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## Rivers and drainage introduction

### The Bay of Plenty region

#### The place

The Bay of Plenty is located on the east coast of the North Island of New Zealand. The region incorporates the full extent of the coastline from Cape Runaway in the east, to Waihi Beach in the west captures the coastal townships of Tauranga and Whakatane. On the landward side, the region is mostly bounded by the watersheds of the catchments that flow into the Bay of Plenty; this includes the lakes in the Rotorua district. On the ocean side, the region includes 18 offshore islands including the volcanically active White Island, and the sea extending out to the 12-nautical-mile boundary.

The area of the region is 21,740 square kilometres, comprising 12,231 square kilometres of land and 9,509 square kilometres of coastal marine area as shown in Figure 1 below.

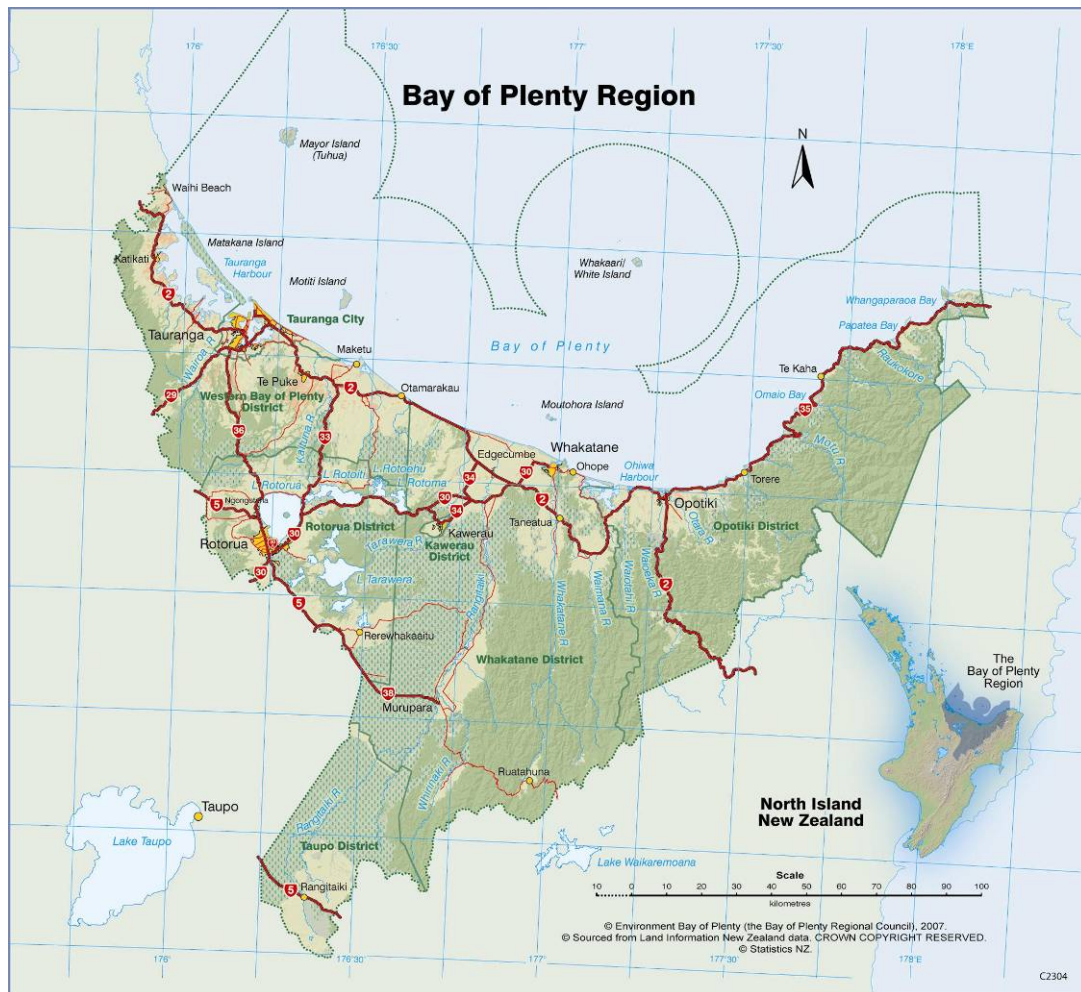


Figure 1 Map of the Bay of Plenty region

#### The natural environment

The Bay of Plenty Region has a number of prominent features and landmarks. The prominent features of the region include islands such as Matakana, Tuhua (Mayor) and an active volcano, Whakaari (White Island). Other distinctive landmarks in the region include the numerous lakes of the Rotorua district and the distinctive peaks of Mount Tarawera and Putauaki (Mount Edgecumbe), the Tauranga and Ohiwa Harbours and Mauao (Mount Maunganui).

The region is volcanically active with The Taupo Volcanic Zone crossing the area between White Island and Lake Taupo. The two major features of this zone include a number of extensive geothermal areas (for example those found in Rotorua) and a number of earthquake fault lines that run parallel to each other within this zone.

Eight major rivers empty into the Bay - these are the Wairoa, Kaituna, Tarawera, Rangitaiki, Whakatane, Waioeka, Motu and Raukokore rivers. In addition, there are seven large estuaries - the Maketu, Little Waihi, Whakatane, Waioeka, Waioeka/Otara, Tauranga and Ohiwa estuaries. The abundance of waterways in the area combine to enhance the active lifestyle opportunities for the Bay's residents and visitors and also presents a number of challenges regarding provision of access to waterways whilst protecting the surrounding areas from extreme flooding events.

The region extends inland, generally to the ridge of the catchments that drain into the Bay of Plenty. The furthest point from the coast is the top of the Rangitaiki River Catchment which is 139 kilometres from the sea.

## Climate

The Bay of Plenty generally has one of the sunniest climates in New Zealand, especially in coastal areas where dry spells have been traditionally quite common place. Annual rainfall follows variations in topography and varies from 1,400 mm near the coast to 4,000 mm on the highest parts of the Raukumara Ranges. Indications of climate change by the IPCC are that the Bay of Plenty region may receive less rainfall in future, however the intensity and frequency of high rainfall events will likely to increase. Sea level is predicted to rise with increased magnitude of tidal storm surge.

The region has lower than average wind. Temperature inversions trap warm air under a layer of cold air in many places, particularly in winter.

## Economy and population

At the 2006 census, the region had a population of 257,379 with the largest urban area being Tauranga. A total of 82% of the population live in the urban areas of Tauranga city, Rotorua district, and Western Bay of Plenty.

The region's population is predicted to grow by 15% by 2021 and will make the Bay of Plenty region the second fastest growing region in New Zealand.

Results from the 2006 census indicate that the unemployment rate in the Bay is approximately 6.1 percent for people aged 15 years and over, compared with 5.1 percent for New Zealand. Proportionally those working in the Bay earn slightly less than the national average and there are slightly more retirees in the region also.

The following figure outlines the projected population to 2031 and some key points are noted below.

- ▶ 257,379 people usually live in Bay of Plenty region. This is an increase of 17,964 people, or 7.5 percent, since the 2001 Census.
- ▶ Bay of Plenty population ranks 5<sup>th</sup> in size out of the 16 regions in New Zealand.
- ▶ Bay of Plenty region has 6.4 percent of New Zealand's population.

From the following Figure, it is evident that the medium projection has a similar gradient to the actual rate of change for the region. This projection shows a projected population of just over 300,000 by 2021.

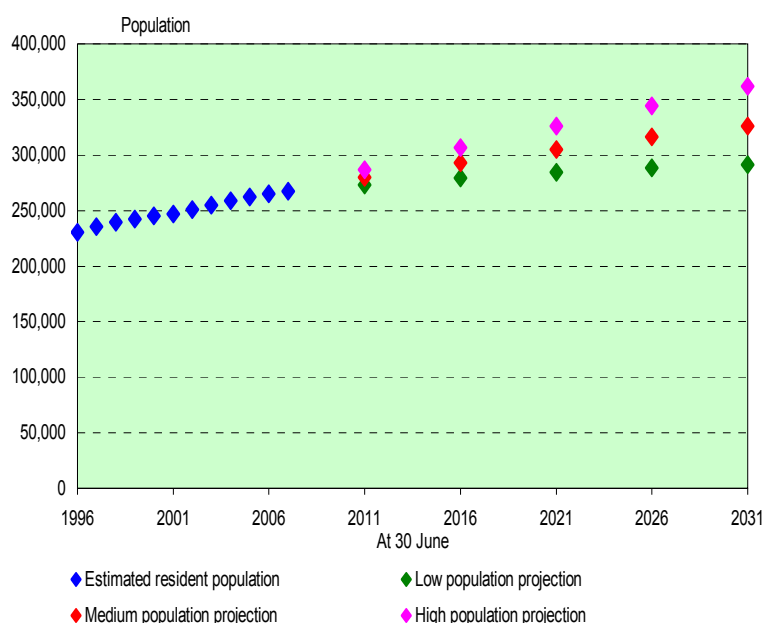


Figure 2 Population projections

The following figure shows the percentage of people living in the Bay of Plenty by district. Fewer than 200 people live in the small part of Taupo district that is located in the Bay of Plenty region. Around 50 people live on islands in the region that are not part of any district or city area.

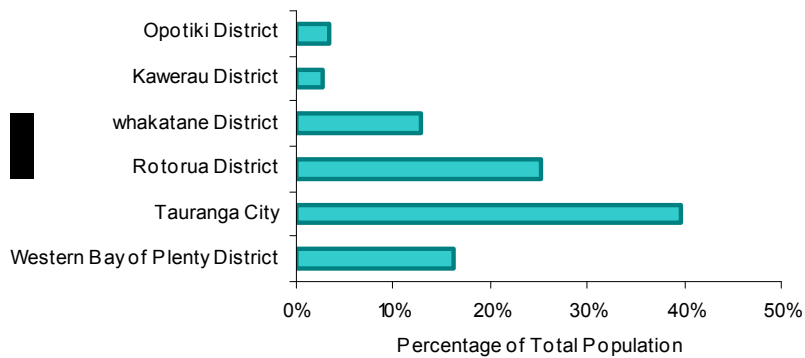


Figure 3 Population by district

Note: All population data is as at 30 June 2006 population data is sourced from Statistics New Zealand.

Bay of Plenty region data is a sum of the six territorial authorities and therefore includes the small part of Rotorua district not located in the Bay of Plenty region and does not include the small part of Taupo district located in the region or the non-district offshore islands.

## Rivers and drainage at a glance

Major rivers and drainage schemes and drainage areas within the regional boundaries of Bay of Plenty Regional Council (BOPRC) include:

- ▶ Kaituna Catchment Control Scheme
- ▶ Whakatāne-Waimana Rivers Scheme
- ▶ Rangitāiki Drainage Scheme
- ▶ Rangitāiki-Tarawera Rivers Scheme
- ▶ Waioeka-Otara Rivers Scheme

There are also a number of minor rivers and drainage schemes that complete the rivers and drainage network in the Bay of Plenty. The minor drainage schemes are not part of the Rivers and Drainage Asset Management Plan (AMP), Bay of Plenty Regional Council do not own these assets, but do manage on behalf of these schemes. Each scheme has the discretion to use Council or others to manage their scheme.

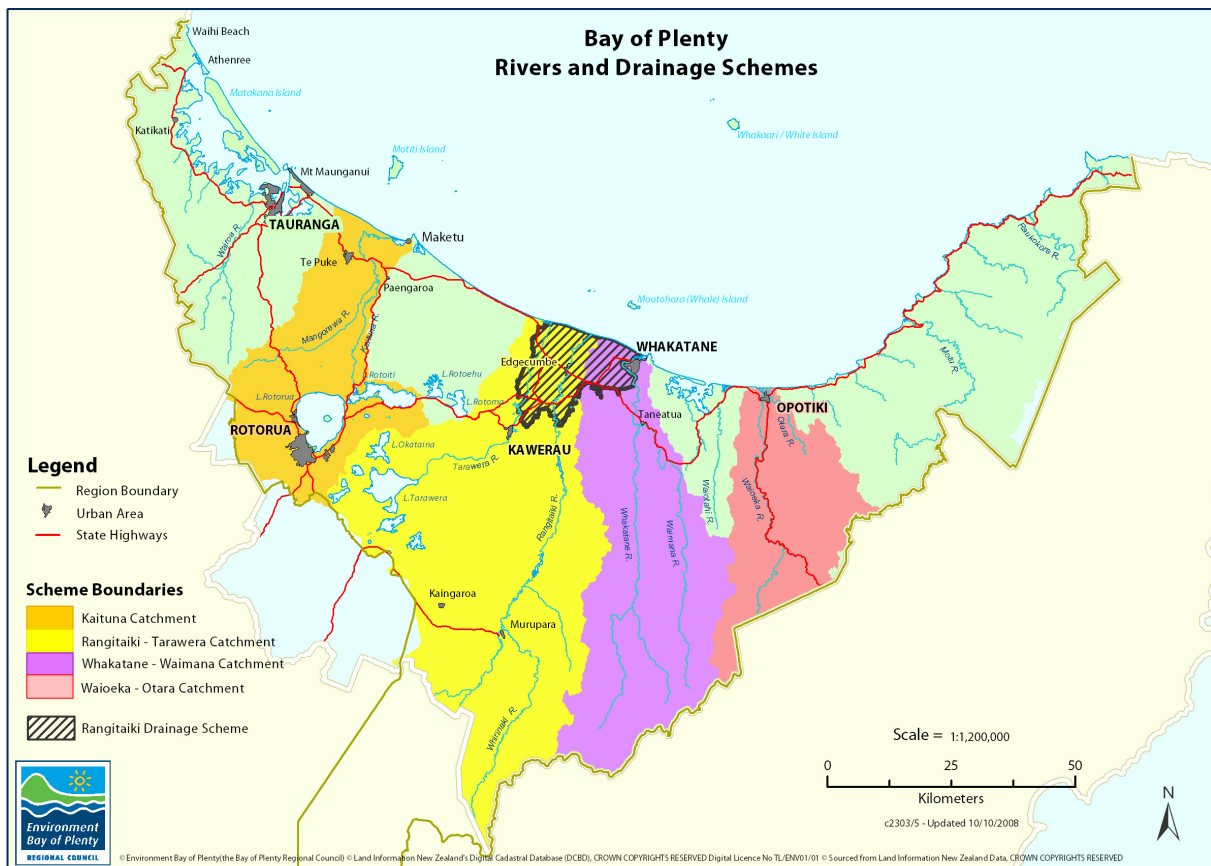


Figure 4 Overview map of river schemes

An overview of these assets related to these areas is provided below.

*Table 1 Overview of rivers and drainage assets*

<b>Combined schemes assets</b>	<b>\$</b>
Erosion protection	\$20,997,659
Pump stations	\$7,040,376
Stopbanks	\$138,632,989
Structures	\$9,969,996
Waterways	\$13,418,815
<b>Value</b>	
Replacement cost	\$190,059,834
Optimised depreciation replacement cost	\$176,917,941

## Overview of asset management planning

### Asset management planning 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 first combined AMP for all rivers and drainage. The first Rivers and Drainage Asset Management Plans (AMPs) were completed in 1996 – 1998 and updated in subsequent years on a five yearly cycle for each scheme.

In order to fulfil the Community Outcomes, Vision, Goals and Objectives outlined in the Strategic Environment (next section), 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.
- ▶ 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.

### Purpose of this Plan

The purpose of this Plan is to formally document 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 Ten Year Plan (TYP).

This long-term planning approach is considered 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 this Plan is prepared in consultation with them.

The key purpose of this plan is to:

- ▶ Provide a document 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.
- ▶ 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.
- ▶ This AMP also aims to demonstrate that the service potential of the rivers and drainage assets is being maintained.

## Plan timeframe

This AMP covers a 50 year timeframe. The Plan assumes that the rivers and drainage assets as a whole have an indefinite life and the main focus of the Plan is determining the strategies required maintaining, rehabilitating and renewing components over the next 10 years. This AMP provides the detail underlying the TYP, and is also completed every three years.

## Key planning assumptions and limitations of this Plan

This intermediate-advanced AMP has been prepared based on the following assumptions:

- ▶ Currently available information and data.
- ▶ Existing levels of service.
- ▶ Financial forecasts for 50 years.
- ▶ Limited community consultation.
- ▶ Changes to various standards and technologies are not significant.
- ▶ Natural disasters will not change the demography of the region over the planning period.

## Relationship with other plans and documents

Bay of Plenty Regional Council has a number of key strategic documents in place that govern many of its activities. These relate to, and will assist, in working towards the achievement of the community outcomes. The relationship between this AMP and other documents is shown in Figure 5.

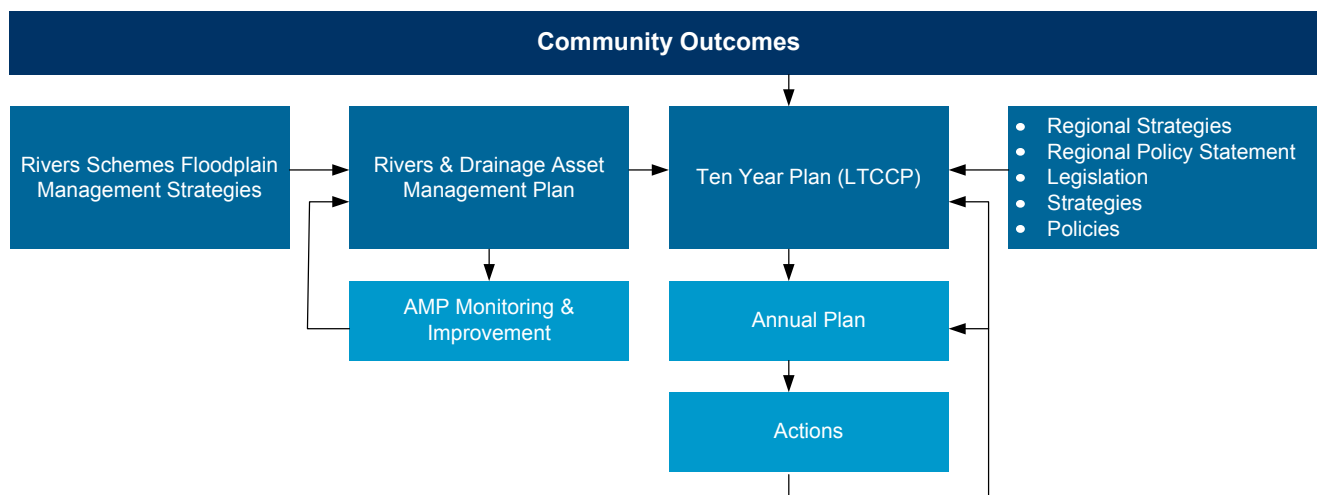


Figure 5 Integrated planning framework/linkages

Table 2 Cycle planning relationships with other plans, reports and documents

Plans/documents	Description	Frequency
<b>Long-Term Council Community Plan (TYP)</b> <b>2009 - 2019</b>	The TYP sets out an agreed vision and community outcomes for Bay of Plenty Regional Council. The framework of this plan is in line with the requirements of the Local Government Act 2002 (LGA 2002). This Plan assists in promoting sustainable practices as well as assisting the community to determine over time what 'outcomes' need to be achieved.	Must be produced every three years. Consultation for community outcomes must be undertaken every six years.
<b>Annual Plan</b>	The works identified in the AMP should automatically become the basis on which future Annual Plans are prepared (as well as the TYP above).	Must be produced in the intervening years between TYPs. Every third year the Annual Plan is embedded in the TYP.
<b>Annual Report</b>	The Annual Report is the mechanism to report back to the community, showing Council's achievement against Annual Plan and TYP targets.	Must be produced every year to report progress.



Plans/documents	Description	Frequency
<b>Asset Management Plans (AMP)</b> <b>June 2009</b>	Levels of service, growth, risk, maintenance, renewal and development works and strategies are identified and budgeted for within this Plan. This information automatically feeds into the TYP and annual planning processes.	Should be reviewed and aligned every year prior to the Annual Plan process and a major update every three years prior to the TYP process.
<b>Contracts</b>	The service levels, strategies and information requirements contained in AMPs are translated into contract specifications and reporting requirements.	Contract performance should be reviewed on a monthly basis.
<b>Triennial Agreement</b>	Sets out the agreement concerning communication and coordination with the other local authorities of the region.	Reviewed every three years with local authorities.
<b>Bay of Plenty Regional Policy Statement</b> <b>December 1999</b>	Promotes the sustainable management of natural and physical resources. Contains objectives, policies and methods for land, air, fresh water, heritage, energy and geothermal resources, the coastal environment, hazardous substances and waste management, natural character and indigenous ecosystems and the built environment.	Produced on a 10 year cycle.
<b>Regional Water and Land Plan</b> <b>December 2008</b>	Sets out the objectives, policies and methods for the sustainable management of water, land and geothermal resources. Aims to maintain or improve land and water quality. Allows for the use and development of these resources where consistent with other aims. Aims to maintain or enhance the Maori cultural values of these resources.	Produced on a 10 year cycle.
<b>Regional Coastal Environment Plan</b> <b>July 2003</b>	Sets out the objectives, policies and methods for the sustainable management of the coastal environment. Provides water classifications for all areas of the Bay of Plenty coastal marine area. Provides for development within the Port Zone and Harbour Development Zones. Provides for preservation of heritage sites in the coastal environment.	Produced on a 10 year cycle.
<b>Regional Air Plan</b> <b>December 2003</b>	Sets out the objectives, policies and methods for the sustainable management of discharges of contaminants into air throughout the region to ensure clean air is available for present and future generations.	Produced on a 10 year cycle.
<b>Regional Plan for the Tarawera River Catchment</b> <b>February 2004</b>	Promotes the sustainable management of natural and physical resources within the Tarawera River Catchment. Aims to ensure that the mauri of the Tarawera River is restored and the balance maintained.	Produced on a 10 year cycle.
<b>Rotorua Geothermal Plan</b> <b>July 1999</b>	Promotes the integrated and sustainable management of Rotorua's geothermal resource with all other resources in the Rotorua environment. Aims to ensure that the Rotorua geothermal resource retains its values and potential, while, for example, protecting tikanga Maori, and providing for the allocation of this economically significant resource.	Produced on a 10 year cycle.
<b>Regional River Gravel Management Plan</b>	Aims to manage the extraction of gravel from the beds of the region's rivers primarily for flood and erosion control purposes. Gravel extraction has economic benefits as a source of construction and roading aggregate, and contributes to the avoidance and mitigation of flood hazards.	Produced on a 10 year cycle. RMA requirement.
<b>SmartGrowth Strategy</b>	Promotes the integrated management of growth and development in the Western Bay of Plenty sub-region. Seeks to achieve long-term visions for maintaining and improving the natural and cultural environment, efficient infrastructure, enhanced lifestyles, providing for communities' social needs and a thriving economy. Implemented in collaboration with other authorities and agencies.	Produced on a 10 year cycle.

## Scope of this Plan

The plan format shown below outlines the sections contained within this AMP.







# Strategic environment

## Strategic overview

### Purpose

Bay of Plenty Regional Council's work guides and supports the sustainable development of the Bay of Plenty, to ensure the region grows and develops in a way that keeps its values safe for future generations.

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

Bay of Plenty Regional Council also has a broader responsibility in combination with others for the economic, social and cultural wellbeing of the regional community.

Bay of Plenty Regional Council's other responsibilities relevant to the rivers and drainage activity includes:

- ▶ Strategic thinking for the region's future.
- ▶ Supporting sustainable economic development.
- ▶ Managing flood risks posed by our regions rivers including the region's major flood control schemes.

### Mission

Bay of Plenty Regional Council's mission is described as:

***"Working with our communities for a better environment"***

### Linkages – community outcomes, and the rivers and drainage activity

Between May 2003 and August 2005, Bay of Plenty Regional Council worked with the region's city and district councils and other organisations to facilitate a Community Outcomes identification process. Different approaches were used for the different communities involved:

**Tauranga City** Community Outcomes (Tauranga Tomorrow) were identified through stakeholder forums, community working groups, a postal survey, display stands, hui, and by talking with people on the street and at events.

**Whakatane, Opoitiki and Kawerau districts'** Community Outcomes (Eastern Bay Beyond Today) were identified through stakeholder forums, questionnaires and workshops, postal feedback forms, hui, display stands, district meetings and by talking with people on the street.

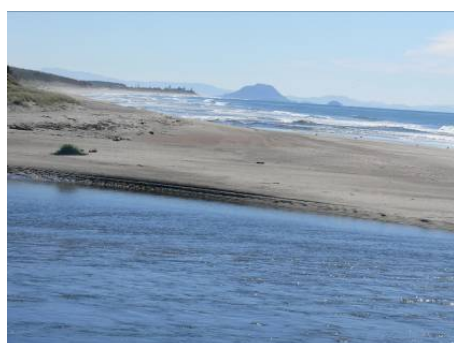
**Rotorua district** Community Outcomes (BrightFuture) were identified through information held by Rotorua District Council, which was provided to the public for their feedback and comments.

**Western Bay of Plenty district** Community Outcomes (SmartFuture) were identified through stakeholder forums, a household questionnaire, public open days, display stands and information brochures.

Bay of Plenty Regional Council used the Community Outcomes that were identified from these four processes to put together a draft set of Regional Community Outcomes. Five community focus groups were held across the region, and the feedback used to make changes to the draft. The resultant community outcomes are:

▶ A clean and protected environment	▶ Value on learning and excellence
▶ Healthy and safe communities	▶ A vibrant and fulfilling lifestyle
▶ Quality affordable infrastructure	▶ Open and inclusive leadership
▶ A prosperous and sustainable economy	▶ Respected culture and heritage

\*Denotes Primary Outcomes contributed to by the Rivers & Drainage activity.



## Rivers and drainage relationship to community outcomes

Figure 6 below illustrates the links between Community Outcomes, groups of activities, Council activities and the AMP. Please refer to Council's TYP for further information for other activities.

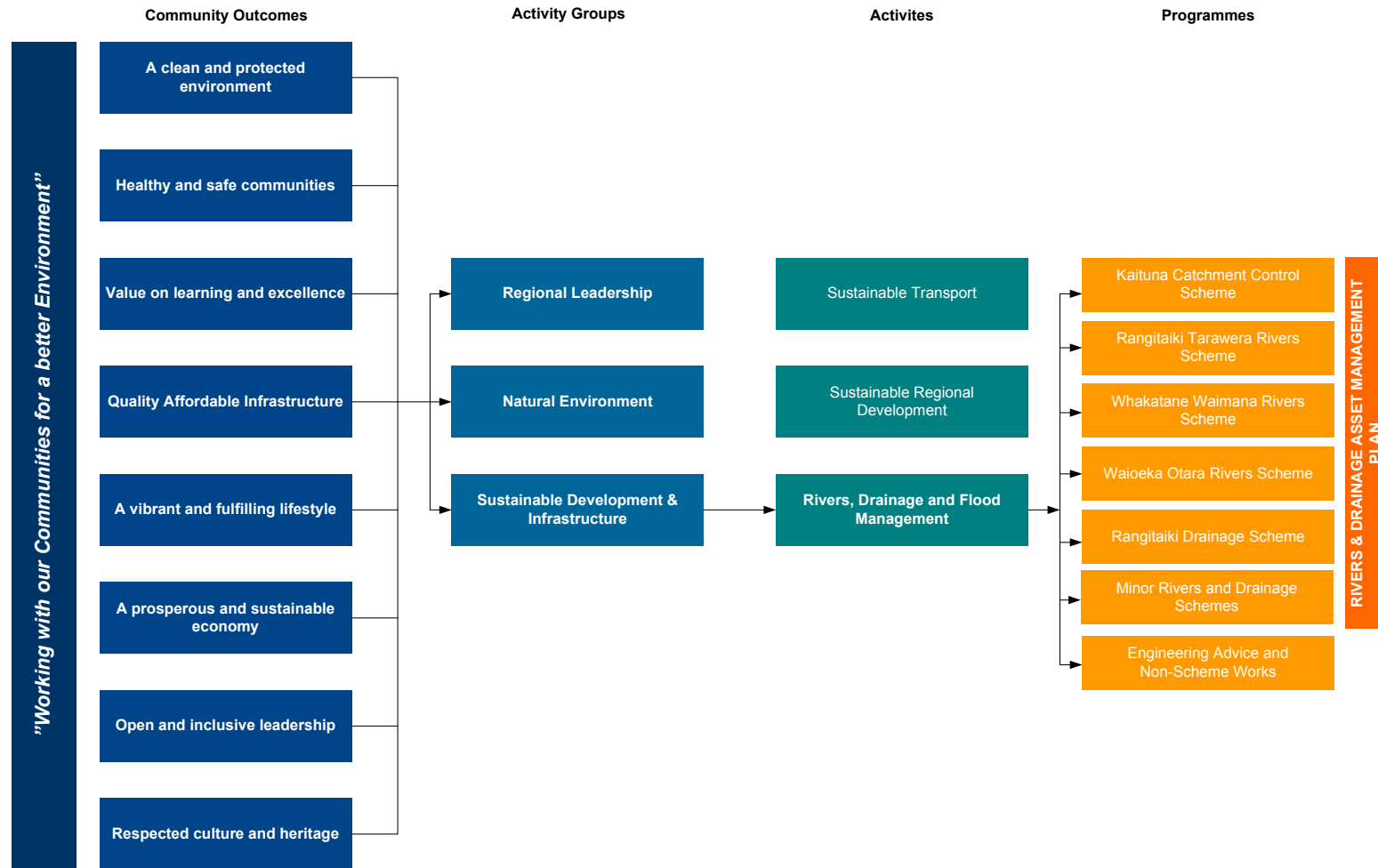


Figure 6 Linkages to community outcomes and the Rivers and Drainage AMP

## How Rivers and drainage contribute to community outcomes

The TYP outlines the community outcomes that relate to the provision of protection works for the rivers and drainage networks. The outcomes that are interlinked with flood protection and operation of the rivers and drainage schemes are outlined below combined with specific objectives for the activity.

Table 3 Contribution to community outcomes

Community outcomes	Contribution to community outcomes (TYP)	Objectives	Addressed in
<b>A Clean and Protected Environment</b>	<ul style="list-style-type: none"> <li>▶ Rare and endangered habitats and species are protected and enhanced</li> <li>▶ Areas of important natural beauty are recognised and protected</li> <li>▶ Our harbours, foreshore and waterways are clean and healthy</li> <li>▶ There are strongly connected open spaces within and between residential and business/industrial areas</li> <li>▶ The community is educated and involved in environmental care</li> <li>▶ Waste is minimised and managed to ensure efficient use of resources</li> <li>▶ Environmental legislation is enforced to ensure population increase and growth pressures are managed in a sustainable way</li> <li>▶ Kaitiakitanga guardianship is practised by all - we look after our land, air, and water resources</li> <li>▶ The region is a place where people can truly experience, enjoy and appreciate nature</li> </ul>	<p>Identify potential hazards and formulate mitigation measures to protect property and the environment</p> <p>Protecting the environment from flood damage using flood protection measures</p>	Environmental Stewardship, Risk Management, Projects & Financial Forecasts, Levels of Service
<b>Healthy and Safe Communities</b>	<ul style="list-style-type: none"> <li>▶ Healthy, active people involved in their communities</li> <li>▶ Greater attention to health promotion with information on preventative health issues readily available</li> <li>▶ An environment that supports healthy living, including such things as safe drinking water, comfortable public spaces and adequate recreational opportunities</li> </ul>	<p>Managing the effect of development upon the existing rivers and drainage schemes and provides a sustainable solution for future requirements</p>	Growth & Demand, Risk
<b>Quality Affordable Infrastructure</b>	<ul style="list-style-type: none"> <li>▶ Infrastructure improvements support sustainable economic growth and development</li> </ul>	<p>Provide sustainable, safe, ongoing, and cost effective rivers and drainage schemes</p> <p>Provide robust maintenance, renewal and capital programmes</p>	Levels of Service, Life Cycle Management
<b>A Prosperous and Sustainable Economy</b>	<ul style="list-style-type: none"> <li>▶ A wide range of employment opportunities are available in urban and rural areas</li> <li>▶ Maori economic development is supported</li> <li>▶ Tourism plays an important role, building on the region's attributes and unique character</li> <li>▶ Economic growth is balanced with social and environmental responsibility</li> </ul>	<p>Provide protection of public health and property by providing flood protection and mitigation</p> <p>Create safe conditions for new business through the management of potential rivers and drainage hazards</p>	Risk, Levels of Service, Environmental Stewardship, Projects and Financial forecasts

## Rationale for Councils' involvement in the rivers and drainage activity

The rationale for the existing ownership is as a result of the Local Government Act provisions whereby regional authorities are responsible for the provision and control of the asset. In common with other similar river schemes throughout New Zealand these schemes were established under the auspices of the Soil Conservation Rivers Control Act 1941. This legislation had its genesis earlier this century and was, for its time, far reaching; Government recognised that flooding and drainage problems were best dealt with on a large-scale (catchment) basis.

Major catchments frequently traversed more than one existing territorial authority. The magnitude of the problem was such that the authorities of the day determined special purpose (ad hoc) authorities, with specialist engineering and soil conservation skills, were required to administer these functions and hence the creation of catchment boards and catchment commissions. The Eastern Bay of Plenty Catchment Commission was created in 1962 in response to flood problems in the region. In 1964 it became the Bay of Plenty Catchment Commission.

***This Plan has been developed on the basis that Council intends to be responsible for the provision of the rivers and drainage activity (specifically excluded from this AMP are private drainage systems or those owned and managed by other councils within the region), for the Bay of Plenty, and considers the provision of the rivers and drainage activity to be an essential function of the Regional Council.***

## Significance Policy

Section 90 of the Local Government Act 2002 requires each Council to adopt a Policy on Significance, which:

- ▶ Sets out that Council's general approach to determining the significance of proposals and decisions in relation to issues, assets or other matters;
- ▶ Sets out any thresholds, criteria or procedures that are to be used by the Council in assessing the extent to which issues, proposals, decisions or other matters are significant, and
- ▶ Lists the assets considered by the local authority to be strategic assets.

## Strategic assets

The Local Government Act 2002 (Section 97) requires that this policy shall identify all of the assets the Council considers to be strategic, as defined in Section 5 of the Local Government Act 2002.

***Bay of Plenty Regional Council has determined the rivers and drainage assets to be strategic in nature.***

Any decision to transfer ownership or control of a strategic asset or a decision to construct, replace or abandon a strategic asset cannot be made unless it has first been included in the TYP (and in a statement of proposal relating to the TYP).

All such actions relating to a strategic asset are automatically significant and must meet the requirements relating to significant decisions with the LGA, specifically Part 6, Section 90.

## Key partnerships and stakeholders

As mentioned previously, Bay of Plenty Regional Council cannot achieve the Community Outcomes alone. There is a need to work with other councils, community groups, businesses, individual landowners, central government, iwi/hapu and non-governmental organisations.

### Key partnerships

- ▶ Environmental Programmes,
- ▶ Care Groups and Environmental education,
- ▶ Maori Regional Representation Committee,
- ▶ Central government,
- ▶ Non-government organisations (Environmental Enhancement Fund, heritage management and regional plans),
- ▶ Sustainable Business Network,
- ▶ Regional development partnerships (Environmental Business Awards, Environmental Programmes and the Ballance Farm Environmental Awards),
- ▶ Local authorities in the region under the Bay of Plenty Triennial Agreement.

## External stakeholders

- ▶ The community – citizens and ratepayers
- ▶ Ratepayers associations
- ▶ Iwi consultation groups
- ▶ Emergency service providers (Police, Ambulance, Fire, Civil Defence)
- ▶ Utility companies – power (generation, transmission, distribution), communication, gas
- ▶ Environmental groups
- ▶ Other Government agencies (Audit NZ, Ministry for the Environment), Housing NZ etc
- ▶ Other contractors
- ▶ Maori Committee (this has been outlined in more detail in the Community Engagement section)
- ▶ Professional service providers

## Internal stakeholders

- ▶ Bay of Plenty Regional Council – councillors, CEO, committees, and managers
- ▶ Asset Management staff
- ▶ Policy and Planning staff
- ▶ Regulatory Services
- ▶ Financial and Corporate staff
- ▶ Information Services and GIS team
- ▶ Human Resources

## Business drivers

Levels of service, health and safety, statutory requirements, national standards, bylaw policies and strategies define the business drivers for the current operation of the rivers and drainage services. These are overviewed below.

## Delivery of rivers and drainage services

Levels of Service (LoS) standards define the levels to which Bay of Plenty Regional Council provides services to the community. Some standards are defined by statutory requirements, others in conjunction with the community, and some with key stakeholders. These standards (or levels of service) provide a basis for determining whether assets need to be constructed, replaced, renewed or maintained. These performance measures have been defined to enable Bay of Plenty Regional Council's performance to be measured and reported against.

These are covered in detail in the LoS section of the Rivers and Drainage AMP.

## Health and safety

The management of Bay of Plenty Regional Council is committed to providing and maintaining a safe and healthy working environment for its employees, visitors and all persons using the premises as a place of work. A Health and Safety Policy is in place to address this and the key elements of this Policy are outlined below.

**To ensure a safe and healthy work environment, management will develop and maintain a health and safety management system to:**

- ▶ Set health and safety objectives and performance criteria for all work areas.
- ▶ Review health and safety objectives and performance annually.
- ▶ Actively encourage the accurate and timely reporting and recording of all accidents, incidents and unsafe conditions.
- ▶ Investigate all reported accidents, incidents and unsafe conditions, to ensure all contributing factors are identified and, where appropriate, plans are formulated to take corrective action.
- ▶ Provide a treatment and rehabilitation plan that ensures an early and durable return to work.
- ▶ Identify all existing and new hazards and take all practicable steps to eliminate, isolate or minimise the exposure to any hazards deemed to be significant.
- ▶ Ensure that all employees are made aware of the hazards in their work area and are adequately trained to enable them to perform their duties in a safe manner.
- ▶ Encourage employee consultation and participation in all matters relating to health and safety.

- ▶ Promote a system of continuous improvement.
- ▶ Meet our obligations under the Health and Safety in Employment Act 1992, the Health and Safety in Employment Regulations 1995, Codes of Practices and any relevant Standards or Guidelines.

**Every employee of Bay of Plenty Regional Council is expected to share in the commitment to this Policy**

- ▶ Every manager and supervisor has a responsibility for the health and safety of those employees working under their direction.
- ▶ Each employee is expected to play a vital and responsible role in maintaining a safe and healthy workplace through:
  - Observing all safe work procedures, rules and instructions.
  - The early reporting of any pain or discomfort.
  - Taking an active role in the company's treatment and rehabilitation plan, to ensure an early and durable return to work.
  - Ensuring that all accidents, incidents and unsafe conditions are reported to the appropriate person.
  - Representatives of senior management and employees will be appointed to the company's Health and Safety Committee, responsible for the implementation, monitoring and review of the Health and Safety Policy and management system.
- ▶ External contractors employed must ensure they have developed and appropriate Health and Safety Plan relevant to their industry safety standards.

## Statutory requirements

Statutory requirements impact on the way in which Bay of Plenty Regional Council operates to meet its obligations to its customers. Some of the key legislation relevant to the rivers and drainage activity is as follows:

### Local Government Act 2002

The Local Government Act 2002 provides councils with a framework of powers to carry out democratic decision-making and action for and on behalf of its community. It also imposes accountability for prudent management and stewardship of community assets in the present and into the future. The Act requires councils to identify community outcomes and develop a comprehensive long-term council community plan (TYP) including the identification of assets and how those assets are to be managed. It is intended that this AMP will be a vehicle for developing and recording community outcomes in relation to the river schemes management, and will be a 'feeder plan' supporting TYP functions and forecasts and asset information.

### Resource Management Act 1991 and Amendments

The RMA 1991 is New Zealand's primary legislation dealing with the management of natural and physical resources. It provides a national framework to manage land, air, water and soil resources, the coast, subdivision and the control of pollution, contaminants and hazardous substances.

The RMA has a single overarching purpose:

***"To promote the sustainable management of natural and physical resources"***

The RMA establishes a hierarchy of policy documents from national instruments to regional policy statements, and regional (and district) plans. This 'hierarchy' and requirement to ensure consistency between plans, is to promote sustainable management and ensure integrated management of natural and physical resources at a national, regional and local level.

### Civil Defence Emergency Management Act (CDEM) 2002

The Civil Defence Emergency Management Act 2002 (CDEM Act 2002) came into force on 1 December 2002. The CDEM Act 2002 ensures that New Zealand has the resources to manage disasters.

Emergency Management focuses on 'the 4Rs':

- ▶ **Reduction** – identifying and analysing risks to human life and property.
- ▶ **Readiness** – developing capabilities before an emergency occurs.
- ▶ **Response** – taking action immediately before, during or directly after an emergency.
- ▶ **Recovery** – initiating activities after impact, and extending them until the community's capacity for self-help is restored.

The CDEM Act 2002 requires:

- ▶ Bay of Plenty Regional Council and other district and city councils in the region to form a Civil Defence and Emergency Management Group (CDEM Group).
- ▶ To develop a Civil Defence Emergency Management Plan that identifies risks from hazards and puts readiness, response and recovery procedures in place. The Plan is developed with public input to ensure hazards and risks are dealt with to a level accepted by the community.

### **Health and Safety in Employment Act 1992**

The objective of the Health and Safety and Employment Act 1992 is to promote the prevention of harm to all people at work, and others in, or in the vicinity of, places of work. The Act applies to all New Zealand workplaces and places duties on employers, the self-employed, employees, principals and others who are in a position to manage or control hazards.

The emphasis of the law is on the systematic management of health and safety at work. It requires employers and others to maintain safe working environments, and implement sound practice. It recognises that successful health and safety management is best achieved through good faith co-operation in the place of work and, in particular, through the input of those doing the work.

### **Rating Powers Act 1988**

The Local Government (Rating) Act 2002 replaced the Rating Powers Act 1988 with updated and streamlined rating powers. The intention is to ensure that the community has the opportunity to be well informed about what its money is being spent on, and to express its views when major decisions are being made.

The three main purposes of the Act are to:

- ▶ Provide local authorities with flexible powers to set, assess and collect rates.
- ▶ Ensure that rates reflect decisions made in a transparent and consultative manner.
- ▶ Provide for processes and information to ensure that ratepayers can identify and understand their liability for rates.

### **Building Act 2004**

In New Zealand, the building of houses and other buildings is controlled by the Building Act 2004. It applies to the construction of new buildings as well as the alteration and demolition of existing buildings.

The Building Act 2004 has repealed the Building Act 1991 and introduces a number of changes to the law governing building work.

### **Land Drainage Act 1906**

Under this Act, local authorities are given powers required to manage watercourses and drainage.

### **Soil Conservation and Rivers Control Act 1941**

The Act provides for the installation of separately rated river schemes on a catchment-by-catchment basis. The purpose of these schemes is to provide flood protection, river control and some drainage and flood pumping within the scheme's catchment areas.

### **Health Act 1956**

This Act establishes the government structure required to enact and enforce health requirements, including the activities of local government and other various sections of legislation, regulations and guidelines.

## **Specific requirements for asset management planning**

The Local Government Act 2002 (LGA 2002) has brought about some significant changes to the way councils operate, with a focus on community consultation and participation and the promotion of social, economic, environmental and cultural wellbeing of communities in the present and in the future.

Schedule 10(2)d of the LGA 2002 covers specific requirements relating to asset management planning with a strong emphasis on the following:

- ▶ **Demand** – In relation to estimated additional capacity and the associated costs and funding sources, including maintenance renewal and upgrades. Section 6 of this AMP covers this in more detail.
- ▶ **Levels of Service (LoS)** – Intended LoS performance targets and other measures by which actual levels of service provision may be meaningfully assessed, and the estimated costs of achieving and maintaining identified LoS, including sources of funding. Section 4 of this AMP covers this in more detail.



## National standards

There are a number of national standards that provide guidance on flood risk and flood risk management, these have been noted below.

### National Policy Statement for Flood Risk Management (Draft)

In 2007, the Minister for the Environment decided that it would be desirable to develop a national policy statement for managing flood risk. This follows the provisions set out in the Resource Management Act 1991. Appropriate flood risk management is important for New Zealand's communities and part of the impetus for this policy statement are the potential impacts of climate change.

A number of organisations, councils and iwi that have an interest in flood management have been contacted to provide input and comments into the first draft that is currently being prepared. This feedback will be considered during the development of the policy statement and it is likely that the final draft will be available for public comment by 2009.

### New Zealand Standard for Flood Hazard Risk Management (NZS9401:2008)

The above standard is currently being completed by the Managing Flood Risk Committee (NZS9401) and provides guidance on the management of flood risk.

The standard provides and explanation of hazard risk management and defines the significant factors that affect flood risk management. Part of this approach is to highlight the importance of shared responsibilities and outlines the key management approaches, assessment principles and implementation criteria that can be considered when making decisions around flood risk management.

The standard aligns with the risk based approach identified in the AS/NZS 4360:2004 - Risk Management.

A number of bylaws, policies and strategies have been developed at a regional level and these have been detailed in the following tables.

## Bylaws

Table 4 Bylaws

Bylaw	Status
Bay of Plenty Regional Council Floodway and Drainage Bylaw 2008	Adopted

## Policies and strategies

Bay of Plenty Regional Council has developed various policies and works in partnership with other agencies, to fulfil its role and align its activities to other agencies and organisations throughout the region. This means that in establishing its programmes, Council must be aware of the following policies, strategies and guidelines.

Table 5 Policies and guidelines

Policy/guideline name	Status
Statement of Significant Accounting Policies (2006 TYP)	Current
Funding Impact Statement (including Rating Policy)	Current
Policy on Determining Significance	Current
Liability Management Policy	Current
Revenue and Financing Policy	Current
Policy on Partnerships between the Council and the Private Sector	Current
Earthworks Erosions and Sediment Control Guidelines	Current
Hydrological and Hydraulic Guidelines	Current
River Gravel Management Guidelines	Current
Environmental Code of Practice for River and Drainage Maintenance Activities	Current



*Table 6 Plans and strategies*

<b>Policy/guideline name</b>	<b>Status</b>
National Policy Statement for Flood Risk Management	Draft
New Zealand Standard for Flood Hazard Risk Management (NZS9401)	Current
Regional Policy Statement	Operative
Regional River Gravel Management Plan	Operative
Regional Coastal Environment Plan	Operative
Regional Water and Land Plan	Proposed
Waioeka Otara Floodplain Management Strategy	Adopted
Whakatane – Waimana Floodplain Management Strategy	Staged
Rangitaiki Tarawera Floodplain Management Strategy	Staged
Regional Land Management Plan	Operative
Regional Plan for the Tarawera River Catchment	Operative
Kaituna River and Ongatoro/Maketu Estuary Strategy	Draft
Kaituna Floodplain Management Strategy	Planned 2010/11
Waioeka-Otara Asset Management Plan	Adopted
Kaituna Asset Management Plan	Adopted
Whakatane Waimana Asset Management Plan	Adopted
Rangitaiki Tarawera Rivers Scheme Asset Management Plan	Adopted
Rangitaiki Drainage Scheme Asset Management Plan	Adopted
Iwi Management Plans	Various
Rivers and Drainage Asset Management Plan	Draft



## Business overview

### Funding and expenditure

#### 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 Rangitaiki Drainage Scheme under the Rangitaiki Land Drainage Act 1956.

Funding for the schemes is predominantly from the scheme ratepayers, identified under each separate rating area.

A general rate (20% of the rate) is also imposed regionally to acknowledge the broader benefits (e.g. environmental) that the schemes provide, except the Rangitaiki Drainage Scheme, which is 100% targeted rate funded. Rates on any property are calculated on the bases of land area and benefit classification of that property.

#### Expenditure

Expenditure on the rivers and drainage activities represents a significant Council investment as shown in Table 7 below.

Table 7 Council investments

2009/2009	
<b>Expenditure</b>	
Operations	4,879,375
Interest	1,271,652
Depreciation	764,390
Total operating expenditure	6,915,417
<b>Revenue</b>	
User fees and charges	(88,900)
Share of Corp income	(6,724)
Other public funding	(12,848)
Targeted rates	(5,085,300)
General RATES	(913,679)
Investment income	(1,679,159)
Total revenue	<b>(7,786,610)</b>
<b>Net cost of operations</b>	<b>(871,193)</b>
<b>Source &amp; application of funding</b>	
Funding from:	
Operating surplus	(871,193)
Depreciation RESERVES	(764,390)
General reserves	(447,344)
Loans raised	(3,049,800)
Funds applied to:	
Operating deficit	0
Loan repayments	1,034,200
Capital expenditure	3,869,127
Payments to reserves	229,400
<b>Net funds applied</b>	<b>0</b>

## Rivers and drainage schemes

Bay of Plenty Regional Council is responsible for the provision and management of five rivers and drainage schemes (Kaituna Catchment Control Scheme, Rangitaiki-Tarawera Rivers Scheme, Whakatane-Waimana Rivers Scheme, Waioeka-Otara Rivers Scheme and Rangitaiki Drainage). These schemes contain a mix of stopbanks, floodways, level control structures, erosion control structures, pump stations, canals and drains.

The management of the rivers and drainage schemes activity involves:

- ▶ Capital works and restoration projects as required.
- ▶ Undertaking an ongoing programme of maintenance in accordance with the AMP.
- ▶ Design and investigation projects.
- ▶ Administering and enforcing the Bay of Plenty Regional Council Floodway and Drainage Bylaw 2008.
- ▶ Reviewing the scheme AMP every eight years with annual improvements.

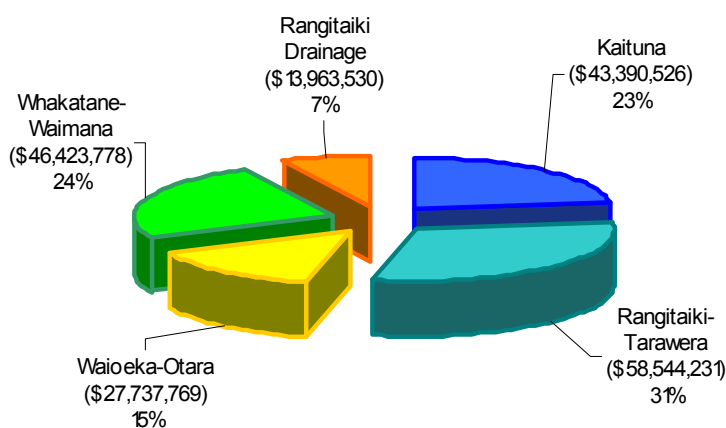
Physical works on the scheme are carried out in accordance with the Environmental Code of Practice for River and Drainage Maintenance Activities that was adopted in consultation with the community.

Table 8 and Table 9 show the gross replacement cost and total depreciation for each scheme. These costs are represented pictorially in Figure 7 and Figure 8.

*Table 8 Summary of gross replacement costs (GRC)*

Scheme	Gross replacement costs
Kaituna	43,390,526
Rangitaiki-Tarawera	58,544,231
Waioeka-Otara	27,737,769
Whakatane-Waimana	46,423,778
Rangitaiki Drainage	13,963,530
<b>Total</b>	<b>190,059,834</b>

(Based on 2008 valuation)



*Figure 7 Gross replacement costs (GRC)*

*Table 9 Total depreciation by scheme*

Scheme	Total depreciation
Kaituna	4,890,298
Rangitaiki-Tarawera	2,794,711
Waioeka-Otara	997,662
Whakatane-Waimana	2,735,618
Rangitaiki Drainage	1,723,605
<b>Total</b>	<b>13,141,894</b>

(Based on 2008 valuation)

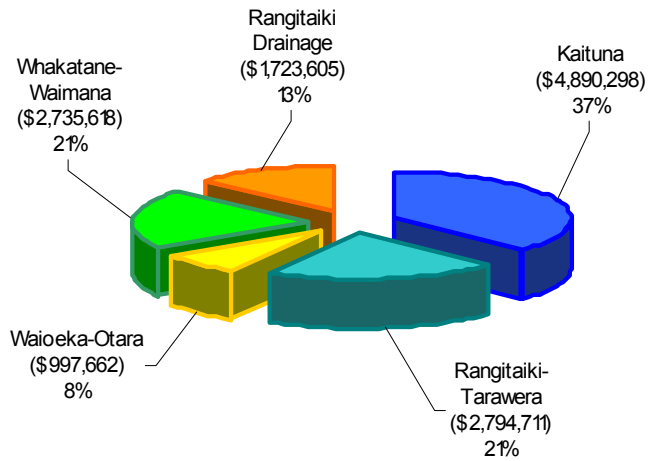


Figure 8 Total depreciation

Annual depreciation represents the annual loss in value as a cost to be funded by the ratepayer. This ensures the benefits from the assets (protection from flooding etc) and the funding costs (loss in “service potential” or asset value) of the assets are matched on an annual basis. This is particularly important for long life assets where they can last across generations, but are expensive to build or replace.

Overviews of the rivers and drainage schemes are provided below.

## Kaituna Catchment Control Scheme

### Scheme overview

The Kaituna Catchment Control Scheme encompasses the Kaituna River, Lake Rotorua and Lake Rotoiti catchments. The scheme consists of two discrete areas divided at Okere: Upper Kaituna (Lakes Rotorua, Rotoiti and tributaries) and Lower Kaituna (the Kaituna River, tributary streams, canals and drainage network).

The scheme provides flood protection, drainage and conservation of soil resources within the scheme’s catchment area as well as lake level control for Lakes Rotorua and Rotoiti.

The scheme boundaries and location are shown in Figure 9.



Figure 9 Kaituna Catchment Control Scheme

## Rangitaiki-Tarawera River Scheme

### Scheme overview

The Rangitaiki-Tarawera Rivers Scheme includes the two adjoining catchments of the Rangitaiki River and the Tarawera River.

The scheme provides flood protection, channel edge stability and some drainage and flood pumping to the township of Edgecumbe and the arable Rangitaiki Plains, Galatea and Waiohau Plains.

The Rangitaiki-Tarawera Rivers Scheme boundaries and location are shown in Figure 10 below.

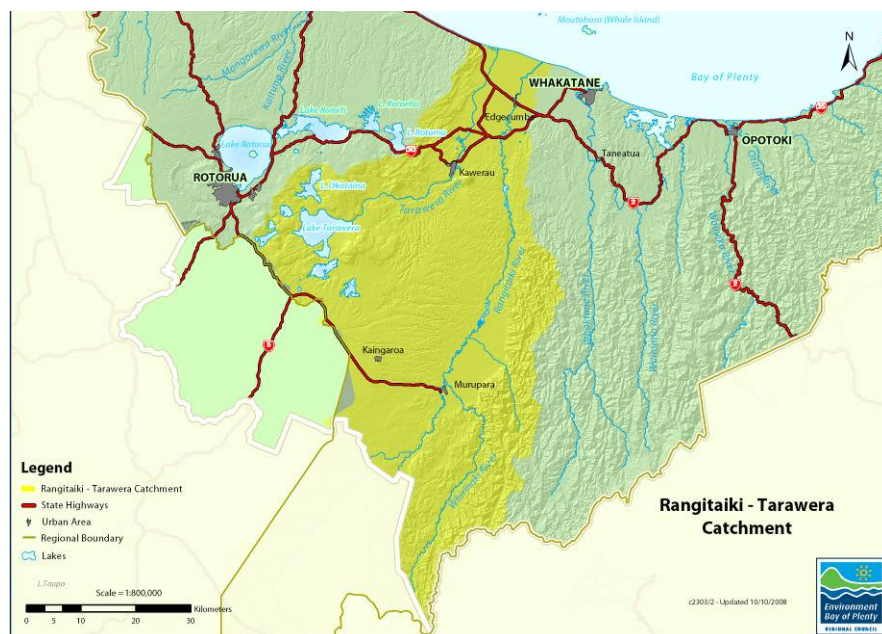


Figure 10 Rangitaiki-Tarawera Rivers Scheme

## Whakatane-Waimana Rivers Scheme

### Scheme overview

The Whakatane-Waimana Rivers Scheme comprises of the Waimana Catchment and the upper Whakatane Catchment of the Whakatane and Waimana Rivers. The scheme provides flood protection, channel edge stability, some drainage and flood pumping within the Catchment including the town of Whakatane.

Note that within the urban area of Whakatane, flood protection works are managed by Whakatane District Council. The Whakatane-Waimana Rivers Scheme boundaries and location are shown in Figure 11 below.

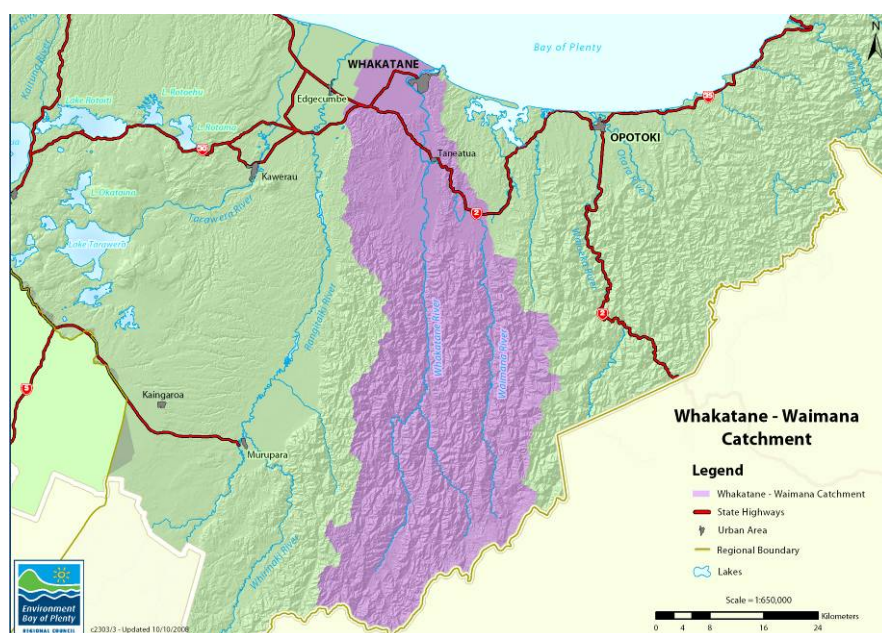


Figure 11 Whakatane-Waimana Rivers Scheme



## Waioeka-Otara Rivers Scheme

## Scheme overview

The Waioeka-Otara Rivers Scheme encompasses the Waioeka and Otara Rivers including their confluence at Opotiki. The scheme provides flood protection, channel edge stability and some drainage and flood pumping within the catchment area including the town of Opotiki. Flood protection (and some drainage works) to the land adjoining Mill Stream and its tributaries is also provided by this scheme. The Waioeka-Otara Rivers Scheme boundaries and location are shown in Figure 12 below.

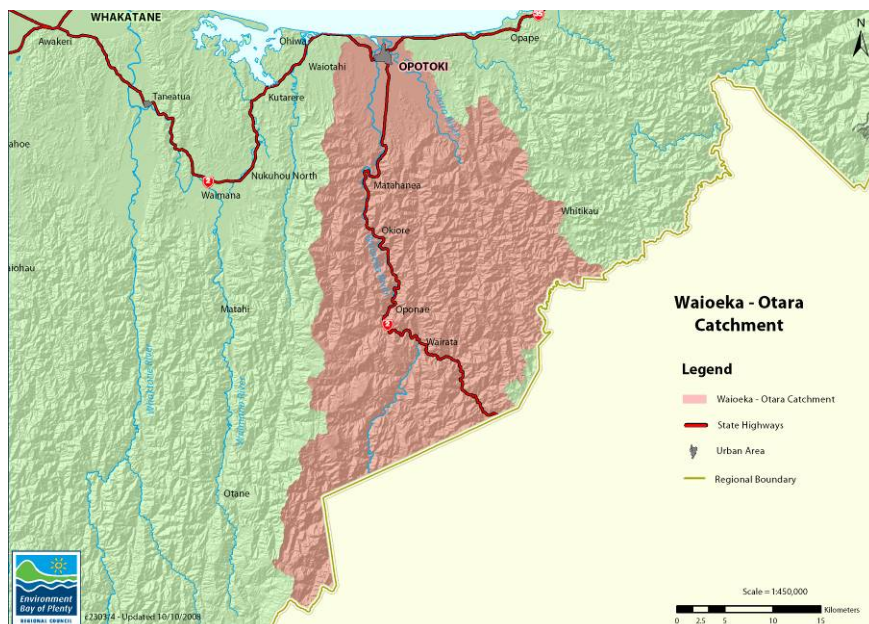


Figure 12 Waioeka-Otara Rivers Scheme

## Rangitaiki Drainage Scheme

## Scheme overview

The Rangitaiki Drainage Scheme provides gravity drainage to much of the Rangitaiki Plains, an area of approximately 29,000 hectares between Matata, Whakatane and Kawerau.

The Plains are predominantly farmland with small areas of wetland reserve and urban development.

The Rangitaiki Drainage Scheme is funded 100% from targeted scheme rates over the area of benefit, mainly dairying.

The Rangitaiki Drainage Scheme boundaries and location are shown in Figure 13 below.

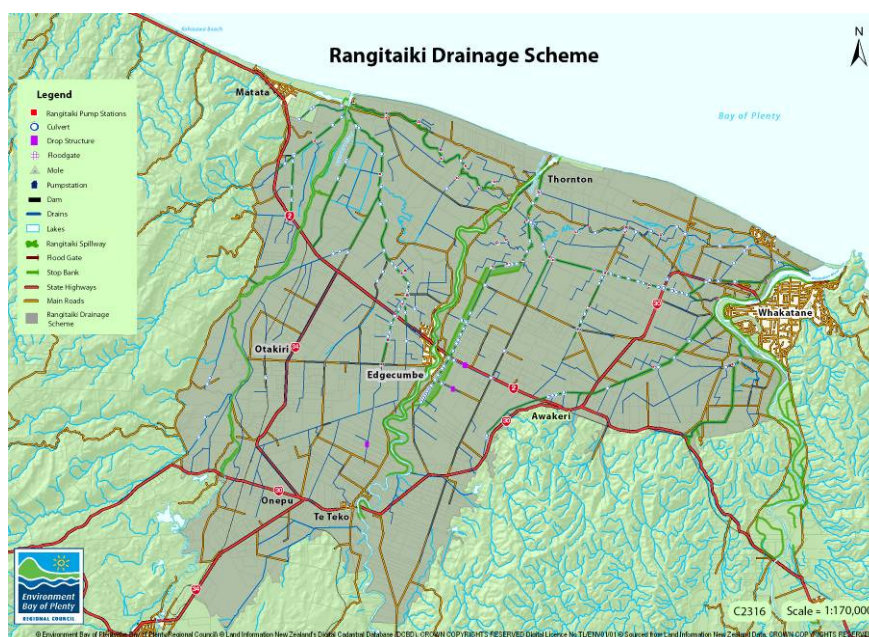


Figure 13 Rangitaiki Drainage Scheme

## Significant negative effects of this activity

Schedule 10 of the Local Government Act covers the information required to be included in the Long Term Council Community Plan (LTCCP). Part 2 (1) (c) states that a LTCCP must, in relation to each group of activities of the local authority:

**(c) Outline any significant negative effects that any activity within the group of activities may have on the social, economic, environmental, or cultural wellbeing of the local community**

This sub-section provides information in accordance with this legislative requirement.

The purpose of identifying significant negative effects is to ensure that Council activities are conducted in accordance with the principles of sustainability. The rivers and drainage activity has the potential to have negative effects on community wellbeing. The possible negative effects are outlined in the table below:

**Table 10**      **Significant negative effects**

Significant negative effect	Cultural	Social	Economic	Environmental	Mitigation of negative effects	Addressed in
Lack of infrastructure to convey runoff safely and to prevent flooding.		✓	✓	✓	Consult with the community on all costs and options for LoS through the LTCCP process.	Projects & Financial Forecasts Risk Management
Inadequacy of existing assets to cope with large rainfall events causing flooding, which could result in social and economic hardship.		✓	✓	✓	Compliance with Council's Hydrological and Hydraulic Guidelines.	Life Cycle Management Risk Management
Health and safety risks associated with the operation, maintenance, or construction of infrastructure.		✓	✓		Ensure compliance with legislation and Health and Safety Management Plans. Maintain an Incidents Register.	Risk Management
Economically, the cost of desired infrastructure improvements may exceed the community's ability to pay.		✓	✓		Consult with the community on all costs and options for LoS through the LTCCP process.	Levels of service Project & Financial Forecasts Risk Management
Potential impacts on customer satisfaction due to service failure/ delays/responsiveness.		✓	✓		Monitor and report on LoS and in service provider contracts. Seek to resolve customer complaints "close the loop".	Levels of service Community Engagement
Access to waterways.		✓	✓		Monitor requirements for access and liaise with the community as appropriate.	Levels of Service Community Engagement
Destruction of wetlands.	✓		✓	✓	Set area aside as reserve. Installation of weir controls (e.g. Tumurau Lagoon and Kohika). Secure funding for mitigation measures from regional rates. Identify opportunities to enhance the condition and value of the remaining wetland habitat when programming upgrading or refurbishment works.	Environmental Stewardship Community Engagement
Disruption to wildlife.				✓	Programme works to minimise wildlife disruption avoiding fish spawning and bird nesting seasons.	Environmental Stewardship
Damage due to de-silting etc.		✓		✓		Life Cycle Management
Gravel extraction.			✓	✓	Cross-section monitoring process.	Life Cycle Management
Over drainage.			✓	✓	Regular monitoring of channel capacity and drainage standards.  Regular review of design standards and economically optimum levels of drainage.	Life Cycle Management



The significant negative effects identified above can be managed and/or mitigated by effective risk management, options assessments, asset management and operational procedures.

## Delivery of services

### Organisational structure

The Council management and staff structure is shown below. The structure also demonstrates the relationship to service providers for administrative and professional services, and physical and maintenance works.

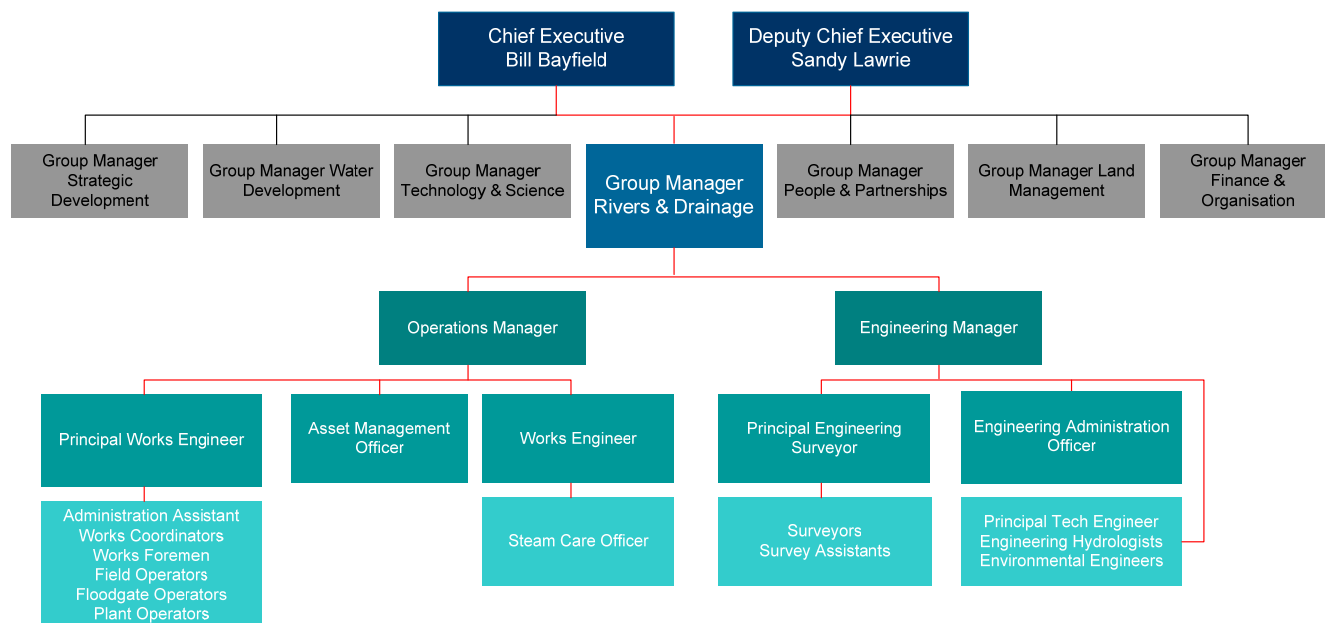


Figure 14 Organisational structure

### Relationships with key service providers

Table 11 Roles and responsibilities

Specific responsibilities	Relationships	Party
Maintenance	Internal	Operations manager
	External contractor	Contractors
Capacity/design	Internal	Engineering manager
	External consultant	Various consultants
Valuations	Internal	Engineering manager
Valuation peer reviews	External consultant	Opus
Performance monitoring	Internal	Engineering manager
Condition assessments	Internal	Engineering and operations managers
Rate collection	External contractor	Territorial authorities



## Levels of service

### Overview

Asset management planning enables the relationship between levels of service and the cost of the service (the price/quality relationship) to be determined. This relationship is then evaluated in consultation with the community to determine the levels of service they are prepared to pay for.

Defined LoS can then be used to:

- ▶ Inform customers of the proposed LoS.
- ▶ Develop asset management strategies to deliver LoS.
- ▶ Measure performance against defined LoS.
- ▶ Identify the costs and benefits of services offered.
- ▶ Enable customers to assess customer values as accessibility, quality, safety, and sustainability.

In this context LoS define the quality of delivery for a particular activity or service against which service performance can be measured.

This section of the AMP covers the following:

**Local Government Act 2002 requirements** - Details the legislation behind the process, including clause references and requirements.

**Linking Levels of Service to Community Outcomes and relationship with asset management planning** - Explains the links between this Plan, LoS and community outcomes.

**Rivers and Drainage Levels of Service** - Provides details of the process of establishing LoS for the rivers and drainage activity.

**Understanding community priorities** - Details how the community will assist in determining LoS and indicate their willingness to pay for those services.

**Rivers and Drainage values and outcomes** - Details customer values, activity strategic outcomes and how these relate to customer and technical LoS. This is presented as a table to ensure each value is addressed, outcomes identified and relevant levels of service (first draft) established for future consultation.

### Local Government Act 2002 requirements

The Local Government Act 2002 (LGA 2002) has prescribed that LoS must now be developed from a community perspective. This is a fundamental change in the traditional approach.

Historically, LoS have been expressed in a technical way that describes what Council has expected from its internal or external service providers (e.g. contractors). These need to be presented to the community in a clear, informed way as 'customer levels of service', and consultation used to obtain the 'community perspective'.

### Developing LoS

Schedule 10, Section 2 (a) of the LGA 2002 provides some specific requirements for the development of LoS as follows:

- ▶ Intended LoS, measures and targets and costs are required to be stated for each group of activities.
- ▶ Forecast capital work costs need to be apportioned between growth and LoS.
- ▶ LoS targets are to be set in detail for the first three years and in outline for the next seven years.

### LoS Decision Making Process

Section 76-81 of the LGA 2002 states the way in which LoS are developed within the decision-making process:

<b>Section 76</b>	Decision-making
<b>Section 77</b>	Requirements in relation to decisions
<b>Section 78</b>	Community views in relation to decisions
<b>Section 79</b>	Compliance with procedures in relation to decisions
<b>Section 80</b>	Identification of inconsistent decisions
<b>Section 81</b>	Contributions to the decision-making process by Maori

## LoS reporting

Schedule 10, Section 15 of the LGA 2002 states the way in which levels of service must be reported in the Annual Report including the following:

- ▶ Reporting the results of any measurement undertaken during the year of progress toward achievement of community outcomes to which a group of activities contributes.
- ▶ Include in an audited statement a comparison between the actual service provisions and the intended LoS (as per the TYP) for groups of activities.
- ▶ Include in the audited statements the reasons for any significant variance between the actual service provision and the expected service provision.

## Changes in LoS

A change in LoS will either be reflected as a requirement to increase or decrease the LoS.

Any significant change will need to be consulted on with key stakeholders and the community. The outcomes then incorporated into the decision making process.

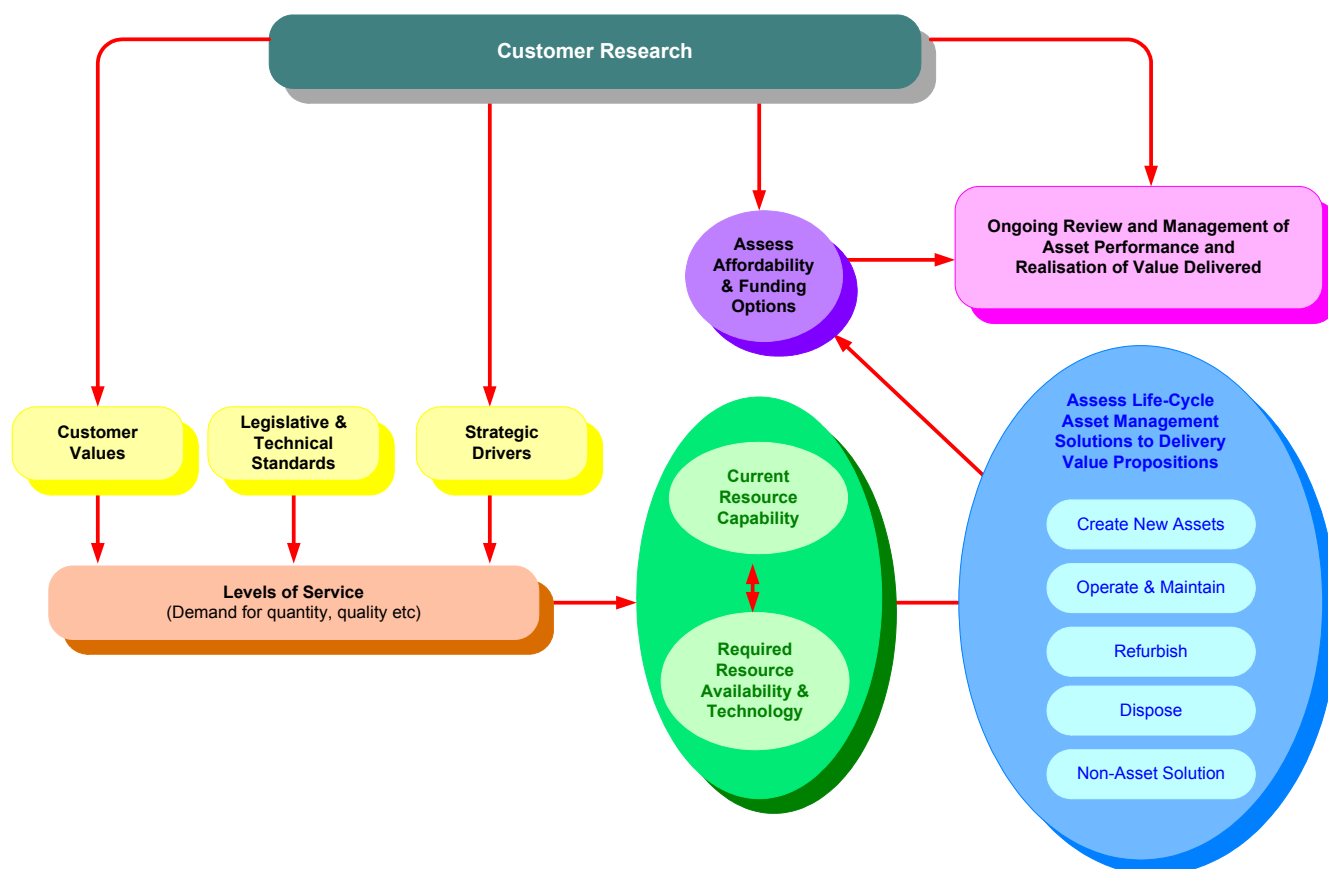
## LoS relationship to asset managing planning

One of the basic cornerstones of sound asset management is:

**To provide the levels of service that the current and future community want and are prepared to pay for.**

LoS therefore provide the platform for all decisions relating to infrastructure management (as illustrated in Figure 15). Before developing detailed asset management strategies, Council needs to agree the LoS with the community with consideration given to the following:

- ▶ Required planned outcomes
- ▶ Minimum legislative requirements
- ▶ Technical constraints



Source: *The Developing Levels of Service and Performance Measures Manual 2007*.

Figure 15 LoS relationship to asset management planning

## Linking LoS to community outcomes

### Council outcomes

As outlined in the Strategic Environment section Council's rivers and drainage activity primarily contributes to the following community outcomes:

#### Healthy and Safe Communities

E Hauora ana e Aupai ana hoki a tatau Iwi Whanui

#### Quality Affordable Infrastructure

E Pai ana e Ea ana hoki nga Rawa katoa

#### A Prosperous and Sustainable Economy

E Rangatira ana e Ukauka ana hoki nga Mahi Whairawa katoa

In order to deliver these outcomes, it is important that the Rivers and Drainage technical and customer services and operational and maintenance contracts are clearly linked to achieve this.

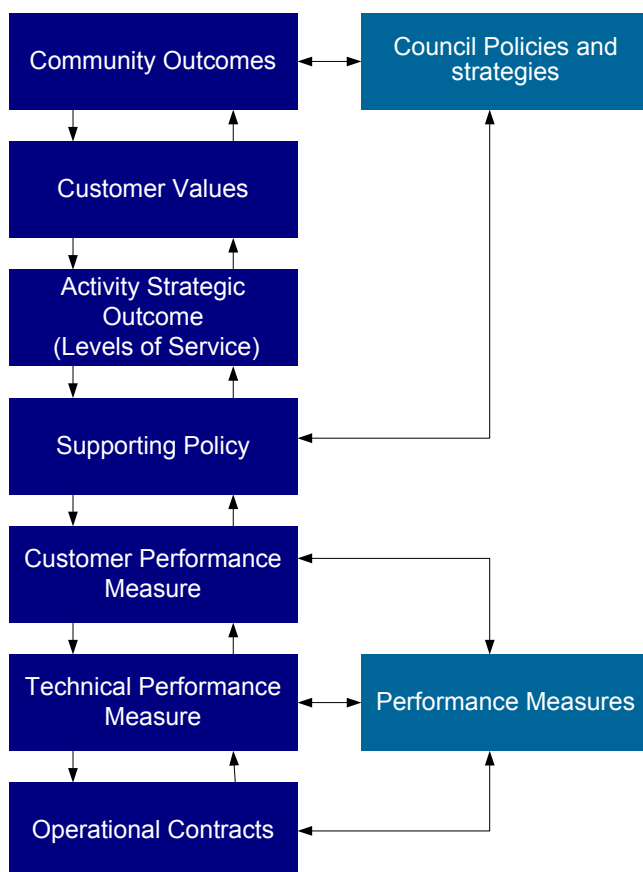


Figure 16 LoS linkages

### LoS delivery process

Bay of Plenty Regional Council has some key service providers for the maintenance of rivers and drainage.

- ▶ Internal maintenance staff
- ▶ External contractors (e.g. earthworks, electrical)
- ▶ Internal sections (e.g. data services)
- ▶ Various consultants
- ▶ Government and other agencies (e.g. DoC, NIWA, Fish and Game)

This is detailed in the Business Overview section.

## LoS development process

As part of the 2006 TYP development process Bay of Plenty Regional Council carried out a review of LoS. The outcome of the review defined a set of high level LoS statements and measures that were included in the 2006 TYP.

Bay of Plenty Regional Council is now seeking to develop the existing LoS further and to identify gaps in their knowledge of customers' perspectives about the delivery of the rivers and drainage activity. Council will also identify what information needs to be provided from service providers to enable measurement between customer and technical LoS.

This process is described below in three parts as follows:

### Part 1

To date Bay of Plenty Regional Council is working through the completion of Part 1 of the process as shown below, the results of which are included in this section. Figure 17 below illustrates the process undertaken.

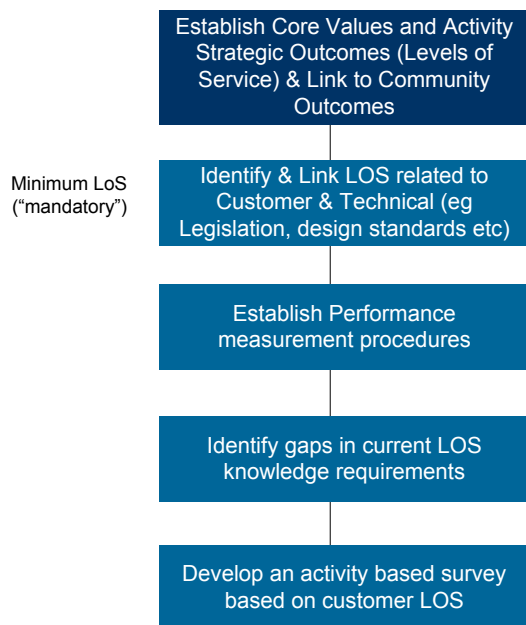


Figure 17 LoS process (Part 1)

### Part 2

Bay of Plenty Regional Council has undertaken consultation through the TYP, rivers and drainage scheme liaison meetings and previous customer satisfaction surveys (see Community Engagement section for detailed analysis).

The schemes have established LoS benchmarks and the next step is to confirm that these benchmarks are still relevant.

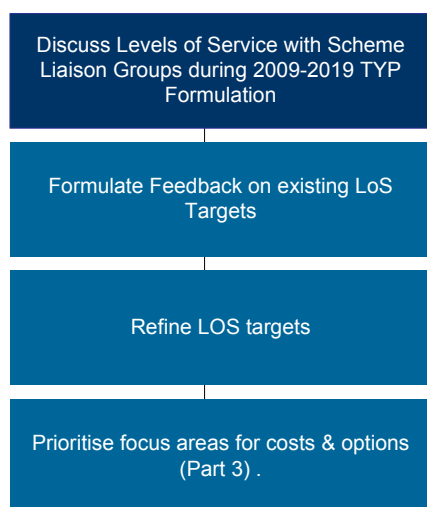


Figure 18 LoS process (Part 2)

### Part 3

The third part is to establish the benchmark survey and then consult with the community on service delivery options and their associated costs (as required under Schedule 10, Section 2(a) in the 2009/10 TYP).

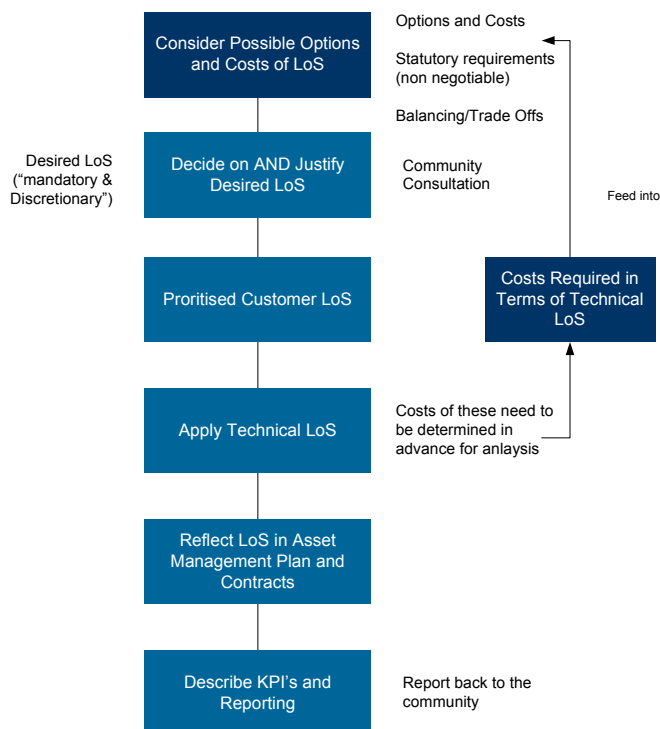


Figure 19 LoS process (Part 3)

***It should be noted that this process may be repeated in its entirety or specific parts updated such as technical levels of service in contracts. All changes must be reintegrated and linked back into the process.***

### Establishing customer values

Customer values provide the cornerstone to the development of LoS from both a customer and technical point of view. One simple word can easily define what is expected by the customer and to be delivered by the asset owner.

The Developing Levels of Service and Performance Measures Manual describes customer values for Council activities (i.e. Rivers and Drainage, Land Management, Water Management). It is important for the customers and Council to consider which of these are most important as the priorities flow into the final required LoS.

The customer values considered to be important for the rivers and drainage activity are as follows:

- ▶ Affordability
- ▶ Community engagement
- ▶ Reliability/responsiveness
- ▶ Quality
- ▶ Safety
- ▶ Sustainability (whole community benefits)

### Activity strategic outcomes (LoS)

Community outcomes were developed as part of the 2006 TYP. Further work has been undertaken to develop activity strategic outcomes for the rivers and drainage activity. The activity outcomes developed with the LoS represented in the AMP are described as follows and aligned with the customer values as suggested in the NAMS Developing Levels of Service and Performance Measures Manual.

Table 12 Customer values (NAMS) and activity strategic outcomes

Customer value (NAMS)	Activity strategic outcomes (Levels of Service)
Affordability Quality	<ul style="list-style-type: none"> <li>▶ Provide flood protection in river and drainage scheme areas to agreed design levels.</li> <li>▶ Flood protection is affordable and predominantly paid for by targeted ratepayers.</li> </ul>
Safety	<ul style="list-style-type: none"> <li>▶ Health and safety risks are minimised.</li> </ul>
Sustainability (whole community benefits)	<ul style="list-style-type: none"> <li>▶ Community is informed of potential widespread flooding allowing them to take actions to avoid the hazard.</li> <li>▶ Effects on the environment are minimised in operations, works and asset maintenance.</li> </ul>
Community Engagement	<ul style="list-style-type: none"> <li>▶ Decision-making processes are transparent and easily understood and enables participation.</li> </ul>
Reliability/responsiveness	<ul style="list-style-type: none"> <li>▶ Response to service requests, complaints and events is timely and appropriate solutions are provided.</li> </ul>



## Identify and linking customer and technical levels of service

It is critical that from community outcomes right down to operational contracts, that the linkages are made clear. The table below describes how this has been achieved and provides a roadmap to assist with the understanding of the LoS tables that will be developed.

The following tables are based on the NZ NAMS “Developing Levels of Service and Performance Measures” Manual. It should be noted that these tables act as a template for developing LoS. Accordingly, these need to be developed and refined further, then presented in an appropriate way for further community consultation.

### How to read this table...

How to read this table...

Community Outcomes  
drawn from the TYP  
2006 - 2016

Activity Outcomes (Levels of Service)  
defines in a clear statement, the outcomes expected to ensure the relevant customer value for this activity.

Technical Performance Measures states how a particular activity or service area is measured. Each technical performance measure is linked to a customer performance measure, in many cases providing a more detailed version or measure. Where the future target is a planned improvement from the current.

Performance Measure procedure details the practical means of being able to measure the technical and customer performance measures.

Community outcome	Activity strategic outcomes (Levels of Service)	Customer value	Customer performance measure			Technical performance measure					Performance measure procedure	Frequency
			Measure	Current target	Proposed target	Factors of influence	Measure	Current target	Current performance	Proposed target		
Quality affordable infrastructure  A prosperous and sustainable economy	Provide flood protection in River and Drainage scheme areas to agreed design levels	Safety Quality Reliability	No failure of flood protection system below specified design levels	Zero failures	Zero failures	<div>► Security from flooding</div> <div>► Where possible incorporate sustainability principles into the design</div>	<div>► Systems designed for annual exceedance levels for each scheme as per Table xx (and Figures yy)</div>	<div>► 100% compliance</div>	<div>► 100% compliance</div>	<div>► As for current</div>	<div>► Reports for events greater than specified annual exceedance levels</div> <div>► Inspections and capacity review</div>	

Customer Value (from NAMS developing LoS and Performance Measures Manual) details the general benefit of the service.

Customer Performance Measure is a statement of how the customer receives the service. This is backed up by one or more technical LoS, and a practical means of measurement. Where the future target is a planned improvement from the current.



## Rivers and Drainage Levels of Service, performance measures and reporting

Table 13 Levels of service tables

Community Outcome	Activity Strategic Outcomes (Levels of Service)	Customer Value	Customer Performance Measure			Technical Performance Measure					Performance measure procedure	Frequency
			Measure	Current target	Proposed target	Factors of influence	Measure	Current target	Current performance	Proposed target		
Quality affordable infrastructure  A prosperous and sustainable economy	Provide flood protection in river and drainage scheme areas to agreed design levels*	Safety Quality Reliability	No failure of flood protection system below specified design levels	Zero failures	Zero failures	► Security from flooding  ► Where possible incorporate sustainability principles into the designs	► Systems designed for annual exceedance levels for each scheme as per Table xx and Figures xx	► 100% compliance	► 100% compliance	► As for current	► Reports for events greater than specified annual exceedance levels  ► Inspections and capacity review	► Ongoing  ► Annual and ten yearly ► Monthly  ► Ongoing
						► Maintenance	► Programmed maintenance for each scheme	► 100% compliance	► 100% compliance	► As for current	► Monthly operational checks	
						► Asset condition	► Programmed works for each scheme	► 100% compliance	► 100% compliance	► As for current	► Scheduled maintenance checks ► Maintenance records (database)	
	Flood protection is affordable and predominantly paid for by targeted ratepayers	Affordability	Ratio of targeted rate to land value	To be determined Ratio of targeted rate to land values for sample properties	Consistent or decreasing trend in ratio with time	► Targeted rates ► Land values	► Ratio of targeted rate to land value for each scheme  ► Targeted rate increases agreed to with schemes	► To be determined	► To be determined	► Consistent or decreasing trend in ratio with time	► Annual Plan/Ten Year Plan process ► Scheme rating systems ► Economic analysis reports	► Annual and ten yearly ► As required  ► For major proposals
						► Competitive and fair full-cost pricing of scheme maintenance and works	► Compliance with the Council Contracts Manual	► 100% compliance (including approved exceptions)	► 100%	► As for current	► Contract records and documentation ► Annual Report to Council	► Ongoing  ► Annually
	Healthy and safe communities	Health and safety risks are minimised	Safety	No health and safety incidents attributable to lack of management of rivers and drainage assets	Zero	Zero	► Activity on assets	► Report on all health and safety incidents	► New measure	► N/A	► 100% reporting and compliance	► Report to Council
► Maintain a health and safety system to record and investigate incidents involving staff and contractors							► 100% of known incidents are recorded and investigated	► 100% compliance	► 100% compliance	► As for current	► Report accidents to Human Resources ► Health and safety audits	► Ongoing  ► Annually
► Contractors compliance with health and safety regulations							► Comply with Council Contract Manual and Health and Safety Policy, and legislation	► 100% compliance	► 100% compliance	► As for current	► Contract records ► Health and safety audits	► Ongoing/annually
A prosperous and sustainable economy  Healthy and safe Communities	The regional community is informed of potential widespread flooding allowing them to take actions to avoid the hazard*	Sustainability Safety	All flood warnings at predetermined levels are given in accordance with the Flood Warning Manual	100%	100%		► All flood warnings at predetermined levels are given in accordance with the Flood Warning Manual	► 100% compliance	► 100% compliance	► As for current	► Flood event logs and Flood Warning Manual	► Ongoing/annually
	Effects on the environment are minimised in operations, works and asset maintenance	Sustainability	All operations, works and asset maintenance undertaken according to current legislation policy	100%	100%	► Designed for the long-term, including climate change, structural integrity etc	► Compliance with adopted design guidelines(e.g. BOPRC Hydrological and Hydraulic Guidelines, updated Ministry for the Environment Climate Change Releases)	► 100% compliance	► 100%	► 100% compliance	► Peer review of internal designs ► Internal review of external designs	► Ongoing

Community Outcome	Activity Strategic Outcomes (Levels of Service)	Customer Value	Customer Performance Measure			Technical Performance Measure					Performance measure procedure	Frequency
			Measure	Current target	Proposed target	Factors of influence	Measure	Current target	Current performance	Proposed target		
						<ul style="list-style-type: none"> <li>▶ Minimise adverse effects</li> <li>▶ Use of sustainable practices (e.g. bio-engineering alternatives, material re-use, fish-friendly floodgates)</li> </ul>	▶ Compliance with Environmental Code of Practice and Guidelines	▶ 100% compliance	▶ 100%	▶ 100% compliance	<ul style="list-style-type: none"> <li>▶ Environmental Code of Practice</li> <li>▶ Work completion reports</li> </ul>	▶ Ongoing
						<ul style="list-style-type: none"> <li>▶ Minimise negative environmental effects on assets from surrounding land and water</li> <li>▶ Appropriate consultation</li> </ul>	▶ Obtain all necessary consents and compliance with consent conditions	▶ 100% compliance	▶ 100%	▶ 100% compliance	<ul style="list-style-type: none"> <li>▶ Resource consent records</li> <li>▶ Land entry agreements</li> <li>▶ Contract records</li> </ul>	<ul style="list-style-type: none"> <li>▶ Condition of contract</li> <li>▶ Ongoing</li> </ul>
<b>Healthy and safe communities</b>  <b>Quality affordable infrastructure</b>  <b>A prosperous and sustainable economy</b>	<b>Decision making process are transparent, easily understood and enable participation</b>	<b>Community engagement</b>	Scheme stakeholders and community are informed and consulted in decisions related to schemes	100%	As for current	<ul style="list-style-type: none"> <li>▶ Significant proposed changes/ enhancements or additions to the rivers and drainage services/ infrastructure</li> </ul>	▶ Carry out the special consultative procedure through the Annual Plan and Ten Year Plan (or separately as required) including options, issues and costs	▶ 100% compliance	▶ 100%	▶ 100% compliance	<ul style="list-style-type: none"> <li>▶ Ten Year Plan</li> <li>▶ Annual Plan</li> <li>▶ Council, Operations Committee reports</li> </ul>	<ul style="list-style-type: none"> <li>▶ 10 yearly</li> <li>▶ Annually</li> <li>▶ Monthly</li> </ul>
						<ul style="list-style-type: none"> <li>▶ The regional community is well informed about the BOPRC's activities and the environment</li> </ul>	▶ Provide appropriate feedback to the community	▶ 100% compliance	▶ 100%	▶ 100% compliance	<ul style="list-style-type: none"> <li>▶ Liaison meeting minutes for each scheme</li> <li>▶ Annual scheme newsletters to all stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>▶ Annually</li> <li>▶ Annually</li> </ul>
						<ul style="list-style-type: none"> <li>▶ Information on rivers and drainage accessible via website and brochures</li> </ul>	▶ Website and brochures contain information on rivers and drainage and key issues	▶ 100% compliance	▶ 100% compliance	▶ 100% compliance	<ul style="list-style-type: none"> <li>▶ Website, newsletter and brochure</li> </ul>	▶ Annually/ongoing
<b>Quality Affordable infrastructure</b>	<b>Response to service requests and complaints is timely and appropriate solutions are provided</b>	<b>Reliability/ responsiveness</b>	Response to non-urgent complaints and service requests within five working days	100%	100%	<ul style="list-style-type: none"> <li>▶ Service request/ complaints recording and reporting system with response timeframes to be implemented (e.g. job tracker system)</li> </ul>	▶ Report on response times for all complaints and requests	▶ 100%	▶ 88% compliance	▶ 100%	<ul style="list-style-type: none"> <li>▶ Documented response times</li> <li>▶ Documented investigation</li> </ul>	▶ Annually
			24 hour phone line for more urgent issues	100% availability	As per current	<ul style="list-style-type: none"> <li>▶ External service provision of hotline</li> <li>▶ Shared service with other hotlines</li> </ul>	▶ Respond to all urgent flooding and drainage requests within 24 hours	▶ 100% compliance	▶ Undetermined	▶ 100% compliance	<ul style="list-style-type: none"> <li>▶ Record of request closure. Not currently available. To be implemented by 2010</li> </ul>	▶ Annually

Table 14 Stopbank design standards

Location	Design level
<b>Waioeka Otara</b>	
Waioeka Urban Right Bank	1% AEP (100 yr) plus 450 mm freeboard
Waioeka Rural Right Bank	5% AEP (20 yr) plus 300 mm freeboard
Waioeka Rural Left Bank	5% AEP (20 yr) plus 300 mm freeboard
Waioeka Rural Coastal Left Bank	50% AEP (2 yr) plus 300 mm freeboard
Waioeka Left Bank for 1 km upstream of SH2 bridge	20% AEP (5 yr) plus 300 mm freeboard
Mill Stream Right Bank downstream of Clark Cross Road	1% AEP (100 yr) plus 450 mm freeboard
Mill Stream downstream of Matchett Road	5% AEP (20 yr) plus 300 mm freeboard
Peterson's Ring Bank	20% AEP (5 yr) plus 300 mm freeboard
Otara Urban Left Bank	1% AEP (100 yr) plus 450 mm freeboard
Otara Rural Right Bank downstream of Gow Road	5% AEP (20 yr) plus 300 mm freeboard
Otara Rural Coastal Right Bank	50% AEP (2 yr) plus 300 mm freeboard
Otara Rural Left Bank	10% AEP (10 yr) plus 300 mm freeboard
Otara Rural Right Bank	10% AEP (10 yr) plus 300 mm freeboard
Gault Ring Bank	2% AEP (50 yr) plus 400 mm freeboard
<b>Whakatāne Waimana Rivers Scheme</b>	
Whakatane Right Bank downstream of Yacht Club	1% AEP (100 yr) plus 600 mm freeboard
Whakatane Right Bank from Landing Road Bridge to Yacht Club	1% AEP (100 yr) plus 800 mm freeboard
Whakatane Left Bank downstream of Pekatahi Bridge SH2	1% AEP (100 yr) plus 500 mm freeboard
Whakatane Right Bank from Pekatahi Bridge (SH2) to Landing Road Bridge	1% AEP (100 yr) plus 500 mm freeboard
Waioho Stream	1% AEP (100 yr) plus 600 mm freeboard
Te Rahu Canal downstream of SH2 at Awakeri	1% AEP (100 yr) plus 600 mm freeboard
Kopeopeo Canal	20% AEP (5 yr) plus 270 mm freeboard
<b>Rangitāiki-Tarawera Rivers Scheme</b>	
Tarawera Right Bank downstream of SH30	1% AEP (100 yr) plus 300 mm freeboard
Tarawera Left Bank downstream of SH2	1% AEP (100 yr) plus 300 mm freeboard
Tarawera Left Bank from SH30 to SH2	1% AEP (100 yr) plus 150 mm freeboard
Rangitaiki River – Rural from SH30 to Mouth	1% AEP (100 yr) plus 300 mm freeboard
Rangitaiki River – Urban (Te Teko, Edgecumbe, Thornton)	1% AEP (100 yr) plus 600 mm freeboard
Rangitaiki Floodway	1% AEP (100 yr) plus 250 mm freeboard
Awaiti, Omeheu, 109 canals	20% AEP (5 yr) plus 300 mm freeboard
Awakaponga	10% AEP (10 yr) plus 300 mm freeboard
Old Rangitaiki Channel	20% AEP (5 yr) plus 150 mm freeboard
<b>Rangitāiki Drainage Scheme</b>	
Drains, canals and pump stations	20% AEP (5 yr) Drainage co-efficient of 28 mm/day
Wilson's Creek N.B. The left bank was lowered by 300 mm. A freeboard of 500 mm is probably more appropriate - review needed	10% AEP (10 yr) plus 300 mm freeboard
<b>Kaituna Scheme</b>	
<b>Lower Kaituna</b>	
Kaituna River: Mangorewa to Te Matai, Mangorewa River for 600 m	10% AEP (10 yr) no freeboard
Kaituna River: downstream of Te Matai	1% AEP plus 500 mm freeboard
Bells Road No.1 Drain	10% AEP (10 yr) no freeboard
Singletons Drain	10% AEP (10 yr) no freeboard

Location	Design level
Parawhenuamea Stream	10% AEP (10 yr) no freeboard
Waiari Stream upstream of SH2	10% AEP (10 yr) no freeboard
Waiari Stream downstream of SH2	1% AEP (100 yr) plus 300 mm freeboard
Ohineangaanga downstream of SH2	1% AEP (100 yr) plus 300 mm freeboard
Raparapahoe downstream of SH2	1% AEP (100 yr) plus 300 mm freeboard
Raparapahoe from SH2 to Quarry Road	10% AEP (10 yr) no freeboard
Kopuaroa downstream of SH2	1% AEP (100 yr) plus 300 mm freeboard
<b>Lower Kaituna Drainage</b>	
Drains, canals and pump stations, Lower Kaituna	20% AEP (5 yr) Drainage co-efficient of 37.5 mm/day
<b>Upper Kaituna</b>	
Waingaehe – downstream of SH30	1% AEP (100 yr)
Puarenga – downstream of SH30	1% AEP (100 yr)
Utuhina – downstream of SH5	1% AEP (100 yr)
Waiowhero – downstream of SH5	1% AEP (100 yr)
Ngongotaha – downstream of Ngongotaha Road	1% AEP (100 yr)
Waiteti – downstream of Ngongotaha Road	1% AEP (100 yr)
Streams of Haupara Bay – downstream of SH30	10% AEP (10 yr)
Streams of Gisborne Point – downstream of SH30	10% AEP (10 yr)



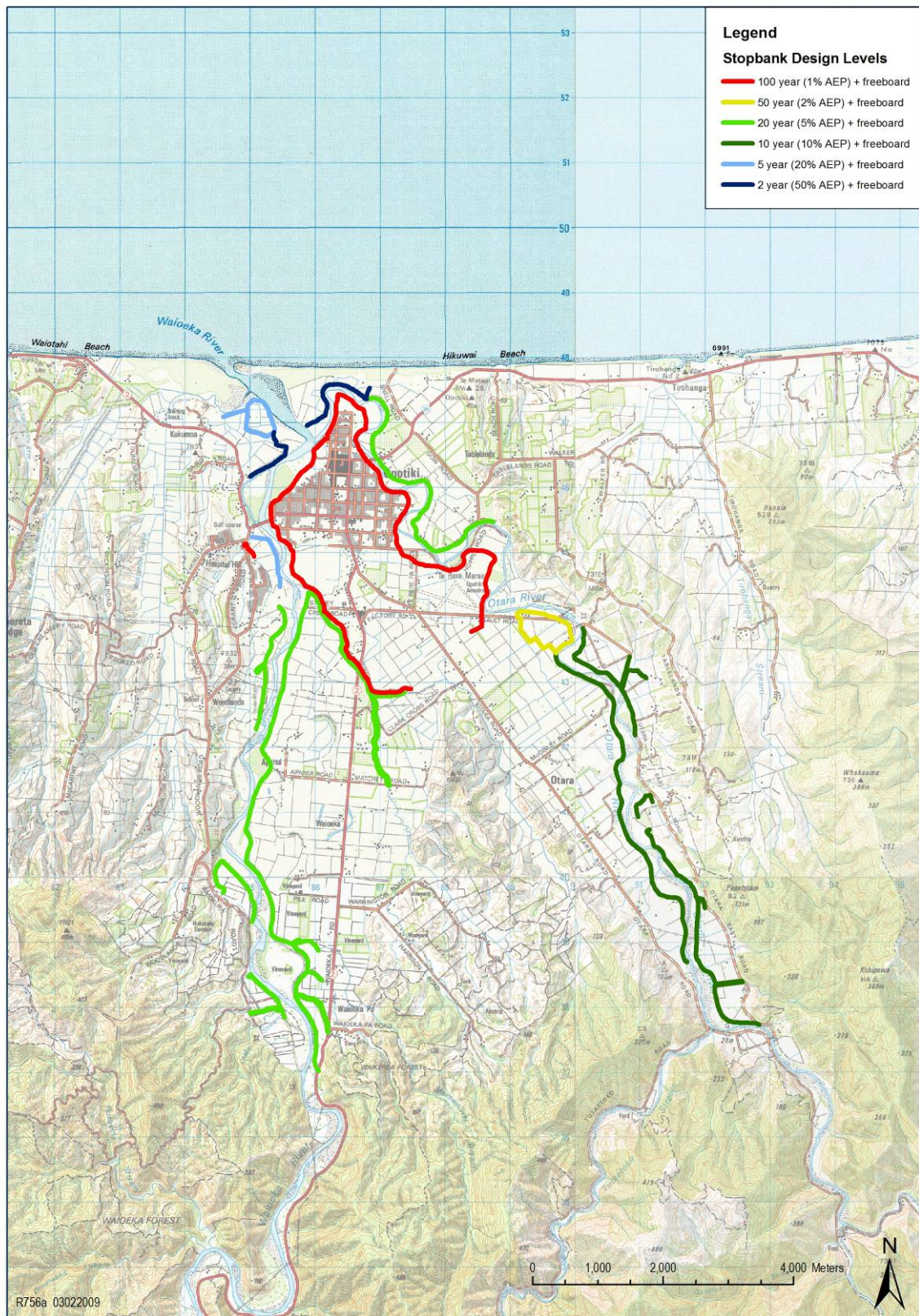


Figure 20 Stopbank and return period plan for Waioeka-Otara Rivers Scheme



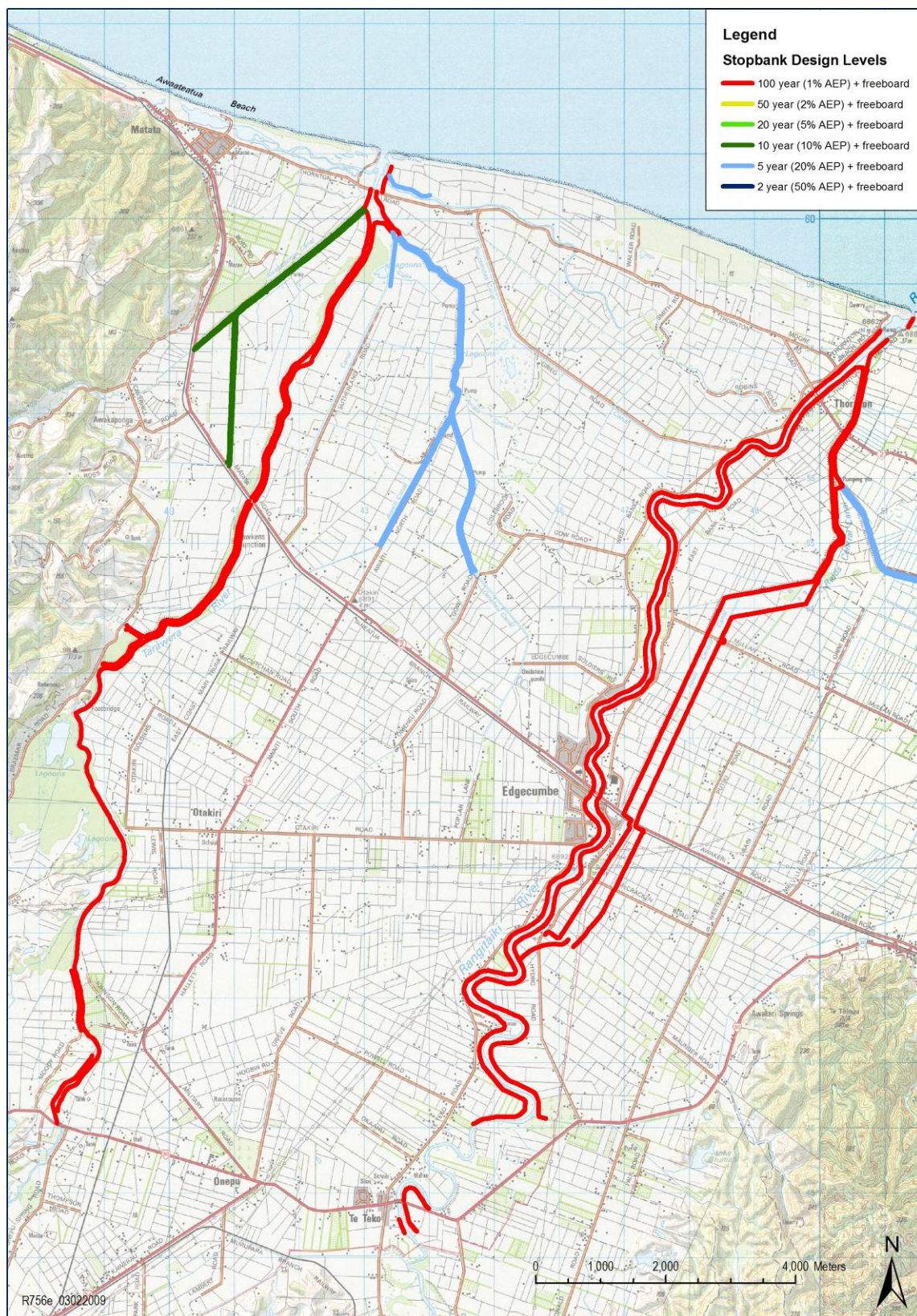


Figure 21 Stopbank and return period plan for Rangitāiki-Tarawera Rivers Scheme



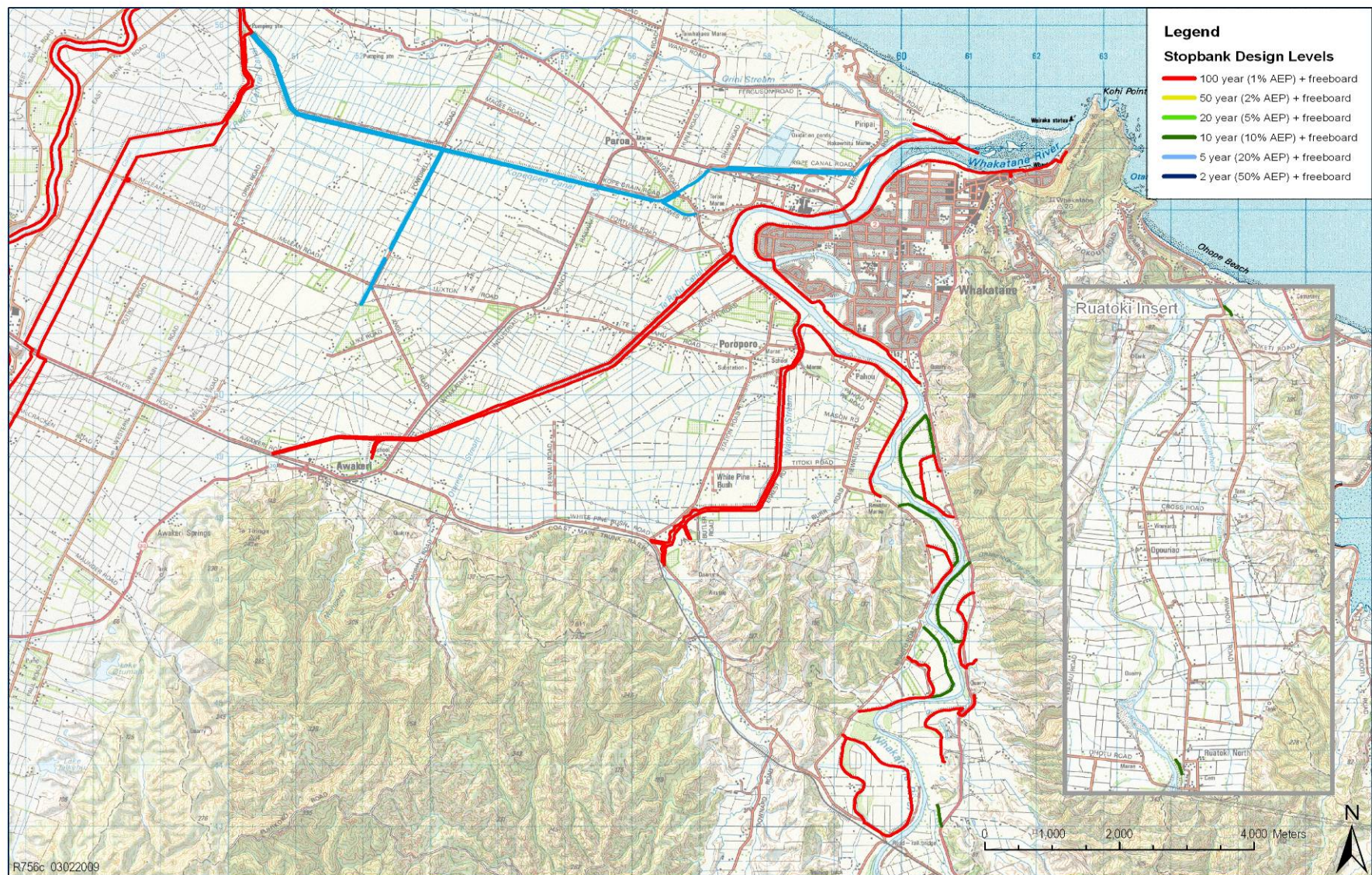


Figure 22 Stopbank and return period plan for Whakatāne-Waimana Rivers Scheme



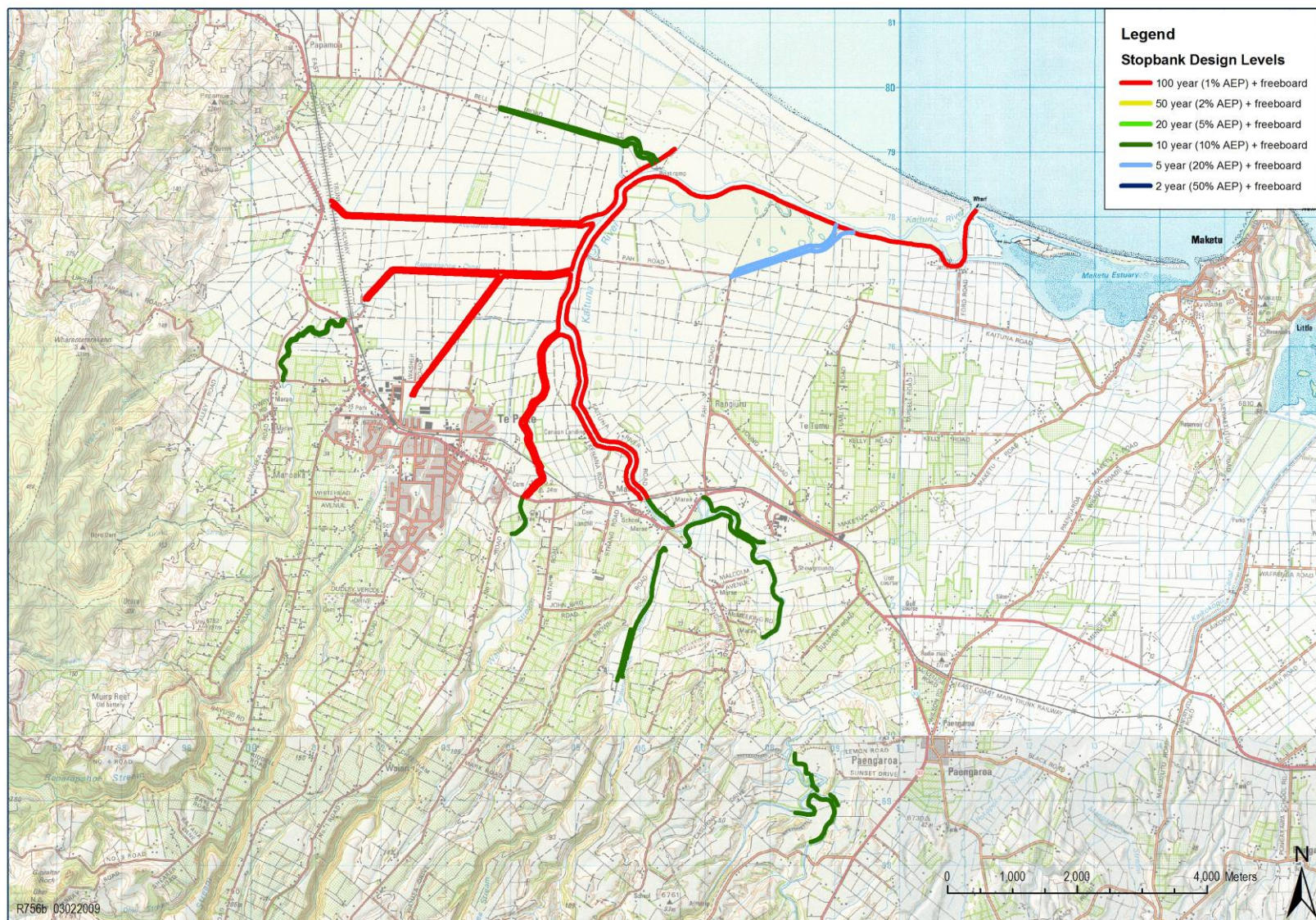


Figure 23 Stopbank and return period plan for Kaituna Rivers Scheme (Lower)





Figure 24 Stopbank and return period plan for Kaituna Rivers Scheme (Upper)

## Future levels of service improvement

Council are progressively working through a robust LoS development and community agreement process as outlined and flow-charted earlier in this section. Below is the key tasks and timeline for development and inclusion into the 2009/10 TYP.

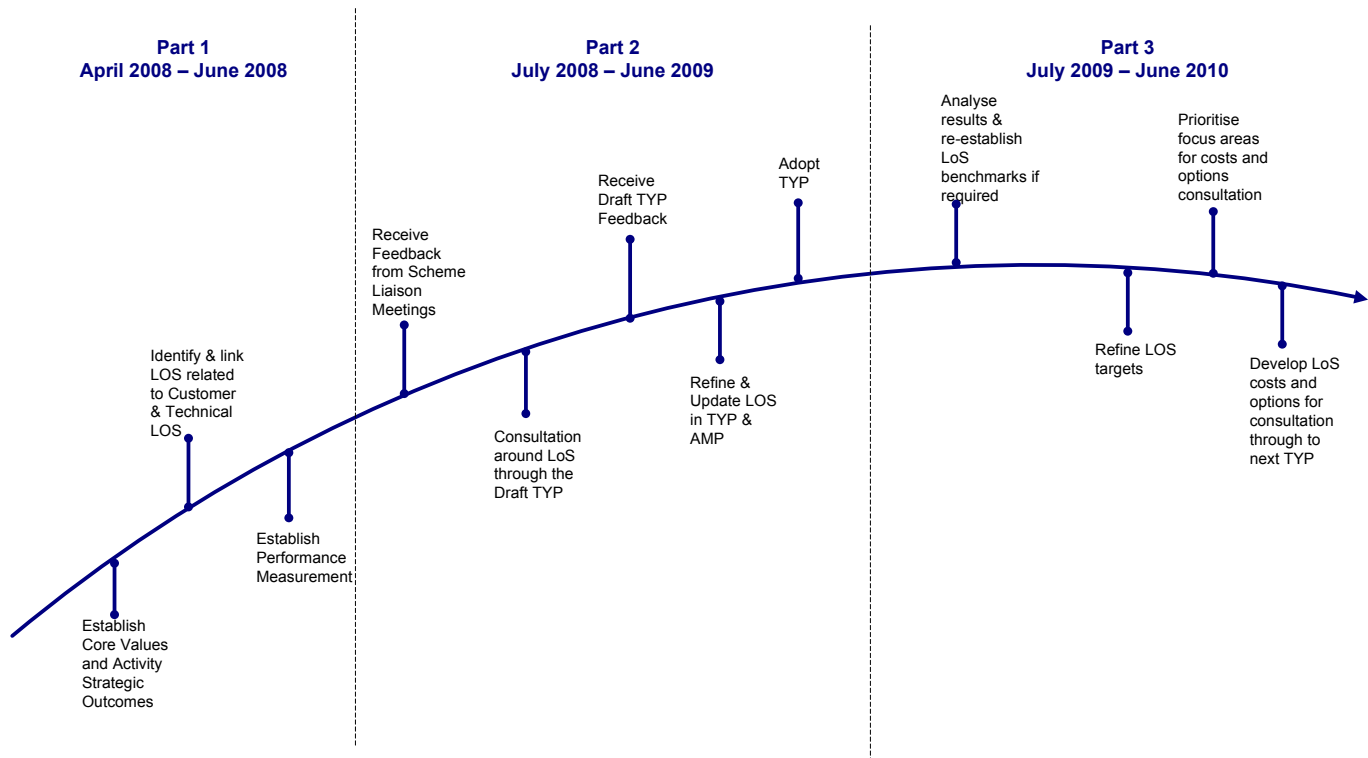


Figure 25

Timeline for developing LoS in conjunction with the community 2007-2009

# Community engagement

## Overview

This Community Engagement section provides details of the consultation and research that Bay of Plenty Regional Council has undertaken to establish how the regional community perceives the rivers and drainage activity and how it may better deliver LOS.

## Consultation methods

Council has engaged in a variety of consultation approaches to gauge public opinion and to communicate its decisions and programmes to residents across the region, including:

- ▶ Bay of Plenty Regional Council Attitudes and Perceptions Surveys (1992-2007).
- ▶ Customer service requests and complaints (informally).
- ▶ Consultation carried out as part of the TYP (2006-2016) process.
- ▶ Scheme Liaison Groups
- ▶ Consultation carried out as part of the Annual Plan (07/08 and 08/09) process (2006-2016 TYP).
- ▶ The Māori Committee actively invites participation and engagement from local Māori. These meetings take place at various venues in each sub-region to capture local issues and concerns.

An outline and results of each approach are summarised in the following sub-sections.

## Consultation links

Consultation processes undertaken with the community help to underpin the overall direction and goals that Council will follow. Figure 26 below shows all of the ways in which the local community has been consulted with regarding the districts' rivers and drainage activity over the last five years and how this consultation links into outcomes developed as part of this AMP.

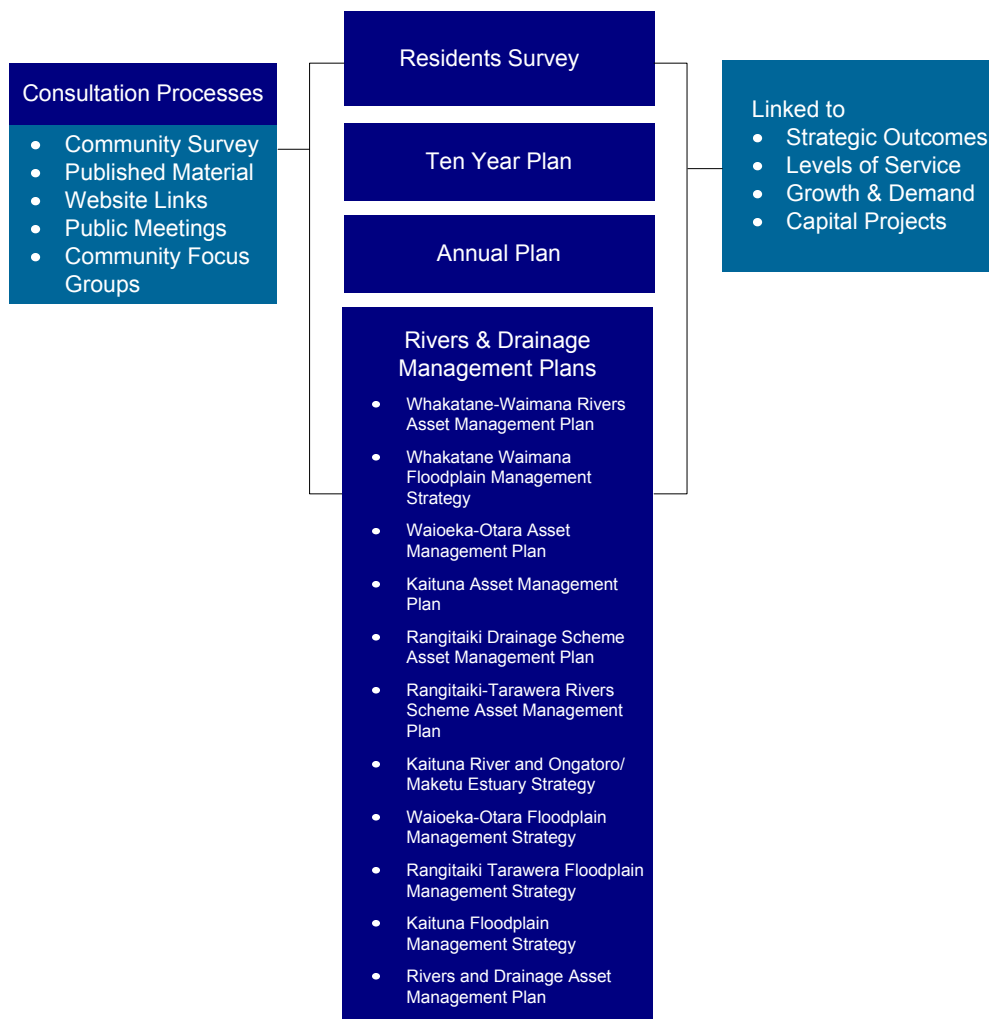


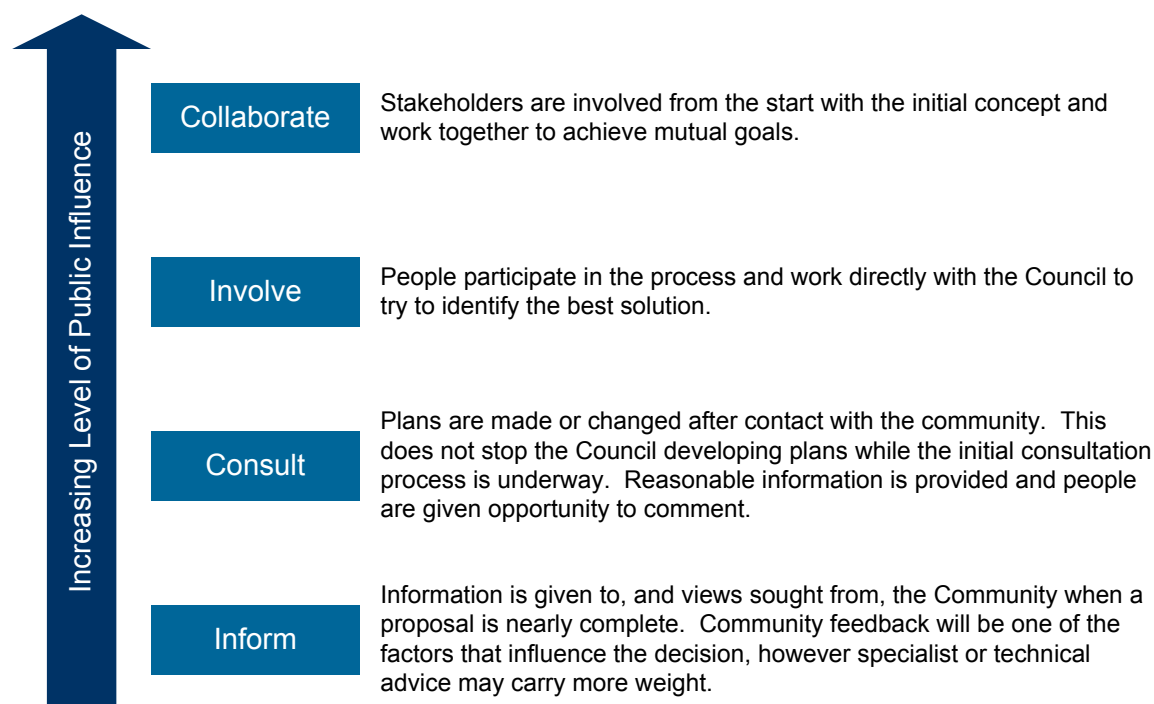
Figure 26 Consultation with the Bay of Plenty regional community

## Consultation Policy

Bay of Plenty Regional Council follows the special consultative procedure as outlined in the LGA 2002 when consulting with the public.

Bay of Plenty Regional Council endeavours to provide the opportunity for those who might be affected by Council decisions to express an opinion and be supplied with additional information where requested. This does not mean that the community will directly make decisions (unless there is a referendum situation), rather that the views of the community will be taken into account in all major decisions. Bay of Plenty Regional Council Communications Team has produced a "Working with Communities" "how to" tool kit for Council to engage with communities, Maori, and other stakeholders. This is accessible to all staff.

Figure 27 below shows the main levels of consultation that can be used by Council dependent upon the proposal or decision under consultation.



Source: IAP2 Public Participation Spectrum  
International Association for Public Participation

Figure 27 Type of consultation

## Māori consultation

The Bay of Plenty has a long and proud Maori heritage with more than one quarter (26%) of the population of the region identifying themselves as Maori at the 2006 Census. This is in comparison with only 14% of New Zealand's total population identifying themselves as Maori. Bay of Plenty Regional Council has a dedicated Maori Policy Section to support Maori and Bay of Plenty Regional Council engage in effective consultation and effective decision-making.

Since 2004 Bay of Plenty Regional Council has had three Maori representation seats on the Council – the first Regional Council in New Zealand to establish Maori seats on the same terms as the Parliamentary Maori seats.

A Maori Committee was established in 2006. The objectives of this Committee are to consider governance issues in relation to the principles of the Treaty of Waitangi and Council's legislative obligations to Maori. It also oversees Council's work to build the capacity of Maori to contribute to decision-making. The Committee meets bi-monthly and has a dedicated agenda slot to hear from hapu/iwi/Maori. The Committee also takes the meetings out to the communities, often utilising Marae for venues.

Hapū/Iwi Resource Management Plans (developed and approved by hapū and/or iwi) outline resource management issues of importance to hapū and/or iwi from which "tangata whenua interests can be considered in council in decision-making". Bay of Plenty Regional Council supports the development of these plans with allocated funding.

The LGA sets out further requirements for Council to consult with Maori:

- ▶ Section 4: Recognise the principles of the Treaty of Waitangi.
- ▶ S14(1)(d): Principle for local authorities to provide opportunities for Maori contributions to decision-making.
- ▶ S77(c): Council must consult with Maori if a decision relates to land or a body of water.



- ▶ S81: Council needs to set out how it will build Maori capacity to contribute to its decision-making (see page 37 of Council's TYP 2006-2016).
- ▶ S82(2): Council needs to ensure it has a process for consulting with Maori (e.g. when assisting with iwi/hapu management plans, resource policies/strategies/plan, iwi consultation guidelines for resource consent applications etc).

Bay of Plenty Regional Council has developed a Treaty of Waitangi Toolbox containing:

- ▶ The various versions of the Treaty.
- ▶ Statutory obligations pertaining to the Treaty.
- ▶ Bay of Plenty Regional Council initiatives promoting the sustainable social, economic, environmental and cultural wellbeing of the regional community.

## Bay of Plenty Regional Council sub-regional residents' surveys

Environment Bay of Plenty conducts Attitudes and Perceptions Surveys every three years (since 1992). The most recent survey took place in February/March 2007 and was undertaken by Key Research Consultants.

In 2007, for the first time a Community Outcomes Survey was also undertaken and run concurrently with the Attitudes and Perceptions Survey.

### Attitudes and Perceptions Survey

The overall purpose of the survey was to determine the community's attitudes and perceptions regarding the natural environment and Bay of Plenty Regional Council as an organisation and to monitor the performance of key Council services. Some of the key objectives of the survey were:

- ▶ To assess Council's performance against the perception-based LoS in the TYP and determine performance measures.
- ▶ To identify the major environmental issues across the region and assess residents' understanding of natural environmental issues.
- ▶ To ascertain residents' understanding of the Bay of Plenty Regional Council organisation specifically its roles, responsibilities and presence in the region.
- ▶ Assess how resident satisfaction has changed since the benchmark in 1992 and establish baseline trends for Council's TYP LoS performance monitoring.

### Sample size

Key Research Consultants undertook the Attitudes and Perceptions telephone survey from a randomly chosen sample of 1,300 residents with quotas met for age, gender, ethnicity and area ensuring representation of the region's population.

Results were given across the region and broken down across the three sub-regions: Western Bay of Plenty, Eastern Bay of Plenty and Rotorua.

The spread of sample interviews reflected the population distribution within the district for age, ethnicity and gender as shown in the following figures:

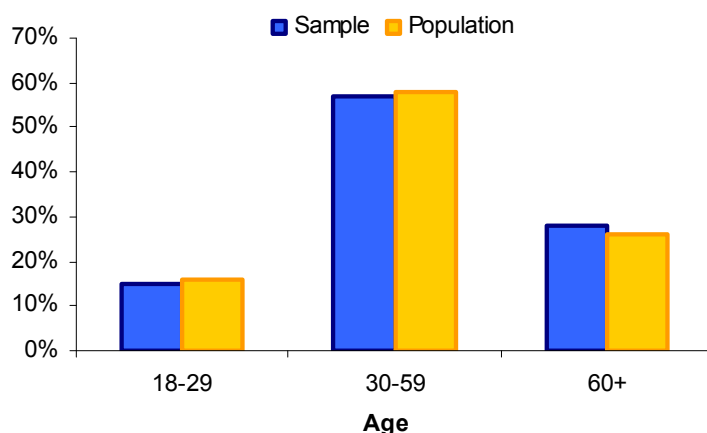


Figure 28 Age distribution

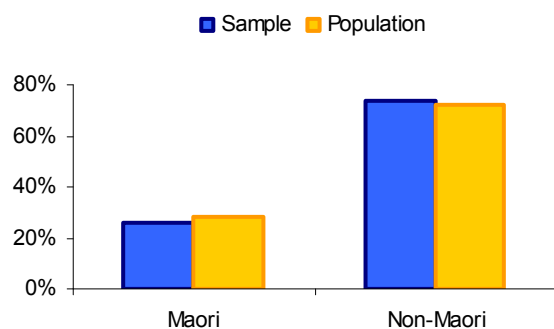


Figure 29 Ethnicity distribution

The above two figures indicate that a representative sample had been chosen for this survey with appropriate ages and ethnic groups included in the survey.

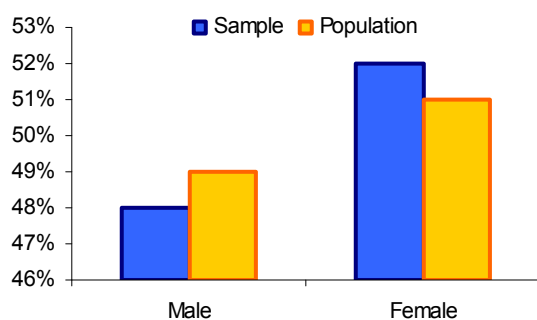


Figure 30 Gender

A representative sample was used across each of the three sub-regions. Approximately 37% of the survey population are from the Western Bay of Plenty, 33% from the Eastern Bay and 30% from Rotorua. Significantly more surveys were undertaken with residents that have lived in the region for more than five years (84%). These results are shown in Figure 31 and Figure 32 that follow:

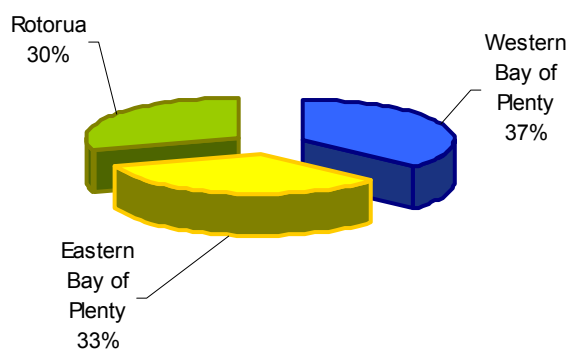


Figure 31 Sub-region

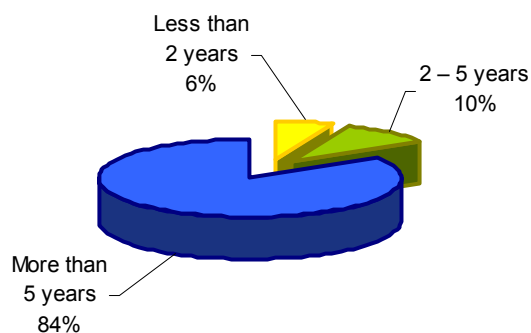


Figure 32 Length of time living in the Bay of Plenty region

## Advantages and disadvantages

The advantages and disadvantages of the survey are as follows:

### Advantages

- ▶ Comparative results from 1992, 1997, 2000 and 2003 surveys.
- ▶ Demographic balance: e.g. percentage of Maori respondents, area balance, and reflective age distribution.
- ▶ Survey carried out by independent professionals: Key Research Consultants.

### Disadvantages

- ▶ Cost.
- ▶ Individual satisfaction ratings can be significantly biased by one bad experience or the time of year (weather/holidays etc).
- ▶ Not targeted to user groups (i.e. river schemes and is a random sample of the general community).

## Assets surveyed

The questions pertaining to the rivers and drainage activity in the Attitudes and Perceptions Survey were as follows (including the results):

**Q: Respondents were asked if there is a river in the Bay of Plenty that they consider to be deteriorating**

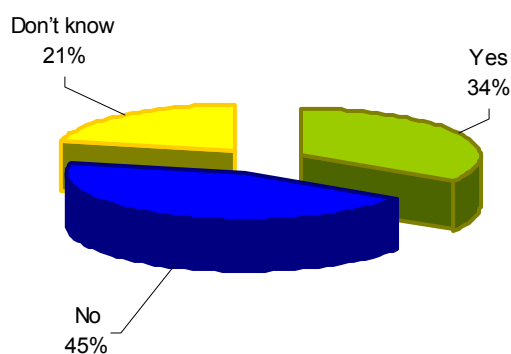


Figure 33 Deterioration of rivers in the Bay of Plenty region

**Q: Respondents who stated that there is a river in the Bay of Plenty that they consider to be deteriorating were then asked to state which river they believe is deteriorating**

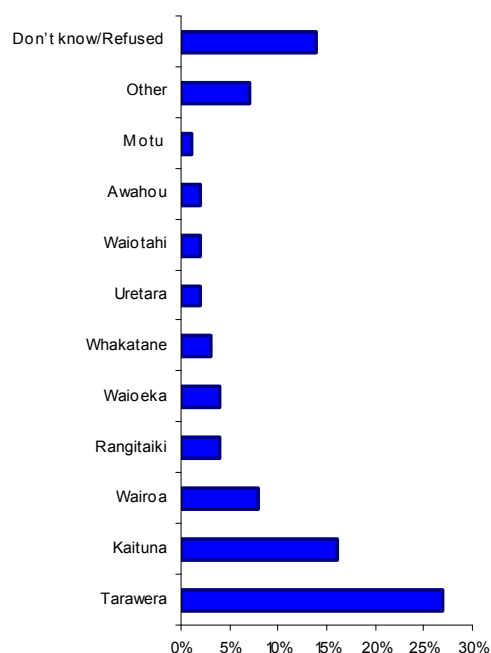
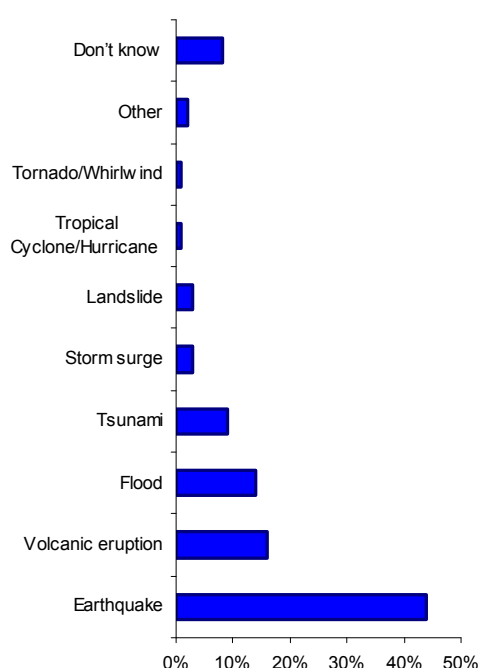


Figure 34 River showing deterioration

Evidently there is significant community concern about the deterioration of the Tarawera River with more than one quarter of the residents perceiving deterioration.



**Q: Respondents were asked what natural hazard event they see as being most likely to endanger them or their property**



**Figure 35** Most likely natural hazard

The results indicated that across the region more than one tenth of the residents identified flood as being the natural hazard event they see as being most likely to endanger them or their property (third after earthquake and volcanic eruption). However residents who identified themselves as Maori or who lived in urban areas were more likely to identify flood as the most likely disaster.

## Targeted ratepayers engagement

In the Bay of Plenty region ratepayers benefiting from or contributing to the rivers and drainage activity pay targeted rates i.e. more than the rest of the region. In order to accurately determine whether Council is achieving community outcomes associated with the rivers and drainage activity it is necessary to engagement these targeted ratepayers as a specific group. It is envisaged that such engagement during the period June 2009 to July 2010 through focus groups and scheme meetings when refining levels of service in preparation for 2012-2022 TYP.

## Customer service requests and complaints

Currently there is no formalised process in place to track customer or stakeholder requests or complaints. Calls generally come directly to Rivers and Drainage staff and are dealt with as relevant. It is planned to investigate potential future options for recording this information to provide a closeout loop and track timeframes to completion of any queries. Currently information is recorded by individuals as appropriate; at present there is no coordinated system to provide an indication regarding the nature of recent calls to the Council.

## Development of community outcomes

Between 2003 and 2005 the six district/city councils in the region, with support from Bay of Plenty Regional Council, worked with their communities to identify each of the local community outcomes. Four approaches were used to identify the community outcomes for the Tauranga city, Eastern Bay of Plenty sub-region, and Rotorua and Western Bay of Plenty districts. Each of the communities were engaged through a combination of workshops, discussion groups, hui, postal questionnaires, and public displays.

Bay of Plenty Regional Council supported the district/city councils during this process. It enabled Bay of Plenty Regional Council to highlight the common threads of the six local community outcomes to draft the community outcomes for the whole region. Bay of Plenty Regional Council held five community focus groups across the region, and used the feedback from them to make changes to the draft. Bay of Plenty Regional Council used its quarterly newspaper ('Backyard') to ask people how important each outcome was to them. While most respondents agreed that all were important, more people thought that "a clean and protected environment" and "healthy and safe communities" were extremely important compared to the other outcomes.

The process to identify the community outcomes differed across the different communities as shown in Table 15 below:

Table 15 Identification of community outcomes process

Community	Process to identify community outcomes
Tauranga city community outcomes <b>Tauranga Tomorrow</b>	<ul style="list-style-type: none"> <li>▶ Stakeholder forums</li> <li>▶ Community working groups</li> <li>▶ Postal survey</li> <li>▶ Display stands</li> <li>▶ Hui</li> <li>▶ Talking with people on the street and at events</li> </ul>
Whakatane, Opotiki and Kawerau districts' community outcomes <b>Eastern Bay Beyond Today</b>	<ul style="list-style-type: none"> <li>▶ Stakeholder forums</li> <li>▶ Questionnaires and workshops</li> <li>▶ Postal feedback forms</li> <li>▶ Hui</li> <li>▶ Display stands</li> <li>▶ District meetings</li> <li>▶ Talking with people on the street</li> </ul>
Rotorua district community outcomes <b>BrightFuture</b>	<ul style="list-style-type: none"> <li>▶ Information held by Rotorua District Council was provided to the public for their feedback and comments</li> </ul>
Western Bay of Plenty district community outcomes <b>SmartFuture</b>	<ul style="list-style-type: none"> <li>▶ Stakeholder forums</li> <li>▶ Household questionnaire</li> <li>▶ Public open days</li> <li>▶ Display stands</li> <li>▶ Information brochures</li> </ul>

## Draft Ten Year Plan 2006-2016 consultation

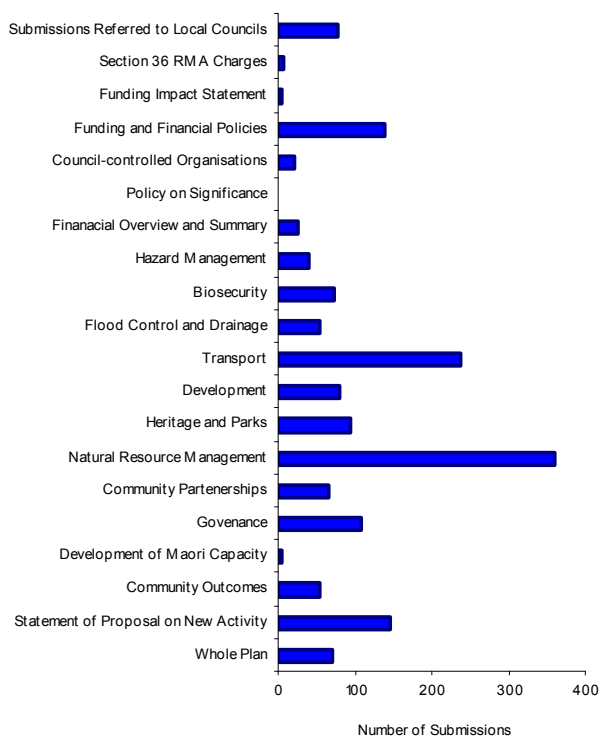
### Background

The Bay of Plenty Regional's TYP 2006-2016 took effect from 1 July 2007.

The community were consulted regarding the content and direction of the Plan and the comments that were received from the community have been provided as follows.

### Analysis and results

The consultation period for the TYP allowed the community to make submissions on the Draft TYP. A total of 1591 submissions points were made across the various sections of the draft Plan including 55 on flood control and drainage. The full breakdown is shown in Figure 36 that follows in order to view the flood control and drainage submissions in context with the other Council activities.



**Figure 36** Overview Ten Year Plan 2006-2016 submission summary

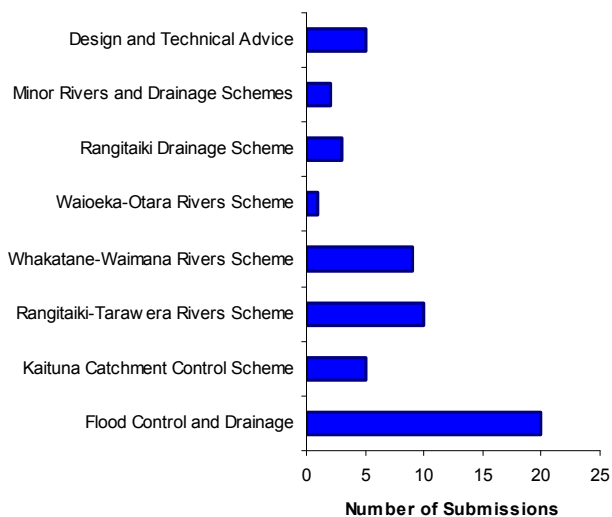
It is evident from the above graph that the area of most concern for people who submitted on the TYP related to the natural resource management of the region.

These submissions covered environmental policy, consents and compliance, sustainable land, air, water and coastal management and waste and contaminated site management.

## Flood control and drainage submissions

The number of flood control and drainage submissions were the 11<sup>th</sup> largest number of submissions received out of the 19 groups of submissions. With 55 submissions made, the flood control and drainage submissions represent 3.5% of all submissions received as part of the TYP consultative process.

The composition of the 55 submission points received for flood control and drainage services is shown in Figure 37.



**Figure 37** Flood control and drainage submission

## Summary

Submissions tended to be in support of Council's flood control and drainage activities with a community understanding of the area's vulnerability to flooding. This is not surprising given the regions large number of rivers and recent extreme flooding events.

### Rangitaiki-Tarawera Rivers Scheme

Ten submissions were received regarding the Rangitaiki-Tarawera Rivers Scheme. Submissions were varied with no common themes or concerns. Generally, comments ranged from a request for a review of the Liaison Committee to a concern about weeds on the riverbanks.

### Whakatane-Waimana Rivers Scheme

Of the nine submissions received regarding the Whakatane-Waimana Rivers Scheme, five specifically mentioned the inclusion of the Downard Road drain – all were in support.

## Draft Annual Plan 2008/2009 consultation

Every year Council publishes an Annual Plan following a consultative process. The draft Plan is published and submissions received are deliberated on to finalise the adopted Plan. This Plan has been adopted and made operative from 1 July 2008 to 30 June 2009.

### Flood control and drainage submissions

Of a total of 213 submission points were received on the Draft Annual Plan 2008/09, 12 of these made reference to the rivers and drainage activity (i.e. 6% of the total Annual Plan submission points).

Of the 213 total, 4 submission points were made on the Draft Bay of Plenty Regional Council Floodway and Drainage Bylaw 2008 (i.e. 2% of total submission points).

The breakdown of rivers and drainage submissions is shown in Figure 38 below.

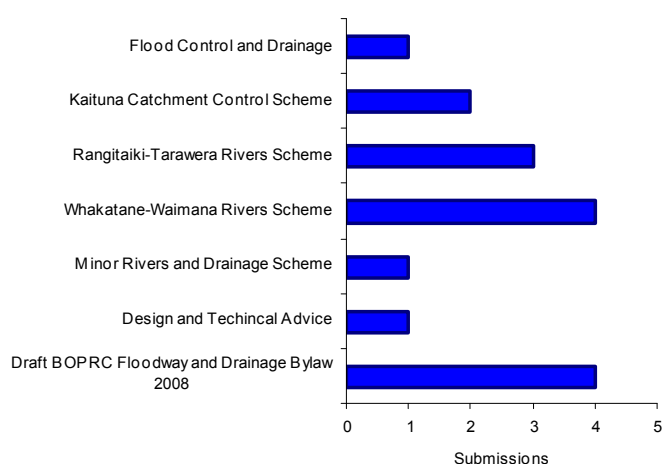


Figure 38 Draft Annual Plan 2008/2009 submission points

## Summary

### Kaituna Catchment Control Scheme

Submissions varied from full support to opposition to proposed rates increases.

### Rangitaiki-Tarawera Rivers Scheme

Three submissions were received regarding the Rangitaiki – Tarawera Rivers Scheme. These three submissions addressed the following different areas:

- ▶ Waitepuru Stream in Matata – in support
- ▶ Reids Canal – support in part
- ▶ Aniwhenua Dam – in opposition

### Whakatane-Waimana Rivers Scheme

All of the submissions received were opposed to the proposed rates increase for this scheme.



## Draft Bay of Plenty Regional Council Floodway and Drainage Bylaw 2008

The submissions that were received were split:

- ▶ Two categorised as oppose in part; and
- ▶ Two categorised as support in part.

## Current and future stakeholder consultation

The LGA 2002 has given Council the mandate to ensure it adequately engages the regional community in its decision-making processes. The Act also sets the purpose of local government to enable local decision-making and action with and on behalf of the community. This means the final decision is made by Council after considering the community views.

### Consultation record

Table 16 outlines the recent consultation that Bay of Plenty Regional Council has engaged in regarding the rivers and drainage activity.

*Table 16 Historical consultation record*

Date	Issues	Consultation approach taken
2007/2008	Waioeka Otara Floodplain Management Strategy (Review)	<ul style="list-style-type: none"> <li>▶ Strategic Policy Committee</li> <li>▶ Waioeka Otara Rivers Scheme Liaison Group meeting</li> <li>▶ Meeting with major stakeholders namely ODC</li> </ul>
2007/2008	Whakatane Waimana Floodplain Management Strategy Consultation Record (Stage 2 document)	<ul style="list-style-type: none"> <li>▶ Strategic Policy Committee</li> <li>▶ Whakatane Waimana Rivers Scheme Liaison Group meeting</li> <li>▶ Major stakeholders invited to review and make submissions (including WDC, LTNZ etc)</li> </ul>
2007/2008	Rangitaiki Tarawera Floodplain Management Strategy (Stage 1 document)	<ul style="list-style-type: none"> <li>▶ Strategic Policy Committee</li> <li>▶ Rangitaiki Tarawera Rivers Scheme Liaison Group meeting</li> <li>▶ Major stakeholders invited to review and make submissions (including WDC, LTNZ etc)</li> <li>▶ Meetings with iwi representatives</li> </ul>

### Proposed future consultation

Table 17 outlines upcoming rivers and drainage activity proposals that Council will consult on with the regional community.

*Table 17 Future proposed consultation*

Date	Issues	Consultation approach taken
2008/2009	Rangitaiki Tarawera Floodplain Management Strategy (draft Stage 2 document)	<ul style="list-style-type: none"> <li>▶ Strategic Policy Committee</li> <li>▶ Rangitaiki Tarawera Rivers Scheme Liaison Group meeting</li> <li>▶ Major stakeholders invited to review and make submissions (including WDC, LTNZ etc)</li> <li>▶ Meetings with iwi representatives</li> </ul>
March 2008	Scheme Management	<ul style="list-style-type: none"> <li>▶ Waioeka Otara Scheme Liaison Group meeting</li> <li>▶ Whakatane Waimana Scheme Liaison Group meeting</li> <li>▶ Rangitaiki Tarawera Scheme Liaison Group meeting</li> <li>▶ Kaituna Scheme Liaison Group meeting</li> </ul>
20/11/08 25/11/08 04/11/08	Scheme Management	<ul style="list-style-type: none"> <li>▶ Waioeka Otara Scheme Liaison Group meeting</li> <li>▶ Whakatane Waimana Scheme Liaison Group meeting</li> <li>▶ Rangitaiki Tarawera Scheme Liaison Group meeting</li> <li>▶ Kaituna Scheme Liaison Group meeting</li> </ul>
27/03/09 09/03/09 12/03/09 05/03/09	Scheme Management	<ul style="list-style-type: none"> <li>▶ Waioeka Otara Scheme Liaison Group meeting</li> <li>▶ Whakatane Waimana Scheme Liaison Group meeting</li> <li>▶ Rangitaiki Tarawera Scheme Liaison Group meeting</li> <li>▶ Kaituna Scheme Liaison Group meeting</li> </ul>

Date	Issues	Consultation approach taken
04/04/08	Edgecumbe Flood Mitigation	► Community Board and Public meetings
08/04/08	Edgecumbe Flood Mitigation	► Community Board and Public meetings
09/08/2008	Edgecumbe Flood Mitigation	► Community Board and Public meetings
16/06/08	Floodplain Management Strategy Whakatane Waimana Floodplain Management Strategy Stage 1 Report send out for comment	► Draft Stage 2 report sent to key stakeholders
14/09/07	Whakatane Waimana Floodplain Management Strategy Stage 2 Report send out for comment	► Draft Stage 1 report send to key stakeholders ► Rangitaiki Tarawera Scheme Liaison Group Stage 1 report send out for comment
	2009-2019 Ten Year Plan	► Consultation process

## Future strategies

- Bay of Plenty Regional Council has engaged in a three yearly Attitudes and Perceptions resident's survey since 1992 and will continue to do so.
- Levels of Service benchmark specific to targeted ratepayers for the rivers and drainage will be undertaken via a survey or as part of the TYP.
- Bay of Plenty Regional Council will consult with the community on the TYP every three years, and the Annual Plan on a yearly basis in between the TYP process. The community will be encouraged to make submissions on issues contained within these plans, including rivers and drainage assets.
- Other consultation with specific relevance to rivers and drainage assets will be undertaken via the scheme liaison groups as the need arises.



### Rivers and Drainage overview

This section outlines the strategy that Bay of Plenty Regional Council will adopt for growth and demand related to the rivers and drainage activity. In conjunction with community outcomes, public health and safety plays a major role in the growth and demand strategy regarding the protection of land and property in the event of serious flooding. In addition, there are key implications around maintaining the LoS that have been agreed with stakeholders and the community.

The Local Government Act (Schedule 10) requires that growth and demand be considered as part of asset management planning to ensure that future requirements are identified and planned for. This will ensure that the needs of the individuals, the community and the region can be maintained over the long term. Relevant legislation is discussed in Section 2 - Strategic Environment.

The key drivers that influence growth and demand are assessed in detail in the following section and investigate the individual components, which contribute to the rivers and drainage activity as a whole. The key drivers that are relevant to the rivers and drainage activity include: Demographic Considerations, Environmental Factors, Community Expectations and Risk, Management of Hazards and Safety and Legislation.

### Introduction

The Bay of Plenty area contains a number of communities with different population densities, varying topography and geomorphology, varying flood protection requirements and consulted levels of service.

Planning for future growth and demand is imperative to provide an economically sustained pathway to meet the needs of the region and visitors to the region. The provision of the River and Drainage activity and its management is considered an essential element in the provision of collective community outcomes, particularly healthy and safe communities.

Growth and demand planning allows for the identification and quantification of areas within the region that are likely to experience significant pressures, or other situations that will impact upon the demand for services.

To assist in the development of this section a number of sources have provided important information around growth and demand drivers, which are considered key for the regions progression.

### Growth strategies

#### Regional growth management strategies

The Bay of Plenty area consists of number district councils that have developed growth strategies for identifying and managing growth in their areas. The following section provides a summary of the growth strategies that are relevant to the region.

##### **Tauranga city, Western Bay of Plenty – Bay of Plenty Regional Council**

In 2004 SmartGrowth Strategy was adopted by the three partner councils (Tauranga city, Western Bay of Plenty and Bay of Plenty Regional Council). SmartGrowth grew out of community concerns about population growth, and effective planning to manage the growth in the future.

SmartGrowth is a programme aimed at developing and implementing a plan for managing growth in the Western Bay of Plenty. The programme takes a holistic approach for the region and encompasses social, economic and environmental goals, which can be achieved in a sustainable way. The SmartGrowth study area is detailed in the SmartGrowth 50-year Strategy and Implementation Plan (May 2007).

The SmartGrowth strategy is a growth management strategy to ensure that as the region grows, it will continue to be a great place to live, work and play.

##### **Kawerau District Council**

The 2001 and 2006 Census recorded small population decreases in the Kawerau district and there have been no major industry expansions identified that would be likely to create growth in the future. Kawerau district is experiencing and is expected to continue to experience zero growth. Pressure on its infrastructure systems is not affected by growth and therefore does not have a pressing need to extend its existing infrastructure due to demand at this stage.

## Rotorua District Council

The 2006 census estimates the Rotorua district population to be approximately 68,100. As well as overall population changes, the demographic profile of Rotorua is projected to change. In particular, the population profile is ageing; there is an increasing number of Maori residents, and also an increasing diversity of people belonging to Asian, Pacific Islands, and other ethnic groups. Migrational churn is a distinctive feature of the Rotorua district and the wider Bay of Plenty region. The latest population projections assume that Rotorua will continue to have slightly more out-migration than in-migration each year, resulting in an expected population growth rate of around 0.4% per annum over the coming 20-year period, compared with a national growth rate of 0.8%.

## Whakatane District Council

The 2006 Census estimates Whakatane's population at 34,500. Future trends predict a 2% growth out until 2021. Whakatane District Council has initiated a plan to manage the growth of the district in a timely, co-ordinated, cost-effective, and equitable manner. The Council is developing a Residential Growth Strategy for these areas and an Industrial Growth Strategy for Whakatane, Ohope and around Kawerau.

## Opotiki District Council

The Opotiki district is made up of miles of coastline, rivers, native bush and farmland. There are a number of communities scattered along the coast, and this forms the basis of community in which the Opotiki District Council works. The Council's vision for the district is "Strong Community – Strong Future". The 2006 Census estimates Opotiki's population at 9,200 the Opotiki District is experiencing and is expected to continue to experience zero growth.

## Growth vs demand

Although growth and demand are considered together in this section, it is worth noting that they do have different implications regarding the ongoing function/delivery of the River and Drainage activity.

**Growth**, in relation to the rivers and drainage activity, mainly refers to the growth in population, or areas that are growing due to new residential or business developments. These changes are likely to create greater demand in two areas; firstly, for the provision of protection from waterways in times high flows and secondly for greater and easier access to waterways for recreational and conservation use.

**Demand** for rivers and drainage infrastructure, protection works and facilities can be influenced by growth, changes in trends, climate, seasonal fluctuations and changes in demographics etc. (e.g. people place a greater demand on land utilisation and/or become interested in recreational activities based around waterways),

## Overview of key demand drivers

The key demand drivers influencing the growth and demand on Council's rivers and drainage activity are summarised in the sub-sections below, which are:

- ▶ Demographic considerations
- ▶ Environmental factors
- ▶ Community expectations/risk
- ▶ Hazards and safety
- ▶ Reliability
- ▶ Legislation

## Demographic considerations

The following section investigates some demographics of the Bay of Plenty region; to gain an understanding of the potential needs of the community and where River and Drainage activities may be required in future as growth occurs in different areas.

### Demographic overview

At the 2006 Census, the region had a population of 257,379 with the largest urban area being Tauranga. A total of 82% of the population live in the urban areas of Tauranga city, Rotorua district, and Western Bay of Plenty.

The region's population is predicted to grow by 15% by 2021 and will make the Bay of Plenty region the second fastest growing region in New Zealand. This growth is projected to continue until 2021.

The following figure outlines the projected population to 2031 and some key points are noted below.

- ▶ 257,379 people usually live in the Bay of Plenty region. This is an increase of 17,964 people, or 7.5%, since the 2001 Census.
- ▶ Bay of Plenty population ranks fifth in size out of the 16 regions in New Zealand.
- ▶ Bay of Plenty region has 6.4% of New Zealand's population.

From the following Figure, it is evident that the medium projection has a similar gradient to the actual rate of change for the region. This projection shows a projected population of just over 300,000 by 2021.

All districts, with the exception of Kawerau and Opotiki, will experience significant growth. Overall the region will experience 15% growth compared to with New Zealand average of 14% growth.

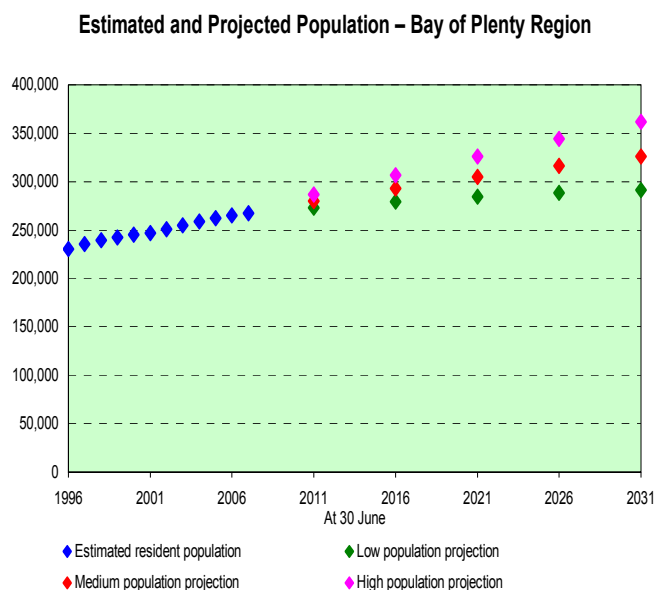


Figure 39 Bay of Plenty region population projections

## Employment statistics

The following Figure shows the income across the region for employed people 15 years and over. The median income is \$22,600. This compares with a median of \$24,400 for all of New Zealand. Over 45% of people over 15 have an annual income of \$20,000 or less compared with 43.2% nationally. In the Bay of Plenty region, 15.3% of people aged 15 years and over have an annual income of more than \$50,000, compared with 18.0% of people throughout New Zealand.

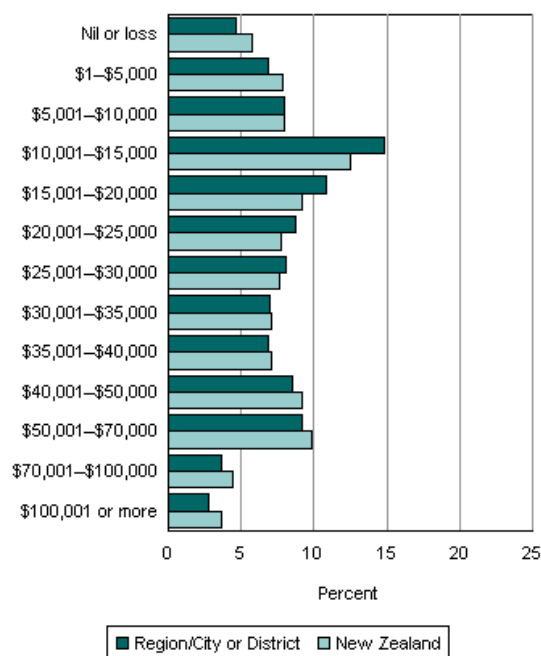


Figure 40 Income – Census 2006 Bay of Plenty region

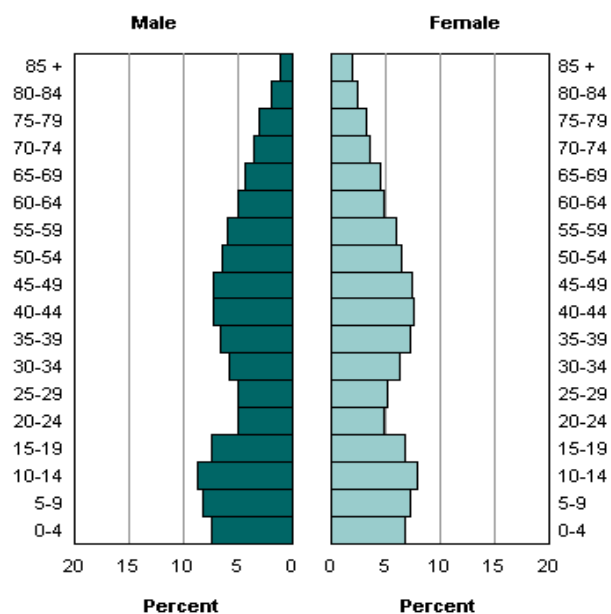


Figure 41 Total population age group and gender Census 2006

The above Figure provides information on the age distribution in the Bay of Plenty region separated by gender. The median age for residents of the Bay of Plenty region is 37.8 years, this compares with the median for New Zealand of 35.9 years.

14.8% of people in Bay of Plenty region are aged 65 years and over, compared with 12.3% of the total New Zealand population. Parts of the Bay of Plenty region historically were popular retirement destinations, this has changed recently with the region developing and attracting new immigrants and younger families.

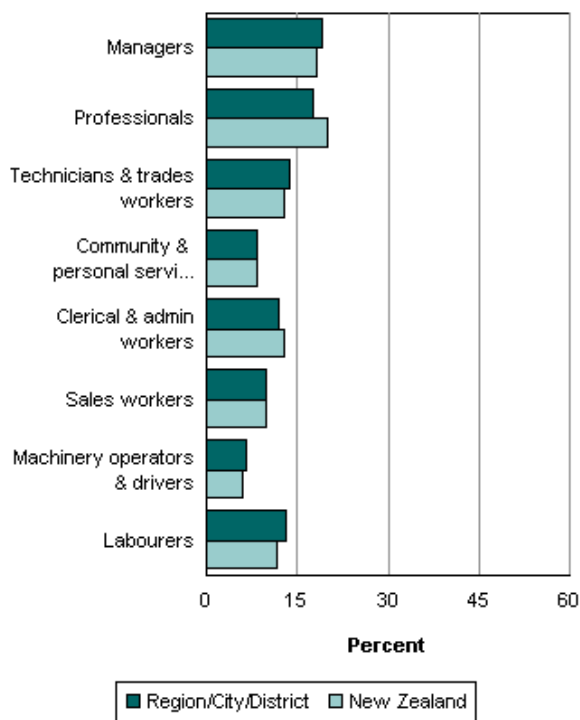


Figure 42 Professions and comparison with national statistics

Figure 42 provides an analysis of the key professions in the Bay of Plenty region in comparison with the rest of New Zealand. The unemployment rate in the Bay is approximately 6.1% for people aged 15 years and over, compared with 5.1% for New Zealand.

The most common occupational groups in the Bay of Plenty region are 'Managers' with around 19% of employed residents being in a managerial role, and 'Professionals' with around 18% in this professional group. There are more technicians/trades people and labourers on average when compared with the rest of New Zealand also.



The New Zealand Deprivation Index for 2006 is shown in Figure 43 above, this is a measure that takes into account various income, lifestyle and accessibility factors, with the most deprived areas having a greater value. It is a decile-based measurement, which compares relative deprivation throughout the country.

Figure 44 which follows provides an indication of the population densities across the region and their location compared with the main rivers. This provides an understanding of the areas in the region that may require more significant flood protection.

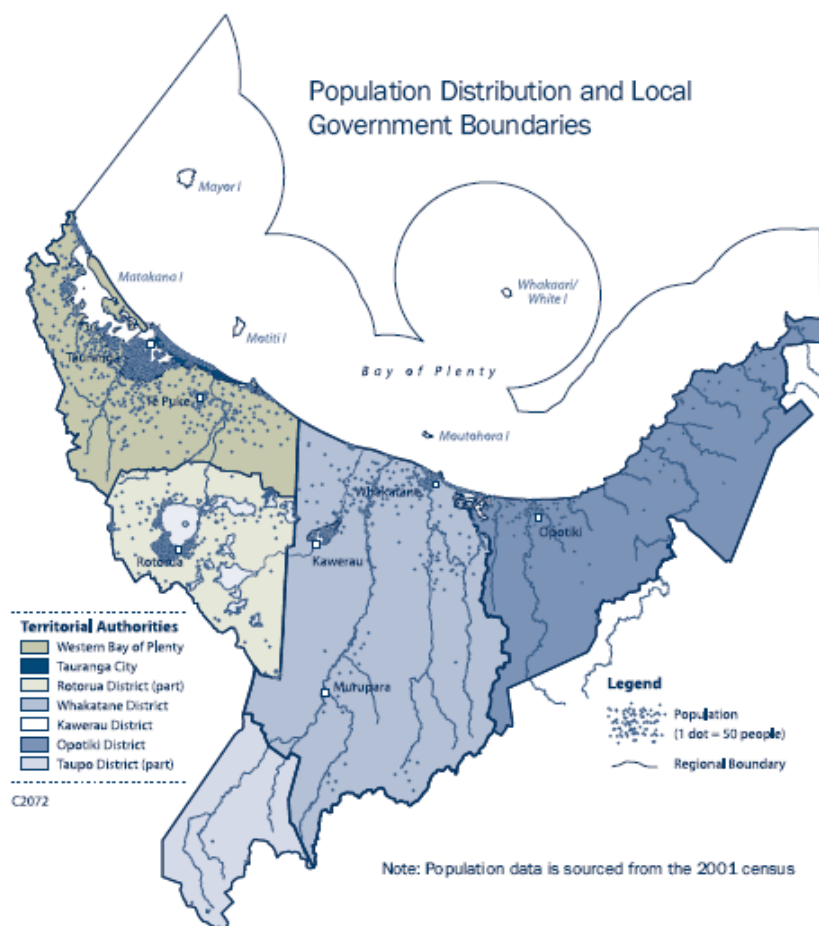


Figure 44 Population distribution

## Impacts of demographics on the rivers and drainage activity

With projected increases in population across the district there will likely be greater demand for business and residential development and therefore greater population densities. This is likely to have the following primary impacts:

- ▶ Demand for an increased level of protection to valuable yet naturally vulnerable productive land;
- ▶ An increasing expectation for uninterrupted access to infrastructure, services and facilities during periods of high rainfall events, i.e. access to towns and business areas and nil to minimal interruption to supply chains;
- ▶ An increased demand for access to rivers and waterways for recreational use;
- ▶ An increased demand for access to rivers and waterways for conservation purposes;
- ▶ Potential increases in capital and operational costs to scheme stakeholders.

## Management strategy

Increasing population leads to an increased demand and in most cases an expectation of increased levels of service. These expectations must be managed through wider community engagement and education to ensure stakeholders understand the impact both physically and economically on decreasing, extending or raising levels of service; this understanding of “cause and effect” will assist in effectively managing the impacts that result on growth and demand and the demographic profile of the region.

## Environmental factors

### Environmental overview

Environmental change and the resulting effects will impact greatly on the River and Drainage activity. Increases in the frequency and intensity of storm events and extremes in weather including droughts and raised sea levels will potentially increase the demand to maintain the existing levels of service. Effects that require consideration include:

- ▶ Climate change
- ▶ Wetland restoration

- ▶ Erosion protection
- ▶ Conservation needs
- ▶ Earthquakes or other climatic events
- ▶ Future proofing

## **Impacts of environmental factors on the rivers and drainage activity**

The main impacts of environmental change on the rivers and drainage activity will include:

- ▶ More frequent and greater levels of damage to assets;
- ▶ A need for higher design standards to mitigate against the larger and/or more frequent events;
- ▶ Higher levels of post event maintenance/repair;
- ▶ A higher level of routine maintenance; and
- ▶ An increase in inspection and monitoring both during and outside storm events.

These impacts, in turn, can have serious deleterious effects on economic, social and environmental values of the community.

## **Management strategy**

In line with climate change projections, Bay of Plenty Regional Council have a policy for the replacement of assets, to assist with determining the capacity of the existing network and the potential impacts of climate change, modelling is undertaken both internally and externally. Capacity reviews are undertaken at regular intervals for river schemes to identify where levels of service are not currently being met.

Modelling coupled with incorporating a greater level of design and/or investigation and employment of alternate protection works to account for environmental factors would be required to determine and effectively manage future capacity requirements within agreed LoS. This will increase capital, operational and maintenance expenditure, which will directly affect resident's contributions to rates.

## **Community expectations and risk**

### **Community expectations and risk overview**

The increased frequency and severity of flood events have, and will continue to impact upon insurance companies' reluctance to insure in high-risk areas without specified conditions, if at all. As a result new business and economic developments will need to be encouraged to occur in less flood prone areas placing greater demand on other areas.

### **Impacts of community expectations and risk on the rivers and drainage activity**

The impacts of community expectations and risk on the rivers and drainage activity will primarily evolve from the wide range of stakeholders that have an interest in the development and management of the rivers and drainage schemes. These different expectations will directly impact upon the way in which the activity is managed, i.e. multiple parties such as landowners, community groups, Iwi, and the general public are likely to have differing expectations and risk tolerances. Potential impacts could include:

- ▶ Increased demand to maintain or increase access for recreational use such from parties such as white baiters.
- ▶ Changes in the level of service required and therefore risk mitigation that is required or acceptable.
- ▶ Determines the extent of future proofing required for climate change and or other environmental effects.
- ▶ Community investment and third party developments are likely to result in an increase in demand for development in areas of high risk. This will affect development patterns and in turn place further pressure on current developed areas.
- ▶ Community groups are likely to continue to expect greater LoS resulting in an increased financial burden.

## **Management strategy**

Bay of Plenty Regional Council should continue to identify and designate areas of greatest risk in conjunction with growth indicators.

Regulatory controls such as restricting the type of activity, structure, or function that can be carried out within those designated areas will need to be applied, with measures such as the setting of minimum floor levels in areas of high risk being implemented widely. Protection of recreational and conservation areas must be a key design criteria during the planning phase of protection structures.

# Management of hazards and safety

## Hazards and safety overview

Proactive hazard and safety management assists in minimising injuries and deaths from water-based incidents while providing a level of protection from some natural hazards, such as floods. Bay of Plenty Regional Council and the district councils also assist communities to prepare for natural hazards, such as earthquakes or tsunamis; and enable a coordinated response to these hazards.

Measures for managing hazards and safety include:

- ▶ Natural hazard assessments (coastal, volcanic, seismic, flooding, subsidence, geothermal).
- ▶ River level monitoring.
- ▶ Community perceptions and feedback.
- ▶ Number of marine/lake/river reported accidents and fatalities.

## Impacts of hazards and safety on the rivers and drainage activity

Effective management of hazards and safety requires systems and resources to monitor, collect, assess, coordinate, educate and react appropriately to the varying levels of hazards event of activity that may occur. The provision of such a service and therefore the cost to the community for its provision will continue to grow proportionally to the level of service demanded by the community.

## Management strategy

River level monitoring combined with onsite observation and monitoring are the primary real-time and predictive tools available to Bay of Plenty Regional Council leading into and during a storm event. They allow known and developing problem areas to be closely monitored, effects to be understood, contingency plans to be developed and when and where appropriate warnings are to be issued.

Surveys, assessments and regular reviewing of incident and accident reports will continue to provide the information required to prioritise and manage hazards and areas of safety concern. In all cases Bay of Plenty Regional Council's Emergency Management Team and associated response plans provide an effective management strategy.

Identification of critical assets would also assist with minimising the risks associated with failures of critical flood protection equipment. Ongoing updates of the activity and critical risk registers assists with the management and mitigation of these risks. Adherence to the National Policy Statement for Flood Risk Management and the New Zealand Standard for Flood Hazard Risk Management is also advised.

Ongoing proactive maintenance programmes will also assist with the minimisation of risk and potential asset failures. Proactive maintenance programmes are already in place, and can be reviewed periodically to determine their effectiveness. Preventative maintenance, regular inspection, monitoring and hydraulic modelling all contribute to ensuring service reliability standards are met.

## Legislation

### Legislation overview

There are a number of key regulations or legislation that impact on the activity, its management, renewal, repairs, upgrades and impacts. The key Legislative Acts are discussed in more detail in the Strategic Environment section. However a key summary outlined below. Development contributions are also discussed at the end of this document.

#### Resource Management Act 1991 and Amendments

*Safeguarding the life-supporting capacity of air, water, soil and ecosystems; and*

**(c) *Avoiding, remedying or mitigating any adverse effects of activities on the environment.***

#### Local Government Act 2002

Schedule 10 of the Act sets out the requirements for local authorities as to how they will assess and manage the implications of the following:

*“(i) (a) Demand for, or consumption of, relevant services; and*

*(b) Service provision levels and standards:*

*(ii) What additional asset capacity is estimated to be required in respect of changes to each of the matters described in the subparagraph (i):*

*(iii) How the provision of additional asset capacity will be undertaken:*

*(iv) The estimated costs of the provision of additional asset capacity identified under subparagraph (ii), and the division of those costs between each of the matters in respect of which additional capacity is required:*

*(v) How the costs of the provision of additional asset capacity will be met.”*

As per the New Zealand standard for Flood Protection, recognise flood risk specifically residual flood risk, National Policy Statement for Flood Risk Management, New Zealand Standard for Flood Hazard Risk Management (NZ9401:2008).

## Impacts of legislation on the rivers and drainage activity

Legislative requirements impact heavily on the River and Drainage activity, as Council must determine how growth and demand will impact on the community in the long term.

Legislative change can significantly impact on Council's ability to meet the minimum levels of service that have been agreed with the community and may require improvements to be made to River and Drainage assets. This will have a direct effect on the community if increased levels of service affect the community's ability to pay for those services.

Council must be able to identify growth and demand needs over a long period of time. This requires a robust knowledge what assets it has, the asset condition, past performance, and future growth strategies and policies.

## Management strategy

Council will ensure it is compliant with the relevant legislative requirements related to the River and Drainage activity. This includes performance and governance through the implementation and continuous improvement of this AMP. Council will involve the community to far greater levels through consultation and decision-making and will implement the following:

- ▶ Ensure an adequate level of understanding of the legislation is obtained by key staff.
- ▶ Carry out reviews of policy changes to establish what the impacts may be (if any).
- ▶ Ensure compliance with consent conditions (where relevant).
- ▶ Development of a Community Consultation Strategy.
- ▶ Promote the preparation, mitigation and response aspects in compliance with the CDEM 2002.
- ▶ Development of the district wide Strategic Plan.

## Demand management planning

The objective of demand management planning is to actively seek to modify customer demands for services, in order to maximise utilisation of existing assets or to reduce or defer the need for new assets or services, including non-asset solutions. Future scenarios need to be investigated. Examples of new and improved services to meet customer demand include:

- ▶ Monitoring development and providing incentives to develop in less flood prone areas.
- ▶ Incorporating alternative designs into new subdivisions etc, for example setting minimum floor levels.

## Management strategies

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

Demand management is practiced continuously to maintain the total demand at reasonable and sustainable levels. The five key components of demand management when promoted as a package or strategy rather than in isolation can dramatically reduce the demand on the activity. The key components with examples are provided in the following table:



Demand component	Rivers and drainage examples
Legislation/regulation	► Manage resources and supporting infrastructure in line with legislation e.g. regulating and monitoring of grave extraction rates and water take quantities.
Education	► Educating the community around River and Drainage related activities in order to manage expectations and reasons for undertaking activities.
Incentives	► Provision of small landowner environmental grants to promote minor works activities that complement Council activities, i.e. out of scheme channel improvements.
Operation	► Continual improvements to assets through stakeholder ownership of assets, i.e. landowners who have assets on their land are more likely to look after them when that asset benefits them either directly or indirectly.
Demand sub	► Maximum use of alternative and/or “soft” materials (i.e. tree plantings) for erosion protection and channel training activities.

## Capital works programme and funding

Key projects identified in the plan relating to growth as a key driver for capital investment.

- Development expenditure (proportion directly relating to growth) for the next 10 years has been estimated at \$2.1 million for additional capital works as a result of growth.

A summary of the projects related to growth over the next 10 years is listed below.

*Table 18 Capital works – growth summary*

Works related to growth	Project cost estimate	Scheme	Loans	Subsidies	Vested	Completion year
Bell Road pump station	\$2.10 million	Kaituna			\$2.10 million	2010



# Environmental stewardship

## Overview

This section describes the environmental legislative obligations that Council has in undertaking the rivers and drainage activity including requirements specified as part of legislative requirements. It also demonstrates Bay of Plenty Regional Council's commitment to environmental stewardship through the inclusion of environmental impact assessment and mitigation as a key Council consideration.

This section pulls together the many elements that contribute to good environmental management as relevant to the wider Bay of Plenty community.

## Environmental drivers

There are a number of mechanisms aimed to avoid or mitigate potential adverse environmental effects associated with rivers and drainage management. These are set at national, regional and district levels.

## National legislation

Statutory requirements have been outlined in the Business Overview section however specific requirements relating to environmental stewardship are covered in more detail in the following sub sections.

The role of central government is one of setting policy for environmental management across New Zealand. This is achieved through the following key statutes:

### The Resource Management Act (1991)

The Resource Management Act 1991 (RMA 1991) promotes the sustainable management of natural and physical resources. It specifies the roles and responsibilities in terms of managing effects on the environment.

In relation to rivers and drainage management, the RMA would require the adverse effects associated with the activities such as flood stopbanks or gravel extraction to be avoided, remedied or mitigated. This will be imposed through the regional and district plans.

The purpose and principles of the Act are set down in Part II. Section 5 defines the purpose as promoting the sustainable management of natural and physical resources. Sustainable management is defined as managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while:

- (a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
- (b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and
- (c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment.

Section 7 states that 'all persons exercising powers and functions under the Act, in relation to managing the use, development and protection of natural and physical resources, shall have particular regard to kaitiakitanga'.

Section 8 states that 'In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi)'.

Part III of the Act prescribes duties and restrictions. Of particular relevance to rivers and drainage activity are sections 9, 12, 13, 14 and 15. These prescribe restrictions on the use of land, the coastal marine area, beds of lakes and rivers, and water respectively. Section 15 restricts discharges of contaminants. Consents are required for activities not allowed by a rule in a regional plan.

Section 31 requires district councils to be responsible for achieving integrated management of the use of land and associated natural and physical resources of their district.

Specific to the management of the nation's water resources, Sections 69 and 70 of the RMA allow rules relating to water quality to be incorporated into a Regional Plan. Section 107 continues to impose restrictions on the granting of certain discharge permits where there are likely to be significant effects on the receiving environment without regard for Section 107(2).

### The Resource Management (Climate Change and Energy) Amendment Act 2004

The Resource Management (Energy and Climate Change) Amendment Act 2004 introduced a further matter into Part II of the RMA, requiring that particular regard be given to the effects of climate change (Section 7(i)).

In the context of the RMA, there are two ways in which particular regard may be given to the effects of climate change. Firstly, in the consideration of resource consents and notices of requirement under the RMA, regard should be given to the effect that climate change is likely to have on the ability of the asset to perform its purpose over its lifetime. Policies should reflect the need to address the effects of climate change and provide guidance for design and planning of drainage assets.



## **Local Government Act 2002 (LGA 2002)**

Specific to environmental stewardship the Local Government Act (LGA) includes the principles of making itself aware of community views; providing opportunities for Māori to participate in decision-making processes; collaborating and cooperating with other local authorities as appropriate; ensuring prudent stewardship of resources; and taking a sustainable development approach.

The LGA outlines the responsibilities of local authorities and the decision making process for activities undertaken on behalf of their community, primarily through the requirement to adopt a Long Term Council Community Plan (LTCCP), called a TYP in Bay of Plenty Regional Council's context. Councils are encouraged by the LGA to identify overall long-term priorities and to plan for the future.

### **Long Term Council Community Plan (Ten Year Plan)**

Bay of Plenty Regional Council has specified the following environmental community outcome as part of the TYP 2006-2016 ("LTCCP") which relate to rivers and drainage management:

- ▶ A clean protected environment
- ▶ Healthy and safe communities
- ▶ Quality, affordable infrastructure

## **Local Government (Rating) Act 2002**

The Local Government (Rating) Act 2002 (LGRA) provides councils with powers to set, assess and collect rates to fund local government activities. It updates and simplifies previous rating powers to meet the needs of modern local authorities. There are three main purposes of the LGRA –

- ▶ To provide local authorities with flexible powers to set, assess, and collect rates.
- ▶ To ensure rates reflect decisions made in a transparent and consultative manner.
- ▶ To provide for processes and information to ensure ratepayers can identify and understand their liability for rates.

One of the prime objectives of the LGRA is to establish clarity, certainty, and stability in rating matters.

Mechanisms are set out in the LGRA to allow local authorities to raise revenue from the community generally, specified groups or categories of ratepayers, and those who use or generate the need for particular services or amenities.

## **Land Drainage Act 1908**

Legislation under the Land Drainage Act 1908 provides the structure to form legal drainage areas that operate as a co-operative venture between multiple land owners with engineering and administrative support from Council.

## **Soil Conservation and Rivers Act (SCRCA) 1941**

The overriding purpose of the Act is to make provision for the conservation of soil resources, the prevention of damage by erosion and to make better provision for the protection of property from damage by floods. In order to achieve the Act's purpose and objects catchment boards were established under the Act. Sections 126 and 133 of the SCRCA set the roles and responsibilities of "Catchment Boards" in relation to flooding and flood protection. In essence regional councils, for the purposes of the SCRCA are catchment boards.

## **Civil Defence and Emergency Management (CDEM) Act 2002**

This Act updates and redefines the duties, functions, and powers of central government, local government, emergency services, lifeline utilities, and the general public.

The CDEM Act improves and promotes:

- ▶ The reduction of risks through partnerships with communities.
- ▶ The reduction of community disruption from avoidable hazards and risks.
- ▶ The reduction of fiscal risks from the costs of disruption.
- ▶ More effective and efficient emergency readiness, response and recovery through the integrated activities of responsible agencies and relevant disciplines.
- ▶ A culture, processes and structures that encourage and enable people and communities to: - undertake risk management, build operational capabilities for response and recover from emergencies.

## Role as a Regional Council

Bay of Plenty Regional Council has a key role under the RMA 1991 in developing regional policy statements and regional plans to ensure the integrated and sustainable management of the region's resources. These policies and plans guide the management of water related activities that form part of the Regional Council's jurisdiction.

This includes the following responsibilities in relation to rivers and drainage management.

- ▶ Control the use and development activities for the purposes of soil conservation.
- ▶ Maintain or enhance water quality.
- ▶ Maintain and enhance aquatic ecosystems.
- ▶ Maintaining water quantity.
- ▶ Avoid or mitigate natural hazards.

### Bay of Plenty Regional Policy Statement

The Bay of Plenty Regional Policy Statement promotes the sustainable management of the Bay of Plenty region's natural and physical resources. It provides an overview of the resource management issues of the region with policies and methods to achieve integrated management. Policies relating to land and water are particularly relevant.

In relation to land, the expected outcome of the Policy Statement is that land resources are safeguarded and where relevant developed and enhanced by the regional acceptance and implementation of sustainable resource management and strategic land care practices.

The Policy Statement also aims to ensure water quality, flows and levels will not fall below standards set to protect and safeguard the life-supporting capacity of water, aquatic life and the needs of current and future generations.

### Regional Water and Land Management Plan

Bay of Plenty Regional Council has developed a Regional Water and Land Management Plan, which outlines the rules and regulations regarding earthworks and discharges. Under these rules and regulations certain stormwater management related development requires resource consent for activities such as:

- ▶ Earthworks (s.9).
- ▶ Use, disturbance, occupation or reclamation in the Coastal Marine Area (CMA) (s.12).
- ▶ Any proposed activity within the bed of a lake, river or stream such as the construction of structures (culverts) (s.13).
- ▶ An activity which involves the taking, use, damming or diversion of water (s.14).
- ▶ Any activity that results in discharges of water containing contaminants (i.e. including stormwater) into water or onto land (s.15).

Land use consent applications for earthworks will invariably include an Erosion and Sediment Control Plan. The purpose of these plans is to illustrate which erosion and sediment control measures are intended for the development.

### Regional Water and Land Plan

Bay of Plenty Regional Council's Regional Water and Land Plan addresses sustainable land management, soil conservation, riparian management, protection of wetlands and integration of land and water management. The Plan outlines the rules and requirements for earthworks, vegetation clearance, culverts, bridges and fords, and wetland modification. Bay of Plenty Regional Council issues resource consents to control such activities.

### Regional Coastal Plan

Bay of Plenty Regional Council's Regional Coastal Management Plan outlines the rules and requirements regarding earthworks, structures and discharges to the coastal environment from stormwater management related development (amongst others). As such Bay of Plenty Regional Council issues coastal permits to control such activities.



## Consents

Consents are a requirement for most rivers and drainage works due to the potential impact on receiving environments. Consent is required for activities that are not permitted by a rule in a regional plan, as outlined in Part III of the RMA 1991. Bay of Plenty Regional Council's consent requirements are specified in the Proposed Regional Water and Land Plan.

Land use consent may also be required from the relevant district council for some activities as prescribed in the District Plan.

Both regional and district councils provide advice to perspective applicants and facilitate the consenting process within their regional or territorial boundaries. Part of the consenting process involves the applicant developing an Assessment of Environmental Effects.

An Assessment of Environmental Effects (AEE) is required to support the resource consent applications to the respective councils when seeking approval to implement projects.

The AEE process involves the identification and assessment of both the potential and the perceived physical, social and cultural impacts that the proposed works may have on the existing environment, and includes the examination and comparison of options and alternatives for mitigating any identified adverse effects, and the confirmation and recommendations on the preferred options and methodology to carry out the works.

The critical environmental factors requiring consideration include the impact earthworks and structures on the integrity of natural environment particularly in the coastal, river or lake environment, the ecological effects associated with vegetation removal and site development, the cultural, archaeological and social effects and contamination and discharge issues. A number of these factors may require specialist input and consultation with the local community and asset users.

Positive effects associated with rivers and drainage management, particularly flood protection need to be balanced against the adverse effects identified in the AEE.

When Bay of Plenty Regional Council propose to undertake activities as noted above, a consent is required under the Regional Water and Land Plan and potentially the relevant district plan. The following tables provide information on recent consents that have been issued relating to the rivers and drainage activity.



Table 19 Rivers and drainage related consents

Consent No.	Purpose	Status	Property address	Expiry	Comments
20074	Divert flood water from Waingaehe Stream and discharge floodwater into Lake Rotorua.	Current	Holdens Bay, Rotorua	01/10/2026	Retain
20075	Divert water from Lake Rotoma and discharge water from Lake Rotoma to Lake Rotoehu.	Current	Lake Rotoma Diversion into Lake Rotoehu	01/10/2026	Retain
20105	Control outflows from Lake Rotomahana and discharge excess water into Lake Tarawera.	Current	Lake Rotomahana	01/10/2026	Retain
20150	Divert/alleviate flooding and siltation.	Current	State Highway 2, Taneatua	01/10/2026	Retain
20170	Divert the total flow of the Kaituna River; discharge from diversion water to channel for the purpose of controlling flooding.	Current	Kaituna River	01/10/2026	Surrender  Divert flood flows of the Kaituna River and discharge back into the existing channel.
20954	Discharge drainage water into Kope West Canal.	Current	Thornton	01/10/2026	Retain
21825	Divert Ohineangaanga Stream into the Raparapahoe Canal.	Current	Te Puke	01/10/2026	Retain (discharging into a different catchment).
21842	Divert flow of stream to diversion channel.	Current	Ngongotaha Bridge	01/10/2026	Retain

Consent No.	Purpose	Status	Property address	Expiry	Comments
22038	Divert the flow of the Kaituna River into a diversion channel to improve the flood carrying capacity and to cut off a loop.	Current	Upstream Te Matia Bridge, Rangiora.	01/10/2026	Surrender
22059	Discharge drainage water from a pump station to Omeheue Canal.	Current	Poplar Lane	01/10/2026	Retain
22061	Discharge drainage water.	Current	Otakiri Road, Edgecumbe	01/10/2026	Retain
22156	Divert floodwaters from Western Drain and discharge floodwaters into Reids Canal.	Current	Western Drain	01/10/2026	Surrender
22178	Floodwater disposal Kope West to East.	Current	Junction Kope West and East Canals, Whakatane	28/02/2009	Surrender requested
22325	Divert overflow drainage.	Current	State Highway 2, Opotiki	01/10/2026	Retain
22363	Divert 50% of Otara Road West Drain flow and discharge diversion flow to drain.	Current	Otara Road (corner State Highway 2), Opotiki	01/10/2026	Check if Otara Road West Drain and Otara Road Drain are in the same catchment?
22365	Divert Otara Road Drain into Duke Street Drain.	Current	State Highway 2	01/10/2026	Surrender?
22897	Divert Mangorewa and Kaituna Rivers.	Current	Mangorewa and Kaituna Rivers, Sunset Drive, Paengaora	31/03/2027	Surrender  Divert the flow of the Mangorewa and Kaituna Rivers by cutting through a meander loop for flood flows.
24504	Control level of Lake Rotoiti.	Current	Lake Rotoiti	30/06/2010	Retain
24505	Control level of Lake Rotorua.	Current	Lake Rotorua	30/06/2010	Retain
40286	Erect and maintain eight poles in Tauranga Harbour.	Current	Tauranga Harbour	30/11/2031	Retain
50353	To improve the channel and to stabilise banks of the Wharawhara Stream.	Current	Wharawhara Stream	30/04/2029	Surrender  Improve channel and stabilise banks works will be covered under 64864
50355	Carry out and maintain protection works in and adjacent to the bed of the Nukuhou Stream.	Current	Nukuhou Stream	30/04/2029	Surrender  Improve channel and stabilise banks works will be covered under 64864.
50661	Control structure.	Current	Lake Rotoiti	30/06/2010	Retain
50663	Placement of structure.	Current	Ohau Channel	30/06/2010	Retain
50774	To repair bank erosion and to remove large tree growth from the beds of various rivers and streams in the Bay of Plenty region.	Expired s124	Various stream/ rivers throughout Bay of Plenty region	31/07/2007	Replacement consent underway
51060	Shingle extraction from Waioeka River.	Expired s124	Waioeka River	31/01/2002	Replacement consent underway
51061	Shingle extraction from Otara River.	Expired s124	Otara River	31/01/2002	Replacement consent underway

Consent No.	Purpose	Status	Property address	Expiry	Comments
60776	Take, divert, pipeline and discharge water.	Current	Lake Okareka, Spence Road	31/05/2026	Retain
61321	Shingle extraction from Waioeka River.	Submission closed	Waioeka River	- (status = submission s closed)	
61322	Shingle extraction from Otara River.	Submission closed	Otara River	- (status = submission s closed)	
61429	Gravel extraction.	Current	Horomanga River	31/03/2012	Retain
61885	Excavate dunes and divert Waitahanui Stream.	Current	Waitahanui Stream	30/06/2018	Retain (at present but may be superseded by consent 64864 (replacement for 50774).
61910	Divert coastal water to provide for the raising of the Mataatua Reserve and Muriwai Drive stopbank to the design 1% AEP level.	Current	Mataatua Reserve	30/11/2038	Retain (constructed after 2002)
61982	Discharge diquat into waterways.	Current	Lower Kaituna Catchment	31/05/2009	Retain (at least until endofall application have been consented).
61983	Discharge diquat into waterways.	Current	Rangitaiki Drainage Catchment	31/05/2009	Retain (at least until endofall application have been consented).
63209	Construct structure to divert channel.	Current	Ohau Channel diversion	31/10/2014	Retain
63228	Modify wetland.	Current	Ohau Channel	31/08/2010	
63261	Deploy tide gauge in sea bed.	Current	Kohi Point and West End	31/07/2025	Retain
63912	Place structure for flood overflow.	Hearing	Thornton Road, Matata	- (status = hearing)	
64684	To repair bank erosion and to remove large tree growth from the beds of various rivers and streams in the Bay of Plenty region.	Time extended	Various stream/ rivers throughout Bay of Plenty region	- (status = time extended)	
64711	Construct a stopbank for flood protection.	Current	Woodlands Road, Opotiki	31/03/2042	Retain

Table 20 Coastal related permits – Whakatāne-Waimana Coastal Permit, 65210, term 35 years (to 31/08/43)

Type (asset code)	Use	Map reference	Legal descriptions	Location
Rock rip-rap (WKR05RR1)	Erosion protection	W15 6231 5387 to W15 6215 5374	CMA Lot 1 DPS 72551	True right bank of Whakatane River
Flap-gate culvert (WKR06CV1)	Discharge stormwater	W15 6216 5375		
Rock rip-rap (WKR07RR1)	Erosion protection	W15 6212 5372 to W15 6196 5368		
Flap-gate culvert (WKR08CV1)	Discharge stormwater	W15 6196 5386		
Flap-gate culvert (WKR10CV1)	Discharge stormwater	W15 6180 5367	CMA	
Flap-gate culvert (WKR11CV1)	Discharge stormwater	W15 6170 5365	CMA	
Rock rip-rap (WKR11RR1)	Erosion protection	W15 6170 5365 to W15 6161 5363	Lots 1 2 DPS 89239	



Type (asset code)	Use	Map reference	Legal descriptions	Location
Flap-gate culvert (WKR11CV2)	Discharge stormwater	W15 6162 5364	Lots 1 DPS 72031 Lots 1 2 3 DPS 75728	
Rock rip-rap (WKR12RR1)	Erosion protection	W15 6161 5362 to W15 6149 5364		
Flap-gate culvert (WKR12CV1)	Discharge stormwater	W15 6151 5364		
Rock rip-rap (WKR14RR1)	Erosion protection	W15 6141 5363 to W15 6132 5361		
Rock rip-rap (WKR15RR1)	Erosion protection	W15 6131 5362 to W15 6124 5362	CMA	
Rock rip-rap (WKR31RR1)	Erosion protection	W15 5992 5363 to W15 5961 5317	CMA	
Flap-gate culvert (WKR37CV1)	True right bank of Whakatane River	W15 5961 5317	Lot 18 DPS 9222 Lot 37 DPS 10787 Lot 21 DPS 8899 Lot 22 DPS 14067 Lot 10 DPS7522 - Riverbank and Esplanade Reserves	
Rock rip-rap (WKR38RR1)	Erosion protection	W15 5959 5316 to W15 5953 5304		
Flap-gate culvert (WKR39CV1)	Discharge stormwater	W15 5953 5304		
Rock rip-rap (WKR40RR1)	Erosion protection	W15 5953 5303 to W15 5928 5283		
Culvert (WKR41CV1)	Discharge stormwater	W15 5928 5283		
Rock rip-rap (WKR41RR1)	Erosion protection	W15 5928 5283 to W15 5924 5282		
Rock rip-rap (WKL16RR1)	Erosion protection	W15 6126 5384 to W15 6122 5287	CMA	True left bank of Whakatāne River
Rock rip-rap (WKL21RR1)	Erosion protection	W15 6083 5409 to W15 6081 5410	CMA	
Flap-gate (WKL21FG1)	Discharge stormwater	W15 6080 5411	PT Lots 3 4 DP 21268 PT Lots 1 2 DPS 11166 Allots 19 20 165 216 PT 28B2E1 Rangitaiki Psh Closed Rd Sec 10 Blk li Whakatane Sd and Pts Orini Canal and Whakatane River (Allot -165 And Sec 10 Owned by Whakatane District Council Allots 19 20 Owned by Maori owners)	
Rock rip-rap (WKL21RR2)	Erosion protection	W15 6081 5412 to W15 6088 5411		
Rock rip-rap (WKL22RR1)	Erosion protection	W15 6084 5402 to W15 5953 5336		
Rock rip-rap (WRR00RR1)	Erosion protection	W15 6162 5361 to W15 6162 5357	CMA	True right bank of Wairere Stream
Retaining wall (WRL00RW1)	Erosion protection	W15 6160 5361 to W15 6160 5357	Lots 49 50 PT 48 DP 13036 & PT 10 DP 7871	True left bank of Wairere Stream
Rock rip-rap (WRL00RR1)	Erosion protection	W15 6160 5360 to W15 6161 5358		
Retaining wall (WRL00RW2)	Erosion protection	W15 6161 5358 to W15 6161 5356		

Table 21

Coastal related permits – Waioeka Otara Coastal Permit, 65211, term 35 years (to 31/08/43)

Type (asset code)	Use	Map reference	Legal descriptions	Location
Rock rip-rap (OT00RR1)	Erosion protection	W15 8594 4659 to W15 8602 4668	CMA Allots 339 343 346 Pt Allots 340 342 345 Opotiki Tship Blk Iii Opotiki Sd - Pt Eroded-Pt Volkners Is- Rec Res	True right bank of Otara River
Rock rip-rap (OT01RR1)	Erosion protection	W15 8604 4669 to W15 8608 4674	CMA	True left bank of Otara River
Flap-gate culvert (OTR01CV1)	Discharge stormwater	W15 8609 4675	CMA	True right bank of Otara River
Rock rip-rap (OT03RR1)	Erosion protection	W15 8616 4682 to W15 8630 4724	CMA  Gaz 81-496 Allot 218 Of Sec 1 Opotiki Tn-Pt Eroded-Rec Res Gaz 81-496 Allot 271 Of Sec 1 Opotiki Tn- Rec Res	
Flap-gate culvert (OTR03CV1)	Discharge stormwater	W15 8623 4692	CMA	
Flap-gate culvert (OTR05CV1)	Discharge stormwater	W15 8629 4704	CMA	
Rock rip-rap (WAL07RR1)	Erosion protection	W15 8507 4736 to W15 8519 4733	CMA Allot 439 Waiotahi Parish	True left bank of Waioeka River
Rock rip-rap (WAL08RR1)	Erosion protection	W15 8519 4732 to W15 8529 4716		
Rock rip-rap (WAL23RR1)	Erosion protection	W15 8543 4642 to W15 8554 4653	CMA  Allot 444 Waiotahi Parish  Allot 444A Waiotahi Parish	

Table 22

Coastal related permits – Rangitaiki Tarawera Coastal Permit, 65212, term 35 years

Type (asset code)	Use	Map reference	Legal descriptions	Location
Rock rip-rap (RAR01RR1)	Erosion protection	W15 5148 5856 to W15 5126 5828	CMA Allot 439 Waiotahi Parish  Pt Allot 274 Rangitaiki Psh Blk V Awaateatua Sd -Thornton Lagoon Wildlife Management Reserve	True right bank of Rangitāiki River
Rock rip-rap (RAL07RR1)	Erosion protection	W15 5091 5823 to W15 4493 5736	Pt Allotment 176 Rangitaiki Psh Blks Iv V Awaateatua SD	True left bank of Rangitāiki River
Rock rip-rap (TAR01RR1)	Erosion protection	V15 4336 6098	CMA	True right bank of Tarawera River
Pump station (TAR04PS1)	Drainage	V15 4336 6065	CMA Allots 107 108 109 110 Rangitaiki Psh Blks Iii Iv V Vi Awaateatua Sd	
Flap-gate (TAR04FG1)	Drainage	V15 4336 6064	CMA Allots 107 108 109 110 Rangitaiki Psh Blks Iii Iv V Vi Awaateatua Sd	



Type (asset code)	Use	Map reference	Legal descriptions	Location
Rock rip-rap (TAR05RR1)	Erosion protection	V15 4326 6069 to V15 4318 6045	CMA Pt Allots 108a 345 & Clsd Rd Matata Psh Blks Iii Vi Awaateatua Sd -Awaiti Development Block	
Rock rip-rap (TAL01RR1)	Erosion protection	V15 4328 6104 to V15 4323 6093	CMA Pt Sec 6 Blk Vi Awaateatua S D - Wildlife Res-	True left bank of Tarawera River
Rock rip-rap (TAL02RR1)	Erosion protection	V15 4322 6092 to V15 4322 6091		
Rock rip-rap (TAL05RR1)	Erosion protection	V15 4320 6065 to V15 4314 6046	CMA Pt Allots 108a 345 & Clsd Rd Matata Psh Blks Iii Vi Awaateatua Sd -Awaiti Development Block	

Table 23 Coastal related permits – Kaituna Coastal Permit, 65213, term 35 years (to 31/08/43)

Type (asset code)	Use	Map reference	Legal descriptions	Location
Kaituna mole (KAR00TM1)	Erosion protection	V14 1115 7814	CMA Secs 6 7 So 46938 Pt Sec 1 So 38964 Blk Vi Te Tumu Sd - Lp & Rec Res	True right bank of Kaituna River
Rock rip-rap (KAR01RR1)	Erosion protection	V14 1115 7814 to V14 1097 7736		
Flood-gate (KARXXFL5)	Discharge floodwater	V 14 1092 7726		
Flood-gate (KARXXFL6)	Discharge floodwater			
Flap-gate (KARXXFG1)	Discharge stormwater			
Culvert (KARXXCV1)	Discharge stormwater			
Culvert (KARXXCV2)	Discharge stormwater			
Rock rip-rap (KAR07RR1)	Erosion protection	V14 1066 7767 to V14 1061 7767	CMA Secs 6 7 So 46938 Pt Sec 1 So 38964 Blk Vi Te Tumu Sd - Lp & Rec Res Pt Sec 3 So 25204 Blk Vi Te Te Tumu Sd - Bal At 6623/003/07	
Rock rip-rap (KAR03RR1)	Erosion protection	V14 1087 7787 to V14 1092 7793	CMA Pt Sec 3 Blk Vi Te Tumu Sd	True left bank of Kaituna River
Rock rip-rap (MARXXRR1)	Erosion protection	V14 1351 7587 to V14 1096 7729	CMA Pt Sec 1 Blk Vi Te Tumu Sd Sec 2 So 12541 Sec 19 So 12521b Tumu Kaituna 10b Pt 9b MI 1916 Blk Iv Maketu Whakapoukorero Pt 3b Block MI 11450 Blk Iv Maketu Sd Whakapoukorero 5a & 5b2 Lot 2 Dps 68882 Blk Iv Maketu Sd Sec 17 Blk Iv Maketu Sd	True right side of Maketū Estuary
Flap-gate (MARXXFG1)	Discharge stormwater	V14 1291 7643	CMA	

Type (asset code)	Use	Map reference	Legal descriptions	Location
Flap-gate (MARXXFG5)	Discharge stormwater	V14 1127 7732	CMA Pt Sec 1 Blk Vi Te Tumu Sd	
Flap-gate (MARXXFG4)	Discharge stormwater	V 14 1157 7729		
Flap-gate (MARXXFG3)	Discharge stormwater	V14 1189 7708	CMA Sec 2 So 12541 Sec 19 So 12521b Tumu Kaituna 10b Pt 9b MI 1916 Blk Iv Maketu	
Flap-gate (MARXXFG2)	Discharge stormwater	V14 1210 7671		
Culvert (MARXXCV1)	Discharge stormwater	V14 1242 7645		
Flap-gate (MARXXFG6)	Discharge stormwater	V14 1353 7586	CMA Whakapoukorero Pt 3b Block MI 11450 Blk Iv Maketu Sd	
Flap-gate/culverts (MARXXCV2)	Discharge stormwater			
Flap-gate (MARXXFG7)	Discharge stormwater			

## Land use consents

Bay of Plenty Regional Council and the relevant district councils both issue land use consents. Bay of Plenty Regional Council has requirements in the Regional Plan for:

- ▶ Land disturbance: earthworks and vegetation clearance

The following activities in watercourses:

- ▶ Using, placing, altering or removing any structures
- ▶ Disturbing the bed, including the excavation of gravel
- ▶ Planting
- ▶ Reclaiming or draining part of the bed

District councils address sub-division and geo-technical aspects of earthworks, including matters relating to the Building Act, land use, and such matters as landscape, natural character, amenity values, and protection of heritage sites. Construction of buildings such pump stations generally require land use consent from a district council.

Land use consents have been obtained where works are required to the river and land drainage assets. These include works such as excavations, stop bank protection construction, disturbance or structures in a riverbed, channel realignment and bank protection works.

As both a consent holder and consenting authority, Bay of Plenty Regional Council is responsible for ensuring compliance with the conditions of the consent, and also for monitoring whether the conditions of any self-issued consents have been met. The conditions are generally those required to mitigate the effects of the works. Many conditions are only relevant at the time the works are being undertaken, however some may require ongoing monitoring.

Conditions of consent may include sediment control measures and reinstatement requirements.

## Water permits

Section 14 of the RMA requires consent for damming, diverting, taking or using natural water. Instances may include land drainage, construction of structures in a channel, channel realignment, damming or diversion of flow and bank protection works. Water permits are issued by Bay of Plenty Regional Council and may be relevant to both the construction and operation phase of assets.

As both a consent holder and consenting authority, Bay of Plenty Regional Council is responsible for ensuring compliance with the conditions of its consents, and also for monitoring whether the conditions have been met.

Conditions are generally those required to mitigate downstream effects such as:

- ▶ Flooding
- ▶ Security of water supply and quality for downstream users
- ▶ Ecological effects from disturbance and flow regime changes
- ▶ Erosion

## Discharge consents

Discharge consents are required for discharges to water or land and are issued by Bay of Plenty Regional Council. The consents that have been obtained include discharges from land drainage schemes.

These consents contain a number of conditions relating to monitoring of the discharge. These conditions include:

- ▶ Conditions restricting the rate of the discharge.
- ▶ Monitoring of the pH and flow of the receiving river at the time of discharge.
- ▶ Requirement to keep a record of the rate, volume, duration, date, time of the discharge and the pH and flow of the river.
- ▶ Requirement for a monitoring manual or programme to be prepared.
- ▶ Requirement for an annual report summarising monitoring.

## Strategies

A number of strategies are currently in place for a number of schemes, these include:

- ▶ WO FMS (period 2001-2008)
- ▶ WW FMS (period 2003-2008)
- ▶ RT FMS (period 2007-ongoing)

Kaituna FMS (planned to commence in 2010).

## Potential issues

There are a number of adverse environmental effects that can occur in the process of undertaking the rivers and drainage activity. These are mainly related to development, particularly major construction projects and the impacts associated with discharges. The information provided below outlines some of these issues.

### Water quantity effects

The quantity of water in a water body has a direct bearing on a water body's ecosystem, its potential to flood, its use for a wide variety of purposes including recreational activities, and its ability to assimilate contamination. The main concerns with regard to water quantity in rivers and lakes are increased flooding due to climate change and/or land use changes.

#### Mitigation Measures

The following mitigation measures can be considered when taking into account water quantity:

- ▶ Monitoring flow and water levels;
- ▶ Taking account of climate change in forecast of catchment flow and water level;
- ▶ Monitoring land use changes and evaluation their effects on catchment flow and water levels; and
- ▶ Making any new development that increases the runoff from its sites wholly responsible for mitigating its effects (including peak flow and volume).

### Water quality effects

Sediment from urban and rural land clearing, contaminants from roads and stormwater discharges combines with runoff that is suspended in water can have significant impacts on the flora and fauna living within the receiving environment. Apart from increased turbidity, water quality can also be affected by increased loads of nutrients and other contaminants attached to the sediment particles.

The key to safeguarding environmental and human health in the foreseeable future is through implementation of monitoring, regulations and education. Bay of Plenty Regional Council in conjunction with local authorities, currently monitors stormwater around the district and will continue into the future to ensure compliance with legislation and to safeguard the environment as far as practicable against adverse effects. In addition, new development will need to meet or exceed Council or other approved guidelines in place to assist in the monitoring of the effectiveness of developmental controls (i.e. detention ponds, sediment ponds, artificial wetlands and stormwater control). This will ensure sediment will have no more than minor effects on receiving waters. Council approved documents associated with water quality treatment are:

- ▶ Hydrological and hydraulic guidelines
- ▶ Auckland Regional Council's Technical Publication 10

### **Mitigation measures**

The following mitigation measures may be considered in the control of discharges:

- ▶ Evaluate receiving waters to determine background water quality.
- ▶ Monitoring of the mixing zone.
- ▶ Investigate options to treat stormwater.
- ▶ Retention dams, swales, and rain gardens, which may remove contaminants and suspended material. Any number of operations can be evaluated prior to consent approvals.

### **Sediment runoff**

Sediment runoff from development works is generally controlled via sediment control techniques. Sediment from exposed areas of land can enter waterways, streams and rivers, potentially causing adverse effects to fauna and flora.

Council approved documents associated with management of sediment runoff are:

- ▶ Erosion and Sediment Control Guidelines for Land Disturbing Activities; and
- ▶ Erosion and Sediment Control Guidelines for Forestry Operations.

### **Mitigation measures**

The following mitigation measures may be considered in the control of sediment runoff:

- ▶ Undertaking maintenance works in accordance with Environmental Code of Practice for River and Drainage Maintenance activities;
- ▶ Undertaking works in accordance with Earthworks Erosion and Sediment Control Guidelines; and
- ▶ Undertaking agreed extraction activities in accordance with River Gravel Management Guidelines.

### **Landscape values**

Rivers and drainage assets have the potential to impact on the landscape values of coastal, river and lake environments where structures may not be considered sympathetic to the natural character of the surrounding environment. Clearing of waterways and riparian planting have the potential to contribute positively to the visual amenity of an area in addition to increasing the capacity of the assets and to minimise the potential effects of flooding.

### **Mitigation measures**

The following mitigation measures can be considered when taking into account landscape values:

- ▶ Community consultation
- ▶ Sympathetic design to add to minimise visual impacts

### **Ecological effects**

River water quality can be impacted upon by stormwater as it collects contaminants from surfaces it flows over or land it flows through collecting pollutants and sediment. Ecosystems are particularly vulnerable to increases in toxicity, heavy metals or nutrients entering the water. The potential adverse ecological effects may include:

- ▶ Groundwater and soil contamination
- ▶ Suspended sediment in water reducing water quality and clarity
- ▶ Ecosystem and habitat changes
- ▶ Deoxygenation of waterways
- ▶ Eutrophication (nutrient enrichment)
- ▶ Bioaccumulation (accumulation of contaminants in flora and fauna)

### **Mitigation measures**

- ▶ Monitoring including indicator species
- ▶ Management of flow velocity and quality through engineering and landscape management

### **Cultural heritage**

Water is of particular significance to Maori as it is considered as the source of life and sustenance. Therefore maintaining water quality in the best possible condition, so that a river or lake and its ecosystems are healthy, is an issue of major concern for many Maori. Whilst the management of cultural heritage maybe considered it is nonetheless an important factor to take into account.

## Mitigation measures

The following mitigation measures may be considered when taking into account cultural heritage values or sites:

- ▶ Consultation with key stakeholders including Māori
- ▶ Development of protocols
- ▶ Due diligence prior to development

## Climate change

The International Panel on Climate Change (IPCC) best mid-range estimate of sea-level rise has been adopted in the Bay of Plenty Regional Coastal Environment Plan (the IPCC mid-range scenario (IS92a) estimate of 0.49 metres by the year 2100).

A recent review of the effect of climate change on the Bay of Plenty coastline (NIWA 2006) confirms that climatic variation can influence storm intensity, wave conditions sediment supply and erosion. Future changes in climate will alter these processes in the coastal environment, but in many instances there needs to be more data to accurately assess impacts. This also applies to sea level rise, which has been rising at a historical rate of around 1.8 mm/year.

Until more information becomes available on rates of vertical land movement throughout the Bay of Plenty and any acceleration that could occur with global climate change, then accurate local impact assessment is not possible. In the meantime the current global estimate is considered appropriate and it is recommended that for planning purposes an allowance of 0.5 m for 2100 is used (as currently adopted by the plan) (Bay of Plenty Regional Council website). However, with future development works climate change will need to be taken into account with the increased frequency and intensity of storm events. Bay of Plenty Regional Council are currently reviewing the potential impacts of climate change following the release of the IPCC Assessment Report 4 (2007) and also MFE Guidance on Assessing the Impact of Climate Change for the Bay of Plenty region and are determining the policy for the provision of climate change in the region's rivers and drainage schemes.

The MFE has published a number of guidance and information documents on climate change aimed at supporting and assisting local, regional and central government. Key publications include:

- ▶ *Climate Change Adaptation and Second Generation RMA Plans* (Sept 2008).
- ▶ *Coastal Hazards and Climate Change: A Guidance Manual for Local Government in New Zealand* (July 2008).
- ▶ *Preparing for Climate Change: A Guide for Local Government in New Zealand* (July 2008).
- ▶ *Climate Change Effects and Impacts Assessment: A Guidance Manual for Local Government New Zealand* (May 2008).

## Mitigation measures

The following mitigation measures may be considered when taking into account climate change:

- ▶ Have regard to projections during planning phases (e.g. for augmentation of infrastructure and also determining ongoing capacity of assets).
- ▶ Maintenance activities to maintain current asset capacities.
- ▶ Cognisance of areas located as being potential hazard zones.
- ▶ Specialist advice.
- ▶ Capacity modelling of rivers to incorporate future climate change scenarios.

## Hazards

The Bay of Plenty region is exposed to a number of natural hazards. From an activity point of view hazards have the potential to cause major disruption and damage and therefore need to be taken into account.

Key impacts that are relevant to the rivers and drainage activity have been outlined below.

## Flooding

Flooding is a commonly occurring major natural hazard that results when the natural and modified drainage systems fail in a particular rainfall event. The risk of flooding is influenced by a number of factors such as:

- ▶ Weather systems (intensity, low pressure, duration)
- ▶ Hydrological factors (catchment size, rainfall intensity and infiltration)
- ▶ Hydraulic factors

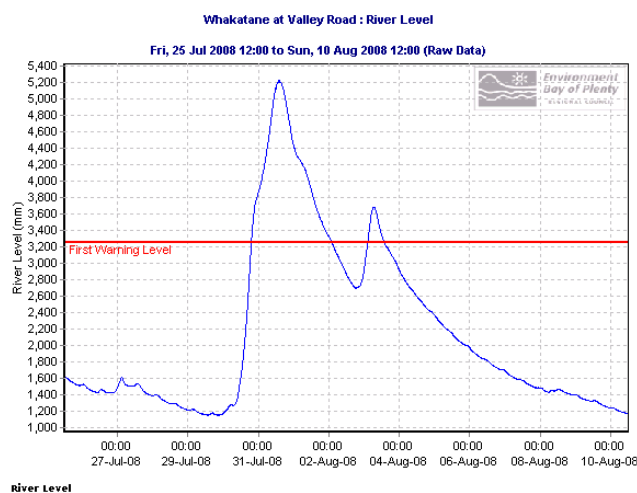


- Soil type
- Land use
- Ground saturation

Storm events and the resulting flooding can result in significant adverse effects on both residents and the environment. These effects may include:

- Personal injury or loss of life, property and possessions or livelihood.
- Disruption of utilities and transportation networks.
- Impacts on the environment may include vegetation and habitat loss, erosion and sedimentation in waterways, and soil and water contamination.

Bay of Plenty Regional Council undertake ongoing monitoring of river levels and river flows and has alarms in place to identify rivers at risk of flooding. An example of this monitoring information is shown below for the Waimana River.



The Bay of Plenty region was affected by severe flooding in 2004 and 2005. Mitigation works are currently underway for many of the affected communities including Matata and Edgumbe.

During the July 2004 event, flood waters covered much of the Rangitaiki Plains and part of the Whakatane township. Work was undertaken to repair the consequential damage to stopbanks, streams and rivers throughout the region.

In 2005, Matata and Tauranga were particularly badly hit by extreme storms. Works are still ongoing in conjunction with Whakatane District Council to mitigate against potential future events. The following photograph provides an indication of the extent debris flows and resultant damage in Matata.



*Photo courtesy of Whakatāne Beacon.*

Flood management was traditionally based around river controls, this has changed now to incorporate softer non asset solutions such as floodplain management, education and development restrictions in floodplain areas.

Bay of Plenty Regional Council is developing floodplain management strategies for its major floodplains and these will incorporate traditional measures in combination with flood warnings and flood hazard awareness and preparedness.

Additional measures that can be incorporated to help mitigate against flooding include:

- ▶ Catchment land use management
- ▶ River gravel extraction to increase capacity
- ▶ Modelling to determine capacity, sediment deposition and maintenance strategies

## Earthquakes

New Zealand is considered amongst the most seismically active places on earth as it is located on an active boundary of two tectonic plates.

The Bay of Plenty is a zone of active tectonics with earthquakes occurring on a regular basis although most are not strong enough to be felt. However the region has experienced significant earthquakes in the past that have resulted in widespread damage and serious injury such as the Edgecumbe Earthquake in 1987.

The average return interval for moderate to strong ground shaking for all major communities in the region is less than 50 years.

## Volcanic eruption

The Bay of Plenty region is located in a highly important area of volcanic activity, the Okataina Volcanic Centre. Southwest of the Bay of Plenty is the Taupo Volcanic Centre, this links with Mount Ruapehu and Mount Tongairiro, active volcanoes in the central plateau. The zone from Mount Ruapehu in the south to White Island in the east incorporates the Taupo Volcanic zone and this runs through the centre of the Bay of Plenty region.

On average, major eruptions from the Okataina Volcanic Centre occur every 2,000 years. A major recent event from this volcanic centre was the 1886 Mount Tarawera eruption.

Recent activity in the Taupo Volcanic Zone includes several eruptions from Mount Ruapehu over the last decade. In addition White Island is in close proximity to the region and could potentially result in a tsunami if it erupted.

## Tsunamis

There have been eleven recorded tsunamis in the Bay of Plenty region since 1840 and they have not generally been considered a major threat to the region. Further research has highlighted the fact that tsunami risk to the region may be greater than initially thought.

There have been two major regional and four localised paleo-tsunami events recorded over the last 4,000 years. All of these have been equal or greater than the five-metre resolution level that is required for detection in the paleo record.

Some potential sources for tsunamis in the Bay of Plenty region can be categorised as follows:

- ▶ Local volcanic eruption (e.g. Mayor Island or White Island, or fault movement within the offshore Taupo Volcanic Zone).
- ▶ Regional origin, such as a landslide in the Hikurangi Trough.
- ▶ Distant origin, for example an earthquake in South America.
- ▶ The local Bay of Plenty Civil Defence and Emergency Management (CDEM) Group works alongside Bay of Plenty Regional Council and local authorities and emergency services to determine the likely threat of a tsunami in the region and also the response required to minimise impacts and also to prepare the community for such an event.

## Future requirements

The main item that needs to be addressed from an Environmental Stewardship perspective will be how Bay of Plenty Regional Council addresses climate change and how it manages the non-asset solution side of the rivers and drainage activity to minimise potential impacts on the environment.

Understanding the current capacity of the rivers and drainage assets and the existing risks, particularly around flooding and resultant damage, will need to be investigated further to be fully understood.

Ongoing interaction with local authorities to identify hazard risks on floodplains, establish habitable floor levels, and the protection of public and to ensure environmental health and safety are key. In addition to this, a constant monitoring of natural hazards and their impacts will need to be ongoing.



# Risk management

## Overview

This asset specific risk management planning for Bay of Plenty Regional Council will provide the basis for future risk analysis and improvement planning.

This section covers the risk management implemented by Bay of Plenty Regional Council and how these apply to the current and future activities. In addition, an overview of risk management is provided along with suggested improvements to current practices.

The objective of risk management is to identify the specific business risks, together with any possible risks to the health and safety of employees, other contractors and the general public, associated with the ownership and management of the assets. This can be used to determine the direct and indirect costs associated with these risks, and form a priority-based action plan to address them.

## Putting the risks into perspective

Council policy and operation cannot influence all the factors contributing to these events. Bay of Plenty Regional Council has a responsibility to assess the risks in order to best manage the assets with the resources available to avoid and mitigate the effects of any event.

In addition, Bay of Plenty Regional Council has highlighted a number of key risk areas across the activity including:

- ▶ *General:* Unexpected asset depreciation (cost escalations to maintain level of service)
- ▶ *Rivers and drainage:* Increased frequency and/or size of adverse weather effects
- ▶ *Rivers and drainage:* Rise in sea level and storm surges
- ▶ *Rivers and drainage:* Stopbank deterioration, weakness and failure

These are discussed in further detail in the Risk Registers and the overall Action Plan contained in this section of the AMP.

## Level of risk

The purpose of this risk plan is to identify the risks associated with the activity and assets. This requires approaching the risks from many perspectives including financial, operational, organisational and public health and safety.

These risks are pertinent to both a higher, corporate level, and to a more detailed asset - specific level, but do not substitute for more specific risk analysis at those levels (see diagram).

The next step beyond this risk analysis is to develop more detailed risk plans where the criticality of specific assets is assessed and an action plan developed as appropriate.

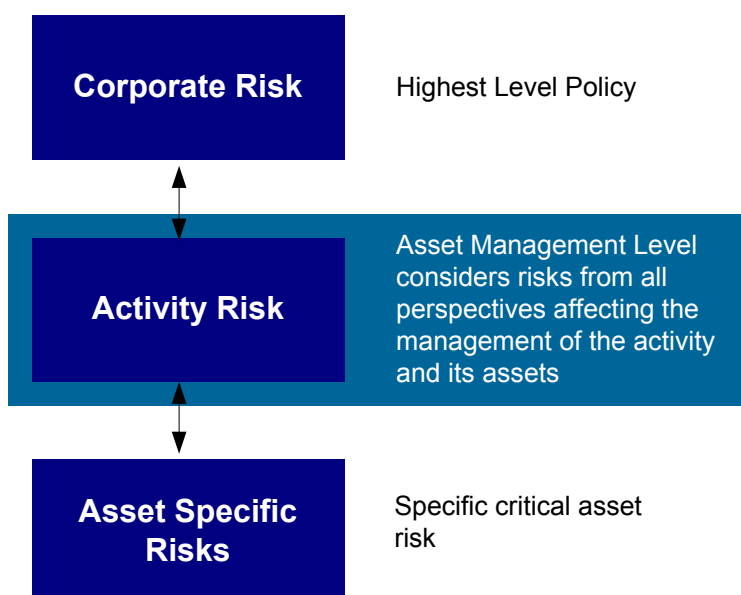


Figure 45 Organisation levels of risk

## Current situation

### Corporate policy

Bay of Plenty Regional Council has introduced risk management initiatives across the organisation, but do not have an adopted risk framework for the assessment of risk consequences and a risk priority treatment matrix. Accordingly, the risk criteria and matrices have been proposed as the basis for risk evaluation in this section developed from the NZS 4360 National Risk Management Standard.

### Risk management process

The following flowchart and text details the key elements of the risk management process undertaken.

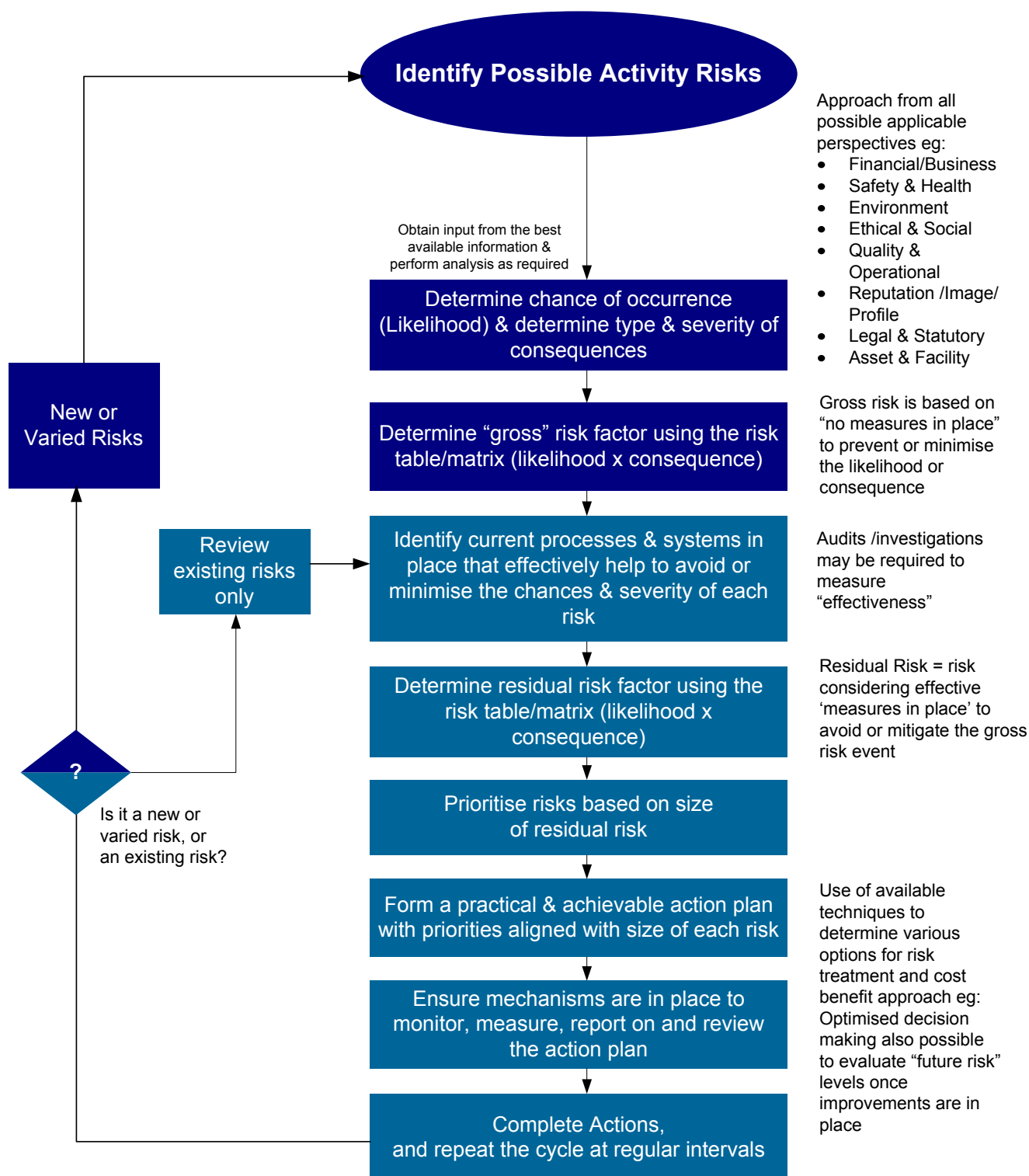


Figure 46 Risk management process



The following sections expand upon the risk management process as identified in the flowchart (previous page). The risk assessment process has been generally based upon the Australian New Zealand Risk Management Standard 4360:2004 to establish a Risk Matrix as shown in Table 26. This Matrix provides a tool to quantify a risk by identifying the likelihood of the risk occurring and the outcomes, or consequences should the risk occur.

## Identify possible activity risks

All possible risks affecting the asset activity need to be identified. Risks can include financial, environmental, social, operational and health and safety considerations. Once identified, risks are entered into the Risk Register (see Table 28 and Table 29). The Register is used to record and summarise each risk and to outline current mitigation measures and potential future management options.

## Determine likelihood and consequence for gross risk factor

Table 24 and Table 25 demonstrate the scales used to determine the likelihood and consequence levels, which are input into the risk calculation to consider the effect of a risk event.

The likelihood of occurrence and severity of consequences should be based on as much real data as possible, for example local knowledge or recorded events such as maintenance records, weather events etc. Some analysis may be required for verification.

The likelihood scales identify how likely, or often, a particular event is expected to occur, these are shown in the table below.

Table 24 Likelihood occurrence

Likelihood	Descriptor	Probability
Frequent	Continuous or will happen frequently Major Risk: Will most certainly occur in the foreseeable future	5
Often	5 – 12 times per year Major Risk: Will possibly occur in the foreseeable future	4
Likely	1 – 5 times per year Major Risk : There is always a chance it will occur in the foreseeable future	3
Possible	Once every 2 to 5 years Major Risk: There is little chance of occurrence in the foreseeable future	2
Rare	Less than once every five years Major Risk: Occurrence is unlikely in the foreseeable future	1

The consequence descriptors in Table 25 indicate the level of possible consequences for a risk.

Table 25 Consequence rating

Consequence	Descriptor	Score
Catastrophic	Loss of life, major financial loss, prolonged national media and political attention	5
Major	Major financial impact, widespread damage, serious harm, national media	4
Moderate	Moderate financial impact, potential litigation, loss of image, regional media	3
Minor	Minor financial impact, involves management time	2
Insignificant	Negligible effects	1

After the likelihood and consequence factors have been determined, the level of risk is calculated by multiplying the Likelihood of Occurrence (Table 24) and Consequence Rating (Table 25) together. **Risk = the likelihood of an event occurring x the consequence of such an event.**

The final outcome is a risk rating. The risk rating enables definition between those risks that are significant and those that are of a lesser nature. Having established the comparative risk level applicable to individual risks, it is possible to rank those risks. Four risk categories have been used: Extreme, High, Moderate, and Low (see Table 26 and Table 27).

Table 26 Risk assessment matrix

Likelihood	Consequence				
	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Frequent (5)	5	10	15	20	25
Often (4)	4	8	12	16	20
Likely (3)	3	6	9	12	15
Possible (2)	2	4	6	8	10
Rare(1)	1	2	3	4	5

Once the impact has been ranked according to the relative risk level it poses, it is then possible to target the treatment of the risk exposure, by beginning with the highest risks and identifying the potential mitigation measures.

Table 27 Comparative levels of risk

12-25	Extreme risk	Requires immediate remedial action.
8-12	High risk	Requires remedial planning and action via the AMP.
4-6	Moderate risk	Address via new procedures and/or modification of existing practices and training.
1-3	Low risk	No formal requirement for further action, unless escalation of risk is possible.

Initially, the gross risk needs to be calculated, so likelihood and consequences need to be considered as if there were no measures in place to prevent or mitigate the risk occurrence. Essentially gross risk is an exercise to determine "What is the worst that could happen?" Once the gross risk is determined it is possible to investigate the current systems and processes to identify the residual risk and then formulate an action plan to further reduce the likelihood or consequences of identified risks occurring.

## Identify current systems and processes, and their effectiveness

Current systems and processes are identified, and as far as resources allow, their effectiveness measured. It is often practical to identify these processes and systems initially, and rank the effectiveness conservatively until the audits and actual practice prove otherwise. Audits can be identified as part of the improvement process.

Effectiveness of existing systems and processes is expressed in the following categories:

Excellent	Fulfils requirements thoroughly, very robust and positive measurable effects.
Good	Fulfils requirements, robust and measurable, room for improvement.
Fair	Barely fulfils requirements, effects hard to measure (or haven't been audited or measured), improvement required.
Poor	Not fulfilling requirements, little measurement or effect on overall risk.
Very Poor	Totally ineffective in avoiding or mitigating associated risk events.

## Determine residual risk

The residual risk is the actual risk that exists considering the effective measures implemented. The measures in place reduce either, or both, the consequence and the likelihood of a risk occurrence. The revised factors are input into the same Risk Matrix to obtain the Residual Risk Factor.

## Prioritise residual risks and formulate action plan for risk management

A priority order of issues to be addressed is obtained by sorting Residual Risk Factors by risk level. The most suitable actions are determined considering available options and resources. The costs and benefits of these actions need to be analysed. The best available techniques are required to analyse the options e.g. optimised decision-making (ODM).

Application of ODM applies a 'value chain' to the proposed actions rather than just working from the highest risk down regardless of cost, for example:

- ▶ *A high risk may have to remain due to the inhibitive costs associated with avoidance or mitigation.*
- ▶ *A medium risk event could be easily and cost-effectively avoided within resources available.*

From an asset management perspective, the options for mitigating risks considered to reduce the cause, probability or impact of failure, are typically:

Do nothing	Accept the risk
<b>Management strategies</b>	Implement enhanced strategies for demand management, contingency planning, quality processes, staff training, data analysis and reporting, reduce the target service standard, etc.
<b>Operational strategies</b>	Actions to reduce peak demand or stresses on the asset, operator training, documentation of operational procedures, etc.
<b>Maintenance strategies</b>	Modify the maintenance regime to make the asset more reliable or to extend its life.
<b>Asset renewal strategies</b>	Rehabilitation or replace assets to maintain service levels.
<b>Development strategies</b>	Investment to create a new asset or augment an existing asset.
<b>Asset disposal/ rationalisation</b>	Divestment of assets surplus to needs because a service is determined to be a non-core activity or assets can be reconfigured to better meet needs.

## Monitor, measure, report, review plan and actions

The management structure needs to be in place to ensure that actions are monitored, reported on and reviewed regularly. It is important to identify and constantly review the following:

<b>Responsibility</b>	Nominated person responsible for ensuring the risks are managed and improvements carried out in accordance with the programme.
<b>Best appropriate practice</b>	The practices that should ideally be carried out to manage risks to an acceptable level.
<b>Audit trail</b>	Date of entries and revisions, target date for actions to be taken and actual task completion dates.

In addition, management options should be ranked via benefit/cost analysis using Net Present Value (NPV) calculations. The inputs considered in the NPV calculation are:

- ▶ Capital investment costs
- ▶ Changes in business risk exposure (BRE)
- ▶ Increase in effective asset life/value
- ▶ Increase in level of service

All capital development projects should be ranked corporately for inclusion in the TYP/Annual Plan consultation process using benefit/cost analysis plus the following additional criteria:

- ▶ Contribution to Council's strategic plan objectives
- ▶ Contribution to the region's business objectives
- ▶ Level of project commitment (contractual and legal issues)

The resulting action plan for risk treatment needs to be practical and achievable such that the necessary resources and time frames are realistically met. The actions also need to be able to be monitored and measured. Table 28 provides more detail with regard to future actions/tasks required for future stages of risk management, which include the ranking outlined above.

## **Review risks**

Most of the time, the risks identified will remain the same and reviews will occur in the context of these risks. However, it will be important to recognise when a new risk arises, or an existing risk changes in nature. In the latter case, the gross risk also needs to be re-evaluated.

## Risk Register

The risk registers provided in the following tables for the current and future rivers and drainage activities of the Bay of Plenty Regional Council have been developed in consultation with key staff.

Table 28 Asset management risks – general

Risk factor	Risk descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk type	Gross Risk (no effective measure in place)			Current practice/strategy (avoidance and mitigation measures)		Residual risk (considering measures in place)			Person(s) responsible	Management options
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
DR01	<b>Lack of internal resources</b> – the ability to attract key staff and or retain skilled staff. High workload vs lifestyle.	Organisational	3	5	15	<ul style="list-style-type: none"> <li>▶ Career development programme and training.</li> <li>▶ City/district promotion (lifestyle).</li> <li>▶ Dedicated HR staff/recruitment consultancies.</li> <li>▶ Staff handover/exit process – HR processes.</li> <li>▶ Recruitment standards.</li> <li>▶ Benchmarked salary levels/remuneration review.</li> <li>▶ Annual staff satisfaction surveys – best places to work.</li> <li>▶ Promoting positive work environment – social, team building.</li> <li>▶ Good office accommodation/layout.</li> <li>▶ Policies (e.g. EEO, Stress Management, Personnel).</li> <li>▶ Flexible working hours.</li> <li>▶ Good organisational structure.</li> <li>▶ Succession planning.</li> </ul>	Good	2	4	8	<ul style="list-style-type: none"> <li>▶ Group Manager People &amp; Partnerships (GM P&amp;P)</li> <li>▶ Group Manager Rivers &amp; Drainage (GM RD)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Continue current practice and review flexibility within individual contracts and working hours. Family/lifestyle friendly policies.</li> <li>▶ Review and monitor work levels of staff.</li> <li>▶ Instigate cadetship programme in conjunction with wider industry.</li> <li>▶ Review and improve succession planning.</li> <li>▶ Improve team approach, back up roles.</li> </ul>
DR02	<b>Loss of knowledge</b> – inability to retain knowledge or have sufficient systems in place to manage data/information, especially regarding asset performance and condition. Loss of institutional knowledge. IT failure.	Organisational	3	3	9	<ul style="list-style-type: none"> <li>▶ Processes and practices – guidelines to be followed e.g. Easyinfo. Established robust filing system.</li> <li>▶ Team of competent, trained staff, development into roles.</li> <li>▶ IT practices (backup, virus, security etc).</li> <li>▶ Asset changes/updating process – developing AMIS (GIS/Finance One).</li> <li>▶ Programmed condition surveys undertaken on some assets.</li> <li>▶ Best practice manuals e.g. NAMS, hydraulic guidelines, BOPRC environmental code of practice.</li> <li>▶ NZ Standards e.g. building code.</li> <li>▶ Contracts Manual.</li> <li>▶ Responsibilities defined.</li> </ul>	Good	2	2	4	<ul style="list-style-type: none"> <li>▶ GM P&amp;P</li> <li>▶ GM R&amp;D</li> <li>▶ Group Manager Technology and Science (GM T&amp;S)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Continue development of integrated AMIS in-house.</li> <li>▶ Develop processes to ensure that asset knowledge is transferred, stored and accessible and audited (externally), including maintenance information. Define mentors/coaches and successors.</li> <li>▶ Ongoing training for staff.</li> </ul>
DR03	<b>Inadequate project management</b> – projects inadequately scoped, budgeted, managed, documented, and reviewed, inadequate consultation with owners, resource consent issues etc resulting in time and cost, loss of image and other impacts.	Operational	4	5	20	<ul style="list-style-type: none"> <li>▶ Project management training for key staff.</li> <li>▶ Annual Plan/TYP process.</li> <li>▶ Use of trained/competent external resource.</li> <li>▶ Some life of asset calculations.</li> <li>▶ Appropriate resource (e.g. software/information systems).</li> <li>▶ Strategies and plans dictate project requirements.</li> </ul>	Good	3	2	6	<ul style="list-style-type: none"> <li>▶ GM R&amp;D</li> <li>▶ Operations Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Increase level of internal project management training for key staff. PMBOK.</li> <li>▶ Maintain and improve stakeholder consultation.</li> <li>▶ Standardise and document project management processes (organisation wide) e.g. project reviews and debriefing.</li> <li>▶ Optimised decision-making. More consistent life of asset calculations. Consider use of multi-criteria analysis.</li> </ul>
DR04	<b>Inadequate contract management (service/maintenance/capital)</b> – resulting in unnecessary or excessive costs and/or insufficient output or quality. Poor contractor performance.	Operational	3	5	15	<ul style="list-style-type: none"> <li>▶ Contract tendering process in place.</li> <li>▶ Contract conditions (KPI's, penalties).</li> <li>▶ Financial reporting/cost monitoring.</li> <li>▶ Contract procedures manual, contract penalties, contractor evaluations, quick response to failures.</li> <li>▶ Adequately trained staff or external resource.</li> <li>▶ Contract administrator.</li> <li>▶ Quality auditing.</li> <li>▶ Approved design and specification prior to letting contracts.</li> </ul>	Good	2	2	4	<ul style="list-style-type: none"> <li>▶ GM R&amp;D</li> <li>▶ Operations Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Continue current practice.</li> <li>▶ Improve auditing and reporting through term of the contract.</li> <li>▶ Continue to improve training for appropriate staff on contract management.</li> <li>▶ Review and revise contract procedures manual as required.</li> <li>▶ Project reviews and debriefing.</li> <li>▶ Improved financial reporting/cost monitoring.</li> </ul>



Risk factor	Risk descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk type	Gross Risk (no effective measure in place)			Current practice/strategy (avoidance and mitigation measures)			Residual risk (considering measures in place)			Person(s) responsible	Management options
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor			
DR05	<b>Inadequate asset management</b> – not up to date, or insufficiently quality of process and output.	Operational Legislative	4	4	16	<ul style="list-style-type: none"><li>▶ Asset management processes and practices and organisation structure.</li><li>▶ Asset management system (GIS, AMIS).</li><li>▶ Use of professional services.</li><li>▶ Adequately trained staff or external resource.</li><li>▶ Resourcing of internal services.</li><li>▶ Identifying gaps.</li><li>▶ Peer to peer information sharing on best practice.</li></ul>	Good	3	2	6	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li></ul>	<ul style="list-style-type: none"><li>▶ Achieve medium/advanced AMP status.</li><li>▶ Develop and implement improvement plans.</li><li>▶ Continuing staff development in asset management.</li><li>▶ Ongoing external review of asset management planning.</li><li>▶ Ongoing budget provision.</li><li>▶ Document asset management processes, development business rules.</li><li>▶ Update and improve AMIS/AM information systems and interfaces e.g. with GIS or financial system.</li><li>▶ Improve information flow to asset management e.g. as-built drawings, contractor audit information.</li></ul>	
DR06	<b>Inadequate condition/performance assessments</b> – reliable data for maintenance/renewals/replacements and valuations.	Operational	4	4	16	<ul style="list-style-type: none"><li>▶ Internal and external feedback, complaints/job tracker.</li><li>▶ Ongoing condition assessment programmes for selected assets.</li><li>▶ Annual audits and scheduled inspections e.g. pump stations.</li><li>▶ Asset management systems (e.g. GIS, AMIS).</li><li>▶ Use external professionals.</li></ul>	Fair	3	3	9	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li><li>▶ GM T&amp;S</li></ul>	<ul style="list-style-type: none"><li>▶ Staff training and continuity regarding assessments.</li><li>▶ Develop condition assessment programme and methodology for all assets.</li><li>▶ Develop a process to ensure that knowledge is transferred, stored and accessible. Define champions and successors. External backup.</li></ul>	
DR07	<b>Non-compliance with legislation and consent conditions</b> – inability or failure to comply with consents, statute and national standards. Increase in requirements.	Legislative	3	5	15	<ul style="list-style-type: none"><li>▶ Compliance with resource consents, RMA, LGA, District and Regional Plans and Bylaws.</li><li>▶ Contract conditions. Service contract standards.</li><li>▶ Internal audits and continuous monitoring.</li><li>▶ Dedicated Consents Manager.</li><li>▶ Some knowledge and awareness among key staff.</li><li>▶ Local government and national networking.</li><li>▶ Feedback from and liaison with councils, DoC, Historic Places Trust and Fish and Game, Iwi/hapū.</li><li>▶ Use of external advice/resources.</li><li>▶ Follow Council Environmental Code of Practice.</li><li>▶ Some auditing of works contracts (e.g. traffic management, safety, OSH).</li><li>▶ Appropriate response to incidents.</li></ul>	Good	2	2	4	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li><li>▶ GM T&amp;S</li></ul>	<ul style="list-style-type: none"><li>▶ Improve monitoring of expiring consents and identification of new consents.</li><li>▶ Better compliance through consents database and monitoring of consent requirements.</li><li>▶ Improve tools for Consents Manager.</li><li>▶ Allocate adequate budget for consent renewals.</li><li>▶ Identify upfront what resource consents are required and develop a framework to ensure all legislative requirements are met.</li><li>▶ Key staff to keep updated on current legislation.</li><li>▶ Continue communicating effects of legislative change to Council/Annual Plan/Ten Year Plan process.</li></ul>	
DR08	<b>Slow response to known impaired service levels</b> – such as known under-capacity stopbank.	Organisational Financial Operational	4	3	12	<ul style="list-style-type: none"><li>▶ Consultation.</li><li>▶ Fit for purpose works.</li><li>▶ Prioritisation/risk assessment (ODM).</li><li>▶ Education.</li><li>▶ Flood management strategies.</li></ul>	Good	3	2	6	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li></ul>	<ul style="list-style-type: none"><li>▶ Communication of prioritised response.</li></ul>	

Risk factor	Risk descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk type	Gross Risk (no effective measure in place)			Current practice/strategy (avoidance and mitigation measures)			Residual risk (considering measures in place)			Person(s) responsible	Management options
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor			
DR09	<b>Moderate natural hazard damage</b> – (slips/flooding/coastal erosion/wind) causing damage to assets and or hindering development.	Public and Environmental Health Organisational	4	3	12	<ul style="list-style-type: none"><li>▶ Group Civil Defence Emergency/Management Plan.</li><li>▶ Dedicated emergency management coordinator.</li><li>▶ Hazard identification, maps and reports, monitoring, use of Geotech consultants.</li><li>▶ Complaints feedback.</li><li>▶ Equipment Agreement (with out of region resources).</li><li>▶ Resource sharing agreement between councils.</li><li>▶ National and Council Engineering Standards.</li><li>▶ Procedures for activation of resources (equipment, rooms, computers etc) for emergency response.</li><li>▶ Building code/standards.</li><li>▶ Flood Manual.</li><li>▶ Emergency management training and exercises.</li></ul>	Good	3	3	9	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li></ul>	<ul style="list-style-type: none"><li>▶ As per current practice.</li><li>▶ Liaise with regional policy makers to identify hazards and ensure emergency response mechanisms are in place in the event of a hazard occurring.</li><li>▶ Increase public awareness of residual risk.</li></ul>	
DR10	<b>Extreme natural hazards damage</b> – (earthquake/tsunami/volcanic/major storm event/over design event) causing damage to assets and or hindering development.	Environmental Public Health Organisational Financial	5	2	10	<ul style="list-style-type: none"><li>▶ Group Civil Defence Emergency/Management Plan.</li><li>▶ Dedicated emergency management coordinator.</li><li>▶ Hazard identification, maps and reports, monitoring use of Geotech consultants.</li><li>▶ Complaints feedback.</li><li>▶ Equipment Agreement (with out-of-region resources).</li><li>▶ Resource sharing agreement between councils.</li><li>▶ National and Council Engineering Standards.</li><li>▶ Building code/standards.</li><li>▶ Flood Manual.</li><li>▶ Procedures for activation of resources (equipment, rooms, computers etc) for emergency response.</li><li>▶ Lifelines Group.</li><li>▶ Emergency management training and exercises.</li></ul>	Fair	4	2	8	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li></ul>	<ul style="list-style-type: none"><li>▶ Liaise with national and regional policy makers to identify hazards and ensure emergency response mechanisms are in place in the event of a hazard occurring.</li><li>▶ Staff training, awareness of roles.</li><li>▶ Implementation of policies and Emergency Civil Defence Management Plan.</li><li>▶ Increase public awareness of residual risk.</li></ul>	
DR11	<b>Technology lapse</b> – inability to track technology, engineering developments/techniques, local and national trends and to utilise where relevant.	Organisational	3	3	9	<ul style="list-style-type: none"><li>▶ Local government networking.</li><li>▶ Staff development and training.</li><li>▶ Conference attendance.</li><li>▶ Peer to peer contact.</li><li>▶ Use of external advice/resources.</li></ul>	Good	2	2	4	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li><li>▶ GM T&amp;S</li></ul>	<ul style="list-style-type: none"><li>▶ Continue good external networking and training.</li><li>▶ IT Policy/IT roadmap.</li><li>▶ Better IT and GIS resource availability.</li><li>▶ Further staff development and training.</li></ul>	
DR12	<b>Lack of political alignment</b> – or inability of elected members to fulfil roles and responsibilities or disregard for community views. Change in the make-up of Council could alter ability to achieve long-term objectives.	Organisational Reputation/Image	3	5	15	<ul style="list-style-type: none"><li>▶ Councillors roles well defined and implemented.</li><li>▶ Legislative requirements/Ten Year Plan process.</li><li>▶ Reports to Council.</li><li>▶ Induction of new politicians (councillor induction/handbook/workshop/conferences/inter-council tours).</li><li>▶ Bulletins to councillors. One-on-one contact and forums. Councillors are made aware of who to talk to.</li><li>▶ Elected members on project teams/steering groups.</li></ul>	Good	2	3	6	<ul style="list-style-type: none"><li>▶ CE</li><li>▶ SLG</li><li>▶ GM R&amp;D</li></ul>	<ul style="list-style-type: none"><li>▶ Continued communication to Council.</li><li>▶ Manage process through CE/Strategic Leadership Group (SLG).</li></ul>	
DR13	<b>External economic influence (cost escalations)</b> – rising costs (e.g. materials, fuel), due to economic circumstances and worldwide incidents. Inability to afford maintenance and repair.	Economic Financial	3	4	12	<ul style="list-style-type: none"><li>▶ Respond to external influences as appropriate.</li><li>▶ Local government networking.</li><li>▶ Consultation with stakeholders and Council.</li><li>▶ Responding to national directives.</li><li>▶ Monitoring world events and reacting.</li><li>▶ Review existing contracts.</li><li>▶ Procurement strategies, buying locally.</li></ul>	Fair	3	4	12	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li></ul>	<ul style="list-style-type: none"><li>▶ Recycling incentives.</li><li>▶ Increase contingencies if necessary.</li><li>▶ Improve efficiencies.</li><li>▶ Investigate alternative resources.</li></ul>	

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			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor			
DR14	<b>Unexpected asset depreciation (cost escalation to maintain level of service)</b> – greater loss of service (e.g. more rapid than expected stopbank settlement). Inability to afford renewals.	Operational Financial	4	4	16	<ul style="list-style-type: none"><li>▶ Respond to cost escalation as appropriate.</li><li>▶ Prioritising works through optimised decision-making.</li><li>▶ Consultation with stakeholders and Council.</li><li>▶ Responding to national directives.</li><li>▶ Procurement strategies, buying locally, alternate sources of material.</li><li>▶ Reducing level of service.</li></ul>	Fair	4	4	16	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li></ul>	<ul style="list-style-type: none"><li>▶ Change design.</li><li>▶ Increase depreciation rates.</li><li>▶ Plan for more frequent renewal.</li><li>▶ Public education.</li><li>▶ Increasing efficiency.</li><li>▶ Rationalise spending – prioritise activities.</li></ul>	
DR15	<b>Decrease in funding</b> – both internal to pay debt, rates and including failure to acquire external subsidies.	Organisational	3	3	9	<ul style="list-style-type: none"><li>▶ Monitor other funding opportunities.</li><li>▶ Prioritising projects/Annual Plan/Ten Year Plan process.</li><li>▶ Liaising with other councils.</li><li>▶ Submitting external applications and reporting internally to Council.</li><li>▶ Contract external specialists as required.</li></ul>	Good	3	2	6	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li><li>▶ GM Finance &amp; Organisation (F&amp;O)</li></ul>	<ul style="list-style-type: none"><li>▶ Maintain and manage clear lines of communication with key external agencies.</li><li>▶ Forecast likely scenarios regarding effects of budget changes.</li><li>▶ Increasing efficiency.</li><li>▶ Rationalise spending – prioritise activities.</li></ul>	
DR16	<b>Inadequate communications and PR management</b> – e.g. a lack of communication, or information overload, being ignored, reporting only negative information, promising the undeliverable and raising expectations, coming on too strong.	Reputation/Image Safety Financial Operational	3	4	12	<ul style="list-style-type: none"><li>▶ Dedicated corporate communications team.</li><li>▶ Some timely communication to affected customers (public/ratepayers, councillors, staff, contractors).</li><li>▶ Existing corporate communications procedures and protocols (who gets what and when).</li><li>▶ Customer service interface.</li><li>▶ Include communications/customer service component in project debrief process.</li><li>▶ Access to communications tools – Web, Intranet, newsletters, bulletins.</li><li>▶ Communications Plan.</li></ul>	Good	1	3	3	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li></ul>	<ul style="list-style-type: none"><li>▶ Continue current practice.</li><li>▶ More communication/PR involvement at earlier stage of contracts/capital works/projects.</li><li>▶ Improve integration of communications across BOPRC/contractors and other councils to inform external customers.</li><li>▶ Build further customer service understanding of Council issues/projects.</li><li>▶ Increase public education and residual risk communication.</li></ul>	
D17	<b>Public health and safety incident</b> – causing injury and or damage to residents/visitors /staff or property resulting in claims and or negative publicity (e.g. poorly designed or maintained assets etc).	Public Health Reputation/Image	5	4	20	<ul style="list-style-type: none"><li>▶ Inspection, contract management, hazard identification.</li><li>▶ Complaints.</li><li>▶ Structure safety check and electrical audits.</li><li>▶ Local Council's Engineering Standards.</li><li>▶ Building code/standards/guidelines.</li><li>▶ Specialised standards (e.g. agrichemical).</li><li>▶ Condition assessments.</li><li>▶ Programmes in place to identify areas, issues, risks that may impact on assets.</li><li>▶ Fencing.</li><li>▶ Signage.</li><li>▶ Ten Year Plan consultation.</li><li>▶ ACC/Indemnity insurance.</li><li>▶ Health and safety representative.</li><li>▶ Corporate auditing of health and safety.</li><li>▶ Approved contractor health and safety plans.</li><li>▶ Emergency response.</li><li>▶ Training/staff induction/manuals/person protective equipment/Incident Register (HR).</li><li>▶ Contractor inductions.</li></ul>	Good	3	3	9	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li><li>▶ GM P&amp;P</li></ul>	<ul style="list-style-type: none"><li>▶ Review Council's Liability and Health and Safety Policy.</li><li>▶ Design standards maintained.</li><li>▶ Asset management planning.</li><li>▶ Level of service determined from community consultation (Ten Year Plan process).</li><li>▶ Local Government networking.</li><li>▶ Ensure BOPRC is carrying out appropriate renewals and managing the budget correctly.</li><li>▶ Review and develop safe working methods and practices where necessary.</li></ul>	
DR18	<b>Inadequate security</b> – inadequate security plan, lighting, community and employee safety.	Public health Reputation/Image Operational Financial	3	5	15	<ul style="list-style-type: none"><li>▶ Complaints.</li><li>▶ Respond to community concerns.</li><li>▶ Locked/fenced property and land.</li><li>▶ Restricting vehicular access.</li></ul>	Good to excellent	2	3	6	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li></ul>	<ul style="list-style-type: none"><li>▶ Incident reporting.</li><li>▶ Identify problem areas quickly and respond.</li></ul>	

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DR19	<b>Vandalism</b> – off assets (e.g. control structures)	Reputation/Image Operational Public health Financial	3	3	9	<ul style="list-style-type: none"><li>▶ Design to minimise.</li><li>▶ Custodians.</li><li>▶ Safety inspections.</li><li>▶ Prompt repair response.</li><li>▶ Monitor via telemetry.</li><li>▶ Complaints.</li><li>▶ Fencing and locking access to assets.</li><li>▶ Restrict vehicular access.</li><li>▶ Asset protection bylaws.</li><li>▶ Education and partnership.</li></ul>	Good	2	2	4	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li></ul>	<ul style="list-style-type: none"><li>▶ Continue current practice.</li><li>▶ Implement new technologies as appropriate.</li></ul>	

Table 29 Asset management risks – rivers and drainage

Risk factor	Risk descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk type	Gross Risk (no effective measure in place)			Current practice/strategy (avoidance and mitigation measures)		Residual risk (considering measures in place)			Person(s) responsible	Management options
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
DR20	<b>Increased frequency and/or size of adverse weather effects</b> – rendering flood control and drainage schemes unsustainable.	Operational Public Health and Safety Financial	5	4	20	<ul style="list-style-type: none"> <li>▶ Flood-proofing initiatives</li> <li>▶ River management and planning</li> <li>▶ Floodplain Management Strategy</li> <li>▶ Building regulations, floor levels</li> <li>▶ Flood monitoring and warning systems</li> <li>▶ Education and emergency preparedness (output to Civil Defence)</li> <li>▶ Regional River Gravel Management Plan</li> <li>▶ Civil Defence</li> <li>▶ Hydraulic modelling</li> <li>▶ Inundation studies</li> <li>▶ Flood Manual – guideline to staff (warning levels etc)</li> <li>▶ Monitoring IPCC recommendations and adopting</li> </ul>	Good	4	4	16	<ul style="list-style-type: none"> <li>▶ GM R&amp;D</li> <li>▶ Operations Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Catchment modelling (land use changes etc)</li> <li>▶ Recommend relocation and retreat of at-risk dwellings and industry</li> <li>▶ Increase awareness and education of flood hazards</li> <li>▶ Increased flood protection</li> </ul>
DR21	<b>Rise in sea level and storm surges</b> – rendering flood control and drainage schemes unsustainable	Operational Public Health and Safety Financial	5	4	20	<ul style="list-style-type: none"> <li>▶ Flood-proofing initiatives</li> <li>▶ River management and planning</li> <li>▶ Floodplain Management Strategy</li> <li>▶ Building regulations, floor levels</li> <li>▶ Flood monitoring and warning systems</li> <li>▶ Education and emergency preparedness (output to Civil Defence)</li> <li>▶ Regional River Gravel Management Plan</li> <li>▶ Civil Defence</li> <li>▶ Hydraulic modelling</li> <li>▶ Storm surge monitoring</li> <li>▶ Inundation studies</li> <li>▶ Flood Manual – guideline to staff (warning levels etc)</li> <li>▶ Monitoring IPCC recommendations and adopting</li> </ul>	Good	5	3	15	<ul style="list-style-type: none"> <li>▶ GM R&amp;D</li> <li>▶ Operations Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Dredging coastal marine areas</li> <li>▶ Recommend relocation and retreat of dwellings and industry from coastal inundation and erosion zones</li> <li>▶ Increased awareness and education of coastal flood hazards</li> </ul>
DR22	<b>Stopbank deterioration, weakness and failure</b> – (including foundation) resulting in ineffective flood control, flooding	Operational Public Health and Safety Financial Reputation/Image	5	5	25	<ul style="list-style-type: none"> <li>▶ Regular BOPRC condition reviews</li> <li>▶ Visual inspections, physical surveys</li> <li>▶ Scheme reviews, hydraulic capacity modelling</li> <li>▶ Use of internal/external specialists e.g. geotechnical</li> <li>▶ Renewal/upgrade programmes</li> <li>▶ Maintenance regime</li> <li>▶ BOPRC floodway and drainage bylaws</li> </ul>	Good	5	3	15	<ul style="list-style-type: none"> <li>▶ GM R&amp;D</li> <li>▶ Operations Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ As per current practice</li> <li>▶ Recommend relocation and retreat of dwellings and industry from flood prone areas</li> <li>▶ Increased awareness and education</li> <li>▶ Increased geotechnical investigations</li> <li>▶ Monitor improvements in geotechnical advancements</li> <li>▶ Upstream catchment management to reduce flood levels</li> </ul>
DR23	<b>Flood control gate malfunction or inadequately operated</b> – resulting in flooding of low lying areas	Operational Public Health and Safety Financial Reputation/Image	3	3	9	<ul style="list-style-type: none"> <li>▶ Regular inspections</li> <li>▶ Condition monitoring</li> <li>▶ Renewal/upgrade programmes</li> <li>▶ Maintenance regime – internal staff (dedicated custodian)</li> <li>▶ Operations manuals</li> </ul>	Good	3	2	6	<ul style="list-style-type: none"> <li>▶ GM R&amp;D</li> <li>▶ Operations Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ As per current practice</li> <li>▶ Review inspection programme</li> <li>▶ Telemetry/monitoring/alarms</li> </ul>
DR24	<b>Structure failure (concrete walls, flood control gates)</b> – resulting in failure of asset to perform and/or unexpected costs and resources	Operational Public Health and Safety Financial Reputation/Image	4	3	12	<ul style="list-style-type: none"> <li>▶ Regular inspections</li> <li>▶ Condition monitoring</li> <li>▶ Renewal/upgrade programmes</li> <li>▶ Maintenance regime – internal staff (dedicated custodian for flood control gates)</li> </ul>	Good	4	1	4	<ul style="list-style-type: none"> <li>▶ GM R&amp;D</li> <li>▶ Operations Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ As per current practice</li> <li>▶ Review inspection programme, including condition/structural assessment</li> </ul>



Risk factor	Risk descriptor – details the main component and provides an example of a risk(s) that may be attributable	Risk type	Gross Risk (no effective measure in place)			Current practice/strategy (avoidance and mitigation measures)		Residual risk (considering measures in place)			Person(s) responsible	Management options
			Consequence	Likelihood	Factor	Description	Effectiveness	Consequence	Likelihood	Factor		
DR25	<b>Pump station failure</b> – resulting in inundated areas – predominantly rural	Operational Public Health and Safety Financial Reputation/Image	3	3	9	<ul style="list-style-type: none"><li>▶ Regular inspections</li><li>▶ Condition monitoring</li><li>▶ Renewal/upgrade programmes</li><li>▶ Maintenance regime – internal staff, caretakers</li><li>▶ Emergency backup pumps, connections for generators, mobile pumps</li><li>▶ Experienced staff – ongoing training</li><li>▶ Key stations have telemetry/alarms</li><li>▶ Feedback from landowners</li></ul>	Good	2	2	4	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li></ul>	<ul style="list-style-type: none"><li>▶ As per current practice</li><li>▶ More stations with telemetry monitoring</li></ul>
DR26	<b>River bank erosion</b> – resulting in decreased flood protection, loss of land, increasing risk of breach	Operational Public Health and Safety Financial Reputation/Image	3	4	12	<ul style="list-style-type: none"><li>▶ Edge protection, vegetation, structural, rip-rap, gabion walls</li><li>▶ Buffer zones, fenced</li><li>▶ Subsidised stream care programme</li><li>▶ Renewal/upgrade programmes</li><li>▶ Maintenance regime</li><li>▶ Regular inspections</li><li>▶ Regional River Gravel Management Plan</li><li>▶ River bank trial protection works</li><li>▶ Trial native planting</li><li>▶ Willow protection research group contribution</li><li>▶ Environmental Code of Practice</li></ul>	Good	2	3	6	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li></ul>	<ul style="list-style-type: none"><li>▶ As per current practice</li><li>▶ Increased gravel removal (certain rivers)</li><li>▶ Public education (e.g. stock control)</li></ul>
DR27	<b>Failure of drains (excavated channels)</b> – silting, aquatic weed growth, blockages causing loss of land drainage capacity	Operational Public Health and Safety Financial Reputation/Image	2	5	10	<ul style="list-style-type: none"><li>▶ Maintenance regime – internal staff</li><li>▶ Regular inspections</li><li>▶ Condition monitoring</li><li>▶ Biological and mechanical weed control</li><li>▶ Renewal/upgrade programmes</li><li>▶ Hydraulic modelling</li><li>▶ Environmental Code of Practice</li></ul>	Good	2	2	4	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li></ul>	<ul style="list-style-type: none"><li>▶ As per current practice</li><li>▶ Improved drainage system as ecological habitat e.g. fish friendly flood-gate</li></ul>
DR28	<b>Effect of low bridges across canals and rivers</b> – e.g. affecting flood flows, risk of failure	Operational Public Health and Safety Financial Reputation/Image	3	4	12	<ul style="list-style-type: none"><li>▶ Hydraulic modelling</li><li>▶ Liaison/agreements with bridge owners</li><li>▶ Floodway and drainage bylaws</li><li>▶ Hydraulic guidelines and advice</li></ul>	Good	2	2	4	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li></ul>	<ul style="list-style-type: none"><li>▶ As per current practice</li></ul>
DR29	<b>Residential intensification</b> – resulting in increased need to manage extra stormwater capacity	Public Health and Safety Financial Reputation/Image	3	5	15	<ul style="list-style-type: none"><li>▶ Technical reviews of resource consent applications</li><li>▶ Submissions to district plans</li><li>▶ District applications are reviewed by experienced staff and recommendations provided</li><li>▶ General advice provided on request</li></ul>	Good	2	2	4	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li></ul>	<ul style="list-style-type: none"><li>▶ As per current practice</li><li>▶ Streamline review process (increase TLA responsibility)</li><li>▶ Education and awareness of public (e.g. website)</li></ul>
DR30	<b>International shortage of hydraulic and hydrologic design engineering expertise</b>	Operational Public Health and Safety	3	3	9	<ul style="list-style-type: none"><li>▶ Internal training</li><li>▶ Raising profile in tertiary institutions</li><li>▶ Use of current consultants</li><li>▶ Staff retention practices</li></ul>	Good	2	2	4	<ul style="list-style-type: none"><li>▶ GM R&amp;D</li><li>▶ Operations Manager</li></ul>	<ul style="list-style-type: none"><li>▶ As per current practice</li><li>▶ Increase remuneration</li></ul>



## Risk Action Plan

Table 30 is compiled from the Risk Register and highlights the most significant residual risks faced by the rivers and drainage activity. The main risks are listed in order of severity (residual risk) as assigned in consultation with key Council officers.

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.

### Monitor, measure, report, review plan and actions

Management options listed in the risk tables have been refined into actions for each risk listed. These are the actions that are required to cost-effectively reduce the residual risk by increasing the region's ability to minimise the chances of the risk event occurring, or minimising the consequences should it occur.

Actions should consider the overall management of the asset, not just the minimisation of risk. If possible, proposed actions should align with other initiatives to:

- ▶ Reduce capital investment costs
- ▶ Reduce operating and maintenance costs
- ▶ Reduce business risk exposure (BRE)
- ▶ Increase effective asset life/value
- ▶ Increase level of service

The resulting Action Plan for risk treatment needs to be practical and achievable such that the necessary resources and time frames are realistically met. The actions also need to be able to be monitored and measured.

The monitoring/reporting column of the Risk Action Table specifies:

- ▶ **Responsibility:** Nominated person responsible for ensuring the risks are managed and that improvements are carried out in accordance with the programme;
- ▶ **Timeframe:** Achievable target date to be monitored and reported against; and
- ▶ **Method and frequency of monitoring:** This entire action table will be monitored by the Asset Management Steering Group, but there will be certain actions that are being monitored and reported in other forums. These forums are to be specified and the frequency with which these actions will be reviewed.

Bay of Plenty Regional Council will develop a risk management policy to be adopted by Council that will describe the organisations risk appetite. Also included in the policy will be the processes for monitoring, reviewing and reporting risk.

As actions are completed or review takes place, the residual risk should reduce in most cases. The AMP risk tables will need to be updated to reflect these improvements.



Table 30 Asset Management Risk Action Plan – rivers and drainage

Risk reference	Risk descriptor	Risk type	Residual risk	Action	Responsibility	Monitoring/reporting	Timeframe
DR14	<i>General:</i> Unexpected asset depreciation (cost escalations to maintain level of service) – greater loss of service (e.g. more rapid than expected stopbank settlement). Inability to afford renewals.	Operational Financial	16	<ul style="list-style-type: none"> <li>▶ Change design.</li> <li>▶ Increase depreciation rates.</li> <li>▶ Plan for more frequent renewal.</li> <li>▶ Public education.</li> <li>▶ Increasing efficiency.</li> <li>▶ Rationalise spending – prioritise activities.</li> </ul>	<ul style="list-style-type: none"> <li>▶ GM R&amp;D</li> <li>▶ Operations Manager</li> </ul>	▶ Asset condition assessment valuation	▶ Annually
DR20	<i>Rivers and drainage:</i> Increased frequency and/or size of adverse weather effects – rendering flood control and drainage schemes unsustainable.	Operational Public Health and Safety Financial	16	<ul style="list-style-type: none"> <li>▶ Catchment modelling (land use changes etc).</li> <li>▶ Recommend relocation and retreat of at-risk dwellings and industry.</li> <li>▶ Increased awareness and education of flood hazards.</li> <li>▶ Increased flood protection.</li> </ul>	<ul style="list-style-type: none"> <li>▶ GM R&amp;D</li> <li>▶ Operations Manager</li> </ul>	▶ Capacity review using updated records	▶ 10 yearly
DR21	<i>Rivers and drainage:</i> Rise in sea level and storm surges - rendering flood control and drainage schemes unsustainable.	Operational Public Health and Safety Financial	16	<ul style="list-style-type: none"> <li>▶ Dredging coastal marine areas.</li> <li>▶ Recommend relocation and retreat of dwellings and industry from coastal inundation and erosion zones.</li> <li>▶ Increased awareness and education of coastal flood hazards.</li> </ul>	<ul style="list-style-type: none"> <li>▶ GM R&amp;D</li> <li>▶ Operations Manager</li> </ul>	▶ Capacity review using updated sea level rise and storm surge	▶ 10 yearly

Risk reference	Risk descriptor	Risk type	Residual risk	Action	Responsibility	Monitoring/reporting	Timeframe
DR22	<i>Rivers and drainage:</i> Stopbank deterioration, weakness and failure - (including foundation) resulting in ineffective flood control, flooding.	Operational Public Health and Safety Financial Reputation/image	15	<ul style="list-style-type: none"> <li>▶ As per current practice.</li> <li>▶ Recommend relocation and retreat of dwellings and industry from flood prone areas.</li> <li>▶ Increased awareness and education.</li> <li>▶ Increased geotechnical investigations.</li> <li>▶ Monitor improvements in geotechnical advancements.</li> <li>▶ Upstream catchment management to reduce flood levels.</li> </ul>	<ul style="list-style-type: none"> <li>▶ GM R&amp;D</li> <li>▶ Operations Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Stopbank stability assessment</li> </ul>	<ul style="list-style-type: none"> <li>▶ 10 yearly renewal cycle</li> </ul>
DR13	<i>General:</i> External economic influences (cost escalations) – rising costs (e.g. materials, fuel), due to economic circumstances and worldwide incidents. Inability to afford maintenance and repair.	Economic Financial	12	<ul style="list-style-type: none"> <li>▶ Recycling initiatives.</li> <li>▶ Increase contingencies if necessary.</li> <li>▶ Improve efficiencies.</li> <li>▶ Investigate alternative resources.</li> </ul>	<ul style="list-style-type: none"> <li>▶ GM R&amp;D</li> <li>▶ Operations Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Valuations</li> <li>▶ Council reports</li> </ul>	<ul style="list-style-type: none"> <li>▶ Annually</li> <li>▶ Ongoing</li> </ul>
DR06	<i>General:</i> Inadequate condition/ performance assessments – reliable data for maintenance/renewals/ replacements and valuations.	Operational	9	<ul style="list-style-type: none"> <li>▶ Staff training and continuity regarding assessments.</li> <li>▶ Develop condition assessment programme and methodology for all assets.</li> <li>▶ Develop a process to ensure that knowledge is transferred, stored and accessible. Define champions and successors. External backup.</li> </ul>	<ul style="list-style-type: none"> <li>▶ GM R&amp;D</li> <li>▶ Operations Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ AMP Improvement Plan</li> <li>▶ Valuations</li> </ul>	<ul style="list-style-type: none"> <li>▶ 3 yearly</li> <li>▶ Annually</li> </ul>

Risk reference	Risk descriptor	Risk type	Residual risk	Action	Responsibility	Monitoring/reporting	Timeframe
DR09	<i>General:</i> Moderate natural hazard damage – (slips/flooding/coastal erosion/wind) causing damage to assets and or hindering development.	Public and Environmental Health Organisational	9	<ul style="list-style-type: none"> <li>▶ As per current practice.</li> <li>▶ Liaise with regional policy makers to identify hazards and ensure emergency response mechanisms are in place in the event of a hazard occurring.</li> <li>▶ Increase public awareness of residual risk.</li> </ul>	<ul style="list-style-type: none"> <li>▶ GM R&amp;D</li> <li>▶ Operations Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Council report following event</li> </ul>	<ul style="list-style-type: none"> <li>▶ Ongoing</li> </ul>
DR17	<i>General:</i> Public health and safety incident – causing injury and or damage to residents/visitors/staff or property resulting in claims and or negative publicity (e.g. poorly designed or maintained assets etc).	Public Health Reputation/Image	9	<ul style="list-style-type: none"> <li>▶ Review Council's liability and Health and Safety Policy.</li> <li>▶ Design standards maintained.</li> <li>▶ Asset management planning.</li> <li>▶ Levels of service determined from community consultation (Ten Year Plan process).</li> <li>▶ Local Government networking.</li> <li>▶ Ensure BOPRC is carrying out appropriate renewals and managing the budget correctly.</li> <li>▶ Review and develop safe working methods and practices where necessary.</li> </ul>	<ul style="list-style-type: none"> <li>▶ GM R&amp;D</li> <li>▶ Operations Manager</li> <li>▶ GM P&amp;P</li> </ul>	<ul style="list-style-type: none"> <li>▶ Health and safety annual audit</li> </ul>	<ul style="list-style-type: none"> <li>▶ Annually</li> </ul>
DR01	Lack of internal resources – the ability to attract key staff and or retain skilled staff. High workload vs lifestyle.	Organisational	8	<ul style="list-style-type: none"> <li>▶ Continue current practice and review flexibility within individual contracts and working hours. Family/lifestyle friendly policies.</li> <li>▶ Review and monitor work levels of staff.</li> <li>▶ Instigate cadetship programme in conjunction with wider industry.</li> <li>▶ Review and improve succession planning.</li> <li>▶ Improve team approach, backup roles.</li> </ul>	<ul style="list-style-type: none"> <li>▶ GM P&amp;P</li> <li>▶ GM R&amp;D</li> </ul>	<ul style="list-style-type: none"> <li>▶ Human resources reports to management</li> <li>▶ Remunerations system reports – market data</li> </ul>	<ul style="list-style-type: none"> <li>▶ Annually</li> </ul>



Risk reference	Risk descriptor	Risk type	Residual risk	Action	Responsibility	Monitoring/reporting	Timeframe
DR10	Extreme natural hazards damage – (earthquake/tsunami/volcanic/major storm event/over design event) causing damage to assets and or hindering development.	Environmental Public Health Organisational Financial	8	<ul style="list-style-type: none"> <li>▶ Liaise with National and regional policy makers to identify hazards and ensure emergency response mechanisms are in place in the event of a hazard occurring.</li> <li>▶ Staff training, awareness of roles.</li> <li>▶ Implementation of policies and Emergency Civil Defence Management Plan.</li> <li>▶ Increase public awareness of residual risk</li> </ul>	<ul style="list-style-type: none"> <li>▶ GM R&amp;D</li> <li>▶ Operations Manager</li> </ul>	<ul style="list-style-type: none"> <li>▶ Council report following extreme event</li> </ul>	<ul style="list-style-type: none"> <li>▶ Ongoing</li> </ul>



# Lifecycle management

## Introduction

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

This section covers the following groups of rivers and drainage assets at a scheme-by-scheme level with individual component assets addressed where required.

### Asset groups

Erosion protection
--------------------

Pump stations
---------------

Stopbanks
-----------

Structures
------------

Waterways
-----------

The LCM section covers the lifecycle of the rivers and drainage activities including:

Operations
------------

Maintenance – proactive and reactive
--------------------------------------

Renewal-replacement, rehabilitation
-------------------------------------

New capital (growth), levels of service (improvements) and regulatory improvements
--

Asset disposal
----------------

## Work category definitions

Expenditure on infrastructure assets can be categorised into key areas, which are discussed below:

### Operations and maintenance

Operations and maintenance expenditure is that required for the day-to-day operation of the rivers and drainage schemes while maintaining the current levels of service.

### Capital replacement (renewals)

Capital replacement or renewal expenditure includes rehabilitation and replacement of assets. The objective is to restore an asset to its original level of service as measured by for example capacity or another required condition. Renewals expenditure forecasts cover the cost of asset renewal through its whole lifecycle through to disposal or retirement of the asset.

### New capital works

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.

### Asset disposal

Asset disposal are activities necessary to dispose of decommissioned assets.

Figure 47 below illustrates the following components of lifecycle management categories.

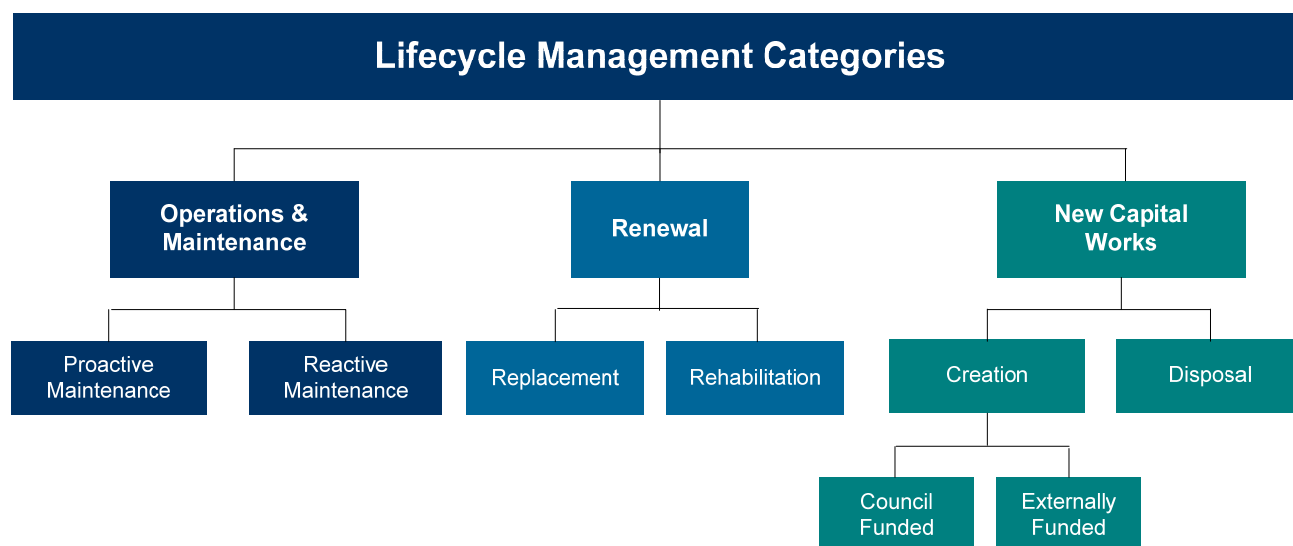


Figure 47 Rivers and drainage lifecycle management categories

These categories are described in more detail under the individual schemes.

## Rivers and Drainage overview

The LCM section provides the broad strategies and work programmes required to achieve the goals and standards outlined earlier in this AMP. This section presents the lifecycle management plan for the rivers and drainage assets, and includes:

- ▶ A description of the assets in physical and financial terms
- ▶ Key issues
- ▶ Operations, maintenance and renewal and development strategies
- ▶ Financial forecasts
- ▶ Levels of service

## Key issues and strategies

Table 31 Rivers and drainage key issues and strategies

Key issues	Strategies to address key issues
▶ Sea level rise.	▶ Some provision included in some schemes.
▶ Increased frequency and magnitude of flooding due to climate change.	▶ No current policy or provision.
▶ Interdecadal Pacific Oscillation.	▶ To be considered in any future review of flood protection assets.
▶ Stock damage to stopbanks.	▶ Monitoring to assess condition.
▶ Stopbank alignment – too close to river channel increasing risk of undermining.	▶ Additional edge protection works. ▶ Maintenance of existing edge protection works and buffer zones.
▶ Stopbank narrowness in some rural locations.	▶ Stability analysis.
▶ Aggradation of river bed through the natural movement of river metal.	▶ Monitoring.
▶ Degradation of river beds through extraction of metal.	▶ Regulatory controls and monitoring.
▶ Water takes for irrigation purposes.	▶ Regulatory controls and monitoring.
▶ Increased requirement to waterways for recreational purposes.	▶ Identify and develop existing and potential access points.

## Rivers and drainage asset overview

### Background

Council currently has four major rivers schemes and one major drainage scheme, these are as listed below:

- ▶ Kaituna Catchment Control Scheme
- ▶ Rangitaiki Drainage Scheme
- ▶ Rangitaiki-Tarawera Rivers Scheme
- ▶ Waioeka-Otara Rivers Scheme
- ▶ Whakatāne-Waimana Rivers Scheme

The schemes provide flood protection for approximately 22,600 targeted ratepayers.

*Table 32 River scheme total catchment areas*

Scheme	Total Catchment Area (km <sup>2</sup> )	Total No. of Ratepayers
Kaituna Catchment Control Scheme	1,246	36,000
Rangitaiki Drainage Scheme	290	4323
Rangitaiki-Tarawera Rivers Scheme	3,995	8,100
Waioeka-Otara Rivers Scheme	1,175	3,300
Whakatane-Waimana Rivers Scheme	1,540	7,635

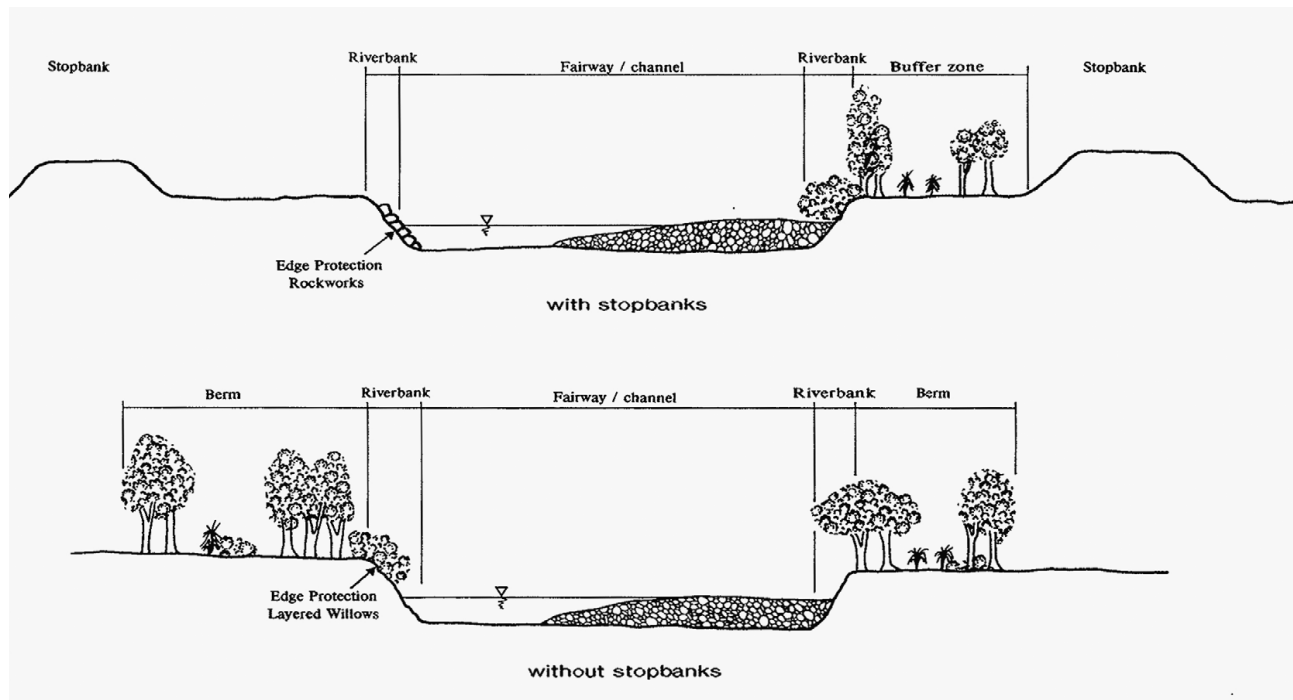
### Asset description

All the assets associated with the rivers and drainage activity can be grouped under five asset group headings as shown below.

Asset group	Asset
Erosion protection	<ul style="list-style-type: none"> <li>▶ Buffer zone</li> <li>▶ Edge planting</li> <li>▶ Fencing</li> <li>▶ Groyne</li> <li>▶ Rock work</li> <li>▶ Rubble</li> <li>▶ Trenched willows</li> </ul>
Pump stations	<ul style="list-style-type: none"> <li>▶ Pumps</li> <li>▶ Pump station</li> <li>▶ Pump – electrical</li> <li>▶ Pump – electronics</li> </ul>
Stopbanks	<ul style="list-style-type: none"> <li>▶ Stopbanks</li> </ul>
Structures	<ul style="list-style-type: none"> <li>▶ Culvert</li> <li>▶ Concrete structure</li> <li>▶ Concrete wall</li> <li>▶ Drop structure</li> <li>▶ Flood gate</li> <li>▶ Radial gate</li> <li>▶ Sluice gate</li> <li>▶ Stop log</li> <li>▶ Timber wall</li> </ul>
Waterways	<ul style="list-style-type: none"> <li>▶ Canals</li> <li>▶ Drains</li> </ul>

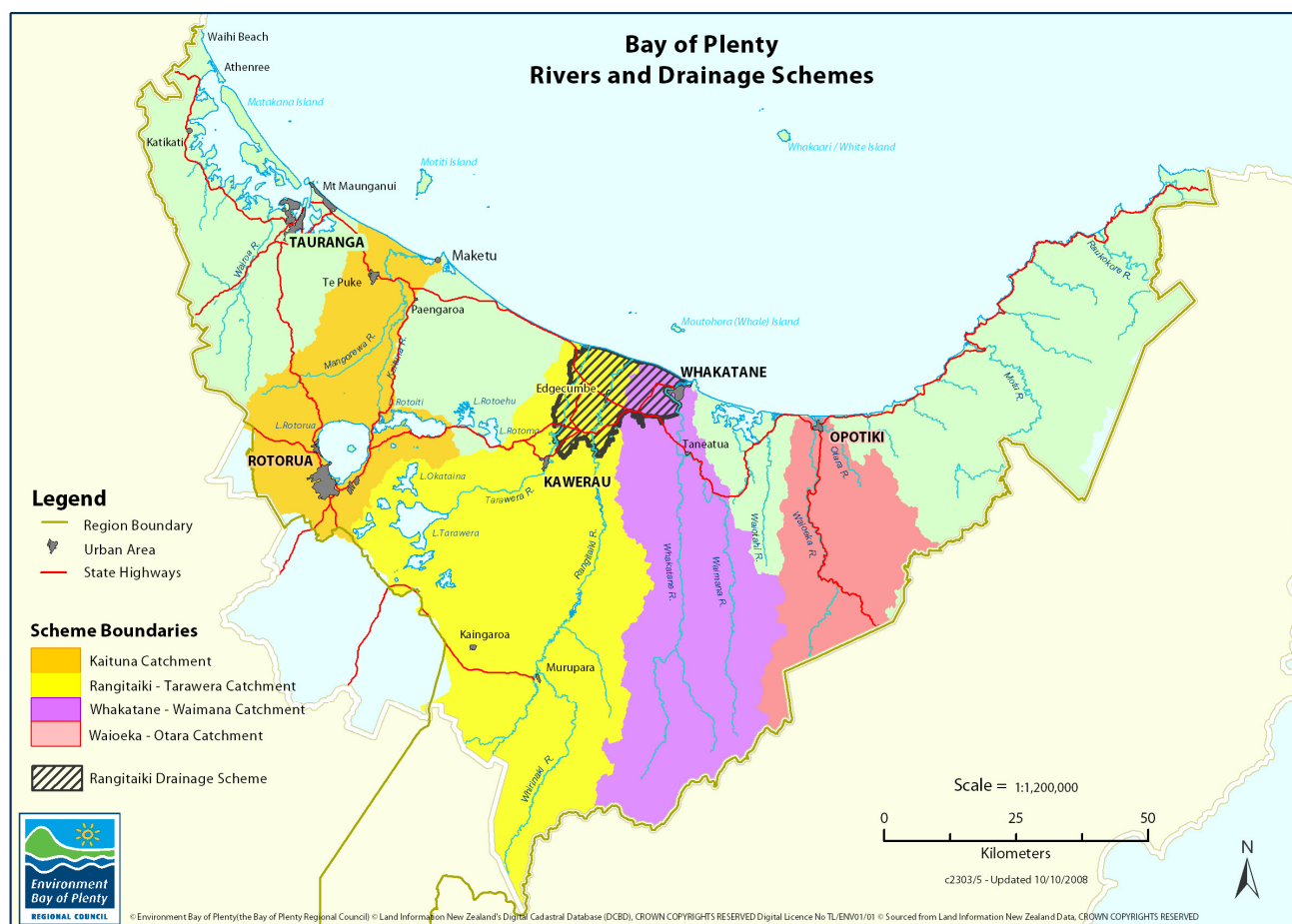
Throughout the LCM section the assets are addressed as asset groups or individual component assets where appropriate.

Figure 48 below illustrates the physical relationship of the individual assets and how they contribute to the rivers and drainage activity.



*Figure 48 Typical river cross section*

Figure 49 below shows the schemes included within this AMP and their approximate boundaries.



**Figure 49**      *Regional scheme location overview*



## Asset summary

Table 33 below is a summary of the rivers and drainage assets currently owned by Bay of Plenty Regional Council, including average age, condition and expected useful life. The Optimised Replacement Cost (ORC), Optimised Depreciated Replacement Cost (ODRC), annual depreciation as at 1 July 2008.

Table 33 Asset inventory

Asset	Asset group	Base life (year)	Average age (years)	Condition (average)	Optimised replacement cost (ORC) (\$)	Optimised depreciated replacement cost (ODRC) (\$)	Annual depreciation (\$)
Buffer Zone	Erosion Protection	Perpetuity	–		160,694	160,694	0
Concrete Structure	Structures	70	22.5		1,808,102	1,243,485	23,990
Concrete Wall	Structures	50	17.8		1,540,496	1,002,651	30,810
Culvert	Structures	50	35.9		3,605,402	1,488,595	67,034
Drop Structure	Structures	40	16.7		297,022	162,913	6,896
Edge Planting	Erosion Protection	Perpetuity	–		980,938	980,938	0
Fencing	Erosion Protection	Perpetuity	–		439,501	439,501	0
Flood Gate	Structures	70	28.7		2,100,930	1,229,238	26,847
Groyne (mole)	Erosion Protection	70	51		265,415	85,819	3,521
Pump – Electrical	Pump Stations	30	20		43,381	16,397	1,343
Pump – Electronics	Pump Stations	15	2.4		282,511	243,854	17,819
Pump Station	Pump Stations	70	22.9		4,645,290	3,280,079	60,912
Pumps	Pump Stations	35	15		2,069,195	1,403,429	53,564
Radial Gate	Structures	40	18		209,682	115,182	5,250
Rockwork	Erosion Protection	Perpetuity	16.5		16,872,379	16,872,379	0
Rubble	Erosion Protection	Perpetuity	–		355,579	355,579	0
Sluice Gate	Structures	70	20		46,595	34,705	594
Stopbank	Stopbanks	Perpetuity (with settlement)	15.3		138,632,989	132,110,315	415,899
Stop Log	Structures	40	4		75,774	69,007	1,692
Timber Wall	Structures	40	10		20,577	15,800	478
Trenched Willows	Erosion Protection	Perpetuity	–		2,188,567	2,188,567	0
Waterway	Waterways	Perpetuity	–		13,418,815	13,418,815	0
<b>Total</b>					<b>190,059,834</b>	<b>176,917,942</b>	<b>716,650</b>

\* Asset condition not available at this stage, target for improvement

## Data confidence and reliability

Table 34 provides the confidence framework from the National Asset Management Group's International Infrastructure Management Manual (NAMS IIMM) used to determine the confidence in the asset data used in this AMP.

Table 34 Asset data – confidence grades

Confidence grade	General meaning
Accurate	Data based on sound records, procedure, investigations and analysis, documented properly and recognised as the best method of assessment.
Minor inaccuracies	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example the data is old, some documentation is missing, and reliance is placed on unconfirmed reports or some extrapolation.
50% estimated	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade highly reliable or reliable data is available.
Significant data estimated	Data based on unconfirmed verbal reports and/or cursory inspection and analysis.
All data estimated	All data has been estimated, with no checks, inspections or verification

Table 35 following reflects the confidence in the asset data for the rivers and drainage activity.

Table 35 Overall confidence data - accuracy

Asset type	Accurate	Minor inaccuracies	50% estimated	Significant data estimated	All data estimated
Erosion protection		√			
Pump stations		√			
Stopbanks		√			
Structures				√	
Waterways		√			

Table 36 Overall data completeness

Asset type	60%	70%	80%	90%	100%
Erosion protection				√	
Pump stations				√	
Stopbanks				√	
Structures	√				
Waterways				√	

A six-month data capture project has been underway to check physical attributes and aerial photographs. A project to componentise culvert structures is due to be completed prior to the next revaluation, June 2009.

Table 37 Condition and performance for critical and non-critical assets

Asset type	Highly reliable	Reliable	Uncertain	Very uncertain
Erosion protection				
Pump stations				
Stopbanks				
Structures				
Waterways				

## Asset condition

Bay of Plenty Regional Council has an asset register for all assets that contains:

- ▶ A definition of all assets including description and location
- ▶ Physical dimensions and capacity
- ▶ Age and replacement costs

An assessment of asset condition should also be included in the future. The development and continued use of condition assessment data will allow preparation of verifiable predictive decay curves for particular asset types and hence permit informed prediction of remaining life.

Currently a stopbank condition programme is in place but is currently not prioritised. Annual inspections are undertaken and periodic capacity audits are in place.

### Condition assessment and results

The condition assessment model in Table 39 should be the basis of assessing the condition of Bay of Plenty Regional Council's assets.

## Risk summary

Table 38 outlines the risk management relating to rivers and drainage assets. Section 7 of this AMP provides an overview of how risk is derived and managed.

Table 38 Risk summary

Risk descriptor	Residual risk	Action
<b>General: Unexpected asset depreciation (cost escalations to maintain level of service)</b> – greater loss of service (e.g. more rapid than expected stopbank settlement). Inability to afford renewals.	16	<ul style="list-style-type: none"> <li>▶ Change design</li> <li>▶ Increase depreciation rates</li> <li>▶ Plan for more frequent renewal</li> <li>▶ Public education</li> <li>▶ Increasing efficiency</li> <li>▶ Rationalise spending - prioritise activities</li> </ul>
<b>Rivers and drainage: Increased frequency and/or size of adverse weather effects</b> – rendering flood control and drainage schemes unsustainable.	16	<ul style="list-style-type: none"> <li>▶ Catchment modelling (land use changes etc)</li> <li>▶ Recommend relocation and retreat of at-risk dwellings and industry</li> <li>▶ Increased awareness and education of flood hazards</li> <li>▶ Increased flood protection</li> </ul>
<b>Rivers and drainage: Rise in sea level and storm surges</b> – rendering flood control and drainage schemes unsustainable.	16	<ul style="list-style-type: none"> <li>▶ Dredging coastal marine areas</li> <li>▶ Recommend relocation and retreat of dwellings and industry from coastal inundation and erosion zones</li> <li>▶ Increased awareness and education of coastal flood hazards</li> </ul>
<b>Rivers and drainage: Stopbank deterioration, weakness and failure</b> – (including foundation) resulting in ineffective flood control, flooding.	15	<ul style="list-style-type: none"> <li>▶ As per current practice</li> <li>▶ Recommend relocation and retreat of dwellings and industry from flood prone areas</li> <li>▶ Increased awareness and education</li> <li>▶ Increased geotechnical investigations</li> <li>▶ Monitor improvements in geotechnical advancements</li> <li>▶ Upstream catchment management to reduce flood levels</li> </ul>

Table 39 Typical condition rating model

Grade	Condition	Description of condition
1	Very good	Sound physical condition; asset likely to perform adequately without major work for 10 years or more.
2	Good	Acceptable physical condition; minimal short-term failure risk but potential for deterioration in long-term (5 years plus). Minor work required
3	Fair	Significant deterioration evident; failure likely within the next 3 years but further deterioration likely and major replacement likely within next 15 years. Minor components or isolated sections of the asset need replacement or repair now but asset still functions safely at adequate level of service.
4	Poor	Failure likely in short-term; likely need to replace most or all of assets within 3 years. No immediate risk to health or safety but works required within 1 year ensuring asset remains safe. Substantial work required in short-term, asset barely serviceable.
5	Very poor	Failed or failure imminent; immediate need to replace most or all of asset. Health and safety hazards exist which present a possible risk to public safety or asset cannot be serviced/operated without risk to personnel. Major work or replacement required urgently

## Asset valuation (July 2008)

### Optimised replacement cost (ORC)

The total ORC for the rivers and drainage infrastructure is \$190,059,834. A breakdown for each asset type is shown below in Figure 50. Stopbanks contribute to 73% of the total asset value.

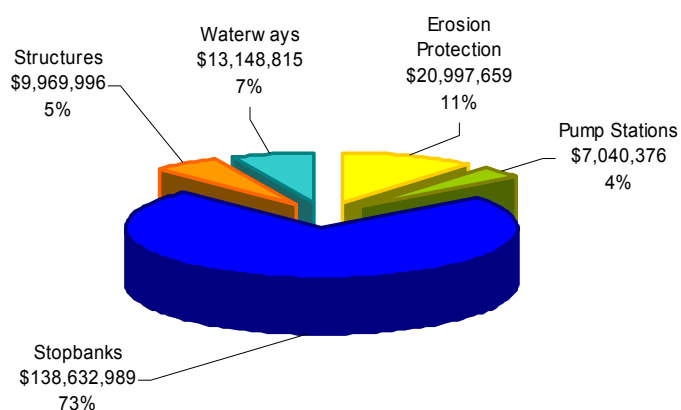


Figure 50 ORC Rivers and drainage infrastructure

The total ODRC is \$176,917,942. A breakdown by asset type is shown in Figure 51.

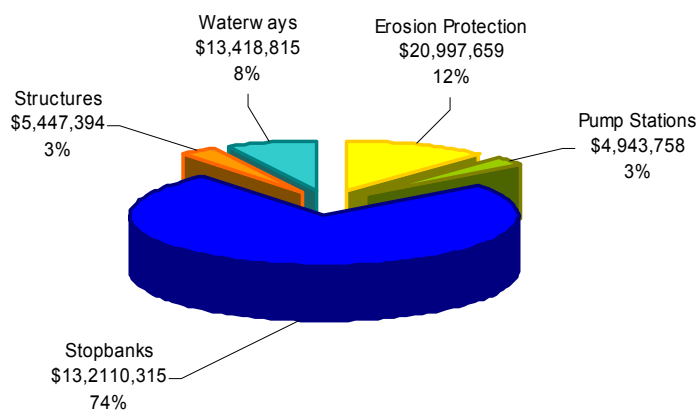


Figure 51 ODRC BOPRC rivers and drainage infrastructure

## Annual depreciation costs

The Annual Depreciation (AD) is \$716,650 as shown in Figure 52.

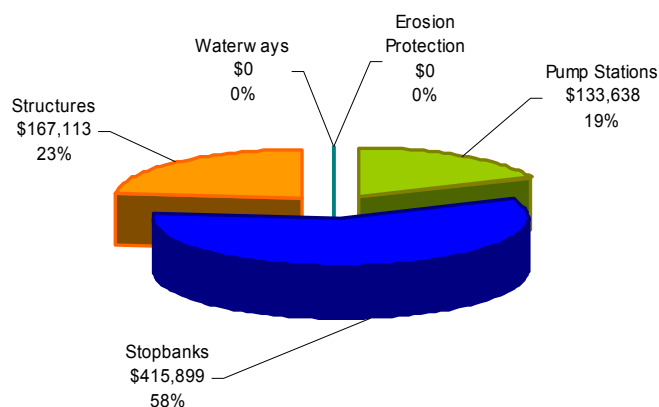


Figure 52 Annual depreciation

## Asset age

Figure 53 below shows a comparison between the average age of the asset groups and the remaining useful life (RUL). The stopbank, waterways and erosion protection asset groups have an expected life of perpetuity. In addition to these asset groups, key components from the erosion protection asset groups have also been analysed in the figure below.

The pump station asset group is on average 37% through the estimated average useful life and structures as a total group are on average 64% of the way through the average estimated useful lives. The remaining assets shown here are expected to last for perpetuity for valuation purposes therefore do not show a remaining useful life figure.

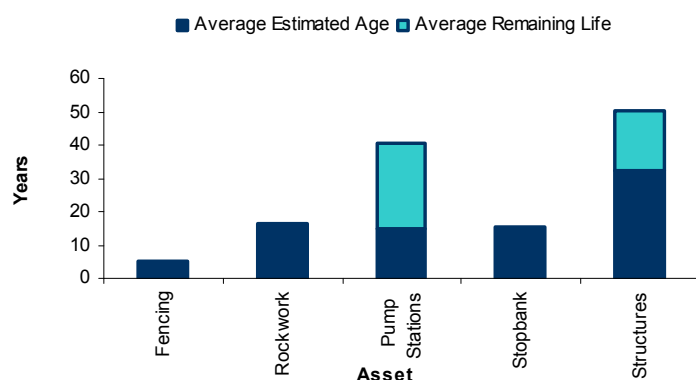


Figure 53 Asset age v remaining life

## Condition assessment and results

Asset condition is monitored by regular inspection however no asset ratings have been determined in the July 2008 valuation. It is anticipated that prior to the next valuation, condition data will be collected and this will provide sound information for decisions around renewals and maintenance programmes. Different maintenance regimes are used for all assets e.g. stopbanks, waterways and fencing.

<insert figure>

Figure 54 Average condition result

Condition assessment surveys will be undertaken in preparation for the next annual valuation scheduled 30 June 2009.

This information will be included in the next review of the Rivers and Drainage AMP, scheduled 2011.

The valuer for the 2008 valuation can comment that in his view no assets are in very poor condition, recognising that some stopbank assets require remedial geotechnical work to reduce their risk of failure during an extreme event.

## Asset capacity and reliability

Table 40 outlines the different design capacities (where applicable) of the rivers and drainage assets across the schemes.

Table 40 Asset capacity

Asset group	Kaituna Catchment Control Scheme	Rangitāiki Drainage Scheme	Rangitāiki-Tarawera Rivers Scheme	Waioeka-Otara Rivers Scheme	Whakatāne-Waimana Rivers Scheme
Erosion Protection	<ul style="list-style-type: none"> <li>▶ All rockwork is maintained to a minimum of 75% of design placement rate</li> </ul>	<ul style="list-style-type: none"> <li>▶ All rockwork is maintained to a minimum of 75% of design placement rate</li> </ul>	<ul style="list-style-type: none"> <li>▶ All rockwork is maintained to a minimum of 75% of design placement rate</li> </ul>	<ul style="list-style-type: none"> <li>▶ All rockwork is maintained to a minimum of 75% of design placement rate</li> <li>▶ Buffer zones where practical have width of the minor meander (30 m) however where space prohibits, an average of 15 m has been adopted</li> </ul>	<ul style="list-style-type: none"> <li>▶ All rockwork is maintained to a minimum of 75% of design placement rate</li> </ul>
Pump Stations	<ul style="list-style-type: none"> <li>▶ 6 Pump Stations each designed for a 5 year storm (20% AEP) (37.5 mm/day)</li> </ul>	<ul style="list-style-type: none"> <li>▶ N/A</li> </ul>	<ul style="list-style-type: none"> <li>▶ 1 Pump Station designed for a 5 year storm (28 mm/day)</li> </ul>	<ul style="list-style-type: none"> <li>▶ 1 Pump Station designed for a 10 year 24 hr storm (160 mm).</li> </ul>	<ul style="list-style-type: none"> <li>▶ 3 Pump Stations each designed for a 5 year storm (28 mm/day)</li> </ul>
Stopbanks	<ul style="list-style-type: none"> <li>▶ Maintained to the design flood level</li> <li>▶ Allowable settlement of 50% of the freeboard before reconstruction is required</li> </ul>	<ul style="list-style-type: none"> <li>▶ Maintained to the design flood level</li> <li>▶ Allowable settlement of 50% of the freeboard before reconstruction is required</li> </ul>	<ul style="list-style-type: none"> <li>▶ Maintained to the design flood level</li> <li>▶ Allowable settlement of 50% of the freeboard before reconstruction is required</li> </ul>	<ul style="list-style-type: none"> <li>▶ Maintained to the design flood level</li> <li>▶ Allowable settlement of 50% of the freeboard before reconstruction is required</li> </ul>	<ul style="list-style-type: none"> <li>▶ Maintained to the design flood level</li> <li>▶ Allowable settlement of 50% of the freeboard before reconstruction is required</li> </ul>
Structures	<ul style="list-style-type: none"> <li>▶ All structures in the scheme are maintained to ensure they are functioning at design standards at all times</li> </ul>	<ul style="list-style-type: none"> <li>▶ All structures in the scheme are maintained to ensure they are functioning at design standards at all times</li> </ul>	<ul style="list-style-type: none"> <li>▶ All structures in the scheme are maintained to ensure they are functioning at design standards at all times</li> </ul>	<ul style="list-style-type: none"> <li>▶ The Waioeka-Otara Scheme has concrete walls designed to accommodate a 100 year flood plus 450 mm freeboard</li> </ul>	<ul style="list-style-type: none"> <li>▶ All structures in the scheme are maintained to ensure they are functioning at design standards at all times</li> </ul>
Waterways		<ul style="list-style-type: none"> <li>▶ Maintained to ensure hydraulic design capacity</li> </ul>			

## Reliability (performance)

In the rivers and drainage activity, a small asset failure (namely in the stopbanks or erosion protection asset groups) can lead to inundation of a large area of the floodplain resulting in disproportionate damage to the initial failure.

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

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

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

## Operations and maintenance

Maintenance plans have been developed for each of the schemes operated by Bay of Plenty Regional Council. These plans outline the maintenance activities that are required to ensure the agreed levels of service for each scheme are met and to meet the scheme requirements for typical river flows.

Due to the nature of these assets and their main purpose, during periods of high flow, or flooding, additional works will be required to restore the scheme to acceptable operating levels of service. The general maintenance plans for these schemes have been summarised in Table 41 and individual plans have been included in the Lifecycle Management Section for each scheme.



Table 41 The maintenance plan

Maintenance Plan – Rivers and drainage		Scheme				
Activity	Description	Upper Kaituna	Lower Kaituna	Rangitāiki-Tarawera	Waioeka-Otara	Whakatāne - Waimana
Stream/Fairway Channel						
General overview	► Oversight and general inspection of stream.	► 1 year	► 1 year	► 1 year	► 1 year	► 1 year
Cross-section survey	► Re-survey for main streams.	► 15 years	► 5 years	► 5 years	► 5 years	► 5 years
Routine inspection and maintenance	► Inspection, miscellaneous weed clearing, minor erosion repairs.	► Monthly	► Monthly	► Monthly	► Monthly	► Monthly
Berm maintenance	► Miscellaneous/weed spray/mowing.	► 1 year	► 1 year	► 1 year	► 1 year	► 1 year
Beach shaping	► Managing gravel build-ups on beaches. ► Move gravel build-up on inside bends of rivers.				► 5 years	► 5 years
Rock or rubble rip-rap	► Repositioning and replacement of rock/rubble as required.	► 1-15 years	► 1-15 years	► 1-15 years	► 1-15 years	► 1-15 years
Drop structures	► Repositioning and replacement of rock/rubble/gabions.	► As required	► As required			
Timber retaining wall		► 50 years				
Channel excavation	► Remove silt build up.	► As required	► As required	► As required	► As required	► As required
Debris clearance	► Remove debris and log-jams.	► As required	► As required	► As required	► As required	► As required
Stopbanks and Floodwall						
Minor flood-gates	► Regular operational check.	► Monthly	► Monthly	► Monthly	► Monthly	► Monthly
Annual inspection	► Oversight and inspection.	► 1 year	► 1 year	► 1 year	► 1 year	► 1 year
Survey	► Stopbank long section and representative sections.	► 10 years	► 10 years	► 10 years	► 10 years	► 10 years
Miscellaneous maintenance	► Miscellaneous minor repairs to stopbanks /culverts/fences/ trees removal of gorse/weeds.	► Ongoing	► Ongoing	► Ongoing	► Ongoing	► Ongoing
Stopbank reconstruction	► Reconstruction for settlement and miscellaneous damage.	► 10–25 years	► 10-25 years	► 10–25 years	► 10–25 years	► 10–25 years
Ohau Channel and Weir						
Adjust stoplog settings	► Remove or add stoplogs as required.	► Average 4 per year				
General inspection	► Annual inspection.	► 1 year				
Miscellaneous maintenance	► Handrails, fishpass maintenance, desilting the fish blocks, willow clearing (channel).	► 6 months				
Rock repairs	► Rock replacement, additions and maintenance as required.	► 1-15 years				
Gabion replacement	► Replacement as baskets deteriorate.	► 25 years				

Maintenance Plan – Rivers and drainage		Scheme				
Activity	Description	Upper Kaituna	Lower Kaituna	Rangitāiki-Tarawera	Waioeka-Otara	Whakatāne - Waimana
Replace stoplogs	▶ Replace with new stoplogs.	▶ 7 years				
Okere Falls Gates Control						
Adjust Gate settings	▶ Adjust gates as required.	▶ As required				
Inspection	▶ Regular operational and site safety checks.	▶ 6 months				
Miscellaneous maintenance	▶ Electrical, signage, handrails, lights repairs.	▶ 6 months				
Gate ropes	▶ Replace.	▶ 5 years				
Lifting mechanism	▶ Replace motors, gearboxes, and other elements.	▶ 25 years				
Gate refurbishment	▶ Remove, refurbish, repaint and reinstall.	▶ 20 years				
Major Flood-gates and Culverts						
Normal inspection	▶ Regular operational check.		▶ 2-4 weeks	▶ 2-4 weeks	▶ 2-4 weeks	▶ 2-4 weeks
Open/close wetlands culvert			▶ As required			
Annual inspection	▶ Condition/settlement check.		▶ 1 year	▶ 1 year	▶ 1 year	▶ 1 year
Desilting	▶ Sediment removal around floodgates and in culvert.		▶ 5 years	▶ 5 years	▶ 5 years	▶ 5 years
Miscellaneous maintenance	▶ Flood-gate chains/bolts etc.		▶ 2 years	▶ 2 years	▶ 2 years	▶ 2 years
Ancillary replacement	▶ Flap-gates/winchies/retaining walls/timber.		▶ 20 years	▶ 20 years	▶ 20 years	▶ 20 years
Floodgate replacement	▶ Full replacement.		▶ 50 years	▶ 50-70 years	▶ 50 years	▶ 70 years
Floodgate inspection	▶ Regular operational check.		▶ 2-4 weeks	▶ 2-4 weeks	▶ 2-4 weeks	▶ 2-4 weeks
Pump Stations						
Normal inspection	▶ Regular operational check, clean screens and floodgates. Replace minor electrical components as required.		▶ 2 weeks	▶ 2 weeks	▶ 2 weeks	▶ 2 weeks
Regular inspection	▶ Full pump station check (refer pump station check sheet).		▶ 6 monthly	▶ 6 monthly	▶ 6 monthly	▶ 6 monthly
Miscellaneous maintenance	▶ Check oil for contamination, test windings, check/replace sacrificial anodes. ▶ Replace electrical and pump components as required. ▶ Replace bearings and mechanical seals. Sandblast and repaint with anticorrosive paint.		▶ 2 ½ yearly  ▶ 5 yearly	▶ 5 yearly	▶ 2 ½ yearly  ▶ 5 yearly	▶ 5 yearly

Maintenance Plan – Rivers and drainage		Scheme				
Activity	Description	Upper Kaituna	Lower Kaituna	Rangitāiki-Tarawera	Waioeka-Otara	Whakatāne - Waimana
Pump recondition/major maintenance	<ul style="list-style-type: none"> <li>Fully dismantle, re-varnish windings; replace wear ring, impellor and castings as required. Replace/refurbish weed screens, upgrade switchboard as needed.</li> <li>Replace bell mouth, shaft, deflector casing, build-up and balance impellers.</li> </ul>		► 20 years	► 20 years	► 20 years	► 20 years  ► 10 years
Pump machinery replacement	► Replace items not refurbished or replaced during major maintenance period.		► 50 years	► 40 years		
Pump station replacement	► Full replacement of structure.		► 50- 70 years	► 50- 70 years	► 50- 70 years	► 50- 70 years
Riverbanks						
Normal inspection	► Oversight and general inspection of reach.		► 6 monthly	► 6 monthly	► 6 monthly	► 6 monthly
Planting	► Ongoing protective planting as required.		► Yearly			
Layering	► Trimming and lopping of willows.			► 6 yearly	► 6 yearly	► 6 yearly
Tree clearing	► Removal of willows and trimming of other plantings and burning.		► 15 years	► 15 years		► 15 years
Rock	► Provision for new and maintenance of existing rip rap as required.		► 15 years	► 15 years	► 15 years	► 15 years
Rubble	► As for rock.		► 10 years	► 10 years	► 10 years	
Fence maintenance	► Inspection and repair.		► Ongoing	► Ongoing	► Ongoing	► Ongoing
Buffer Zone						
Normal inspection	► Oversight and general inspection, particularly fencing and vegetation.			► Yearly	► Yearly	► Yearly
Clearing/burning	► Clearing and burning of overgrown willows, plantings and vegetation.			► 15 years	► 15 years	► 15 years
Fence maintenance	► Inspection and repair.			► Ongoing	► Ongoing	► Ongoing
Minor Outlet Structures						
Normal inspection	► Regular operational check.					► Twice a year
Miscellaneous maintenance	► Repair flap-gates/ replace bolts.					► Yearly
Desilt outlet	► Arawa Road pump station (W47) and James Street (W29) only.					► 5 yearly
Stoplogs						
Refurbish	► Replace seals and re-galvanise stoplogs.					► 10 yearly

Maintenance Plan – Drainage Schemes Maintenance Plan		Scheme	
Activity	Description	Lower Kaituna	Rangitāiki Drainage
Drains			
Maintenance	► Drain clearance, weed spraying, cutting.	► Ongoing	► Ongoing
Survey	► Cross-section survey.	► 15 years	► 15 years
Canals			
General overview	► Oversight and general inspection.	► 1 year	► 1 year
Regular inspection	► Regular inspection of drain condition.	► Ongoing	► Ongoing
Cross-section survey	► Resurvey for main canals.	► 8 years	► 8 years
	► Resurvey of other canals.	► As required	► As required
Bank maintenance	► Miscellaneous bank repairs/weed spray.	► Ongoing	► Ongoing
Maintaining waterway	► Weed clearance, drain clearing, desilting.	► Ongoing	► Ongoing
Stopbank			
General overview	► Oversight and inspection.		► 1 year
Survey	► Stopbank long section and representative sections.		► As required
Stopbank reconstruction	► Reconstruction for settlement and miscellaneous damage.		► 20 years
Culverts and flap-gates			
Regular inspection	► Regular operational check.	► Ongoing	► Ongoing
Culvert cleaning	► Desilting, removing blockages.	► Ongoing	► Ongoing
Miscellaneous maintenance	► Replacement of flood-gate chains/bolts etc.	► 2 years	► 2 years
Ancillary replacement	► Replacement of flap-gates, winches, retaining walls, timber.	► 20 years	► 20 years
Culverts and flap-gate replacement	► Full replacement.	► 50 years	► 50 years
Erosion Control Structures			
Regular inspection	► Regular inspection of condition.		► Ongoing
Minor repairs	► Minor repairs to gabion and mattress structures.		► 5 years
Replacement	► Full replacement.		► 50 years

## Erosion protection

Erosion protection is use to:

- Protect stopbanks and natural channel banks from erosion
- Maintain channel stability
- Reduce sediment deposition

The erosion protection asset comprises of:

- Buffer zone
- Edge planting
- Fencing
- Groyne
- Rockwork
- Rubble
- Trenched willows

Erosion protection comprises 11.1% of the Optimised Replacement Cost (ORC) for all the assets, with a total value of \$ 20,997,659.



**Key issues**

- ▶ Damage from stock on buffer zone planting.
- ▶ Willows require ongoing maintenance and subject to pests and diseases, alternatives are more expensive.
- ▶ Flood damage costs.
- ▶ Vandalism of fencing.
- ▶ Diseases on vegetative planting.
- ▶ Use of invasive species is limited.
- ▶ Have gorse and other weed control programmes in place.
- ▶ Large cost in future to maintain rock work, hard protection more costly in the long term compared with soft protection.
- ▶ Bay of Plenty Regional Council has conducted field trials of native species for edge planting to determine the most appropriate solution. Natives aren't as hardy and recent floods have damaged recent planting.

Figure 55 shows the comparison of erosion protection ORC for each scheme. The Rangitaiki-Tarawera Scheme accounts for 52% of the overall erosion protection ORC with a value of \$11.1 million.

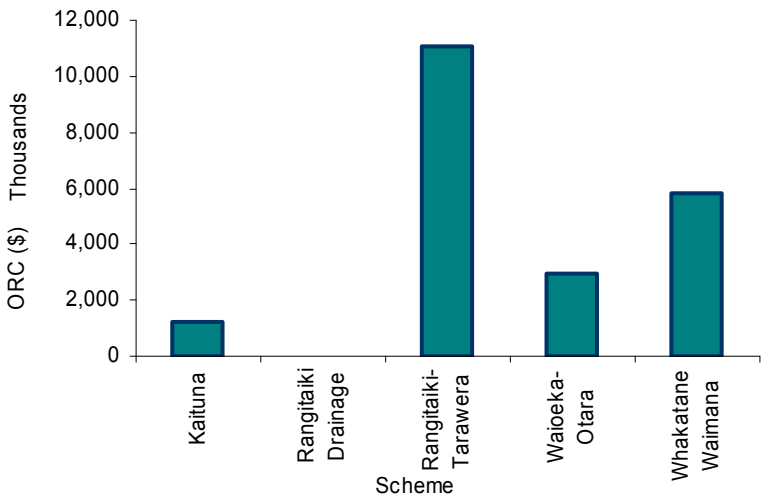


Figure 55 Erosion protection ORC by scheme

The erosion protection assets are not depreciated.

Figure 56 shows the ORC of the individual erosion protection assets totalled for all schemes. Rockwork accounts for the majority (79%) of the ORC at \$16.9 million. Trenched willows are next at 10% with \$2.2 million with the remaining assets all accounting for less than \$1 million.

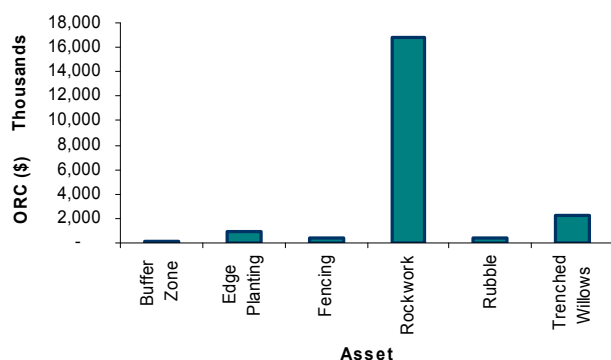


Figure 56 ORC by individual erosion protection asset

Figure 57 represents, where applicable, total length of individual assets totalled across all of the schemes. There are 235 km of edge planting across the five schemes and 78 km of fencing.

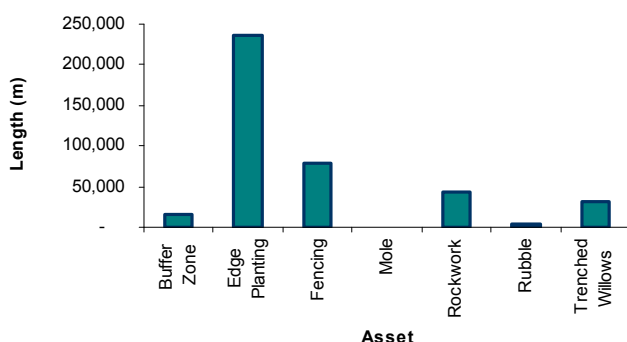


Figure 57 Lengths of erosion protection assets

## Pump stations

Pump stations for 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. computer electronics)

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

Pump stations make up only 3.7% of the ORC for all of the rivers and drainage assets, with a total value of \$7,040,376.





## Key issues

- ▶ Electricity supply failures.
- ▶ Pump failures.
- ▶ Insufficient capacity due to increasing required performance standards e.g. community expectations, climate change.
- ▶ Vandalism.
- ▶ Weed control – causing pumps not running to capacity.
- ▶ Land ownership and access issues.

(Rangitaiki drainage scheme communal pumps are not covered under this AMP, these belong to the communal pump schemes).

Figure 58 shows the comparison of ORC across each scheme. The Kaituna and Whakatane-Waimana schemes account for the greatest ORC, with 53% and 33% respectively.

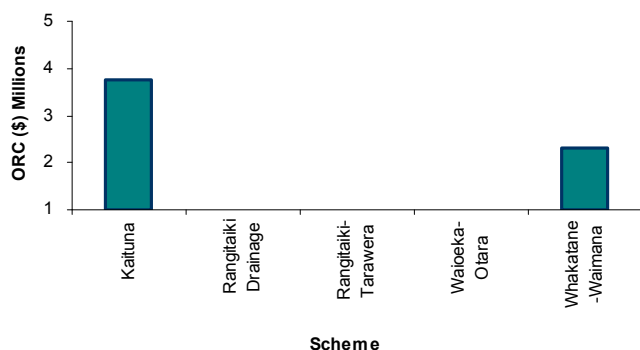


Figure 58 Pump station ORC by scheme

Figure 59 shows the annual depreciation for pump stations, which amounts to \$133,638 or 18.6% of the total annual depreciation across all the schemes.

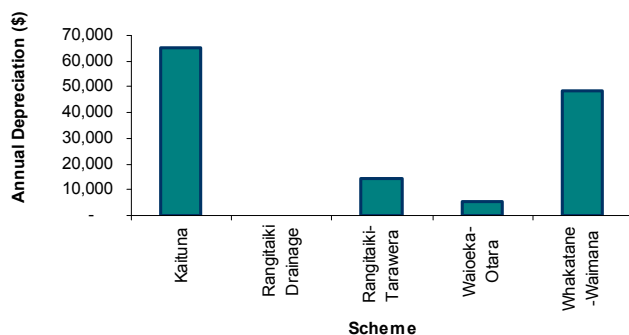


Figure 59 Pump station annual depreciation

Figure 60 shows the number of pump stations per scheme. Kaituna with seven pump stations has the most of all the rivers and drainage schemes.

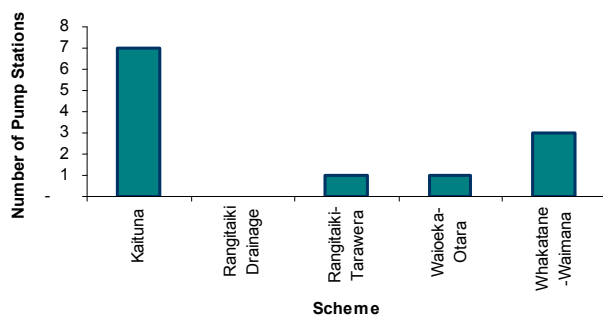


Figure 60 Number of pump stations by scheme

Figure 61 shows the average remaining life compared to the average age of the pump station components across the five schemes. The pump station components as a whole are all well below halfway through their expected lives. The Kaituna assets are generally the oldest, being 42% through their expected lives.

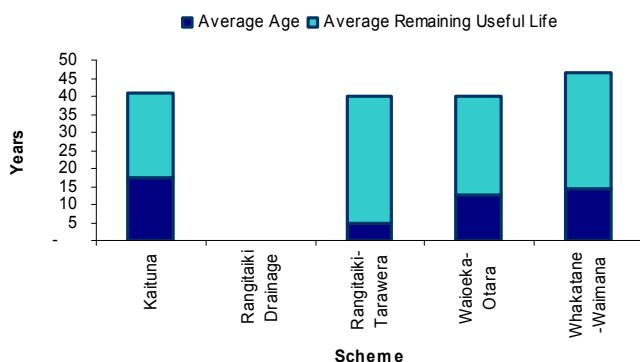


Figure 61 Pump stations age vs remaining life by scheme

Figure 62 shows the components of the pump station assets by age and remaining life averaged across all schemes. Pumps – electrical is the only asset greater than halfway through its estimated life at exactly two-thirds.

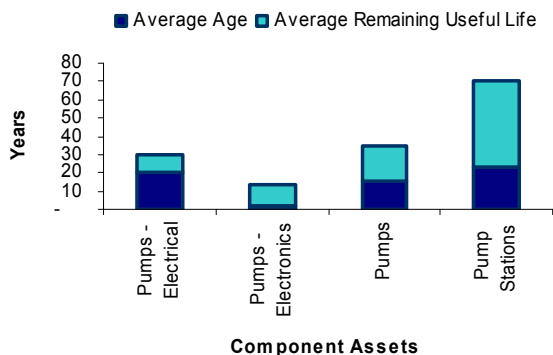


Figure 62 Age vs remaining life by component assets

## 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 Replacement Cost (ORC) of these assets is \$138.6 million (as at 30 June 2008); this represents 72.9% of the total network value. Stopbank asset condition is monitored by visual inspections, physical surveys and scheme reviews including detailed computer modelling.



## Key issues

- ▶ Stock damage.
- ▶ Stopbank alignment being too close to the river channel increasing the risk of undermining.
- ▶ Stopbank narrowness in some rural locations e.g. Ōpōtiki.
- ▶ Settlement of stopbanks requiring top-up.
- ▶ Keeping up with changes in stopbank height (i.e. channel capacity) to maintain existing levels of service and taking into account silting and/or aggradation of river beds, climate change and increased rainfall intensity.
- ▶ Toe erosion and old, large trees compromising stopbank integrity.
- ▶ Geothermal activity threatening foundations.
- ▶ Foundation stability due to geotechnical conditions.
- ▶ Land ownership and access issues.

Figure 63 shows the ORC for stopbanks across all of the schemes. The Rangitaiki-Tarawera scheme accounts for 33% of the total ORC, with a value of \$45.5 million.

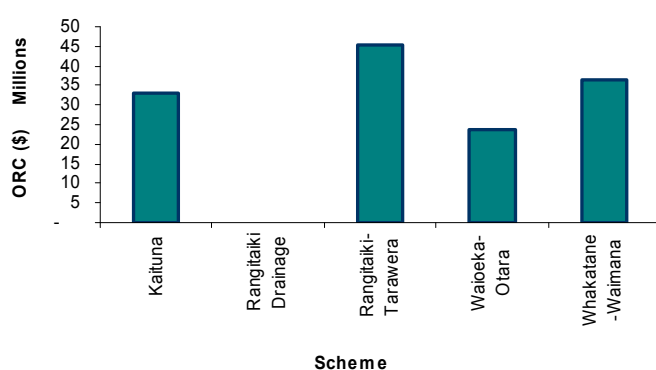


Figure 63 Stopbanks ORC

Figure 64 shows the annual depreciation for stopbanks, which amounts to \$415,899 or 58% of the total annual depreciation for the entire network per annum.

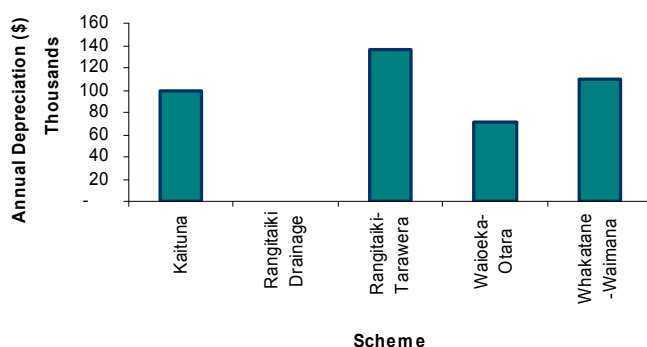


Figure 64 Stopbanks annual depreciation

Figure 65 represents, where applicable, the length of stopbanks totalled across all of the schemes. There is a total of 346 km of stopbanks across the five schemes with Rangitaiki-Tarawera totalling the most at 118 km.

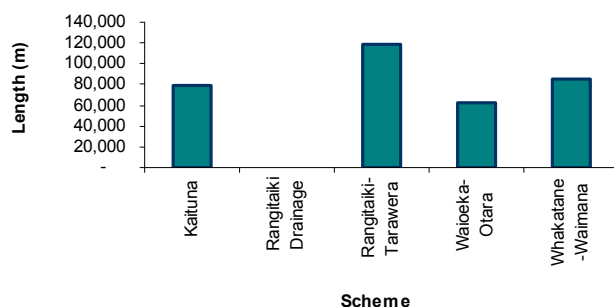


Figure 65 Length of stopbanks

Figure 66 shows the average age of the stopbank assets across all of the schemes. Note that 'remaining useful life' is not applicable as the stopbanks have an estimated life of perpetuity for depreciation purposes. Whakatane-Waimana has many of the newest stopbanks.

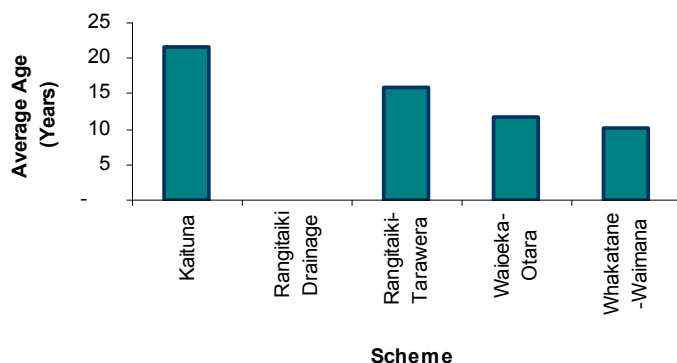


Figure 66 Stopbanks estimated average age

## Structures

Bay of Plenty Regional Council's 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 assets undergo a programme of regular maintenance with asset condition monitored by regular inspection.

Structures make up 5% of the total ORC of all of the rivers and drainage assets, with a total value of \$9,969,996.



## Key issues

- ▶ Geothermal activity causing corrosion and undermining foundations.
- ▶ Tidal and saline erosion of flood gates and other structures.
- ▶ Blockages due to debris in flood gates etc and consequential backflow.
- ▶ Vandalism e.g. welding floodgates open.
- ▶ Public safety e.g. on the outlet groyne.

- Fish passage when new assets are built and other environmental requirements.
- Earth dam displacement and earthquake damage to structures.
- Scouring.

Figure 67 shows the ORC for structures across the schemes. The Kaituna scheme accounts for 46.9% of the total ORC, with a value of \$3.87 million.

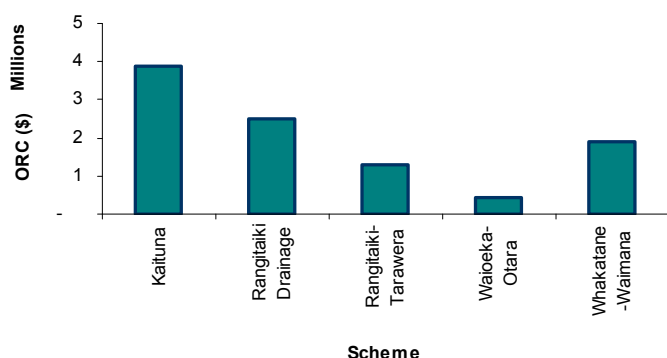


Figure 67 Structures ORC

Figure 68 shows the annual depreciation for rivers and drainage structures. The total annual depreciation amounts to \$167,112, which is equivalent to 23.3% of the total annual depreciation for the entire network.

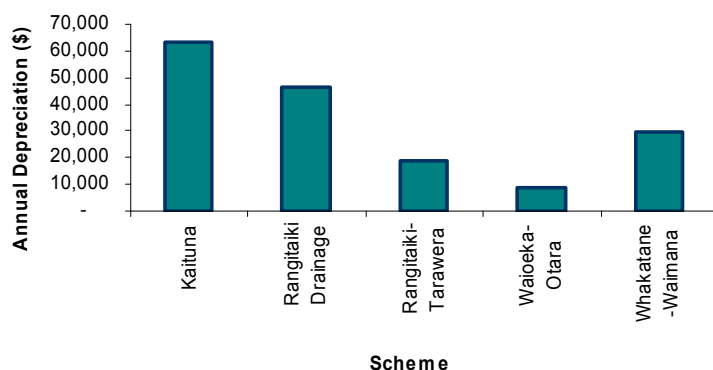


Figure 68 Structures annual depreciation

Figure 69 shows the ORC of the individual structures assets totalled for all schemes. Culverts account for 36% of the ORC at \$3.6 million. Flood-gates are next at 23.6%; concrete structures at 18% and concrete walls at 15.5%.

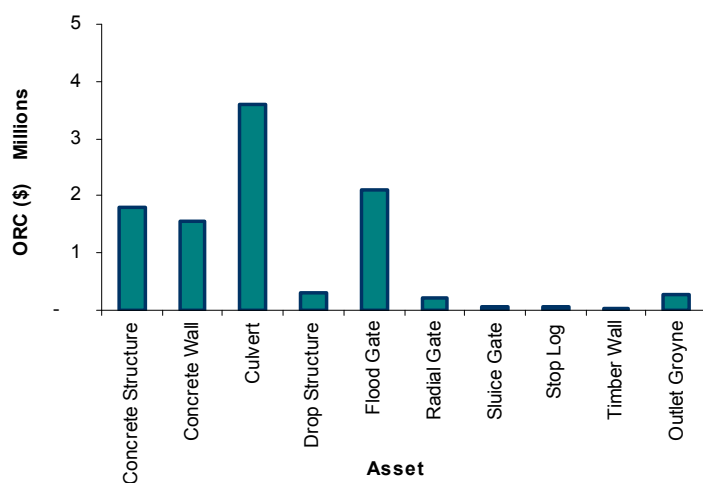
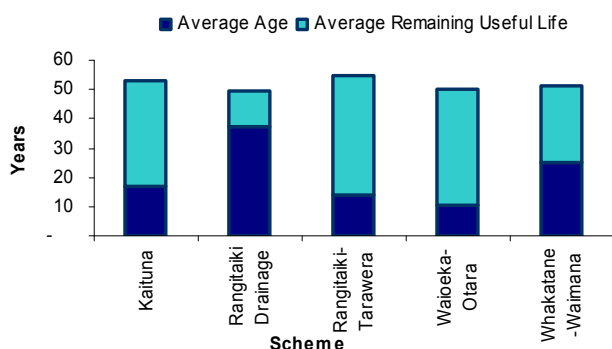


Figure 69 ORC by individual structures asset

Figure 70 shows the average remaining useful life versus estimated average age for the structures assets across all the schemes. The structures assets are less than halfway through their estimated lives with the exception of the Rangitai Drainage Scheme where the structures assets on average are 75% of the way through their



expected lives.

Figure 70 Structures age vs remaining life by scheme

Figure 71 shows the individual component assets of the structures asset by age and remaining useful life averaged across all of the schemes. The culverts and the outlet groyne are the only assets on average more than halfway through their expected life.

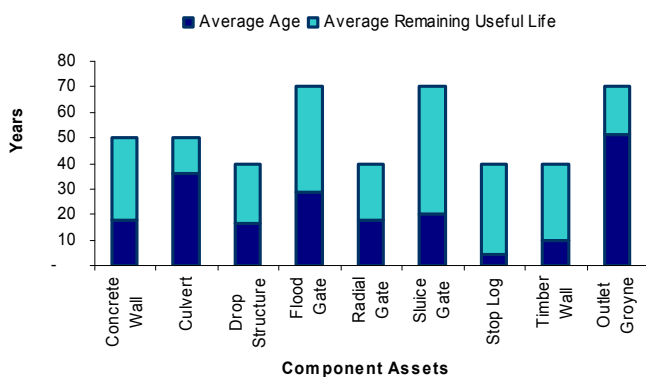


Figure 71 Age vs remaining life by component assets

## Waterways

### Drains and canals

The drains and canals assets are channels excavated to provide drainage (drains) or sufficient flow capacity for design floods (canals). These assets do not include natural streams.

Drains and canals contribute to 7% of the total ORC for all of the assets, with a total value of \$13,418,814.

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

Condition of the waterways is generally monitored by:

- ▶ Visual inspections
- ▶ Physical surveys
- ▶ Scheme reviews including detailed computer modelling





## Key issues

- ▶ Siltation of the channel and disposal of this material.
- ▶ Organic farms e.g. controls around weed spraying and desilting.
- ▶ Excessive weed growth.
- ▶ Bank erosion.
- ▶ Environmental issues, e.g. fish migration spawning, wildfowl.
- ▶ Environmental issues e.g. timing of maintenance.
- ▶ Pollution and contaminated sites.
- ▶ Pest and weed control e.g. invasive exotic species.
- ▶ Compromised access e.g. barriers, roadside working etc.
- ▶ Unauthorised crossings.
- ▶ Adjacent services restricting capacity.
- ▶ Rivers – accumulation of gravel e.g. can affect the maintenance of assets adjacent to the waterways. Can reduce overall capacity and height of stopbanks, may increase erosion in varying places in the river.
- ▶ Regular maintenance is required to ensure design capacity is maintained.

Figure 72 shows the ORC for drainage and canal assets across the six schemes. The Rangitaiki Drainage Scheme accounts for 85% of the total ORC, with a value of \$ 11,466,676.

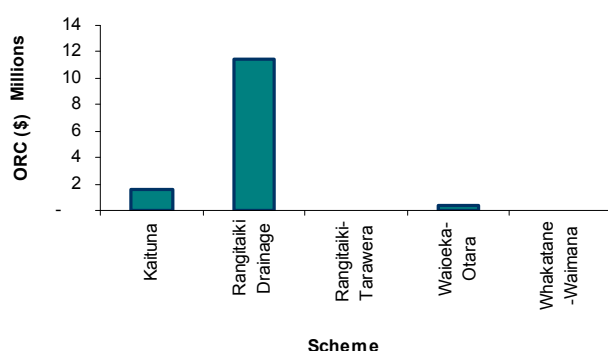


Figure 72 Drains and canals ORC

Figure 73 represents, where applicable, the length of waterways totalled across all the schemes. There is a total of 491 km of waterways across the five schemes with the Rangitaiki Drainage Scheme totalling the most at 366 km.

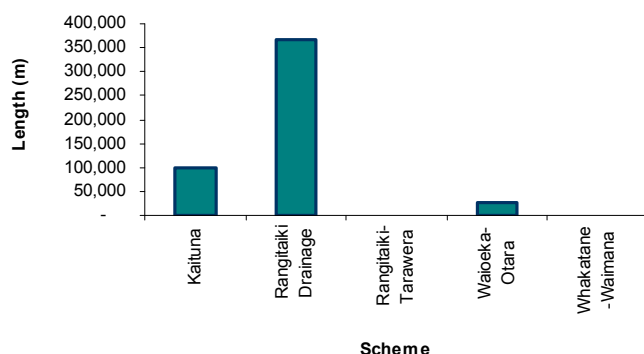


Figure 73 Length of waterways

## 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.

Some of the key issues that relates to the maintenance of rivers and streams are noted below.

## Key issues

- ▶ Siltation and gravel aggradation and/or degradation
- ▶ Vegetation control
- ▶ Weed control
- ▶ Access for maintenance purposes
- ▶ Edge planting
- ▶ Environmental issues e.g. timing of maintenance

## Kaituna Catchment Control Scheme

### Overview

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.

The Upper Kaituna area includes

- ▶ 10 km of stopbank through the Rotorua urban area
- ▶ Level control structures on Lakes Rotorua and Rotoiti
- ▶ Excavated channels and spillways
- ▶ Diversion and grade control structures
- ▶ Erosion protection – planting and rock rip-rap

The Lower Kaituna area includes:

- ▶ 69 km of stopbank
- ▶ 88 km of canals and drains across the plains
- ▶ Six operative pump stations
- ▶ Flood-gate, culvert and weir structures
- ▶ Erosion protection – planting and rock rip-rap
- ▶ A groyne structure at the river mouth

## Key issues

- ▶ Bank erosion caused from the wake created by motorised river traffic.
- ▶ Stopbank erosion from stock access and control, poor cover, inadequate berm, large trees.
- ▶ Geothermal activity in the upper Kaituna area (corrosion of flap-gate structures, hazardous working conditions).
- ▶ Private ownership of riparian land restricting access for maintenance.
- ▶ Stream channel aggradation.
- ▶ Catchment land use changes e.g. lifestyle blocks.
- ▶ Cost of upgrading the stopbanks for climate change. A number of canals are due for their renewal works. Climate change criteria has been included in design and therefore will have an effect on the cost of renewal works. This is likely to affect the stopbank system in lower part of catchment, which is more likely to be affected by climate change.
- ▶ Land settling in the Lower Kaituna Catchment which then affects stopbanks and their potential capacity.
- ▶ Consent renewal for lake level control structures.
- ▶ River bank erosion due to storm damage, the nature of the river makes this difficult to maintain.
- ▶ Debris and silt deposited in canals from beyond the scheme maintenance area.
- ▶ Tauranga Eastern Motorway – effect on flood levels.
- ▶ Lake level operation management (competing use).
- ▶ Vandalism e.g. cutting down trees and fences for access.

## Asset description

Figure 74 below gives an overview of the Kaituna Catchment Control Scheme. Figure 75 overleaf show the upper Kaituna Catchment.

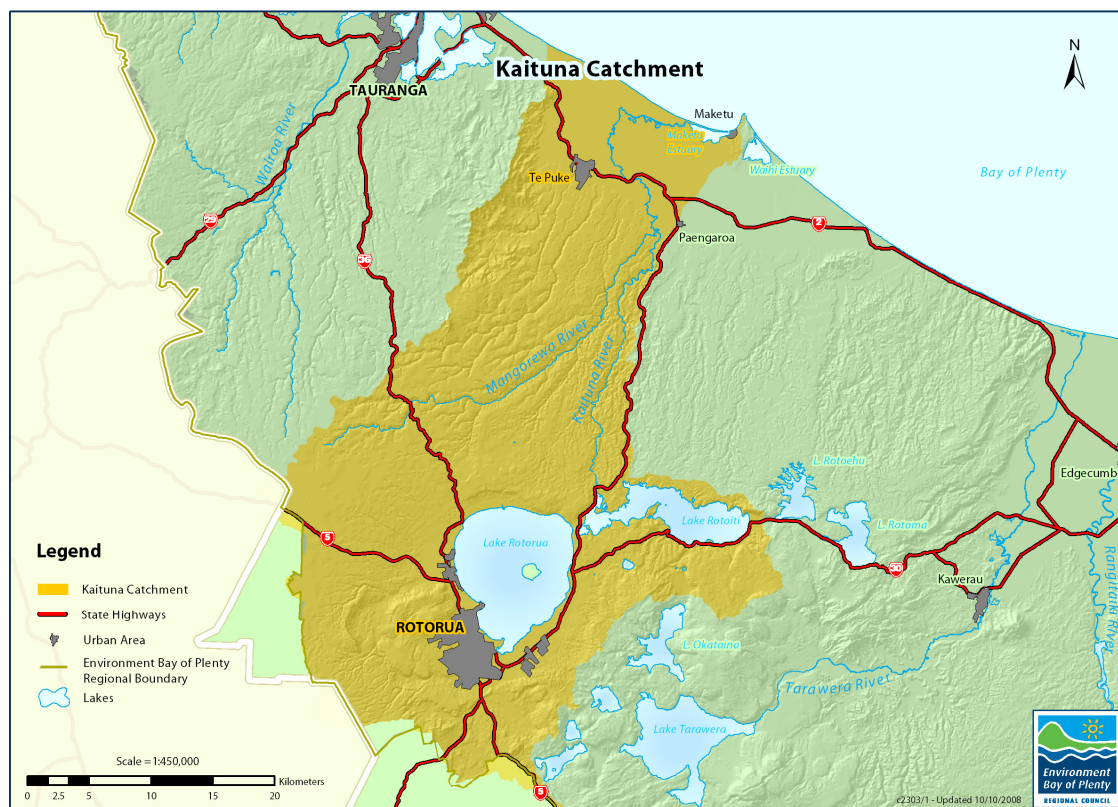


Figure 74 Kaituna Catchment Control Scheme

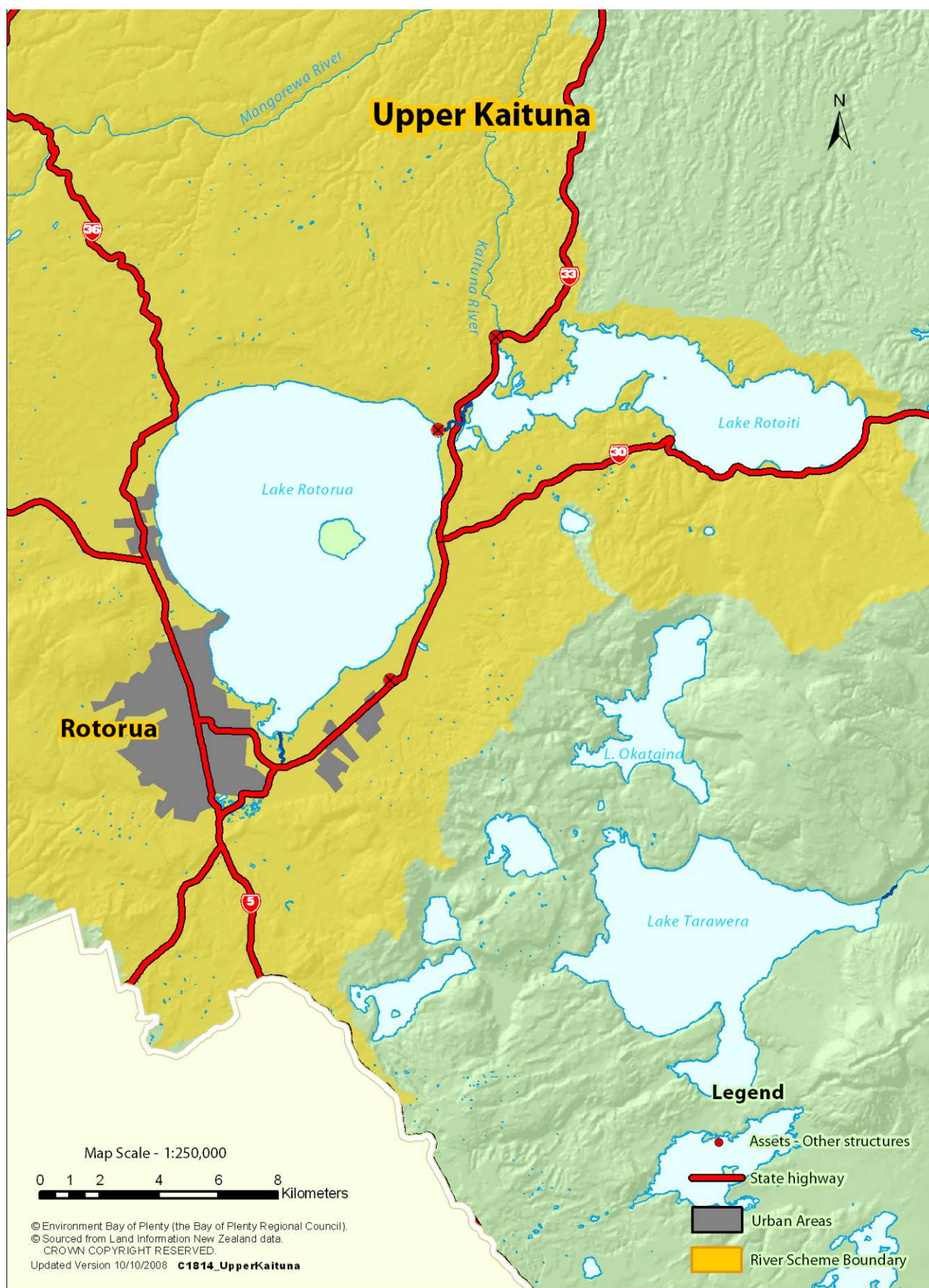


Figure 75 Upper Kaituna Catchment



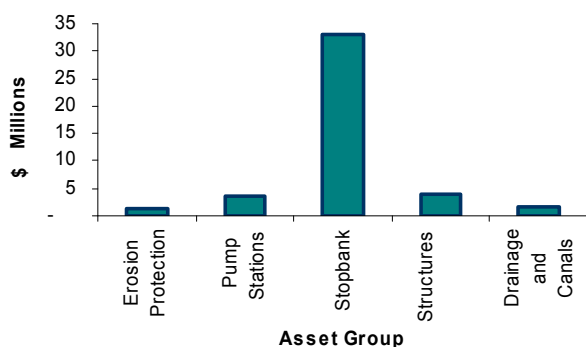
The following asset groups are found in the Kaituna Catchment Control Scheme. Table 42 below summarises the expected life, age, condition and financial information for these asset groups.

**Table 42** *Asset information*

Asset group	Quantity (m)	Average base life	Average estimated asset age	Condition	ORC (\$)	ODRC (\$)	Total depreciation (\$)
Erosion protection	13,206	Perpetuity	N/a		1,188,342	1,188,342	0
Pump stations		41	17.3		3,754,379	2,471,502	1,282,876
Stopbanks	79,026	Perpetuity (with settlement)	21.7		33,025,752	30,848,728	2,177,023
Structures		52	16.8		3,874,793	2,444,395	1,430,397
Drainage and canals	98,803	Perpetuity	N/a		1,547,258	1,547,258	0
<b>Total</b>	<b>191,035</b>				<b>43,390,526</b>	<b>38,500,228</b>	<b>4,890,298</b>

Figure 76 shows the ORC for the rivers and drainage assets associated with the Kaituna Scheme, which amounts to \$43,390,526 (as at 1 July 2008). Stopbanks account for 76% of the ORC.

Waterways have a zero depreciation rate due to their estimated life of perpetuity. Stopbanks also have an estimated life of perpetuity however a depreciation rate of 0.3% is included to account for settlement.

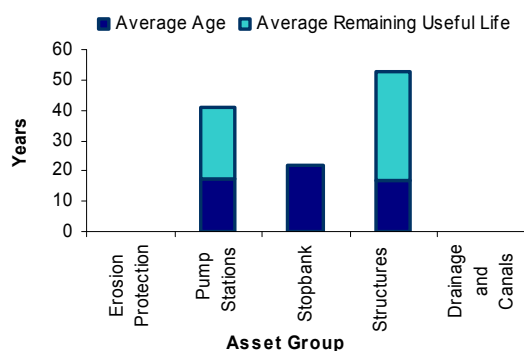


**Figure 76** *ORC for Kaituna scheme assets*

### Asset age

Figure 77 shows the average age and remaining useful life of the Kaituna Scheme assets. Waterways and stopbanks have estimated lives of perpetuity.

Pump stations and structures assets are on average less than halfway through their expected useful lives.



**Figure 77** *Age of Kaituna Catchment Scheme assets*

### Asset condition

The following information relates to the condition of the Kaituna Scheme assets. This information is critical to the overall life cycle management of the assets, with regards to maintaining the asset at minimum cost, whilst maintaining the required level of service.

Asset condition will be included when condition monitoring is carried out as part of the June 2009 valuation.

## Operations and Maintenance Plan

The Kaituna Catchment Control Scheme has a detailed Maintenance Plan to ensure assets operate as the agreed levels of service and provides ongoing protection to the surrounding environment. Tables are provided earlier in this section that highlight some of the key maintenance practices for the upper and lower Kaituna. In general the priority order for maintenance work in the scheme will be:

- ▶ Retaining the integrity of the stopbanks
- ▶ Maintaining pump stations operational
- ▶ Retaining the strength and integrity of erosion control works
- ▶ Keeping channels clear of obstruction
- ▶ Maintenance of ancillary works

Table 43 summarises the operational expenditure (including disaster and flood damage reserve contributions but excluding depreciation/DISP) for the Kaituna Scheme area over the last five years. This information shows that expenditure has remained relatively steady during the period.

*Table 43 Historical operations and maintenance expenditure for Kaituna*

	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009 (current)
Total (\$000)	897	950	925	1,026	

### Projected operational expenditure

Table 44 below sets out the projected operational expenditure for the Kaituna Scheme for the 50 years.

*Table 44 Projected operations and maintenance expenditure for the Kaituna scheme*

	Ten year expenditure										Remaining 40 years expenditure			
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/2029	2030/2039	2040/2049	2050/2059
Maintenance	884,754	991,480	1,003,371	1,033,451	1,121,359	1,176,963	1,159,411	1,153,943	1,139,373	1,182,282	12,550,343	12,249,318	11,602,185	12,169,946
LAPP Contribution	18,800	18,800	18,800	18,800	18,800	18,800	18,800	18,800	18,800	18,800	188,000	188,000	188,000	188,000
Flood Damage Reserve	51,913	51,913	51,913	51,913	51,913	51,913	51,913	51,913	51,913	51,913	519,130	519,130	519,130	519,130
Projects & Investigations	111,863	116,619	123,698	122,988	125,102	130,704	124,888	123,969	128,364	123,287	1,239,590	1,239,590	1,239,590	1,239,590
Predicted Flood Damage			400,000					200,000			600,000	600,000	600,000	600,000
Depreciation	239,125	287,928	292,928	294,281	326,004	329,291	329,486	330,258	330,767	330,839	3,403,759	3,471,705	3,526,411	3,590,313
<b>Total</b>	<b>1,306,455</b>	<b>1,466,740</b>	<b>1,890,710</b>	<b>1,521,433</b>	<b>1,643,178</b>	<b>1,707,671</b>	<b>1,684,498</b>	<b>1,878,883</b>	<b>1,669,217</b>	<b>1,707,121</b>	<b>18,500,822</b>	<b>18,267,743</b>	<b>17,675,316</b>	<b>18,306,979</b>



## Renewal Plan

The overall LoS objective is to steadily renew assets considering the following:

- ▶ The age profile
- ▶ The condition profile
- ▶ The level of ongoing maintenance
- ▶ The economic lives of the materials used
- ▶ Financial and customer risks

Renewals are reviewed regularly, with any deferred work re-prioritised alongside new renewal projects and a revised programme established where required. The projected 10 year (10 years in Section 11) renewal expenditure in Table 45 will be improved as data confidence, accuracy and asset condition assessments are updated during 2008. These budgets may be adequate to maintain current LoS, however, the potential number or size of problems that may be identified as confidence in the asset data increases may make these budgets inadequate in the future.

## Capital works plan

Capital works are generally initiated through triggers such as growth, LoS, regulatory or operational efficiency.

Table 45 below summarise the projected capital works to be undertaken over the next 10 years. More detail on funding sources for these projects is outlined in Section 11 Projects & Financial Forecasts.

*Table 45 Project renewals and capital expenditure for Kaituna*

Year	Capital works	Renewal or new	How much	Funding source
Year 1 (2009/2010)	Kaituna – Ford Road gravity culvert replacement	Renewal	\$250,000	Replacement Reserve
Year 2 (2010/2011)	Kaituna Scheme Ford Road pumping station	Renewal	\$1,250,000	Loans & Replacement Reserve
Year 3 (2011/2012)	Kaituna River left stopbank top up (downstream of Waiari section)	Renewal	\$453,000	Loans & Replacement Reserve
Year 4 (2012/2013)	Kaituna River left stopbank top up (Railway to Waiari, up-stream)	Renewal	\$450,000	Loans & Replacement Reserve
	Kaituna River right stopbank top up (Railway to Waiari, up-stream section)	Renewal	\$800,000	Loans & Replacement Reserve
Year 5 (2013/2014)	Kaituna River right stopbank top up (Railway to Waiari, down-stream section)	Renewal	\$646,000	Loans & Replacement Reserve
	Kaituna River left stopbank top up (Railway to Waiari, down-stream section)	Renewal	\$453,000	Loans & Replacement Reserve
Year 6 (2014/2015)	Kaituna River right stopbank top up (5268 to Waiari)	Renewal	\$72,000	Replacement Reserve
	Okere control gates – lifting mechanism replacement	Renewal	\$137,000	Loans & Replacement Reserve
Year 7 (2015/2016)	Kaituna River right stopbank top up (downstream of wetland)	Renewal	\$228,000	Loans & Replacement Reserve
	Upper Kaituna River stopbank renewals 50%	Renewal	\$39,500	Replacement Reserve
Year 8 (2016/2017)	Kaituna (Raparapahoe Canal right stopbank top up)	Renewal	\$180,000	Loans & Replacement Reserve
Year 9 (2017/2018)	Lower Kaituna pump electronics renewals	Renewal	\$30,300	Replacement Reserve
Year 10 (2018/2019)	Lower Kaituna pump electronics renewals	Renewal	\$62,600	Replacement Reserve

## Disposal Plan

Bay of Plenty Regional Council does not have a disposal and/or acquisition plan or strategy developed for the Kaituna Catchment Control scheme as these functions are not usually relevant in the management of river schemes. There are no intentions to dispose of any of the Scheme assets at this time.

# Rangitaiki Drainage Scheme

## Overview

The Rangitaiki Drainage Scheme provides gravity drainage to the Rangitaiki 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 Rangitaiki Plains into the Tarawera, Rangitaiki and Whakatane Rivers.

## Key issues

- ▶ Lowering of ground levels as a result of over drainage.
- ▶ Restriction of access to stream banks by landowners and physical constraints and unauthorised crossings.
- ▶ Weed control and disposal.
- ▶ Damage to assets from major floods.
- ▶ Environmental impact of plains drainage on natural wetlands.
- ▶ Contaminated sediments in the lower reaches of the Kope-Orini Canal from industry discharge.
- ▶ Aggradation from outside of the drainage area.
- ▶ Catchment land use changes e.g. lifestyle blocks.
- ▶ Seismic movement.
- ▶ Drain bank erosion due to storm damage.
- ▶ Organic land use restricting maintenance activities.
- ▶ Environmental impacts e.g. fish passage, wildfowl breeding etc.

## Asset description

Figure 78 is an overview map of the Rangitaiki drainage scheme.

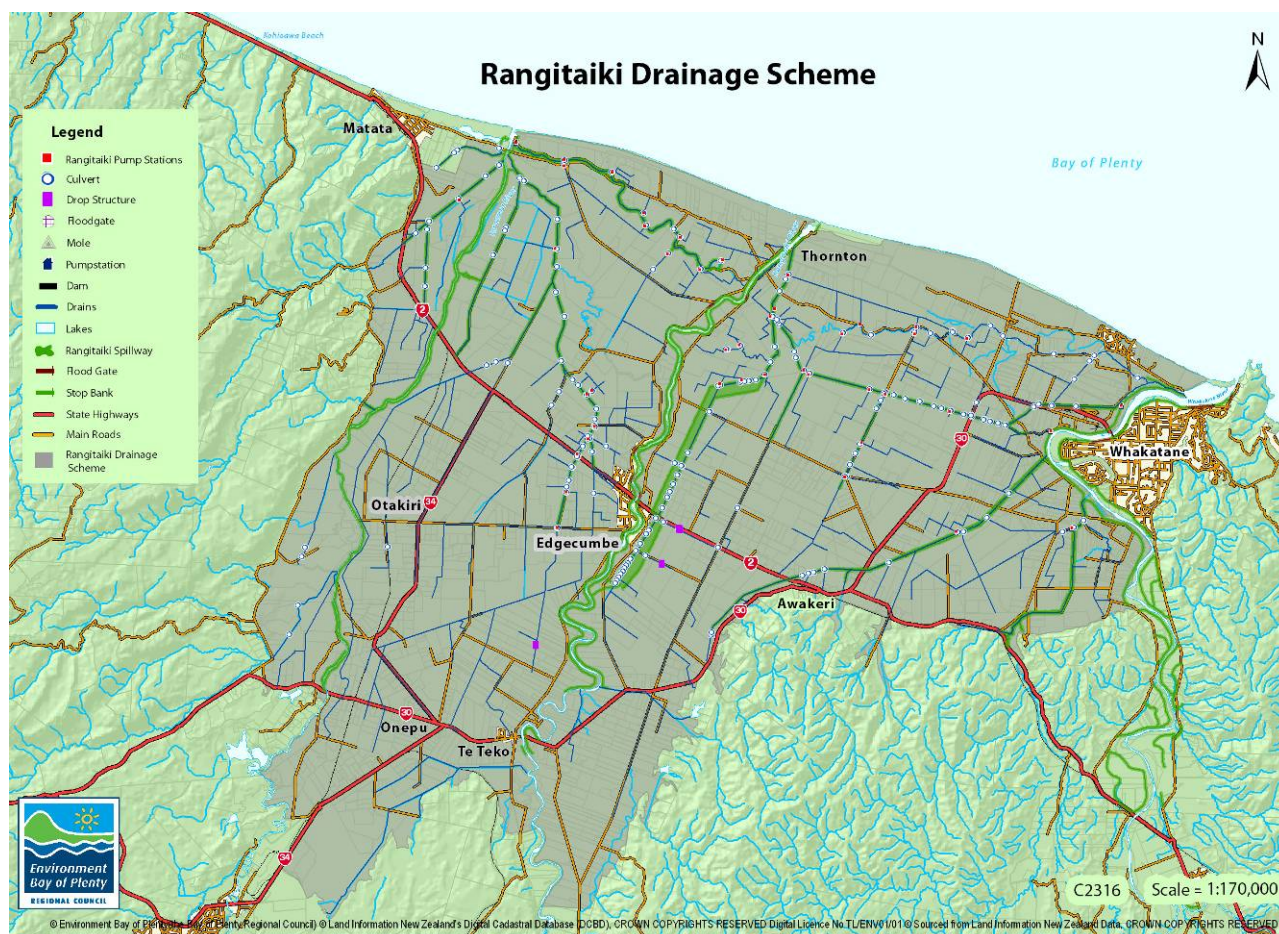


Figure 78 Rangitaiki drainage scheme area

Table 46 Asset information

	Quantity (m)	Estimated Base Life	Average Estimated Asset Age	Condition	ORC (\$)	ODRC (\$)	Total Depreciation (\$)
Structures	2,296	50	37		2,496,854	773,249	1,723,604
Waterways	366,475	Perpetuity			1,146,6675	11,466,675	0
<b>Total</b>	<b>368,767</b>		<b>37</b>		<b>13,963,529</b>	<b>12,239,925</b>	<b>1,723,604</b>

Figure 79 following shows the ORC for the drainage assets associated with the Rangitaiki Drainage Scheme, which amounts to \$13,963,530 (as at 1 July 2008). Waterways account for 82% of the ORC, with structures accounting for the remaining 18%.

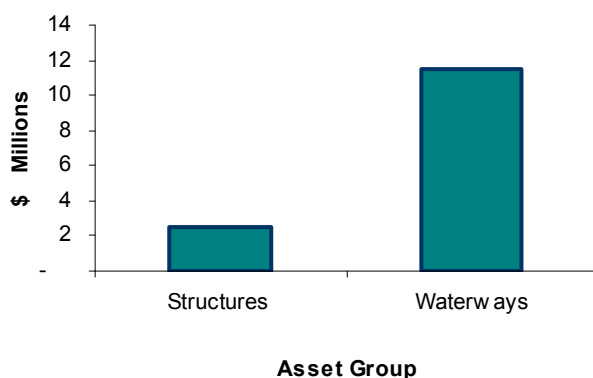


Figure 79 ORC for Rangitaiki drainage scheme assets

## Asset age

Figure 80 shows the average age and remaining useful life of the Rangitaiki Scheme drainage assets. On average the structures group of assets are 74% through their useful lives. The waterways assets have an assumed life of perpetuity.

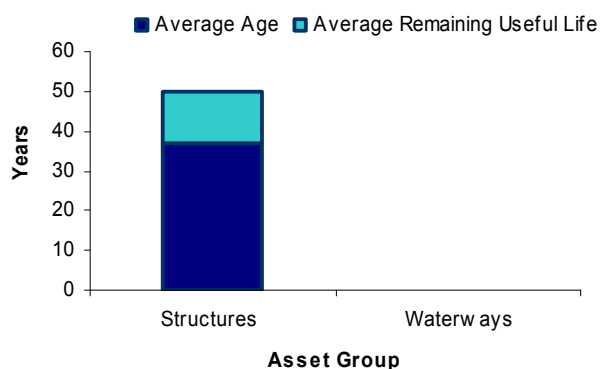


Figure 80 Age of Rangitaiki drainage scheme assets

## Asset condition

The following information relates to the condition of the Rangitaiki Drainage Scheme assets. This information is critical to the overall life cycle management of the assets, with regards to maintaining the asset at minimum cost, whilst maintaining the required level of service.

## Operations and Maintenance Plan

Table 47 summaries the operational expenditure for the Rangitaiki Drainage Scheme over the last five years, excluding depreciation. Expenditure has remained relatively stable through the period.

Table 47 Historical operations and maintenance expenditure for Rangitaiki drainage

	2004/05	2005/06	2006/07	2007/08	2008/09 (current)
Total (\$000)	651	669	666	639	

### Projected Operational Expenditure

Table 48 below sets out the projected operational expenditure for the Rangitaiki Scheme for the 50 years.

Table 48 Projected operations and maintenance expenditure for the Rangitaiki Drainage Scheme

	Ten years expenditure										Remaining 40 years expenditure			
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/2029	2030/2039	2040/2049	2050/2059
Maintenance	673,338	704,755	706,853	729,591	753,349	755,592	744,794	743,045	736,424	717,411	7,603,579	8,115,849	7,979,178	7,648,741
LAPP Contribution	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	138,000	138,000	138,000	138,000
Flood Damage Reserve	1,740	1,740	1,740	1,740	1,740	1,740	1,740	1,740	1,740	1,740	17,400	17,400	17,400	17,400
Projects & Investigations														
Predicted Flood Damage			30,000					15,000			45,000	45,000	45,000	45,000
Depreciation	46,574	46,693	48,847	46,026	46,044	46,157	46,193	46,231	46,241	46,259	476,095	494,832	496,409	497,602
<b>Total</b>	<b>735,452</b>	<b>766,988</b>	<b>801,240</b>	<b>791,157</b>	<b>814,933</b>	<b>817,289</b>	<b>806,527</b>	<b>819,816</b>	<b>798,205</b>	<b>779,210</b>	<b>8,280,074</b>	<b>8,811,081</b>	<b>8,675,987</b>	<b>8,346,743</b>

### Renewal Plan

The overall LoS objective is to steadily renew assets considering the following:

- ▶ The age profile
- ▶ The condition profile
- ▶ The level of ongoing maintenance
- ▶ The economic lives of the materials used
- ▶ Financial and customer risks

Renewals are reviewed regularly, with any deferred work re-prioritised alongside new renewal projects and a revised programme established where required. The projected 10 year renewal expenditure in Table 49 will be improved as data confidence, accuracy and asset condition assessments are updated during 2008. These budgets may be adequate to maintain current LoS, however, the potential number or size of problems that may be identified as confidence in the asset data increases may make these budgets inadequate in the future.

## Capital Works Plan

Capital works are generally initiated through triggers such as growth, LoS, regulatory or operational efficiency.

Table 49 below summarise the projected capital works to be undertaken over the next 10 years. More detail on funding sources for these projects is outlined in Section 11 Projects & Financial forecasts.

*Table 49 Projected renewals and capital expenditure for the Rangitaiki Drainage Scheme*

Year	Capital works	Renewal or new	How much	Funding source
Year 1 (2009/2010)	Multiple flood-gate replacements	Renewal	\$77,200	Replacement Reserve
Year 2 (2010/2011)	Multiple flood-gate replacements	Renewal	\$12,400	Replacement Reserve
Year 3 (2011/2012)	Multiple flood-gate replacements	Renewal	\$43,600	Replacement Reserve
Year 4 (2012/2013)	Multiple flood-gate replacements	Renewal	\$11,500	Replacement Reserve
Year 5 (2013/2014)	Multiple flood-gate replacements	Renewal	\$73,500	Replacement Reserve
Year 6 (2014/2015)	Multiple flood-gate replacements	Renewal	\$23,900	Replacement Reserve
Year 7 (2015/2016)	Multiple flood-gate replacements	Renewal	\$24,700	Replacement Reserve
Year 8 (2016/2017)	Multiple flood-gate replacements	Renewal	\$6,700	Replacement Reserve
Year 9 (2017/2018)	Multiple flood-gate replacements	Renewal	\$11,500	Replacement Reserve

## Disposal Plan

Bay of Plenty Regional Council does not have a disposal and/or acquisition plan or strategy developed for the Rangitaiki Drainage Scheme. There are no intentions to dispose of any of the scheme assets at this time as river scheme assets are not normally disposed of and design standards are not normally lowered. Although there is no current acquisition plan, with the potential effects of climate change it may be necessary to alter the required design parameters for the scheme dependent upon community wishes.

## Rangitaiki-Tarawera Rivers Scheme

### Overview

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

#### Edgecumbe/Lower Rangitaiki flood mitigation project

Flooding in 2004 has caused damage to private property and also raised concerns regarding the integrity of the stopbanks surrounding the town. Bay of Plenty Regional Council manages the drainage system outside of the town boundaries. Whakatane District Council and Bay of Plenty Regional Council worked together to investigate options to protect the town from future flooding. The identified options have been consulted on with affected parties and stakeholders prior to the lodgement of a resource consent applications and physical works are currently underway.

### Key issues

- ▶ Private ownership of riparian land restricting access.
- ▶ Water level variance as a result of hydroelectric power station activity causing bank erosion.
- ▶ High level of debt for the scheme, long-term sustainability an issue – 6-8,000 ratepayers. Previous flooding, Edgecumbe earthquake 1998 flooding, 2004/05 plus major capital projects including Edgecumbe earthquake restoration project, stopbank restoration project and the restoration works following the most recent floods. Government funding provided however required additional funds from ratepayers.
- ▶ Flood mitigation at Waitepuru from 2005 Matata floods.
- ▶ Dams - adverse effect on edge protection vegetation works due to fluctuations in water levels. Assists with attenuation during storms sedimentation of Aniwhenua Dam headwaters.
- ▶ Gravel accumulation in upper tributaries.
- ▶ Land use changes in the upper catchment increased discharges and increased gravel and sediment.
- ▶ Land use changes in the lower catchment causing access issues.



- Flood damage repair works ongoing.
- Stock damage.
- Weeds and pest control (damaging stopbanks).

## Asset description

Below is an overview map of the Rangitaiki-Tarawera Rivers Scheme.

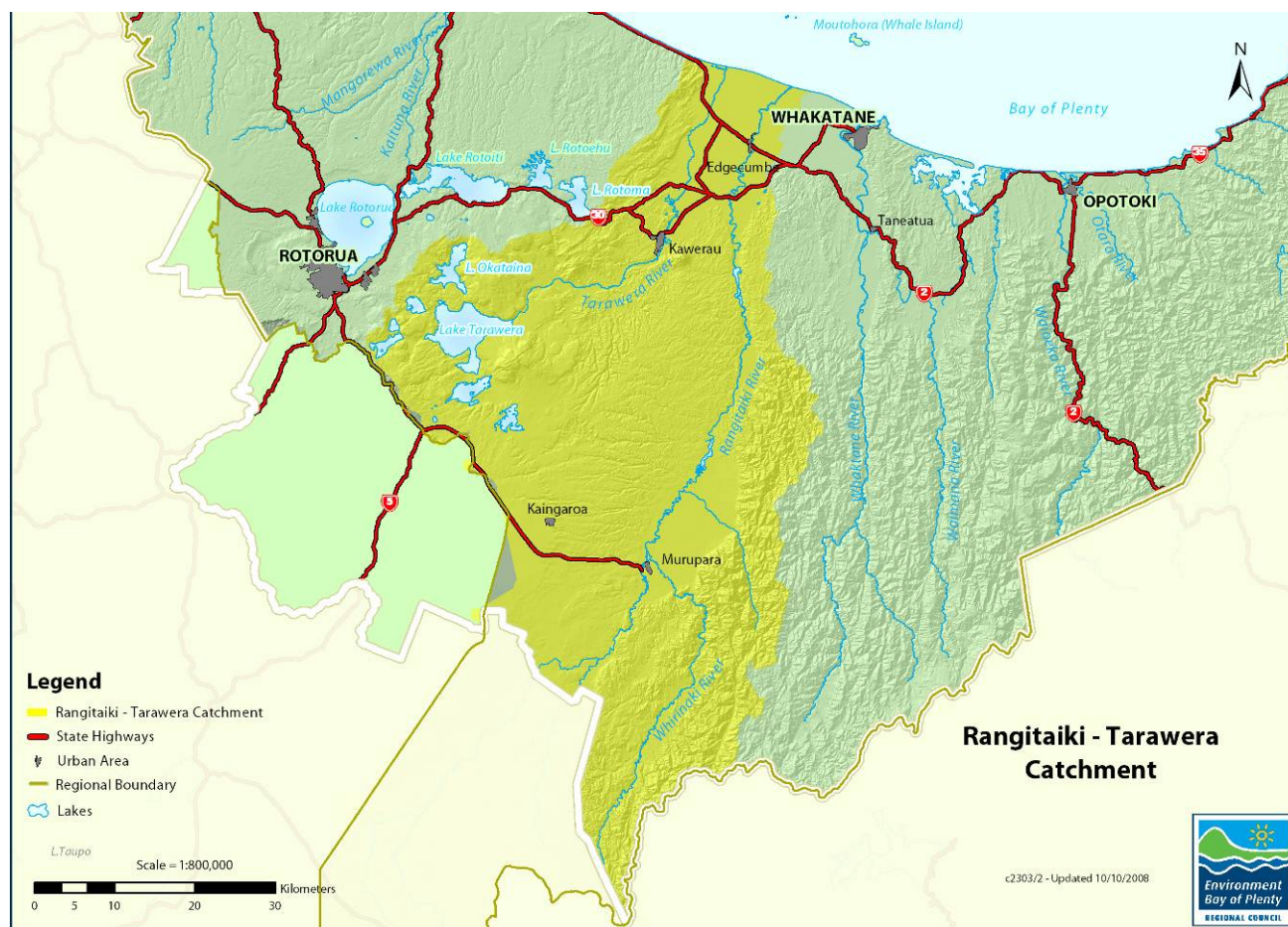


Figure 81 Rangitaiki-Tarawera Catchment

Table 50 below summaries the assets within the scheme indicating the expected life, age, condition and financial information for each item.

Table 50 Asset information

	Quantity (m)	Average Base Life	Average Estimated Asset Age	Condition	ORC (\$)	ODRC (\$)	Total Depreciation (\$)
Erosion protection	156,388	Perpetuity	18.0		11,073,866	11,073,867	0
Pump stations		40	5.0		728,764	635,992	92,772
Stopbanks	117,963	Perpetuity (with settlement)	15.9		45,458,998	43,145,307	2,313,691
Structures		55	14.3		1,282,601	894,354	388,247
<b>Total</b>			<b>15.3</b>		<b>58,544,231</b>	<b>55,749,520</b>	<b>2,794,711</b>

Figure 82 shows the ORC for the rivers and drainage assets associated with the Rangitaiki-Tarawera Rivers Scheme, which amounts to \$58,544,231 (as at 1 July 2008). Stopbanks account for 78% of the ORC, followed by erosion protection with 19%.





Figure 82 ORC for Rangitaiki-Tarawera Scheme assets

## Asset age

Figure 83 shows the average age and remaining useful life of the Rangitaiki-Tarawera's Rivers Scheme assets. Erosion protection and stopbanks have expected lives of perpetuity. The pump stations and structures assets both are less than halfway through their useful lives, with structures at 26% and pump stations at 12.5%.

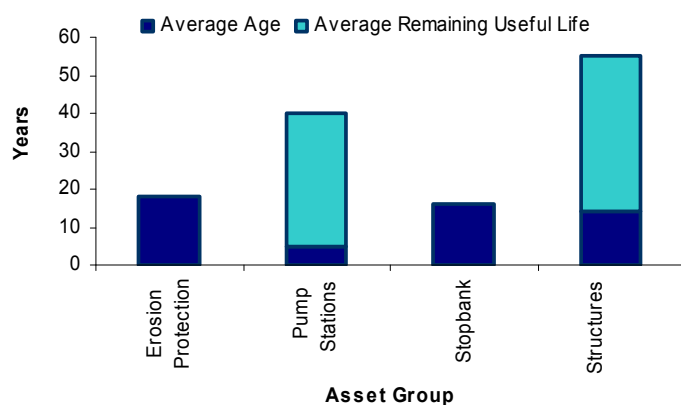


Figure 83 Age of Rangitaiki-Tarawera Scheme assets

## Asset condition

The following information relates to the condition of the Rangitaiki-Tarawera's Rivers Scheme assets. This information is critical to the overall life cycle management of the assets, with regards to maintaining the asset at minimum cost, whilst maintaining the required level of service. This data will be updated during 2009.

## Operations and Maintenance Plan

Table 51 below summaries the operational expenditure for the Rangitaiki-Tarawera Rivers Scheme over the last five years. This information shows that expenditure has varied as a result of the 2004 and 2005 flood events.

Table 51 Historical operations and maintenance expenditure for Rangitaiki-Tarawera Rivers Scheme

	2004/05	2005/06	2006/07	2007/08	2008/09 (current)
Total (\$000)	5,210	782	2,143	830	

## Projected operational expenditure

Table 52 below sets out the projected operational expenditure for the Rangitāiki-Tarawera Rivers Scheme for the next 50 years.

*Table 52 Projected operations and maintenance expenditure for Rangitāiki-Tarawera Rivers Scheme*

	Ten years expenditure										Remaining 40 years expenditure			
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/2029	2030/2039	2040/2049	2050/2059
Maintenance	912,018	1,168,913	1,214,790	1,344,936	1,449,701	1,504,255	1,508,302	1,506,480	1,508,433	1,548,979	13,068,190	912,018	1,168,913	1,214,790
LAPP Contribution	44,600	44,600	44,600	44,600	44,600	44,600	44,600	44,600	44,600	44,600	446,000	446,000	446,000	446,000
Flood Damage Reserve	43,625	51,300	54,378	39,641	42,019	44,540	47,213	50,045	44,048	46,691	482,722	508,599	554,943	637,936
Projects & Investigations	109,778	114,256	122,646	120,394	122,574	129,666	122,442	121,479	127,492	120,800	1,060,397	1,060,397	1,060,397	1,060,397
Predicted Flood Damage			300000					150000			450000	450000	450000	450000
Depreciation	186,309	192,459	196,209	204,459	212,709	218,409	220,509	222,309	224,124	225,393	2,311,892	2,357,883	2,435,483	2,517,119
<b>Total</b>	<b>1,296,330</b>	<b>1,571,528</b>	<b>1,932,623</b>	<b>1,754,030</b>	<b>1,871,603</b>	<b>1,941,470</b>	<b>1,943,066</b>	<b>2,094,913</b>	<b>1,948,697</b>	<b>1,986,463</b>	<b>17,819,201</b>	<b>13,597,832</b>	<b>13,426,845</b>	<b>13,653,795</b>

## Renewal Plan

The overall LoS objective is to steadily renew assets considering the following:

- ▶ The age profile
- ▶ The condition profile
- ▶ The level of ongoing maintenance
- ▶ The economic lives of the materials used
- ▶ Financial and customer risks

Renewals are reviewed regularly, with any deferred work re-prioritised alongside new renewal projects and a revised programme established where required. The projected 10 year renewal expenditure in Table 53 will be improved as data confidence, accuracy and asset condition assessments are updated during 2008. These budgets may be adequate to maintain current LoS, however, the potential number or size of problems that may be identified as confidence in the asset data increases may make these budgets inadequate in the future.

## Capital works plan

Capital works are generally initiated through triggers such as growth, LoS, regulatory or operational efficiency.

Table 53 below summarises the projected capital works to be undertaken over the next 10 years. More detail on funding sources for these projects is outlined in Section 11 Projects and Financial Forecasts.

*Table 53 Projected renewals and capital expenditure for Rangitaiki-Tarawera Rivers Scheme*

Year	Capital works	Renewal or new	How much	Funding source
Year 1 (2009/2010)	Rangitaiki-Tarawera stopbank strengthening (geotechnical) works	Renewal	\$1,250,000	Loans and Subsidy
Year 2 (2010/2011)	Rangitaiki-Tarawera stopbank strengthening (geotechnical) works – final stage	Renewal	\$1,250,000	Loans and Subsidy
Year 3 (2011/2012)	Rangitaiki Floodway widening – stage 1	New	\$2,750,000	Loans and Subsidy
Year 4 (2012/2013)	Rangitaiki floodway widening – stage 2	New	\$2,750,000	Loans and Subsidy
Year 5 (2013/2014)	Rangitaiki River spillway control structure	New	\$1,900,000	Loans and Subsidy
Year 6 (2014/2015)	Rangitaiki-Tarawera stopbanks (Te Teko school section)	New	\$100,000	Loans
	Tarawera River stopbanks – stage 1	Renewal	\$600,000	Loans
Year 7 (2015/2016)	Tarawera River stopbanks – stage 2	Renewal	\$600,000	Loans
Year 8 (2016/2017)	Rangitaiki River stopbanks – stage 1	Renewal	\$605,000	Loans
Year 9 (2017/2018)	Rangitaiki River stopbanks – stage 2	Renewal	\$423,000	Loans
Year 10 (2018/2019)	Floodway stopbank raising (outside of widened sections)	Renewal	\$800,000	Loans

## Disposal Plan

Bay of Plenty Regional Council does not have a disposal and/or acquisition plan or strategy developed for the Rangitaiki-Tarawera Rivers Scheme. There are no intentions to dispose of any of the scheme assets at this time as river and drainage scheme assets are not normally disposed of and design standards are not normally lowered. Although there is no current acquisition plan, with the potential effects of climate change it may be necessary to alter the required design parameters for the scheme dependent upon community wishes.

## Waioeka-Otara Rivers Scheme

### Overview

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

### Key issues

- ▶ Berm and river aggradation, particularly in tidal reaches.
- ▶ Gravel extraction (sustainability).
- ▶ Opotiki Harbour works (proposed Harbour groynes may affect flood levels).
- ▶ Private ownership of riparian land restricting access.
- ▶ Gravel accumulation.
- ▶ Land use changes in the upper catchment increased discharges and increased gravel and sediment.
- ▶ Flood damage repair works ongoing.
- ▶ Stock damage.
- ▶ Weeds and pest control (damaging stopbanks).
- ▶ Petersons ring bank, low lying area requires protection.
- ▶ State Highway 2 flooding, downstream of bridge.
- ▶ Gordon Estate erosion at the Waioeka confluence.
- ▶ Flood capacity underneath the Waioeka Bridge.
- ▶ Te Rere Pa area drainage and flooding.
- ▶ Site specific flooding issues (Te Rere Pa, Gordon Estate, Waioeka Bridge).

## Asset description

Below is an overview map of the Waioeka-Otara Rivers Scheme. A more detailed area map is located in Appendix B.

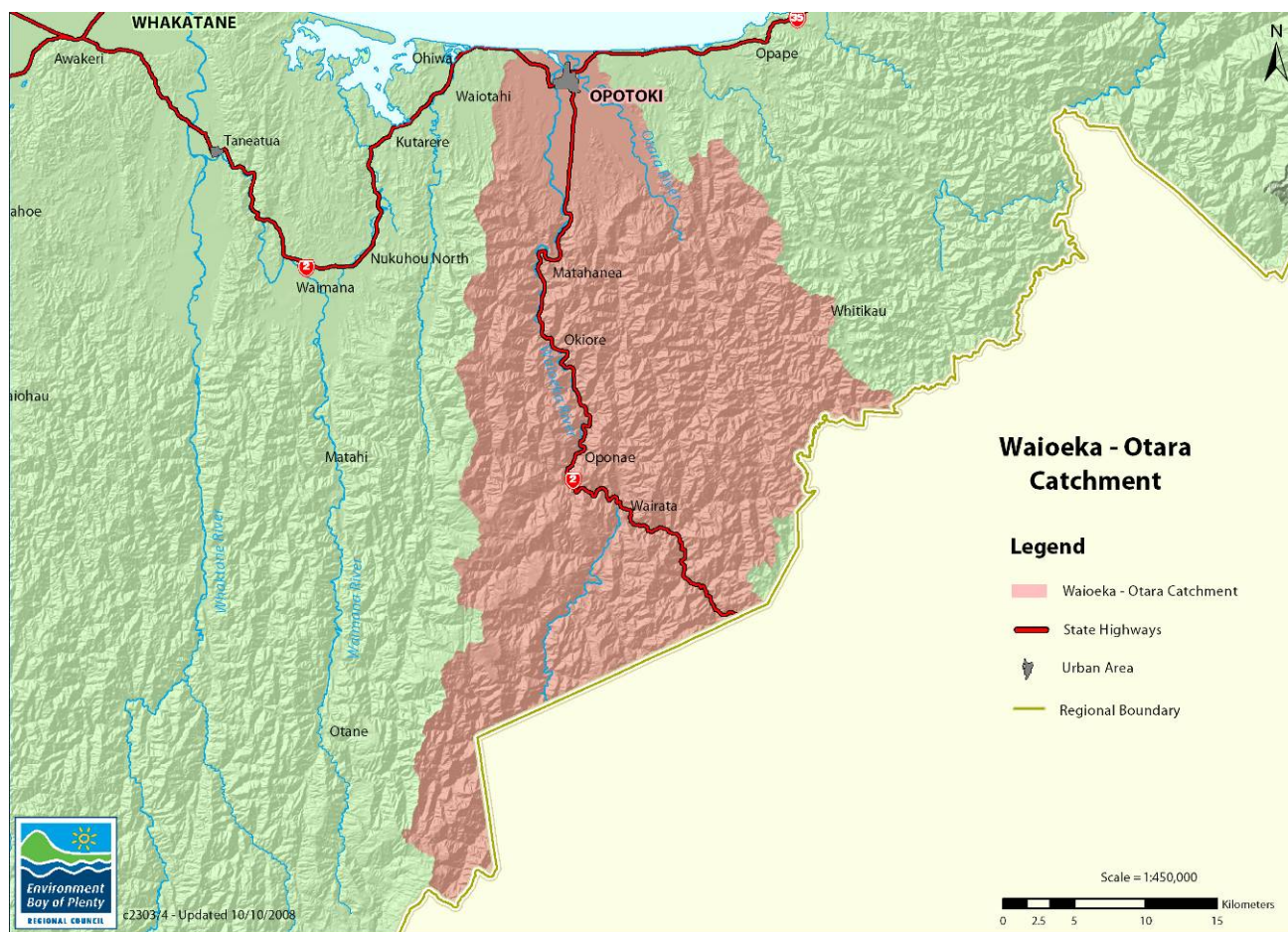


Figure 84 Waioeka-Otara Rivers Scheme

Table 54 below summarises the assets in the Waioeka-Otara Rivers Scheme indicating the expected life, age, condition and financial information for each item.

Table 54 Asset information

	Quantity (m)	Estimated Base Life	Estimated Average Asset Age	Condition	ORC (\$)	ODRC (\$)	Total Depreciation (\$)
Erosion protection	53,248	Perpetuity	5		2,919,100	2,919,099	0
Pump stations		40	13		232,145	161,953	70,192
Stopbanks	62,925	Perpetuity (with settlement)	12		23,749,616	22,880,108	869,509
Structures	379	50	11		432,028	374,067	57,961
Waterways	25,854	Perpetuity			404,880	404,880	0
<b>Total</b>	<b>191,893</b>		<b>11</b>		<b>27,737,769</b>	<b>26,740,108</b>	<b>997,662</b>

Figure 85 that follows shows the ORC for the rivers and drainage assets associated with the Waioeka-Otara Rivers Scheme, which amounts to \$27,737,769 (as at 1 July 2008). Stopbanks are the major asset accounting for 86% of the ORC, followed by erosion protection at 11%.

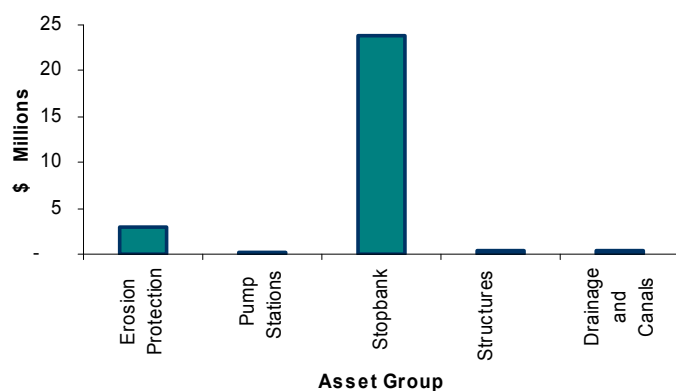


Figure 85 ORC for Waioeka-Otara Rivers Scheme assets

## Asset age

Figure 86 shows the average age and remaining useful life of Waioeka-Otara Rivers Scheme assets. Both the pump stations and structures groups of assets are less than one third through their useful lives. The erosion protection, stopbanks and drainage and canal assets have assumed lives of perpetuity.

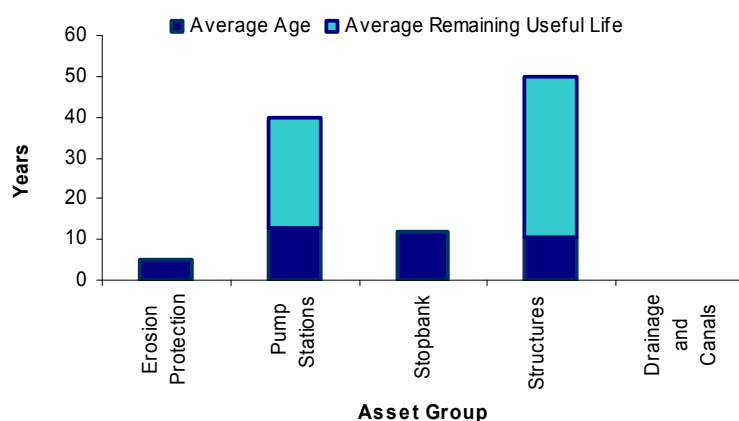


Figure 86 Age of Waioeka-Otara Rivers Scheme assets

## Asset condition

The following information relates to the condition of the Waioeka-Otara Rivers Scheme assets. This information is critical to the overall life cycle management of the assets, with regards to maintaining the asset at minimum cost, whilst maintaining the required level of service. This data will be updated during 2009.

## Operations and Maintenance Plan

Table 55 below summaries the operational expenditure (including Disaster Reserve contribution) for the Waioeka-Otara Rivers Scheme over the last five years. This information shows that expenditure has remained relatively stable over the period.

Table 55 Historical operation and maintenance expenditure for Waioeka-Otara

	2004/05	2005/06	2006/07	2007/08	2008/09 (current)
Total (\$000)	426	387	280	387	

### Projected operational expenditure

The table below sets out the projected operational expenditure for the Waioeka-Otara Rivers Scheme for the 50 years.

*Table 56 Projected operations and maintenance expenditure for the Waioeka-Otara Rivers Scheme*

	Ten years expenditure										Remaining 40 years expenditure			
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/2029	2030/2039	2040/2049	2050/2059
Maintenance	459,981	497,194	522,988	560,402	559,522	552,653	538,707	528,382	521,699	505,511	5,571,826	5,747,224	5,621,252	5,653,539
LAPP Contribution	8,900	8,900	8,900	8,900	8,900	8,900	8,900	8,900	8,900	8,900	89,000	89,000	89,000	89,000
Flood Damage Reserve	22,458	27,157	28,786	21,513	22,804	24,172	25,623	27,160	24,289	25,747	274,911	314,384	284,698	315,239
Projects & Investigations	66,694	69,946	74,534	74,208	75,653	79,288	75,536	74,914	77,743	74,449	777,430	777,430	777,430	777,430
Predicted Flood Damage			150,000					75,000			225,000	225,000	225,000	225,000
Depreciation	91,388	91,538	92,618	93,698	93,698	93,698	93,698	93,698	93,698	93,698	978,040	1,029,604	1,071,665	1,112,580
<b>Total</b>	<b>649,421</b>	<b>694,735</b>	<b>877,826</b>	<b>758,721</b>	<b>760,577</b>	<b>758,711</b>	<b>742,464</b>	<b>808,054</b>	<b>726,329</b>	<b>708,305</b>	<b>7,916,207</b>	<b>8,182,642</b>	<b>8,069,045</b>	<b>8,172,788</b>

### Renewal Plan

The overall LoS objective is to steadily renew assets considering the following:

- ▶ The age profile
- ▶ The condition profile
- ▶ The level of ongoing maintenance
- ▶ The economic lives of the materials used
- ▶ Financial and customer risks

Renewals are reviewed regularly, with any deferred work re-prioritised alongside new renewal projects and a revised programme established where required.

The projected 10 year renewal expenditure in Table 49 will be improved as data confidence, accuracy and asset condition assessments are updated during 2008. These budgets may be adequate to maintain current LoS, however, the potential number or size of problems that may be identified as confidence in the asset data increases may make these budgets inadequate in the future.



## Capital Works Plan

Capital works are generally initiated through triggers such as growth, LoS, regulatory or operational efficiency.

Table 57 below summarise the projected capital works to be undertaken over the next 10 years. More detail on funding sources for these projects is outlined in Section 11 Projects and Financial Forecasts.

Table 57 Projected renewals expenditure for the Waioeka-Otara Rivers Scheme

Year	Capital works	Renewal or new	How much	Funding source
Year 2 (2010/2011)	Waioeka-Otara stopbank top ups - stage 1	Renewal	\$360,000	Loans & Replacement Reserve
Year 3 (2011/2012)	Waioeka-Otara stopbank top ups - stage 2	Renewal	\$360,000	Loans & Replacement Reserve

## Disposal Plan

Bay of Plenty Regional Council does not have a disposal and/or acquisition plan or strategy developed for the Waioeka-Otara Rivers Scheme as these functions are not usually relevant in the management of river schemes. There are no intentions to dispose of any of the Waioeka-Otara Rivers Scheme assets at this time.

## Whakatāne-Waimana Rivers Scheme

### Overview

The Whakatane-Waimana Rivers Scheme provides flood protection, channel edge stability and drainage to the Whakatane River and Waimana River Catchments. All schemes (except Rangitaiki drainage and Kaituna) have Floodplain Management Strategies. These Strategies are non-statutory documents that pull together various measures available to authorities and the community for managing flood risk. These Strategies cover include stopbank and river works, upper catchment management, statutory plans, emergency management and education.

### Whakatāne-Waimana Floodplain Management Strategy

A Floodplain Management Strategy has been prepared for Whakatane-Waimana. The purpose of the Strategy being to:

- ▶ Stage 1 – establish the context for flood hazard
- ▶ Stage 2 – Identify mitigation options
- ▶ Stage 3 – Treat flood problem

Stages 1 was completed in January 2007 (updated in June 2008) and Stage 2 was completed in June 2008. Stage 3 was not required since recommendations from the previous two stages could be implemented simply and independently.

### Key issues

- ▶ Berm and river aggradation, particularly in tidal reaches.
- ▶ Private ownership of riparian land restricting access, particularly in the Waimana River.
- ▶ Gravel accumulation and extraction.
- ▶ Land use changes in the upper Catchment increased discharges and increased gravel and sediment.
- ▶ Flood damage repair works ongoing.
- ▶ Stock damage.
- ▶ Weeds and pest control (damaging stopbanks).
- ▶ Maintenance of flood relief fuse at River mouth.
- ▶ High level of debt.
- ▶ Add environmental list i.e. fish passage and contaminated sites.
- ▶ Contaminated sediments in the lower reaches of the Kope-Orini Canal from industry discharge.

## Asset description

Below is an overview map of the Whakatane-Waimana Rivers Scheme.

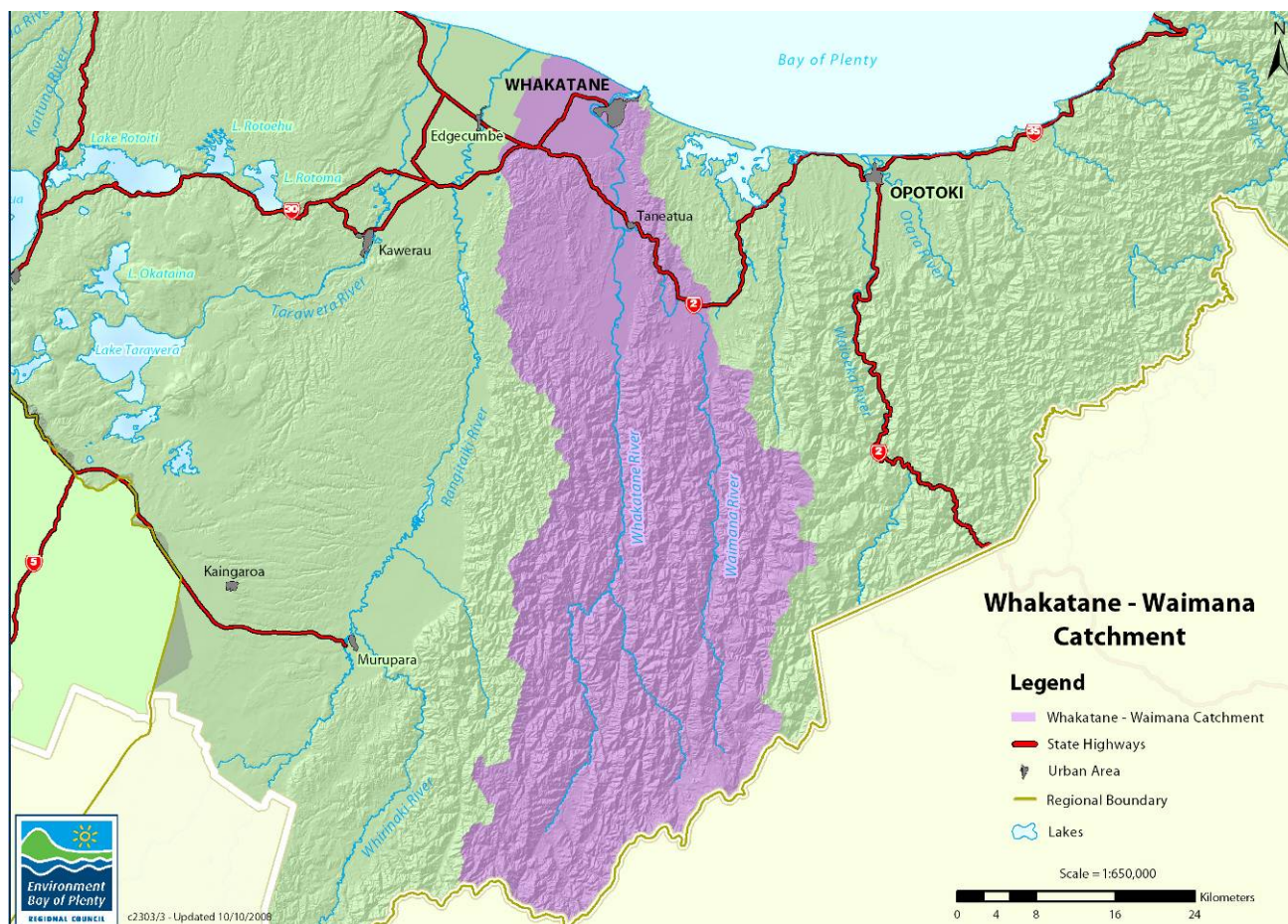


Figure 87 Whakatāne-Waimana Rivers Scheme

Table 58 summarises the assets within the scheme, indicating the expected life, age, condition and financial information for each item.

Table 58 Asset information

	Quantity (m)	Estimated Base Life	Estimated Average Asset Age	Condition	ORC (\$)	ODRC (\$)	Total Depreciation (\$)
Erosion protection	90,945	Perpetuity	15		5,816,350	5,816,350	0
Pump stations		40	15		2,325,087	1,674,310	650,777
Stopbanks	85,676	Perpetuity (with settlement)	10.		36,398,622	35,236,172	1,162,450
Structures		51	25		1,883,719	961,328	922,391
<b>Total</b>	<b>178,124</b>		<b>14</b>		<b>46,423,778</b>	<b>43,688,161</b>	<b>2,735,618</b>

Figure 88 shows the ORC for the rivers and drainage wastewater assets associated with the Whakatane-Waimana Rivers Scheme, which amounts to \$46,423,778 (as at 1 July 2008). Stopbanks are the major asset in this scheme accounting for 78% of the ORC, followed by erosion protection (13%), pump stations (5%) and finally structures (4%).

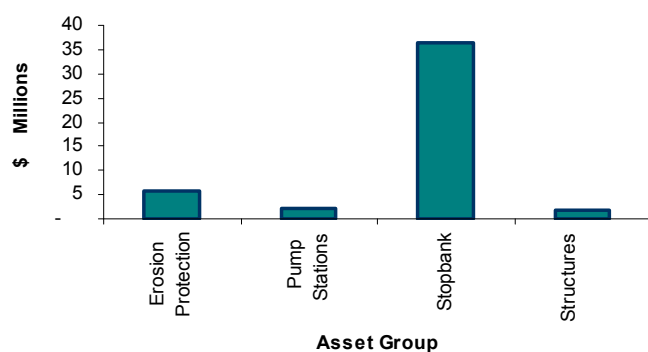


Figure 88 ORC for Whakatāne-Waimana Scheme assets

## Asset age

Figure 89 shows the average age and remaining useful life of the Whakatane-Waimana Rivers Scheme assets. The structures assets average approximately halfway through their useful lives (49%) with the pump stations less than halfway (38%). The erosion protection and stopbank assets have estimated lives of perpetuity.

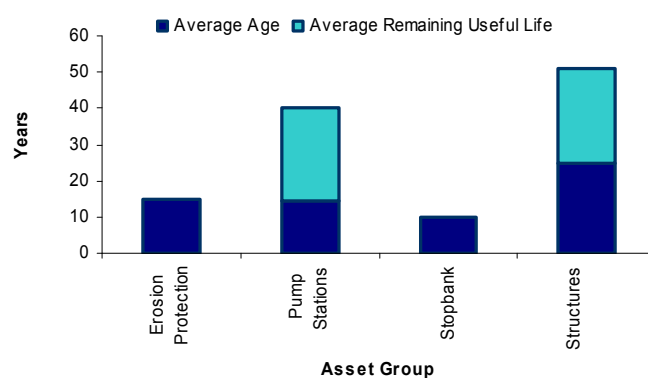


Figure 89 Age of Whakatāne-Waimana Scheme assets

## Asset condition

The following information relates to the condition of the Whakatane-Waimana Rivers Scheme assets. This information is critical to the overall life cycle management of the assets, with regards to maintaining the asset at minimum cost, whilst maintaining the required level of service. The asset condition data will be updated during 2009.

## Operations and Maintenance Plan

Table 59 below summaries the operational expenditure for the Whakatane-Waimana Rivers Scheme over the last five years. This information shows that expenditure has varied over the period. This is attributed to works required following the 2004 and 2005 flood events.

Table 59 Historical operations and maintenance expenditure for the Whakatāne-Waimana Rivers Scheme

	2004/05	2005/06	2006/07	2007/08	2008/09
Total (\$000)	4,036	838	1,571	675	

## Project operational expenditure

Table 60 below sets out the projected operational expenditure for the Whakatāne-Waimana Rivers Scheme for the 50 years.

*Table 60 Projected operations and maintenance expenditure for the Whakatāne-Waimana Rivers Scheme*

	Ten years expenditure										Remaining 40 years expenditure			
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/2029	2030/2039	2040/2049	2050/2059
Maintenance	848,142	970,506	983,732	1,016,248	1,015,415	992,171	979,694	1,150,270	951,691	918,255	9,041,828	9,410,483	9,799,795	8,644,743
LAPP Contribution	20,500	20,500	20,500	20,500	20,500	20,500	20,500	20,500	20,500	20,500	205,000	205,000	205,000	205,000
Flood Damage Reserve	59,342	68,562	72,676	53,036	56,218	59,591	63,167	66,957	58,974	62,513	647,233	684,588	751,484	871,284
Projects & Investigations	95,202	99,297	106,189	104,820	106,737	112,425	106,599	105,759	110,444	105,154	1,008,813	1,008,813	1,008,813	1,008,813
Predicted Flood Damage			400,000					20,000			600,000	600,000	600,000	600,000
Depreciation	196,613	197,663	198,713	199,463	200,063	200,063	200,963	201,863	201,863	201,863	2,062,707	2,151,586	2,254,750	2,320,693
<b>Total</b>	<b>1,219,799</b>	<b>1,356,528</b>	<b>1,781,810</b>	<b>1,394,067</b>	<b>1,398,933</b>	<b>1,384,750</b>	<b>1,370,923</b>	<b>1,565,349</b>	<b>1,343,472</b>	<b>1,308,285</b>	<b>13,565,581</b>	<b>14,060,470</b>	<b>14,619,842</b>	<b>13,650,533</b>

## Renewal Plan

The overall LoS objective is to steadily renew assets considering the following:

- ▶ The age profile
- ▶ The condition profile
- ▶ The level of ongoing maintenance
- ▶ The economic lives of the materials used
- ▶ Financial and customer risks

Renewals are reviewed regularly, with any deferred work re-prioritised alongside new renewal projects and a revised programme established where required.

The projected 10 year renewal expenditure in Table 61 will be improved as data confidence, accuracy and asset condition assessments are updated during 2009. These budgets may be adequate to maintain current LoS, however, the potential number or size of problems that may be identified as confidence in the asset data increases may make these budgets inadequate in the future.

## Capital Works Plan

Capital works are generally initiated through triggers such as growth, LoS, regulatory or operational efficiency.

Table 61 summaries the projected capital works to be undertaken over the next 10 years. More detail on funding sources for these projects is outlined in Section 11 Projects and Financial Forecasts.

*Table 61 Projected renewals and capital expenditure for the Whakatāne-Waimana Rivers Scheme*

Year	Capital works	Renewal or new	How much	Funding source
Year 1 (2009/2010)	Waioho Canal stopbanks top up - stage 1	Renewal	\$350,000	Loans
Year 2 (2010/2011)	Waioho Canal stopbanks top up - stage 2	Renewal	\$350,000	Loans
Year 3 (2011/2012)	Whakatane-Waimana stopbank reconstruction (Te Rahu Drain - Barrs)	New	\$250,000	Loans
Year 4 (2012/2013)	Te Rahu Canal stopbank renewal	Renewal	\$200,000	Loans
Year 6 (2014/2015)	Whakatane-River stopbanks – stage 1	Renewal	\$300,000	Loans
Year 7 (2015/2016)	Whakatane-River stopbanks – stage 2	Renewal	\$300,000	Loans

## Disposal/Acquisition Plan

Bay of Plenty Regional Council does not have a disposal and/or acquisition plan or strategy developed for the Whakatane-Waimana Rivers Scheme as these functions are not usually relevant in the management of river schemes. There are no intentions to dispose of any of the Whakatane-Waimana Rivers Scheme assets at this time.





## Projects and financial forecasts

### Overview

To undertake a sustainable, long-term approach to asset management, it is essential to prepare long-term financial forecasts. This allows a long term view of how the asset will be managed, how much this will cost and when additional funding may be required to meet expected service levels. These financial forecasts are a culmination of the previously discussed aspects of the AMP such as:

- ▶ Community engagement
- ▶ Levels of service
- ▶ Demand management
- ▶ Lifecycle management
- ▶ Asset lives
- ▶ Condition ratings
- ▶ Asset valuation

The above forms the basis of the long-term operations, maintenance and capital requirements. Funding requirements have also been included in the financial statements.

### Expenditure

Expenditure on infrastructure assets can be categorised into some key areas, which are discussed below:

#### Operations and maintenance

Operations and maintenance expenditure is that required for the day-to-day operation of the network whilst maintaining the current levels of service. Examples of this type of expenditure are:

- ▶ Overheads
- ▶ Minor replacements

Maintenance costs are generally subdivided into three groups; these are described in Table 62.

Table 62 Maintenance types

Maintenance type	General meaning
Routine	Day to day maintenance which is required on an ongoing basis and is budgeted for.
Planned (proactive)	Non day to day maintenance which is identified in advance and is incorporated into a maintenance budget for a certain time period.
Reactive	Maintenance that is unexpected and necessary to attend to immediately to continue operation of the service.

#### Replacement (renewals)

Renewal expenditure 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.

#### Capital works (new works)

Capital works (new 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.

#### Disposals

Asset disposal is the retirement or sale of assets whether surplus or superseded by new or improved systems. Assets may become surplus to requirements due to obsolescence, under utilisation, changes in policy etc.

## Asset management assumptions

The following rivers and drainage asset management assumptions have been made in preparing the 50-year expenditure forecasts:

- ▶ Asset information is as complete as possible at 1 July 2008. This is based on the valuation data and report compiled by the Rivers and Drainage Team.
- ▶ Only rivers and drainage assets have been valued.
- ▶ The determination of, asset replacement value, depreciated value, and renewal projections are based on the valuation data as at 1 July 2008.
- ▶ All projected expenditure is stated in dollar values as at 1st July 2008. With no allowance made for inflation.
- ▶ Operational costs are largely based on historical expenditure.
- ▶ Maintenance and operations allocations are largely based on maintaining current service levels.
- ▶ The depreciation has been calculated on a straight-line basis.
- ▶ Confidence in the financial data used to produce the 50-year forecasts for this AMP has been assessed at 70-75%.
- ▶ Council staff have developed this programme. No formal consultation has been undertaken with the public.
- ▶ It is assumed that regulations relating to rivers and drainage will remain essentially the same over the planning period (i.e. 50 years to June 2059).

The TYP assumptions and associated risks are outlined at the end of this section.

## Summary financial forecast – all schemes

The tables below contains the Rivers and Drainage Statement of Financial Performance, which incorporates the projected income and funding sources to fund operational, renewal and capital expenditure for the next 50 years (2008/2009 – 2058/2059).

Table 63 Rivers and drainage financial performance 2008/2009 – 2058/2059

	Forecast for the financial year ending June										Forecast for 10 year period ending June			
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/ 2029	2030/ 2039	2040/ 2049	2050/ 2059
<b>Revenue</b>														
Targeted rates	4,510,606	5,013,789	5,198,509	5,448,132	5,746,485	5,914,046	5,920,341	5,942,073	5,953,172	6,024,270	61,018,470	54,161,563	52,274,660	51,507,999
General rates	312,754	353,365	371,955	403,648	419,338	442,147	456,595	452,500	460,494	477,711	5,426,259	4,666,514	4,486,364	4,441,382
Investment income	611,579	661,976	679,130	710,846	723,237	754,555	771,045	752,030	757,816	771,626	7,765,239	6,678,006	6,420,204	6,355,832
User fees and charges	81,540	81,540	81,540	81,540	81,540	81,540	81,540	81,540	81,540	81,540	815,400	815,400	815,400	815,400
Vested asset revenue	2,100,000	0	0	0	0	0	0	0	0	0	0	0	0	0
Other public funding	676,657	1,332,500	907,500	907,500	627,000	0	0	0	0	0	0	0	0	0
Interest from reserves	51,146	100,311	115,989	56,026	71,022	83,199	99,089	115,887	96,375	122,386	1,240,385	1,420,700	1,792,005	2,098,675
<b>Total operating revenue</b>	<b>8,344,283</b>	<b>7,543,481</b>	<b>7,354,623</b>	<b>7,607,692</b>	<b>7,668,623</b>	<b>7,275,488</b>	<b>7,328,610</b>	<b>7,344,030</b>	<b>7,349,396</b>	<b>7,477,533</b>	<b>76,265,753</b>	<b>67,742,183</b>	<b>65,788,633</b>	<b>65,219,287</b>
<b>Expenditure</b>														
<b>Operational costs by scheme</b>														
Kaituna Catchment Control Scheme	994,653	1,045,719	1,460,499	1,079,063	1,104,575	1,113,603	1,098,354	1,296,151	1,096,120	1,145,652	11,699,800	11,699,800	11,699,800	11,699,800
Rangitāiki Drainage Scheme	688,878	718,228	752,392	745,131	768,889	771,132	760,334	773,585	751,963	732,950	7,595,000	7,595,000	7,595,000	7,595,000
Rangitāiki-Tarawera Rivers Scheme	792,357	811,372	1,131,803	842,950	854,889	865,052	853,531	1,002,942	857,423	912,666	9,073,000	9,073,000	9,073,000	9,073,000
Waioeka-Otara Rivers Scheme	486,866	499,240	663,131	524,897	533,530	538,898	530,374	604,208	531,284	522,654	5,680,000	5,680,000	5,680,000	5,680,000
Whakatāne-Waimana Rivers Scheme	795,735	812,639	1,230,809	844,781	856,617	865,263	854,656	1,053,279	856,133	845,077	9,150,000	9,150,000	9,150,000	9,150,000
Interest	688,959	1,153,040	1,216,260	1,344,658	1,492,207	1,568,323	1,559,377	1,542,489	1,496,304	1,432,332	13,651,593	10,216,360	9,484,517	8,894,629
Depreciation	760,010	816,281	829,316	837,928	878,518	887,619	890,851	894,360	896,695	898,053	9,232,492	9,505,609	9,784,718	10,038,307
<b>Total expenditure</b>	<b>5,207,458</b>	<b>5,856,519</b>	<b>7,284,210</b>	<b>6,219,408</b>	<b>6,489,225</b>	<b>6,609,890</b>	<b>6,547,476</b>	<b>7,167,016</b>	<b>6,485,921</b>	<b>6,489,384</b>	<b>66,081,885</b>	<b>62,919,769</b>	<b>62,467,036</b>	<b>62,130,736</b>
<b>Operating surplus (Deficit)</b>	<b>3,136,825</b>	<b>1,686,962</b>	<b>70,413</b>	<b>1,388,284</b>	<b>1,179,398</b>	<b>665,598</b>	<b>781,134</b>	<b>177,014</b>	<b>863,475</b>	<b>988,149</b>	<b>10,183,868</b>	<b>4,822,414</b>	<b>3,321,597</b>	<b>3,088,551</b>
<b>Reserve transfers</b>														
Transfers to Flood Damage Reserve	(210,529)	(259,694)	(275,275)	(214,992)	(227,891)	(241,565)	(256,059)	(271,422)	(249,308)	(264,266)	(2,795,374)	(3,014,526)	(3,205,371)	(3,561,799)
Transfers to General Reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfers to Asset Replacement Reserves	(1,426,666)	(2,128,780)	(1,736,911)	(1,745,844)	(1,508,030)	(888,634)	(893,263)	(898,207)	(903,144)	(915,555)	(9,271,319)	(9,505,599)	(9,886,295)	(10,080,199)
Transfers from Flood Damage Reserve	0	0	1,280,000	0	0	0	0	640,000	0	0	1,920,000	1,920,000	1,920,000	1,920,000

	Forecast for the financial year ending June										Forecast for 10 year period ending June			
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/ 2029	2030/ 2039	2040/ 2049	2050/ 2059
Cash surplus from Depreciation	760,010	816,281	829,316	837,928	878,518	887,619	890,851	894,360	896,695	898,053	9,232,492	9,505,609	9,784,718	10,038,307
Transfers from General Reserves	19,020	45,924	55,297	49,315	89,877	77,051	50,378	79,349	69,997	61,493				
<b>Net surplus (Deficit) after reserve transfer</b>	<b>2,278,660</b>	<b>160,693</b>	<b>222,840</b>	<b>314,692</b>	<b>411,872</b>	<b>500,069</b>	<b>573,041</b>	<b>621,095</b>	<b>677,715</b>	<b>767,874</b>	<b>9,269,667</b>	<b>3,727,898</b>	<b>1,934,649</b>	<b>1,404,860</b>
<b>Capital statement</b>														
Loans advance	2,442,734	1,653,057	2,675,761	3,078,764	2,157,954	1,021,407	989,813	616,839	423,000	800,000	10,203,270	10,419,938	9,106,640	12,376,476
Transfers from Asset Replacement Reserves	1,457,293	2,094,488	1,731,568	1,710,902	1,532,974	865,362	869,357	854,829	734,821	757,516	10,805,366	9,452,078	9,212,633	9,943,664
Net surplus (Deficit) after reserve transfers	2,278,660	160,693	222,840	314,692	411,872	500,069	573,041	621,095	677,715	767,874	9,269,667	3,727,898	1,934,649	1,404,860
<b>Total capital funding</b>	<b>6,178,688</b>	<b>3,908,238</b>	<b>4,630,170</b>	<b>5,104,358</b>	<b>4,102,800</b>	<b>2,386,837</b>	<b>2,432,211</b>	<b>2,092,763</b>	<b>1,835,537</b>	<b>2,325,390</b>	<b>30,278,304</b>	<b>23,599,914</b>	<b>20,253,922</b>	<b>23,725,000</b>
Capital expenditure – renewal	3,377,200	3,222,400	1,106,600	1,461,500	1,172,500	1,232,900	1,192,200	791,700	464,800	862,600	8,017,048	7,721,338	6,715,436	10,139,691
Capital expenditure – new	0	0	2,750,000	2,750,000	1,900,000	0	0	0	0	0	4,545,566	3,170,566	3,425,940	3,505,940
Capital expenditure – growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vested assets to capital	2,100,000	0	0		0	0	0	0	0	0	0	0	0	0
Debt repayment	701,487	685,838	773,569	892,858	1,030,300	1,153,938	1,240,011	1,301,062	1,370,737	1,462,790	17,715,689	12,708,009	10,112,546	10,079,369
<b>Total capital expenditure</b>	<b>6,178,687</b>	<b>3,908,238</b>	<b>4,630,169</b>	<b>5,104,358</b>	<b>4,102,800</b>	<b>2,386,838</b>	<b>2,432,211</b>	<b>2,092,762</b>	<b>1,835,537</b>	<b>2,325,390</b>	<b>30,278,304</b>	<b>23,599,914</b>	<b>20,253,922</b>	<b>23,725,000</b>
<b>Net surplus (Deficit)</b>	<b>0</b>	<b>(0)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>(0)</b>	<b>(0)</b>	<b>0</b>	<b>(0)</b>	<b>(0)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## Maintenance planning

### Operations and maintenance

Maintenance strategies cover the policies that will determine how the rivers and drainage schemes will be operated and maintained on a day-to-day basis to consistently achieve the optimum use of the asset. The work categories are defined as follows:

#### Routine (general) maintenance

Routine maintenance is the regular ongoing day-to-day work that is necessary to keep assets operating, including instances where portions of the asset fail and need immediate repair to make the asset operational again. This work falls into two broad categories as follows:

#### Planned (proactive)

Proactive inspection and maintenance works planned to prevent asset failure.

## Reactive

Reactive action to correct asset malfunctions and failures on an as required basis.

A key element of asset management planning is determining the most cost-effective blend of planned and unplanned maintenance as illustrated in Figure 90.

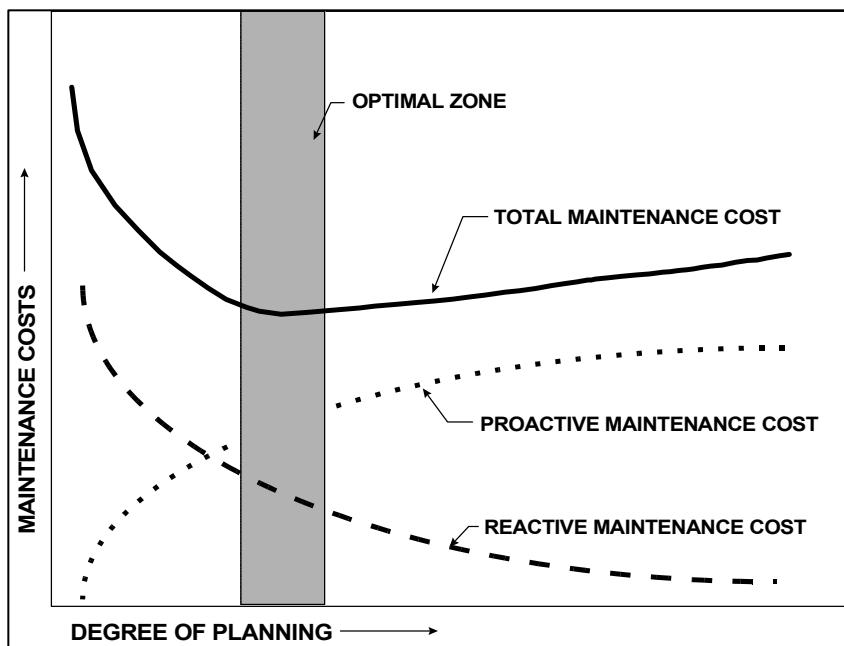


Figure 90 Balancing proactive and reactive maintenance

The short-term maintenance strategy is intended to maintain the current levels of service standards. The long-term maintenance strategy will be modified to reflect the following factors:

- ▶ **Risk of failure** – the risk associated with failure of critical assets
- ▶ **Levels of service** – changes in the current or agreed level of service
- ▶ **Economic efficiency** – asset condition assessment
- ▶ **Extend the life of the asset component** – asset improvements and development programme
- ▶ **Legislative compliance** – e.g. requirements of, LGA 2002, DWSNZ

## Kaituna Catchment Control Scheme financial summary 2008/2009 – 2058/2059

Table 64 Forecast financial summary (\$)

	Forecast for the financial year ending June										Forecast for 10 year period ending June			
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/ 2029	2030/ 2039	2040/ 2049	2050/ 2059
<b>Revenue</b>														
Targeted rates	1,066,498	1,186,726	1,221,902	1,246,480	1,343,876	1,395,471	1,376,932	1,372,440	1,364,708	1,395,031	14,803,569	14,713,070	14,029,716	14,471,072
General rates	88,395	98,785	102,742	108,080	114,313	121,099	122,983	120,928	121,951	127,099	1,522,344	1,513,038	1,442,764	1,488,151
Investment income	172,853	185,058	187,558	190,335	197,156	206,665	207,680	200,976	200,689	205,298	2,178,548	2,165,230	2,064,665	2,129,617
User fees and charges	15,245	15,245	15,245	15,245	15,245	15,245	15,245	15,245	15,245	15,245	152,450	152,450	152,450	152,450
Vested asset revenue	2,100,000	0	0	0	0	0	0	0	0	0	0	0	0	0
Other public funding	264,157	920,000	0	0	0	0	0	0	0	0	0	0	0	0
Interest from reserves	27,170	51,323	57,517	40,082	45,602	51,453	57,655	64,229	59,198	74,446	748,533	766,319	885,886	970,758
<b>Total operating revenue</b>	<b>3,734,318</b>	<b>2,457,137</b>	<b>1,584,964</b>	<b>1,600,223</b>	<b>1,716,192</b>	<b>1,789,933</b>	<b>1,780,496</b>	<b>1,773,819</b>	<b>1,761,790</b>	<b>1,817,118</b>	<b>19,405,445</b>	<b>19,310,107</b>	<b>18,575,481</b>	<b>19,212,047</b>
<b>Expenditure</b>														
Operating costs	994,653	1,045,719	1,460,499	1,079,063	1,104,575	1,113,603	1,098,354	1,296,151	1,096,120	1,145,652	11,699,800	11,699,800	11,699,800	11,699,800
Interest	72,677	133,093	137,283	148,088	212,599	264,776	256,657	252,473	242,330	230,630	3,397,262	3,096,238	2,449,105	3,016,765
Depreciation	239,125	287,928	292,928	294,281	326,004	329,291	329,486	330,258	330,767	330,839	3,403,759	3,471,705	3,526,411	3,590,313
<b>Total expenditure</b>	<b>1,306,455</b>	<b>1,466,740</b>	<b>1,890,710</b>	<b>1,521,433</b>	<b>1,643,178</b>	<b>1,707,671</b>	<b>1,684,498</b>	<b>1,878,883</b>	<b>1,669,217</b>	<b>1,707,121</b>	<b>18,500,822</b>	<b>18,267,743</b>	<b>17,675,316</b>	<b>18,306,878</b>
<b>Operating surplus (Deficit)</b>	<b>2,427,863</b>	<b>990,397</b>	<b>(305,747)</b>	<b>78,791</b>	<b>73,014</b>	<b>82,262</b>	<b>95,998</b>	<b>(105,064)</b>	<b>92,573</b>	<b>109,997</b>	<b>904,623</b>	<b>1,042,364</b>	<b>900,165</b>	<b>905,170</b>
<b>Reserve transfers</b>														
Transfers to flood damage	(79,083)	(103,235)	(109,429)	(91,995)	(97,515)	(103,366)	(109,568)	(116,142)	(111,110)	(117,777)	(1,246,256)	(1,285,446)	(1,353,020)	(1,474,035)
Transfers to general reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfers to asset replacement	(493,282)	(1,187,928)	(292,928)	(294,281)	(326,004)	(329,291)	(329,486)	(330,258)	(330,767)	(339,421)	(3,425,163)	(3,471,705)	(3,578,403)	(3,606,161)
Transfers from flood damage	0	0	400,000	0	0	0	0	200,000	0	0	600,000	600,000	600,000	600,000
Cash surplus from depreciation	239,125	287,928	292,928	294,281	326,004	329,291	329,486	330,258	330,767	330,839	3,403,759	3,471,705	3,526,411	3,590,313
Transfers from general reserves	5,377	12,838	15,177	13,205	24,501	21,104	13,569	21,206	18,537	16,361				
<b>Net surplus (Deficit) after reserve transfer</b>	<b>2,100,000</b>	<b>0</b>	<b>0</b>	<b>(0)</b>	<b>0</b>	<b>(0)</b>	<b>0</b>	<b>0</b>	<b>(0)</b>	<b>(0)</b>	<b>236,964</b>	<b>356,918</b>	<b>95,153</b>	<b>15,286</b>
<b>Capital statement</b>														
Loans advanced	417,295	124,762	230,121	1,036,264	884,954	21,407	89,813	11,839	0	0	3,957,255	3,072,847	2,312,335	6,109,792
Transfers from Asset Replacement	493,282	1,187,928	292,928	294,281	326,004	329,291	329,486	330,258	203,636	236,560	3,655,155	3,471,705	3,578,403	3,606,161
<b>Net surplus (Deficit) after reserve</b>	<b>2,100,000</b>	<b>0</b>	<b>0</b>	<b>(0)</b>	<b>0</b>	<b>(0)</b>	<b>0</b>	<b>0</b>	<b>(0)</b>	<b>(0)</b>	<b>236,964</b>	<b>356,918</b>	<b>95,153</b>	<b>15,286</b>



	Forecast for the financial year ending June										Forecast for 10 year period ending June			
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/ 2029	2030/ 2039	2040/ 2049	2050/ 2059
<b>Total capital funding</b>	<b>3,010,577</b>	<b>1,312,690</b>	<b>523,049</b>	<b>1,330,545</b>	<b>1,210,958</b>	<b>350,698</b>	<b>419,299</b>	<b>342,097</b>	<b>203,636</b>	<b>236,560</b>	<b>7,849,374</b>	<b>6,901,470</b>	<b>5,985,890</b>	<b>9,731,240</b>
Capital expenditure – renewal	850,000	1,250,000	453,000	1,250,000	1,099,000	209,000	267,500	180,000	30,300	62,600	2,335,026	2,294,513	2,118,361	6,025,099
Capital expenditure – new	0	0	0	0	0	0	0	0	0	0	2,184,000	809,000	809,000	809,000
Capital expenditure – growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vested assets to capital	2,100,000	0	0	0	0	0	0	0	0	0	0	0	0	0
Debt repayment	60,577	62,690	70,049	80,545	111,958	141,698	151,799	162,097	173,336	173,960	3,330,348	3,797,958	3,058,530	2,897,140
<b>Total capital expenditure</b>	<b>3,010,577</b>	<b>1,312,690</b>	<b>523,049</b>	<b>1,330,545</b>	<b>1,210,958</b>	<b>350,698</b>	<b>419,299</b>	<b>342,097</b>	<b>203,636</b>	<b>236,560</b>	<b>7,849,374</b>	<b>6,901,470</b>	<b>5,985,890</b>	<b>9,731,240</b>
<b>Net surplus (Deficit)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>(0)</b>	<b>0</b>	<b>(0)</b>	<b>0</b>	<b>0</b>	<b>(0)</b>	<b>(0)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## Rangitāiki Drainage Scheme financial summary 2008/2009 - 2058/2059

Table 65 Forecast financial summary (\$)

	Forecast for the financial year ending June										Forecast for 10 year period ending June			
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/ 2029	2030/ 2039	2040/ 2049	2050/ 2059
<b>Revenue</b>														
Targeted rates	737,192	768,728	772,980	792,897	816,673	819,029	808,267	806,557	799,945	780,950	8,252,475	8,783,483	8,648,389	8,319,145
General rates	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Investment income	0	0	0	0	0	0	0	0	0	0	0	0	0	0
User fees and charges	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vested asset revenue	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other public funding	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Interest from reserves	4,281	7,700	8,362	7,483	10,108	9,172	11,162	13,226	15,595	18,720	144,283	204,108	243,825	245,903
<b>Total operating revenue</b>	<b>741,473</b>	<b>776,428</b>	<b>781,342</b>	<b>800,381</b>	<b>826,781</b>	<b>828,201</b>	<b>819,429</b>	<b>819,782</b>	<b>815,541</b>	<b>799,670</b>	<b>8,396,759</b>	<b>8,987,591</b>	<b>8,892,214</b>	<b>8,565,047</b>
<b>Expenditure</b>														
Operating costs	688,878	718,228	752,392	745,131	768,889	771,132	760,334	773,585	751,963	732,950	7,595,000	7,595,000	7,595,000	7,595,000
Interest	0	2,067	0	0	0	0	0	0	0	0	208,979	721,249	584,578	254,141
Depreciation	46,574	46,693	48,847	46,026	46,044	46,157	46,193	46,231	46,241	46,259	476,095	494,832	496,409	497,602
<b>Total expenditure</b>	<b>735,452</b>	<b>766,988</b>	<b>801,240</b>	<b>791,157</b>	<b>814,933</b>	<b>817,289</b>	<b>806,527</b>	<b>819,816</b>	<b>798,205</b>	<b>779,210</b>	<b>8,280,074</b>	<b>8,811,081</b>	<b>8,675,987</b>	<b>8,346,743</b>
<b>Operating surplus (Deficit)</b>	<b>6,021</b>	<b>9,440</b>	<b>(19,898)</b>	<b>9,223</b>	<b>11,848</b>	<b>10,912</b>	<b>12,902</b>	<b>(34)</b>	<b>17,336</b>	<b>20,460</b>	<b>116,685</b>	<b>176,510</b>	<b>216,227</b>	<b>218,304</b>
<b>Reserve transfers</b>														
Transfers to flood damage	(6,021)	(9,440)	(10,006)	(8,807)	(9,335)	(9,895)	(10,489)	(11,118)	(10,886)	(11,539)	(144,252)	(221,510)	(261,227)	(263,304)
Transfers to general reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfers to asset replacement	(46,574)	(46,693)	(48,943)	(46,443)	(48,557)	(47,173)	(48,606)	(50,079)	(52,692)	(55,181)	(493,528)	(494,832)	(496,409)	(497,602)
Transfers from flood damage	0	0	30,000	0	0	0	0	15,000	0	0	45,000	45,000	45,000	45,000
Cash surplus from depreciation	46,574	46,693	48,847	46,026	46,044	46,157	46,193	46,231	46,241	46,259	476,095	494,832	496,409	497,602
Transfers from general reserves	0	0	0	0	0	0	0	0	0	0				
<b>Net surplus (Deficit) after reserve transfer</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>(0)</b>	<b>0</b>	<b>0</b>
<b>Capital statement</b>														
Rangitāiki drainage scheme	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loans advanced	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfers from Asset Replacement	77,200	12,400	43,600	11,500	73,500	23,900	24,700	6,700	11,500	0	1,797,573	441,301	58,765	49,381

	Forecast for the financial year ending June										Forecast for 10 year period ending June			
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/ 2029	2030/ 2039	2040/ 2049	2050/ 2059
Net surplus (Deficit) after reserve	0	0	0	0	0	0	0	0	0	0	0	(0)	0	0
<b>Total capital funding</b>	<b>77,200</b>	<b>12,400</b>	<b>43,600</b>	<b>11,500</b>	<b>73,500</b>	<b>23,900</b>	<b>24,700</b>	<b>6,700</b>	<b>11,500</b>	<b>0</b>	<b>1,797,573</b>	<b>441,301</b>	<b>58,765</b>	<b>49,381</b>
Capital expenditure – renewal	77,200	12,400	43,600	11,500	73,500	23,900	24,700	6,700	11,500	0	1,797,573	441,301	58,765	49,381
Capital expenditure – new	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capital expenditure – growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vested assets to capital	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Debt repayment	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total capital expenditure</b>	<b>77,200</b>	<b>12,400</b>	<b>43,600</b>	<b>11,500</b>	<b>73,500</b>	<b>23,900</b>	<b>24,700</b>	<b>6,700</b>	<b>11,500</b>	<b>0</b>	<b>1,797,573</b>	<b>441,301</b>	<b>58,765</b>	<b>49,381</b>
<b>Net surplus (Deficit)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>(0)</b>	<b>0</b>	<b>0</b>

## Rangitāiki-Tarawera Rivers Scheme financial summary 2008/2009 – 2058/2059

Table 66 Forecast financial summary (\$)

	Forecast for the financial year ending June										Forecast for 10 year period ending June			
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/ 2029	2030/ 2039	2040/ 2049	2050/ 2059
<b>Revenue</b>														
Targeted rates	1,134,348	1,352,993	1,431,357	1,576,718	1,722,713	1,825,113	1,867,734	1,909,084	1,957,471	2,032,989	19,761,369	12,608,832	10,553,832	10,760,364
General rates	94,019	112,625	120,283	136,715	146,537	158,384	166,820	168,213	174,920	185,222	2,032,186	1,296,646	1,085,317	1,106,556
Investment income	183,851	210,986	219,631	240,762	252,734	270,293	281,707	279,561	287,859	299,182	2,908,156	1,855,562	1,553,141	1,583,535
User fees and charges	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	150,000	150,000	150,000	150,000
Vested asset revenue	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other public funding	412,500	412,500	907,500	907,500	627,000	0	0	0	0	0	0	0	0	0
Interest from reserves	7,080	14,755	17,833	3,096	5,475	7,996	10,668	13,501	7,504	10,147	117,276	143,154	239,092	298,544
<b>Total operating revenue</b>	<b>1,846,799</b>	<b>2,118,859</b>	<b>2,711,604</b>	<b>2,879,791</b>	<b>2,769,458</b>	<b>2,276,786</b>	<b>2,341,929</b>	<b>2,385,358</b>	<b>2,442,753</b>	<b>2,542,540</b>	<b>24,968,988</b>	<b>16,054,195</b>	<b>13,581,383</b>	<b>13,898,999</b>
<b>Expenditure</b>														
Operating costs	792,357	811,372	1,131,803	842,950	854,889	865,052	853,531	1,002,942	857,423	912,666	9,073,000	9,073,000	9,073,000	9,073,000
Interest	317,664	567,697	604,611	706,622	804,005	858,008	869,025	869,662	867,150	848,404	6,434,310	2,166,949	1,918,363	2,063,676
Depreciation	186,309	192,459	196,209	204,459	212,709	218,409	220,509	222,309	224,124	225,393	2,311,892	2,357,883	2,435,483	2,517,119
<b>Total expenditure</b>	<b>1,296,330</b>	<b>1,571,528</b>	<b>1,932,623</b>	<b>1,754,030</b>	<b>1,871,603</b>	<b>1,941,470</b>	<b>1,943,066</b>	<b>2,094,913</b>	<b>1,948,697</b>	<b>1,986,463</b>	<b>17,819,201</b>	<b>13,597,832</b>	<b>13,426,845</b>	<b>13,653,795</b>
<b>Operating surplus (Deficit)</b>	<b>550,468</b>	<b>547,331</b>	<b>778,981</b>	<b>1,125,761</b>	<b>897,855</b>	<b>335,317</b>	<b>398,864</b>	<b>290,445</b>	<b>494,056</b>	<b>556,077</b>	<b>7,149,787</b>	<b>2,456,362</b>	<b>154,538</b>	<b>245,204</b>
<b>Revenue transfers</b>														
Transfers to flood damage	(43,625)	(51,300)	(54,378)	(39,641)	(42,019)	(44,540)	(47,213)	(50,045)	(44,048)	(46,691)	(482,722)	(508,599)	(554,943)	(637,936)
Transfers to general reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfers to asset replacement	(598,809)	(604,959)	(1,103,709)	(1,111,959)	(839,709)	(218,409)	(220,509)	(222,309)	(224,124)	(225,393)	(2,311,892)	(2,357,883)	(2,485,078)	(2,543,172)
Transfers from flood damage	0	0	300,000	0	0	0	0	150,000	0	0	450,000	450,000	450,000	450,000
Cash surplus from depreciation	186,309	192,459	196,209	204,459	212,709	218,409	220,509	222,309	224,124	225,393	2,311,892	2,357,883	2,435,483	2,517,119
Transfers from general reserves	5,717	14,637	17,926	16,703	31,407	27,601	18,406	29,497	26,589	23,843				
<b>Net surplus (Deficit) after reserve transfer</b>	<b>100,060</b>	<b>98,168</b>	<b>135,029</b>	<b>195,323</b>	<b>260,243</b>	<b>318,377</b>	<b>370,057</b>	<b>419,897</b>	<b>476,596</b>	<b>533,229</b>	<b>7,117,065</b>	<b>2,397,763</b>	<b>0</b>	<b>31,215</b>
<b>Capital statement</b>														
Loans advanced	1,637,500	837,500	1,842,500	1,842,500	1,273,000	700,000	600,000	605,000	423,000	800,000	1,388,433	1,919,941	2,421,067	2,225,040
Transfers from Asset Replacement	598,809	604,959	1,103,709	1,111,959	839,709	218,409	220,509	222,309	224,124	225,393	2,311,892	2,357,883	2,249,050	2,854,848
Net surplus (Deficit) after reserve	100,060	98,168	135,029	195,323	260,243	318,377	370,057	419,897	476,596	533,229	7,117,065	2,397,763	0	31,215

	Forecast for the financial year ending June										Forecast for 10 year period ending June			
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/ 2029	2030/ 2039	2040/ 2049	2050/ 2059
<b>Total capital funding</b>	2,336,369	1,540,627	3,081,238	3,149,782	2,372,952	1,236,787	1,190,566	1,247,206	1,123,720	1,558,622	10,817,390	6,675,587	4,670,117	5,111,103
Capital expenditure – renewal	2,050,000	1,250,000	0	0	0	700,000	600,000	605,000	423,000	800,000	1,388,433	1,919,941	1,582,011	1,534,187
Capital expenditure – new	0	0	2,750,000	2,750,000	1,900,000	0	0	0	0	0	0	0	1,200,000	1,180,000
Capital expenditure – growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vested assets to capital	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Debt repayment	286,369	290,627	331,238	399,782	472,952	536,787	590,566	642,206	700,721	758,622	9,428,957	4,755,646	1,888,105	2,396,916
<b>Total capital expenditure</b>	2,336,369	1,540,627	3,081,238	3,149,782	2,372,952	1,236,787	1,190,566	1,247,206	1,123,721	1,558,622	10,817,390	6,675,587	4,670,117	5,111,103
<b>Net surplus (Deficit)</b>	(0)	(0)	0	0	(0)	(0)	(0)	(0)	(0)	(0)	0	0	0	0

## Waioeka-Otara Rivers Scheme financial summary 2008/2009 – 2058/2059

Table 67 Forecast financial summary (\$)

	Forecast for the financial year ending June										Forecast for 10 year period ending June			
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/ 2029	2030/ 2039	2040/ 2049	2050/ 2059
<b>Revenue</b>														
Targeted rates	533,748	569,999	596,473	626,549	633,456	637,750	630,930	629,998	631,658	624,755	6,715,433	6,950,834	6,822,574	6,781,221
General rates	44,239	47,448	50,124	54,327	53,883	55,344	56,353	55,510	56,445	56,921	690,590	714,798	701,608	697,356
Investment income	86,508	88,886	91,524	95,673	92,932	94,449	95,162	92,255	92,889	91,941	988,268	1,022,910	1,004,035	997,950
User fees and charges	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vested asset revenue	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other public funding	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Interest from reserves	4,692	9,391	11,020	3,748	5,038	6,407	7,857	9,394	6,524	7,981	97,255	136,728	185,915	226,383
<b>Total operating revenue</b>	<b>669,188</b>	<b>715,724</b>	<b>749,142</b>	<b>780,297</b>	<b>785,309</b>	<b>793,950</b>	<b>790,302</b>	<b>787,158</b>	<b>787,517</b>	<b>781,598</b>	<b>8,491,547</b>	<b>8,825,270</b>	<b>8,714,133</b>	<b>8,702,909</b>
<b>Expenditure</b>														
Operating costs	486,866	499,240	663,131	524,897	533,530	538,898	530,374	604,208	531,284	522,654	5,680,000	5,680,000	5,680,000	5,680,000
Interest	71,167	103,956	122,077	140,126	133,349	126,114	118,392	110,148	101,347	91,953	1,258,167	1,473,039	1,317,379	1,380,207
Depreciation	91,388	91,538	92,618	93,698	93,698	93,698	93,698	93,698	93,698	93,698	978,040	1,029,604	1,071,665	1,112,580
<b>Total expenditure</b>	<b>649,421</b>	<b>694,735</b>	<b>877,826</b>	<b>758,721</b>	<b>760,577</b>	<b>758,711</b>	<b>742,464</b>	<b>808,054</b>	<b>726,329</b>	<b>708,305</b>	<b>7,916,207</b>	<b>8,182,642</b>	<b>8,069,045</b>	<b>8,172,788</b>
<b>Operating surplus (Deficit)</b>	<b>19,767</b>	<b>20,989</b>	<b>(128,685)</b>	<b>21,576</b>	<b>24,732</b>	<b>35,238</b>	<b>47,839</b>	<b>(20,896)</b>	<b>61,188</b>	<b>73,293</b>	<b>575,340</b>	<b>642,628</b>	<b>645,089</b>	<b>530,122</b>
<b>Reserve transfers</b>														
Transfers to flood damage	(22,458)	(27,157)	(28,786)	(21,513)	(22,804)	(24,172)	(25,623)	(27,160)	(24,289)	(25,747)	(274,911)	(314,384)	(284,698)	(315,239)
Transfers to general reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfers to asset replacement	(91,387)	(91,537)	(92,617)	(93,697)	(93,697)	(93,697)	(93,697)	(93,697)	(93,697)	(93,697)	(978,030)	(1,029,594)	(1,071,655)	(1,112,570)
Transfers from flood damage	0	0	150,000	0	0	0	0	75,000	0	0	225,000	225,000	225,000	225,000
Cash surplus from depreciation	91,388	91,538	92,618	93,698	93,698	93,698	93,698	93,698	93,698	93,698	978,040	1,029,604	1,071,665	1,112,580
Transfers from general reserves	2,690	6,166	7,470	6,637	11,549	9,645	6,218	9,734	8,580	7,327				
<b>Net surplus (Deficit) after reserve transfer</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6,701</b>	<b>13,478</b>	<b>20,712</b>	<b>28,435</b>	<b>36,679</b>	<b>45,479</b>	<b>54,874</b>	<b>525,439</b>	<b>553,254</b>	<b>585,401</b>	<b>439,893</b>
<b>Capital statement</b>														
Loans advanced	37,940	340,795	353,140	0	0	0	0	0	0	0	1,710,641	1,808,394	1,338,417	1,930,543
Transfers from Asset Replacement	91,388	91,538	92,618	93,698	93,698	93,698	93,698	93,698	93,698	93,698	978,040	1,029,604	1,071,665	1,112,580
<b>Net surplus (Deficit) after reserve</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6,701</b>	<b>13,478</b>	<b>20,712</b>	<b>28,435</b>	<b>36,679</b>	<b>45,479</b>	<b>54,874</b>	<b>525,439</b>	<b>553,254</b>	<b>585,401</b>	<b>439,893</b>



	Forecast for the financial year ending June										Forecast for 10 year period ending June			
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/ 2029	2030/ 2039	2040/ 2049	2050/ 2059
<b>Total capital funding</b>	129,328	432,333	445,758	100,399	107,176	114,410	122,133	130,377	139,177	148,572	3,214,119	3,391,251	2,995,483	3,483,016
Capital expenditure – renewal	50,000	360,000	360,000	0	0	0	0	0	0	0	724,075	821,828	746,477	1,244,923
Capital expenditure – new	0	0	0	0	0	0	0	0	0	0	986,566	986,566	591,940	691,940
Capital expenditure – growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vested assets to capital	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Debt repayment	79,328	72,333	85,758	100,399	107,176	114,410	122,133	130,377	139,177	148,572	1,503,478	1,582,857	1,657,066	1,546,153
<b>Total capital expenditure</b>	129,328	432,333	445,758	100,399	107,176	114,410	122,133	130,377	139,177	148,572	3,214,119	3,391,251	2,995,483	3,483,016
<b>Net surplus (Deficit)</b>	0	0	0	0	0	(0)	0	0	(0)	0	0	0	0	0

## Whakatane-Waimana Rivers Scheme financial summary 2008/2009 – 2058/2059

Table 68 Forecast financial summary (\$)

	Forecast for the financial year ending June										Forecast for 10 year period ending June			
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/ 2029	2030/ 2039	2040/ 2049	2050/ 2059
<b>Revenue</b>														
Targeted rates	1,038,819	1,135,342	1,175,797	1,205,488	1,229,767	1,236,684	1,236,478	1,223,994	1,199,390	1,190,545	11,485,623	11,105,344	12,220,148	11,176,197
General rates	86,101	94,508	98,807	104,526	104,606	107,320	110,439	107,848	107,178	108,469	1,181,139	1,142,032	1,256,675	1,149,319
Investment income	168,368	177,046	180,417	184,076	180,415	183,149	186,496	179,238	176,378	175,205	1,690,267	1,634,304	1,798,362	1,644,731
User fees and charges	51,295	51,295	51,295	51,295	51,295	51,295	51,295	51,295	51,295	51,295	512,950	512,950	512,950	512,950
Vested asset revenue	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other public funding	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Interest from reserves	7,923	17,142	21,256	1,616	4,799	8,172	11,747	15,537	7,555	11,093	133,036	170,390	237,286	357,087
<b>Total operating revenue</b>	<b>1,352,506</b>	<b>1,475,333</b>	<b>1,527,571</b>	<b>1,547,001</b>	<b>1,570,882</b>	<b>1,586,619</b>	<b>1,596,454</b>	<b>1,577,913</b>	<b>1,541,795</b>	<b>1,536,607</b>	<b>15,003,014</b>	<b>14,565,020</b>	<b>16,025,422</b>	<b>14,840,284</b>
<b>Expenditure</b>														
Operating costs	795,735	812,639	1,230,809	844,781	856,617	865,263	854,656	1,053,279	856,133	845,077	9,150,000	9,150,000	9,150,000	9,150,000
Interest	227,452	346,226	352,288	349,822	342,254	319,424	315,304	310,207	285,476	261,344	2,352,875	2,758,884	3,215,092	2,179,840
Depreciation	196,613	197,663	198,713	199,463	200,063	200,063	200,963	201,863	201,863	201,863	2,062,707	2,151,586	2,254,750	2,320,693
<b>Total expenditure</b>	<b>1,219,799</b>	<b>1,356,528</b>	<b>1,781,810</b>	<b>1,394,067</b>	<b>1,398,933</b>	<b>1,384,750</b>	<b>1,370,923</b>	<b>1,565,349</b>	<b>1,343,472</b>	<b>1,308,285</b>	<b>13,565,581</b>	<b>14,060,470</b>	<b>14,619,842</b>	<b>13,650,533</b>
<b>Operating surplus (Deficit)</b>	<b>132,706</b>	<b>118,805</b>	<b>(254,239)</b>	<b>152,934</b>	<b>171,948</b>	<b>201,869</b>	<b>225,531</b>	<b>12,564</b>	<b>198,323</b>	<b>228,322</b>	<b>1,437,433</b>	<b>504,550</b>	<b>1,405,579</b>	<b>1,189,751</b>
<b>Reserve transfers</b>														
Transfers to flood damage	(59,342)	(68,562)	(72,676)	(53,036)	(56,218)	(59,591)	(63,167)	(66,957)	(58,974)	(62,513)	(647,233)	(684,588)	(751,484)	(871,284)
Transfers to general reserves	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfers to asset replacement	(196,613)	(197,663)	(198,713)	(199,463)	(200,063)	(200,063)	(200,963)	(201,863)	(201,863)	(201,863)	(2,062,707)	(2,151,586)	(2,254,750)	(2,320,693)
Transfers from flood damage	0	0	400,000	0	0	0	0	200,000	0	0	600,000	600,000	600,000	600,000
Cash surplus from depreciation	196,613	197,663	198,713	199,463	200,063	200,063	200,963	201,863	201,863	201,863	2,062,707	2,151,586	2,254,750	2,320,693
Transfers from general reserves	5,236	12,282	14,725	12,770	22,420	18,702	12,185	18,912	16,291	13,963				
<b>Net surplus (Deficit) after reserve transfer</b>	<b>78,600</b>	<b>62,525</b>	<b>87,811</b>	<b>112,668</b>	<b>138,150</b>	<b>160,980</b>	<b>174,550</b>	<b>164,519</b>	<b>155,640</b>	<b>179,772</b>	<b>1,390,199</b>	<b>419,963</b>	<b>1,254,095</b>	<b>918,466</b>
<b>Capital statement</b>														
Loans advanced	350,000	350,000	250,000	200,000	0	300,000	300,000	0	0	0	3,146,941	3,618,756	3,034,822	2,111,100
Transfers from Asset Replacement	196,613	197,663	198,713	199,463	200,063	200,063	200,963	201,863	201,863	201,863	2,062,707	2,151,586	2,254,750	2,320,693
<b>Net surplus (Deficit) after reserve</b>	<b>78,600</b>	<b>62,525</b>	<b>87,811</b>	<b>112,668</b>	<b>138,150</b>	<b>160,980</b>	<b>174,550</b>	<b>164,519</b>	<b>155,640</b>	<b>179,772</b>	<b>1,390,199</b>	<b>419,963</b>	<b>1,254,095</b>	<b>918,466</b>

	Forecast for the financial year ending June										Forecast for 10 year period ending June			
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/ 2029	2030/ 2039	2040/ 2049	2050/ 2059
<b>Total capital funding</b>	<b>625,213</b>	<b>610,188</b>	<b>536,524</b>	<b>512,131</b>	<b>338,214</b>	<b>661,043</b>	<b>675,513</b>	<b>366,382</b>	<b>357,504</b>	<b>381,635</b>	<b>6,599,847</b>	<b>6,190,304</b>	<b>6,543,667</b>	<b>5,350,260</b>
Capital expenditure – renewal	350,000	350,000	250,000	200,000	0	300,000	300,000	0	0	0	1,771,941	2,243,756	2,209,822	1,286,100
Capital expenditure – new	0	0	0	0	0	0	0	0	0	0	1,375,000	1,375,000	825,000	825,000
Capital expenditure – growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vested assets to capital	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Debt repayment	275,213	260,188	286,524	312,131	338,214	361,043	375,513	366,382	357,504	381,635	3,452,906	2,571,548	3,508,846	3,239,160
<b>Total capital expenditure</b>	<b>625,213</b>	<b>610,188</b>	<b>536,524</b>	<b>512,131</b>	<b>338,214</b>	<b>661,043</b>	<b>675,513</b>	<b>366,382</b>	<b>357,504</b>	<b>381,635</b>	<b>6,599,847</b>	<b>6,190,304</b>	<b>6,543,667</b>	<b>5,350,260</b>
<b>Net surplus (Deficit)</b>	<b>(0)</b>	<b>(0)</b>	<b>(0)</b>	<b>(0)</b>	<b>(0)</b>	<b>(0)</b>	<b>0</b>	<b>0</b>	<b>(0)</b>	<b>(0)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## Capital and renewal planning

### Renewal works

Renewal expenditure is work that restores an existing asset to its original level of service, i.e. capacity or the required condition. These broadly fit into the following work categories as follows:

#### Rehabilitation

Involves the repair of an existing asset, or asset component. Rehabilitation doesn't provide for a planned increase in the operating capacity or design loading. It is intended to enable the assets to continue to be operated to meet the current levels of service.

#### Replacement

Doesn't provide for a planned increase to the operating capacity or design loading. Some minor increase in capacity may result from the process of replacement, but a substantial improvement is needed before asset development is considered to have occurred.

### Renewal strategy

Renewal strategies provide for the progressive replacement or rehabilitation of individual assets that have reached the end of their useful life. This is managed at a rate that maintains the standard and value of the assets as a whole. This programme must be maintained at adequate levels to maintain current levels of service and the overall quality of assets.

The general renewal strategy is to rehabilitate or replace assets when justified by:

#### Asset performance

Assets are renewed where it fails to meet the required level of service. The monitoring of asset reliability, capacity and efficiency during planned maintenance inspections and operational activity identifies non-performing assets. Indicators of non-performing assets include:

- ▶ Structural failure
- ▶ Repeated asset failure (breaks, faults)
- ▶ Ineffective and/or uneconomic operation
- ▶ Unsafe conditions for the public

#### Economics

When it is no longer economic to continue repairing the asset (i.e. the annual cost of repairs exceeds the annualised cost of its renewal). An economic consideration is the co-ordination of renewal works with other planned works such as road reconstruction. Council actively researches the effectiveness of new technology, which may reduce the direct and social costs of repair works.

#### Risk

The risk of failure and associated environmental, public health, financial or social impact justifies proactive action (e.g. probable extent of flooding damage, health and safety risk). Where such assets are identified (critical assets), proactive inspection is undertaken to determine asset condition at a frequency appropriate to the risk and rate of asset decay.

#### Life cycle

The current lifecycle expectations for the rivers and drainage assets and the annual depreciation rates are as follows:

Table 69      Projected asset lives

Item	Annual rate (%)	(Years)
Stopbank	0.3	Perpetuity (with settlement)
Rockwork	0	Perpetuity
Concrete Wall	2.0	50
Culvert	2.0	50
Edge Planting	0	Perpetuity
Buffer Zone	0	Perpetuity
Trenched willows	0	Perpetuity
Fencing	0	Perpetuity
Rubble	0	Perpetuity

Item	Annual rate (%)	(Years)
Waterway	0	Perpetuity
Pump station	1.4286	70
Pumps	2.8577	35
Pump electronics	6.6666	15
Pump electrical	3.3333	30
Pump ancillary	02.5	40
Sluice gate	1.4286	70
Flood-gate	1.4286	70
Stoplog	2.5	40
Drop structure	2.5	40
Timber wall	2.5	40
Mole	1.4286	70
Concrete structure	1.4286	70
Gabion	5.0	20
Radial gate	2.5	40

### Replacement (renewal) works summary

While many of the smaller replacement (renewal) items are undertaken within maintenance, all major works are programmed as replacement items and are managed in a similar way to new capital works.

The replacement (renewal) programme and expenditure forecast for the next 10 years still needs to be improved as asset condition and data confidence improves.

Bay of Plenty Regional Council will consider the financial and customer risks of having sufficient funds to deal with renewal demands, consideration of detailed assessments, implementing proactive renewals and recognising the increasing maintenance and operational requirements.

## New works

New works are the creation of new assets or works, which upgrade or improve an existing asset beyond its existing capacity or performance in response to changes in usage or customer expectations. Bay of Plenty Regional Council recognises that asset development and asset renewal can occur simultaneously.

***Asset renewal is maintaining the condition of the assets and current service levels.***

***Asset development is providing service improvements, measured by asset performance.***

### Development planning categories

New works fall into separate categories as follows:

#### ► Growth

Any asset development (Council funded or externally funded) that is required as a result of growth).

#### ► Levels of service

Any asset development that is required as a result of an increase in levels of service.

#### ► Legislative

Any asset developed to meet legislative requirements.

#### ► Vested

Any assets vested (gifted) with Council.

As required by schedule 10 of the LGA 2002, with respect to Council funded development work, this Plan also identifies and differentiates requirements of additional asset capacity in terms of increased demand (e.g. growth) or increase in service provision levels and standards.

#### ► Selection criteria

Council carries out a prioritisation process of all necessary renewal or development works. The priority list is used to assign funds when preparing the financial plans. It is important that the process be regularly reviewed and that the cost estimates reviewed at detailed design stage and/or purchase.

## Capital and renewal projects – all schemes

The tables below contains the rivers and drainage renewal and capital projects for the next 10 years (2008/2009 – 2018/2019).

*Table 70 Rivers and drainage capital and renewal projects 2008/2009 – 2018-2019*

Works related to growth and demand	Growth/renewal/ LoS	Project cost estimate	Scheme	Loans	Transfer from asset replacement reserve	Other (subsidies or vested)	Start year	Completion year
Bell Road pump station	Growth	\$2.10 million	Kaituna			\$2.10 million	2010	2010
Ford Road gravity culvert	Renewal	\$0.25 million	Kaituna		\$0.25 million		2010	2010
Ford Road pump station	Renewal	\$1.25 million	Kaituna	\$1.25 million			2011	2011
Okere Gates lifting mechanism renewal	Renewal	\$0.14 million	Kaituna	\$0.02 million	\$0.12 million		2015	2015
Raparapahoe stopbank renewal	Renewal	\$3.14 million	Kaituna	\$1.14 million	\$2.00 million		2012	2016
Kaituna stopbank renewals	Renewal	\$0.18 million	Kaituna		\$0.18 million		2017	2017
Edgecumbe flood mitigation	Renewal/LOS	\$9.90 million	Rangitaiki Tarawera	\$6.74 million		\$3.16 million	2010	2014
Te Teko School stopbank	LOS	\$0.10 million	Rangitaiki Tarawera	\$0.10 million			2015	2015
Tarawera stopbank renewals	Renewal	\$1.20 million	Rangitaiki Tarawera	\$1.20 million			2015	2016
Rangitaiki stopbank renewals	Renewal	\$1.03 million	Rangitaiki Tarawera	\$1.03 million			2017	2018
Culvert renewals	Renewal	\$0.28 million	Rangitaiki Drainage		\$0.28 million		2010	2019
Waioho stopbank renewals	Renewal	\$0.70 million	Whakatane Waimana	\$0.70 million			2010	2011
Te Rahu Drain seepage	Renewal	\$0.25 million	Whakatane Waimana	\$0.25 million			2012	2012
Te Rahu Canal stopbank renewals	Renewal	\$0.20 million	Whakatane Waimana	\$0.20 million			2013	2013
Whakatane River stopbank renewals	Renewal	\$0.60 million	Whakatane Waimana	\$0.60 million			2015	2016
Waioeka and Otara stopbank renewals	Renewal	\$0.72 million	Waioeka Otara	\$0.68 million	\$0.04 million		2011	2012



## Disposals

As part of the whole life cycle management of assets, it is vital to consider the costs of asset disposal in the long-term financial forecasts for an asset. The cost of asset disposal is expected to be incorporated within the capital cost of new works, or asset renewals.

*Disposal is the retirement or sale of assets whether surplus or superseded by new or improved systems. Assets may become surplus to requirements for any of the following reasons:*

- ▶ Under utilisation
- ▶ Obsolescence
- ▶ Provision exceeds required level of service
- ▶ Assets replaced before its predicted economic life
- ▶ Uneconomic to upgrade or operate
- ▶ Policy changes
- ▶ Service provided by other means (e.g. private sector involvement)
- ▶ Potential risk of ownership (financial, environmental, legal, social)

*At this time Bay of Plenty Regional Council has no plans to dispose of any of its rivers and drainage assets.*

## Asset valuation

### Introduction

Statutory financial reporting requires Bay of Plenty Regional Council to revalue its fixed assets at least every five years. An asset valuation is to be used for asset management (calculating long-term asset renewal projections), identifying loss of service potential (depreciation) and for financial reporting purposes.

### Accounting standards

New Zealand International Financial Reporting Standard (NZIAS16) applies to all rivers and drainage infrastructure assets considered in the scope of this valuation for the general purpose of financial reports.

### Industry guidelines

All infrastructure assets valued have been done so in accordance with the methodology prescribed in the New Zealand Infrastructure Asset Valuation and Depreciation Guidelines 2006.

Assets have been valued to fair value and in the case of these specialised rivers and drainage assets; fair value is deemed to be depreciated replacement cost as explained in NZIAS16.

## Valuation process and methodology

The last valuation was undertaken by Bay of Plenty Regional Council for the 1<sup>st</sup> July 2008 and builds on valuations undertaken previously.

### Asset register

Bay of Plenty Regional Council's rivers and drainage assets are contained within an excel spreadsheet and this information is to be migrated into the Finance 1 financial system.

Standard replacement costs and unit rates have been established where appropriate from information sourced from recent construction jobs, industry quotes and the latest labour, plant and material costs. Where historical tender prices have been used to value these have been adjusted for inflation using the relevant index.

The Capital Goods Price Index (CGPI) provided by Statistics NZ (Category: Land Improvements: Reclamation & River Control, S2DD) has been used for all rivers and drainage assets.

The information is considered as accurate and complete for the purpose of the valuation.

### Asset assumptions (valuation assumptions)

The assumptions that have been used in the valuation of Bay of Plenty Regional Council's rivers and drainage assets are as follows:

- ▶ Depreciation is by the straight-line method
- ▶ Asset Base Life or Total Useful Life have been used as detailed in Table 71.
- ▶ The valuations are all reported in a Microsoft Excel format.
- ▶ Asset information is as complete as possible at 1 July 2008
- ▶ Only utility assets have been valued

Base live of assets used in this valuation are as follows:

*Table 71 Current infrastructural asset base lives*

Item	Base lives
Stopbank	Perpetuity (with settlement)
Rock work	Perpetuity
Concrete wall	50
Culvert	50
Edge planting	Perpetuity
Buffer zone	Perpetuity
Trenched willows	Perpetuity
Fencing	Perpetuity
Rubble	Perpetuity
Waterway	Perpetuity
Pump station	70
Pumps	35
Pump electronics	15
Pump electrical	30
Pump ancillary	40
Sluice gate	70
Flood-gate	70
Stoplog	40
Drop structure	40
Timber wall	40
Mole	70
Concrete structure	70
Gabion	20
Radial gate	40

### Replacement cost

The asset replacement costs have been calculated as:

**Replacement Cost (RC)** = (Built Cost/Previous Index Value) x Valuation Index Value.

## Future capital expenditure – by scheme

*Table 72 Capital expenditure schedule – Kaituna*

Year	Capital works	Renewal or new	How much	Funding source
Year 1 (2009/2010)	Kaituna – Ford Road gravity culvert replacement	Renewal	\$250,000	Replacement Reserve
Year 2 (2010/2011)	Kaituna Scheme Ford Road pumping station	Renewal	\$1,250,000	Loans & Replacement Reserve
Year 3 (2011/2012)	Kaituna River left stopbank top up (downstream of Waiari section)	Renewal	\$453,000	Loans & Replacement Reserve
Year 4 (2012/2013)	Kaituna River left stopbank top up (Railway to Waiari, up-stream)	Renewal	\$450,000	Loans & Replacement Reserve
	Kaituna River right stopbank top up (Railway to Waiari, up-stream section)	Renewal	\$800,000	Loans & Replacement Reserve
Year 5 (2013/2014)	Kaituna River right stopbank top up (Railway to Waiari, down-stream section)	Renewal	\$646,000	Loans & Replacement Reserve
	Kaituna River left stopbank top up (Railway to Waiari, down-stream section)	Renewal	\$453,000	Loans & Replacement Reserve

Year	Capital works	Renewal or new	How much	Funding source
Year 6 (2014/2015)	Kaituna River right stopbank top up (5268 to Waiari) Okere Control Gates – lifting mechanism replacement	Renewal Renewal	\$72,000 \$137,000	Replacement Reserve Loans & Replacement Reserve
Year 7 (2015/2016)	Kaituna River right stopbank top up (downstream of wetland) Upper Kaituna River stopbank renewals 50%	Renewal Renewal	\$228,000 \$39,500	Loans & Replacement Reserve Replacement Reserve
Year 8 (2016/2017)	Kaituna (Raparapahoe Canal right stopbank top up)	Renewal	\$180,000	Loans & Replacement Reserve
Year 9 (2017/2018)	Lower Kaituna Pump electronics renewals	Renewal	\$30,300	Replacement Reserve
Year 10 (2018/2019)	Lower Kaituna Pump electronics renewals	Renewal	\$62,600	Replacement Reserve

*Table 73 Capital expenditure schedule – Rangitaiki Drainage Scheme*

Year	Capital works	Renewal or new	How much	Funding source
Year 1 (2009/2010)	Multiple flood-gate replacements	Renewal	\$77,200	Replacement Reserve
Year 2 (2010/2011)	Multiple flood-gate replacements	Renewal	\$12,400	Replacement Reserve
Year 3 (2011/2012)	Multiple flood-gate replacements	Renewal	\$43,600	Replacement Reserve
Year 4 (2012/2013)	Multiple flood-gate replacements	Renewal	\$11,500	Replacement Reserve
Year 5 (2013/2014)	Multiple flood-gate replacements	Renewal	\$73,500	Replacement Reserve
Year 6 (2014/2015)	Multiple flood-gate replacements	Renewal	\$23,900	Replacement Reserve
Year 7 (2015/2016)	Multiple flood-gate replacements	Renewal	\$24,700	Replacement Reserve
Year 8 (2016/2017)	Multiple flood-gate replacements	Renewal	\$6,700	Replacement Reserve
Year 9 (2017/2018)	Multiple flood-gate replacements	Renewal	\$11,500	Replacement Reserve

*Table 74 Capital expenditure schedule – Rangitaiki/Tarawera Rivers Scheme*

Year	Capital works	Renewal or new	How much	Funding source
Year 1 (2009/2010)	Rangitaiki-Tarawera stopbank strengthening (geotechnical) works	Renewal	\$1,250,000	Loans and Subsidy
Year 2 (2010/2011)	Rangitaiki-Tarawera stopbank strengthening (geotechnical) works – final stage	Renewal	\$1,250,000	Loans and Subsidy
Year 3 (2011/2012)	Rangitaiki Floodway widening – stage 1	New	\$2,750,000	Loans and Subsidy
Year 4 (2012/2013)	Rangitaiki floodway widening – stage 2	New	\$2,750,000	Loans and Subsidy
Year 5 (2013/2014)	Rangitaiki River spillway control structure	New	\$1,900,000	Loans and Subsidy
Year 6 (2014/2015)	Rangitaiki-Tarawera stopbanks (Te Teko School section) Tarawera River stopbanks – stage 1	New Renewal	\$100,000 \$600,000	Loans Loans
Year 7 (2015/2016)	Tarawera River stopbanks – stage 2	Renewal	\$600,000	Loans
Year 8 (2016/2017)	Rangitaiki River stopbanks – stage 1	Renewal	\$605,000	Loans
Year 9 (2017/2018)	Rangitaiki River stopbanks – stage 2	Renewal	\$423,000	Loans
Year 10 (2018/2019)	Floodway stopbank raising (outside of widened sections)	Renewal	\$800,000	Loans

**Table 75** *Capital expenditure schedule – Waioeka-Otara Rivers Scheme*

Year	Capital works	Renewal or new	How much	Funding source
Year 2 (2010/2011)	Waioeka-Otara stopbank top ups - stage 1	Renewal	\$360,000	Loans & Replacement Reserve
Year 3 (2011/2012)	Waioeka-Otara stopbank top ups - stage 2	Renewal	\$360,000	Loans & Replacement Reserve

**Table 76** *Capital expenditure schedule – Whakatane-Waimana Rivers Scheme*

Year	Capital works	Renewal or new	How much	Funding source
Year 1 (2009/2010)	Waioho Canal stopbanks top up - stage 1	Renewal	\$350,000	Loans
Year 2 (2010/2011)	Waioho Canal stopbanks top up - stage 2	Renewal	\$350,000	Loans
Year 3 (2011/2012)	Whakatane-Waimana stopbank reconstruction (Te Rahu Drain - Barrs)	New	\$250,000	Loans
Year 4 (2012/2013)	Te Rahu Canal stopbank renewal	Renewal	\$200,000	Loans
Year 6 (2014/2015)	Whakatane-River stopbanks – stage 1	Renewal	\$300,000	Loans
Year 7 (2015/2016)	Whakatane-River stopbanks – stage 2	Renewal	\$300,000	Loans

## Policies

Significant forecast assumptions have been used in preparing this plan. Those assumptions have come from:

- ▶ Legislative requirements;
- ▶ Council's funding and financial policies;
- ▶ Relevant financial reporting standards issued by the New Zealand Institute of Chartered Accountants;
- ▶ Industry best practices and norms; and
- ▶ Generally Accepted Accounting Practice (GAAP).

Risks that threaten our expected future or outlook have been identified. If the risks were to eventuate they would have an effect on our intended levels of service, actions and assets.

The assumptions underlying the preparation of these forecasts were adopted on 17 March 2009 and incorporate known financial results as at that date and estimates for the year to 30 June 2009. Events occurring after this date may have a significant effect on these forecasts.

### Critical judgements and estimations in applying Council's accounting policies

Preparing financial statements that conform with NZIFRS requires judgements, estimates and assumptions that affect the application of policies, and reported amounts of assets and liabilities, income, and expenses. The estimates and associated assumptions are based on historical experience and other factors that are believed to be reasonable under the circumstances. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed regularly. Revisions to accounting estimates are recognised during the period it is revised, if the revision only affects that period. If it affects more than one period, then it is revised for current and future periods.

The key assumptions made and risks identified in preparing Council's budget for the 2009-2019 financial period and forecasts for the TYP are outlined.

### General assumptions

The financial information disclosed in this Plan is forward-looking and based on a number of assumptions that may or may not eventuate. If any of the assumptions prove invalid this may have a direct effect on the projected average rates funding requirements and on levels of service. The financial impacts of these effects cannot be reliably assessed.

The figures for individual years are subject to final ratification as part of each TYP and Annual Plan process.

### Assumptions about operating and capital expenditure

The average cost of borrowing is 7.0 percent on existing debt. The cost of borrowing of 7.0 percent per annum has been applied on new borrowings for the full ten years, for example, no allowance has been made for movements in interest rates when loans are re-financed.

Central Government contributes 50 percent to the costs as defined in the Funding Deed for the Rotorua Lakes Protection and Restoration Action Programme.

Rates-funded depreciation is used to fund the renewal of assets for groups of activities.

Depreciation rates for assets are based on their useful life.

#### **Assumptions about assets**

Assumptions on the useful life of Council's significant assets and the sources of funds for their future replacement are:

<b>Assets</b>	<b>Useful life</b>	<b>Source of funds for replacement</b>
Buildings	10 years to 100 year	Depreciation/loans
Plant and equipment	3 years to 10 years	Depreciation/general funds
Infrastructural assets	20 to 70 years	Depreciation/loans

The stopbanks are maintained to convey their design flood carrying capacity. However settlement of 50 percent of the freeboard will be allowed before stopbank reconstruction is undertaken.

Stopbank reconstruction will be required estimated on average every 20 years. To account for this, a depreciation rate of 0.3 percent is used, in this instance, after 20 years, the stopbanks will have lost six percent of their value.

Those asset classes that are re-valued will be valued on a three yearly valuation cycle. The carrying values of reviewed items will be reviewed at each balance date to ensure that those values are not materially different to fair value.

Current external borrowing for rivers and drainage schemes will, on maturity, be re-financed using internal loans from Council's cash reserves.

## **Risk to significant forecasting assumptions**

The table below outlines the risks to significant forecasting assumptions. Should these assumptions prove to be incorrect there could be a significant effect on the level of rates to be collected from the community. If this were to occur, Bay of Plenty Regional Council would re-evaluate the works programmes to determine if the expenditure is appropriate and rates altered accordingly or whether the scope of the proposed works could be scaled down.

#### **General risks**

The risks that threaten our expected future or outlook are:

- ▶ An economic downturn reducing the funding available from Quayside Holdings Limited, our wholly-owned Council-controlled organisation, and in particular the returns from Port of Tauranga;
- ▶ Legislative changes that substantially alter our statutory functions and/or powers;
- ▶ Lack of competition for some services tendered out could adversely impact on costs and levels of service;
- ▶ Insufficient central government funding support being made available for the Edgecumbe Flood Mitigation project; and
- ▶ Maintaining the flood control and rivers and drainage schemes becomes unsustainable due to the frequency and/or size of adverse weather events.

#### **Natural disasters**

Allowance has been made in this Plan for funding the repair of infrastructure damaged by any future natural disasters such as storms, floods, earthquakes and volcanic eruptions. The outcome of any one of these events will influence decisions on the affordability of Council activities.

The Local Authority Protection Programme provides a fund to cover 40 percent of the repair costs to damaged infrastructure, and central government may come up with the remainder. However roads and bridges are not covered by this programme with the only cost relief available from the New Zealand Transport Agency.

#### **Climate change**

Climate change is expected to bring more periods of sunshine, but also more intense periods of rain. The occurrence of events currently classified as 15-year to 20-year storms and floods is expected to increase. During the past 10 years there have been three major flood events in the region in 1998, 2004 and 2005.

#### **Biological disasters**

Major outbreaks of diseases affecting the primary sector could affect the regional economy and reduce ratepayers' ability to afford the activities contained in this Plan.

#### **Changes in policy direction and priorities**

**Significant decline in the real income of ratepayers**

Our region's population is predicted to grow at a compounding rate of 0.8 percent per annum. If ratepayers' incomes decline to the extent that overall they are unable to afford the current level of services provided by the Council, the activities and strategies of this Plan will need to be reconsidered.

**Change in Council direction following triennial elections**

Following each election, the newly-elected Council may change its approach on how it believes it should best respond to meet the needs of the community. This Plan could be reconsidered so that it reflects any different responses. The next election will be held in October 2010.



## Business processes

### Overview

This section covers the key business processes in place to assist Bay of Plenty Regional Council in delivering asset management and services.

Specific detail is provided on the following aspects:

**Lifelines** - Lifelines groups are typically voluntary groups of utilities working together to improve the resilience of infrastructure to hazards, often operating under the auspices of the Regional Council.

**Civil Defence Emergency Management (CDEM)** - The CDEM Group works together to reduce the potential effects of hazard events and to promote community and Council readiness (preparedness).

**Bay of Plenty Regional Council – Flood Warning Manual** - Provides an overview of the flood warning system and the procedures that need to be followed during a flooding event to protect lives and property.

**Human Resources and Business Services Continuity Plan** - This details Bay of Plenty Regional Council's ability to function and respond to, and during a disaster or other significant event to assist with ongoing operation of key functions.

**Service Level Agreements** – Provides an understanding of the service level agreements that are currently being agreed as part of the TYP process.

**Plan Review and Monitoring** – Provides guidance on the long-term sustainability of this document.

**Compliance with LGA 2002 Schedule 10 requirements** – Key elements within Schedule 10 that directly relate to AMPs have been noted and the relevant sections of the Plan have been referenced. This provides Bay of Plenty Regional Council with the confidence that the requirements under the act have been addressed.

**Advanced AMP and OAG Criteria** – Tables are provided that indicated the requirements that need to be addressed to achieve advanced AMP status. This can be used as a guide for future asset management improvement in combination with the Improvement Plan.

### Lifelines

Lifelines are the essential 'utility' services, which support the life of the community. These services include water, wastewater, stormwater, power, gas, telecommunications and transportation networks. Lifelines groups are typically voluntary groups of utilities working together to improve the resilience of infrastructure to hazards, often operating under the auspices of the Regional Council. Bay of Plenty Regional Council has a lifelines group in place with a Council representative from the Civil Defence Management Group who also sits within the lifelines group.

### Civil Defence Emergency Management

#### Purpose of this Plan

The purpose of this Plan is to provide a framework for civil defence and emergency management decisions to be made across the Bay of Plenty. The Plan also creates a commitment to the implementation of tasks and actions. It is expected that local authority long-term council community plans and the funding programmes of other agencies and groups will include financial or resource provision to enable the implementation of this Plan development and review.

The Plan is a requirement of the Civil Defence Emergency Management Act (CDEM Act) 2002. The Act requires that each Civil Defence Emergency Management Group has a plan to ensure that hazard management within the region occurs in an integrated and coordinated way. The plan must be consistent with the provisions of the CDEM Act 2002.

#### Why is a plan needed?

The Bay of Plenty has a wide range of hazards, including flooding, earthquakes, volcanic eruption, fire and a range of technological hazards. These hazards can cause disruption and death in communities, so there is a need to be ready to meet the challenges that hazard events create.

It has been recognised for some years that emergency management needs to improve its ability to manage these hazards, respond to and recover from disasters, and to better coordinate limited emergency management resources. There is also an unrealistic level of expectation of what can be done for communities in a time of disaster. Communities need to be aware of the hazards and the potential consequences of these so that they are able to appropriately prepare for, respond to, and recover from a hazard event.

## Jurisdictional boundary

The Civil Defence Emergency Management Group Plan provides the basis for Civil Defence and Emergency Management (CDEM) in the Bay of Plenty. It has been prepared by the CDEM Group. This Group is made up of the following Bay of Plenty local authorities:

- ▶ Bay of Plenty Regional Council
- ▶ Kawerau District Council
- ▶ Opotiki District Council
- ▶ Rotorua District Council
- ▶ Tauranga City Council
- ▶ Western Bay of Plenty District Council

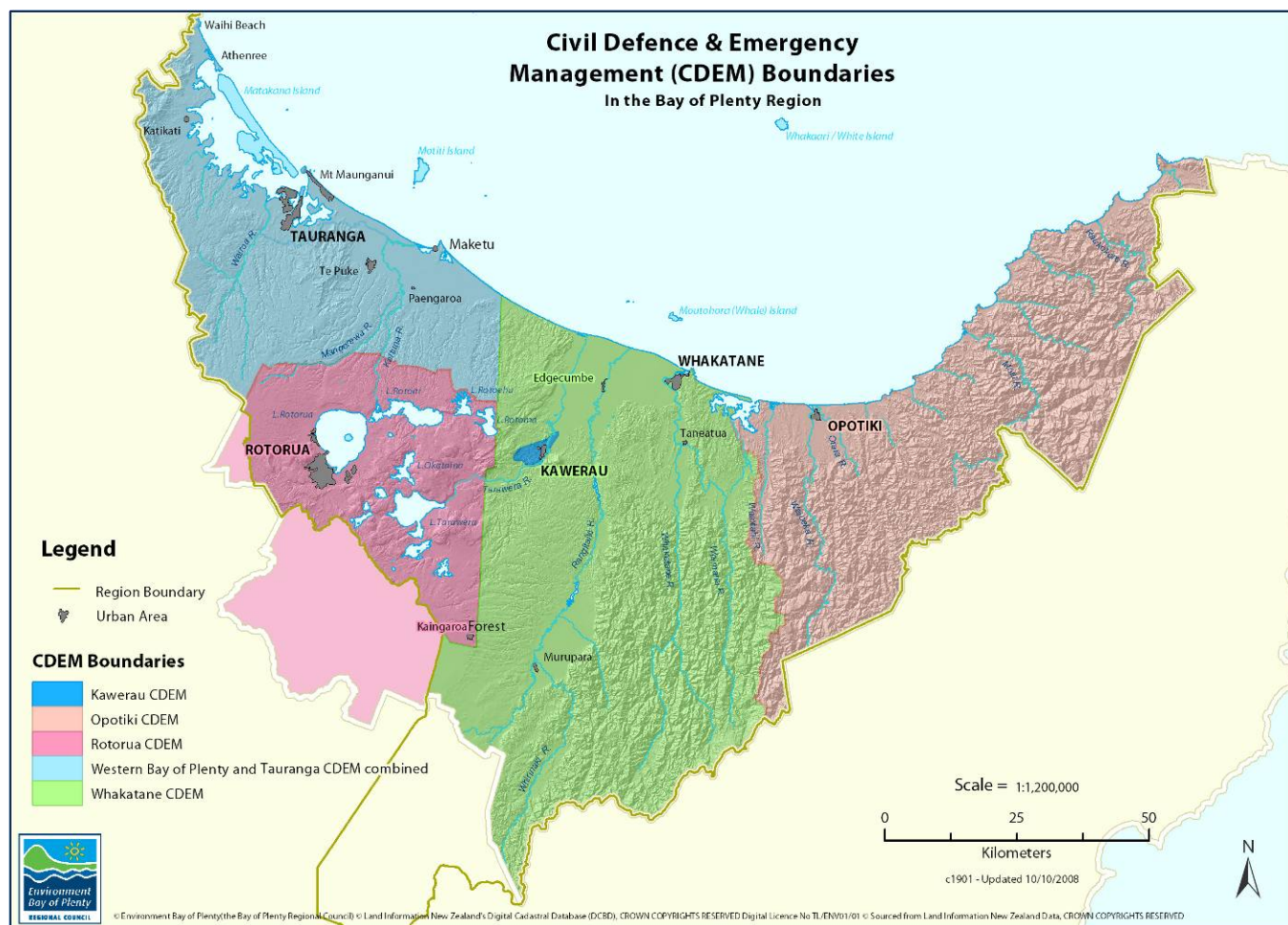


Figure 91 Bay of Plenty CDEM Group area

## Bay of Plenty Regional Council Flood Warning Manual

Bay of Plenty Regional Council has a detailed Flood Warning Manual that outlines the key procedures that need to be undertaken during a flooding event. The main purpose of the manual is to assist the flood controller or anyone else on duty during a flood event to carry out key functions with the objective of avoiding or reducing the risk to life and property from floods.

The manual is divided into several parts, generally covering the following:

- ▶ Introduction to use of the manuals
- ▶ General flood warning
- ▶ Otara River
- ▶ Waioeka River
- ▶ Waimana River
- ▶ Whakatane River

- ▶ Rangitaiki River
- ▶ Tarawera River
- ▶ Kaituna River
- ▶ Lakes operational procedures
- ▶ Coastal flooding processes

Under each of the river schemes, the following items are generally covered:

- ▶ Warnings and warnings lists
- ▶ River telemetry sites
- ▶ Catchment hydrological characteristics
- ▶ Current stopbank design standards
- ▶ Predicted warning stages and travel times
- ▶ Previous floods
- ▶ Flood warning phone lists

The flood warning telephone lists are updated on an annual basis to verify property owners, telephone numbers etc. In addition a number of plans are provided in the Manual, with copies stored in the Flood Room.

Bay of Plenty Regional Council have telemetry systems that record river flows at various points in the river schemes. The telemetry system is linked to a pager and alarms are sent from the telemetry equipment to the officer on duty. During a flood event a number of people are advised including:

- ▶ Engineering staff in charge of river works
- ▶ Works supervisors
- ▶ Group Manager – Rivers and Drainage
- ▶ Any contractors currently working on or near rivers

Flood warnings are notified to the Group Controller and the Manager of the EMO where there is the possibility that the nature or extent of the flood could lead to the declaration of a civil defence emergency and there is likely to be requirements greater than those that can be handled by the usual services (police, hospitals, district councils etc). The information that is generally notified includes:

- ▶ Expected extent and area of flooding;
- ▶ Damage to property and works expected; and
- ▶ Potential numbers of people that could be adversely affected.

## Human Resources and Business Services Continuity Plan

In the interests of sound business continuance planning, Bay of Plenty Regional Council has a Human Resources and Business Services Continuity Plan. This provides a tool to effectively react and respond to a crisis in a manner that ensures that its activities, provision of services and staff well-being are not unduly affected.

This Plan has been prepared to ensure the viability of Bay of Plenty Regional Council in the event of an emergency or other event that significantly affects Council's ability to deliver effective services to stakeholders. In line with the Plan, areas within the Whakatane office have been allocated which have separate power generation and telephone links to ensure that minimum ongoing operations and communication can be maintained.

The key areas covered by the Continuity Plan include:

- ▶ Information Services Section Emergency Management Response
- ▶ Databases, Internet and Emergency Management Response
- ▶ GIS and Emergency Management Response
- ▶ Human Resources Section Emergency Management Response
- ▶ Property & Procurement Section Emergency Management Response
- ▶ Customer Services and Records Section Emergency Management Response
- ▶ Governance Services Section Emergency Management Response
- ▶ IT Operations Section Emergency Management Response

## **Service level agreements**

A number of service level agreements have recently been put in place to provide support to the rivers and drainage activity. These service level agreements provide the basis for internal services provided by other service delivery groups within Council. Many of the services are required to administer a compliant local government organisation under appropriate statutes. The costs associated with the provision of service are allocated across the organisation on a user pay basis. The allocated cost of each service is included in the budgets for each of the River and Drainage schemes. A brief summary of these functional areas is outlined below.

### **Finance**

This agreement provides for the Finance services required for an effective and financially compliant organisation. Services included are: financial administration, financial services, management accounting service, financial reporting, treasury services and fixed assets.

### **Human Resources**

This agreement provides for the Human Resource services required for an effective and efficiently staff resourced organisation. Services included are: recruitment and selection, performance and remuneration management, health and safety, policy and legal advice, training, employment and industrial relations.

### **Information Services**

This agreement provides for the Information Services required for an effective and efficient professional organisation. Services included are: business solutions advice, development services - GeoSpatial and applications and, operational and maintenance services – GeoSpatial and applications.

### **Information Technology**

This agreement provides for the Information Technology required for an effective and efficient professional organisation. Services included are: desktop services, data system services, network and telecommunication services and mobile telephony.

### **Data Services**

This agreement provides for the Data Services required to support the science and engineering programmes of the organisation. It also provides for service provision to external clients. Services included are: laboratory services and data collection services.

### **Property and Procurement**

This agreement provides for the Property and Procurement services required for an efficient and cost effective organisation. Services include: general operations and management, vehicles, buildings, plant and equipment and furniture and fittings.

### **Support Services**

This agreement provides for the Support Services required for an effective and efficient professional organisation. Services include: records management, library services, stationary supplies and customer service.

## Business systems

Bay of Plenty Regional Council has developed its IT infrastructure around a number of key products that provide a platform for all IT applications. The table below sets out Bay of Plenty Regional Council's cornerstone IT applications used by the Rivers and Drainage Team.

*Table 77 Cornerstone applications*

Function	Product	Group responsible	Primary users
Microsoft Software Word, spreadsheets, email, Project, Access, XP, Word 2003 and for others, MS Project. For others GIS Spatial, database applications.	Microsoft Office	Information Technology	All Council activities
Design tools River Modelling, Surveying Micro-station for drafting, MS Excel. Numerous specific hydraulic software tools.	DHI - Mike 11 Mike Flood Hilltop	Information Technology /Rivers and Drainage	Rivers and Drainage
Financial accounting and reporting Microsoft Excel Spreadsheets, Finance One AM module project in progress due to go live in October 2008.	Finance One	Information Technology, Finance Group	All Council activities
Corporate Planning Microsoft Excel Spreadsheets, internal memos, Finance One,	Finance One	Business Information	All Council activities
Document and record management EDIM project in progress due to go live in October 2008 Systems will run in parallel until December 2008.	Objective	Information Technology	All Council activities
Geographical Information System GeoView - for Corporate GIS viewing, ArcMap for Rivers and Drainage.	GeoView/ArcMap	Information Systems/ Rivers and Drainage	All Council activities
Asset Management System Currently use spreadsheets, integration with Finance One Module and Asset Register (including integration with ArcMap for spatial data). Due to go live October 2008.	Spreadsheet/Finance One module	Information Systems/ Rivers and Drainage	All Council asset activities
Complaints, works orders All calls received via reception. Deployment of a works order system being discussed at a corporate level. After hours have answer companies for pollution hotline and flood warning services.	TBA once decision has been made. Works and Assets module is being implemented by the organisation	Information Systems	
Consents management Manual processes in place. Notification and reminders via Outlook. One main point of contact responsible for the management and process of the consents.	Consents Database	Information Systems	Rivers and Drainage
Business continuity Entire network backup completed daily and stored at an offsite location. Business Continuity Plan outlining procedures during a major or catastrophic event.	N/A	Information Technology	All Council activities

## Asset Management Plan 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 Committee/Council.
- ▶ Complete AMP Improvement Plan annually.
- ▶ Review and formally adopt LoS to comply with community outcomes.
- ▶ Revise AMP three yearly prior to TYP to incorporate and document changes to works programmes, outcome of service level reviews and new knowledge resulting from the AMP improvement programme.

- ▶ 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'.

Table 78 outlines the procedures and timetables adopted to achieve these objectives and community outcomes.

*Table 78 AMP review and monitoring processes*

Activity	Action	Milestones
AMP development and review	<ul style="list-style-type: none"> <li>▶ Adoption of AMP by Council.</li> <li>▶ Annual update and enhancement to achieve an intermediate/advance AMP.</li> <li>▶ Set up of an Asset Management Steering Group. Asset management now seen as a priority to the Council.</li> <li>▶ Complete next revision of AMP.</li> <li>▶ Update operational plans in alignment with AMP.</li> <li>▶ Annual review of Plan content by Rivers and Drainage Manager and Improvement Plan.</li> <li>▶ Check AMP content for consistency with adopted Council programmes and plans.</li> <li>▶ Compliance with agreed asset management improvement programmes.</li> <li>▶ Effectiveness and adequacy of AMP processes, systems and data.</li> <li>▶ External review of technical content, with results reported in LTCCP.</li> <li>▶ External review of AMP information by Audit New Zealand.</li> </ul>	<ul style="list-style-type: none"> <li>▶ 30 June 2009</li> <li>▶ Annually</li> <li>▶ 2008</li> <li>▶ 2011 for TYP cycle</li> <li>▶ Annually</li> <li>▶ Annually</li> <li>▶ 3 yearly</li> <li>▶ 30 November triennially</li> </ul>
Asset management data	<ul style="list-style-type: none"> <li>▶ Develop data collection and data standards, specifications, and quality assurance.</li> <li>▶ Undertake quality audits on data integrity and report results.</li> <li>▶ Develop capital works data capture process.</li> </ul>	<ul style="list-style-type: none"> <li>▶ 2009</li> </ul>
Level of service	<ul style="list-style-type: none"> <li>▶ Review current levels of service (LoS options vs costs), key performance indicators (KPIs) including public consultation process.</li> <li>▶ Measure levels of service delivered and reporting process (in terms of social, economic, environmental and cultural well-being) in Annual Report.</li> <li>▶ Review and implement community consultation process.</li> <li>▶ Adopt LoS through TYP.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Ongoing</li> <li>▶ Every 3 years</li> </ul>



## Compliance with LGA 2002 Schedule 10 Requirements

During the AMP reviews the following Local Government Act 2002, Schedule 10 Requirements need to be taken into consideration. The section where these have been discussed has been itemised.

LGA 2002 Schedule 10 Requirement	LGA 2002 references	Section covered
Identify the rationale for delivery of the group of activities (including the community outcomes to which the group of activities primarily contributes).	LGA 2002 Schedule 10 – 2(1)(b)	Business Overview
Outline any significant negative effects that any activity within the group of activities may have on social, economic, environmental or cultural well-being of the local community.	LGA 2002 Schedule 10 – 2(1)(c)	Strategic Environment
Identify the assets or groups of assets required by the group of activities and identify, in relation to those assets or groups of assets.	LGA 2002 Schedule 10 – 2(1)(d)	Business Overview
How the local authority will assess and manage the asset management implications of changes to demand for, or consumption of, relevant services.	LGA 2002 Schedule 10 – 2(1)(d)(i)(A)	Growth & Demand
How the local authority will assess and manage the asset management implications of changes to service provision levels and standards.	LGA 2002 Schedule 10 – 2(1)(d)(i)(B)	Levels of Service
What additional asset capacity is estimated to be required in respect of changes to each of the matters described in subparagraph (i).	LGA 2002 Schedule 10 – 2(1)(d)(ii)	Growth & Demand Levels of Service Projects & Financial Forecasts
How the provision of additional asset capacity will be undertaken.	LGA 2002 Schedule 10 – 2(1)(d)(iii)	Growth & Demand Projects & Financial Forecasts
The estimated costs of the provision of additional asset capacity identified under subparagraph (ii), and the division of those costs between each of the matters in respect of which additional capacity is required.	LGA 2002 Schedule 10 – 2(1)(d)(iv)	Growth & Demand Projects & Financial Forecasts
How the costs of the provision of additional asset capacity will be met.	LGA 2002 Schedule 10 – 2(1)(d)(v)	Growth & Demand Projects & Financial Forecasts
How the maintenance, renewal, and replacement of assets will be undertaken.	LGA 2002 Schedule 10 – 2(1)(d)(vi)	Life Cycle Management
How the costs of maintenance, renewal, and replacement of assets will be met.	LGA 2002 Schedule 10 – 2(1)(d)(vii)	Projects & Financial Forecasts
A statement of the intended levels of service provision for the group of activities, including the performance of targets and other measures by which actual levels of service provision may meaningfully be assessed: and (i) in detail in relation to each of the first three (1-3) financial years covered by the plan; and (ii) in outline in relation to each of the subsequent financial years covered by the plan (4-10).	LGA 2002 Schedule 10 – 2(2)(a) and 2(1)(e)	Levels of Service
The estimated expenses of achieving and maintaining the identified levels of service provision, including the estimated expenses associated with maintaining the service capacity and integrity of assets: and (i) in detail in relation to each of the first three (1-3) financial years covered by the plan; and (ii) in outline in relation to each of the subsequent financial years covered by the plan (4-10).	LGA 2002 Schedule 10 – 2(2)(b) and 2(1)(e)	Projects & Financial Forecasts
A statement of how the expenses are to be met; and (i) in detail in relation to each of the first three (1-3) financial years covered by the plan; and (ii) in outline in relation to each of the subsequent financial years covered by the plan (4-10).	LGA 2002 Schedule 10 – 2(2)(c) and 2(1)(e)	Projects & Financial Forecasts
A statement of the estimated revenue levels, the other sources of funds, and the rationale for their selection in terms of section 101 (3). And (i) in detail in relation to each of the first three (1-3) financial years covered by the plan; and (ii) in outline in relation to each of the subsequent financial years covered by the plan (4-10).	LGA 2002 Schedule 10 – 2(2)(d) and 2(1)(e)	Projects & Financial Forecasts

## Progress towards achieving advanced AMP against the OAG criteria

Bay of Plenty Regional Council has started on the journey towards achieving intermediate/advanced asset management processes. This first combined Rivers and Drainage AMP is the initial step in this process and this will need to be built upon using the Improvement Plan that is contained within this Plan. The table below provides the OAG criteria against which future AMPs can be considered, in conjunction with the Improvement Plan, to determine the current status of the AMP and the future requirements that need to be met to achieve more advanced AMP development.

## Progress towards achieving advanced AMP against the OAG criteria

The Office of the Auditor General (OAG) has established the following criteria for acceptability of an AMP for infrastructural assets. The OAG criteria provides a clear understanding of the status and in conjunction with a good Improvement Plan, Council is able to map out the tasks ahead to achieve advanced asset management.

Table 79 OAG criteria for core and advanced asset management

Key AMP criteria	Key points for achieving "core" criteria	Key points for achieving "advanced" criteria	Covered in/expected to be covered in AMP section	In development /not addressed	Basic	Intermediate	Advanced	Comments
Levels of Service	Asset management (AM) planning should define the level of service or performance required of the asset, linked to the strategic/community outcomes of the organisation.  The significant services (for which service levels should be subject to consultation and agreement) should be stated.	▶ Community outcomes linked to LoS, customer and technical performance measures	Levels of Service					A LoS framework has been developed to link community outcomes with the customer and performance measures
		▶ Evaluating LoS options and costs	Levels of Service					BOPRC have regular meetings with stakeholders to investigate the costs and options for LoS for each scheme. This will need to be developed further to incorporate scheme modelling and scenarios for future LoS provision.
		▶ For each of those significant services: • Undertaking consultation with the community and other relevant stakeholders, using consultation processes which meet industry recognised standards.	Future Community Consultation Section					Very developed consultation practices with the scheme stakeholders. Collation of information around performance against these LoS e.g. using a customer request system, or other, would be advantageous.
		• Adoption by the Council or governing body of the levels of service and standards after consultation has taken place.	Levels of Service					LoS are contained in the TYP (and have been included in the AMP for completeness) and will have been adopted through this process. Good practice is to have the AMP and Improvement Plan adopted by a committee or council.
		• Public communications of the levels of service and standards in a 'Customer Charter' or equivalent public document.	Future Community Consultation Section					As above, community outcomes were consulted throughout the district. Reference is made to a Maori Policy Section around how iwi will be engaged with. Extend this to include an overall customer charter.

Key AMP criteria	Key points for achieving “core” criteria	Key points for achieving “advanced” criteria	Covered in/expected to be covered in AMP section	In development /not addressed	Basic	Intermediate	Advanced	Comments
		<ul style="list-style-type: none"> <li>Regular monitoring and public reporting of the organisations adherence to agreed LoS and standards.</li> </ul>	Levels of Service					The frequency of reporting of measures is now clearly defined in the AMP in the processes and practices section, LoS and risk sections.  Typically you might expect to see monthly or quarterly reporting to councils/committees/ scheme stakeholders and internal reporting by contractors on a monthly basis, with a summary presented to Council.
		<ul style="list-style-type: none"> <li>Ensuring the AMP of each significant service reflect and are based on the agreed LoS, including technical performance targets and measures which underpin the customer-agreed LoS and standards.</li> </ul>	Levels of Service					LoS have been reviewed and developed within a new framework linking customer and technical LoS. Further development will ensure that it is easy for staff/contractors to report on LoS accurately.
<i>Description of Assets</i>	<p>An adequate description of the asset, both physically and in financial terms, with the ability to aggregate and disaggregate information. State the remaining useful lives of assets. A financial description of the assets that is linked to the physical description and meets the requirements of:</p> <ul style="list-style-type: none"> <li>Financial Reporting Standards</li> <li>Valuation Standards augmented by the NZ Depreciation and Valuation Guidelines</li> <li>A financial description of the assets that is linked to the physical description and meets the requirements of NZIAS 16. Augmented by the NZ Depreciation and Valuation Guidelines</li> </ul>	<ul style="list-style-type: none"> <li>A reliable physical inventory of assets at both an individual asset level and at a network level. This would include: <ul style="list-style-type: none"> <li>Physical attributes such as condition, location, material, age etc.</li> </ul> </li> </ul>	Lifecycle Management					Assets are outlined for each scheme in the LCM section and this provides good detail including physical attributes such as data confidence, estimated age and expected life, which are in a tabulated format.
		<ul style="list-style-type: none"> <li>Systematic monitoring and analysis of physical condition.</li> </ul>	Lifecycle Management					A detailed improvement item has been included in the Improvement Plan to allow investigating the applicability of cyclic condition monitoring.
		<ul style="list-style-type: none"> <li>Systematic measurement of asset performance (including utilisation/capacity).</li> </ul>	Lifecycle Management					Currently performance data is not available, however an improvement item has been allowed for to address this item including tracking maintenance histories and establishing failure trends.

Key AMP criteria	Key points for achieving “core” criteria	Key points for achieving “advanced” criteria	Covered in/expected to be covered in AMP section	In development /not addressed	Basic	Intermediate	Advanced	Comments
<i>Financial Forecasts/ Recognise Depreciation (Loss of Service Potential)</i>	<p>AM planning should translate the physical aspects of planned maintenance, renewal and new work into financial terms for at least the ensuing 10 years and in a manner that is fair, consistent and transparent.</p> <p>The forecasts should include sufficient information to enable decline in service potential (depreciation) of an asset to be measured. Guidance on depreciation is included in the NZ Valuation and Depreciation Guidelines.</p>	<p>► AM planning should translate the physical aspects of planned operational, maintenance, renewal and new works into financial terms:</p> <ul style="list-style-type: none"> <li>Generally over the timeframe in which the asset network must deliver services.</li> <li>In more specific terms, over the period for which the organisation has a strategic plan.</li> </ul>	Lifecycle Management					Financial forecasts have been provided by scheme in this version of the AMP . These forecasts are generally for a 50 year timeframe.
		<p>► The assumptions underpinning financial forecasts should be disclosed in the organisations strategic plans and AMPs.</p>	Financial Forecast					Assumptions have been provided in the Projects and Financial forecasts section for both asset management and the asset valuation.
		<p>► The compilation of financial forecasts should be consistent, reliable and provable.</p>	Financial Forecast					A review of the Annual Plan or TP has not been undertaken, but it is assumed these are consistent and provable.
<i>Planning Assumptions and Confidence Levels</i>	<p>AM planning should:</p> <ul style="list-style-type: none"> <li>► List all assumptions and provisos under which the Plan and financial forecasts are prepared.</li> <li>► Indicate the degree of confidence of the reliability of data underpinning the AMP, particularly: <ul style="list-style-type: none"> <li>Data on asset condition</li> <li>Data on asset performance</li> <li>Accuracy of asset inventory</li> <li>Demand/growth forecasts</li> </ul> </li> </ul>	<p>As for 'core' plus:</p> <p>► List all the assumptions and provisos in the AMPs, and note key assumptions regarding AM planning in the organisations strategic plans.</p>	Financial Forecast					Key assumptions have been outlined in detail in the Projects and Financial Forecasts Section.
		<p>► Have degrees of confidence on the reliability of data as follows:</p> <p>► Inventory data</p> <ul style="list-style-type: none"> <li>Grade 1 (critical assets)</li> <li>Grade 2 (non-critical assets)</li> </ul>	Lifecycle Management					Confidence in the reliability of asset data has been included in the LCM section for each sub component level.
		<p>► Condition data</p> <ul style="list-style-type: none"> <li>Grade 1 or 2 (critical assets)</li> <li>Grade 1, 2 or 3 (non-critical assets)</li> </ul>	Lifecycle Management					Condition data is not yet available and has been targeted as an area for improvement.

Key AMP criteria	Key points for achieving "core" criteria	Key points for achieving "advanced" criteria	Covered in/expected to be covered in AMP section	In development /not addressed	Basic	Intermediate	Advanced	Comments
		<ul style="list-style-type: none"> <li>▶ Performance data/Utilisation <ul style="list-style-type: none"> <li>• Grade 1 or 2 (critical assets)</li> <li>• Grade 1, 2 or 3 (non-critical assets)</li> </ul> </li> </ul>	Lifecycle Management					Confidence in performance, age, material, and completeness of the Asset Register has also been included in this section to be addressed in the future when information becomes available.
	<ul style="list-style-type: none"> <li>▶ On the basis of the preceding assumptions and confidence of underlying data, provide a level of precision or confidence on the expenditure forecasts for the asset network.</li> </ul>	As for 'core' AMP criteria.	Financial Forecast					Confidence tables have been included in the Lifecycle Management Section.
Outline Improvement Programmes	<ul style="list-style-type: none"> <li>▶ AM planning should state what needs to be done to improve AM processes and techniques</li> <li>▶ Improvement programmes should outline: <ul style="list-style-type: none"> <li>• The weak areas and how these will be addressed</li> <li>• The timeframe over which the improvements will occur and</li> <li>• The resources (human and financial) needed</li> </ul> </li> </ul>	As for 'core' plus: <ul style="list-style-type: none"> <li>▶ Improvement programmes should outline key performance indicators (KPIs) for monitoring AM improvement.</li> </ul>	Improvement Plan					An improvement programme has been compiled which contains improvement tasks, responsibilities costs, and the year tasks to be completed.
		<ul style="list-style-type: none"> <li>▶ The Improvement Plan should comment generally on achievements against the previous Plan, and formally report against KPIs.</li> </ul>	Improvement Plan					Achievements against previous improvement plans have not been documented, however will need to be in future.
		As for 'core' AMP criteria.	Improvement Plan					As above.
Planning by Qualified Persons	<ul style="list-style-type: none"> <li>▶ AM planning must be undertaken by a suitably qualified person. A suitable qualification would be a Level 6 (Tactical) or Level 7 (Strategic) National Diploma in Asset Management or equivalent skill level.</li> </ul>	As for 'core' AMP criteria.	Team Page					The Plan has been developed with the assistance and guidance of GHD Ltd who are suitably qualified in Asset Management.  The team page at the beginning of the AMP provides an opportunity to outline team members involved (internal and external), sign off processes, including department head, committee or Council. This has in part been documented as part of the Executive Summary.
	<ul style="list-style-type: none"> <li>▶ If plans are prepared by persons not suitably qualified, a qualified person should independently assess the plans.</li> </ul>	As for 'core' AMP criteria.	Team Page					A peer review is recommended once this AMP is fully completed (with forecasts from the LTCCP).
	<ul style="list-style-type: none"> <li>▶ The planning process should be peer reviewed.</li> </ul>	As for 'core' AMP criteria.	Team Page					

Key AMP criteria	Key points for achieving “core” criteria	Key points for achieving “advanced” criteria	Covered in/expected to be covered in AMP section	In development /not addressed	Basic	Intermediate	Advanced	Comments
<i>Commitment</i>	<ul style="list-style-type: none"> <li>▶ The AMP must be approved and adopted by the governing body, Board or Council. This includes approval of the improvement element of the Plan.</li> <li>▶ AMPs must be seen as the key planning tool for infrastructure assets and/or significant physical assets which provide the inputs for Council’s strategic plans (LTCCP).</li> </ul>	As for ‘core’ AMP criteria.	Team Page					<p>This Draft AMP has not yet been adopted. Space has been left for this in the document including version numbering.</p> <p>There is commitment to improvement, up skilling and enhancement of knowledge to improve decision-making.</p> <p>It is difficult to determine if AMP requirements are being implemented through operational plans and if these are being formally reported for discrepancies. This will need to be addressed once the new plan becomes operational and project plans are developed</p>
		As for ‘core’ plus: <ul style="list-style-type: none"> <li>▶ The organisation must demonstrate that AMP requirements are being implemented through operational plans and formally report discrepancies.</li> </ul>	Lifecycle Management					
<i>Updating</i>	<ul style="list-style-type: none"> <li>▶ AMPs must be regularly updated to reflect the most current future plans for the assets (it is expected that ‘core’ AM planning will be significantly revised in the light of action under improvement programme. In the first few years annual revisions of AMPs are likely).</li> </ul>	<ul style="list-style-type: none"> <li>▶ AM planning is seen as a constantly evolving process, with underpinning AM systems constantly providing better information.</li> </ul>	Improvement Plan, Asset Management Practices					The Plan reviewed is dated 16 December 2008. BOPRC have adopted a new AM framework over the last six months.
		<ul style="list-style-type: none"> <li>▶ It is expected that formal AMPs and overarching asset management strategies will be formally revised every three years, with the timing of revisions linked to the organisation’s strategic planning cycles.</li> </ul>	Improvement Plan, Practices and Systems					A new, robust Improvement Plan has been developed that will need to be updated, monitored and progress achieved documented.
<i>Risk Management</i>	Risk management to identify critical assets and associated risks and risk management strategies.	Management of assets must include recognition and application of the principles of integrated risk management. Specifically: <ul style="list-style-type: none"> <li>▶ Risk management should be consistent with AS/NZS4360, and industry good practice such as the NZ Local Government Handbook for risk management.</li> </ul>	Risk Analysis and Management					Risk management has largely been developed at an activity level for this AMP. It has been developed to be consistent with AS/NZS4360.
		<ul style="list-style-type: none"> <li>▶ Risk management for assets should be integrated with other corporate risk management processes.</li> </ul>	Risk Analysis and Management					The Risk process is being developed across a number of asset groups. Alignment with a Corporate Risk Policy would be advisable.



Key AMP criteria	Key points for achieving “core” criteria	Key points for achieving “advanced” criteria	Covered in/expected to be covered in AMP section	In development /not addressed	Basic	Intermediate	Advanced	Comments
		<ul style="list-style-type: none"> <li>Asset risk management should encompass: <ul style="list-style-type: none"> <li>Identification and risk management strategies for critical assets.</li> </ul> </li> </ul>	Risk Analysis and Management					This has been identified as a task in the Improvement Plan.
		<ul style="list-style-type: none"> <li>The link to maintenance and replacement strategies.</li> </ul>	Risk Analysis and Management					This is not as explicit as it could be although maintenance and replacement strategies are discussed in the LCM section.
		<ul style="list-style-type: none"> <li>Engineering lifelines based risk assessments and mitigation plans including reference to the organisations disaster recovery and business continuity plans.</li> </ul>	Risk Analysis and Management					Business continuity planning has been considered along with the CDEM and lifelines roles of Council.
<i>Lifecycle (Optimised) Decision-Making</i>	<ul style="list-style-type: none"> <li>Identify gaps between current service capability and the required service capability to meet future demand and target service levels and reflect these gaps in an asset development programme.</li> <li>Evaluation and ranking based on suitable criteria of options for significant capital investment decisions.</li> </ul>	<p>The ability to predict robust and defensible options for asset treatments that can assist in achieving optimal costs over the life cycle of the asset or network including:</p> <ul style="list-style-type: none"> <li>Applying appropriate economic evaluation tools (or other organisation endorsed prioritisation systems) in developing short term project lists.</li> </ul>	Life Cycle Management					This has been identified as part of a number of improvement items.
		<ul style="list-style-type: none"> <li>Using predictive modelling techniques to provide defensible long term financial forecasts.</li> </ul>	Life Cycle Management, Growth and Demand					As above.
<i>Managing Growth</i>	<ul style="list-style-type: none"> <li>Demand forecasts for each network or facility for a 10 year period are based on latest growth forecasts.</li> <li>Demand management strategies and demand drivers are understood and documented.</li> </ul>	<ul style="list-style-type: none"> <li>Demand forecasts include analysis of the different factors that comprise demand.</li> </ul>	Growth and Demand					<p>The demand drivers have been overviewed. Projected resident population and percentage change has been analysed.</p> <p>Management options have been included along with alternative demand management techniques.</p> <p>Key growth drivers (e.g. demographic considerations, environmental factors, community expectations/risk, hazards and safety, reliability and legislation) have been noted, along with the impacts on the activity and the demand management strategy in tangible terms.</p>

Key AMP criteria	Key points for achieving “core” criteria	Key points for achieving “advanced” criteria	Covered in/expected to be covered in AMP section	In development /not addressed	Basic	Intermediate	Advanced	Comments
		<ul style="list-style-type: none"> <li>▶ The sensitivity of asset development (capital works) programmes to demand changes is understood.</li> </ul>	Growth and Demand					This can be further defined once modelling of different scenarios are developed and then determining the proportion of proposed capital works that are attributable to growth.

# Improvement Plan

## Asset management improvement process

### Overview

Council is adopting a strategic management approach to improvement planning, continually developing AMPs, and implementing improvement processes and practices. This Improvement Plan is integral to that approach, quantifying current business practice and measuring progress toward an identified future position.

The purpose of the Improvement Plan is to Identify and develop implementation of AMP processes. 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 LoS, 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. This section describes:

- ▶ The specific improvements proposed over the next three years.
- ▶ The procedures proposed to be implemented within the organisation for monitoring and review.

### What are typical key improvement areas?

A typical business is made up of a series of key organisational processes that must be managed if the organisation is to continually improve. These processes can be the key areas that are investigated to form the Improvement Plan. The key Asset Management process areas are listed below:

Core business process	Key elements
Asset management/information systems	<ul style="list-style-type: none"><li>▶ Asset register (AMIS)</li><li>▶ Plans and records</li><li>▶ Financial system</li><li>▶ Customer inquiries</li><li>▶ Project management</li></ul>
Asset data and knowledge processes	<ul style="list-style-type: none"><li>▶ Asset hierarchy</li><li>▶ Spatial data</li><li>▶ Physical attributes</li><li>▶ Maintenance records</li><li>▶ Condition data and assessments</li><li>▶ Performance monitoring and utilisation</li><li>▶ Lifecycle cost data</li><li>▶ Risk data (critically)</li><li>▶ Asset age/lives</li><li>▶ Valuations/accounting</li></ul>
Operations and maintenance processes	<ul style="list-style-type: none"><li>▶ Operations and maintenance (O&amp;M) policy/strategy</li><li>▶ O&amp;M manuals</li><li>▶ Emergency planning</li><li>▶ Contract monitoring and control</li><li>▶ Operational expenditure analysis/review</li></ul>

Core business process	Key elements
Demand analysis and strategic planning processes	<ul style="list-style-type: none"> <li>▶ Demand analysis</li> <li>▶ Failure prediction</li> <li>▶ Risk assessment</li> <li>▶ Renewal optimisation</li> <li>▶ Levels of Service reviews</li> <li>▶ Long Term Council Community Plan</li> </ul>
Asset capital processes	<ul style="list-style-type: none"> <li>▶ Project identification/priorities</li> <li>▶ Capital expenditure evaluation</li> <li>▶ Contract monitoring and control</li> <li>▶ Construction/design standards</li> <li>▶ Asset handover</li> <li>▶ Asset rationalisation</li> </ul>
Organisational/commercial	<ul style="list-style-type: none"> <li>▶ Asset management review and improvement</li> <li>▶ Contracting policies</li> <li>▶ Internal QA processes</li> <li>▶ Corporate commitment</li> <li>▶ Asset management roles</li> <li>▶ Corporate asset management team</li> <li>▶ Training programme</li> </ul>

These key asset management process areas are critical to achieving sustained performance of the organisation at the lowest lifecycle cost. Each of the components “adds value” to the raw business processes consistent with regulations, customer demands and shareholder requirements.

All activities undertaken by Bay of Plenty Regional Council should contribute to its value in terms of delivery. Each activity will be linked and form a component part of the business. Figure 92 depicts the relationship between a typical asset based business and key asset management process areas.

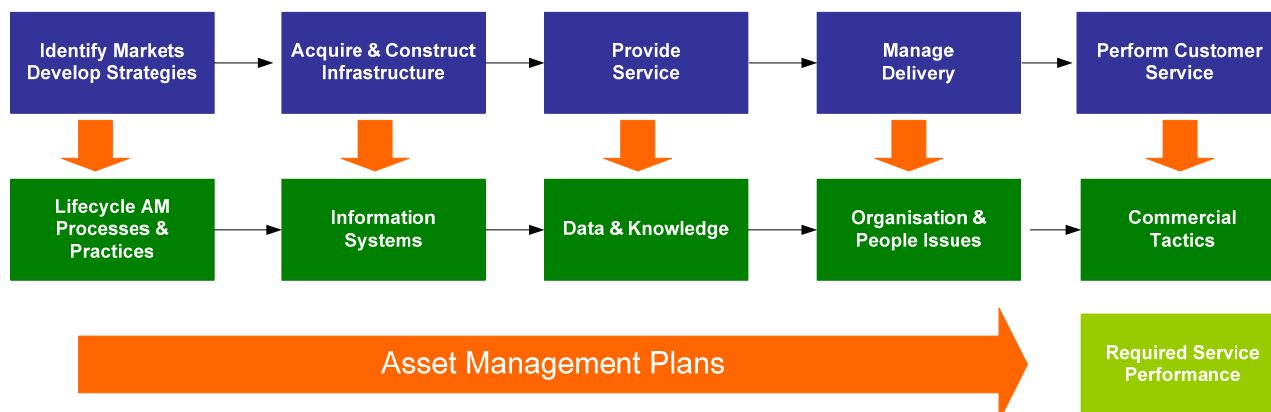


Figure 92 Key business process chain

### Three year improvements

The tables that follow contain the improvement projects/tasks to be undertaken over the next three years including levels of resources, funding, dependencies and priorities.

### Asset management information systems

From the initial decision to proceed with asset management through to the final operational phases, Bay of Plenty Regional Council needs systems to support a management decision-making structure with accurate asset information. The information systems necessary to support this type of program are often based around information technology (IT) systems.

It is critical that the IT system is accurately specified to meet the asset management requirements. The needs analysis to accomplish this involves understanding:

- ▶ The full ramifications of lifecycle asset management on the Council.
- ▶ The benefits to be derived.
- ▶ What is required from the IT systems.

The resources required will include project management, implementation and ongoing support staff, software, hardware, data collection, and system operation and maintenance. The cost can represent a substantial business investment, and this warrants a dedicated project management team to ensure satisfactory implementation and completion.

Information systems of this magnitude should be driven from the bottom-up; if the information meets the requirements at the workforce level, then the systems will have a high level of ownership and will produce data that is valid and up to date. By aggregating this data, the information can be fed upwards to provide accurate and critical information to the management of the unit, and Council as a whole.

The needs and the type of data required at the workforce are different depending on the level of management. Advancements in IT mean information databases – financial and technical – can be integrated into a common system.

Table 80 Information systems

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Year	Project	Owner
					Internal	External					
<b>Asset Register</b>	<ul style="list-style-type: none"> <li>▶ Spreadsheets utilised as the main Asset Register.</li> <li>▶ Majority of rivers and drainage assets information is stored in the spreadsheet.</li> <li>▶ Updates of the Asset Register are undertaken by engineering staff, currently this happens in an ad hoc manner.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Asset data is to be migrated into Finance One for use in the AM and works module.</li> <li>▶ Implement the works and asset module, track the capital works process.</li> <li>▶ Develop a policy to ensure the process of maintenance versus capitalisation of assets is clear e.g. decision trees etc. Process to be clearly defined, current and repeatable.</li> <li>▶ Clearly define persons responsible.</li> </ul>	Lifecycle Management	BOPRC/ External	65	8	\$1,750	Resources	2008/09	1.1	Rivers and Drainage

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Year	Project	Owner
					Internal	External					
Plans and Records (as - built, modelling reports etc)	<ul style="list-style-type: none"> <li>▶ The Records Management Team has responsibility for maintaining plans and records, including the hardcopy data. Information is generally accessed through contract number.</li> <li>▶ Historical hard copy reports/plans (back as far as 1960) have been scanned and electronically stored for access.</li> <li>▶ No existing process for the capture of new capital works into the Asset Register.</li> <li>▶ There is no robust system currently in place to ensure document transmittal or storage.</li> <li>▶ Useable information will be transferred into the EDRMS system, otherwise information will be archived.</li> <li>▶ New system called EasyInfo being implemented. This is a document management software suite designed for use in-house. The system goes live in October 2008.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Development of a robust plans and records system (i.e. flow chart process diagram and document practices) so that current and future information is easily locatable.</li> <li>▶ Develop process for the accurate capture of assets from new capital works projects.</li> <li>▶ Ensure that there is a central repository for key processes that are accessible by the whole team and that those involved are trained in the processes required to ensure consistency of data capture.</li> <li>▶ Store key processes so they are accessible to all and responsibility allocated to someone to review.</li> </ul>	Business Processes	BOPRC	30			Resources	2009/10	1.2	Records Management



Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Year	Project	Owner
					Internal	External					
<b>Financial system</b>	<ul style="list-style-type: none"> <li>▶ Finance One is Councils financial system.</li> <li>▶ All financial reporting will originate from Finance One, including all historic cost information from 2005.</li> <li>▶ A manual PO system exists, with invoices generated posted to the accounts department. This is potentially to be changed to be an automated system.</li> <li>▶ Information from Finance One can be exported into Excel.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Ascertain the requirement for a central person to coordinate interface between the Rivers and Drainage "Asset Register" aspect of the finance system.</li> <li>▶ Undertake a review of the system to ensure it meets the needs of the business. (This is underway with the Business Analyst).</li> <li>▶ Electronic PO system will be fully implemented in the New Year, train relevant staff in use of the system.</li> <li>▶ New budgeting system TECH 1 – enterprise budgeting. This links to Finance One. Manage the process of linkage between the systems and ensure that staff are trained as appropriate in the use of the two systems.</li> </ul>	Lifecycle Management, Projects and Financial Forecast	BOPRC/ External	20			Resources, Project 1.1	2008/09	1.3	Finance
<b>Maintenance management</b>	<ul style="list-style-type: none"> <li>▶ No formal maintenance management system exists.</li> <li>▶ Maintenance is predominantly proactive.</li> <li>▶ Reactive maintenance mainly following a flooding event.</li> <li>▶ Systematic proactive maintenance is often disrupted by reactive maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Review the applicability of allocating maintenance and condition data including costs against individual assets in the Asset Register.</li> <li>▶ Review maintenance budgets with proactive and reactive split and look at increasing funding needs based on historical trends and forward projections.</li> </ul>	Lifecycle Management	BOPRC/ External	24	8	\$1,800	Resources, Funding	2008/09	1.4	Rivers and Drainage

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Year	Project	Owner
					Internal	External					
<b>GIS</b>	<ul style="list-style-type: none"> <li>▶ ArcMap is the core GIS system.</li> <li>▶ GeoView viewers are available on desktop Council wide.</li> <li>▶ BOPRC has a dedicated GIS department (sits outside of the Rivers and Drainage group although there are skills within the group).</li> <li>▶ Editing rights are limited to avoid any data issues in the systems. Version control is in place with assets updated annually.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Develop robust data capture and assimilation process to ensure consistency with the management of the GIS system database and the Finance One Asset Register.</li> <li>▶ Integrate Finance One and ArcMap.</li> <li>▶ Develop a process to outline data capture requirements required for uploading and subsequent checking of the data.</li> <li>▶ Ensure that staff are involved in the process development and are taken through the process once it is finalised, including explanation of the importance of the project in relation to final outcomes.</li> </ul>	Business Processes, Lifecycle Management	BOPRC (excluding IT project already underway)	20			Resources, Funding, existing IT project	2008/09	1.5	Rivers and Drainage & Business Development
<b>Advanced AM modules</b>	<ul style="list-style-type: none"> <li>▶ Hydraulic modelling software (e.g. DHI currently) provides assessments and predicts impacts of future conditions on the flooding defence's network.</li> <li>▶ 50% of modelling done in-house. Data is provided to external; consultants who undertakes the building and running of the models.</li> <li>▶ Model is used to determine current capacity, future upgrades and potential future climate change capacity issues for each scheme.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Develop a modelling archive, including indexing and version control capability, system and process.</li> <li>▶ Review ways to increase ODM capability based on asset performance history, age and condition, capacity (currently being done based on field knowledge).</li> </ul>	Growth and Demand, Lifecycle Management, Projects and Financial Forecasts	BOPRC/ External	60 +			Resources, Funding, expertise, IT capability	2011/12	1.6	Rivers and Drainage

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Year	Project	Owner
					Internal	External					
<b>Customer inquiries</b>	<ul style="list-style-type: none"> <li>Customer enquiries are not managed through a central call centre or other.</li> <li>Calls/complaints/issues received by general staff member, operational staff or potentially reception.</li> <li>No existing Service Request (SR) module although BOPRC are investigating how this could work across Council.</li> <li>SR or other has no current tracking or escalation.</li> <li>Reported in a quarterly reporting now stopped??</li> <li>Works issued by Flood Manager or Works and Operations Manager.</li> <li>KPIs to respond within particular timeframes.</li> </ul>	<ul style="list-style-type: none"> <li>Review the possibility of managing SR and works through the potential corporate system. Identify the current process, review the pros and cons and consider how Rivers and Drainage could integrate with the Council system.</li> <li>Develop a robust process including flow diagrams etc to show how SR/customer enquiries etc are to be tracked based on outcome of preceding review.</li> <li>Develop a formal induction to the use of the system/process.</li> <li>Document and flowchart the process for establishing an SR and the closeout loop.</li> <li>Implement a mechanism for auditing responses in accordance with published service levels.</li> </ul>	Community Consultation, Levels of Service	BOPRC/ External	24 +		Un-known	Resources, Council Departments Funding	2009/10	1.7	Business Development
<b>Project management</b>	<ul style="list-style-type: none"> <li>Internal project management system is not being as widely used as 18 months ago (e.g. Quarterly update on progress of projects).</li> <li>Asset managers are responsible for the management of capital renewals or new works asset development (i.e. can choose to manage internally).</li> <li>Internal staff are responsible for tracking financial elements and progress.</li> </ul>	<ul style="list-style-type: none"> <li>Redefine the needs for a formal project management procedure that could include job establishment, quality assurance, use of MS Project, tracking of financials, auditing contractors/consultants.</li> <li>Internal vs external focused reporting, there is currently not the same vigour around projects that are not currently being reported to Council.</li> </ul>	Business Processes, Projects and Financial Forecasts	BOPRC	25			Resources	2010/11	1.8	SLG

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Year	Project	Owner
					Internal	External					
<b>System integration</b>	<ul style="list-style-type: none"> <li>Currently ArcMap and Finance One are programmed for integration.</li> <li>Finance One will track maintenance costs.</li> </ul>	<ul style="list-style-type: none"> <li>Review how Finance One will track maintenance costs; ensure that proactive and reactive maintenance can be tracked appropriately.</li> </ul>	Business Processes, Lifecycle Management	BOPRC	16			System Functionality	2008/09	1.9	Joint Project
<b>Availability/usability</b>	<ul style="list-style-type: none"> <li>Systems are available for those that need them (i.e. GeoView Viewer).</li> <li>Finance One is relatively user friendly.</li> <li>Overall speed of systems is good.</li> <li>All staff have access to GeoView.</li> <li>Only management have access to Finance One.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct training of use of the new Finance One asset management module for those who have access.</li> <li>Review how staff without Finance One access will have access to the Asset Register.</li> <li>Review reporting capability/requirements of the system.</li> </ul>	Business Processes, Lifecycle Management, Financial Forecasts	BOPRC	20			Resources, System functionality	2008/09	1.20	Business Development

## Asset data and knowledge processes

One of the key assessment areas of asset management deals with data and knowledge factors such as the quality, accuracy, availability, and means of storing asset-related data and information. The asset data and knowledge that Bay of Plenty Regional Council holds forms the basis of every decision. In fact, the extent and quality of the data dictates the quality and timeliness of the decisions made by Bay of Plenty Regional Council.

The asset data and knowledge element assesses how Bay of Plenty Regional Council acquires and maintains knowledge of its assets: That is; how well do we really understand our assets?

Data standards are the rules governing the collection, organisation, and maintenance of data about assets. Good data is critical to both making sound decisions and to the confidence we have that the decision being recommended is, in fact, the right decision at the right time. High levels of confidence are generated from implementing the best appropriate practices throughout the organisation and from good data.

The table below identifies the key elements of the recorded asset data and the accuracy and completeness of the existing data.

Table 81 Asset data and knowledge

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Years	Project	Owner
					Internal	External					
<b>Asset hierarchy</b>	<ul style="list-style-type: none"> <li>▶ Asset hierarchy used in the valuations has been transferred to the Finance One system for use in the AM and works module.</li> <li>▶ Asset hierarchy in a fairly flat structure.</li> <li>▶ Main assets are provided for (i.e. stop banks, structures, pump stations etc).</li> </ul>	<ul style="list-style-type: none"> <li>▶ Review and confirm asset hierarchy.</li> </ul>	Lifecycle Management	BOPRC/ External	15	8-10	\$2,000	Resources Funding	2008/09	2.1	Business Development
<b>Physical attributes</b>	<ul style="list-style-type: none"> <li>▶ Standard fields are provided for in the Asset Register. <ul style="list-style-type: none"> <li>• Asset type.</li> <li>• Size/Diameter, length.</li> <li>• No consistent date built.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▶ Review completeness of physical attribute date in Asset Register.</li> <li>▶ Review the way that asset age is considered e.g. have install dates for assets that are expected to last for perpetuity and are "replaced" every 20 years so that appropriate renewal profiles can be developed from the Asset Register.</li> </ul>	Lifecycle Management, Projects and Financial Forecasts	BOPRC/ External	10	8	\$1,500	Resources Funding	2008/09	2.2	Rivers and Drainage
<b>Maintenance records</b>	<ul style="list-style-type: none"> <li>▶ Maintenance histories are not stored for the assets in the Asset Register.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Review whether or not the maintenance records could be tracked by asset, this allows for a greater understanding of asset performance, link with Project 1.9.</li> </ul>	Lifecycle Management, Projects and Financial Forecasts	BOPRC	14			Resources	2008/09	2.3	Rivers and Drainage

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Years	Project	Owner
					Internal	External					
<b>Condition assessments</b>	<ul style="list-style-type: none"> <li>▶ Capture of condition data has not been undertaken for stopbanks for some time.</li> <li>▶ Condition assessment undertaken in an informal manner when maintaining assets e.g. pump stations.</li> <li>▶ Condition is assessed informally during inspections but not recorded.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Review the applicability of a cyclic condition rating exercise for rivers and drainage assets and develop a policy.</li> <li>▶ Review the use of the condition field in the new Finance One module, for use in generating renewals profiles.</li> <li>▶ Fully document the process.</li> </ul>	Lifecycle Management, Projects and Financial Forecasts, Growth and Demand, Business Processes and Practices	BOPRC	20			Resources	2009/10	2.4	Rivers and Drainage
<b>Performance monitoring/ utilisation</b>	<ul style="list-style-type: none"> <li>▶ Network modelling using Mike 11, Mike Flood.</li> <li>▶ Ongoing proactive maintenance programme.</li> <li>▶ Pump stations, desilting, tree maintenance etc.</li> <li>▶ Service requests not recorded, calls generally come straight to the person relevant to a particular scheme.</li> <li>▶ How do you track failures of an asset e.g. stopbank foundation failure, stopbank failure during a design flood.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Track maintenance history by asset type to identify trends in failure (Project 1.9).</li> <li>▶ Review service records to establish trends of failure or issues in the network.</li> </ul>	Financial Forecasts	BOPRC/ External	24	15	\$4,000	Resources, Funding, IT capabilities	2009/10	2.5	Rivers and Drainage
<b>Lifecycle cost data</b>	<ul style="list-style-type: none"> <li>▶ No formal process in place for tracking lifecycle expenditure.</li> <li>▶ Currently unable to track costs by asset type.</li> <li>▶ Expenditure is tracked on a scheme basis due to targeted rates.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Review the applicability of establishing a formal process for tracking lifecycle cost expenditure by asset. Determine the appropriate level (i.e. component) of cost recording.</li> </ul>	Lifecycle Management, Projects and Financial Forecasts	BOPRC	12			Resources/ IT skills	2010/11	2.6	Finance

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Years	Project	Owner
					Internal	External					
<b>Asset age/ lives</b>	<ul style="list-style-type: none"> <li>▶ Asset age and life is stored and updated in Finance One?</li> <li>▶ Spent six months capturing data – checking off aerals, physical audits.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Review data in Finance One for appropriate asset ages and base lives.</li> <li>▶ Develop and document process for determining asset lives using latest condition/performance data including factors affecting lives such as maintenance history, design standards etc.</li> </ul>	Lifecycle Management, Projects and Financial Forecasts	BOPRC	14	5	\$1,200	Resources	2008/09	2.7	Rivers and Drainage
<b>Valuations/ accounting</b>	<ul style="list-style-type: none"> <li>▶ Valuations are undertaken internally, data is extracted from excel Asset Register and valued accordingly.</li> <li>▶ Valuations are peer reviewed externally.</li> <li>▶ Valuations are undertaken three yearly (last was 2008).</li> </ul>	<ul style="list-style-type: none"> <li>▶ Develop and implement a database to record unit rates.</li> <li>▶ Undertake valuation in 2009, have peer reviewed by qualified reviewer.</li> </ul>	Lifecycle Management, Projects and Financial Forecasts	BOPRC	50	20	\$4,000	Resources	2009/10	2.8	Rivers and Drainage
<b>Risk data (critically)</b>	<ul style="list-style-type: none"> <li>▶ Critical assets are not currently identified in the asset register.</li> <li>▶ Some assets have been assessed for earthquake risk.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Undertake detailed risk assessments on critical rivers and drainage assets.</li> <li>▶ Consideration to be taken as part of an overall network strategy.</li> </ul>	Risk, Lifecycle Management	BOPRC	20			Resources	2010/1	2.9	Rivers and Drainage



## Operations and maintenance processes

### Operate

Assets are operated to support Bay of Plenty Regional Council's objectives and service delivery requirements. They are required to meet physical, functional, and financial requirements over their effective life. This process area covers the activities that asset managers use to:

- ▶ Develop five to ten year strategic operations plans;
- ▶ Prepare annual operations plans for inclusion in the capital program;
- ▶ Implement and improve the operations program that outlines the activities and resources involved in managing and implementing operations. It includes measures against which actual performance can be monitored;
- ▶ Ensure that the asset meets its functional requirements and is operated to deliver its service function and value to the community and scheme stakeholders;
- ▶ Meet all statutory and technical requirements for health, safety, security, and reliability;
- ▶ Achieve and sustain defined levels of physical, functional, and financial performance throughout the asset's life.

### Maintain

The asset maintenance approach is designed to establish the right balance of preventive, predictive, and reactive maintenance by implementing improved maintenance and operational procedures that will enhance work planning and scheduling.

The aim of maintaining assets is to meet service delivery performance requirements by controlling fixed plant, equipment, and component aging by optimising whole-of-life costs.

This approach:

- ▶ Allows Bay of Plenty Regional Council to agree upon maintenance standards.
- ▶ Provides a structure in which changes are incorporated into maintenance operations.

Maintenance management systems have greatly assisted the way assets can be efficiently operated and maintained. Some benefits include:

- ▶ Improved support and reduced disruption to operations.
- ▶ Increased understanding of the asset portfolio.
- ▶ Better value from budgets.
- ▶ Maintained asset conditions and performance.
- ▶ Effective assessment of maintenance needs, monitoring, and reporting.
- ▶ Adherence to technical and statutory requirements.
- ▶ Continuous improvement of maintenance strategies and delivery.

The table below identifies the key elements of the operations and maintenance processes.

Table 82 Operations and maintenance processes

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Years	Project	Owner
					Internal	External					
<b>Operations and maintenance contracts</b>	<ul style="list-style-type: none"> <li>▶ Maintenance is undertaken by in house staff.</li> <li>▶ There is no formal service level/ performance agreement in place.</li> <li>▶ Service levels and maintenance regimes are identified in the AMPs Lifecycle Management section for each scheme.</li> <li>▶ Cyclic maintenance undertaken.</li> <li>▶ Respond to service requests that come through from the community.</li> <li>▶ Quarterly traffic light reporting to Council (RAG – red, amber, green) against Annual Plan KPIs.</li> <li>▶ Six weekly reports provided to operations manager.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Develop an internal Service Level Agreement (SLA) and determine reporting requirements and responsibilities.</li> <li>▶ Develop an internal reporting process to Rivers and Drainage Manager.</li> </ul>	Lifecycle Management	BOPRC	30			Resources	2009/10	3.1	Rivers and Drainage
<b>Emergency planning</b>	<ul style="list-style-type: none"> <li>▶ Flood Warning Manuals with specific triggers are in place for the flood protection schemes.</li> <li>▶ Flood management strategies for some of the schemes.</li> <li>▶ Business Continuity Plan in place.</li> <li>▶ CDEM Group in place and a separate group in Council has this function.</li> <li>▶ Telemetry flood warning system in place with specific triggers identified.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Establish a formal process for updating flood warning manual, when, by who, signed off.</li> </ul>	Business Processes	BOPRC	10			Resources	2008/09	3.2	Primarily Rivers and Drainage

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Years	Project	Owner
					Internal	External					
<b>Contract monitoring and control</b>	<ul style="list-style-type: none"> <li>▶ Contracts manual provides guidance on how work should be monitored.</li> <li>▶ Monitored by each manager.</li> <li>▶ Contracts manual has been in place since 2006. First full year 2007/08 has been used within the organisation.</li> <li>▶ Reporting to Council on this process for the first time September 2008.</li> <li>▶ Procurement Policy is in place.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Establish a formal contract monitoring and auditing process including clear accountabilities, cyclical reporting defined etc.</li> </ul>	Business Processes	BOPRC	20			Resources	2009/10	3.3	SLG
<b>Operational expenditure analysis/ review</b>	<ul style="list-style-type: none"> <li>▶ Annual budget is established, based on AMP process.</li> <li>▶ Operations budgets reviewed yearly.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Implement quarterly budget reporting at task level to track expenditure.</li> <li>▶ Robust project management process to ensure efficiency.</li> <li>▶ Performance has not been as good as previously thought with stopbanks requiring more frequent top-up, review information and decide upon appropriate base lives.</li> </ul>	Business Processes Projects and Financial Forecasts	BOPRC	24			Resources, IT capability	2009/10	3.4	Engineering/Group Manager

## Demand analysis and strategic planning process

The AMP is the means by which Bay of Plenty Regional Council aligns its asset portfolio with its service delivery requirements. It documents what assets are needed and how those assets support Bay of Plenty Regional Council's service delivery strategy and it allows Bay of Plenty Regional Council to plan and control recurrent expenditure by adopting a whole-of-life approach to asset management. The AMP then becomes an integral part of the strategic and operational planning process and links with the strategic plans for Bay of Plenty Regional Council's other resource areas such as Human Resources, Information Technology, and Finance.

To achieve this, the AMP should clearly document:

- ▶ An understanding of the demand drivers that impact on service delivery and the strategies in place to manage demand.
- ▶ The processes used to predict the way in which individual assets or their components can fail to meet the KPIs of service delivery.
- ▶ The risks associated with asset acquisition and management and the risk of failure of assets to support service delivery.
- ▶ Optimised renewal decision, giving an overview of the deployment, condition, failures, and performance of the assets.
- ▶ The lifecycle funding strategy for 10 years, showing proposed investment and sources of funding with the likely impacts on the operating budget and an analysis of the gap between existing assets and required assets.
- ▶ The improvement programmes and strategies used to align the existing asset portfolio with service delivery needs. This will include the need for new assets, renewals, refurbishment, operations and maintenance, and disposals.
- ▶ The method by which Bay of Plenty Regional Council presents their long term strategic planning information to their customer and stakeholder groups and how the feedback from customers is included in their long term strategic planning.
- ▶ The way in which Bay of Plenty Regional Council is able to link its business goals with the AMP.

The table below identifies the key elements of demand analysis and the strategic planning processes.

*Table 83 Demand analysis and strategic planning*

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Years	Project	Owner
					Internal	External					
<b>Demand analysis</b>	<ul style="list-style-type: none"> <li>▶ From an operation perspective service demand is analysed to include: <ul style="list-style-type: none"> <li>• Climate change as required (draft Climate Change Policy).</li> <li>• Community demand (resulting from land use changes and risk mitigation e.g. for businesses wanted increased protection).</li> <li>• Options modelling.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▶ Review draft Climate Change Policy.</li> <li>▶ Develop and implement demand strategy for each scheme to include: <ul style="list-style-type: none"> <li>• Consultation.</li> <li>• Costs and options for flood protection.</li> <li>• Climate change.</li> </ul> </li> </ul>	Lifecycle Management, Levels of Service, Community Consultation	BOPRC/ External peer review	Un-known			Resources/ Funding	<b>2010/11 Large project could stage</b>	4.1	Group Manager Rivers and Drainage

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Years	Project	Owner
					Internal	External					
<b>Failure prediction</b>	<ul style="list-style-type: none"> <li>▶ Scheme modelling is the predominant tool used for failure prediction.</li> <li>▶ Geotechnical investigations are completed on all new works to identify/quantify observed areas at risk.</li> <li>▶ Geotechnical Engineer identifies new works in problem areas.</li> <li>▶ Flood hazard mapping shows where assets have failed, inundation maps.</li> <li>▶ Flood plan management strategies document where they have failed previously.</li> <li>▶ Stability and seepage assessments are undertaken based on historical and hydraulic capacity and condition reports. When problems identified, strengthening then occurs.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Include failure mode analysis prior to capital works.</li> <li>▶ Recording failure and predictive modelling to identify potential investment required (stability analysis).</li> </ul>	Lifecycle Management, Levels of Service, Risk	BOPRC /External peer review	Un-known	Un-known		Resources/ Funding	<b>2009/10 Tie into 4.1</b>	4.2	Engineering Manager

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Years	Project	Owner
					Internal	External					
<b>Risk assessment</b>	<ul style="list-style-type: none"> <li>▶ A Risk Register and framework has been developed with the AMP.</li> <li>▶ Risk is based on NZ/AS 4360.</li> <li>▶ Historically the schemes have never been assessed from a risk, criticality, failure mode perspective.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Undertake actions as outlined in the Risk Management Action Plan.</li> <li>▶ Identified critical modes of failure and critical locations.</li> <li>▶ Put critical areas onto GIS including level of risk.</li> <li>▶ Identify process and responsibility for updating the Register. Review and maintain the Risk Register.</li> <li>▶ Implement management options/strategies to reduce risk if necessary.</li> <li>▶ Report regularly to the Council.</li> <li>▶ Tie in with criticality development from 2.9.</li> </ul>	Risk	BOPRC	80+			Ongoing resourcing	Start 2008/09 ongoing	4.3	Engineering Manager
<b>Renewal optimisation</b>	<ul style="list-style-type: none"> <li>▶ Valuation data provides basis for renewals.</li> <li>▶ Renewals are currently based on age v life (except for those expected to last a very long time, these are renewed every 20 years (stopbanks).</li> <li>▶ Pump stations are itemised separately.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Develop optimised decision making strategies, documenting key failure modes, intervention criteria and lowest long-term cost solutions (asset level).</li> <li>▶ Review failure analyses.</li> <li>▶ Carry out condition rating on key assets.</li> </ul>	Risk, Projects and Financial Forecasts	BOPRC/ External	Extensive	?	?	Resources/ Funding	2009/10 ongoing  Large projects only	4.4	Rivers and Drainage

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Years	Project	Owner
					Internal	External					
<b>Levels of Service (LoS) review</b>	<ul style="list-style-type: none"> <li>▶ Development of LoS undertaken as part of the AMP.</li> <li>▶ Technical LoS are well established for each scheme.</li> </ul>	<ul style="list-style-type: none"> <li>▶ LoS to consulted on with the next LTCCP.</li> <li>▶ Consult with the community (scheme stakeholders) on service level options and costs at least annually and for specific projects.</li> <li>▶ With potential increases in the cost of maintaining services levels, it is necessary to develop costs and options per scheme.</li> </ul>	Levels of Service	BOPRC				Resources/ Funding	Start 2008/09 ongoing	4.5	Strategic Development
<b>TYP</b>	<ul style="list-style-type: none"> <li>▶ First LTCCP completed in 2006.</li> <li>▶ Second LTCCP due 2009/10 financial year.</li> <li>▶ AMP being reviewed and updated prior to 09/10 LTCCP, ensuring strong linkages.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Ensure linkages between AMP and TYP are clear and budgeting for improvement is provided for.</li> </ul>	Projects and Financial Forecasts, total AMP	BOPRC				Resources	2008/09	4.6	Group Manager Rivers and Drainage



## Asset capital processes

### Creation/acquisition

Asset creation is providing or improving an asset where the outlay can reasonably be expected to provide benefits beyond the year of the outlay. The main reasons for creating an asset are to:

- ▶ Satisfy or improve a level of service.
- ▶ Provide for new demand from customers.
- ▶ Provide a commercial return.

Once an asset is created, Bay of Plenty Regional Council takes on the full cost of ownership for the rest of its life. We can, of course, optimise the operating costs, but we cannot alter the basic costs relating to the capital invested, its depreciation, and the operations and maintenance required. Therefore, it is obvious that if we create the wrong asset, at the wrong time, in the wrong configuration, with the wrong level of redundancy, we have to carry most of those costs for the rest of the asset's life.

### Renewal

Renewal decision-making and management is a key ingredient of the advanced asset management lifecycle. The essence of responsible asset management is choosing the right option, which requires sound asset management processes, appropriate information systems, and adequate data.

Once the appropriate asset management information systems are in place, the data must be analysed, and decisions must be made. The key is to derive the greatest benefit from the resources invested while meeting the business objectives Bay of Plenty Regional Council and their and customers' expectations.

Bay of Plenty Regional Council must be aware that reduced or delayed maintenance and renewal will reduce immediate costs but may also:

- ▶ Decrease levels of service.
- ▶ Increase the risk of failures.
- ▶ Shorten the effective life of the asset.

In the area of capital investment, effectiveness should be based on an acceptable benefit/cost or return on capital, with new investment being made as late as possible (just-in-time). This requires accurate risk assessment.

A key ingredient for cost effectiveness will be the ability of managers to select the most cost effective renewal strategy for each asset, such as:

- ▶ Better preventive (planned) maintenance.
- ▶ Rehabilitation just prior to failure.
- ▶ Regular rehabilitation program.

This requires a renewal decision-making process that enables investment to be made in the area of greatest return to Bay of Plenty Regional Council or optimised renewal decision-making (ODRM).

If Bay of Plenty Regional Council delays investment in the area of infrastructure renewal, then they can expect a greater number of failures. This constitutes a risk cost (or a loss) through the consequences of these failures. This will mostly relate to loss of service or system failure, but in some cases, it could result in litigation or even loss of life. Risk management (loss reduction) will become a critical activity over time.

### Disposal/rationalisation

The nominal end of the lifecycle of any asset is often simply when the asset owner decides to remove the asset from their portfolio. This removal is intended to free the owner from any further responsibility or liability associated with the asset. Assets are abandoned as they reach the end of their useful life or when there is no value or market for the functions they provide.

Asset rationalisation and disposal is a vital strategy that must be considered as part of all AMPs.

The table that follows identifies the key elements of asset capital processes.

Table 84 Asset capital processes

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Years	Project	Owner
					Internal	External					
<b>Project identification / priorities</b>	<ul style="list-style-type: none"> <li>▶ No current process in place to prioritise capital works. Currently done using engineering judgement within the wider Rivers and Drainage Team e.g. contractors, BOPRC staff etc.</li> <li>▶ Projects are identified through strategic documents (AMPs), where a specific need is warranted.</li> <li>▶ Projects are potentially identified through third party developers (partially phasing of works).</li> <li>▶ Extreme weather events mitigate effects (e.g. Matata).</li> <li>▶ This communicated/agreed with the scheme stakeholders by the existing consultation mechanisms e.g. Scheme Liaison Groups.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Develop a robust project ranking and priority matrix.</li> </ul>	Lifecycle Management, Projects and Financial Forecasts, Community Consultation	BOPRC /External peer review	50+			Resources Funding	2009/10	5.1	Group Manager Rivers and Drainage
<b>Capital expenditure evaluation</b>	<ul style="list-style-type: none"> <li>▶ New capital is minimal.</li> <li>▶ Processes in place for larger projects that take into account: <ul style="list-style-type: none"> <li>• Whole of life cycle cost</li> <li>• Options analysis/feasibility</li> </ul> </li> <li>▶ No process in place to identify: <ul style="list-style-type: none"> <li>• Benefit/Cost analysis/NPV</li> <li>• Project risk</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▶ Develop robust business case template.</li> </ul>	Projects and Financial Forecasts	BOPRC /External	40+	30	\$7,000	Resources Funding	2009/10 tie into 5.1	5.2	Group Manager Rivers and Drainage

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Years	Project	Owner
					Internal	External					
<b>Contract monitoring and control</b>	<ul style="list-style-type: none"> <li>▶ Large capital and renewal contracts are managed by external providers.</li> <li>▶ Small to medium contracts are managed internally.</li> <li>▶ Internal project managers responsible for financial performance and progress including: <ul style="list-style-type: none"> <li>• Standard reporting</li> <li>• Auditing of projects</li> </ul> </li> <li>▶ Contract Procedures Manual reviewed cyclically.</li> <li>▶ Procurement Policy reviewed cyclically.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Undertake performance monitoring.</li> <li>▶ Commissioning formalised.</li> <li>▶ Undertake debrief</li> </ul>	Business Processes, Projects and Financial Forecasts	BOPRC	10			Ongoing resourcing	<b>Start 2008/09 ongoing</b>	5.3	SLG
<b>Construction / design standards</b>	<ul style="list-style-type: none"> <li>▶ Buildings are constructed to Local Authority Code of Practice.</li> <li>▶ Structures are designed to industry standards.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Formally adopt the industry standard currently in use as a code of practice.</li> <li>▶ Review, update and implement engineering design standards to ensure that all assets are designed, constructed and handed over to the Council in accordance with the standards. (e.g. Bell Road).</li> </ul>	Lifecycle Management	BOPRC	60+			Resources	<b>2009/10</b>	5.4	Engineering Manager

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Years	Project	Owner
					Internal	External					
<b>Asset handover</b>	<ul style="list-style-type: none"> <li>▶ No asset handover process currently in place.</li> <li>▶ No process in place to ensure quality of handover assets.</li> <li>▶ No process currently in place to ensure this information is added into the Asset Register.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Identify current procedures in place or develop standard procedures to ensure the quality of assets being handed over. Document and flowchart the handover process procedures to include: <ul style="list-style-type: none"> <li>• Check lists for external parties</li> <li>• Construction audits and design checks</li> <li>• As Builts</li> <li>• Quality assurance checks</li> </ul> </li> <li>▶ Develop and document a process to add new assets to Asset Register.</li> </ul>	Levels of Service, Lifecycle Management	BOPRC/ contractor input?				Resources Tie into earlier project	2009/10	5.5	Engineering Manager
<b>Asset rationalisation /disposal</b>	<ul style="list-style-type: none"> <li>▶ No formal process for disposals at present.</li> <li>▶ Field work identification of assets that have been swept away.</li> <li>▶ Valuation process deals with disposals and additions.</li> <li>▶ Valuation will be undertaken annually.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Review assets disposals at each valuation.</li> </ul>	Lifecycle Management	BOPRC	10			Resources	2009/10	5.6	Engineering Manager

## Organisational/commercial strategies

### Commercial strategies

Commercial strategies form the basis for the implementation of asset management planning into the field through internal or external service providers. Good commercial tactics are necessary for Bay of Plenty Regional Council to drive efficiencies through all aspects of an asset's lifecycle from conception to disposal.

### Organisational issues

The organisational issues element involves the determination of whether organisational factors such as structure are appropriate to deliver asset-related services. Under this element we assess how Bay of Plenty Regional Council's structure, roles, and responsibilities support the asset management functions.

Bay of Plenty Regional Council shows its commitment to asset management through:

- ▶ The direct sponsorship of the asset management programme.
- ▶ Clear budget commitments to asset management.

The make-up, role, and responsibilities of the asset management team are important, especially in:

- ▶ Asset management policies and strategies.
- ▶ Asset management analysis and reporting.
- ▶ Asset management support services.

### People issues

The people issues element involves staff related issues such as adequate training and support. The skills and attitudes of the staff drive Bay of Plenty Regional Council to achieve its goals and deliver services in the most efficient manner.

- ▶ The training available to staff about lifecycle asset management and how these training programs are integrated into the professional development programs for individual staff;
- ▶ The training programs related to the implementation of new processes and practices are completed as part of the initial implementation. Ongoing training relates to the way in which Bay of Plenty Regional Council sustains its skill levels through induction and promotion of staff;
- ▶ How Bay of Plenty Regional Council manages and takes advantage of the knowledge held by individual staff members;
- ▶ How Bay of Plenty Regional Council provides equipment to support the asset management activities and how best practices are identified and implemented in this area;
- ▶ Assessment of the information support systems necessary for the various staff.

The way in which the Council's structure, roles and responsibilities support the lifecycle asset management functions is assessed as follows.

Table 85 Organisational/commercial

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Years	Project	Owner
					Internal	External					
<b>AM review/ improvement</b>	<ul style="list-style-type: none"> <li>First generation AMP has been undertaken since 1996 for five river schemes.</li> <li>This second generation AMP developed with external help from GHD.</li> <li>Benchmarked against OAG criteria.</li> <li>Development of improvement programme.</li> </ul>	<ul style="list-style-type: none"> <li>Improvement programme to be implemented.</li> <li>Annual review of AMP.</li> <li>Alignment with TYP.</li> <li>Team or person responsible to be appointed going forward.</li> </ul>	Business Processes	BOPRC /GHD				Resources, Funding	2008/09 ongoing	6.1	Group Manager Rivers and Drainage
<b>Contracting policies</b>	<ul style="list-style-type: none"> <li>Contracts Procedures Manual.</li> <li>Procurement Policy.</li> <li>Delegations Authority Policy.</li> </ul>	<ul style="list-style-type: none"> <li>Review and update policies every two years.</li> </ul>	Projects and Financial Forecasts, Business Processes	BOPRC	24 +			Resources,	2009/10	6.2	SLG
<b>Internal QA Processes</b>	<ul style="list-style-type: none"> <li>No formalised process in place for QA.</li> <li>Reviews undertaken by senior or corporate staff as required.</li> <li>Inherent quality assurance when consultant used however this isn't often.</li> </ul>	<ul style="list-style-type: none"> <li>Formalise QA processes, document and flow chart.</li> </ul>	Projects and Financial Forecasts, Business Processes	BOPRC	35			Resources, Experience	2010/11	6.3	Group Manager Rivers and Drainage
<b>Corporate commitment</b>	<ul style="list-style-type: none"> <li>Council is committed to the AM process.</li> </ul>	<ul style="list-style-type: none"> <li>Identify AM improvement priorities in the AMP and budget accordingly through to 09/10 LTCCP.</li> </ul>	Total AMP	BOPRC	10			Resources,	2008/09	6.4	CE
<b>AM Roles</b>	<ul style="list-style-type: none"> <li>Group Manager Rivers and Drainage.</li> </ul>	<ul style="list-style-type: none"> <li>Carry out annual review of job responsibilities and adequate resourcing in conjunction with improvement tasks.</li> </ul>	Total AMP	BOPRC	16			Resources,	2009/10	6.5	Group Manager Rivers and Drainage

Process	Current practice	Target practice (3 year focus)	AMP section	Resources	Time (Hrs)		Costs	Dependencies	Years	Project	Owner
					Internal	External					
<b>Corporate AM Team (Strategic Leadership Group)</b>	<ul style="list-style-type: none"> <li>▶ No formalised corporate AM Team in place.</li> <li>▶ Group manager in place for the rivers and drainage activity.</li> <li>▶ Internal relationships with Finance Team.</li> <li>▶ Key group set up for the TYP process.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Consideration be given to the formation of an Asset Management Steering Group (AMSG) within Council to provide guidance and leadership for AM development, this could follow on from the development of the TYP group.</li> </ul>	Total AMP	BOPRC				Resources,	<b>2009/10 onwards</b>	6.6	SLG
<b>Training programme</b>	<ul style="list-style-type: none"> <li>▶ Training programmes developed as part of performance review.</li> <li>▶ Training is monitored and developed by each group.</li> <li>▶ Levels of training: <ul style="list-style-type: none"> <li>• Corporate – lwi, health and safety</li> <li>• Job</li> <li>• Individual – career development</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▶ Staff to undertake AM training as needed.</li> <li>▶ New staff to undertake skill matrices and competencies for roles as they come on board.</li> <li>▶ Generate a training calendar and budget accordingly.</li> </ul>	Total AMP	BOPRC/ HR	?	?	?	Resources,	<b>2009/10</b>	6.7	Engineering Manager





## Glossary of terms

<b>Annual Plan</b>	The Annual Plan provides a statement of the direction of Council and ensures consistency and coordination in both making policies and decisions concerning the use of Council resources. It is a reference document for monitoring and measuring performance for the community as well as the Council itself.
<b>Aggradation</b>	The accumulation of sediment in rivers and waterways due to sediment supply exceeding the waterways ability to transport sediment.
<b>Asset Management (AM)</b>	The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost effective manner.
<b>Asset Management System (AMS)</b>	A system (usually computerised) for collecting, analysing and reporting data on the utilisation, performance, lifecycle management and funding of existing assets.
<b>Asset Register</b>	A record of asset information considered worthy of separate identification including inventory, historical, financial, condition, construction, technical and financial information about each.
<b>Asset Renewal</b>	Major work, which restores an existing asset to its original capacity or the required condition (stopbank top-up etc).
<b>Auditor General</b>	The Auditor General of the New Zealand Audit Office.
<b>Benefit Cost Ratio (BCR)</b>	A ratio which compares the benefits accruing to customers and the wider community from constructing a project with at projects costs.
<b>Capital Expenditure (CAPEX)</b>	Expenditure used to create new assets or to increase the capacity of existing assets beyond their original design capacity or service potential. CAPEX increases the value of an asset.
<b>Climate Change</b>	A long-term significant change in the average weather.
<b>Community Outcomes</b>	Outcomes developed with the community, which outline the community's vision.
<b>Components</b>	Specific parts of an asset having independent physical or functional identity and having specific attributes such as different life expectancy, maintenance regimes, risk or criticality.
<b>Condition Monitoring</b>	Continuous or periodic inspection, assessment, measurement and interpretation of resulting data, to indicate the condition of a specific component so as to determine the need for some preventative or remedial action
<b>Condition Rating Survey</b>	Survey carried out to assess the condition of assets.
<b>Critical Assets</b>	Assets for which the financial, business or service level consequences of failure are sufficiently severe to justify proactive inspection and rehabilitation. Critical assets have a lower threshold for action than non-critical assets.
<b>Current Replacement Cost</b>	The cost of replacing the service potential of an existing asset, by reference to some measure of capacity, with an appropriate modern equivalent asset.
<b>Deferred Maintenance</b>	The shortfall in rehabilitation work required to maintain the service potential of an asset.
<b>Depreciated Replacement Cost</b>	The replacement cost of an asset spread over the expected lifetime of the asset.
<b>Depreciation</b>	The wearing out, consumption or other loss of value of an asset whether arising from use, passing of time or obsolescence through technological and market changes. It is accounted for the by historical cost (or re-valued amount) of the asset less its residual value over its useful life.

<b>Disposal</b>	Activities necessary to dispose of decommissioned assets.
<b>Edge Protection</b>	Rockwork or planting to help maintain the integrity of stopbanks or other flood defences structures.
<b>Emergency Work</b>	The restoration work required to restore an asset damaged by a sudden and unexpected event (e.g. storm event) to its previous condition.
<b>Finance One</b>	Financial management and information system.
<b>Geographic Information System (GIS)</b>	Software which provides a means of spatially viewing, searching, manipulating, and analysing an electronic database.
<b>Groyne</b>	A rigid hydraulic structure that extends from the shore or riverbank that interrupts/alters flows and sedimentation patterns.
<b>Interdecadal Pacific Oscillation</b>	A pattern of Pacific climate variability that changes phases usually about every 20 to 30 years.
<b>Life Cycle Management</b>	A process of managing an asset from initial construction through to disposal.
<b>Net Present Value (NPV)</b>	The value of an asset to the organisation, derived from the continued use and subsequent disposal in present monetary values. It is the new amount of discounted total cash inflows arising from the continued use and subsequent disposal of the asset after deducting the value of the discounted total cast outflows.
<b>Non-Structural Measures</b>	Flood mitigation measures to separate the community from floodwaters.
<b>Optimised Renewal Decision Making</b>	An optimisation process for considering and prioritising all options to rectify performance failures of assets. The process encompasses NPV analysis and risk assessment.
<b>Reach</b>	A defined section of a river, used for management purposes.
<b>Remaining Useful Life (RUL)</b>	Remaining Useful Life of an asset or asset component. (Generally Useful or Effective life less age).
<b>Stakeholder</b>	A person or organisation who has a legitimate interest in an activity e.g. community, Iwi, etc.
<b>Stopbank</b>	An embankment adjacent to a river or watercourse, which retains floodwaters from flowing onto a floodplain.
<b>Structural Measures</b>	Structures or physical works constructed to keep floodwaters away from existing development e.g. stopbanks.
<b>Sustainability</b>	The process of meeting the needs of the present community without compromising the ability of future generations to meet their own needs.

## References and acknowledgements

Material from the following Bay of Plenty Regional Council documents has been used in the preparation of this AMP:

- 1 Bay of Plenty Regional Council Ten Year Plan 2006 - 2016
- 2 Bay of Plenty Regional Council Annual Plan 2007 - 2008
- 3 Whakatane-Waimana Rivers Asset Management Plans
- 4 Kaituna Asset Management Plan
- 5 Waioeka-Otara Asset Management Plan
- 6 Rangitaiki – Tarawera Rivers Scheme Asset Management Plan
- 7 Whakatane – Waimana Rivers Asset Management Plan
- 8 Whakatane Waimana Floodplain Management Strategy – Stage 1
- 9 Whakatane-Waimana Floodplain Management Strategy – Stage 2
- 10 Hydraulic Capacity Review of the Te Rahu Canal
- 11 Valuation Report - 2008
- 12 Flood Warning Manual 2008

Material from the following documents has been used in the preparation of the assessments:

- 1 NAMS International Infrastructure Management Manual (IIMM) Version 2, April 2002
- 2 NAMS Creating Customer Value from Community Assets, October 2002
- 3 NAMS New Zealand Valuation and Depreciation Guidelines, 2001
- 4 Local Government Amendment Act, 2002
- 5 Resource Management Act, 1991
- 6 SNZ HB 4360:2000 Risk Management For Local Government, Standards New Zealand
- 7 AS/NZS 4360:2004 Risk Management, Standards New Zealand
- 8 Various Growth Strategies for the district councils of the Bay of Plenty