

# 2014/2015 Rivers and Drainage Asset Management Plan

## Executive Summary



Bay of Plenty Regional Council

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NEW ZEALAND



# Document control

## Document information

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Debbie Fransen	Correct valuation date (from 2015 to 2014) replaced Figure 3 (new grouping of assets). Updated capital works tables.	27/11/2014	1.2
Roger Waugh	Review and update following deliberations. For adoption by Council 25 June 2015.	15/06/2015	2.0

## Future review

<b>Review timeframe:</b>	2017/2018 In line with the requirements of Council's Long Term Plan.
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## Distribution control

Person	Role	Date of issue	Version
David Boothway	Engineering Manager	24 November 2014	1.1
Roger Waugh	Programme Leader (Rivers and Drainage)	25 June 2015	2.0

### Reviewed:

Signed \_\_\_\_\_ Date \_\_\_\_\_

Roger Waugh  
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### Approved for issue:

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# Asset Management Team

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Bay of Plenty Regional Council Rivers and Drainage Asset Management Team:

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Roger Waugh	Programme Leader Rivers and Drainage
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This is the third edition of the Rivers and Drainage Schemes combined Asset Management Plan. The original plan was produced in 2008/2009 using a framework developed by GHD Limited in conjunction with staff from Bay of Plenty Regional Council.





## 1 Scope of this Plan

This Asset Management Plan (AMP) Executive Summary describes how Bay of Plenty Regional Council manages the region's rivers and drainage assets on behalf of the community. By providing a summary of the full AMP we are seeking to make the information accessible and appropriate for its readers, which includes Executive Leadership Team and elected members of the Council, interest groups, business partners and the community. This plan covers the services that are provided, the assets and the long-term planning and management goals that are taken into account when delivering the service.

## 2 Rivers and Drainage Schemes

Bay of Plenty Regional Council is responsible for the provision and management of five rivers and drainage schemes within its regional boundaries. These are shown in table 1 and listed with their respective catchment areas and rateable properties.

*Table 1 Overview of the Rivers and Drainage Schemes.*

	Total catchment area (km <sup>2</sup> )	Total number of rateable properties
Kaituna Catchment Control Scheme	1,246	36,600
Rangitāiki Drainage Scheme	290	4,323
Rangitāiki-Tarawera Rivers Scheme	3,995	8,100
Waioeka-Otara Rivers Scheme	1,175	3,300
Whakatāne-Waimana Rivers Scheme	1,540	7,635
<b>Totals</b>	<b>8,246</b>	<b>59,958</b>

In addition to these schemes there are a number of minor rivers and drainage schemes that complete the rivers and drainage network in the Bay of Plenty. These minor schemes are not part of the Rivers and Drainage AMP as Bay of Plenty Regional Council do not own these assets, although they do manage them. Each scheme has the discretion to use Council or others to manage their scheme.

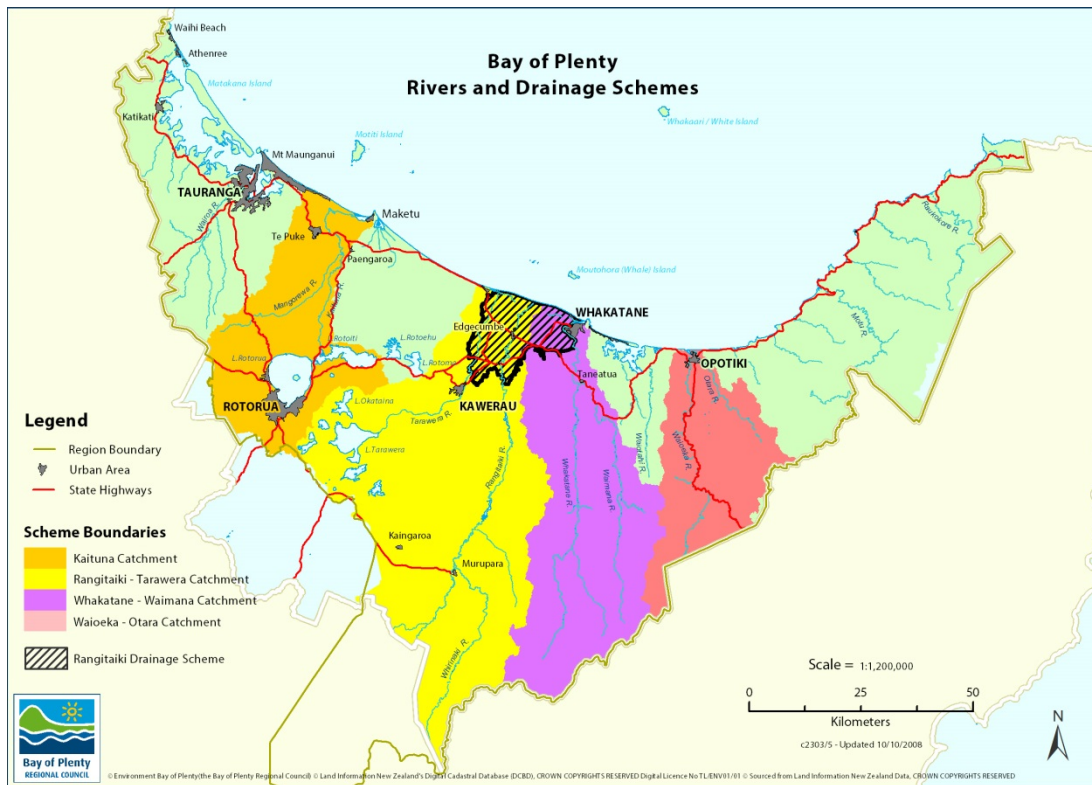


Figure 1 Rivers and Drainage Scheme Catchments.

### 3 Purpose of this document

The purpose of this document is to summarise the Rivers and Drainage Asset Management Plan (AMP), which formally documents the management philosophy that is applied to the rivers and drainage infrastructure assets and services. This approach ensures that acceptable levels of service are provided in the most cost effective manner and contribute to the achievement of the community outcomes identified in the Bay of Plenty Regional Council's Long-Term Plan (LTP).

This long-term planning approach is necessary given the large capital and operating expenditure, the long lives of the assets and the lead times in planning for upgrades of new assets when required. The sequencing and timing of works are developed through discussions with key stakeholders and the AMP is prepared in consultation with them.

The key purposes of the AMP are to:

- Convey the long-term strategy for the management of the rivers and drainage assets and services,
- Improve understanding of service level standards, options and costs to smooth peak funding demands, while improving customer satisfaction and organisational image,
- Provide a tool to assist with management assets in a cost effective and sustainable manner,
- Manage the environmental, service delivery and financial risks of asset failure,
- Identify lifecycle (long-term) costs to provide agreed Level of Service over the long-term,

- Explain how the long-term works programmes have been developed and how they will be funded, and
- Demonstrate that the service potential of the rivers and drainage assets is being maintained.

### 3.1 **Asset management objectives**

Bay of Plenty Regional Council recognises that the Rivers and Drainage AMP is the fundamental driver of flood protection and drainage. This AMP represents the third edition of the combined AMP for all of the rivers and drainage schemes. The first Rivers and Drainage AMPs were completed in 1996–1998 and updated in subsequent years on a five-yearly cycle for each scheme.

In order to fulfil the outcomes, vision, goals and objectives of these assets the Bay of Plenty Regional Council have adopted a systematic approach to the long-term management of its assets and services by preparing this AMP.

Bay of Plenty Regional Council is committed to best appropriate practice asset management in order to achieving the following key objectives:

- Meet the service expectations of the community ('customer values').
- Ensure capital projects and maintenance activities achieve efficient results with optimal benefits.
- Demonstrate Council's approach to managing risk and meeting growth requirements towards a sustainable future.
- Comply with all statutory requirements.

### 3.2 **Plan timeframe**

This AMP covers a 50-year timeframe. The main focus of the plan is determining the work programmes required for maintaining, rehabilitating and renewing assets over the next ten years. This AMP provides the detail underlying the Long Term Plan, and will be revised every three years.

### 3.3 **Limitations of the AMP**

This AMP has been prepared based on:

- Currently available information,
- Condition assessments completed to date,
- Existing Levels of Service, and
- Forecasts completed for 50 years.

## 4 **Strategic environment**

### 4.1 **Purpose**

As caretakers of our land, air and water, Bay of Plenty Regional Council monitors the effects of human activities on our environment. We also promote the sustainable management of our natural and physical resources for present and future generations.

## 4.2 Vision

The Bay of Plenty Regional Council's vision is:

*"Thriving together - mo te taiao, mo ngā tangata" (for the environment, for the people).*

## 4.3 Community outcomes

The five Community outcomes identified in the BOPRC 2015-2025 LTP are illustrated in the figure below.

### Thriving together - mō te taiao, mō ngā tāngata



The Flood Protection and Control Works Activity contributes directly to three of the five Community outcomes, these are set out below:

Community outcome	Contribution to community outcomes	Objectives/methods
<b>Resilience and Safety:</b> Our planning and infrastructure provides resilience to natural hazards and flooding so that our communities' safety is improved and maintained.	<ul style="list-style-type: none"><li>• Maintain flood protection to agreed levels for our schemes.</li></ul>	<ul style="list-style-type: none"><li>• Identify potential hazards and develop ways to mitigate flood risks to protect people, property and their livelihoods.</li><li>• Manage the effect of development upon the existing rivers and drainage schemes and provides a sustainable solution for future requirements.</li><li>• Provide protection of public health and property by providing flood protection and mitigation.</li><li>• Protecting the environment from flood damage using flood protection measures.</li><li>• Undertake River Scheme Sustainability work to manage schemes over the next 100 years in a sustainable manner.</li></ul>

Community outcome	Contribution to community outcomes	Objectives/methods
<b>Economic Development:</b> We facilitate and enable initiatives that boost the region's economic performance.	<ul style="list-style-type: none"> <li>• Providing protection to the scheme's floodplains to enable resources to be used efficiently and effectively so the community can benefit.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide sustainable, safe, ongoing, and cost effective rivers and drainage schemes.</li> <li>• Create safe conditions for new business through the management of potential rivers and drainage hazards.</li> <li>• Provide robust maintenance, renewal and capital programmes.</li> <li>• Provide protection of critical public infrastructure and regionally significant industries by providing flood protection and mitigation.</li> </ul>
<b>Regional Collaboration &amp; Leadership:</b> We have established the region's priorities and strategic direction with our partners and communities. We have collaborated to achieve integrated planning across the Bay of Plenty.	<ul style="list-style-type: none"> <li>• Providing protection to the region's floodplains to enable resources to be used efficiently and effectively so the community can benefit.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide sustainable, safe, ongoing, and cost effective rivers and drainage schemes.</li> <li>• Create a catchment based collaborative approach to managing flood risk, through the Regional Flood Risk Management Framework Project.</li> </ul>

#### 4.4 Rationale for Council's involvement

Council carries out its Rivers, Drainage and Flood Management Activity to:

- Protect important infrastructure and urban areas from flooding,
- Provide security to existing economic and social developments from flooding,
- Protect productive soils from stream and river erosion,
- Protect natural, physical and cultural heritage sites from the adverse effects of flooding and erosion,
- Provide drainage and pumping to low lying properties within scheme areas for flood protection, and
- Manage water levels in Lakes Rotorua and Rotoiti to obtain optimum benefit for lakeside residents, and lake and river recreational/commercial users.

If Council was to stop its involvement in the management of the schemes it is unlikely there would be another public body able to provide the region wide service that spans multiple Territorial Authority boundaries.

#### 4.5 Levels of Service

Community outcomes were developed as part of the LTP 2015-2025. The Flood Protection and Control Works Activity Outcomes developed with the Levels of Service represented in the AMP are described and aligned with customer values including affordability, quality, safety, community engagement, reliability and sustainability.

A key level of service for the Flood Protection and Control Works Activity is to provide flood protection and drainage in scheme areas to mitigate the effect of flooding. The design standard (or KPIs) for this level of service is to have:

- Zero failures of flood protection systems below specified design standards, and
- Zero times when drainage schemes do not provide effective drainage to low-lying land up to the specified design standards.

The Levels of Service and design standards are reported in the full AMP.

## 5 Business overview

### 5.1 Funding

The rivers and drainage schemes are managed under the Soil Conservation and Rivers Control Act 1941. The Act allows for separately rated river schemes on a catchment-by-catchment basis.

Bay of Plenty Regional Council manages the Rangitāiki Drainage Scheme under the Rangitāiki Land Drainage Act 1956.

Targeted rates contribute 80% of river scheme costs. These are identified under each separate rating area, with the proportional funding distribution varying across each scheme.

Regional general funds contribute to 20% of the scheme rates (except Rangitāiki Drainage) to acknowledge the broader regional benefit that the schemes provide. These broader benefits include environmental, economic, protection of roading and public infrastructure etc. Rangitāiki Drainage Scheme is funded 100% from targeted scheme rates over the area of benefit, mainly dairying, some 29,200 ha. Rates on any property are calculated on the bases of land area and benefit classification of that property.

### 5.2 Capital Expenditure

Capital expenditure on the Flood Protection and Control activity represents a significant Council investment as shown in the figure below.

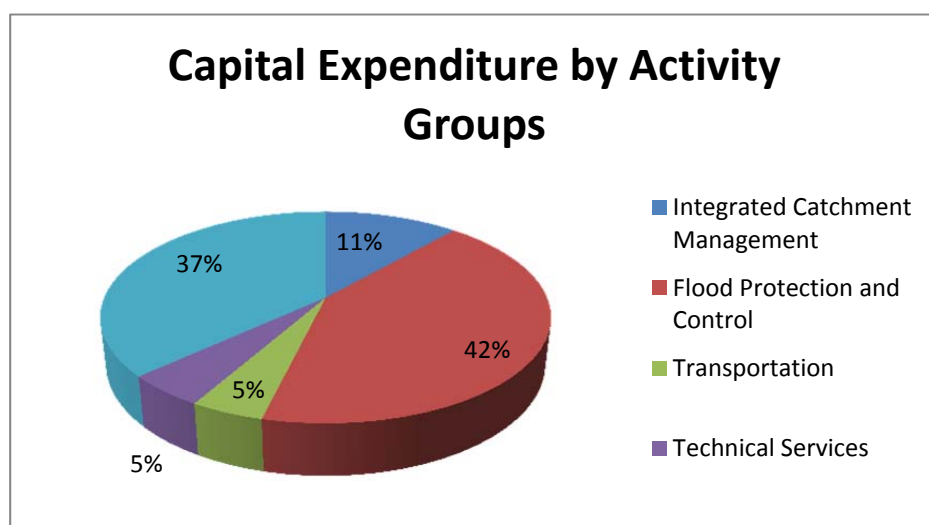


Figure 2 2015/2016 Capital expenditure budget by Council Activity Group.

## 6 Major capital works programme summary

Major new flood control infrastructure projects (defined as being \$0.5M or more of capital expenditure) that are expected to be undertaken in the 2015-2045 period are shown in the table below.

*Table 2 Capital works in next 30 year period.*

Major work	Cost \$000	Timing	Assumptions
<b>Kaituna Catchment Control Scheme</b>			
Ford Road Pump Station replacement.	2,200	2017/2018	Timing to suit Kaituna Diversion Project.
Utuhina Stopbanks (Stage 1).	630	2019/2020	
Utuhina Stopbanks (Stage 2).	500	2020/2021	
Stopbanks reconstruction following geotechnical investigations & capacity review incorporating climate change.	1,900	2024/2025	Geotechnical investigations are scheduled 2018/2019 to identify any issues. Modelling of catchment undertaken 2020-2023.
Kaituna River climate change capital.	775	2031-2035	Change to achieve LOS, dependant on climate change forecasts.
Stopbanks reconstruction following geotechnical investigations.	950	2031-2035	
Kaituna River climate change capital.	775	2041-2045	Change to achieve LOS, dependant on climate change forecasts.
Stopbanks reconstruction following geotechnical investigations.	950	2041-2045	
<b>Rangitāiki – Tarawera Rivers Scheme</b>			
Rangitāiki Floodway (Stage 3).	2,054	2015/2016	
Rangitāiki Floodway stopbank raising.	10,483	2016/2017-2018/2019	
Rangitāiki Spillway.	1,164	2019/2020	Dependant on gaining a new consent to alter the preferred solution and acceptance by landowners.
Rangitāiki River capacity upgrades.	1,160	2020/2021	
Stopbanks reconstruction following geotechnical investigations.	1,800	2021/2022-2023/2024	Scope dependant on geotechnical investigations that are scheduled 2017/2018 to identify any issues.
Stopbanks reconstruction following geotechnical investigations.	1,800	2036-2040	
Climate change capital works.	1,200	2036-2040	Change to achieve LOS, dependant on climate change forecasts.
Stopbanks reconstruction following geotechnical investigations.	1,800	2041-2045	
Climate change capital works.	1,200	2041-2045	Change to achieve LOS, dependant on climate change forecasts.



Major work	Cost \$000	Timing	Assumptions
<b>Whakatāne – Waimana Rivers Scheme</b>			
Stopbanks reconstruction following geotechnical investigations.	570	2023/2024	Geotechnical investigations are scheduled 2018/2019 to identify any issues.
Stopbanks reconstruction following geotechnical investigations.	600	2026-2030	
Climate change capital works.	780	2026-2030	Change to achieve LOS, dependant on climate change forecasts.
Pump replacements.	791	2031-2035	
Canal Stopbank top ups.	500	2031-2035	
Stopbanks reconstruction following geotechnical investigations.	600	2036-2040	
Climate change capital works.	780	2036-2040	Change to achieve LOS, dependant on climate change forecasts.
Canal Stopbank top ups.	500	2041-2045	
<b>Waioeka-Otara Rivers Scheme</b>			
Stopbanks reconstruction following geotechnical investigations.	765	2022/2023	Geotechnical investigations are scheduled 2018/2019 to identify any issues.
Climate change capital works.	850	2022/2023	Change to achieve LOS, dependant on climate change forecasts.
Stopbanks reconstruction following geotechnical investigations.	1,015	2031-2035	
Climate change capital works.	1,100	2031-2035	Change to achieve LOS, dependant on climate change forecasts.
Stopbanks reconstruction following geotechnical investigations.	750	2041-2045	
Climate change capital works.	650	2041-2045	Change to achieve LOS, dependant on climate change forecasts.

## 7 Sustainability

### 7.1 Projects

In addition to on-going management of flood risks in the region, we are also looking at the long-term risks of flooding hazards, including reviewing the current levels of flood protection provided by river schemes in the region, the sustainability of the schemes, and establishing a region-wide Flood Risk Management Framework. These investigations form two significant Council projects and are summarised below.

#### 7.1.1 Regional Flood Risk Management Framework

The Regional Flood Risk Management Framework has been set up to create a catchment based collaborative approach to managing flood risk.



The motivation for development of a Regional Flood Risk Management Framework (RFRMF) came from the high costs of recent floods (2004, 2010 and 2011) and the current fragmented approach to flood risk management in the parts of the region outside of the Rivers and Drainage Scheme. The development of the RFRMF is related to an allied project, the River Scheme Sustainability (RSS) project which is more focussed on sustainability of the River and Drainage Schemes.

#### **7.1.2 River Scheme Sustainability (RSS)**

The River Scheme Sustainability project's goal is to set direction for sustainable management of the River and Drainage Schemes for the next 100 years. The goal is to reduce the long-term risk of flood hazards while encouraging environmentally and economically sustainable land-use practices and raising awareness, changing attitudes and behaviour in the communities.

The project will consider the long-term risks of flooding hazard and provide a strategy and actions to manage the Flood Protection and Control Works Programme of schemes moving forward. Flood risk strategies may include retreat, adaption or defend. Flood management options in the longer term may or may not include the structural solutions currently employed. Non-structural and other alternative solutions will be evaluated.

These are long-term projects, the outcomes of which will guide future reviews of this Asset Management Plan.

### **8 Proposed future consultation**

Council will consult with the community on rivers and drainage activity proposals with River and Drainage Scheme Liaison Groups, River Forums, Iwi and other stakeholders for this AMP.

### **9 Risk management**

#### **9.1 Corporate Policy**

Bay of Plenty Regional Council has a Risk Management Framework and Policy. The risk criteria and matrices established as the basis for risk evaluation were developed in accordance with the NZ/AS/ISO31000:2009 Risk Management Standard.

A risk register of possible risks affecting the Flood Protection and Control Works Activity has been developed in consultation with key staff and is contained in the full AMP.

#### **9.2 Risk Action Plan**

The Risk Register for the AMP highlights the most significant residual risks faced by the Flood Protection and Control Works Activity. The main risks are listed in order of severity (residual risk) as assigned in consultation with key Council officers.

Risks include items such as inability to afford renewals, increased severity of weather events, sea level rise, storm surge and stopbank deterioration.

Actions that are required to achieve the desired improvements are indicated along with how progress on these actions will be monitored and reported. Where applicable, action tasks will detail timeframes for achievement, and responsibility for these actions.

## 10 **Lifecycle Management**

The Lifecycle Management (LCM) Section of the AMP provides the broad strategies and work programmes required to achieve the goals and objectives set out earlier in this AMP.

Expenditure on infrastructure assets can be categorised into two main areas: Operational and Capital works

Operations and maintenance is required for the day-to-day operation of the network whilst maintaining the current Levels of Service. Capital works includes renewals and new (improvement) works.

Renewal includes rehabilitation and replacement of assets to restore an asset to its original level of service, i.e. capacity or the required condition. Renewals expenditure forecasts cover the cost of asset renewal through its whole lifecycle through to disposal of the asset.

New capital works (involves the creation of new assets, or works, which upgrade or improve an existing asset beyond its current capacity or performance in response to changes in usage or customer expectations.

### 10.1 **Asset reliability (performance)**

In the Flood Protection and Control Works Activity, a small asset failure can lead to inundation of a large area of the flood plain resulting in significant damage.

Preventative maintenance, regular inspection, monitoring and hydraulic modelling all contribute to ensuring service reliability standards are met.

Assets can also be subject to substantial damage from flows less than design level especially erosion protection assets.

Reactive maintenance is expended on repairing flood damage resulting from moderate sized floods.

## 11 **Asset summary**

The figures below provide a summary of the Rivers and Drainage assets owned by Bay of Plenty Regional Council, by asset type and by scheme. ODRC is Optimised Depreciated Replacement Cost as at 1 July 2014. ODRC is the optimised replacement cost of an asset less accumulated depreciation based on the already consumed or expired future economic benefits of the asset.

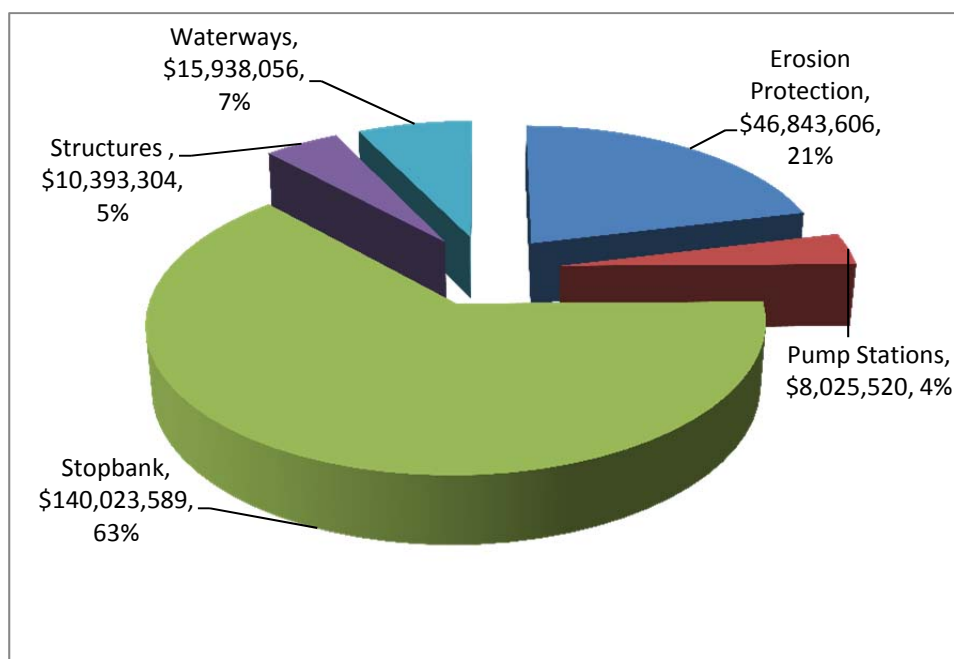


Figure 3 Asset Type as % of Value (ODRC 1 July 2014).

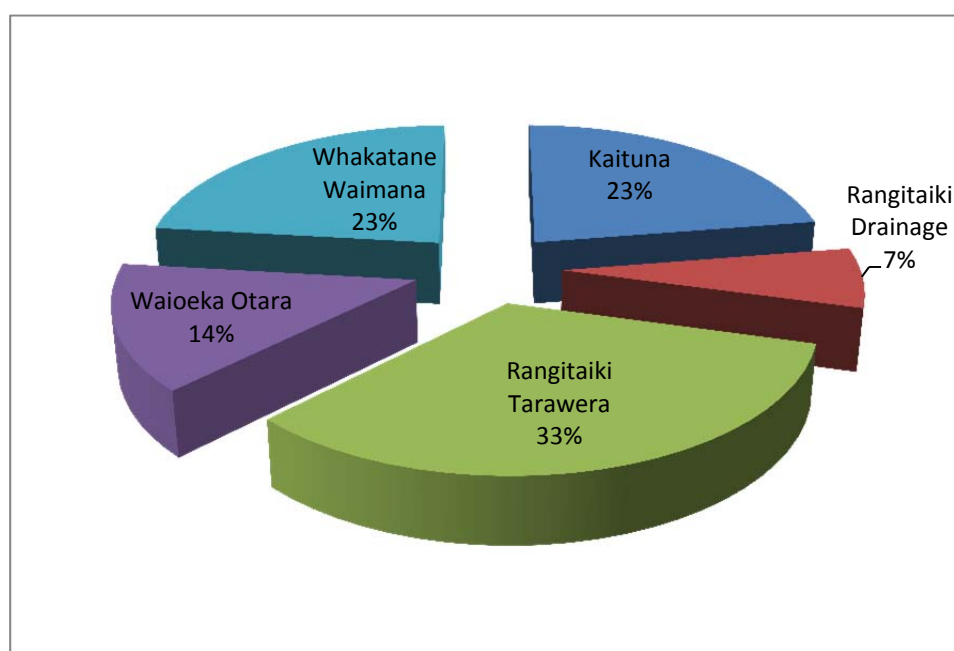


Figure 4 Asset value (ODRC 1 July 2014) by scheme.

### 11.1 Stopbanks

Stopbanks are compacted earth embankments built alongside rivers to provide protection to the bordering land from flooding. Stopbanks are the most significant asset in rivers and drainage infrastructure. The total Optimised Depreciated Replacement Cost (ODRC) of these assets is \$140M (as at 1 July 2014). Stopbank asset condition is monitored by visual inspections, physical surveys and scheme reviews every ten years including detailed computer modelling.

Figure 5 shows the length of stopbanks across all of the schemes. There is a total of 348.3 km of stopbanks across the five schemes with Rangitāiki-Tarawera having the most at 120.7 km. Stopbanks have an estimated life of perpetuity for depreciation purposes.

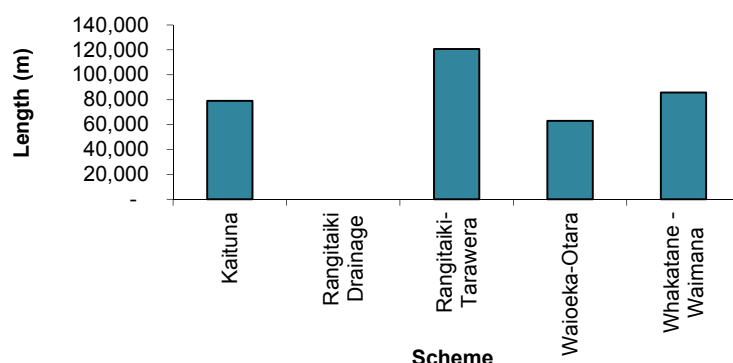


Figure 5 Length of stopbanks.

## 11.2 Erosion protection

Erosion protection is used to protect stopbanks and natural channel banks from erosion, maintain channel stability and reduce sediment deposition. Erosion protection assets include: rock work, buffer zone, edge planting, fencing, groyne, rubble and trenched willows. The erosion protection assets are not depreciated.

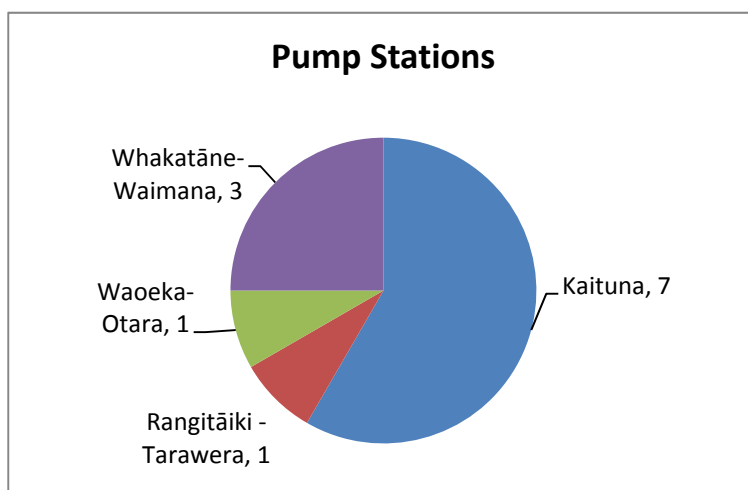
## 11.3 Pump stations

Pump stations in the rivers and drainage activity are used to discharge drainage and flood flows when gravity outlets have either been blocked or inhibited in some way. Pump station components generally include: pumps, pump stations (i.e. structure), pump electricals, pump electronics (e.g. control and telemetry).

Pump stations are inspected fortnightly for operational capability and receive programmed maintenance throughout their life cycle.

Pump Stations including pumps and pump electronics make up 4% of the Optimised Depreciated Replacement Cost (ODRC) for all of the rivers and drainage assets, with a total value of \$8M.

Figure 6 shows the number of pump stations per scheme.



*Figure 6 Number of pump stations by scheme.*

## 11.4 Structures

Rivers and Drainage Schemes have a number of structures that assist with the overall function of the activity. The structures assets that form part of the rivers and drainage infrastructure include; culverts, concrete structures, concrete walls, drop structures, flood gates, radial gates, sluice gates, stop logs, timber walls.

Structures undergo a programme of regular maintenance with asset condition monitored by regular inspection.

## 11.5 Waterways (Drains and canals)

The drains and canals assets are channels excavated to provide drainage (drains) or sufficient flow capacity for design floods (canals). The Rangitāiki-Tarawera and Whakatane-Waimana River Schemes do not have waterways assets. These assets do not include natural streams.

Waterways (Drains and canals) contribute to 7% of the total ODRC for all of the assets.

Rangitāiki Drainage Scheme accounts for 85% of the total ODRC of Drains and Canals, with a value of \$13.6M.

The drains and canals assets have an estimated life of perpetuity and are therefore not subjected to depreciation.

Condition of the Drains and Canal are generally monitored by visual inspections, physical surveys and scheme reviews including detailed computer modelling.

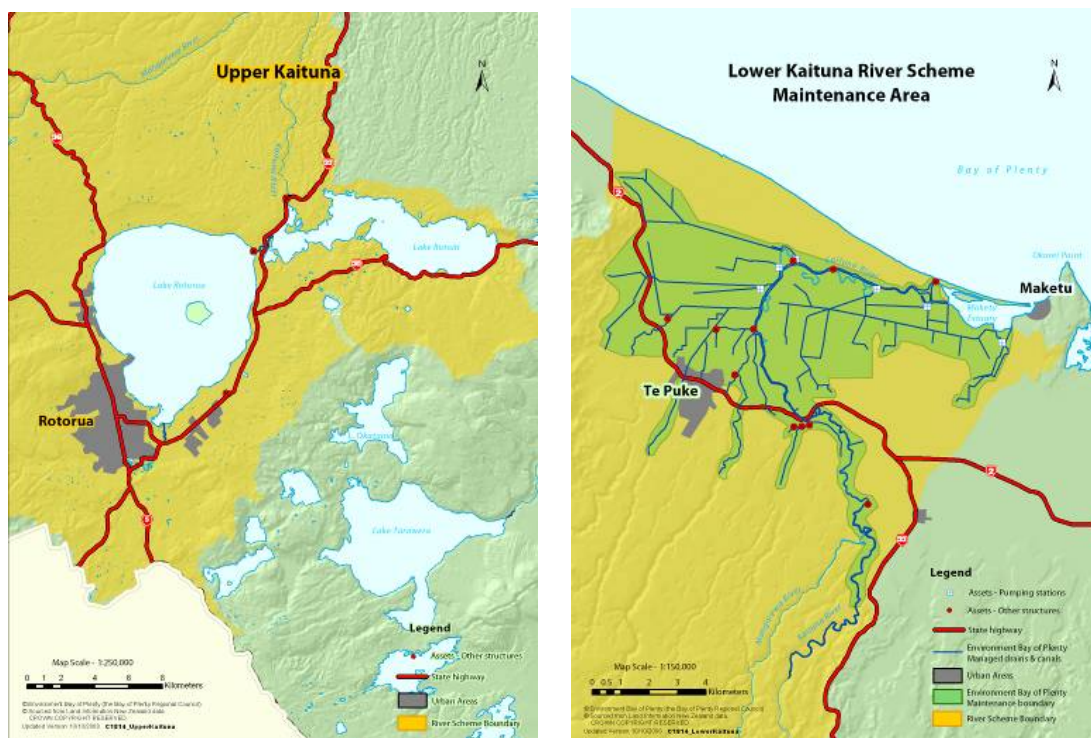
## 11.6 Rivers and streams

A number of rivers and streams are maintained by Bay of Plenty Regional Council. These assets do not have any economic value (i.e. are not considered as part of the valuation), however they do require maintenance and this requires ongoing maintenance and operational budgets to allow maintenance works to go ahead.

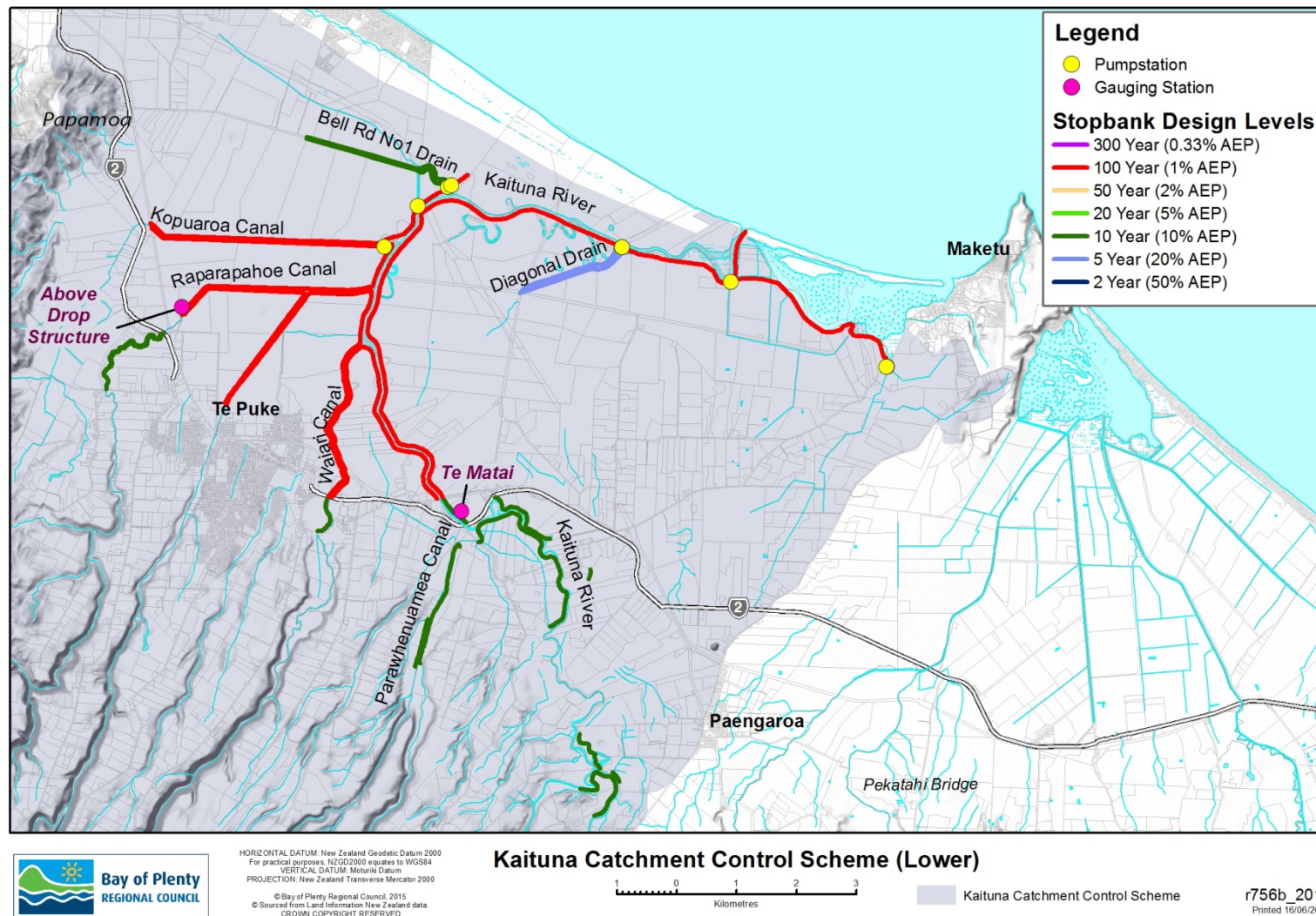
## 12 Scheme summaries

### 12.1 Kaituna Catchment Control Scheme

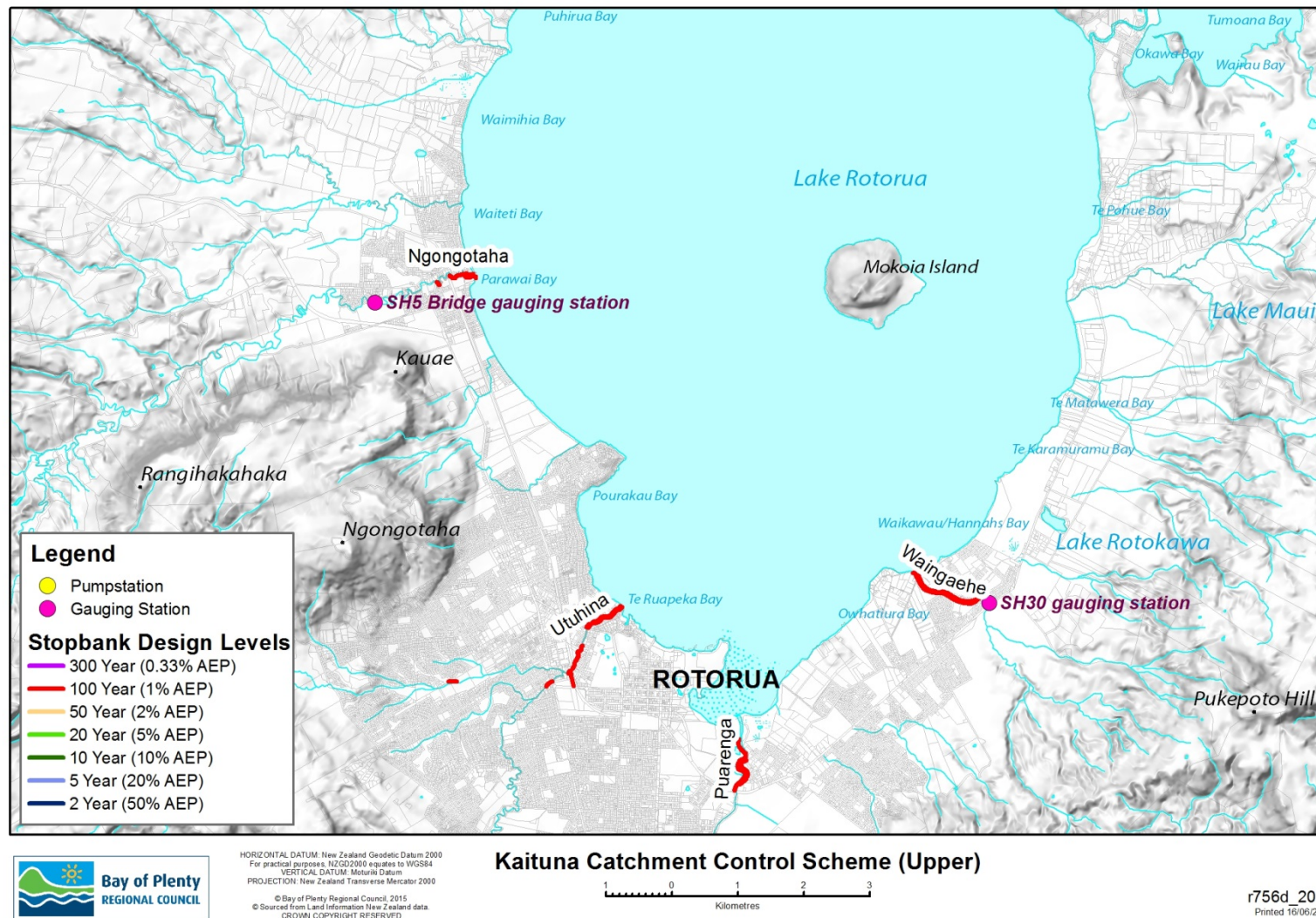
The Kaituna Catchment Control Scheme includes the Kaituna River, Lake Rotorua and Lake Rotoiti Catchments. The scheme consists of two discrete areas divided at Okere: Upper Kaituna and Lower Kaituna.







Asset design standards for Kaituna Catchment Control Scheme (Lower).



Asset design standards for Kaituna Catchment Scheme (Upper).

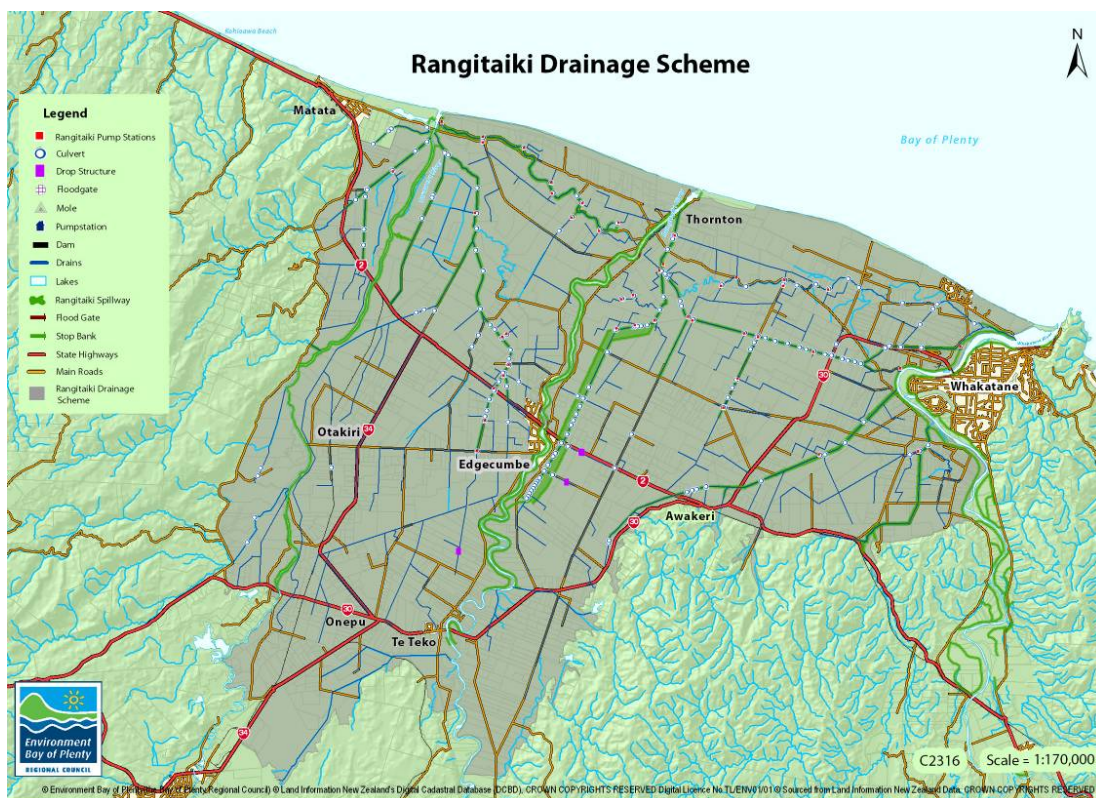


**Table 3**      *Capital expenditure schedule – Kaituna Scheme.*

Year	Capital works	Type	How much
Year 1 (2015/16)	Kaituna River and Canal Stopbanks.	Replacement	\$100,000
Year 2 (2016/2017)	Kaituna River and Canal Stopbanks.	Replacement	\$100,000
	Utuhina stopbanks (optioneering).	Replacement	\$50,000
	Ford Road Pump Station (design).	Replacement	\$125,000
Year 3 (2017/2018)	Utuhina stopbanks (modelling).	Replacement	\$70,000
	Kaituna Mole sheetpile replacement.	Replacement	\$250,000
	Pump station electrical upgrades.	Replacement	\$40,000
	Ford Road Pump Station.	Replacement	\$2,200,000
Year 4 (2018/2019)	Utuhina stopbanks (design).	Replacement	\$50,000
	Kaituna River desilting.	Improvement	\$150,000
	Pump station electrical upgrades.	Replacement	\$80,000
Year 5 (2019/2020)	Utuhina stopbanks.	Replacement	\$630,000
	Kaituna River desilting.	Improvement	\$150,000
	Pumps Replacements.	Replacement	\$420,000
Year 6 (2020/2021)	Utuhina stopbanks.	Replacement	\$500,000
	Pump station electrical upgrades.	Replacement	\$20,000
	Stopbank reconstruction (optioneering).	improvement	\$100,000
Year 7 (2021/2022)	Stopbank reconstruction (modelling)	Improvement	\$100,000
	Pump station electrical upgrades.	Replacement	\$95,000
Year 8 (2022/2023)	Stopbank reconstruction (modelling).	Improvement	\$200,000
	Pump replacements.	Replacement	\$170,000
Year 9 (2023/2024)	Stopbank reconstruction (design).	Improvement	\$100,000
Year 10 (2024/2025)	Stopbank reconstruction.	Improvement	\$1,900,000
<b>Total Planned Capital Expenditure</b>			<b>\$7,600,00</b>

## 12.2 Rangitāiki Drainage Scheme

The Rangitāiki Drainage Scheme provides gravity drainage to the Rangitāiki Plains, an area of approximately 29,000 ha. The scheme has 88 km of major canals (arterial) and 240 km of drains, which divert excess water from the Rangitāiki Plains into the Tarawera, Rangitāiki and Whakatāne Rivers.



The following table outlines the capital expenditure for the Rangitāiki Drainage Scheme.

**Table 4** Capital expenditure schedule – Rangitāiki Drainage Scheme.

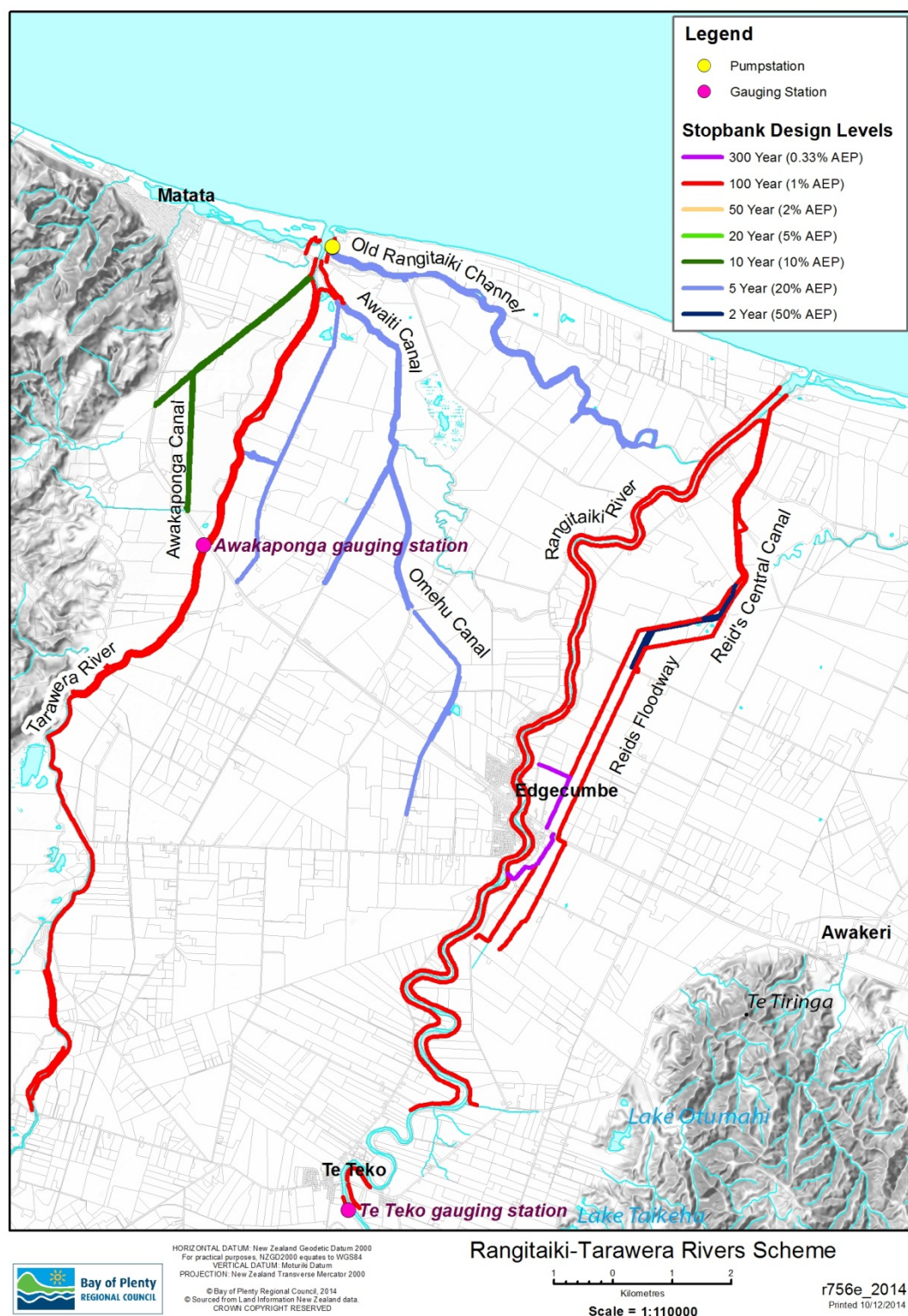
Year	Capital works	Type	How much
Year 1 (2015/2016)	Multiple floodgate replacement.	Replacement	\$205,000
Year 2 (2016/2017)	Multiple floodgate replacement.	Replacement	\$200,000
Year 3 (2017/2018)	Multiple floodgate replacement.	Replacement	\$250,000
Year 4 (2018/2019)	Multiple floodgate replacement.	Replacement	\$255,000
Year 5 (2019/2020)	Multiple floodgate replacement.	Replacement	\$110,000
Year 6 (2020/2021)	Multiple floodgate replacement.	Replacement	\$180,000
Year 7 (2021/2022)	Multiple floodgate replacement.	Replacement	\$210,000
Year 8 (2022/2023)	Multiple floodgate replacement.	Replacement	\$190,000
Year 9 (2023/2024)	Multiple floodgate replacement.	Replacement	\$105,000
Year 10 (2024/2025)	Multiple floodgate replacement.	Replacement	\$105,000
<b>Total Planned Capital Expenditure</b>			<b>\$1,810,000</b>

## Rangitāiki-Tarawera Rivers Scheme

Rangitāiki-Tarawera Rivers Scheme provides flood protection and channel edge stability to land within the Rangitāiki and Tarawera Catchments. It has the largest catchment area of all the schemes.







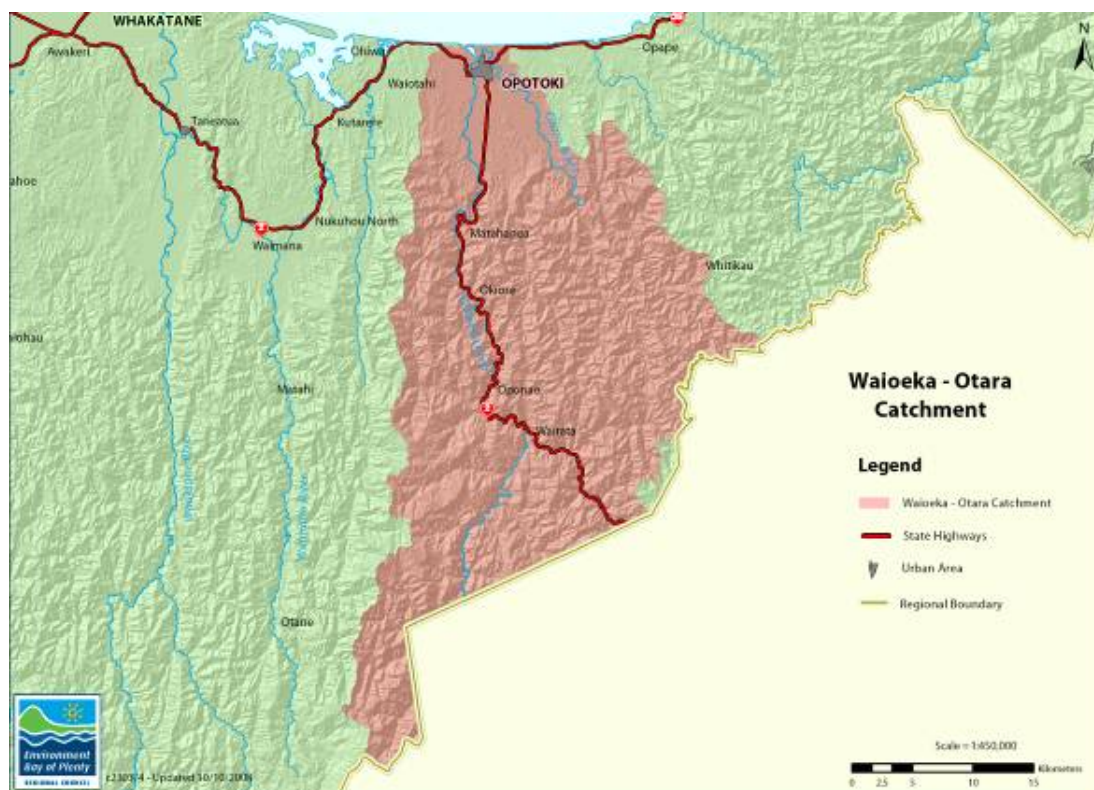
*Asset design standards for Rangitaiki-Tarawera Rivers Scheme.*

**Table 5**      *Capital expenditure schedule – Rangitāiki-Tarawera Rivers Scheme.*

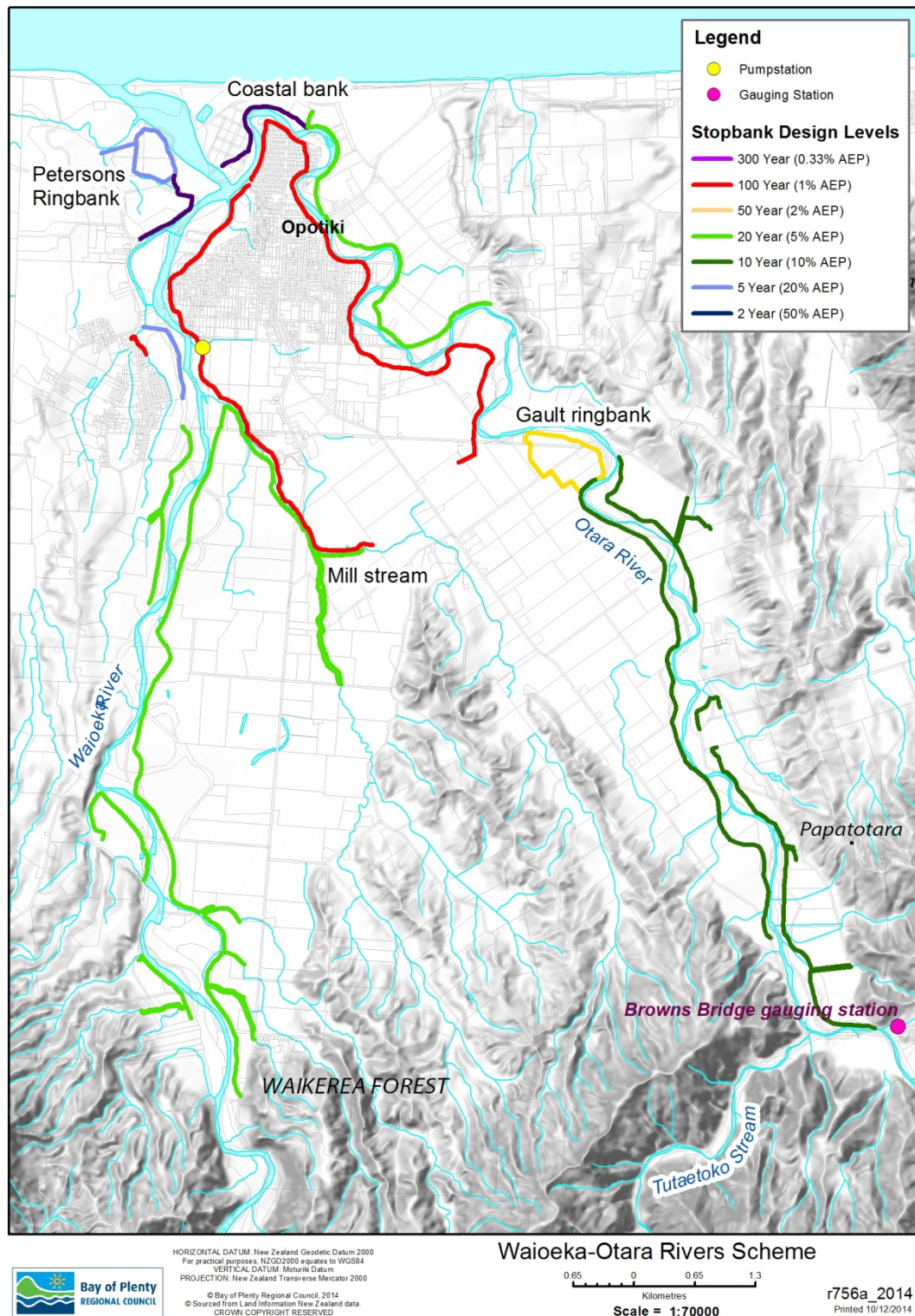
Year	Capital works	Type	How much
Year 1 (2015/2016)	Rangitaiki Floodway widening stage 3 right bank.	Replacement	\$2,050,000
Year 2 (2016/2017)	Rangitaiki Floodway widening stage 3 left bank.	Replacement	\$3,130,000
	Rangitaiki Stopbanks downstream Edgecumbe (modelling).	Replacement	\$70,000
Year 3 (2017/2018)	Rangitaiki Floodway Stopbank top ups.	Replacement	\$4,260,000
	Rangitaiki Stopbanks downstream Edgecumbe (modelling).	Replacement	\$70,000
Year 4 (2018/2019)	Rangitaiki Floodway Stopbank top ups.	Replacement	\$3,080,000
	Rangitaiki Stopbanks downstream Edgecumbe (design).	Replacement	\$150,000
Year 5 (2019/2020)	Rangitaiki Stopbanks downstream Edgecumbe (modelling).	Replacement	\$80,000
	Rangitaiki Spillway Structure	Improvement	\$1,160,000
Year 6 (2020/2021)	Rangitaiki River Stopbanks downstream Edgecumbe.	Replacement	\$1,150,000
Year 7 (2021/2022)	Stopbank renewals following capacity reviews (Reach 10 and other canals).	Replacement	\$600,000
Year 8 (2022/2023)	Stopbank renewals following capacity reviews (Reach 10 and other canals).	Replacement	\$600,000
	ORC pump electronics.	Replacement	\$30,000
Year 9 (2023/2024)	Stopbank renewals following capacity reviews (Reach 10 and other canals).	Replacement	\$600,000
<b>Total Planned Capital Expenditure</b>			<b>\$17,030,000</b>

### 12.3 Waioeka-Otara Rivers Scheme

The Waioeka-Otara Rivers Scheme provides flood protection, channel edge stability and some drainage and pumping to Opatiki and the surrounding land on the floodplain.







*Asset design standards for Waioeka-Otara Rivers Scheme.*

The following table outlines the annual capital expenditure for the Waioeka-Otara Rivers Scheme.

**Table 6**      *Capital expenditure schedule – Waioeka-Otara Rivers Scheme.*

Year	Capital works	Type	How much
Year 3 (2017/2018)	Stopbank renewals following capacity review. (modelling)	Replacement	\$50,000
	Climate change mitigation. (modelling)	Improvement	\$50,000
Year 4 (2018/2019)	Stopbank renewals following capacity review. (modelling)	Replacement	\$50,000
	Climate change mitigation. (modelling)	Improvement	\$50,000
Year 5 (2019/2020)	Stopbank renewals following capacity review. (modelling)	Replacement	\$50,000
	Climate change mitigation. (modelling)	Improvement	\$50,000
	Duke Street pump electronics.	Replacement	\$20,000
	Duke Street pumps.	Replacement	\$125,000
Year 6 (2020/2021)	Stopbank renewals following capacity review. (modelling)	Replacement	\$50,000
	Climate change mitigation. (modelling)	Improvement	\$50,000
Year 7 (2021/2022)	Stopbank renewals following capacity review. (modelling)	Replacement	\$50,000
	Climate change mitigation. (modelling)	Improvement	\$50,000
Year 8 (2022/2023)	Stopbank renewals following capacity review. (modelling)	Replacement	\$765,000
	Climate change mitigation. (modelling)	Improvement	\$850,000
<b>Total Planned Capital Expenditure</b>			<b>\$2,260,000</b>



## 12.4 Whakatāne-Waimana Rivers Scheme

The Whakatane-Waimana Rivers Scheme provides flood protection, channel edge stability and drainage to the Whakatane River and Waimana River Catchments.



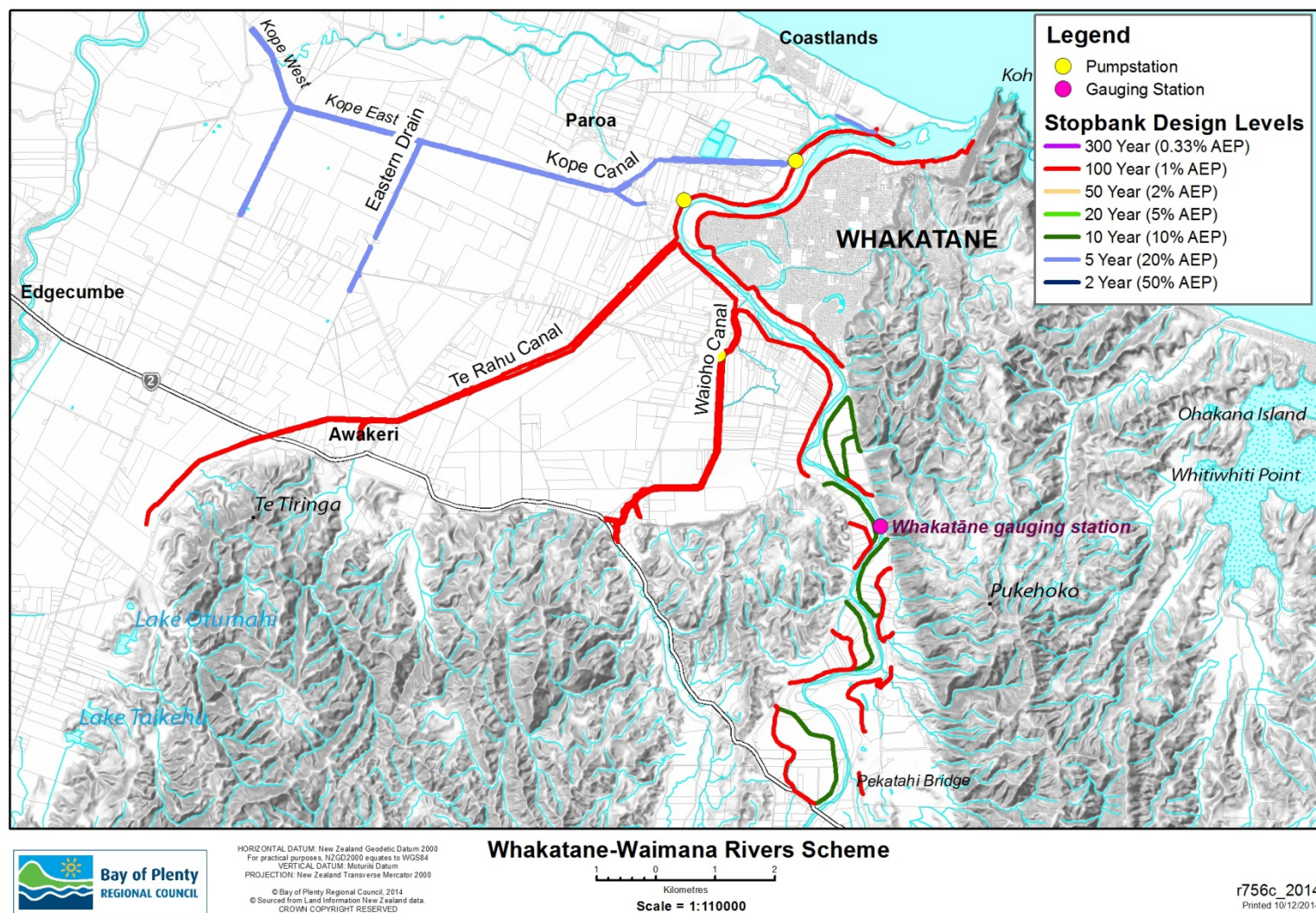


Figure 7 Asset design standards for Whakatāne-Waimana Rivers Scheme.

The following table outlines the annual capital expenditure for the Whakatāne/Waimana Rivers Scheme.

*Table 7 Capital expenditure schedule – Whakatāne/Waimana Rivers Scheme.*

Year	Capital works	Type	How much
Year 1 (2015/16)	Quay Street stormwater improvements. Whakatāne stopbanks. (modelling)	Improvement Replacement	\$270,000 \$50,000
Year 2 (2016/2017)	Whakatāne stopbanks. (modelling)	Replacement	\$50,000
Year 3 (2017/2018)	Whakatāne stopbanks renewals.	Replacement	\$320,000
Year 4 (2018/2019)	Whakatāne stopbanks renewals. Culvert renewals.	Replacement Replacement	\$350,000 \$150,000
Year 8 (2022/2023)	Stopbank renewals. Canals capacity review. (modelling) Pump electronics.	Replacement Replacement	\$50,000 \$35,000
Year 9 (2024/2025)	Stopbank renewals. Canals following capacity review.	Replacement	\$570,000
<b>Total Planned Capital Expenditure</b>			<b>\$1,845,000</b>

## 13 AMP review and monitoring

This plan is a living document, which is relevant and integral to daily activity. To ensure the plan remains useful and relevant the following on-going process of AMP monitoring and review activity will be undertaken:

- Formal adoption of the AMP by the Council.
- Work on AMP Improvement Plan annually.
- Review and formally adopt Levels of Service to comply with community outcomes.
- Revise AMP three yearly prior to Long Term Plan (LTP) to incorporate and document changes to works programmes, outcome of service level reviews and new knowledge resulting from the AMP's Improvement Plan.
- Quality assurance audits of asset management information to ensure the integrity and cost effectiveness of data collected.
- Peer review and external audits will be undertaken to assess the effectiveness with which this plan meets corporate objectives. Periodic internal audits will be undertaken to assess the adequacy of asset management processes, systems and data and external audits will be undertaken to measure asset management performance against 'best practice'.

## 14 Improvement Plan

The purpose of the Improvement Plan is to identify and develop improvements to the AMP processes to ensure it is fit for purpose and effective. This includes:

- The cycle of AMP monitoring, review, revision and audit to improve the effectiveness of AMP outputs and compliance with audit criteria, legislative requirements and best appropriate practice.



- The definition of service standards reflecting community outcomes through public consultation. The AMP is used to identify service level options and costs, and the delivery of services is a key objective of asset management planning.
- Identify and prioritise ways to cost-effectively improve the quality of the AMP, and therefore decision making and service delivery.
- Identify indicative time-scales, priorities, human and financial resources required to achieve asset management planning objectives.

The development of this AMP is based on existing Levels of Service, the best available current information and the knowledge of Bay of Plenty Regional Council staff. It is intended that the development of this Plan is part of an ongoing process and that the document will be reviewed and updated regularly. This review process involves using improved knowledge of customer expectations (community consultation) and information from asset management systems and databases. This will enable Bay of Plenty Regional Council to optimise decision-making, review outputs, develop strategies, improve risk management and extend the planning horizon.