



# Rotorua Lakes Catchment Asset Management Plan

2018-2028

# Document control

## Document information

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## Asset management team

### Rotorua Lakes Catchment

Chris Ingle	General Manager, Integrated Catchments
Helen Creagh	Rotorua Catchments Manager
Andy Bruere	Lakes Operations Manager
Niroy Sumeran	Lakes Operations Officer

#### ***Approved for issue:***

Signed:



Date:

Chris Ingle  
**General Manager, Integrated Catchments**

Signed:



Date:

Helen Creagh  
**Rotorua Catchments Manager**

Signed:



Date:

Andy Bruere  
**Lakes Operations Manager**

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# 1 Introduction

## 1.1 Purpose of this Plan

The purpose of this Plan is to formally document the management philosophy that is applied to the Rotorua Lakes Catchment assets and services. This approach ensures that acceptable levels of service is provided in the most cost effective manner and contribute to the achievement of the Long Term Plan (LTP).

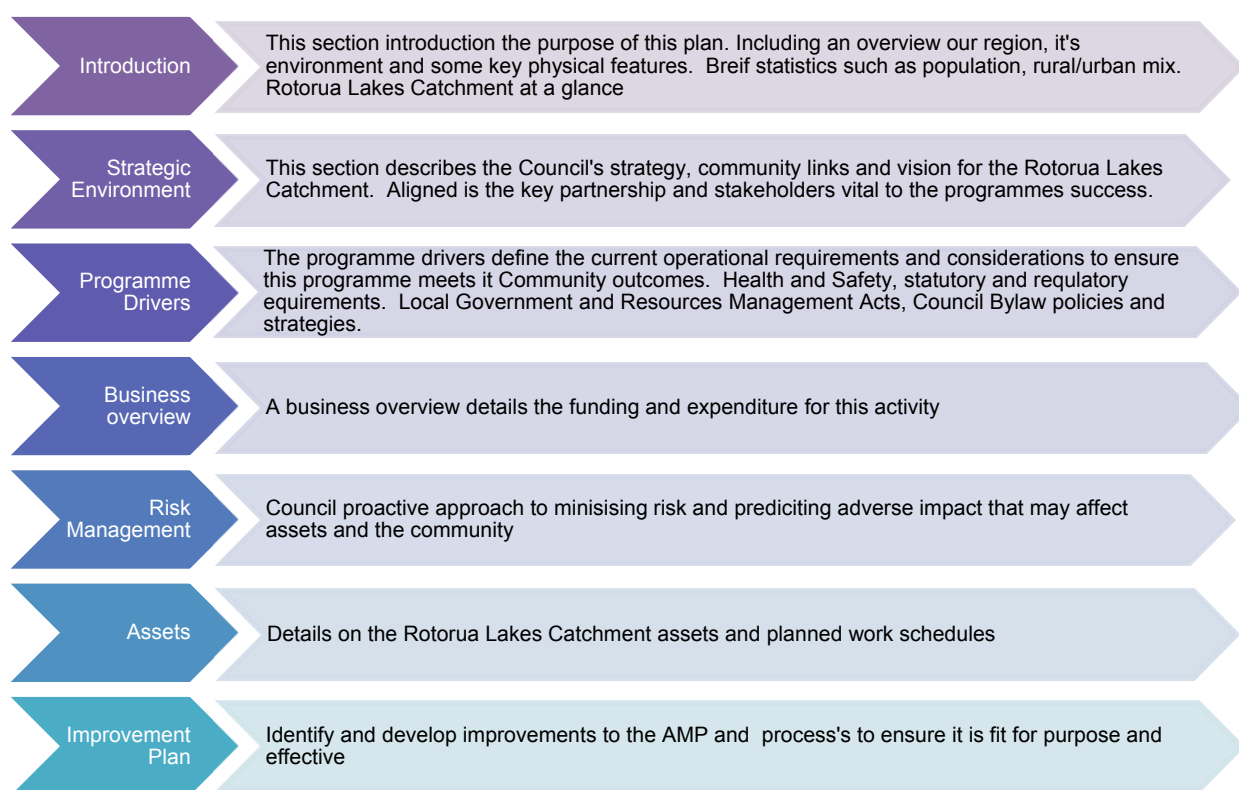
This long-term planning approach is considered necessary given the large capital and operating expenditure, the long lives of the assets and the lead times in planning for upgrades, of new assets when required. The sequencing and timing of works are developed through discussions with key stakeholders 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 Rotorua Lakes Catchment 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 Rotorua Lakes Catchment assets is being maintained.

## 1.2 Scope of this Plan

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



## 2 The Bay of Plenty region

### 2.1 Our region

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 and captures the coastal townships of Tauranga and Whakatāne. 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.



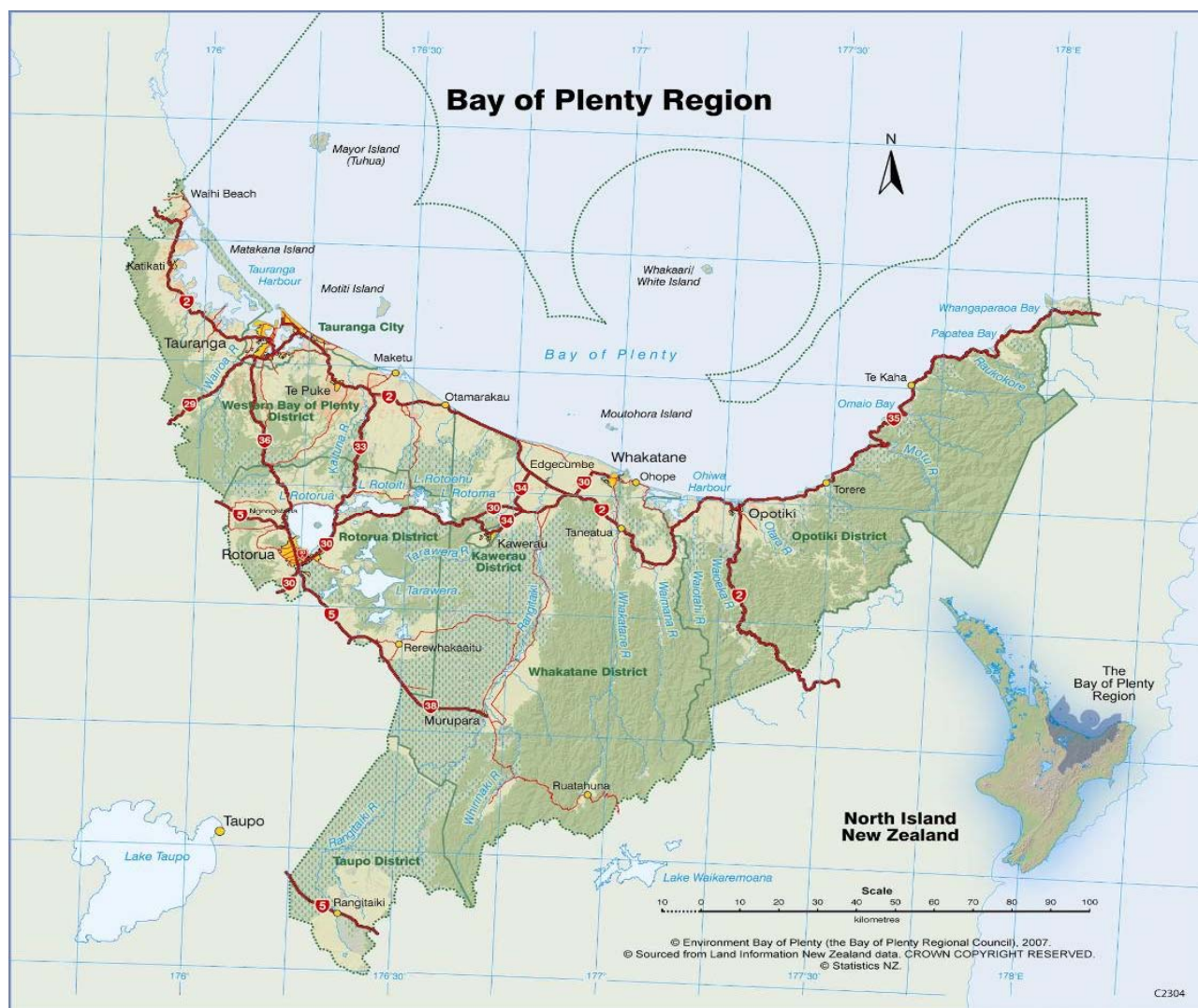


Figure 1 Map of the Bay of Plenty region

### 2.1.1 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, 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.

The Bay of Plenty Regional Council is responsible for twelve lakes with this catchment, Rotorua, Rotoehu, Rotoiti, Ōkāreka, Tikitapu, Ōkataina, Rotokakahi, Tarawera, Ōkaro, Rotomā, Rerewhakaaitu, Rotomahana.

### 2.1.2 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 surges.

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

### 2.1.3 Economy and population

At the 2013 census, the region had a population of 273,360. The population estimate for 2018 is 303,500.

The largest urban area in the region is Tauranga city. 82% of the population live in the areas of Tauranga City, Rotorua District, and Western Bay of Plenty.

Key points from the 2013 Census about the Bay of Plenty population are:

- The population ranks 5th in size out of the 16 regions in New Zealand
- The Māori population ranks third in size out of the 16 regions in New Zealand. Overall 27.5% of people belong to the Māori ethnic group (14.9% in New Zealand). However, the percentage is significantly higher in the eastern part of the region
- For people aged 15 years and over, the median income is \$26,200 (lower than the New Zealand median). A higher percentage of people have an annual income of \$20,000 or less for New Zealand as a whole
- The median age is 40.6 years (38.0 years for New Zealand)
- 17.5 percent of people in Bay of Plenty region are aged 65 years and over, compared with 14.3 percent of the total New Zealand population
- The region's unemployment rate for the year to March 2017 was 5.7% (compared to 9% in the 2013 Census)
- Under the Statistics NZ medium growth scenario, the Bay of Plenty region's population is predicted to grow to 329,800 by 2028

Table 1 Population estimates for Bay of Plenty region

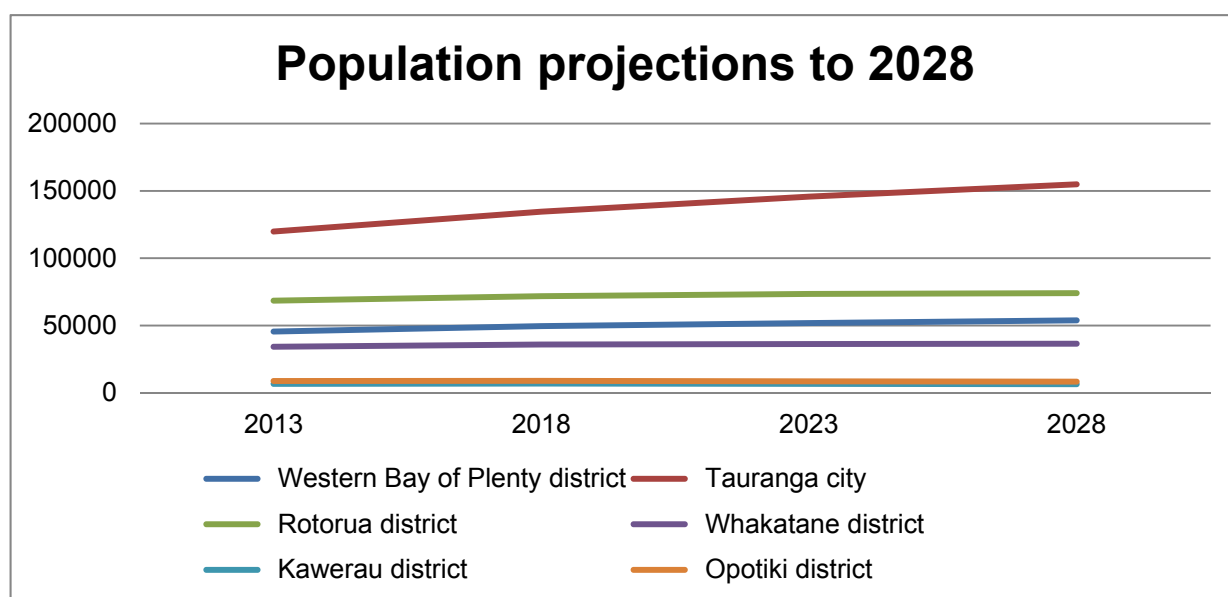
Bay of Plenty region population							
	Census	Population Estimates (Statistics NZ – medium growth projections)					
Year	2013	2018	2023	2028	2033	2038	2043
	279, 700	303,500	318,400	329,800	339,400	346,900	353,100
Projected population growth (%)	Population increase 2018-2028 8.7%						
	Population increase 2018-2043 16%						

Source: [http://stats.govt.nz/browse\\_for\\_stats/population/estimates\\_and\\_projections/subnational-pop-estimates-tables.aspx](http://stats.govt.nz/browse_for_stats/population/estimates_and_projections/subnational-pop-estimates-tables.aspx).

Population projections to 2028 for the territorial authorities in the Bay of Plenty region indicate that there will continue to be strong population growth in Tauranga city. Growth in Western Bay of Plenty, Rotorua and Whakatāne districts will continue, but population may decline in Ōpōtiki and Kawerau districts. This is shown in the graph below. As a result of the population growth in Tauranga City, the percentage share of the region's population increases, and declines for all other districts.



Figure 2 Population projections to 2028 for Territorial Authorities (Statistics NZ medium growth projections as at July 2017).



Source: [http://stats.govt.nz/browse\\_for\\_stats/population/estimates\\_and\\_projections/subnational-pop-estimates-tables.aspx](http://stats.govt.nz/browse_for_stats/population/estimates_and_projections/subnational-pop-estimates-tables.aspx)

## 2.2 Rotorua Lakes Catchment at a glance

The Bay of Plenty Regional Council (BoPRC) manages twelve lakes on behalf of the community via the Rotorua Te Arawa Lakes Programme. These lakes are of regional and national significance as well as being a taonga to the people of Te Arawa.

The twelve lakes that are considered as part of this Asset Management Plan (AMP) are outlined in Table 2. Deed funded lakes are those out of the twelve lakes that have been identified as the most in need of action and have Crown funding (as formalised under a Memorandum of Understanding dated 18 April 2007) towards improving their water quality, subject to Bay of Plenty Regional Council (BoPRC) and Rotorua Lakes Council (RLC) matching the Crown's contribution

Table 2 Lakes covered under the Rotorua Lakes Catchment

Deed Funded Lakes	Non-Deed Funded Lakes
Rotorua	Tikitapu
Rotoehu	Ōkātina
Rotoiti	Rotokakahi
Ōkāreka	Tarawera
	Okaro
	Rotomā
	Rerewhakaaitu
	Rotomahana

## 2.3 Background

The Rotorua Te Arawa Lakes are seen as iconic by many New Zealanders. They have unique cultural, historical, social, and economic value locally, regionally, nationally and internationally.

A Lakes Management Working Group (consisting of Te Arawa Māori Trust Board, Bay of Plenty Regional Council and Rotorua Lakes Council) was initially established in 1998 to identify and address the problems arising from a lack of co-ordination between the many groups with interests in managing the lakes and then to consider how the law and those concerned could work together to solve problems as effectively and efficiently as possible.

In 2000, the Lakes Management Strategy was released to the community for consultation and feedback. A draft strategy for the lakes of the Rotorua District was adopted in October 2002. The document sets goals for the protection, use, enjoyment and management of the lakes.

The Rotorua Te Arawa Lakes Strategy Group (previously known as the Lakes Management Working Group) was established through the Te Arawa Lakes Settlement Act 2006. The strategy group have worked co-operatively on the lakes programme for the protection and restoration of the Te Arawa Lakes. The Rotorua Te Arawa Lakes Strategy Group has set a goal to restore the lake water quality to a sustainable level and a set of targets, action plans and tools were developed to meet that. On 18 April 2007, a Memorandum of Understanding between the Crown and the Rotorua Te Arawa Lakes Strategy Group was signed to formally establish a working relationship between the parties for the purpose of maintaining and improving the water quality of the lakes through the Rotorua Te Arawa Lakes Programme. This is a circa \$200 million programme spanning more than 20 years to improve or maintain water quality to meet community aspirations for water quality.

*\*Source: Section 3 of the Programme Management Plan 2008-2022.*

## 2.4 Programme objectives

The key objective for the Rotorua Te Arawa Lakes Programme is:

***“To meet community expectations for water quality in each lake”.***

Each of the 12 Rotorua lakes has a water quality target based on a Trophic Level Index (TLI) that is identified in the Regional Water and Land Plan. These current measureable objectives set for the programme are calculated using four key indicators – total nitrogen, total phosphorous, water clarity, and chlorophyll-A which are combined into one TLI number. The higher the TLI is, the lower the lake water quality. These current TLI targets are as follows:

Table 3 Trophic Level Index (TLI) Targets for the twelve lakes

Lake TLI target	Nutrient reduction target (N)	Nutrient reduction target (P)	
Rotoehu	3.9	8,880 kg	708 kg
Rotomā	2.3	1,320 kg	250 kg
Tikitapu	2.7	701-822 kg	21-31 kg
Ōkāreka	3.0	2,500 kg	80 kg
Ōkaro	5.0	910 kg	20 kg
Rotorua	4.2	250 tonnes	10 tonnes
Rotoiti	3.5	130 tonnes	19 tonnes
Ōkātina	2.6	860 kg	380 kg
Tarawera	2.6	TBC	TBC
Rerewhakaaitu	3.6	TBC	TBC
Rotokakahi	3.1	TBC	TBC
Rotomahana	-	TBC	TBC

- Rotokakahi is an iwi owned lake managed by the Lake Rotokakahi Control Board
- Lake Rotomahana TLI does not exceed the three-yearly rolling average 0.2 unit trigger

The aim for the above reductions is to meet community expectations for water quality in each lake.

Although objectives are set in a regulatory document, partners within this programme acknowledge and agree that community expectations mean more than meeting a scientific measure of water quality (TLI). Measures of community satisfaction can also include restoration of taonga species, mahinga kai, restoring the mauri of water or simply improving water clarity. \*

\*SOURCE: SECTION 4 OF THE PROGRAMME MANAGEMENT PLAN 2008-2022

### 3 Overview of asset management planning

#### 3.1 Asset management objectives and purpose

BoPRC recognises that the Rotorua Lakes AMP is the fundamental driver of managing the twelve lakes on behalf of the community.

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

BoPRC is committed to "best appropriate practice" asset management in order to achieve the following key objectives:

#### 3.2 Meet the service expectations of the community ('customer values')

Ensure capital projects and maintenance activities achieve efficient results with optimal benefits. We will demonstrate Council's approach to managing risk and comply with statutory requirements.

### **3.3 Plan timeframe**

This AMP covers a 10-year timeframe. The main focus of the plan is to determine the work programmes required to maintain, improve and renew assets over the next ten years. The AMP provides the detail underpinning the LTP 2018-2028 and will be revised every three years.

### **3.4 Key planning assumptions and limitations of this plan**

Financial forecasts have been developed for ten years based upon the summaries in the LTP 2018-2028.

- Total construction costs and renewals profiles have not been altered for CPI. The majority of the assets are new (less than 10 years old)
- Total construction costs include design and supervision/management costs
- Total construction costs have been apportioned across the component assets
- Costs for lakes assets have a very high design component, therefore some minor asset renewals will be much less than the valued replacement cost due to overhead costs being apportioned across the asset base

### **3.5 Relationship with other plans and documents**

Key documents will be used to control the Rotorua Lakes Catchment activity and Rotorua Te Arawa Lakes Programme. Details of these documents, the current version and the approval process are detailed in Table 4.

These documents are key to the success of the programme's objectives and they will be treated as live documents. All documents will be reviewed as stated below to ensure these documents are complete and reflect the current status of the programme.

Table 4 Other plans and documents

Plans/Documents	Description	Frequency	Date of issue
Long-Term Plan	The LTP 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.	Must be produced every three years.	LTP 2018-2028, 1 July 2018
Annual Plan	The works identified in the AMP should automatically become the basis on which future Annual Plans are prepared (as well as the LTP above).	Must be produced in the intervening years between LTPs. Every third year the annual plan is embedded in the LTP.	AP 2017/2018
Programme Management Plan (PMP) 2008-2022	This document groups multiple programme projects to achieve a strategic outcome. It captures and baselines the scope and objectives of the programme and includes the following: work breakdown, governance and controls, reporting, schedules, success measures (including targets) etc.	Must be reviewed and updated quarterly.	V2.0, 21 August 2014
Asset Management Plan	Levels of service, growth, risk, maintenance, renewal and development works and strategies are identified and budgeted for within this plan. This information should automatically feed into the LTP and Annual Plan.	Should be reviewed and aligned every year prior to the Annual Plan process and a major update every three years prior to the LTP.	V2.0, 1 July 2018
Communication and Stakeholder Engagement Plan	This document supports the Programme Management Plan. It is the road map for getting the programme's message to the Stakeholders and community.	Must be reviewed and updated annually.	V1.5, 19 March 2014 Additional plan to sit aside November 2014.
Finance Management Plan	Details the programme spending, baseline budgets, reporting and approval information.	Must be reviewed and updated bi-annually.	V2.0, 28 August 2014
Risk/Issues Management Plan	Details the processes and tools put in place to successfully manage identification; classification; assessment; treatment and escalation of risks and issues.	Must be reviewed and updated quarterly.	V1.0, May 2014
Change Management Plan	Serves to outline the process taken when changes are made to the direction of the programme.	Must be reviewed and updated annually.	V2.0, 7 March 2014

## 4 Strategic environment

### 4.1 Purpose

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

### 4.2 Linkages – community outcomes, and the Rotorua Catchment activity

Bay of Plenty Regional Council's work guides and supports the sustainable development of the Bay of Plenty. We want to make sure our region grows and develops in a way that keeps its values safe for future generations. Council's proposed vision and community outcomes are shown in figure 3 below.

Figure 3 Outcomes and activities



A major focus of our work involves looking after the environment. We manage the effects of people's use of freshwater, land, air and coastal water. However, we also have a broader responsibility with others for the economic, social and cultural well-being of the regional community.

### 4.3 Programme strategy

The Bay of Plenty Regional Council Strategy for the Lakes of the Rotorua District provides an overall management strategy for the Rotorua Lakes. It is an overarching policy document that gives a vision for the future, with some practical steps to achieve that vision.

As caretakers of the region's land, air and water, BoPRC monitors the effects of human activities on the environment. It also promotes the sustainable management of natural and physical resources for present and future generations.



## 4.4 Rotorua Te Arawa Lakes Programme Vision

The lakes of the Rotorua district and their catchments are preserved and protected for the use and enjoyment of present and future generations, while recognising and providing for the traditional relationship of Te Arawa with their ancestral lakes.

Matakite:

E tiakina ana, e manaakitia ana hoki nga rota o te rohe o Te Arawa hei painga mo tataua me nga whakatipuranga e ara mai nei, a, me te aro ana ki te hononga tuku iho o Te Arawa ki o rataua rota.

## 4.5 Key Partnerships and stakeholders

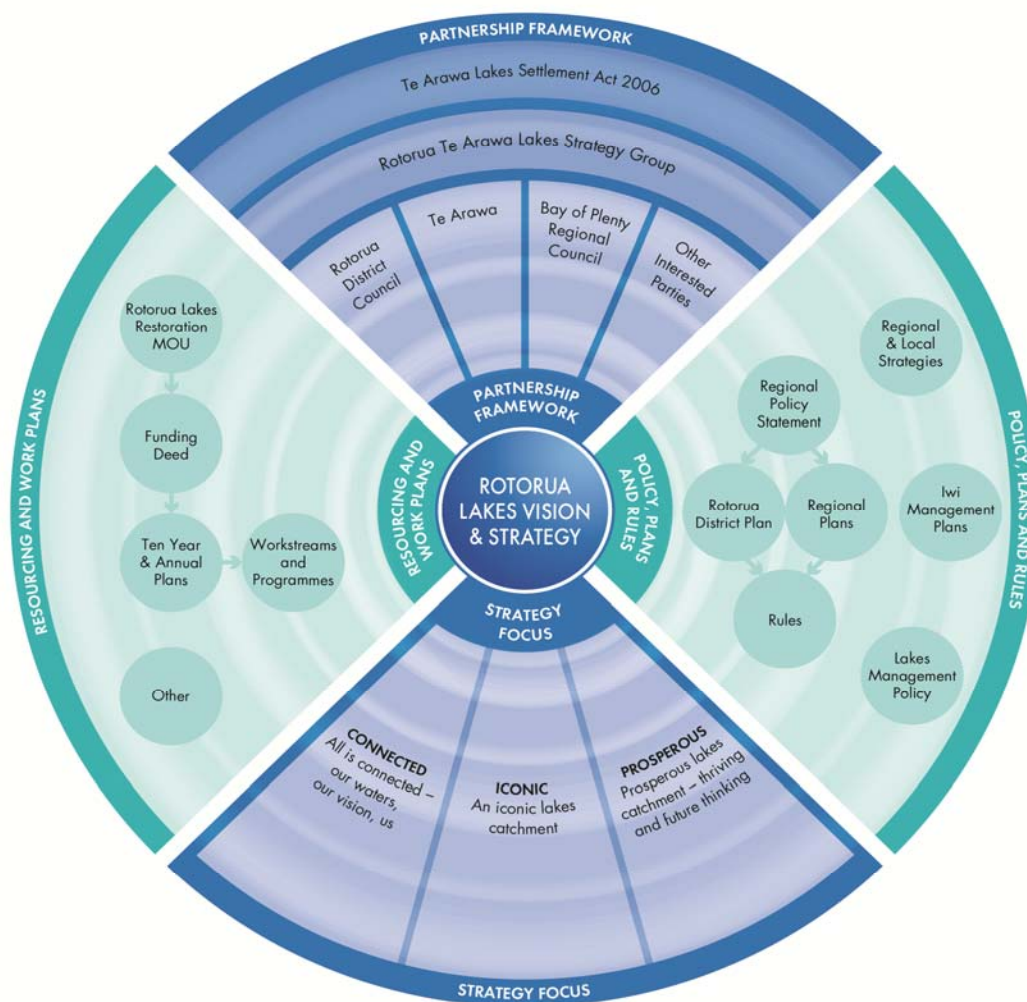
Bay of Plenty Regional Council works with a number of parties to deliver the Lakes Programme and manage the overall goals and objectives of the activity. The Rotorua Te Arawa Lakes Strategy Group is the overarching management group for the 12 lakes in the Rotorua Te Arawa Lakes Programme. The parties involved and their responsibilities are summarised in Table 5.

*Table 5 Roles and responsibilities for the partner organisations*

Agency	Role within Lakes programme
Te Arawa Lakes Trust	<ul style="list-style-type: none"><li>• Representatives of 52 iwi hapū of Te Arawa as outlined in Schedule 2 of the Te Arawa Lakes Settlement Act 2006</li><li>• Land owner of the Te Arawa Lake beds</li><li>• Lead and monitor cultural component of the lakes strategy</li><li>• Involved and engaged in lakes programme strategy deliverables</li></ul>
Rotorua Lakes Council	<ul style="list-style-type: none"><li>• Administer the relevant sections of the Resource Management Act 1991</li><li>• Provide and maintain urban sewerage and storm water discharge infrastructure</li><li>• Plan for and manage land uses within lake catchments through the District Plan</li><li>• Fund agreed portion of the Deed funded projects, in association with Bay of Plenty Regional Council</li></ul>
Bay of Plenty Regional Council	<ul style="list-style-type: none"><li>• Implement the strategy for the lakes</li><li>• Administer the relevant sections of the Resource Management Act 1991</li><li>• Monitor and report water quality issues</li><li>• Implement the Recreation and Aquatic Pest Management Strategy</li><li>• Plan for and manage land uses within lake catchments through the Regional Policy Statement</li><li>• Fund agreed portion of Deed funded projects, in association with Rotorua Lakes Council</li></ul>

An overall shown in figure 4 below is a picture of the partnership framework, the policies, strategies, resourcing and work plans that help to deliver the Rotorua Lakes Vision and Strategy which is the core outcome for the strategy group.

Figure 4 Rotorua Lakes Vision and Strategy



## 4.6 Community outcomes

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

The Rotorua Te Arawa Lakes Programme contributes directly to four of the five Community Outcomes identified in BoPRC's LTP 2018-2028, these are set out below:

*Table 6 How the programme supports community outcomes*

Community outcomes	How the activity contributes to community outcomes	Key performance indicators
<p><b>Water Quality and Quantity</b> Our water and land management practices maintain and improve the quality and quantity of the region's water resources.</p> <p><b>Environmental Protection</b> We maintain and enhance regional biodiversity and our air, land, freshwater, geothermal and coastal resources for the benefit of our communities. We support others to do the same.</p> <p><b>Resilience and Safety</b> Our planning and infrastructure provides resilience to natural hazards and flooding so that our communities' safety is improved and maintained.</p> <p><b>Regional Collaboration and Leadership</b> We have established the region's priorities and strategic direction with our partners and communities. We have collaborated to achieve integrated planning across the region.</p>	<ul style="list-style-type: none"> <li>• Setting water quality improvement actions to achieve each lake's Trophic Level Index (TLI) target</li> <li>• Works with iwi, landowners and the community to provide updates on Rotorua lakes water quality and progress</li> </ul>	<ul style="list-style-type: none"> <li>• Percentage reduction in exports of nitrogen from the Lake Rotorua catchment in accordance with the integrated Framework and engineering solutions target</li> <li>• Meeting the TLI for each lake, which are set in the Regional Water and Land Plan</li> <li>• Achieving nutrient reductions targets set in the Regional Policy Statement for Lake Rotorua and other individual lake action plans</li> <li>• Continue to implement the Rotorua Te Arawa Lakes Programme, including implementing Lake Water Quality Action Plans; investigation lake restoration options; and monitoring interventions</li> <li>• Harvest lake weed</li> <li>• Take proactive measures to minimise algae blooms</li> <li>• Commission and operate the Tikitere Nitrogen Reduction Plant</li> <li>• Continue operation of P-locking plants</li> </ul>

Figure 5 The way we work



## **5 Programme drivers**

### **5.1 Health and safety**

The programme has in place a Health and Safety Management Plan. It is designed to ensure the programme's major deliverables are completed with an acceptable level of safety. The purpose of the Health and Safety Management Plan is to set out the health and safety policy, plans and processes within which health and safety will be managed during the execution of the programme. The main health and safety risks are associated with the lake sites and on-road travel. All personnel involved on sites are considered to be exposed to higher risks; while all office work are considered to be low risks.

*\*Source: Quality Management section of Programme Management Plan 2008-2022.*

### **5.2 Statutory requirements**

Statutory requirements impact on the way in which the Bay of Plenty Regional Council operates to meet its obligations to its stakeholders. Some of the key legislation relevant to the programme is as follows:

### **5.3 Local Government Act 2002 (Amended 2010)**

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 Plan (LTP) including the identification of assets and how those assets are to be managed.

It is intended that this Asset Management Plan will be a vehicle for developing and recording community outcomes in relation to property management and will be a 'feeder plan' supporting LTP functions and forecasts and asset information.

### **5.4 Resource Management Act 1991 (RMA) 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 Regional Water and Land Plan is a vehicle used to meet the requirements of the RMA and this plan then in turn sets the water quality goals for Council to achieve by way of setting Trophic Level Indices for each lake. These are then further considered in the Levels of Service section of this AMP and also as part of the Lake Action Plans that have been/are being developed for each of the twelve lakes.

### **5.5 Hazardous Substances and New Organisms Act 1996 (HSNO)**

The HSNO Act came into force in two stages. Provisions relating to new organisms took effect in July 1998. The provisions relating to hazardous substances came into force on 2 July 2001. The Act and regulations control the import, manufacture, or use (including disposal) of manufactured chemicals that have hazardous properties.

Several of the plants managed and operated on behalf of BOPRC contain hazardous materials and storage and use of these materials are governed by this Act.

## 5.6 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.

## 5.7 Emergency Management focuses on ‘the 4Rs’

Figure 6 4R's



- 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

## 5.8 The Civil Defence Emergency Management Act 2002 requires

The 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.

## 5.9 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.

## 5.10 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



### 5.11 Health Act 1956

This Act establishes the government structure required to enact and enforce health requirements, including the activities of local government.

### 5.12 Regulatory requirements

The 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 the Rotorua Te Arawa Lakes Programme, Council took into account the following policies, strategies and guidelines.

*Table 7 Policies, strategies etc.*

Name	Date
Funding Deed	Original - August 2008, Variation 1 – October 2013
BOPRC Procurement Policy 2010	2010
BOPRC Ten-Year Plan (2009–2019)	June 2009
BOPRC Ten-Year Plan (2012–2022)	June 2012
BOPRC Annual Plan (2013/2014)	June 2013
BOPRC Annual Plan (2014/2015)	June 2014
BOPRC Long Term Plan (2015-2025)	June 2015
BOPRC Annual Plan (2016/2017)	June 2016
BOPRC Annual Plan (2017/2018)	June 2017
BOPRC Long Term Plan (2019-2028)	June 2018 (Draft)
Rotorua Lakes Council's Procurement Policy	September 2012
Rotorua Lakes Council's Annual Plan	2014
Regional Water and Land Plan (Rule 11)	2011
Regional Policy Statement	2010
Rotorua Lakes Restoration MOU	2007
Rotorua Lakes Strategy	Version 1, 2013
Action Plans: <ul style="list-style-type: none"><li>• Lake Ōkaro Action Plan</li><li>• Lake Ōkātina Action Plan</li><li>• Lake Ōkāreka Action Plan</li><li>• Lake Rotoehu Action Plan</li><li>• Lake Rotomā Action Plan</li><li>• Lakes Rotorua and Rotoiti Action Plan</li><li>• Lake Tikitapu Action Plan</li></ul>	2006 2013 2011 2007 2009 2009 2011
Rotorua Lakes Recreation Strategy	2005

## 6 Business overview

### 6.1 Funding and expenditure

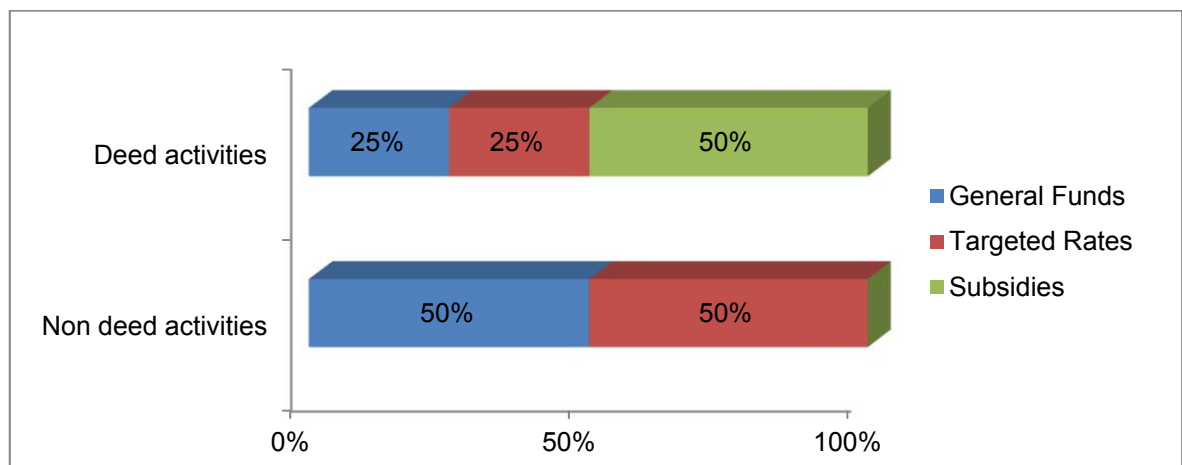
#### 6.1.1 Funding

Bay of Plenty Regional Council is a Regional Council established under the Local Government Act 2002 (LGA), and is domiciled and operates in New Zealand. The relevant legislation governing the Council's operations includes the LGA and the Local Government (Rating) Act 2002.

The Council also receives grants in respect of qualifying operating and capital expenditure from Central Government for the Rotorua Lakes Protection and Restoration Action Plan as detailed in the funding deed. These grants are recognised as revenue in the period they are received.

Below figure 8 show the funding ratios applied to the LTP 2018-2018.

*Figure 8 Rotorua Lakes Catchment Funding ratios*



#### 6.1.2 Expenditure

Financial estimates provided in table 8 incorporates the projected income and funding sources (uninflated) to fund operational, renewal and capital expenditure for the next ten years. Deed project income ends 2022. This is based on the best available information at the time of preparation.

Table 8 Rotorua Lakes financial estimates 2018-2028 (uninflated)

	2018/19 \$000	2019/20 \$000	2020/21 \$000	2021/22 \$000	2022/23 \$000	2023/24 \$000	2024/25 \$000	2025/26 \$000	2026/27 \$000	2027/28 \$000
<b>Operating revenue</b>										
Targeted rates	3,091	3,005	3,150	3,308	3,779	3,768	3,919	3,834	3,807	3,787
Other subsidies	5,378	5,040	4,870	6,545	-	-	-	-	-	-
<b>Total operating revenue</b>	<b>8,468</b>	<b>8,045</b>	<b>8,020</b>	<b>9,853</b>	<b>3,779</b>	<b>3,768</b>	<b>3,919</b>	<b>3,834</b>	<b>3,807</b>	<b>3,787</b>
<b>Operating expenditure</b>										
Operating expenses	14,365	13,465	13,718	17,168	4,734	4,590	4,831	4,527	4,418	4,305
Depreciation and amortisation	795	879	965	1,009	1,009	984	959	937	856	856
<b>Subtotal expenditure</b>	<b>15,160</b>	<b>14,344</b>	<b>14,683</b>	<b>18,178</b>	<b>5,744</b>	<b>5,574</b>	<b>5,790</b>	<b>5,464</b>	<b>5,274</b>	<b>5,161</b>
<b>Overhead charges and recoveries</b>										
Corporate costs	1,006	1,037	1,090	1,127	1,154	1,189	1,205	1,238	1,240	1,220
Rates cost recharged	84	85	95	95	107	107	109	106	108	106
<b>Total overhead charges and recoveries</b>	<b>1,090</b>	<b>1,122</b>	<b>1,185</b>	<b>1,222</b>	<b>1,261</b>	<b>1,296</b>	<b>1,314</b>	<b>1,344</b>	<b>1,347</b>	<b>1,326</b>
<b>Total expenditures</b>	<b>16,250</b>	<b>15,466</b>	<b>15,867</b>	<b>19,400</b>	<b>7,004</b>	<b>6,870</b>	<b>7,104</b>	<b>6,808</b>	<b>6,621</b>	<b>6,487</b>
<b>Net deficit (surplus) to fund</b>	<b>7,782</b>	<b>7,421</b>	<b>7,848</b>	<b>9,547</b>	<b>3,226</b>	<b>3,102</b>	<b>3,185</b>	<b>2,973</b>	<b>2,814</b>	<b>2,700</b>
<b>Funding required</b>										
General funding	2,745	2,723	3,150	3,308	3,779	3,768	3,919	3,834	3,807	3,787
(Increase) decrease in reserves	5,036	4,697	4,698	6,238	- 553	- 666	- 735	- 861	- 993	- 1,087
<b>Total funding</b>	<b>7,782</b>	<b>7,421</b>	<b>7,848</b>	<b>9,547</b>	<b>3,226</b>	<b>3,102</b>	<b>3,185</b>	<b>2,973</b>	<b>2,814</b>	<b>2,700</b>
<b>Capital</b>										
Lakes capital expenditure	1,140	4,300	3,450	-	-	-	-	-	-	-
<b>Total capital expenditure</b>	<b>1,140</b>	<b>4,300</b>	<b>3,450</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Capital funding</b>										
Capital subsidies	250	2,150	1,400	0	0	0	0	0	0	0
Increase/(decrease) in reserves/loans	890	2,150	2,050	0	0	0	0	0	0	0
<b>Total capital funding applied</b>	<b>1,140</b>	<b>4,300</b>	<b>3,450</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## 6.2 Major capital works programme

Capital works and costs as outlined within LTP 2018-2028 are below.

Table 9 Capital works

Project	Costs	Commissioning years
Tikitere Nitrogen Reduction Plant	\$7,600,000	2020/2021
Buoy Okareka	\$35,000	2018/2019
Buoy Rotoiti	\$35,000	2018/2019
Nutrient Assessment Database	\$250,000	2018/2019
Lake Ōkāreka Pipeline	\$970,000	2020/2021
<b>Total</b>	<b>\$8,890,000</b>	

## 7 Risk management

Proactive risk management is key for BoPRC. By predicting adverse impacts that may affect a particular project, plans can be developed to treat a risk before the risk impacts, escalates, or is realised.

Risk assessment and management are vital business processes used to:

- Identify potential threats to the programme, system or asset
- To assess vulnerabilities of the programme, system or asset
- To evaluate the impacts on programme's assets or systems
- To evaluate the probability of these threats occurring
- To evaluate the probability of these threats occurring

Assessing risks at asset level is the focus of this AMP section and the Programme and Project Risk Management Plan.

The identification of the programme risks focuses on the following three key areas as identified in figure 9:

Figure 9 Key risk areas



## 8 Asset summary

Council manages 12 lakes through the Rotorua Te Arawa Lakes Programme activity as noted in the Introduction. The programme focuses on water quality protection and restoration. It is a joint programme between Bay of Plenty Regional Council, Rotorua Lakes Council and Te Arawa Lake Trust. Council manages \$16,542,337 (replacement value) of assets to implement the goals of the Rotorua Lakes Strategy. The assets and their locations (on 5 lakes) are summarised on this page.

Table 10 Asset replacement value

<b>Lakes Summary</b>	<b>\$18,937,209</b>	<b>Lake Okaro</b>	<b>\$412,000</b>
P-Locking plants: Rotoehu, Rotorua	\$1,399,800	Wetland 1 & 2	\$369,700
Nitrogen Reduction (Tikitere Zeolite Pilot Plant) Rotorua	\$442,400	Monitoring buoy	\$42,300
De-stratification plant: Rotoehu	\$71,200		
Koaro Fish pass	\$28,600	<b>Lake Rotoiti</b>	<b>\$12,847,900</b>
Monitoring buoys: Rotorua, Rotoiti, Rotoehu and Tarawera,	\$296,900	Monitoring buoy	\$42,900
Wetlands: Okaro and Rotoehu (floating)	\$1,293,700	Ōhau Channel diversion wall	\$12,805,000
Groundwater monitoring bores: Rerewhakaaitu, Tarawera, Rotokakahi, Tikitapu and Okareka	\$1,542,668		
Aquatic weed harvester trailer: Rotorua	\$60,000	<b>Lake Rotoehu</b>	<b>\$1,502,500</b>
Outlet Structure: Okareka	\$910,800	Waitangi Soda Springs P-locking plant	\$465,000
Diversion wall: Rotoiti.	\$12,805,000	De-stratification plant	\$71,200
Pioneer Pump Canopy unit: Okareka	\$86,141	Monitoring buoys	\$42,300
		Wetland	\$924,000
<b>Lake Rotorua</b>	<b>\$1,852,041</b>	<b>Lake Okareka</b>	<b>\$996,941</b>
Puarenga P-Locking plant	\$377,100	Outlet structure	\$910,800
Utuhina P-Locking plant	\$557,700	Pioneer Pump Canopy unit	\$86,141
Tikitere Zeolite Pilot plant	\$442,400		
Monitoring buoy	\$43,500	<b>Multiple Lakes</b>	<b>\$1,325,827</b>
Koaro Fish pass	\$28,600	Monitoring buoy	\$125,900
Groundwater bores	\$402,741	Groundwater bores	\$1,139,927
		Aquatic weed harvester trailer: Rotorua	\$60,000

## 9 Asset life cycle management

The following Lifecycle Management (LCM) section provides detailed summary of the lakes assets. It also provides key strategies and work programmes that are underway to manage the assets that form the activity, to ensure that Levels of Service are met as are the overall goals and objectives of this plan and the lakes strategy.

The LCM section includes the following:

- Explanation of Lifecycle Management
- Asset valuation and data summaries
- Key issues and actions for each asset group
- Lifecycle Management strategies and programmes

Table 11 Asset ID Depreciation cost

Asset ID	Description	Asset Cost ODRC \$000	Depreciation Rate	Useful Life (years)	2018/2019 \$000	2019/2020 \$000	2020/2021 \$000	2021/2022 \$000	2022/2023 \$000	2023/2024 \$000	2024/2025 \$000	2025/2026 \$000	2026/2027 \$000	2027/2028 \$000
LAK104791	Pioneer Pump canopy unit for Lake Okareka Rapid response equipment	73,208	20	5	20	20	20	20	20	20	20	20	20	20
LAK104731	Aquatic Weed Harvester Trailer	44,855	10	10	10	10	10	10	10	10	10	10	10	10
LAK102529	Utuhina Phosphorus Locking Plant;;4/49 Depot Street Rotorua	175,269	8	12	8	8	8	8	8	8	8	8	8	8
LAK102530	Puarenga Phosphorus Locking Plant;;Rotorua CC Sewage Treatment Plant, State Highway 30a, Rotorua	162,248	8	12	8	8	8	8	8	8	8	8	8	8
LAK102531	Waitangi/Soda Springs Phosphorus Locking Plant;;59 Manawahe Road, Rotoehu	221,461	8	12	8	8	8	8	8	8	8	8	8	8
LAK102532	Tikitere Denitrification Plant;;State Highway 30, Rotorua	118,461	8	12	8	8	8	8	8	8	8	8	8	8
LAK102533	Tikitere Denitrification Plant;;State Highway 30, Rotorua	18,465	8	12	8	8	8	8	8	8	8	8	8	8
LAK102536	Lake Rotorua Monitoring Buoy	13,897	8	12	8	8	8	8	8	8	8	8	8	8
LAK102538	Lake Rotoiti Monitoring Buoy	16,073	8	12	8	8	8	8	8	8	8	8	8	8
LAK102539	Lake Tarawera Monitoring Buoy	20,789	8	12	8	8	8	8	8	8	8	8	8	8
LAK102540	Lake Rotoehu Monitoring Buoy A	19,846	8	12	8	8	8	8	8	8	8	8	8	8
LAK102541	Lake Rotoehu Monitoring Buoy B	19,846	8	12	8	8	8	8	8	8	8	8	8	8
LAK102528	Ohau Channel Diversion Wall	5,944,530	7	15	7	7	7	7	7	7	7	7	7	7
LAK102534	Lake Rotoehu Destratification Plant;;2131 State Highway 30 (approx)	305,351	6	18	6	6	6	6	6	6	6	6	6	6
LAK102535	Lake Rotoehu Floating Wetland;;2131 State Highway 30 (approx), adjacent Te Maero Stream	577,455	5	20	5	5	5	5	5	5	5	5	5	5
LAK104732	Lake Okareka Outlet Structure	232,748	5	20	5	5	5	5	5	5	5	5	5	5
LAK102537	Hamurana Tributary Koaro fish pass	22,344	3	40	3	3	3	3	3	3	3	3	3	3
LAK102542	Okaro Wetlands 1 & 2 Okaro Road, Rainbow Mountain Murupara	180,240	3	40	3	3	3	3	3	3	3	3	3	3
LAK102512	435 Oturoa Rd, Lake Rotorua Asset 10965	99,197	2	50	2	2	2	2	2	2	2	2	2	2
LAK102514	79 Ngongotaha Road, Ngongotaha Boring number 10967	57,280	2	50	2	2	2	2	2	2	2	2	2	2
LAK102515	83 Gee Road, Rotorkawa, Rotorua Bore number 10968	56,902	2	50	2	2	2	2	2	2	2	2	2	2
LAK102516	588 Spencer Road Lake Tarawera Bore number 1000129	65,335	2	50	2	2	2	2	2	2	2	2	2	2
LAK102517	Te Miro, Lake Tarawera Boring number 1000131	65,898	2	50	2	2	2	2	2	2	2	2	2	2
LAK102518	Lake Tarawera Outlet - DOC Campground Bore number 1000134	69,501	2	50	2	2	2	2	2	2	2	2	2	2
LAK102520	1180 Tarawera Road, Buried Village Bore number 1001051	66,008	2	50	2	2	2	2	2	2	2	2	2	2
LAK102521	757 Ashpit Road, Waiotapu Bore number 1001052	63,741	2	50	2	2	2	2	2	2	2	2	2	2
LAK102522	757 Ashpit Road, Waiotapu Bore number 1001053	57,040	2	50	2	2	2	2	2	2	2	2	2	2
LAK102523	1278 Ashpit Road, Waiotapu Bore number 1001055	86,708	2	50	2	2	2	2	2	2	2	2	2	2
LAK102524	101 Rerewhakaaitu Road, Waiotapu Bore number 1001056	76,367	2	50	2	2	2	2	2	2	2	2	2	2
LAK102525	11 Highland Loop Road, Lake Rotokakahi Bore number 1001068	94,542	2	50	2	2	2	2	2	2	2	2	2	2
LAK102526	Tarawera Road, Lake Tikitapu Bore number 1001069	89,040	2	50	2	2	2	2	2	2	2	2	2	2
LAK102527	171 Millar Road, Lake Okareka Bore number 1001070	84,423	2	50	2	2	2	2	2	2	2	2	2	2
<b>Total</b>		9,199,069												



## 10 Asset detailed information

### 10.1 Phosphorus locking (P-locking) plants

There are currently three Phosphorous locking (P-locking) plants in the Rotorua District that are managed by BoPRC. These are:

- Utuhina Stream - Lake Rotorua
- Puarenga Stream - Lake Rotorua
- Waitangi Soda Springs - Lake Rotoehu

P-locking plants are used to reduce available phosphorous from a water body by using a “locking” chemical such as alum. P-locking plants target point sources that are high in phosphorus with the aim of reducing the concentration of phosphorous entering water bodies, i.e. Lake Rotorua or Lake Rotoehu. Various studies have shown that these lakes have degrading water quality due to excess phosphorous. Currently, both Rotorua P-locking plants are going through a re-consent process to continue dosing alum.



Plant	Replacement cost	Sum of ODRC*	Sum of AD**
Puarenga	\$377,100	\$162,248	\$20,062
Utuhina	\$557,700	\$175,269	\$21,672
Waitangi Soda Springs	\$465,000	\$221,461	\$27,384
	<b>\$1,399,800</b>	<b>\$558,979</b>	<b>\$69,118</b>

\* ODRC: Optimised depreciated rate of cost \*\* AD: Annual Asset depreciation

Plant	Scheduled works	Estimate cost	Schedule dates
Puarenga	• General repairs and maintenance, coating	\$5,000	Annual
	• Tank condition review	\$5,000	2019/20
	• Coating	\$30,000	2018/19
Utuhina	• General repairs and maintenance, coating	\$5,000	Annual
	• Tank condition review	\$5,000	2019/20

Plant	Scheduled works	Estimate cost	Schedule dates
	<ul style="list-style-type: none"> <li>Coating</li> </ul>	\$30,000	2018/19
Waitangi Soda Springs	<ul style="list-style-type: none"> <li>General repairs and maintenance,</li> </ul>	\$5,000	Annual
	<ul style="list-style-type: none"> <li>Tank condition review</li> </ul>	\$5,000	2019/20
	<ul style="list-style-type: none"> <li>Consenting process</li> </ul>	\$100,000	2018/19

## 10.2 De-Stratification plant – Lake Rotoehu

The De-Stratification plant (DSP) forces air through diffusers into the lake at different depths to eliminate stratified layers of temperature, plant or animal life. This ensures that more oxygen is available at the lower levels of the lake, leading to improvements in water quality.

The DSP is located at the southern end of Lake Rotoehu and is operated by BoPRC's Lake Operations Officer, University of Waikato and external consultants and contractors. This is a pilot plant and monitoring and sampling has now been completed.



Plant	Replacement cost	Sum of ODRC*	Sum of AD**
De-stratification	\$71,200	\$305,351	\$21,705

\* ODRC: Optimised depreciated rate of cost \*\* AD: Annual Asset depreciation

Plant	Scheduled works	Estimate cost	Scheduled dates
De-stratification	No planned works	\$0	NA

### 10.3 Nitrogen Reduction (Tikitere Zeolite Pilot) plant – Lake Rotorua

The Nitrogen Reduction (Tikitere Zeolite Pilot) plant (TNRP) is located at State Highway 30, Tikitere. It is operated by BoPRC and its consultants/contractors. Originally, this site was set up as a de-nitrification pilot plant which was decommissioned. Components from the de-nitrification plant such as control systems, transmitter units and pumps were reused in plant trials.

The geothermal flows that originate from the Tikitere Hells' Gate thermal field, are high in nitrogen and are discharged into Lake Rotorua via the Waiohewa Stream. The TNRP aims to improve water quality in the lake by absorbing the nitrogen which is in the form of ammonia.

At the December 2014 Rotorua Te Arawa Lakes Strategy Group meeting, construction of the full-scale plant was delayed until the 2018/19 financial year. The main reason for this delay is that the benefits of the nitrogen reduction from that this plant would need to be combined with other reductions of nitrogen for there to be a noticeable impact on lake water quality. Therefore, it was agreed to delay construction of the plant and not incur the \$700,000 per annum operating expense until other reductions in nitrogen within the catchment are made. Adjustments to the forecast expenditure of the Programme as a result of this delay in construction were also approved by BoPRC at the 10 February 2015 meeting. Staff intend to proceed with obtaining the resource consents for the project and complete final detail engineering design and build costing estimates before proceeding to build the plant in 2018/19.



Asset	Replacement cost	Sum of ODRC*	Sum of AD**
Nitrogen Reduction (Tikitere Zeolite Pilot) plant	Est \$442,400	\$136,926	\$16,931

\* ODRC: Optimised depreciated rate of cost \*\* AD: Annual Asset depreciation

Asset	Scheduled works	Estimate cost	Schedule dates
Nitrogen Reduction (Tikitere Zeolite Pilot) plant	• Technical and engineering advice and design work	\$500,000	2018/19
	• Plant construction works	\$7,099,000	2019/21

## 10.4 Water quality monitoring buoys

BoPRC manages seven water quality monitoring buoys. The University of Waikato (UoW) has installed and maintains them on BOPRC's behalf and output information is available online to the public.

Lake	Date deployed	Depth
Tarawera (meteorological)	September 2006	N/A
Rotorua	July 2007	21 m
Rotoiti (narrows)	July 2008	19 m
Rotoehu	April 2011	10.5 m
Rerewhakaaitu	February 2016	13.6 m
Okaro	January 2013	1.5 m
Rotokakahi	To be installed	N/A

Asset	Replacement cost	Sum of ODRC*	Sum of AD**
Combined assets	Est \$296,900	\$90,451	\$11,184

\* ODRC: Optimised depreciated rate of cost \*\* AD: Annual Asset depreciation

Asset	Scheduled works	Estimate cost	Schedule dates
All buoy's	<ul style="list-style-type: none"> <li>Repairs, maintenance and monitoring</li> <li>New – buoy Lake Ōkāreka</li> <li>New – buoy Lake Rotoiti</li> </ul>	\$2,000  \$35,700  \$35,700	Annual  2018/19  2018/19

## 10.5 Koaro Fish pass/Trout Barrier

The Koaro Fish Pass is located in the Hamurana Stream on the northern edge of Lake Rotorua. It was built in 2012.

The assets that form the fish pass include 3 x base slabs and 2 x wing walls.



Asset	Replacement cost	Sum of ODRC	Sum of AD
Koaro Fish pass/Trout Barrier	\$28,600	\$22,344	\$619.23

\* ODRC: Optimised depreciated rate of cost \*\* AD: Annual Asset depreciation

Asset	Scheduled works	Estimate cost	Schedule dates
Koaro Fish pass/Trout Barrier	General monitoring	\$1,000	Annual

## 10.6 Ōhau Channel diversion wall

The Ōhau diversion wall is located in Lake Rotoiti and was built in 2008. The diversion wall has been built to reduce the amount of nutrients reaching Lake Rotoiti from Lake Rotorua via the Ōhau Channel. Water from Lake Rotorua is now diverted down the Kaituna River rather than entering Lake Rotoiti, and due to the reduced nutrient loading has helped to improve the water quality in the lake significantly.

The assets that form the diversion wall include the following:

- King piles (up to 70 m deep)
- Sheet piles (1,300 m long wall)
- Timber facing
- Timber walers
- Mesh
- Navigation equipment



Annual depreciation is approximately \$700,000. Annual depreciation will be revised and reduced once protection system is put in place.

Corrosion identified on the diversion wall in 2014 has led to the development of a structural management plan to ensure the wall meets its service life of 50 years. Structural components are scheduled to be installed in 2018/19 to delay major remediation by 10 years.

Asset	Replacement cost	Sum of ODRC	Sum of AD
Ōhau Channel diversion wall	\$12,805,000	\$5,944,530	\$536,767

\* ODRC: Optimised depreciated rate of cost \*\* AD: Annual Asset depreciation

Asset	Scheduled works	Estimate cost	Schedule dates
Ōhau Channel diversion wall	• General monitoring and maintenance	\$50,000	Annual
	• Design, structural engineering and protection works	\$1,170,000	2018/2022



## 10.7 Wetlands

The Bay of Plenty Regional Council manages a number of wetlands. One land based constructed wetland – the Okaro Wetland, and a 2,800 m<sup>2</sup> floating wetland in Lake Rotoehu. Two small wetlands (70 m<sup>2</sup>) in Lake Rotoiti and a small wetland in Lake Rotorua (around 70 m<sup>2</sup>).

Wetlands act to reduce nitrogen and phosphorous levels in lakes Rotorua and Rotoehu whereby plants extract nitrogen from lake water or land runoff and use for growth.

The floating wetlands also provide additional benefits once they are fully established and are towed to their final location. These benefits include acting as a nursery for Koura, nesting for birds, enhancing fisheries and dampening wave action in the lake.



Asset	Replacement cost	Sum of ODRC*	Sum of AD**
Floating Wetlands	\$924,000	\$577,455	\$35,906
Land based Wetland Okaro	\$369,700	\$180,240	\$4,995

\*ODRC: Optimised depreciated rate of cost \*\*AD Annual Asset depreciation

Asset	Works planned description	Estimate cost	Planned schedule
Floating Wetland	Monitoring	\$500	Annual
Land based Wetland Okaro	Monitoring	\$500	Annual



## 10.8 Groundwater monitoring bores

Bay of Plenty Regional Council has 16 ground water monitoring bores. Four of these are located around Rotorua and the remainder around the greater Tarawera Lake Catchments.



The gross replacement cost for the groundwater monitoring bores is \$1,353,218. The ODRC is \$1,233,490 reflecting that the assets are in as new condition. The assets have been valued in total and have not been itemised down to component level.

Asset	Replacement cost	Sum of ODRC*	Sum of AD**
Groundwater monitoring bores	\$1,542,668	\$1,031,982	\$22,363

\* ODRC: Optimised depreciated rate of cost \*\* AD: Annual Asset depreciation

Asset	Works planned description	Estimate cost	Planned schedule
Groundwater monitoring bores	Monitoring	\$500	Annual

## 10.9 Aquatic weed harvester trailer

The weed harvester trailer provides the ability to transport the harvester to problem lakes where the weed harvester is used to reduce in-lake nutrient recycling and the impact on amenity values.

Asset	Replacement cost	Sum of ODRC*	Sum of AD**
Aquatic weed harvester trailer	\$60,000	\$44,885	\$6,333

\*ODRC: Optimised depreciated rate of cost \*\*AD Annual Asset depreciation

Asset	Works planned description	Estimate cost	Planned schedule
Aquatic weed harvester trailer	General maintenance	\$500	Annual

## 10.10 Outlet structure

The Bay of Plenty Regional Council own and hold a resource consent to operate an outlet pipeline from Lake Ōkāreka to the Waitangi Stream (which flows into Lake Tarawera). The purpose of the pipeline is to manage lake levels. The pipeline has been partially upgraded in 2015 to replace failing asset and increase maximum discharge. BoPRC staff operates an adjustment valve from open (to a maximum consent limit of 239 L/s in winter) to fully closed in summer using a control operating protocol.

Asset	Replacement cost	Sum of ODRC*	Sum of AD**
Lake Ōkāreka Outlet structure	\$910,800	\$232,748	\$13,172

\*ODRC: Optimised depreciated rate of cost \*\*AD Annual Asset depreciation

Asset	Works planned description	Estimate cost	Planned schedule
Lake Ōkāreka Outlet structure	General maintenance	\$5,000	Annual
Lake Ōkāreka Outlet structure – upgrade	Repairs and upgrade construction	\$970,000	2018/2021

## 10.11 Pioneer pump canopy unit

In 2017 a temporary pipeline was used at Lake Ōkāreka to supplement the existing outlet pipeline, reducing critically high lake levels caused by extreme weather events that occurred between March and August. The temporary pipeline requires a pump to function and the cost of hiring a pump becomes excessive over long periods of operation. It was decided that purchasing a pump would provide long term cost benefits verses hiring.

Asset	Replacement cost	Sum of ODRC*	Sum of AD**
Pioneer pump canopy unit	\$86,141	\$73,208	\$14,396

\*ODRC: Optimised depreciated rate of cost \*\*AD Annual Asset depreciation

Asset	Works planned description	Estimate cost	Planned schedule
Pioneer pump canopy unit	General maintenance	\$500	Annual

## 11 Asset management plan review

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 Council
- Work on AMP's Improvement Plan annually
- Review and formally adopt LoS to comply with Community Outcomes
- Revise AMP three yearly prior to LTP to incorporate and document changes to works programmes, outcome of service level reviews and new knowledge resulting from the AMP's Improvement Plan

## 12 Improvement plan

### 12.1 Overview of improvement planning

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

- 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 BOPRC 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 BOPRC to optimise decision-making, review outputs, develop strategies, improve risk management and extend the planning horizon.

### 12.2 Key opportunities for improvement

Council is adopting a strategic management approach to improvement planning, continually developing asset management plans, and implementing improvement processes and practices to a level which is applicable to the extent and available resources for the activity.

Continuous improvement is not a static process and therefore this plan is considered to be “live” in that it will be updated with progress against targets and will be amended as required during the life of the plan (typically 3-5 years). Figure 10 outlines the continual improvement process used and the current improvement actions for the lakes programme for the next three years.

Figure 10 Improvement process

