.

Historical evidence and local knowledge has identified the assets in Table 5 below which could be considered to be "critical". Failure of these assets could compromise the stormwater network. A greater level of management has been applied to the most Critical assets.

Criticality allows for prioritization of renewals, maintenance, and routine operational checks.

Table 5: Critical stormwater assets

Moderate Criticality		
Reticulation	Large culverts ≥ 900mm	• Consider pipes ≥ 900mm to be Moderate due to consequences of ground stability and/or flows taking alternative path in event of pipe failure. • Capacity of these pipes is adversely impacted by high river levels associated with major rain events and/or spring tides

Moderate Criticality		

Reticulation	Inlets and Outlets	• There are 3 potential issues with these grates:
		  ○ potential for blockages of inlet grates with debris;
		  ○ potential for children to enter the drains if the grate is not in place; and
		  ○ significant scouring of the beach leading to undermining of the pipe.

Reticulation	Infrastructure in lowest parts of the district	• As Identified by flood susceptibility maps (NRC or KDC as appropriate) • Minimum of Moderate criticality
High Criticality		
Reticulation	Pipes running under buildings	• High (Major)
Flood protection	Stopbanks on Wairoa (east and west), Awakino and Kaihu Rivers	• High (Extreme)
Flood protection	Floodgates	• High (Extreme)

NB: All other assets are deemed Low criticality

3 CHALLENGES AND KEY ISSUES

3.1 IDENTIFIED NEGATIVE EFFECTS AND ISSUES

The stormwater activity is an essential service that is provided to our communities and the environment. Discharges from the urban stormwater network can impact cultural, social, environmental, and economic wellbeing. In addition to managing the quantity of stormwater it is recognised that the activity also includes the quality of discharges to and from the network on the receiving environment. Both aspects of urban stormwater discharge have the potential to have significant negative effects on the environment and these should be mitigated as best as is practicably possible.

Guidance on the design and construction of new stormwater networks for urban and rural areas is provided in the Engineering Standards (The Standards) published by Kaipara District Council. Holistically, the design of systems in accordance with the Standards will minimise the impacts of stormwater 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 LoS provided throughout the network.

The negative effects/issues identified by Council and mitigation measures in place are listed below:

Table 6: Identified negative effects/issues

Identified negative effect/issue	Mitigation
Level of Service (LoS) versus Feasibility The construction and maintenance costs of infrastructure upgrades to meet a set level of service is beyond the means of the community to afford. Targeted rates for small communities do not enable good network management.	The provision of a set level of urban stormwater management should be assessed on a case-by-case basis. This will be managed through consultation with communities to determine the most practicable way forward, without negatively impacting on public health and the environment or creating risk to persons or property. Council is committed to improving the natural environment but acknowledges that this will take time to make significant improvements due to the low population of the district and the type of land use within. Council will work closely with NRC to ensure that conditions of resource consents are fair and justifiable from a risk and sustainability viewpoint.
Contamination of Urban Watercourses Urban stormwater runoff has the potential to adversely impact the receiving environment stakeholders and users.	The engineering standard provides minimum standards for stormwater infrastructure. It includes guidance on both quantity and quality control to reduce the impact of development on the receiving environment. Updates will include best practice for Water Sensitive Design and treatment. Continue to improve understanding of coastal/estuarine outfalls and the effects on the environment and incorporate best practice into catchment management plans. For existing developments, Council assesses the effectiveness of the existing stormwater management through the following methods: • Individual site management and monitoring for identified high risk industrial and commercial sites

Identified negative effect/issue	Mitigation
	• Champion the use of Water Sensitive Design • Interaction with and education of the public to make people aware of potential impacts; and • Ongoing monitoring of watercourses, in conjunction with NRC, to establish contaminant profiling allowing for targeted treatment schemes where required.
Contamination of Rural Watercourses Rural stormwater runoff is likely to have a different contaminant profile than that from the urban areas. Depending on land use rural runoff potentially has elevated levels of nitrogen and phosphates than urban stormwater, due to fertiliser usage and animal husbandry.	The engineering standard provides general guidance for the management of rural stormwater runoff. The section primarily relates to quantity control of runoff, although there is a recommendation that appropriate water quality treatment options be considered in conjunction with attenuation. The engineering standards will be updated to reflect best practice in Water Sensitive Design and treatment.
Climate Change Increasingly climate change effects, particularly increased rainfall intensity and sea level rise will challenge the resilience and capacity of the network.	The impacts of climate change and sea-level rise on the existing networks and future growth needs to be investigated and any negative effects need to be mitigated as much as practicable, through design of growth network, current capacity, existing flood protection/land drainage measures, and the possibility of future flood protection/land drainage districts. Increasing challenges to the low-lying infrastructure in Dargaville and Mangawhai will need to be met with innovative solutions so LoS can be maintained. Increased focus on water sensitive design and green infrastructure will play a big part in these solutions. Focus on flood protection devices in low-lying areas of Dargaville and Mangawhai is critical.
Flooding Direct Impact Urban catchments create a greater amount of impervious coverage (such as roads, roofs, and paved areas) than would be seen in the natural environment. Runoff is generated quicker from paved areas and can result in overland flow paths and localised flooding, which can damage property and increase the risk to life.	Within urban areas Council's engineering standards consider that attenuation of discharges up to the 100-year event should be no more than the pre-development condition. This allows for protection of the receiving environment from potential erosion and flooding. The attenuation of runoff allows for flooding to be controlled locally, within the specific device. Online tools are being developed to enable better planning around problem areas such as overland flow paths. It should be acknowledged here that effects of climate change on the district's weather patterns can result in a reduced LoS delivered by the older parts of the stormwater network. Although these systems will be upgraded over time, priority will be given to areas where flooding as a result of capacity issues impacts upon property or life.

Identified negative effect/issue	Mitigation
Network Resilience and Capacity not supported by a holistic design Historical focus on grey infrastructure has not gained the district the potential advantages of water sensitive design.	The historical focus on grey infrastructure has enabled systems that have high flow outlets to the receiving environment, are less likely to return water to ground and are less robust. In the long term, continuing this philosophy will negatively impact on the capacity for aquifers to recharge and the catchments to be resilient under increasing hydrologically challenging times. There is now a focus on green infrastructure and water sensitive design.
Stormwater Infiltration Studies of the stormwater network in Dargaville and Mangawhai have found stormwater leaking into the wastewater system.	This is believed to be a common problem throughout the district. Increased loading on the wastewater system has the negative effect of overloading wastewater treatment facilities, which in turn can result in increased discharges to the receiving environment. Not only does this reduce the efficiency of the treatment facility, it can also increase pathogens and other contaminant levels within the receiving environment. Aging infrastructure, particularly in Dargaville, is due to long term under investment. The problem has been identified as originating from both the public and private stormwater systems. A robust renewals programme is planned.
Infrastructure not maintained to the correct standard Base infrastructure maintenance and renewals has been under resources leaving capacity and resilience issues. Green infrastructure devices have been poorly catalogued and maintained.	A robust maintenance schedule is being developed with the maintenance contractor and asset management improvements are set to allow clarity on ownership and responsibility of core assets and green infrastructure assets
Future growth The spatial plans have identified the likely growth areas in Kaipara. Fast growth without good infrastructure planning has in some cases such as Mangawhai left deficit in funding and LoS provision.	Formal, reticulated stormwater systems and funding will be required in the future for small townships so LoS can be maintained with growth. Investigations will need to cover capacity of existing infrastructure and identify a plan to allow and facilitate future growth, this should be covered in Catchment Management Plans. These plans will be updated for Mangawhai and Dargaville and created for all other areas in conjunction with Spatial Plans. Mangawhai network capacity and resilience has suffered due to fast unplanned growth. Because five schemes have targeted stormwater rates, funding for works beyond these schemes is currently very small and an overall funding model should be agreed on to engage community growth.
Public safety Public safety is at the forefront of network operations some assets however have an inherent risk.	All risks to the public are elevated with urgency to the maintenance contractor and continual improvement is applied to the built environment.

Identified negative effect/issue	Mitigation
	Some concern has been raised in urban areas regarding open drains. When concerns are raised, these should be investigated to understand the community's reasons why the drain needs to be piped and then each case assessed with regards to safety, to determine if the piping is warranted. Generally Council policy is to not pipe open drains (and not allow private piping of open drains) unless there a strong evidence for a positive safety gain.
Asset data Many aspects of the asset management system still require improvement.	The current asset data still has gaps and inconsistencies although improvements have been made since the last AMP. Asset data management is a process of continual improvement and there are multiple improvement projects underway and planned. Accurate asset data is essential information to enable Council to plan future works effectively and efficiently, capital upgrades as well as routine operational monitoring of the network. Asset inconsistencies also present a risk in giving the public incorrect information about asset locations. Further clarification of ownership and associated operation and maintenance responsibilities is needed across the district. Some work has been done since the last AMP so that definitions of ownership are clearer for transport and waters assets and an agreement on how to ensure transport assets are populated to the waters database has been reached. There are still many roading assets not represented in the waters database though, and some assets have incorrect ownership tags. These will require asset cleansing surveys.

Refer to Infrastructure Services Risk register for an overview of associated risks.

4 DEMAND MANAGEMENT

4.1 COUNCIL'S APPROACH TO DEMAND MANAGEMENT

The impact of growth is currently managed in multiple ways:

- **Regulatory control**

  Integrating the stormwater management objectives in all new developments from initial planning and design stages. This is the basic approach of Council's Engineering Standards.

- **District Plan**

  The District Plan is the legal framework that is used for land use planning. The proposed District Plan does not allow an increase in downstream flows post development.

- **Catchment management planning**

  Catchment management planning is a key tool for facilitating the integrated approach to stormwater management to achieve the desired environmental outcomes. The draft catchment management plans developed to date will be updated as per the Improvement Plan with no need for adoption.

- **Education building community knowledge**

  Education is an important tool for providing the community with an understanding of their role and responsibility for managing their private stormwater systems, especially in regard to green infrastructure. Environmental awareness is increasing as the community realises the need to protect the environment, however at the same time property owners expect to be able to develop their property without restriction. Council has undertaken limited education to date however it is a demand management mechanism that can be considered in the future and may be added to the SAMP improvement document. Education promotes environmental awareness and the effects of activities such as car washing, where contaminants may enter the stormwater system through sumps.

Table 7: Examples of stormwater demand management strategies

Demand component	Stormwater examples
Operation Looks at LoS provided by the infrastructure and the application of Best Practice Options for sustainable long-term management.	Maintaining the existing stormwater network through the application of an efficient operations and maintenance contract will ensure that the current LoS is met whilst also identifying and highlighting any issues across the district, the better the network is maintained the more resilient it is. Resilience is the key aim of Water Sensitive Design and protection of overland flow and waterways (persistent and ephemeral) is a component of this philosophy. Integration of national and international standards for stormwater device design into engineering standards documents.
Design Constantly changing standards allow for better stormwater design and management, Water Sensitive Design, and treatment at source.	Application of Water Sensitive Design as per existing standards and as technology is constantly improving allow for better stormwater management, reduced peak runoff and better water quality. Integration of improved technology and increased awareness of changes to stormwater management internationally, attendance at conferences and allowing consultants to raise any improvements they feel will better suit environmental needs, will ensure that the best solution to meet the required LoS will be constructed whilst also maintaining focus on environmental improvements and water quality.

Demand component	Stormwater examples
Incentives Encourage the application of Low Impact Design throughout the community, soakage, rain gardens and other source treatment options.	Community education and interaction to promote the use of flow calming and pollutant capture devices such as rain gardens, detention/attenuation ponds and other source treatment options. This will enable the mitigation of damage from peak flows and to allow for water quality treatment prior to the discharge to the receiving environments.
Community education/interaction Develop partnerships with the communities in the district.	Production of engineering standards to aid development in the selection of the Best Practicable Option for stormwater management. Printed/electronic factsheets to promote stormwater and the receiving environment. Working with schools and engaging the community at an earlier level to promote water health,
Connection denial Regulation of connections to the public system to promote long term stability.	Where development lies outside of the prescribed growth zones, or where substantial increases in growth are identified, Council may consider the option to force developers to treat and attenuate stormwater runoff from the development within their site boundaries or to fund the upgrades to the network required to connect them.

4.2 TECHNOLOGICAL CHANGE

Historically the methodology for dealing with stormwater runoff was to quickly remove it from urban and risk areas as quickly as possible through pipe networks and dedicated overland flow paths. Discharges were made direct to the receiving environment with little regard to the potential contaminants that they may contain, and the effects they could have on the stability and functioning of the ecosystems.

Over the past two decades there has been a philosophical shift in this principle as new technologies have been developed to promote Water Sensitive Design in the management of stormwater. This involves implementing solutions to mimic the natural environment prior to development and managing the impacts on the receiving environments. These solutions seek to increase the resilience of the network and can add to other values such as ecological corridors.

Such advancements in stormwater management include the application of a treatment train approach (i.e. the use of two or more treatment methods in a series to provide more effective contaminant removal), such as the use of ground soakage to maximise groundwater recharge and riparian planting around watercourses.

This shift in philosophy is supported by Council and guidance for its application is provided in the engineering standards and supporting documentation.

Technological advances in stormwater management are leading to more economically feasible devices entering the mainstream market and becoming more widely used. Stream restoration and riparian planting is replacing the standard lined channel, whilst the general treatment train approach to water quality is being applied to greatly improve discharge quality to lessen the effect on the receiving environment.

Council considers the use of wetlands and detention basins for stormwater management are integral parts to mimicking the natural flow regime in the receiving environment, whilst providing good levels of treatment.

Council is committed to working with NRC to implement new technology for stormwater management throughout the district. A constant awareness of technology changes is necessary to predict future trends and their impact most effectively on the utility infrastructure assets. This can be achieved through Council staff attending conferences, seminars, and presentations along with seeking advice from professional advisors.

4.3 LEGISLATIVE CHANGE

Legislative change can significantly affect 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 stormwater discharge requirements.

In addition, changes in legislation can influence the ease at which new resource consents are obtained or existing consents are renewed. Experience has demonstrated that resource consent conditions are becoming more stringent with increased monitoring requirements being commonplace and the likelihood of additional treatment being necessary.

The Ministry for the Environment (MfE) is promoting a series of National Environmental Standards that can be enforced as regulations under the RMA. One of the sections under development relates to ecological flows and water levels in rivers, lakes, wetlands, and groundwater resources. Although the receiving environment is already assessed in resource consent applications, the impact of this standard is likely to require greater consideration of discharge quantities and quality of stormwater into the receiving environment.

NRC is in the process of finalising the plans and policy surrounding proposed sea level rise and climate change, once this has been formally adopted KDC will prepare and adopt any changes required to its standards and District Plan to meet the new requirements.

4.4 ENVIRONMENTAL CONSIDERATIONS

Environmental considerations are an everchanging issue. As such, there is a requirement for Council to provide the best service it can with the most up-to-date information.

With climate change and predicted sea level rise KDC will need to alter its focus and the considerations around flood levels, stormwater discharge and consented discharge limits to match the requirements from NRC, the change in public expectations and the altering natural environment.

Public perception of the impact of stormwater on the natural environment has altered noticeably over the last decade and has turned towards treating stormwater at the source and maintaining the quality of the harbours and waterways.

Urban stormwater runoff contains a range of contaminants which typically include organic and inorganic materials, metals, and hydrocarbons. During very intense rainfall events contamination of stormwater from the wastewater network may also be present. The quality of stormwater runoff therefore has a significant impact on the quality of the receiving environment, being streams and rivers.

There is a growing awareness of the environmental issues related to the quality of stormwater runoff on the receiving environments of our streams, rivers and groundwater and its impacts on our cultural, social, and economic wellbeing.

Council, in conjunction with NRC, and communities are dedicated to protecting receiving environments, to protect it for future generations and to improve on the existing state. This is achieved through:

- Management of silt runoff from new development earthwork areas (including silt pond requirements for developers)

- Management of point source contamination risks (through the current Engineering Standards 2011 and community education); and
- Monitoring the receiving environments.

It is likely that as time progresses and more knowledge is gained from monitoring programmes about the effects of contaminants on the receiving environments, that more stringent conditions will be applied on resource consents granted by NRC, including, but not limited to:

- Targeted contaminant removal (for example reduction in zinc loads)
- Increased overall treatment efficiency of stormwater management devices; and
- Greater application of LID in the overall stormwater management on a catchment basis.

Council will promote the best practicable option for the operation of the public stormwater infrastructure on behalf of the community as a whole, implementing strategies and programmes as appropriate. Review of existing consents, engineering standards and the provisions of the District Plan will be undertaken at regular intervals to allow comprehensive development guidance to be provided.

The stormwater network discharges into rivers, streams, or the Coastal Marine Area (CMA).

4.5 CLIMATE CHANGE

The changing climatic conditions are explained in the KDC Activity Management Overview. The effects of this on stormwater are that high intensity rainfalls create an increased flooding frequency.

The impact of long-term changes in weather patterns on the existing systems have been factored into this activity plan and the Infrastructure Strategy, however there is more work ongoing to better identify these issues and what Council's response should be.

Some of the potential impacts of climate change on stormwater and associated public infrastructure could include:

- increased flood frequency resulting from more intense rainfall
- increased number of systems that do not have an appropriate los capacity, due to increased overall rainfall and raised groundwater tables
- increased coastal flooding through higher tide and surge levels
- increased flooding due to higher tides and rainfall breaching existing stop banks
- increased flooding due to higher low tides retaining stormwater and inundating an existing system by removing the ability for it to drain completely
- potential overwhelming of existing treatment devices leading to increased contaminant loadings in the receiving environment; and
- increased coastal and fluvial erosion resulting from increased tide variations and discharges from the stormwater system.

NRC monitors rainfall at five sites throughout the district to understand the long-term effects of climate change on rainfall patterns. In addition, the National Institute of Water and Atmospheric Research (NIWA) maintains rainfall monitoring through an automatic station in Dargaville.

The Council's engineering standards provides design rainfall for the areas of Dargaville, Tinopai, Maungaturoto and Mangawhai, 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 current 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.

Council manages the impact of urban growth and development on the stormwater infrastructure and receiving environment through the application of Stormwater Catchment Management Plans (SWCMPs) and planning provisions set out in the District Plan. Council currently has SWCMPs for the Dargaville and Baylys areas of the district and a SWCMP is currently being developed for Mangawhai as the previous version was finalised in 2005.

The functions of an SWCMPs includes:

- assess stormwater management of the wider catchment and not just the development site
- integrate with growth plans of the district, to assess future performance of the stormwater network
- identify potential quality issues that could develop as a result of future development
- identify catchment wide stormwater management principles to minimise ad-hoc localised solutions
- act as a vehicle to communicate with iwi, the community, and other stakeholders
- identify potential risks (both flood and flow related); and
- identify mitigation options for the stormwater network.

The outputs from the SWCMPs can be used to define capital work's programmes and developer contributions.

4.6 IMPACT OF TRENDS ON INFRASTRUCTURE ASSETS

The impact of growth is currently managed in multiple ways:

Regulatory control

Integrating the stormwater management objectives in all new developments from initial planning and design stages. This is the basic approach of Council's engineering standards.

District Plan

The District Plan is the legal framework that is used for land use planning. The proposed District Plan does not allow an increase in downstream flows post development.

Catchment management planning

Catchment management planning is a key tool for facilitating the integrated approach to stormwater management to achieve the desired environmental outcomes. The draft catchment management plans developed to date will be updated during the 2021/2023 period.

Education

Education is an important tool for providing property owners with an understanding of their role and responsibility for managing their private stormwater systems. Environmental awareness is increasing as the community realises the need to protect the environment, however at the same time property owners expect to be able to develop their property without restriction. Council has undertaken limited education to date however it is a demand management mechanism that can be considered in the future and may be added to the SAMP improvement document. Education promotes environmental awareness and the effects of activities such as car washing, where contaminants may enter the stormwater system through sumps.

Stormwater is unique from other Council services as stormwater is not consumed or directly influenced by population growth. The level of surface permeability and the frequency and intensity of rainfall events are the two main parameters impacting future stormwater flows and demands and these are constantly changing.

Growth in the district generates an increase in impervious surfaces (driveways, buildings, and roads etcetera) which places additional demand on existing stormwater assets or requires new stormwater assets. Currently, the proportion of the district that is impervious is unknown but is a factor considered in the development of Stormwater Catchment Management Plans (SWCMP). It is acknowledged that this will increase with growth, especially in the Mangawhai development area. Council uses the below options to manage the increases in stormwater runoff:

- tolerate the consequences with an implicit reduction in the level of service provided
- increase constructed soakage
- provide piped solutions to cater for the increased flow and/or increase the capacity of existing assets.

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. Costs of implementation for growth can also be reduced through developers constructing pipelines to required sizes and then vesting with Council.

Design parameters

Design parameters for all new Council stormwater assets are set out in the Kaipara District Council Engineering Standards 2011. In summary these requirements include the following:

- flood protection requirements for habitable buildings
- protection of existing overland flow paths, watercourses, wetlands etcetera
- catchment management planning
- required design periods for primary and secondary design flow including rainfall depths by community
- minimum freeboard height to floor levels Nx
- requirements for pipe size, material, location, and layout of reticulation.

5 PROPOSED LOS AND PERFORMANCE MEASURES

The LoS reported in the table below are customer focused and are included in the LTP. An extension of the LoS and performance measures to include the more technical measures associated with the management of the activity has commenced with the inclusion of the non-financial performance measures.

Table 8: LoS and performance measures

Measuring performance				
What we measure	**LTP Year 1 Target 2021/2022**	**LTP Year 2 Target 2022/2023**	**LTP Year 3 Target 2023/2024**	**LTP Year 4-10 Target 2025/2031**
Network System adequacy For each flooding event, using a maximum of 1:50 year (Annual Event Probability 2%), the number of habitable floors affected. (Expressed per 1,000 properties connected to the district's stormwater system.)	<10			
Response time The median response time in an urgent flooding event (defined as an event is where a habitable floor is reasonably at risk of being effected P1), measured from the time that the Council (or subcontractor) receives notification to the time that service personnel reach the site.	<2 hours for urgent events			
Customer satisfaction The number of CSR received regarding single network issues (however reasonably defined) per year/1000 properties. This includes all CSR that relate to SW infrastructure whether directed to the contractor or individual council staff member.	<18			
Discharge compliance Abatement notices, infringement notices, enforcement orders, convictions.	0			
Positive Environmental Outcomes Water sensitive design, green infrastructure, low carbon design and construction, resilient network	As defined in the Stormwater CMP or Emissions Targets			

Strategies for achieving service levels

To achieve the desired LoS specific improvements and management processes will be implemented.

System adequacy

This largely reflects the capacity of the system to capture and convey the flows arising from extreme weather events without damage occurring to habitable floors or business premises. This is not well defined across the district, and it is intended to undertake a number of SWCMP studies in areas subject to growth or with known historical issues. This will identify capacity shortfalls, works that should be undertaken and also minimum floor levels that should be adopted for any new construction. The SWCMP will provide a level of clarity that the desired level of capacity can be achieved for each of the subject areas that is not currently available. Areas that have not been studied and/or upgraded will remain at the LoS that has been historically provided.

Discharge compliance

There are two primary elements to the discharge consent for stormwater drainage and KDC has limited capability to influence either at this time:

1. **Water Quality**

   Stormwater discharges collect and convey whatever contaminants on the ground surface into the receiving waterways. This varies from contaminants such as rubbish, drink bottles etcetera, biological contaminants such as e-coli, chemical contaminants such as zinc, asbestos etcetera and particle contaminants such as clay.

   There is a range of technologies available to reduce these contaminants including chemical treatment, physical filters and settling ponds together with natural processes that focus on reducing flow velocities, maintaining groundcover, and encouraging natural filtration by directing flow through planted areas. These tend to work best with less intense storms when volumes and flow rates are lower.

   KDC has limited resourcing in this area with some detention ponds in newer areas but otherwise limited capacity to focus on water quality. However, a number of older areas still largely rely on open drains and this has some beneficial effects on water quality compared to piped systems.

   While KDC supports a greater focus on water quality it can only be implemented where development is occurring within the current planning timelines and resourcing. Where development is occurring, there are strict controls in place to manage the runoff of silt arising from earthworks.

2. **Flow Rates**

   A discharge consent could specify flow rates arising from a storm with a particular return period, however, KDC has very limited capacity to influence this. The limited number of detention ponds in newer areas will have a beneficial effect in reducing flow rates however KDC has no plans in place at this time to expand this capacity other than through the subdivision processes.

See stormwater scheme plans for specific consent information

Customer satisfaction

This is a much more difficult measure to influence as it reflects the customers overall perception of the quality of the stormwater service that they receive or experience. This will be heavily influenced by whether or not they have had a personal experience (and the outcome of that), the unpredictable frequency and magnitude of storm events that have occurred in the survey period and overall satisfaction with the conduct of the council (via personal experience, experience of others and media coverage) and their understanding of how the

stormwater drainage system works and its associated limitations. Feedback (both positive and negative) is most valuable when it identifies the specific reason for that view, assuming there is one.

Notwithstanding the above, a customer satisfaction survey, or compilation of complaints, will indicate the overall alignment between community expectation and what is being achieved and this may signal the need for change. This is particularly the case if stormwater is ranking significantly lower than other Council services. A sudden change in the level of satisfaction from year to year should trigger a discussion about what has changed or occurred, during that time that could have influenced this.

6 MAINTENANCE AND OPERATING STRATEGY

6.1 MAINTENANCE AND OPERATIONS

The day-to-day operational, inspection and maintenance of the stormwater network is carried out by the three waters maintenance contractor under Contract 798. The contract start date was July 2016 and the contract is administered by Council staff.

All work is performed, and materials used, to comply with the latest edition of the following standards:

- The Stormwater SAMP
- Contract 798 – 3 Waters Operations and Maintenance 2016/2019; and
- The Kaipara District Council Engineering standards and policies.

The operation and maintenance standards for all work activities are specified in the maintenance contract, with performance measures including response times.

Current operation and maintenance activities undertaken across the stormwater network include:

- normal routine maintenance to ensure that drains including natural watercourses are kept open and functioning
- maintaining the capacity of the natural watercourses which collect and convey stormwater runoff from private properties, council's stormwater systems and the roading network
- replace any broken pipes, inlets, or collapsed manholes or catch pits
- repair any scouring due to flooding or malfunctioning of a stormwater drain
- spraying of stormwater drains annually
- inspection of the stormwater stopbanks, floodgates and floodwall within the urban area annually
- inspection of floodgates located in the urban area before high rainfall and high tide events.
- investigations with CCTV survey if necessary when reactive maintenance cannot resolve the network problem; and
- record faults and maintenance undertaken (a future improvement has been identified to begin recording maintenance history and costs at asset component level in AssetFinda.

The table below shows Council's maintenance and operating strategies to ensure that the defined LoS are provided. The table shows the key service criteria affected and mode and impact of failure if the action is not carried out.

Table 9: Maintenance and operating strategies

Activity	Strategy	Service criteria	Impact
General maintenance	Council will manage the assets in a manner that minimises the long term overall total cost and enables delivery of the desired LoS in the most cost-effective way over the long term. Competitive pricing will be ensured by utilising our Procurement Strategy, CPP contract structures and performance-based term contracts where applicable.	Maintaining existing LoS Cost/affordability	Low – Medium Increased costs and risk of failure.

Activity	Strategy	Service criteria	Impact
	A register of all deferred maintenance will be maintained, the total value of which will be recognised in the financial reporting. A review and assessment of levels of deferred maintenance has been identified as a future improvement in the Improvement Plan.		
Unplanned maintenance Disaster i.e. climatic event	Council will maintain a suitable level of preparedness for prompt and effective response to civil emergencies and system failures by ensuring the availability of suitably trained and equipped staff and service delivery contractors. Council will provide a response service for obstructions to drainage facilities that may result in flooding of buildings or urban properties.	Responsiveness	Medium Potential flooding of private property and damage to public roads and utilities.
Unplanned maintenance	Council will provide a repair service and respond to and repair / overcome broken or leaking pipes. A suitable level of preparedness for prompt and effective response to asset failures will be managed by ensuring suitably trained and equipped staff to allow prompt repair of critical assets and mitigation of any hazards. Term contracts specify response times.	Responsiveness (Response time for obstructions to drainage facilities that may result in flooding to buildings is 6 hours)	Medium Flooding of private property and damage to public roads and utilities.
Planned Inspections • Reticulation • Drains • Stopbanks • Floodgates • Floodwalls	Council will undertake scheduled inspections in accordance with good industry practice and as justified by the consequences of failure on LoS, costs, public health, safety, or corporate image.	Maintaining existing LoS	Medium Flooding of private property and damage to public roads and utilities.
Planned preventative maintenance	Council will undertake a programme of planned asset maintenance to minimise the risk of critical equipment failure or where justified economically. Major maintenance needs will be identified through the scheduled asset condition inspections and those generated from the investigation of customer complaints.	Maintaining existing LoS. Cost/affordability	Medium

7 EXPENDITURE FORECASTS

7.1 OPERATIONS AND MAINTENANCE EXPENDITURE

The 10-year forecast for operations and maintenance costs for stormwater assets in the Kaipara District are shown in the following graphs.

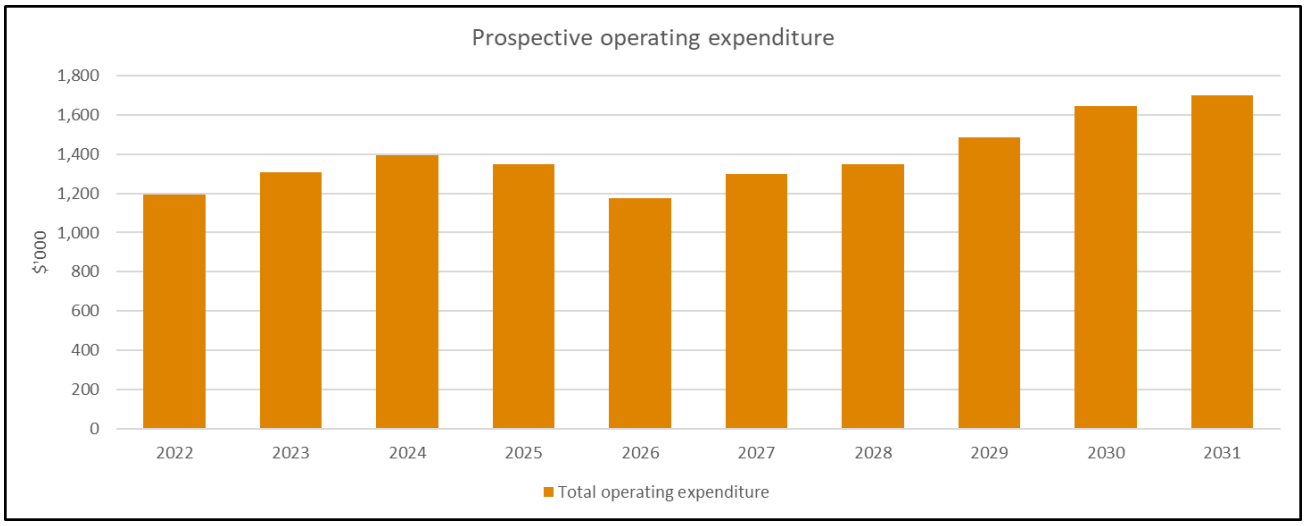
They do not provide for inflation over the 10-year period and do not include the following:

- Costs that would be allocated by finance including depreciation, interest charges, write-offs, and land rates payable for land occupied by facilities
- Costs associated with stormwater staff.

Table 10: OPEX forecasts

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Prospective Funding Impact Statement											
Activity selection: Stormwater Drainage, All, All											
Operating funding											
Sources of operating funding											
General rates, uniform annual general charges, rate penalties	294	385	409	433	438	444	473	516	633	748	776
Targeted rates	1,685	1,764	1,902	2,026	2,023	1,904	2,179	2,285	2,524	2,910	3,044
Subsidies and grants for operating purposes	0	0	0	0	0	0	0	0	0	0	0
Fees and charges	0	0	0	0	0	0	0	0	0	0	0
Internal charges and overheads recovered	0	0	0	0	0	0	0	0	0	0	0
Interest and dividends from investments	0	0	0	0	0	0	0	0	0	0	0
Local authorities fuel tax, fines, infringement fees and other receipts	0	0	0	0	0	0	0	0	0	0	0
Total operating funding	**1,980**	**2,149**	**2,312**	**2,460**	**2,462**	**2,348**	**2,652**	**2,801**	**3,156**	**3,658**	**3,820**
Application of operating funding											
Payments to staff and suppliers	703	590	634	669	669	536	554	568	586	605	625
Finance costs	146	155	192	193	139	146	213	234	319	412	434
Internal charges and overheads recovered	360	450	479	533	540	496	530	548	581	628	642
Other operating funding applications	0	0	0	0	0	0	0	0	0	0	0
Total applications of operating funding	**1,209**	**1,195**	**1,306**	**1,395**	**1,348**	**1,177**	**1,296**	**1,349**	**1,487**	**1,645**	**1,702**
Surplus (deficit) of operating funding	**771**	**954**	**1,006**	**1,065**	**1,113**	**1,171**	**1,355**	**1,451**	**1,670**	**2,013**	**2,118**

Figure 2: OPEX forecast



7.2 CAPITAL EXPENDITURE

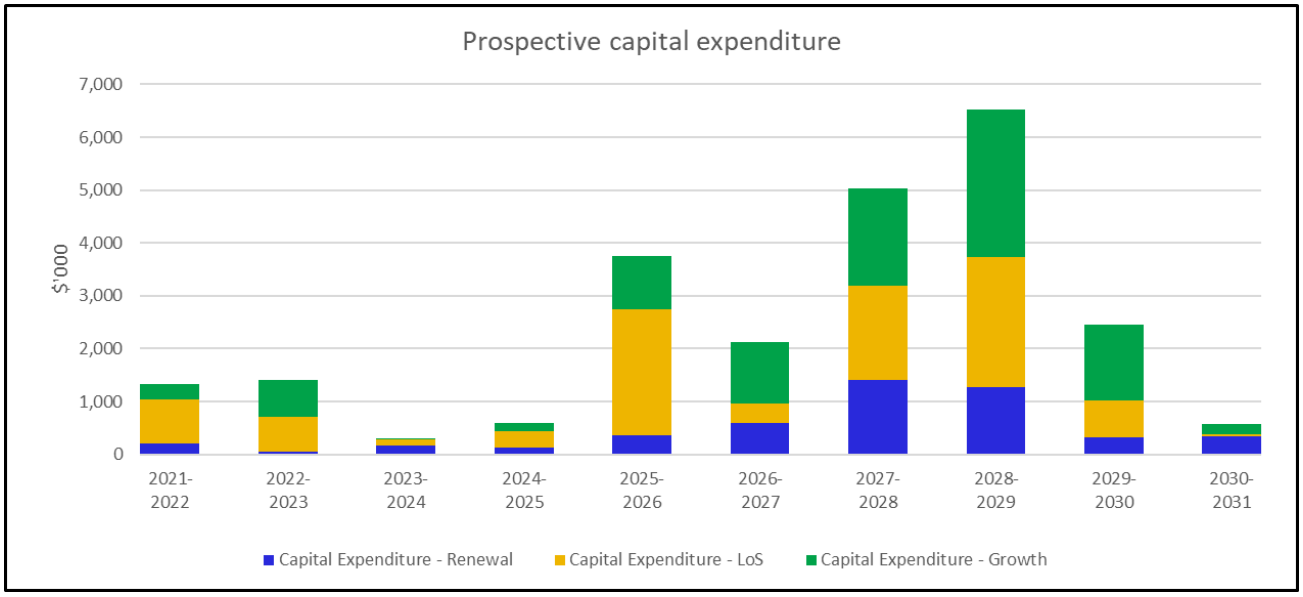
The proposed stormwater capital works programme over the next 10 years, and illustrated below, is a blend of growth, renewals, and LoS improvements. This is an indicative programme that reflects the lack of good quality condition information on the system. The first three years will be focused on collecting better information on the stormwater assets which will inform the prosed programme from 2025-2026.

Table 11: CAPEX forecasts

For the year ended:	Annual Plan	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget
30 June	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Prospective Funding Impact Statement											
Activity selection: Stormwater Drainage, All, All											
Capital funding											
Sources of capital funding											
Subsidies and grants for capital expenditure	0	0	0	0	0	0	0	0	0	0	0
Development and financial contributions	7	98	140	144	127	128	123	120	120	108	111
Increase (decrease) in debt	-5	631	611	-374	-23	2,733	690	2,626	4,192	478	-860
Gross proceeds from sale of assets	0	0	0	0	0	0	0	0	0	0	0
Lump sum contributions	0	0	0	0	0	0	0	0	0	0	0
Other dedicated capital funding	0	0	0	0	0	0	0	0	0	0	0
Total sources of capital funding	**1**	**729**	**751**	**-230**	**104**	**2,861**	**813**	**2,747**	**4,312**	**586**	**-749**
Applications of capital funding											
Capital expenditure - to meet additional demand	27	282	693	11	154	1,002	1,156	1,842	2,794	1,444	204
Capital expenditure - to improve the level of service	373	829	655	118	303	2,385	370	1,781	2,463	696	41
Capital expenditure - to replace existing assets	96	208	52	161	134	369	590	1,412	1,270	322	333
Increase (decrease) in reserves	276	364	357	544	628	277	52	-837	-545	137	792
Increase (decrease) of investments	0	0	0	0	0	0	0	0	0	0	0
Total applications of capital funding	**772**	**1,683**	**1,757**	**835**	**1,218**	**4,032**	**2,169**	**4,198**	**5,982**	**2,599**	**1,369**
Surplus (deficit) of capital funding	**-771**	**-954**	**-1,006**	**-1,065**	**-1,113**	**-1,171**	**-1,355**	**-1,451**	**-1,670**	**-2,013**	**-2,118**
Funding Balance	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

The 10-year forecast for capital expenditure is shown in the graph below:

Figure 4: CAPEX forecast



Renewal Expenditure

Figure 5: Predicted 30-year renewals graph

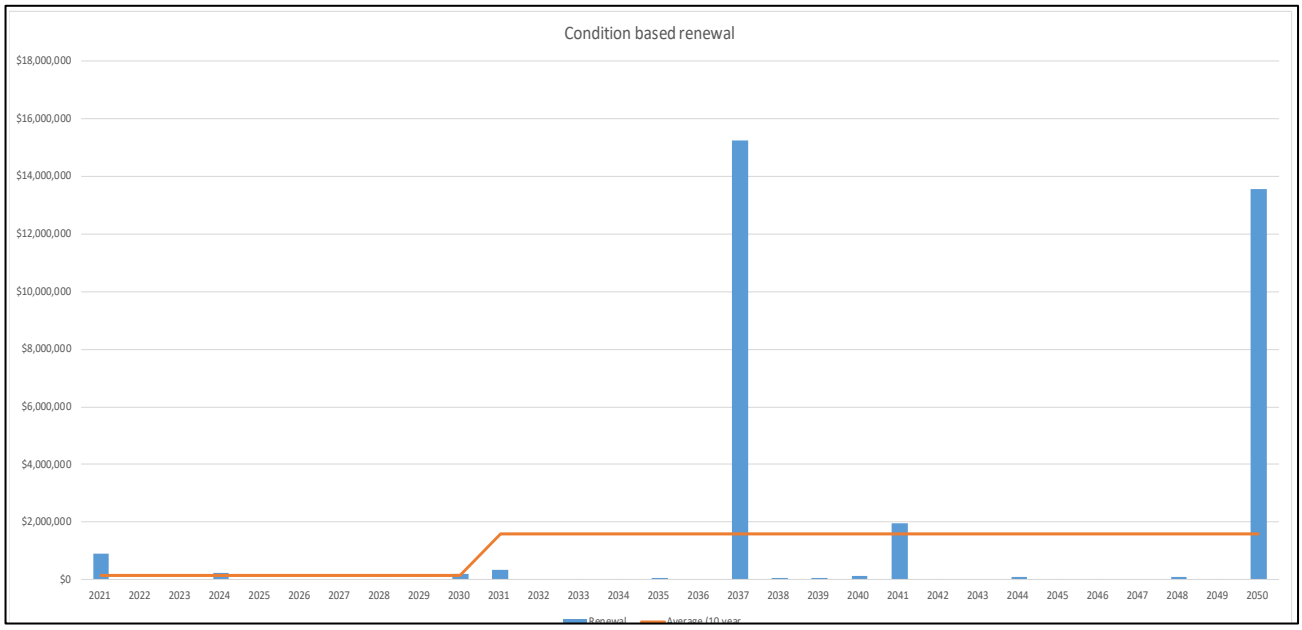


Table 12: Predicted 30-year renewals table

Year	Line	Point	Total
2021	$735,759	$165,740	**$901,499**
2022	$0	$0	**$0**
2023	$0	$0	**$0**
2024	$224,318	$9,520	**$233,838**
2025	$0	$0	**$0**
2026	$0	$0	**$0**
2027	$0	$0	**$0**
2028	$1,280	$0	**$1,280**
2029	$17,798	$0	**$17,798**
2030	$200,810	$0	**$200,810**
2031	$24,710	$320,256	**$344,966**
2032	$0	$0	**$0**
2033	$8,949	$0	**$8,949**
2034	$1,597	$0	**$1,597**
2035	$77,303	$0	**$77,303**
2036	$0	$0	**$0**
2037	$15,232,424	$6,804	**$15,239,228**
2038	$75,375	$0	**$75,375**
2039	$60,025	$0	**$60,025**
2040	$130,830	$3,500	**$134,330**
2041	$1,893,959	$65,084	**$1,959,043**
2042	$23,285	$0	**$23,285**
2043	$0	$0	**$0**
2044	$95,073	$0	**$95,073**
2045	$31,668	$0	**$31,668**
2046	$0	$3,500	**$3,500**
2047	$0	$0	**$0**
2048	$81,380	$1,304	**$82,684**
2049	$16,255	$0	**$16,255**
2050	$13,557,597	$2,500	**$13,560,097**

The current level of condition and/or performance data relating to the stormwater assets is not well documented. The future collection of this data and entry into the AssetFinda database has been identified as an activity to be completed within the AMIP. Over time, as more information is recorded, an initial assessment and listing of renewals needs will be able to be created from AssetFinda for subsequent review and verification.

Planned capital projects

Table 13: Planned capital projects

Primary driver	Community	LTP Project name	Expected timing	Total
Growth	Baylys	Baylys Beach - Cynthia Place stormwater upgrades	2022/23 - 2023/24	$220,000
	Dargaville	Dargaville stormwater growth	2026/27 - 2030/31	$500,000
	Kaiwaka	Kaiwaka stormwater growth capital works	2027/28 - 2029/30	$1,050,000
	Mangawhai	Mangawhai - 130-138 Mangawhai Heads Road redirection of stormwater flow and culvert upgrade	2021/22	$250,000
		Mangawhai - Jack Boyd Drive stormwater resilience	2024/25 - 2027/28	$2,080,000
		Mangawhai stormwater growth	2021/22	$300,000
	Maungaturoto	Maungaturoto Paparoa stormwater growth capital works	2027/28 - 2028/29	$2,050,000
	Dargaville	Stopbanks and floodgates conditions and options	2021-24	$200,000
LoS	Mangawhai	Mangawhai - Pohutukawa Place stormwater pond	2027/28	$460,000
		Mangawhai - Eveline Street	2021/22	$150,000
		Mangawhai stormwater	2021/22	$300,000
		Mangawhai stormwater - Catchment 9 stormwater network link Ti Tree Place, Grove Road north city catchment	2027/28	$1,050,000
		Mangawhai stormwater coastal outfalls upgrade- Olsen Avenue, Wharfdale Crescent, Alamar Crescent	2024/25	$1,850,000
		Mangawhai - Lincoln and Cheviot streets new stormwater system	2026/27	$1,220,000
		Mangawhai secondary stormwater flow path to outlet 38 North Avenue	2022/23	$25,000
		Mangawhai - Taranui Place culvert capacity upgrade	2021/22	$49,000
		Mangawhai – Taranui Place increase upstream capacity and install wetland at 10 Taranui Place	2022/23	$80,000
		Mangawhai Town Plan Wood Street and surrounds stormwater upgrade	2021/22 - 2029/30	$3,500,000
	Maungaturoto	Maungaturoto Paparoa stormwater renewals and LoS	Annual	$350,000
	Pahi	Pahi stormwater network improvements	2024/25	$130,000
Renewal	Baylys	Baylys stormwater renewals	2023/24, 2027/28	$100,000
		Chases Gorge	2021/22	$250,000
	Dargaville	Dargaville stormwater renewals	Annual	$2,785,000
	Kaiwaka	Kaiwaka stormwater renewals	2023/24, 2027/28	$100,000
	Te Kopuru	Te Kopuru stormwater - open drain upgrades -fix Walker Terrace system	2021/22	$50,000
		Te Kopuru stormwater open drain upgrades	2024/25 - 2026/27	$550,000
		Te Kopuru stormwater renewals	2024/25 - 2030/31	$290,000
			Total	**$20,039,000**

8 AM IMPROVEMENT

8.1 OVERVIEW

The SAMPs have been developed as a tool to help Council manage their assets, deliver the LoS and identify the expenditure and funding requirements of the activity. Continuous improvements are necessary to ensure Council continues to achieve the appropriate (and desired) level of AM practice, delivering services in the most sustainable way while meeting the community's needs.

Council has demonstrated its commitment to AM improvement over the last few years and wishes to meet core requirements as defined by the Office of the Auditor General for the Stormwater SAMP.

Table 14: Overall improvement plan

Improvement Plan 2021/2022 - Stormwater Drainage	
Year 1 - 2021/2022 Planned improvement or change	• Create hydrological models for specific areas of the stormwater networks in Mangawhai, Kaiwaka, Dargaville, Te Kopuru, Baylys, Maungaturoto and Paparoa where LoS or growth design questions need answering • Start condition assessment of stopbank assets in the urban area and complete an assessment on urban floodgates with the aim of developing options for flood protection • Model infrastructure requirements in Dargaville for flood susceptible areas to allow LoS under increasing rain intensity and river levels • Create overland flow maps for the whole district. Required for reliable Stormwater Catchment Management Plans (CMP), land use planning and renewals strategy. Incorporate this into public maps system • Complete Closed-Circuit Television (CCTV) condition assessments in Kaiwaka, Maungaturoto, Paparoa, Te Kopuru and Baylys so asset conditions can be used in the renewal's strategy • Start restoration of Mangawhai stormwater ponds requiring upgrade to meet current standards.
Year 2 - 2022/2023 Planned improvement or change	• Continue developing overland flow maps for the whole district. Required for reliable Stormwater Catchment Management Plans (CMP), land use planning and renewals strategy. Incorporate this into public maps system • Continue restoration of Mangawhai stormwater ponds requiring upgrade to meet current standards • Continue collaborative monitoring projects with NRC • Continue the condition assessment of the urban stopbanks • Model infrastructure requirements in Mangawhai for flood susceptible areas to allow funding for LoS • Complete CCTV condition assessments in Whakapirau, Tinopai, Pahi, (Glinks Gully, Kellys Bay, Ruawai, Pouto and Matakohe as necessary) to enable asset conditions to be used in the renewal's strategy and • Finalise the Stormwater Bylaw and/or Policy.

Improvement Plan 2021/2022 - Stormwater Drainage	
Year 3 - 2023/2024 Planned improvement or change	• Continue restoration of Mangawhai stormwater ponds requiring upgrade to meet current standards • Complete the condition assessment of the urban stopbanks • Continue developing overland flow maps for the whole district. Required for reliable Stormwater Catchment Management Plans (CMP), land use planning and renewals strategy. Incorporate this into public maps system and • Continue collaborative monitoring projects with NRC.
Years 4-10 - 2024/2031 Planned improvement or change	• Complete restoration of Mangawhai stormwater ponds requiring upgrade to meet current standards • Continue developing overland flow maps for the whole district. Required for reliable Stormwater Catchment Management Plans (CMP), land use planning and renewals strategy. Incorporate this into public maps system and • Rerun hydrological models for specific areas of the stormwater networks LoS or growth design questions need answering.