

**Executive Summaries for  
Heretaunga Plains Flood Control  
Scheme, Upper Tukituki Flood  
Control Scheme and Small  
Schemes Asset  
Management Plans**

# 2021 AMP Executive Summaries

## 1. Heretaunga Plains Flood Control Scheme Executive Summary

### 1.1 About this Plan

This Asset Management Plan outlines the management philosophy for the flood control and drainage assets on the Heretaunga Plains. It sets out a programme of work for the flood control scheme over the next ten years to ensure that assets meet the objectives for which they were established.

There are a number of assumptions underpinning the Plan. These represent circumstances with which the Hawkes Bay Regional Council (HBRC) reasonably expects to occur, including: that the economic and legislative environment in which the Scheme operates will remain the same; that HBRC's current activities and policies will continue; and that there will not be a significant flood which requires a change to the Scheme or the way it is managed, beyond that included in Scheme assumptions.

This Asset Management Plan (AMP) is supported by, and links to, a number of other documents and databases across HBRC, these include:

- Asset Registers and Valuation databases, which hold specific information on all Scheme assets
- Asset and Catchment Reviews, which investigate problems and identify preferred options for addressing these
- Environmental Codes of Practice and Ecological Management and Enhancement Plans, which guide wider environmental obligations and responsibilities and HBRC policy
- Strategy and guideline documents, which influence how HBRC manages the assets

From this, annual contracts for physical works are developed and financial information is provided for inclusion in the Long Term Plan (LTP).

The AMP has been developed using the Core asset management plan model. This model is considered to provide the appropriate level of detail given the nature of the assets involved in the Scheme, and the defined asset management objectives which are aligned with Councils corporate goals and strategic context. The Plan is reviewed every six years and the assets are revalued every three years. The financial forecasts are reviewed annually.

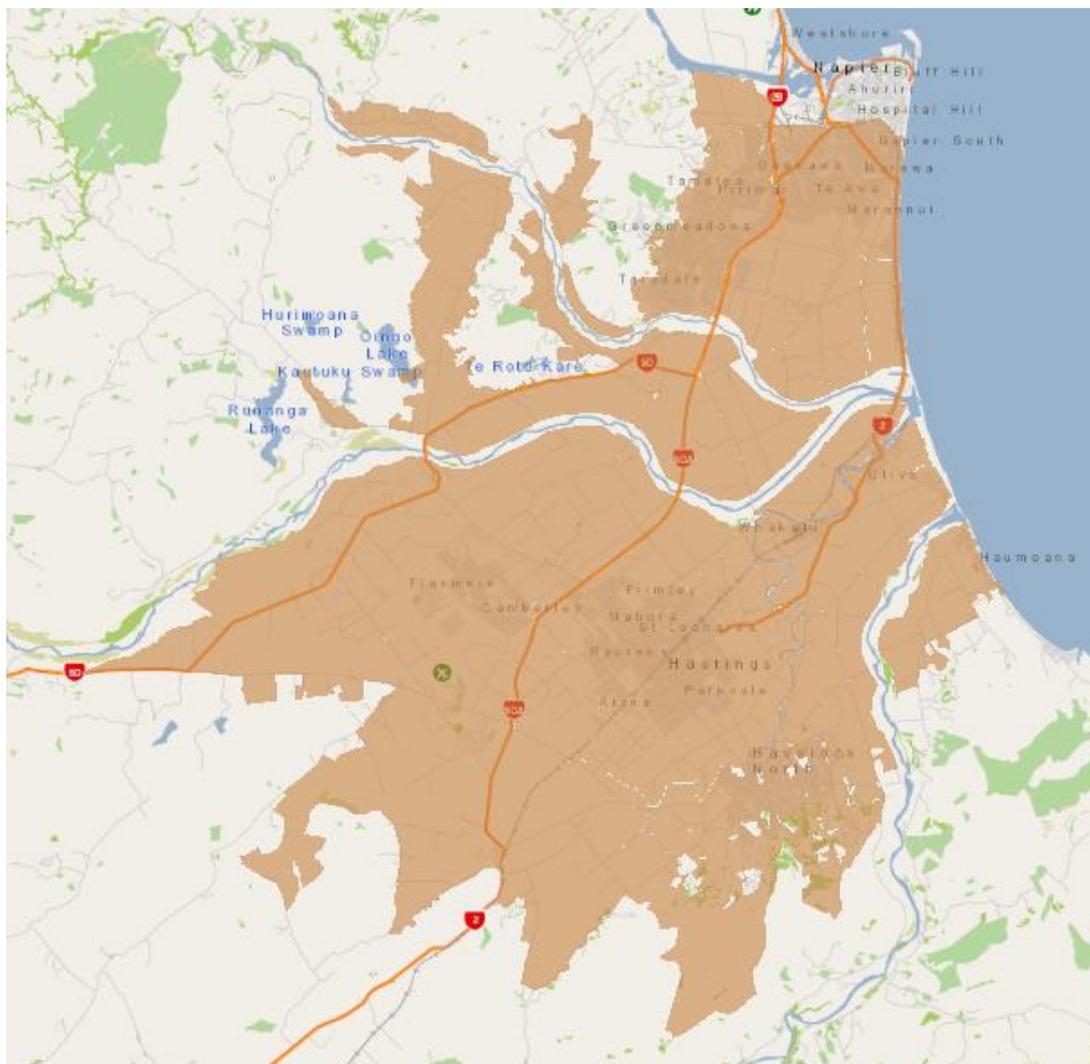
The AMP is a living document and future improvements or enhancements will be considered as part of the next review or prior to that time if circumstances warrant.

### 1.2 The Scheme and Our Customers

#### Overview

The Heretaunga Plains Scheme covers the low lying historic river plains of the Tutaekuri, Ngaruroro and lower Tukituki Rivers (see Figure 1). It includes all of Hastings, Flaxmere and Havelock North urban areas, as well as most of the Napier urban area. The area directly benefiting from the Scheme covers approximately 39,000 hectares with a population of around 138,000 people living within the Scheme boundaries - approximately 82% of the Hawke's Bay population.

**Exec Summary Figure 1: Heretaunga Plains Flood Control Scheme Rating Boundary (Direct Benefit)**



The Scheme as we know it today has evolved over the last 130 years from the efforts of Local River Boards in the late 1800's, through to the Hawke's Bay River Board, the Hawke's Bay Catchment Board, and since 1989, the Hawke's Bay Regional Council. Improvements in the Scheme have followed significant flooding events and specific catchment and asset reviews.

While the underlying goal of the Scheme has remained the same, the threats to the Scheme; its importance to the community; and the drivers behind how it is maintained, have changed.

### **Scheme Objectives**

The objective of the Scheme is to ensure that the Heretaunga Plains communities are very rarely affected by significant flooding, and that waterways within the Scheme are highly valued community assets, from a flood control, environmental and recreational aspect.

## Key Issues

The principal issues now facing asset managers are:

- Sustainable management of gravel within the river systems, including demand exceeding supply in many areas
- Maintenance of the design flood capacity of the river channels and adjacent stopbank systems and drainage outlets, particularly in the face of climate change
- Maintaining the integrity of the live edge protection and the stopbanks to mitigate the effects of insect pest infestations or other pests with the potential to adversely affect live tree edge protection
- Confirming the integrity of the stopbanks and quantifying the risk of failure at less than design capacity
- Increasing the levels of service to provide a greater level of flood protection and reduced flood risk to the Plains over time; Defining levels of service within each drainage catchment
- Maintaining the desired capacity of the drainage systems, while balancing landowner expectations, community willingness to pay, further land development and environmental impacts
- Potential impacts of co-management arrangements with Iwi on HBRC policy and Scheme management regimes
- Minimising the adverse impact of river management methods on the environment *by incorporating advice and direction from Environmental Codes of Practice and Ecological Management and Enhancement Plans*
- Reviewing maintenance methods and techniques to accommodate changes in land management practices; including organic fruit and crop production and trends in best practice management for stormwater and flooding
- Equitably funding drainage capacity improvements required as a result of land use changes given that the Local Government Act 2002 does not provide Regional Councils with the ability to charge development levies on new subdivisions and development

This Plan sets out the direction and work programme to be taken by the asset managers in addressing these issues.

## 1.3 The Services We Provide

The Heretaunga Plains Scheme services provided by HBRC include:

- Stopbank maintenance
- Engineering design and modelling services
- Hydraulic structures and pump stations maintenance,
- River, stream and drainage channels maintenance to ensure they work as expected during floods

## 1.4 Level of Service

### Current Levels of Service

The current Levels of Service (LOS) are based on legal requirements, community expectations and physical restrictions inherited over the evolution of the Scheme. The river assets are designed and maintained to provide protection from storms with up to a 1% AEP (Annual Exceedance Probability); also referred to as the 100 year ARI (Average Recurrence Interval) or a 100 year event (1 in 100 chance of occurrence any given year).

The drainage system standard varies but is typically between 20% and 5% AEP (approximately 5 and

20 year ARI events). The following table provides a summary:

Component	Current Level of Service (Flood prevention)
River Assets	The level of protection in technical terms is to convey a flood discharge with a 1% probability of being exceeded in any one year (1%AEP) safely to the sea
Drainage Assets	The design standard is to drain 32mm of runoff in 24 hours from rural areas. This is nominally a 5 year return period event

### Rivers Level of Service Review

HBRC has an ongoing level of service review programme aimed at increasing the HPFCS Rivers from 1% AEP to a 0.2% AEP level of protection, also referred to as the 500 ARI. The project has been allocated a budget of \$20M implementation is planned over a 10 years period with budget allocation \$1M per year. The project includes assessment of technical options and implementation of the preferred options and recommendations. (This is now part of the IRG project and majority of the upgrade will be delivered within first 2 years of the LPT).

Options include raising the level of stopbanks as well as more substantial and alternative such as double banking, designed floodways, and making more room for river. The cost of such alternative, and their impacts on the scheme, ratepayers, iwi, ecology and other important factors being considered.

### Drainage Level of Service Review-Check Status

A working group has been established with the Napier City Council and the Hastings District Council in order to work together to establish the desired level of protection. The drainage level of service review of the Scheme is currently underway with the Napier-Meeanee catchment, in conjunction with the Napier City Council (NCC). The Heretaunga Plains drainage catchments will be reviewed in financial years 2020-2023. The drainage review takes into consideration the multi-values of the open drainage network and existing capacity

The review will identify:

- An acceptable standard for the drainage secondary network performance, noting that a 10 year standard is proposed for the NCC primary network (internal SW pipe work). With proposal of 50 year protection for the secondary open drainage network
- The future vision for environmental management and public use of Drainage Scheme areas

The review outcomes will identify future works and expenditure within the Scheme and may result in significant changes to how HBRC manages the flood control and drainage assets. This will be particularly relevant when TANK (Tutaekuri, Ahuriri, Ngaruroro and Karamu catchments) plans change takes effect. Greater emphasis will be placed on water quality improvement and improving the riparian habitat.

## 1.5 Scheme Asset Information

The Scheme is separated into two parts –

1. **Rivers assets** associated with the main rivers (Tutaekuri, Ngaruroro and Lower Tukituki) and
2. **Drainage assets** associated with the drainage network (waterways providing a drainage outlet to properties across the Heretaunga Plains).

The key assets associated with the Scheme are summarised below:

**Exec Summary Table 1: Scheme Asset Summary**

Asset Type	Quantity
Stopbank and deflection banks	155km
Drainage channels (including river, stream and drainage channel)	440km
Live edge protection on the riverbanks (including Willow Sawfly remediation 2009)	287km
Structures including, culverts, floodgates, control gates, weirs, rock groynes and pipelines	196
Detention dams	5
Pump stations	18
Mobile pumps	7
Emergency generators	2
Land; including river berms and land underlying other Scheme assets.	760ha

The pump stations, live edge protection and stopbanks are considered to be the most critical assets of the Scheme because they provide protection to large areas of highly productive land and significant parts of urban Napier and Hastings; and the consequence of their failure is high.

#### Asset Value

The replacement value of Scheme assets as at June 15, 2020 (prior to 2020 revaluation) currently equates to nearly \$150.5m (Drainage \$67m, Rivers \$83.5m).

#### Asset Condition

Assets within the Scheme are considered to be in good condition with some areas where more attention is required. These areas are being highlighted through the asset performance assessment for flood protection assets (rivers) and by programmed inspection of key drainage assets.

Pump Stations within the scheme have some localised issues identified during the maintenance and structure inspection programme. These are being programmed into the capital works in the 2021 LTP.

Insect pest infestations are an ongoing issue, and HBRC has a monitoring programme in place to identify at-risk areas and is currently undertaking an alternative species planting programme to lessen the threat of this risk.

#### Asset Monitoring

Checks of all assets are undertaken as part of the annual programme of works. An annual audit of the Scheme is undertaken by a Registered Engineer with experience in river control works and reported to HBRC. These audits are to be carried out in accordance with the recently introduced *“Flood Protection Assets Performance Assessment Code of Practice”* developed by the River Managers Forum (2017). This is a methodology intended to provide a high level of consistency and thoroughness of inspections across New Zealand.

Pump Station annual inspections are undertaken by Qualified Engineer (Structural, Electrical and Mechanical). An annual report summarising condition and performance for each PS will be available for Regional asset management and Scheme manager.

Review of the SCADA control strategy is under way and LTP capital allocated for greater pump station coverage following this review.

### Residual Risk

Residual risk for the Scheme includes the chance of a flood event occurring that exceeds the capacity of the system (a super-design event), and the potential for failure of a flood protection asset. Both factors could result in widespread flooding and damage. There are a wide variety of potential causes for both super-design and failure events, representing a risk that is impossible to eliminate completely.

HBRC management of residual risk focuses on good design and maintenance practice, monitoring of asset status and development of contingency and emergency plans for response management should a super-design or failure event occur.

### Climate Change

Climate change represents a longer-term risk with more uncertainty and HBRC will investigate potential impacts and identify appropriate actions to minimise this risk through the level of service review. The prediction is for Hawke's Bay to be drier but with the potential for increased storminess. Severe storms are predicted to bring more intense rainfall which will result in increased flood flows. Sea level rise will also affect assets in the vicinity of the coast.

## 1.6 Asset Maintenance

Scheme management is provided by the HBRC's Asset Management Group (HBRC AMG), which is responsible for the management of the Scheme and its assets. The maintenance work is being delivered by HBRC Works Group via annual contract arrangements. The scope of works includes both planned/scheduled maintenance and reactive maintenance. At the end of each financial year, a report is prepared outlining the work completed in each rating area, and the associated expenditure.

The estimated annual maintenance costs \$7,813,856/annum (10 Year Average)

## 1.7 Capital Works and Renewals

Capital and Renewal works are planned and programmed by HBRC AM Group based on the LTP and Annual Plan budgets. The projects are delivered by outside contractor unless Works Group have capabilities to do the work.

The key capital projects are summarised in the table below:

**Exec Summary Table 2: Key Capital Projects**

<i>Heretaunga Plains FCS</i>	<i>Capital Work Description</i>	<i>Indicative Project Value</i>	<i>Timing</i>	<i>Delivery</i>
Level of Service Review - Rivers	Increase level of service from current 1 in 100 year protection to 500 year protection	M\$ 19.5 over 2 years with IRG funding contribution	M\$7.02 funding provision included in the LTP with M\$12.48 of IRG co-funding	2021-2023
Public use of Rivers	Development of land within the flood protection for the public use for recreational activity and for planting or productive activity.	\$765,000 over 10 years	Provision in the LTP / part of the LoS review	2021-2031
Scheme review and capital work from these reviews	Review of all and small scheme to include climate change and performance of the assets to current and future conditions.	Only OPex budget, but CAPex to be confirmed in next LTP.	No funding provided in the LTP	2021-2031
Level of Service Review of all HPFCS drainage.	Review all drainage under HPFCS to include multivalued approach	\$100,000 for 10 years. (contribution with NCC)	Provision in the LTP	2021-2031
Pump Station - Fish passage	Installation of fish passages where practical across stream barriers e.g. Pump stations	M\$1 over 10 years	Provision in the LTP	2021-2031
SCADA system for all Pump Stations	Installation of the communication system SCADA for all Pump stations	M\$1 over 10 years	Provision in the LTP	2021-2031
Capital work for TANK plan change	Plan change related activity and work programme implementation	\$938,000 from year 3 to year 10 (perpetuity)	Provision in the LTP	2023-2031-ongoing
Clive River- Land for dredging	Dredging Clive River and discharge of silt to land.	M\$5.9 in 2025-26 & 2029-30	Provision in the LTP	2025-26 & 2029-30
River and Lagoon Opening	Installation of CCTV for better monitoring	\$30,000 in 2021/22 & \$625,000 over the following 10 years	Provision in the LTP	2021-2031
Karamu Scheme- Weed harvesting	Investigate and purchase equipment for better operation of weed cutter.	\$159,000 in 2023-25	Provision in the LTP	2023-2025
Gravel Management-processing and new access to rivers	Building new access to location where gravel needs to be managed for flood protection.	M\$1.2 annually for 10 years	Provision in the LTP	2021-2031

## 1.8 Financial Summary

### Financial Management

The financial information for the Scheme is based on historic costs, the asset register forecasts, asset condition assessments and asset valuation assessments.

Three key assumptions are made with regard to the Scheme financial forecasts:

1. Inflation (from LGNZ based on BERLs figures) is forecast at 1.5 to 2.5%
2. There will be no major floods requiring changes to maintenance or capital works programmes; and,
3. There will be a continuing willingness to pay for the level of service set out in this AMP.

These assumptions are justified by the knowledge that the likelihood of a major flood exceeding the capacity of the river system in any one year is less than 1%, and HBRC's disaster provisions allow for the assets to be replaced following such an event.

### Scheme Costs

The Scheme's annual costs come from:

- Annual operations and maintenance
- Capital works
- Renewal work
- Loan servicing
- Depreciation, disaster reserve and other contributions and,
- Other miscellaneous costs

### Budget Forecasts

The average annual costs over the next ten years are forecast at:

- \$7.81 million for Operations (OPEX); including maintenance, monitoring and research;
- \$0.37 million for Capital Works;
- \$0.75 million for Asset Renewal;
- \$0.43 million for Projects and Investigations

There is approximately \$15.4m of capital improvements and renewals (\$3.7m capital, \$7.5m renewals, \$4.3m Projects/Investigation) planned over the next 10 years within the Scheme (subject to the current Level of Service review).

### Funding the Scheme

Income from Scheme owned land leased for grazing or other purposes

- Targeted rates levied specifically for the purpose of funding scheme works
- HBRC Public Good general funding (30% for river assets, 10% for drainage assets)
- Borrowing where deemed appropriate and reasonable
- Interest from the Disaster Damage and Depreciation Funds
- Miscellaneous minor income sources

No borrowing has been provided for in the budgets presented in this report.

The Scheme Ratepayers are defined by the Scheme boundary. Those within the boundary gain both direct and indirect benefit from the Scheme through reduced frequency of flooding of their land and reduced disruption to their lives, livelihoods and communities. The direct beneficiaries from the nine

drainage areas are also separately rated within the Scheme boundary. Those outside the Scheme and within the wider Napier and Hastings areas also gain indirect benefits from the increased economic activity and the increased choice of service industries, employment and investment opportunities; and recreational and cultural facilities resulting from the associated increase in population sustained through the protection provided by the Scheme. As such, a portion of the Scheme costs are met from general funding sources, part of which is from rates levied on all rateable land within the Hawke's Bay region.

## 1.9 Asset Management Plan Improvements

The Scheme monitoring programme includes asset and catchment reviews, asset condition and risk assessments, and annual audits; as well as a regular review of this Asset Management Plan and associated registers. The programme identifies potential areas for performance improvement in both the physical assets and asset management process.

Projects aimed at improving understanding and knowledge of assets, and future requirements within the Scheme, are included within the Scheme Operational budget.

Key improvement projects include:

- Research and further river and floodplain modelling
- Data collection including LIDAR, asset data improvement and quality review
- Inter-planting edge protection zones with species other than willows such as natives and hardy exotics
- Level of Service Review including Future Demand and Risk Assessments (NZ Rivers FPA)
- GIS asset data improvements and Scheme boundary review
- Climate change and specific asset reviews
- Code of practice and waterways guideline review and development
- Development and implementation of Ecological Management and Enhancement Plans
- Implementing the recommendations resulting from the Gravel Management Plan relating to the effects of extraction and beach raking on instream fish and macroinvertebrates

## 2. Upper Tukituki Flood Control Scheme Executive Summary

### 2.1 About This Plan

This Asset Management Plan (AMP) outlines the management philosophy for flood control assets that protect the Ruataniwha Plains from flooding. It sets out a programme of work for the Upper Tukituki Flood Control Scheme (UTTFC) for the next ten years to ensure that assets meet the objectives for which they were established.

There are a number of assumptions underpinning this AMP. These represent circumstances which the Hawkes Bay Regional Council (HBRC) reasonably expect to occur, including: that the economic and legislative environment in which the Scheme operates will remain the same; that HBRC current activities, level of service targets and policies will continue; and that there will not be a significant flood, which results in significant damage to the Scheme or the way it is managed, beyond that included in scheme assumptions.

This AMP is supported by, and links to, a number of other documents and databases across HBRC, these include:

- Asset Registers and Valuation databases, which hold specific information on all Scheme assets;
- Asset and Catchment Reviews, which investigate problems and identify preferred options for addressing these;
- Environmental Codes of Practice and Ecological Management and Enhancement Plans, which guide wider environmental obligations and responsibilities and HBRC policy,
- Strategy and guideline documents, which influence how HBRC manages the assets.

From this, annual contracts for physical works are developed and financial information is provided for inclusion in the Long Term Plan (LTP).

This AMP has been developed using the Core asset management plan model. This model is considered to provide the appropriate level of detail given the nature of the assets involved in the Scheme, and the defined asset management objectives which are aligned with Councils corporate goals and strategic context. The Plan is reviewed every three years and the assets are revalued every three years to coincide with the Council's Long Term Planning process. The financial forecasts are reviewed annually.

The AMP is a living document and future improvements or enhancements will be considered as part of the next review or prior to that time if circumstances warrant.

Condition scales in this AMP have been revised to be consistent with the condition criteria in the IIMM(2015) where 1 is excellent and 5 is very poor. This is a significant change and need to be noted compared to previous AMP documents where the condition scale was reversed.

### 2.2 The Scheme Overview and Issues

The Upper Tukituki Scheme was constructed during the late 1980's. The Scheme covers the low lying historic river plains of the Upper Tukituki River, the Waipawa River and their various tributaries and was constructed during the late 1980's. It includes the urban centres of Waipawa, Waipukurau, and Ongaonga, covering approximately 24,750 hectares of predominantly pastoral farmland. There are approximately 5,000 people living within the Scheme boundaries.

The objective of the Scheme is to ensure that the Ruataniwha Plains communities are very rarely

affected by significant flooding, and that waterways within the Scheme are highly valued community assets, from a flood control, environmental and recreation aspect.

While the underlying goal of the Scheme has remained the same, the threats to the Scheme, its importance to the community, and the drivers behind how it is maintained have changed over time. The current principal scheme issues are summarised below:

- The transport of gravel from the Ruahine Range and its control and *sustainable extraction* management through the length of the Scheme;
- The risk of gravel build-up in parts of the Scheme and the impacts of that build-up on the flood capacity of the Scheme and the ability to effectively drain adjacent land;
- The maintenance of the design flood capacity of the river channels and adjacent stopbank systems *and drainage outlets*, particularly in the face of climate change;
- The maintenance of the integrity of live edge protection and the stopbanks;
- Identifying and mitigating threats to the Scheme, including potential damage to live tree edge protection from pest infestations and damage to the foundation treatment of the stopbanks; Of particular concern is presence of Chilean Needle Grass in the TukiTuki River which has serious implications for gravel management in the reaches below Stockade Road;
- *Minimising the adverse impact of river management methods on the environment by incorporating advice and direction from Environmental Codes of Practice and Ecological Management and Enhancement Plans;*
- *Confirming the integrity of the stopbanks and quantifying the failure risk at less than design capacity;*
- *Defining levels of service within the Scheme;*
- *Reviewing maintenance methods and techniques to accommodate changes in land management practices, including organic fruit and crop production and trends in best practice management for stormwater and flooding;*
- *Potential impacts of co-management arrangements with iwi on HBRC policy and management of schemes*

This Plan sets out the direction and work programmes to be taken by the asset managers in addressing these issues.

## 2.3 The Scheme Objectives

The overall aim is to reduce the risk of flood and erosion damage while maintaining a high quality river environment.

Five key outcomes have been identified for the Scheme:

- ***The protection of life and communities*** - *by providing for the control of flooding within Scheme rivers and the draining of surface water from Scheme land so that the frequency, duration and extent of flooding presents minimal risk to human life, and community viability and disruption to the community is minimised.*

- **The sustainable use of land** - by providing for the control of flooding of Plains land within the Scheme, so that the frequency, duration and extent of flooding presents minimal risk to land uses, and business disruption risk is minimised.
- **The protection and enhancement of ecology and water quality values** - by ensuring that flood management and maintenance practices do not have significant adverse effects on the ecology of rivers, streams and wetlands and ensuring that, where practicable, enhancement aspects are included as part of asset upgrades and renewals.
- **The sustainable management of river sediment (gravel, sand and silt) resources** - by undertaking beach raking and gravel extraction to maintain the flood carrying capacity of the river channels and managing allocation of river gravel resources in a consistent and equitable way.
- **The protection and enhancement of social and cultural values** - by providing for a wide range of amenity and recreation opportunities, and balancing conflicting uses and demands on river berm areas.
- **The Protection and enhancement of Tangata Whenua values and interests** in the management of waterways and ecosystems of the Scheme.

These outcomes are supported by Scheme Objectives and are reflected in the Levels of Service and Performance Targets identified for the Scheme.

In addition, the Scheme contributes significantly to several Community Outcomes identified in the LTP, including:

- Safe & secure communities;
- A strong, prosperous & thriving economy;
- Transport infrastructure & services that are safe, effective & integrated;
- Communities that value & promote their unique culture & heritage;
- A lifetime of good health and wellbeing;
- Safe & accessible recreational facilities; and
- An environment that is appreciated, protected, and sustained for future generations.

## 2.4 The Services We Provide

The Upper Tukituki flood control services provided by HBRC include:

- Stopbank maintenance
- Engineering design and hydraulic modelling
- Live edge protection and hydraulic structures maintenance
- River and stream channels maintenance to ensure they work as expected during floods

## 2.4 Levels of Service

The current levels of service (LOS) are based on legal requirements, community expectations and physical restrictions inherited over the evolution of the Scheme.

The river assets are designed and maintained to provide protection from storms with up to a 1% AEP (Annual Exceedance Probability); also referred to as a 1 in 100 year ARI (Average Recurrence Interval) or a 100 year event (1 in 100 chance in of occurrence any given year).

The level of service review including the levels of flood protection and the environmental outcomes sought will continue during the 2021 LTP period. This work was begun as part of the 2015/25 LTP

starting with a hydrologic assessment of the design discharges using historical data and all the additional data obtained since the Scheme was first designed. The primary drivers for this review are ongoing development and land-use changes of flood protected land that has occurred since the Scheme was last upgraded. The classification rating by which allocation is determined may no longer fairly reflect the benefit received.

The LOS review processes includes:

- hydrologic assessment,
- Issues and options report to inform the Scheme ratepayers of the options/outcomes of LOS improvements (underway)
- Formal LOS presentation and decision to further review or retain LOS
- Community consultation under the Local Government Act 2002 special consultative procedures
- Continued technical work to define the design parameters, the necessary capital works and funding proposal.

## 2.5 Scheme Asset Information

### Scheme Assets

The assets associated with the Scheme include:

Asset Type	Quantity
Stopbanks	77km
Deflection banks	213
Edge Protection Length	205km
Culverts	41
Floodgates	33
Land (including river berms and land underlying other Scheme assets.)	93ha

The live edge protection and stopbanks are considered to be the most critical assets of the Scheme because they provide protection to large areas of productive land and significant parts of urban Waipawa and Waipukurau; and the consequence of their failure is high.

### Asset Value

The 2020 replacement value of the scheme assets is estimated to be \$34 million.

### Asset Condition

In general, assets within the Scheme are considered to be in good condition. There are some known localised issues associated with:

- Weed and unwanted tree growth including pest plants;
- Gravel aggradation in the upper reaches; which can increase the flood risk and in some cases result in seasonal increased water table on farm land.
- Leakage on the landward side of some stopbanks due to porous foundations. These areas are known and included in a summary report (*Stopbank Seepage Investigation, July 2008, AM05/21*) with staff aware of how to deal with issues if they arise.

The extent and speed with which these issues are able to be addressed will depend on the capacity to undertake these works and ratepayer willingness to fund the work. These will be considered as part of the proposed level of services.

Insect pest infestations are an ongoing risk to the Scheme and HBRC has a programme in place to monitor damage levels and utilise alternative species to lessen the threat of this risk.

Climate change represents a risk with more uncertainty. HBRC has programmed a review of Scheme risks as part of the Level of Service review to be undertaken, and this will include further consideration and investigation into potential impacts of climate change on Scheme assets; the aim being to identify appropriate actions to minimise this risk.

### Residual Risk

Residual risk for the Scheme includes both the chance of an event occurring that exceeds the capacity of the system (a super-design event), and the potential for failure of a flood protection asset; both of which could result in widespread flooding and damage. There are a variety of potential causes for both super-design and failure events and these represent a risk that is impossible to eliminate completely.

HBRC management of residual risk focuses on good design practice, audits of asset status, and development of contingency and emergency plans for response management should a super-design or failure event occur. These audits are to be carried out in accordance with the recently introduced “*Flood Protection Assets Performance Assessment Code of Practice*” developed by the River Managers Forum (2017). This is a methodology intended to provide a high level of consistency and thoroughness of inspections across New Zealand.

## 2.6 Asset Maintenance

It is essential that all Scheme assets are maintained using sound engineering skill and judgement. HBRC has a policy of retaining at least two Chartered Professional Engineers to oversee design and management of Scheme assets.

Scheme management is provided by the HBRC’s Asset Management Group (HBRC AMG), which is responsible for the management of the Scheme and its assets.

The maintenance, capital and renewal work is delivered under contract by HBRC’s Works Group. An annual contract outlines all maintenance works and the required standards.

The physical works generally include the following activities:

- **Stopbanks** – maintenance of an appropriate grass sward and cross-section shape through grazing, mowing and repair when necessary.
- **Berms and Buffers** – lopping and planting of appropriate tree species to maintain a healthy dense buffer, physical repair as necessary of any hard protection (rock revetments), mowing or grazing of grassed berms to reduce fire risk and control weeds.
- **Active Channel** – maintenance of gravel bed levels through beach raking and gravel extraction where necessary.
- **Drainage Structures** – checking and clearing of obstructions as necessary.
- **Groynes** – checking and repair of groyne structures with replacement of structural units as required.

An annual maintenance programme is prepared by the HBRC AMG each year in conjunction with the HBRC’s annual budgeting process.

At the end of each financial year, a report is prepared outlining the work completed in each rating

area, and the associated expenditure. This report is presented to HBRC and the Upper Tukituki Scheme Liaison Committee in November for the previous financial year.

## 2.7 Financial Summary

### Financial Management

The financial information for the Scheme is based on information from the asset register, asset condition assessments and asset valuation assessments.

Three key assumptions are made with regard to the Scheme financials outlined in this Plan:

- Inflation (based on construction costs) is forecast at 3.0%;
- There will be no major floods requiring changes to maintenance or capital works programmes; and,
- There will be a continuing willingness to pay for the level of services as set out in this AMP.

These assumptions are justified by the knowledge that the likelihood of a major flood exceeding the capacity of the river system in any one year is less than 1%, and HBRC's disaster provisions allow for the assets to be replaced following such an event.

### Scheme Costs

The Scheme's annual costs relate to the following activities:

- *Annual operations and maintenance;*
- *Capital works;*
- *Renewal works;*
- *Loan servicing;*
- *Depreciation, disaster reserve rate collection and other contributions; and,*
- *Other miscellaneous costs.*

### Budget Forecasts

An estimate of costs is established as part of developing the maintenance programme. Any issues associated with affordability are addressed as part of the Annual Plan or LTP process. This ensures that the agreed programme of works does not compromise the levels of service and that the consequence of any variance is clearly understood and documented.

Over the next ten years HBRC has provision to spend approximately \$1,180,700 per year (including inflation) to operate and maintain the assets at the desired levels of protection.

The total budget forecast over the next ten years are:

- \$11.8 million for Operations, including maintenance, monitoring and research; and,
- \$10.1 million for special project and capital works.

The average annual costs over the next ten years are forecast at:

- \$1.18 million for Operations (OPEX); including maintenance, monitoring and research;
- \$0.18 million for Capital Works;
- \$0.12 million for Asset Renewal;
- \$0.71 million for Projects and Investigations

<i>Upper Tukituki FCS</i>	<i>Capital Description</i>	<i>Work</i>	<i>Indicative Value</i>	<i>Project</i>	<i>Timing</i>	<i>Delivery</i>
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Public use of rivers	Development of land within the flood protection for the public use for recreational activity and for planting or productive activity.	\$328,000 over 10 years	Provision in the LTP	2021-2031
UTT- Gravel extraction	Extraction of gravels for surplus areas	M\$7.05 over 2 years	M2.54 provision in the LTP with M\$4.51 of co-funding	2021-2023

### Source of Funding

Funding necessary for the Scheme to continue to provide the required levels of service is obtained from the following sources:

- *Rental income from Scheme owned land leased for grazing or other purposes;*
- *Targeted rates levied specifically for the purpose of funding scheme works;*
- *HBRC general funding (17.5%);*
- *Borrowing where deemed appropriate and reasonable;*
- *Any funds from the Scheme depreciation in excess of the predetermined cap;*
- *Miscellaneous minor income sources.*
- *IRG co-funded capital for gravel management*

The IRG gravel management project has a scheme co-fund element to attract the crown contribution. Gravel management is a major issue for the scheme and the opportunity to attract major crown resources to work on the issue.

The Scheme Ratepayers are defined by the scheme boundary. Those within the boundary gain both direct and indirect benefit from the Scheme through reduced frequency of flooding of their land and reduced disruption to their lives, livelihoods and communities. The direct beneficiaries are also separately rated to reflect the varying levels of benefit received. There are five rural classes and four urban classes within the Scheme boundary.

Those outside the Scheme and within the wider Central Hawke's Bay area also gain indirect benefits from the increased economic activity and the increased choice of service industries, employment and investment opportunities, and recreational and cultural facilities resulting from the associated increase in population sustained through the protection provided by the Scheme. As such, part of the Scheme costs are met from general funding sources; a portion of which is from rates levied on all rateable land within the Hawke's Bay region.

## 2.8 Asset Management Plan Improvements

The Scheme monitoring programme includes asset and catchment reviews, asset condition and risk assessments, and annual audits; as well as a regular review of this Asset Management Plan and associated registers. The programme identifies potential areas for performance improvement in both the physical assets and asset management process.

Projects aimed at improving understanding and knowledge of assets, and future requirements within the Scheme, are included within the Scheme Operational budget.

Key projects include:

- IRG co-funding of Gravel Management
- Research and further river and floodplain modelling;

- Data collection, including cross section surveys, sediment samples and LIDAR;
- Inter-planting edge protection zones with species other than willows such as natives and hardy exotics;
- Level of Service Review including Future Demand and Risk Assessments;
- GIS asset data improvements and Scheme boundary review;
- Plant pest, climate change and specific asset reviews;
- Code of practice and waterways guideline review and development;
- Development and implementation of Ecological Management and Enhancement Plans; and
- Implementing the recommendations resulting from the Gravel Management Plan relating to the effects of extraction and beach raking on instream fish and macroinvertebrates.

A number of special projects and capital improvements have been identified to maintain and upgrade Scheme physical assets, so that they achieve their desired design standards and the environmental enhancement goals. This involves capital improvements to stopbank and edge protection and minor flood damage repairs and environmental enhancement works throughout the Scheme.

Expenditure on these projects have been included in the HBRC 2021-31 Long Term Plan.

## 3. Small Schemes Executive Summary

### 3.1 About This Plan

This Asset Management Plan (AMP) outlines the management philosophy for the flood control and drainage assets for a series of 11 small flood, drainage and catchment control schemes collectively grouped as “Small Schemes”. Within this aggregation there are Northern, Central and Southern geographic groupings which correspond to the northern Wairoa, Esk/Whirinaki, and the Central Hawkes Bay coastal areas.

The 11 Small Schemes are the:

#### **Northern**

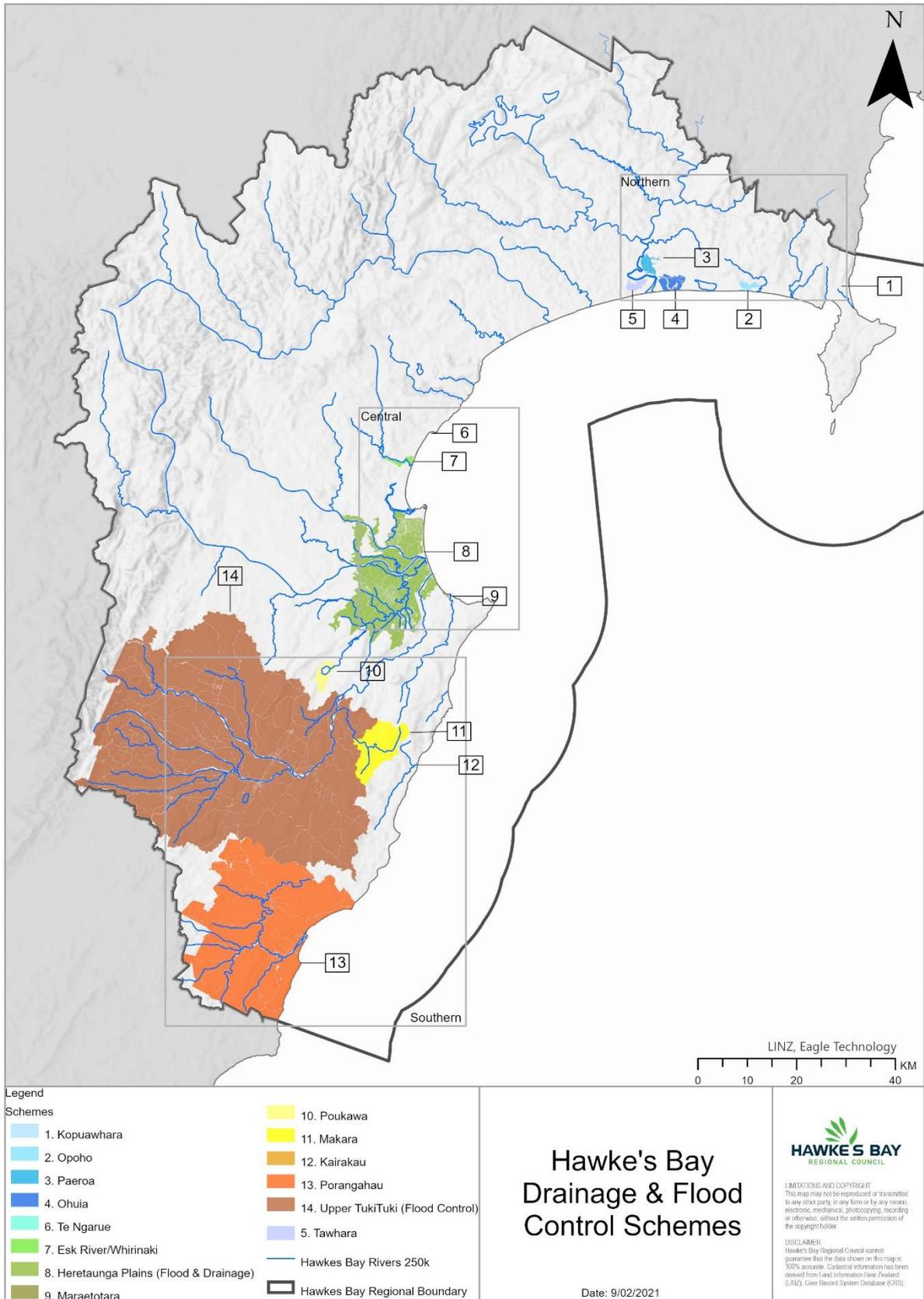
1. Kopuawhara Stream Flood Control Scheme
2. Opoho Drainage Scheme
3. Ohuia Drainage Scheme
4. Paeroa Drainage Scheme
5. Northern Minor Works (includes Tawhara)

#### **Central**

6. Te Ngarue Flood Control Scheme
7. Esk & Whirinaki Flood Control Scheme
8. Te Awanga Flood Control Scheme

#### **Southern**

9. Poukawa Catchment Control Scheme
10. Makara Catchment Control Scheme
11. Porangahau Flood Control Scheme



The AMP sets out a programme of forward work for the schemes to ensure that schemes and their assets meet the objectives for which they were established.

There are a number of assumptions underpinning the Plan. These represent circumstances with which the Hawkes Bay Regional Council (HBRC) reasonably expects to occur, including: that the economic and legislative environment in which the scheme operates will remain the same; that HBRC’s current activities and policies will continue; and that there will not be a significant flood which requires a change to the schemes or the way they are managed, beyond that included in scheme assumptions.

This Asset Management Plan (AMP) is supported by, and links to, a number of other documents and databases across HBRC, these include:

- Asset Register and Valuation data, which hold scheme asset information;
- Asset/Catchment Reviews, which investigate problems, identify preferred options for addressing these, and engage with scheme stakeholders and beneficiaries;
- Environmental Codes of Practice and Ecological Management and Enhancement Plans, which guide wider environmental obligations and responsibilities and HBRC policy,
- Strategy, legislation and guideline documents, which influence how HBRC manages the assets.

From this, annual contracts for physical works are developed and financial information is provided for inclusion in the Long Term Plan (LTP). Rating review across all schemes HBRC manage will be incorporated in individual scheme reviews.

The AMP has been developed using the Core asset management plan model. This model is considered to provide the appropriate level of detail given the nature of the assets involved in the schemes, and the defined asset management objectives which are aligned with Councils corporate goals and strategic context. The plan is reviewed every six years and the assets are revalued every three years. The financial forecasts are reviewed annually.

The AMP is a living document and future improvements or enhancements will be considered as part of the next review or prior to that time if circumstances warrant.

### 3.2 The Services We Provide

The Small Schemes services provided by HBRC include:

- Stopbank maintenance
- Engineering design and Hydraulic modelling
- Detention dam maintenance
- Live edge protection and hydraulic structures maintenance
- River and stream channels maintenance to ensure they work as expected during floods

### 3.3 Levels of Service

The current levels of service (LOS) are based on legal requirements, community expectations and physical restrictions inherited over the evolution of the various small schemes.

The drainage system standard varies but is typically between 20% and 5% AEP (approximately 5 and 20 year ARI events). The following table provides a summary:

Component	Current Level of Service(Flood prevention)
River Assets	The level of protection in technical terms is to convey a flood discharge with a 1% probability of being

	exceeded in any one year (1%AEP) safely to the sea
Drainage Assets	The design standard is to drain 32mm of runoff in 24 hours from rural areas. This is nominally a 5 year return period event.

The small schemes require scheme reviews across the board to look at all aspects of the level of service, and the LTP has additional engineering resources provisioned to complete this work. All aspects of scheme operation, current rating and future funding will be considered as part of the review process.

### 3.4 Scheme Asset Information

The assets of the small schemes are summarised in the table below:

Scheme Name	Stopbank Length (m)	Pump Stations (no.)	Detention Dams (no.)	Edge Protection Length (m)	Floodgates (no.)	Drain Length (m)	Culverts (no.)
Esk				13990	1	810	
Kopuawhara	4500				3		1
Makara	2560		5	14760		17107	
Ohuia	3050	3	1		3	12845	6
Opoho		1			1	7160	1
Paeroa						19800	4
Poukawa						18800	6
Tawhara	2470				1	4140	4
TeAwanga	537			2440	1		1
Whirinaki	1693				4	4723	9
<b>Grand Total</b>	<b>14810</b>	<b>4</b>	<b>6</b>	<b>31190</b>	<b>14</b>	<b>85385</b>	<b>32</b>

#### Asset Value

The replacement value of Small Scheme assets as at June 15, 2020 is summarised in the table below

Scheme	2020 Replacement
Esk	\$ 479,656
Kopuawhara	\$ 116,597
Makara	\$ 4,822,495
Ohuia - Whakaki	\$ 2,228,237
Opoho	\$ 897,353
Paeroa	\$ 2,888,282
Poukawa	\$ 1,526,573
Te Awanga	\$ 594,220
Whirinaki	\$ 1,172,853
Tawhara	\$ 837,004
<b>Total</b>	<b>\$ 15,563,270</b>

#### Asset Condition

With the number of smaller schemes there is a range of asset condition, but the capital programme has two significant capital items for pump stations (Ohuia and Opoho) in year 1 and year 2 subject to rate payer approval to fund the works. Generally, the stopbank, detention dam and drainage channels are in good condition, with issues identified and managed through the annual maintenance contract process. Detention dams are subject to revised NZCOLD regulations which are being worked through

for all HBRC detention dams in the 2021-22 period.

The extent and speed with which these issues are able to be addressed will depend on the capacity to undertake these works and ratepayer willingness to fund the work. These will be considered as part of the proposed level of services.

### Climate Change

Climate change represents a longer-term risk with more uncertainty and HBRC will investigate potential impacts and identify appropriate actions to minimise this risk through the level of service/scheme review. The prediction is for Hawke's Bay to be drier but with the potential for increased storminess. Severe storms are predicted to bring more intense rainfall which will result in increased flood flows. Sea level rise will also affect assets in the vicinity of the coast.

### Asset Monitoring

Checks of all assets are undertaken as part of the annual programme of works. An annual audit of each Scheme is undertaken by an Engineer with experience in river control works and reported to HBRC. This process feeds into the planning of future works.

### Residual Risk

Residual risk for the Small Schemes includes the chance of a flood event occurring that exceeds the capacity of a system (a super-design event), and the potential for failure of a flood protection asset. Both factors could result in flooding and damage. There are a wide variety of potential causes for both super-design and failure events, representing a risk that is impossible to eliminate completely.

HBRC management of residual risk focuses on good design and maintenance practice, monitoring of asset status and development of contingency and emergency plans for response management should a super-design or failure event occur.

## 3.5 Asset Maintenance

Scheme management is provided by the HBRC's Asset Management Group (HBRC AMG), which is responsible for the management of the Scheme and its assets. The maintenance, capital and renewal work is delivered under contract by HBRC's Works Group. An annual contract outlines all maintenance, capital and renewal works and the required standards.

An annual work programme is prepared by HBRC AMG each year in conjunction with developing the HBRC's annual budgets. An estimate of costs is established as part of developing the work programme and any issues associated with affordability are addressed as part of the Annual Plan or LTP process, to ensure that the agreed programme of works does not compromise the levels of service and that the consequence of any variance is clearly understood and documented. The annual programme of maintenance is undertaken unless circumstances dictate otherwise.

At the end of each financial year, a report is prepared outlining the work completed in each rating area, and the associated expenditure. This report is presented to HBRC in November for the previous financial year.

### Operational and Capital Funding

An estimate of each schemes costs is established by developing the maintenance programme. Any issues associated with affordability are addressed as part of the Annual Plan or LTP process. This ensures that the agreed programme of works does not compromise the levels of service and that the consequence of any variance is clearly understood and documented.

The total budget forecast over the next ten years are:  
 \$8.23 million for Operations, including maintenance, monitoring and research; and,  
 \$3.02 million for capital works.

The average annual costs over the next ten years are forecast at:  
 \$0.82 million for Operations (OPEX); including maintenance, monitoring and research;  
 \$0.11 million for Capital Works;  
 \$0.12 million for Asset Renewal;  
 \$0.07 million for Projects and Investigations

### Renewals

The pump station replacements below are the major capital proposals in the next 3 year period. No other renewals scheduled in the 2020-2023 period

Small Schemes	Capital Work Description	Indicative Project Value	Timing	Delivery
Opoho - new Pump station	Upgrade and build of new pump station subject to scheme review	\$261,000 in 2022-23	Provision in the LTP	2022-2023
Ohuia - Whakaki - new Pump station	Upgrade and build of new pump station subject to scheme review	\$305,000 in 2021-22	Provision in the LTP	2021-2022

### New Capital –

No renewals scheduled in the 2020-2023 period

## 3.6 Financial Summary

### Financial Management

The financial information for the Small Schemes is based on the Asset Register, asset condition assessments and asset valuation assessments.

Three key assumptions are made with regard to the various scheme financials outlined in this Plan:

- Inflation (from LGNZ based on BERLs figures) is forecast at 2.5%
- There will be no major floods requiring changes to maintenance or capital works programmes; and,
- There will be a continuing willingness to pay for the level of service set out in this AMP.

These assumptions are justified by the knowledge that the likelihood of a major flood exceeding the capacity of the river system in any one year is less than 1%, and HBRC’s disaster provisions allow for the assets to be replaced following such an event.

### Scheme Costs

The Scheme’s annual costs come from:

- Annual operations and maintenance;
- Capital works;
- Renewal work;
- Loan servicing;
- Depreciation, disaster reserve and other contributions; and,

- Other miscellaneous costs.

### 3.7 Asset Management Plan Improvements

The Scheme monitoring programme includes asset and catchment reviews, asset condition and risk assessments, and annual audits; as well as a regular review of this Asset Management Plan and associated registers. The programme identifies potential areas for performance improvement in both the physical assets and asset management process.

Projects aimed at improving understanding and knowledge of assets, and future requirements within the Scheme, are included within the Scheme Operational budget.

Key projects include:

- Opoho and Ohuia Pump station upgrades (subject to scheme stakeholder approval)
- Rating reviews to assess scheme sustainability and affordability
- Data collection, including cross section surveys, LIDAR coverage;
- Inter-planting edge protection zones with species other than willows such as natives and hardy exotics;
- NZCOLD regulation adaptation to HBRC scheme detention dams
- Level of Service Review including Future Demand and Risk Assessments;
- GIS asset data improvements and Scheme boundary review;
- Plant pest, climate change and specific asset reviews;