



Rangitāiki-Tarawera Rivers Scheme Advisory Group

**Tuesday 30 March 2021
10:00am**

Edgecumbe Memorial Hall
Kauri Street
Edgecumbe

Rangitāiki-Tarawera Rivers Scheme Advisory Group Meeting

Tuesday 30 March 2021 at 10am

Agenda

- 1 **Welcome**
- 2 **Apologies**
- 3 **Notes of previous meeting held 9 September 2020**
- 4 **Matters arising from previous meeting**
- 5 **Engineering update**
- 6 **Gravel management**
- 7 **Operations update**
- 8 **April 2017 Flood Repair Project update**
- 9 **Finance report**
- 10 **Rates forecast**
- 11 **River scheme planning (Asset Management Plan, Long Term Plan)**
- 12 **Co-governance/community group updates**
- 13 **General business**
 - a. Infrastructure insurance review
 - b. Flood protection and drainage bylaws 2020
 - c. Aniwaniwa Delta

Notes of the Rangitāiki-Tarawera Rivers Scheme Advisory Group meeting held at 5 Quay Street, Whakatane, on Wednesday, 9 September 2020, commencing at 10am

Chair:	Councillor Bill Clark
Advisory Group:	Alan Law, Linda Virbickas, Peter Askey, Shona Pedersen, Heyden Johnston, Councillor Alison Silcock, Glenn Cooper
BOPRC Councillors:	Councillor Stacey Rose (until 11am)
BOPRC Staff:	Kirsty Brown (Rivers and Drainage Assets Manager), Lynne Hind (Asset Management Coordinator), Bruce Crabbe (Rivers and Drainage Operations Manager), Peter Hay (Engineering Team Leader), Andrew Pawson (Area Engineer), Tony Dunlop (Flood Repair Project Engineer), Chris Ingle (General Manager Integrated Catchments), Mark Townsend (Engineering Manager), Hemi Barsdell (Asset Management Specialist), Paula Chapman (Project Manager), Charles Harley (Team Leader Eastern Catchments), Kay Boreham (Communications Partner), Craig Rowson (Team Leader Environmental Data – Collection)
Public:	None attended
Apologies:	Councillor Toi Kai Rākau Iti
Absent:	Jim Finlay (replaced by Glenn Cooper), Claire Gordon, Andy Dixon, Lee Ann Waaka

1 Welcome

Councillor Clark welcomed everyone to the meeting and Hemi Barsdell opened the meeting with a karakia.

Councillor Clark introduced Councillor Rose and the newest member of the Rangitāiki-Tarawera Rivers Scheme Advisory Group, Heyden Johnston. Councillor Clark also acknowledged the second new member of the Advisory Group, Lee Ann Waaka who was unfortunately not able to attend this meeting.

Heyden is involved in search and rescue and is the Chairperson of the Thornton Community Emergency Response Team. He lives next to the Rangitāiki River and carries on the tradition with this Group as his father George Johnston was a previous member. Lee Ann would like to gain knowledge on the scheme to inform the Rangitāiki community. Both new members will be a great addition to the Rangitāiki-Tarawera Advisory Group.

Kirsty Brown introduced Lynne Hind as the Acting Asset Management Coordinator who will be filling in for Jo Heath, whilst Jo is on secondment until the end of the year.

2 Apologies

Apologies received as recorded above.

3 Notes of previous meeting held 11 March 2020

Resolved

That the Rangitāiki-Tarawera Rivers Scheme Advisory Group:

- 1 Confirm the notes of the meeting held 11 March 2020 as a true and correct record.

Silcock/Law
CARRIED

4 Matters arising from previous meeting

- Alan Law queried whether an update was available for the Cardno Report. Mark mentioned the Trustpower meeting was postponed due to Covid-19. Chris suggested a deadline be set to get an update on this report.

ACTION:

***Date to be set for Cardno Report update with Trustpower and Mark Townsend.
Mark to report back to Advisory Group.***

5 Central Government Funded Projects

Chris Ingle presented an overview of the Central Government Funding provided to Bay of Plenty Regional Council.

Key points included:

- 75% funding for Rangitāiki River floodway and spillway.
- \$3 million for Rangitāiki floodwalls.
- Kia Kaha Whakatāne – Bruce Crabbe is coordinating some work in river schemes and Paula Chapman is the Project Manager, funds must be spent by 30 November 2020. \$2.1 million awarded via Whakatāne District Council for region-wide projects including track clearance, pest control, coast-care enhancement work and removing problem trees alongside waterways. Over 70 jobs created short-term.
- One Billion Trees (1BT) - \$1.5 million partnership agreement through Te Uru Rakau's 1BT programme. Subsidises all Bay of Plenty Regional Council native plantings.
- Wallabies and Wilding Trees – four-year programme. \$1.45 million for wallaby control in current year with contributions from Waikato and Bay of Plenty Regional Councils. Funding increased in Year Two. Wilding pine control awarded \$817,000 in three management areas.

Discussion:

- Councillor Clark queried the longevity of this funding, e.g. Jobs for Nature, was it likely to go longer term? Chris confirmed it was unlikely. Department of Conservation (DoC) are focused on working with people who have been unemployed due to Covid-19.

6 Engineering Update

Peter Hay presented the engineering update to the Advisory Group.

Key points included:

- Lower Rangitāiki Stopbank Upgrade - \$960,000 budget. Geotechnical aspects to be considered and stopbank height to be increased.
- Rangitāiki River Floodwalls Upgrade - \$1.2 million budget (2020/21). Three concrete floodwalls to be replaced over three years.
- Rangitāiki Floodway Stage 7 – \$1.35 million budget. Part of the floodway capacity upgrades to alleviate pressure on the Rangitāiki River. Phases 1 and 3 have been completed, Phase 2 held up due to landowner access.
- Rangitāiki Floodway Stage 6 - \$10.9 million budget. To raise floodway stopbanks in three stages including associated drainage and seepage works. Work commencing in November 2020.
- Rangitāiki Floodway Spillway. To upgrade spillway for greater capacity.
- Mark Townsend spoke briefly about the River Scheme Sustainability Project. \$100,000 budget – vision to have a 100-year sustainable river management strategy. Three different options to develop, will update the Advisory Group at the March 2021 meeting.

Discussion:

- Discussion around tenders and whether there was interest from outside the district. Councillor Clark asked about the local skillset and how we could protect that. It was acknowledged that Peter Hay has been doing a lot of work to help train local contractors to increase/maintain this skillset.

ACTION:

Mark Townsend to give River Scheme Sustainability Project update to the Advisory Group at March 2021 meeting.

Attendance: Peter Askey arrived.

7 Rangitāiki Monitoring

Craig Rowson (Team Leader Environmental Data – Collection) presented to the Advisory Group.

Key points included:

- A screenshot of our updated website that is available to the public was shown to the Advisory Group. This can be found at <https://envdata.boprc.govt.nz/>
- Craig explained rain gauges in the region and what data was available to the public.

Discussion:

Some data is not available to the public as it belongs to Trustpower, however it is available to us in flood control. General discussion as to whether it was possible to give the public more access to this. Look into getting Trustpower to come to the next meeting to discuss this and give an update on the Cardno report.

ACTION:

Invite Trustpower to the next Advisory Group meeting in March 2021. Would like to hear from them in regards to data with Rangitāiki monitoring and the Cardno Report update.

8 Gravel Management

Mark Townsend spoke to the Gravel Extraction report, which he took as read.

Key points included:

- Gravel management in the Rangitāiki-Tarawera Rivers Scheme presently only occurs in the Rangitāiki River upstream of the Matahina Dam.
- Most extraction occurs in the Horomanga River.
- Extraction has been suspended in the upper part of the Horomanga River, from the confluence with the Ohutu River, to enable bed level recovery.
- Extractions are minor in the Mangamate Stream, Jones Drywash and Ohutu Streams.
- Gravel extractions have been approved for Kopuriki Stream this year, a total of 18,000m³ to date in 2020.

Discussion:

Councillor Clark queried as to whether there was one type of rock stronger than another that we may use, e.g. Manawahe rock fractures when building a wall. Mark explained there is a shortage of rock supply and Manawahe has been looked at and tested. It doesn't have the same properties as Matahina rock but can be used in lower energy / lower velocity areas. Extraction under Rabbit Bridge (Lake Aniwaniwa Delta) was discussed.

Attendance: Councillor Rose and Mark Townsend left the meeting.

9 Operations Update

Bruce Crabbe gave an overview on the Operations report and explained current rock spend on replenishing existing rock.

Andrew Pawson presented the Operations Update PowerPoint to the Advisory Group.

Key points included:

- Pests in and around the river – animals/plants. Some rabbit holes were extensive. One hole can go into the stopbank and migrate into four, then six, etc. Lots of Woolly Nightshade and Alligator Weed.
- Undesirable activities – several sites around the area have had vandalism, graffiti, fly tipping and tree felling into the river. One example of vandalism included a smashed electrical pump station which cost over \$3,000 to ratepayers.
- Planting and releasing – Waikakariki Ltd and Bay of Plenty Regional Council staff. Service from Murupara people has been great.
- Minor scheme works – Omeheu Canal.

- Willow topping/mulching – working with locals on this one.

Discussion:

Continued discussion around rabbits and that it is a significant risk factor. Andrew noted that if anyone sees a lot of rabbits in their area it should be reported to us to remedy.

10 **April 2017 Flood Repair Project Update**

Paula Chapman spoke to the report provided in the agenda pack and delivered a presentation showing progress with the April 2017 Flood Repair Project.

Key points included:

- In Year Four of the flood repair project.
- As at 31 August 2020, 164 sites have been completed or no longer require remediation for the Rangitāiki-Tarawera Rivers Scheme.
- 60 sites are remaining. Some sites in Rangitāiki-Tarawera and Whakatāne will not be completed by 30 June 2021 due to constraints in rock supply.
- There was an original works estimate of just under \$28 million. This is now estimated to be less, at \$25.8 million.
- Expenditure to date is \$15.1 million with \$6.8 million in recoveries.
- Looking at low priority sites to see if they still need to be done. Often high priority sites got worse but low priority sites were self-healing. Andrew Pawson is doing some work in this area.
- Expected progress in the next six months is to complete 80% of the Rangitāiki-Tarawera Rivers Scheme works including Reach 2 Edgecumbe to Te Teko, Reach 5 the last of the Galatea rock works and if rock supply permits, Reach 3 Te Teko to Matahina. It is also envisaged that NEMA Claim 13 will be drafted, the College Road land title transfers will be concluded and the material damage claim (pump stations) will also be completed.

Discussion:

- With work to be done in late spring and into summer the question was asked as to whether there would be any challenge there with El Nino, etc. Paula confirmed that there was a high level of confidence in getting the work done as the high priority sites would be done first.

11 **River Scheme Planning (AMP and LTP)**

Hemi Barsdell presented the River Scheme Planning update.

6 October 2020	Council review of draft Long Term Plan (LTP) 2021-2031 and AMP budgets
10-11 November 2020	Second Council review of draft Long Term Plan (LTP) 2021-2031 budgets and AMP documents
December 2020	AMPs and draft LTP 2021-2031 documents adopted by Council for review by Audit NZ
February – May 2021	LTP consultation, submissions, hearings
March 2021	Advisory Group meeting
June 2021	LTP approved

Key points included:

- Baseline maintenance and operations budgets will increase due mostly to an increase in the number of assets.
- The capital budget shared during the Long Term Plan (LTP) workshop with the Rangitāiki-Tarawera Rivers Scheme Advisory Group on 21 August 2020, is the same.
- Confirmed draft scheme budgets will be shared at the March 2021 Advisory Group meeting.

12 **Finance Report**

Kirsty Brown spoke to the financial report that was tabled at the meeting and provided an overview of the scheme's revenue and expenditure for the 12 months ending 30 June 2020.

Key points included:

- Annual 2020 valuation is currently underway.
- High revenue and lower operational expenditure has resulted in a favourable operational position of \$514,000.
- Capital revenue was higher than budget due to additional recoveries received for the April 2017 Flood Repair project (insurance and NEMA claims).
- Total capital expenditure at year end was \$8,363 million (\$111,000 higher than budget).
- Closing balance of \$6.6 million for reserves.
- Closing loan balance of \$39.7 million.

Councillor Clark questioned why the \$100,000 Papataonga development contribution to Whakatāne District Council was charged against the scheme.

Discussion:

- Discussion around Crown Infrastructure Fund and how it affects rates, e.g. will they go down due to funding? Query around whether it was a grant or loan. Chris confirmed it was a grant and that a financial analysis would be done and emailed out to the Advisory Group.

ACTION:

Finance team to do a financial analysis on Rangitāiki-Tarawera Rivers Scheme to see how Crown Infrastructure funding has affected rates. Emailed analysis to go to the Advisory Group.

- Linda queried what rates were due for swamps/wetland. Charles Harley noted that there may be avenues available to landowners to seek rate exemptions on wetlands. As Councils are encouraging wetlands Alan thought it would be useful to let the public know to incentivise wetland protection, if indeed rates exemptions for wetlands are accessible. Charles would update Linda further on this.

ACTION:

Charles Harley to update Linda Virbickas directly on rating exemptions for wetlands.

13 Co-governance / community group updates

Key points included:

- Councillor Silcock and Shona went through the Lake Aniwanuiwa Walking and Cycling Facility presentation with the Advisory Group.
- Project led by Galatea Community Group.
- Long term goal of establishing a recreational resource for the local community and potential local and overseas visitors.
- Cost will be approximately \$30,000. Pioneer Energy / Southern Generation, Whakatāne District Council and Bay of Plenty Regional Council are supporting this project by funding the cost of the initial design and concept plan.
- Damian Clarke from Rotorua Trails Trust is working on a detailed plan.
- Bruce Crabbe offered the services of PGF (Kia Kaha Whakatāne) contractors if some trees need clearing now for the trail and landowners are happy for this to go ahead. Tree clearing would need to be completed by mid-November so must be ready to go now.

ACTION:

Shona will contact Damian Clarke to confirm if any tree clearing is required.

Discussion:

- Talk around how long Lake Aniwanuiwa Walking and Cycling Track may take, Damian Clarke had confirmed they were getting through 100-150 metres per day.
- Discussion around weed issues and whether Southern Generation can drop the river to assist with this as diquat has not been very effective. Chris confirmed they were lowering it once a year. Charles Harley added that the consent allowed them to lower the river twice a year by a metre for weed control, but it wasn't mandatory. Currently his team were flying drones in the area to see how effective weed control had been.

14 General business

14.1 Infrastructure insurance

Kirsty presented an overview of the infrastructure insurance. Central government pays up to 60% of the repair costs for essential infrastructure to local authorities, conditional on us showing we can meet the remaining 40% through other means.

On 30 July 2020 a workshop was held between Council staff and Aon representatives. Aon will now be carrying out a frequency loss assessment for us and in turn we have created a video to show how the Bay of Plenty river and drainage area has been hit with recent disasters and what systems we have in place to prepare for this. As part of the loss assessment, Aon will identify and analyse the loss exposures for rivers and drainage assets and examine the feasibility of self-insurance as a cost-effective option. Other ways to manage risk will also be examined, e.g. capacity to borrow, to fund any loss or damage.

As our insurance is obtained on the London market it was noted that due to the impact of Covid-19 on this market, our insurance premiums may go up.

The Rangitāiki-Tarawera scheme's infrastructure premium for this year was \$243,000.

A video has been created by Bay of Plenty Regional Council to show what systems we have in place within Rivers and Drainage and how prepared we are for flood protection, as part of the information package for Aon. This was shown to the Advisory Group.

14.2 Review of the Floodway and Drainage Bylaw

The Flood Protection and Drainage Bylaws are regulations that safeguard flood protection and land drainage assets from third party damage or misuse. The bylaws are reviewed to ensure they are still fit-for-purpose and informed by the latest science and flood information. Due to Covid-19, deliberation and adoption timeframes were postponed until the following dates:

- Hearings – 26 August 2020
- Deliberations – 30 September 2020
- Adoption – 29 October 2020

Submissions closed 28 April 2020 with a total of 43 submissions received. Fifteen organisations and individuals advised they would like to be heard at the hearing.

Further information on the proposed Flood Protection and Drainage Bylaws 2020 can be found on our website at <https://www.boprc.govt.nz/our-projects/flood-protection-and-drainage-bylaw-review>

14.3 Advisory group membership – September 2020 to September 2023

The first three-year term for Advisory Group membership was due to finish this month (September 2020). With the resignation of Maurice Warbrick and Graham Smeaton, two vacancies were available - one as a hill country representative and one as an urban representative.

As per the Terms of Reference these vacancies were advertised via public notice in the Whakatāne Beacon and on our website.

Applications closed on Friday, 21 August 2020 and a selection panel of Councillor Clark, Councillor Iiti, Chris Ingle and Kirsty Brown reviewed the applicants. Heyden Johnston and Lee Ann Waaka were selected as the two newest members of the Rangitāiki-Tarawera Rivers Scheme Advisory Group starting in September 2020.

Hemi Barsdell closed the meeting with a karakia.

Meeting closed at 1:02 pm

Action Sheet

Rangitāiki-Tarawera Rivers Scheme Advisory Group Meeting

9 September 2020

Action	Person Responsible	Completed	Comment
1. Mark Townsend to have deadline to release Cardno report update to Advisory Group (see item 3).	Mark Townsend		In progress.
2. Advisory Group to be updated on River Scheme Sustainability Strategy at March 2021 meeting.	Mark Townsend	✓	Will be included in Engineering Report of agenda pack, prior to March meeting.
3. Trustpower – Kirsty to invite Trustpower to the next meeting, to discuss the Cardno Report and data monitoring information.	Kirsty Brown		To be deferred to September 2021 meeting.
4. Finance to do an analysis on rates (is there a decrease coming now that Crown Infrastructure funding is in place)? The answer will be emailed out to the Advisory Group.	Loris Hastie / Hemi Barsdell	✓	Hemi sent out a memo to the Rangitāiki-Tarawera Advisory Group on 16 November 2020 with this information.
5. Charles to update Linda Virbickas on exemption for wetlands.	Charles Harley	✓	Has been done, with some of the wetlands being reviewed from the rating layer. Investigation to occur in the future to review the potential exclusion of managed and protected high value ecological sites from the rating scheme.
6. Shona will contact Damian Clark re: possible BOPRC assistance to remove wilding trees for Cycle/walkway. Needs to be completed by mid-November 2020.	Shona Pedersen	✓	Shona put Damian in contact with Bruce Crabbe. Unfortunately the timing didn't coincide as Damian's plans still had more detail to be done prior to the Kia Kaha programme finishing, so no wilding trees could be removed.

MEMORANDUM



To: Rangitāiki-Tarawera River Scheme Advisory Group

From: Mark Townsend
Engineering Manager

Date: 24 March 2021

File Ref: A3751658

Subject: Engineering update

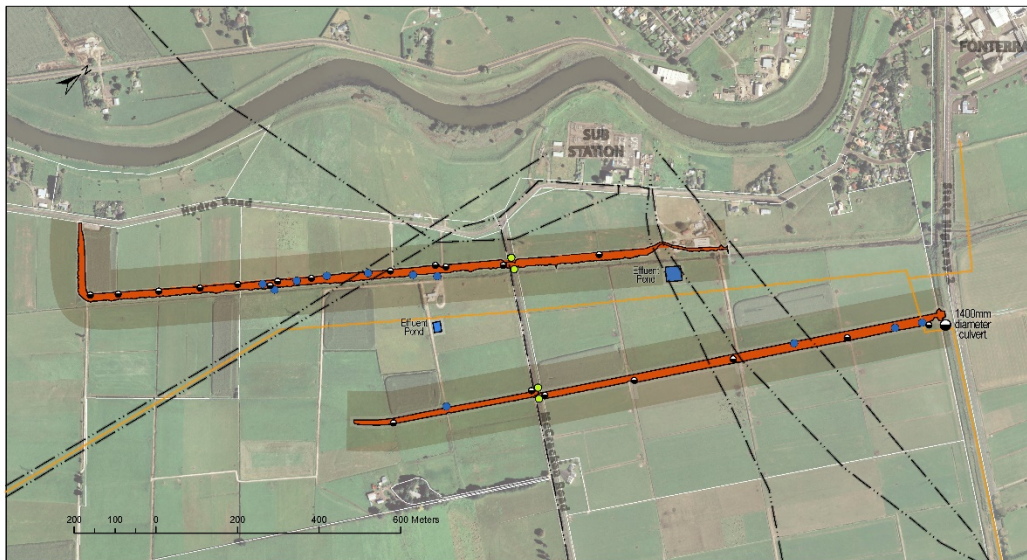
1 2020/21 Capital Works Programme – Update

1.1 Rangitāiki Floodway

Budget 2020/21: Design, consenting and construction \$12,262,000

1.1.1 Rangitāiki Floodway - Stage 7 (Hydro Road to SH2/Awakeri Road)

Consenting requirements resulted in a delay for the last section of Stage 7a. Works are scheduled to commence this month. The work involves upgrades to the left and right stopbanks of the floodway.



Rangitāiki Floodway
Stage 7 - Stopbank Raising

Consent Plan
Plan no - ENG-594569



REFERENCE

- Overhead Transmission Line
- Underground Gas Line
- Stopbank Design Footprint
- Culvert
- Fonterra Whey line
- Stop Log

Fig 1: Stage 7 works locations

1.1.2 Rangitāiki Floodway Stage 6

Stage 6 involves increasing stopbank heights along a section of the floodway downstream of State Highway 2 at Edgecumbe. In total 6.5 km of stopbank is proposed to be raised along with subsequent required drainage and infrastructure changes and this will be undertaken in three stages.

Stage 6a works were awarded in September and are almost complete. Stage 6b works are progressing well at around 50% completion and Stage 6c works have been awarded and are expected to begin late March.

This project has been approved as part of Crown Infrastructure Partners (CIP) funding to help kick-start the country's recovery post- COVID-19. The funding will contribute up to \$ \$8,175,000 (75%) for Rangitāiki Stage 6.

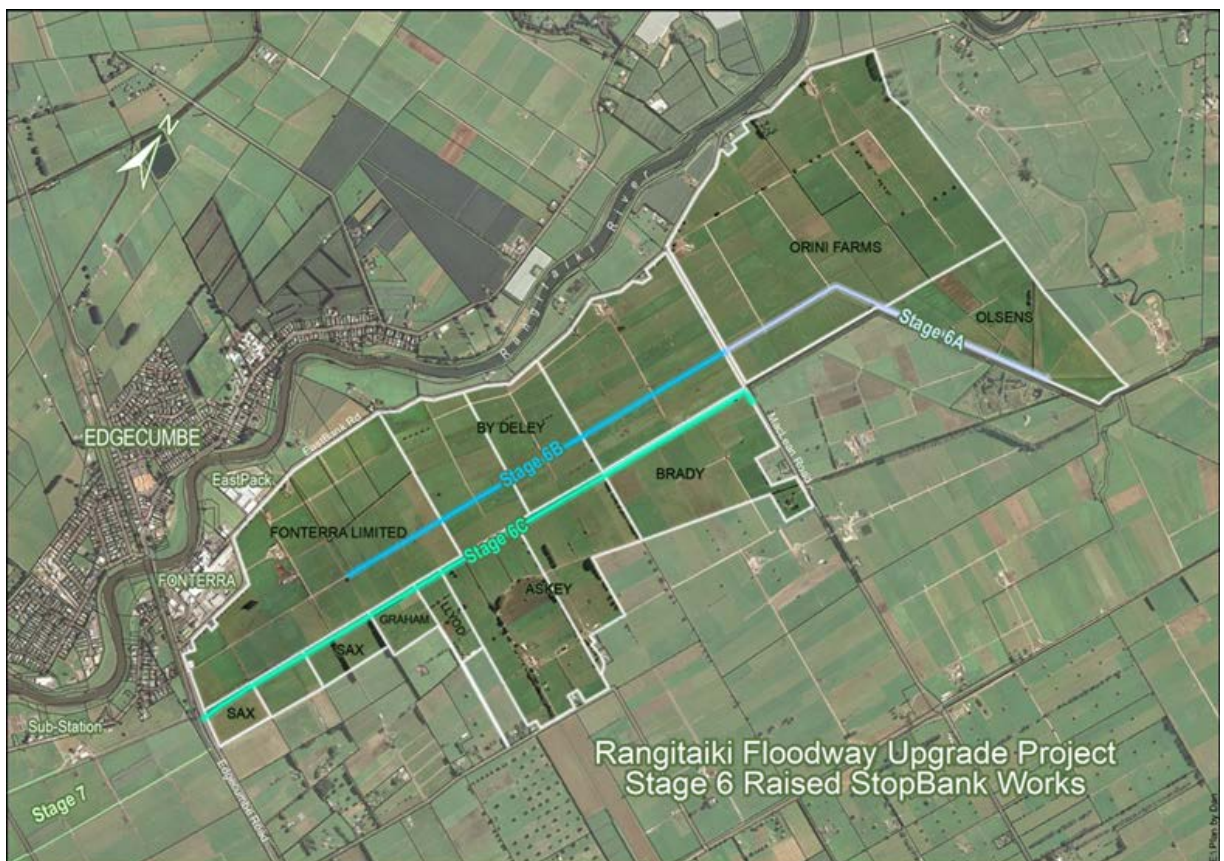


Fig 2: Stage 6a, 6b and 6c works locations

1.1.3 Rangitāiki Floodway Spillway

Budget 2021/22: Design and consenting, funding is incorporated in the Stage 6 budget

The spillway is the starting point for the Rangitāiki Floodway. The proposal is for a fixed crest spillway with radial gates. The spillway formed part of the Stage 6 consultation events and is well supported by the community. The final design layout has now been finalised ready for final consultation with effected parties. The consent application for the updated spillway proposal is currently being written and is to be lodged following the final consultation round. It is noted that the physical works are programmed for 2021/22.

This project has been approved as part of Crown Infrastructure Partners (CIP) funding. The funding will contribute up to \$2,100,000 (75%) for the Spillway physical works.

1.2 Rangitāiki River Floodwalls Upgrade

Budget 2020/21: Design, consent and construction \$1,200,000

As a result of the April 2017 flood event and the subsequent Rangitāiki River Scheme Review a number of existing floodwalls were identified for investigation as to their structural and performance integrity. The sites are as follows:

- 87-109 College Road
- West Bank Road (by Greig Road)
- Thornton floodwall on East Bank Road

The projects involve replacing the three concrete floodwalls. Work will include comprehensive consultation and communications with the local Rangitāiki community, and resource consents including cultural impact assessments. This project has been approved as part of Crown Infrastructure Partners (CIP) funding. The funding will contribute up to \$2,250,000 (75%) for the Rangitāiki floodwalls project.

The Greig Road tender was awarded to Waiotahi Contractors Ltd in September 2020 and is now nearing completion. The Thornton Floodwall (Eastbank Road) is currently out for tender with works expected to begin in April and the College Road works are in the consultation and design phase.

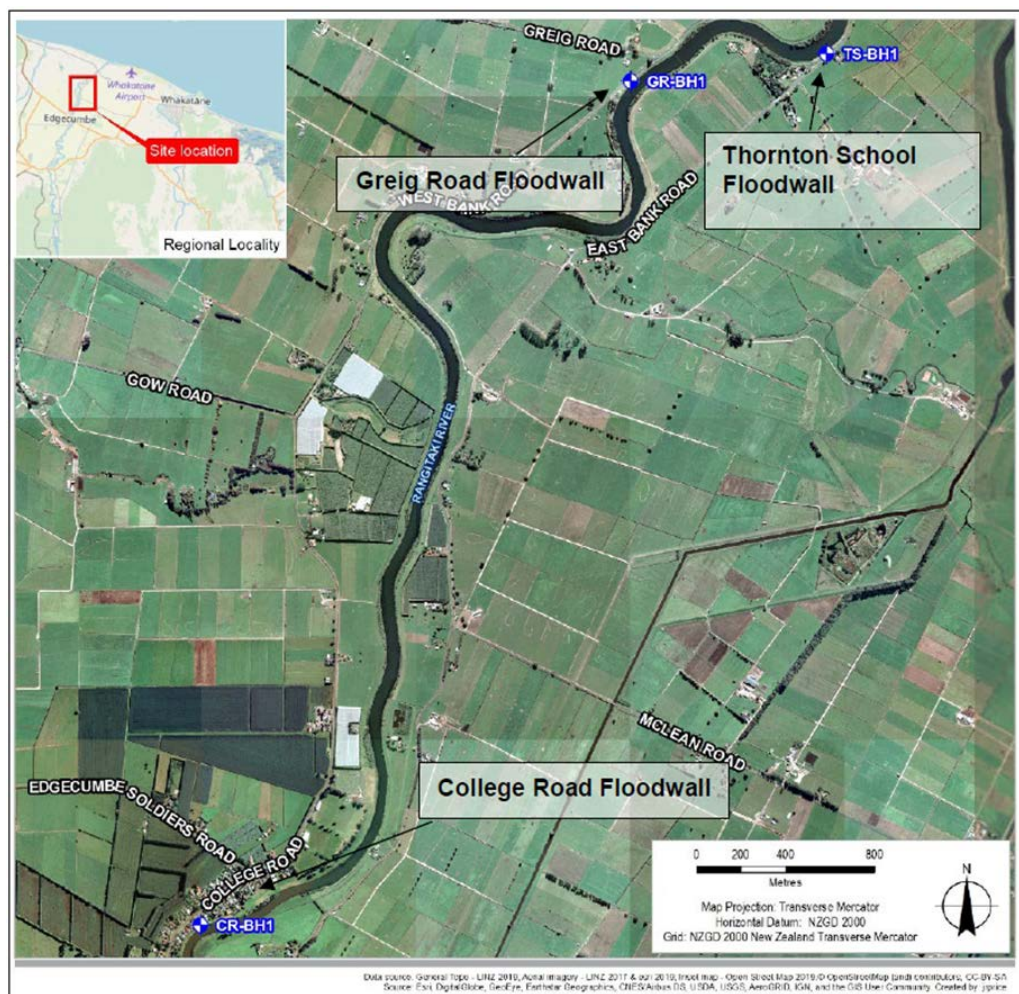


Fig 3: Rangitāiki floodwall locations

1.3 Lower Rangitāiki River Stopbank Upgrades

Budget 2020/21: Design and construction \$950,000

The project involves stopbank raising on the left and right banks of the Rangitāiki River below Thornton Road Bridge. Right bank works were completed in 2019/20 and left banks works were scheduled to begin this financial year, but have now been deferred to 21/22 FY. The project will increase the height of 1.2km of stopbank to improve levels of service. The geotechnical aspects of the stopbank structures are critical to the project.



Fig 4: Lower Rangitāiki stopbank upgrade works remaining - left bank

1.4 Rangitāiki River and Floodplain Modelling

Budget 2020/21: Modelling \$76,000

The aim of the project is to build and run a hydraulic model of the river and floodplain to help assess river and stopbank capacity and system performance. The scope involves the entire Rangitāiki River catchment and Rangitāiki Plains Drainage Scheme.

This work covers two financial years. Most of the model runs have been completed with modelling instabilities from the large flows slightly delaying the 200 year and 500 year runs. These are expected by the end of April and the results are currently being peer reviewed.

1.5 Rangitāiki River Erosion Report

The final draft Rangitāiki River Erosion Report (aka Cardno report) is now available. It details the river geomorphology and erosion responses happening in the Lower Rangitāiki River. The report identifies erosion processes attributable to the lower reach, quantifies erosion threshold flows and flow durations when erosion is accelerated.

Once Trustpower have had an opportunity to review the report BOPRC will need to consider next steps. The suggestion is firstly a peer review of the findings. Secondly undertake flow scenarios quantifying and comparing, run of river, historical (twin peaking) and latest modified flow regimes under the current consent. This will then better inform the effects of the dam operation on bank erosion rates.

Depending on the above findings engagement with the Consenting Authority and further engagement with Trustpower will be required.

1.6 Old Rangitāiki Channel Flood Gate

Diving work was undertaken at the old Rangitāiki River channel flood gate to investigate piping observed last year underneath the structure, on an incoming tide. Despite the poor visibility the divers were able to detect and pinpoint the seepage pathway. A temporary repair is planned within the next 8 weeks while a replacement option is being scoped.

Mark Townsend
Engineering Manager

MEMORANDUM



To: Rangitāiki-Tarawera River Scheme
Advisory Group

From: Mark Townsend
Engineering Manager

Date: 30 March 2021

File Ref: A3752606

Subject: Gravel extraction in the Rangitāiki-Tarawera River catchments

Gravel management in the Rangitāiki-Tarawera Rivers Scheme presently only occurs in the Rangitāiki River upstream of the Matahina Dam. No extraction is carried out in the reaches below Matahina or in the Tarawera River.

The principal extraction occurs in the Horomanga River. The Horomanga extraction is focussed on the reach in and around Galatea Road where the river is close to being perched in places. The estimated supply rate to the river is around 45,000 cubic metres per annum.

Extraction quantities increased in 2019 to the same level as was experienced pre-2016.

Horomanga River – gravel extraction 2017-2020

Year	Quantity Allocated m ³	Quantity Extracted m ³
2017	19,000	12,834
2018	30,000	20,400
2019	76,000	56,353
2020	81,000	50,010
2021	20,000	13,026

The primary interest in extraction is Timberlands who use the material for forestry roading work, however there were minor allocations to Waiotahi Contractors Ltd and Whakatāne District Council in 2020.

With the river bed severely perched above Galatea Road, it is expected that to achieve a desirable mean bed level of around 1 metre below surrounding farm land, extraction of about 270,000 m³ will be required in the 5.3 km reach experiencing aggradation in the lower river.

Extraction has been suspended in the upper part of the Horomanga River, from the confluence with the Ohutu River, to enable bed level recovery. Minor extractions have occurred in the Mangamate Stream.

Jones Drywash, Mangamate and Ohutu Streams - gravel extraction 2017-2020

Year	Jones Drywash quantity extracted m ³	Mangamate Stream quantity extracted m ³	Ohutu Stream quantity extracted m ³
2017	16,519	26,492	23,920
2018	8,711	29,128	34,276
2019	22,638	0	0
2020	4,393	0	0
2021	0	0	0

It is noted that significant quantities continue to move down these streams from catchment erosion incurred during the April 2017 major storm.

No gravel has been extracted from the Whirinaki River in recent years.

Kopuriki Stream

Year	Quantity Allocated m ³	Quantity Extracted m ³
2018	0	0
2019	0	0
2020	22,000	4,493
2021	0	0

It is noted that last year gravel extractions were approved for the Kopuriki Stream. Prior to 2020 there had been no gravel extracted since 2014.

The environmental engineer notes that the stream bed is extremely perched and needs to be dropped at least a metre in depth. Current allocations have been issued in accordance with Rule 3 of the Regional River gravel Management Plan. Benefits of the extraction to the river system include

1. Reducing the potential for flooding from a severely aggraded stream;
2. Reducing the potential for the stream to avulse (jump out of its bed and change course);
3. Improving the flood carrying capacity of the Galatea Road Bridge.

Mark Townsend
Engineering Manager

Rangitāiki - Tarawera Rivers Scheme: Routine Maintenance Works Programme: Financial Year 2020-2021

Date: 10-03-2021

Objective ID: A3566577

	Reach	Work Type	Location	Annual Cost	Job Estimate	Status
1	General					
2		Annual Flood Damage allowance		\$200,000		
3	Tarawera River	R8	Rock works, Below Recorder	RB 6.3	\$30,000	In Progress
4	Tarawera River	R9	Upstream of SH30 Bridge	LB 18.2	\$60,000	On Hold
5	Horomanga River	R6	Rock Works [Mills]	L/B 6.7	\$60,000	Completed
6		Subtotal			\$150,000	
7						
8		Fly tipping and rubbish collection/disposal		\$8,000		
9		All Reaches			\$8,000	As required
10		Subtotal			\$8,000	
11						
12		Pest control		\$8,000		
13	R1,2,8,10	Various			\$10,000	As required
14		Subtotal			\$10,000	
15		SUBTOTAL - GENERAL			\$168,000	
16						
17	Lower Rangitāiki River					
18		Riverbank weed spraying (where required)		\$8,900		
19	Rangitāiki River	R1	Pampas, blackberry, gorse, woolly nightshade	L & R/Bs	\$4,000	In Progress
20	Rangitāiki River	R2	Pampas, blackberry, gorse, woolly nightshade	L & R/Bs	\$4,000	In Progress
21	Rangitāiki River	R3	Pampas, blackberry, gorse, woolly nightshade	L & R/Bs	\$4,000	
22		Subtotal			\$12,000	
23						
24	Rangitāiki River	R1,2,3	Tree Clearing/mulching/layering		\$43,000	
25		Various Sites, work in with F/Damage works			\$70,000	In Progress
26		Subtotal			\$70,000	
27						
28		Native Planting		\$22,200		
29	Omeheu Canal	R10	Gow's box planting	L/B 2.2	\$2,000	Completed
30	Section 109 Canal	R10	Spot planting trial	L/B 0.9 to 1.6	\$500	Completed
31	Awaiti Stream		Investigate planting site and plant	L & R/B	\$2,500	
32	Rangitāiki Rvr, Chalmers	R1	Whitebait trial site/planting	R/B8.1	\$4,000	On Hold
33	Rangitāiki, Ngaio Place	R2	Plant berm	L/B 11.5	\$1,500	Completed
34	Horomanga Rvr, Mills	R6	Planting banks after repairs	L/B 7.1	\$10,000	In Progress
35	Horomanga Rvr, Holmes	R6	Fish habitat/planting [Land Management]	L/B 1.8	\$5,000	In Progress
36	Rangitāiki Rvr, Moses	R2	Planting banks after repairs	R/B 22.0	\$4,000	Completed
37	Rangitāiki Rvr, Ngati Manawa	R5	Planting [White Cliffs]	L/B 89.6	\$3,000	Completed
38		Subtotal			\$32,500	
39						
40		Rock replenishment		\$300,500		
41	Reid's Central Canal	R10	Reid's Central, lower reaches		\$180,000	On Hold
42	Rangitāiki River	R1	Laws Corner [Investigate]	L/B 5.9	\$100,000	On Hold
43		Subtotal			\$280,000	
44						
45	Rangitāiki River		Fencing	\$22,500		
46		R1,2,3	Various sites as required	L & R/B	\$20,000	As required
47		Subtotal			\$20,000	
48						
49		Concrete floodwall sealant replacement:				
50		College Rd	LB		\$8,000	On Hold
51		Subtotal			\$8,000	
52						
53		Minor floodgates/Culvert Inspection		\$9,500		
54	Rangitāiki River	R1	Floodgate annual inspection		\$2,000	In Progress
55		R1	Floodgate desilting		\$2,000	As required
56		R1	Floodgate maintenance		\$3,000	As required
57		R1	Floodgate structure maintenance		\$3,200	As required
58		Subtotal			\$10,200	
59		SUBTOTAL - LOWER Rangitāiki			\$432,700	
60						
61	Upper Rangitāiki River					
62		Channel/riverbank weed spraying		\$27,000		
63	Rangitāiki	R5	Gorse, pampas, blackberry	Various	\$5,000	As required
64	Whirinaki River	R7	Gorse, pampas, blackberry	Various	\$5,000	
65	Horomanga	R6	Gorse, pampas, blackberry	Various	\$10,000	In Progress
66	Mangamate	R6	Gorse, pampas, blackberry	Various	\$3,000	
67	Ohutu	R6	Gorse, pampas, blackberry	Various	\$3,000	
68	Jones Dry Wash	R6	Gorse, pampas, blackberry	Various	\$3,000	
69		Subtotal			\$29,000	
70						
71		Tree clearing/mulching/layering/burning		\$101,700		
72		R4,5,6,7	Various sites to be determined		\$140,000	In Progress
73		Subtotal			\$140,000	
74						

75			Channel maintenance, realignment		\$344,000		
76	Whirinaki River	R7	Various sites [Late summer]	L & R/Bs		\$70,000	
77	Rangitāiki River	R5	Various sites	L & R/Bs		\$70,000	As required
78	Ohutu Stream	R6	Gryone wire rope sites, Various	L & R/Bs		\$30,000	
79	Mangamate Stream	R6	Various sites	L & R/Bs		\$10,000	Completed
80			Subtotal			\$180,000	
81							
82			Planting poles		\$53,400		
83	Rangitāiki River	R4,5,6,7	Various sites, and recheck last years poles			\$50,000	As required
84			Subtotal			\$50,000	
85							
86			Rock/rubble/ trenched willows		\$37,800		
87		R4,5,6,7	After site inspections			\$100,000	As required
88			Subtotal			\$100,000	
89			SUBTOTAL - UPPER Rangitāiki			\$499,000	
90							
91	Tarawera River						
92			Riverbank weed spraying		\$7,100		
93		R8	Pampas, blackberry, gorse, woolly nightshade	L & R/Bs		\$10,000	Completed
94		R8	Spraying glyceria on hard corners [Reduce bank erosion]	L & R/Bs		\$3,000	Completed
95			Subtotal			\$13,000	
96							
97	Tarawera River		Tree mulching/clearing/layering		\$21,300		
98		R8	Mulching downstream SH30 Bridge, [Various]			\$30,000	
99		R9	Various sites as required, trees in river			\$15,000	
100			Subtotal			\$45,000	
101							
102	Tarawera River	R8	Planting		\$11,000		
103	Tarawera/Waikamihi	R8	Planting site on river berm	L/B 9.0		\$2,500	Completed
104	Tarawera/ORC	R8	Downstream ORC pump berm	R/B 0.3		\$2,500	Completed
105	Tarawera below Bridge	R8	Extend fish habitat [Land Management]	R/B 0.6		\$2,500	Completed
106			Subtotal			\$7,500	
107							
108			Rock replenishment (where required)		\$50,900		
109		R8,9				\$30,000	
110			Subtotal			\$30,000	
111							
112			Fencing		\$1,200		
113		R8 & 9	Various sites as required	L & R/B		\$3,000	Partially completed
114		R8	Minor floodgate inspections		\$700	\$1,000	As required
115			Subtotal			\$4,000	
116			SUBTOTAL - TARAWERA			\$99,500	
117							
118	Reach 10 Canals, Awaiti, etc.						
119	Omeheu Canal	R10	Raising stopbank low spots - Poplar Lane	R/B 6.2 to 6.9		\$40,000	Completed
120			Subtotal			\$40,000	
121							
122			Pump Inspections		\$1,000	\$1,000	As required
123	Old Rangitāiki Channel		Pump six month inspection		\$700	\$1,000	Completed
124	Pump Station		2.5 year maintenance		\$0		
125			5 year maintenance		\$2,600		
126			Ancillary maintenance		\$5,000	\$4,000	
127			Electricity		\$2,000	\$4,000	As required
128			ORC Floodgate underwater inspections, [Divers]	R/B 0.0		\$8,000	Completed
129			Subtotal			\$18,000	
130							
131		R8,10	Floodgate inspections		\$4,100		
132			Inspections and minor maintenance			\$6,000	As required
133			Subtotal			\$6,000	
134							
135	Floodgates Replacement		Kope West F/gates x 2, Built in house [FFGs]			\$12,000	In Progress
136			Subtotal			\$12,000	
137							
138			Canal bank weed spraying		\$1,800		
139	Kope West stopbanks	R10	Pampas, blackberry, gorse	Various		\$1,500	
140	Reid's Central stopbanks	R10	Pampas, blackberry, gorse	Various		\$3,000	Completed
141	Omeheu/Awaiti stopbanks	R10	Pampas, blackberry, gorse	Various		\$2,500	Completed
142			Subtotal			\$7,000	
143							
144	Stopbanks	R1,2,3,8,10	Stopbank miscellaneous maintenance		\$12,400		As required
145			After Condition Assessment report			\$20,000	
146			Subtotal			\$20,000	
147			SUBTOTAL - REACH 10 CANALS, AWAITI, ETC.			\$103,000	
148							
149	Annual Maintenance Budget				\$1,108,300	\$1,152,200	
150	Annual Flood Damage Repair Allowance				\$200,000	\$150,000	
151	Overall Maintenance Budget				\$1,308,300		
152	Total Scheduled Annual Maintenance Estimate					\$1,302,200	

MEMORANDUM



To: Rangitāiki-Tarawera Rivers Scheme
Advisory Group

For period 1 August 2020 to 31 January 2021

From: Paula Chapman
Project Manager - Flood Recovery

Date: 30 March 2021

File Ref: A3751873

Subject: Status Report - April 2017 Flood Repair Project (1 August 2020 to 31 January 2021)

April 2017 flood event - background

In early April 2017, the Eastern Bay of Plenty was hit by ex-Tropical Cyclone Debbie. The cyclone brought with it prolonged torrential rain, resulting in rising river levels across all the rivers and waterways in the region. The cyclone dropped considerable rainfall over the entire Bay of Plenty region which produced record high river levels and flows. In the Rangitāiki, flows reaching the Matahina Dam were 20% higher than ever recorded. Flows in the Whakatāne River were captured as 34% higher than previously recorded.

The event resulted in significant damage to river and drainage networks and assets across the region, from the Kaituna in the west through to the Waioeka-Otara catchment in the east.

1 Programme Update

1.1 Programme update summary

- The flood recovery project is now in its last year of the estimated four year programme. Physical repair works have been steady across the programme as conditions and material availability have allowed. At this stage it is likely that there will be a small number of sites that will be carried over for completion into the 2021/22 year.
- As at 31 January 2021, 445 site repair works are complete (or have been assessed as no longer required) from the total programme of 520 sites. In the case of the Rangitāiki-Tarawera Rivers Scheme, 179 sites from a total programme of 224 sites have either been completed (or identified as no longer required).
- Given the few remaining rock repair works the availability of suitable rock material across the programme is no longer a major concern.
- The process for claiming eligible costs from central government is well established. Current claims are for essential infrastructure repairs. Claim 13 was received in December and Claim 14 is currently being drafted. The total amount received from central government to date is over \$9.2 million.
- Three progress payments for Infrastructure Insurance have been approved totalling \$3,600,000.
- The Material Damage insurance claim for all pump damage is still to be received.

1.2 Environment and heritage

- Works comply with the Regional Natural Resources Plan, Bay of Plenty Regional Council policies and bylaws for the Rivers and Drainage activities.
- The project team continues to work with Coastal Catchments (Land Management) to identify opportunities to work together to increase inanga and tuna habitat.

1.3 Quality

- Sections of river are re-inspected prior to developing the detailed work scope for each site. Due to the passage of time more often than not high priority sites are showing increased levels of damage compared to initial assessments and estimates.
- The project team is currently reviewing all remaining sites to determine which are no longer required and can be removed from the programme. In the case of Rangitāiki-Tarawera Rivers Scheme to date 54 sites have been identified where work is not required and those sites will be monitored until the end of the programme. This number of sites is likely to increase as the last of the remaining low priority sites are re-inspected.
- As part of the review the team is also reconsidering proposed repairs and in some cases due to substantial self-healing, willow works are now planned in favour of previously proposed rockwork. This has helped reduced the forecast cost to complete work in the Scheme.

1.4 Communications, community and stakeholder engagement

- Council continues to input into the regular established newsletters, such as the Edgecumbe Collective Newsletter and the Regional Council website to keep the community informed on work plans and progress. The project page is included on Council's website and interested people can follow the page to ensure they receive regular updates. <https://www.boprc.govt.nz/floodrepairs>

1.5 Procurement

- The total programme is made up of multiple smaller projects and these have been delivered utilising established Rivers and Drainage Panel Supplier contract agreements. The panel approval process ensures contractors are capable of the work and hold the necessary accreditations and insurance cover.
- Rangitāiki-Tarawera Rivers Scheme rock work is supported by the Alan Rust Quarry (Te Mahoe) and Ywarri Quarry (Manawahe).

1.6 Programme Delivery

A total of 520 sites have been identified in the repair programme across the region, 224 are associated with the Rangitāiki-Tarawera Rivers Scheme.

Across the programme 445 sites have been completed, 279 of these are in the Rangitāiki-Tarawera Rivers Scheme.

Total programme completion date remains at 30 June 2021, however there may be a small number of sites carried over to the following financial year.

1.6.1 Key sites completed during the last period include:

Site reference	Comment
----------------	---------

RT122 and RT336 Warbricks, river distance 16.0km and 16.7km	Right bank, repair of existing rockwork and extension of the rock erosion protection.
RT120 Lawrence river distance 13.5km	Right bank, significant rock erosion protection work at a site without any existing assets.
RT212 Silcock River distance 87.4km	130lm rock work, existing trench willow asset.
RT323, RT324 BOPRC lease and substation at river distance 12 and 12.6km	Right bank, significant rock erosion protection work, some existing assets.



Photo 1: RT122 and RT336 locations

1.6.2 Key sites underway or planned for the next six month period include:

Site reference	Comment
RT128 Omataroa right bank river distance 20.3	180 lm of riverbank erosion, rock lining underway
RT114 Sullivan/Pattillo right bank river distance 12.7	230 lm of riverbank erosion, rock lining underway
RT369 P Martin right bank river distance 29.7	200 lm of riverbank erosion, rock lining proposed

1.7 Programme Risks and Issues

Risk/Issue	Description	Action/management	Owner
Weather	Severe weather event may cause new damage	Review works programme against new works (annual flood damage)	BOPRC NEMA Insurer
Programme length	Some works unable to be completed as part of programme	Reassess and undertake works alongside annual maintenance.	BOPRC

Cost	Cost exceeds budget	Work closely with NEMA and insurers, maximise contributions from other stakeholders	BOPRC Aon NEMA Insurer
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2 Financial

Forecast costs - total programme

Original estimated total programme cost - Rangitāiki-Tarawera	\$26,000,000
Current estimated total programme cost - Rangitāiki-Tarawera	\$21,500,000
Estimated betterment value	\$9,000,000

Year	Expenditure budget	Actual Costs for infrastructure works
2017/18	\$5,504,854	\$6,707,296
2018/19	\$5,497,800	\$5,320,620
2019/20	\$5,941,680	\$3,040,514
2020/21	\$7,300,000	Ytd 31 Jan \$1,651,248
Total	\$24,244,334	Ytd \$16,719,678

3 Recoveries

- Staff are working with insurance specialists Aon to progress the insurance claims process to date. Recoveries to date total \$3,600,000.
- The project team are working with the central government National Emergency Management Agency (NEMA previously MCDEM) representatives and are comfortable with the process and speed of recoveries to date.
- Recoveries to date specifically related to Rangitāiki-Tarawera Rivers Scheme flood repair works amount to \$7,433,947.

4 Expected progress within the next six month period

- Review all remaining Rangitāiki-Tarawera Rivers Scheme sites to determine what sites can be removed from the programme.
- Complete all remaining Rangitāiki-Tarawera Rivers Scheme Site repairs.
- Draft NEMA Claim 14.
- Receive Material Damage pump station repairs claim.

Paula Chapman
Project Manager Flood Recovery

Bay of Plenty Regional Council - Toi Moana - Rivers Advisory Group

Statement of revenue and expense: Rangitaiki-Tarawera Rivers Scheme

For the 6 months ending 31 December 2020

Rangitaiki-Tarawera Rivers Scheme

Variance Indicators					
Low <10%		Medium 10% to 30%		High >30%	

		Variance		Variance comments		2020/21
Budget	Actual	\$	Variance indicator			Total AP Budget Budget
\$000						

Line Operating revenue by class

1	General rates	198	198	0	-			397
2	Targeted rates	2,189	2,189	0	-			3,830
3	External interest income	11	0	(11)	Lower			22
4	Other revenue	5	(105)	(110)	Lower		A credit note processed for duplicated charge in 2019/20	87
5	Fees and charges	6	0	(6)	Lower			12
6	Revaluation and asset disposal gains	0	7	7	Higher			0
7	Investment income	282	282	0	-			564
8	Total revenue	2,691	2,571	(119)	Lower			4,912

Operating expenditure by class




9	Administration expenses	2	12	(10)	Higher			3
10	Other expenses	156	232	(76)	Higher		Additional infrastructure insurance costs	421
11	Consultancy fees	0	2	(2)	Higher			0
12	Contract work	186	466	(280)	Higher		Maintenance work spend is ahead of budget and at 63% of total year's budget	739
13	Revaluation and asset disposal loss	0	390	(390)	Higher		Effect of 2020/21 revaluation of assets	0
14	Finance costs	532	600	(68)	Higher			1,065
15	Depreciation and asset disposal	282	282	0	-			
16	Subtotal - expenditure	1,158	1,985	(827)	Higher			2,228
17	Net overhead charges and recoveries	386	271	114	Lower			771
18	Total operating expenditure	1,544	2,256	(713)	Higher			2,999
19	Total operating surplus (deficit)	1,147	315	(832)	Unfavourable			1,913

Bay of Plenty Regional Council - Toi Moana - Rivers Advisory Group

Statement of revenue and expense: Rangitaiki-Tarawera Rivers Scheme



For the 6 months ending 31 December 2020

Rangitaiki-Tarawera Rivers Scheme







Variance Indicators					
Low <10%		Medium 10% to 30%		High >30%	

		Variance		Variance comments		2020/21
Budget	Actual	\$	Variance indicator			Total AP Budget Budget
\$000						

Capital revenue by class

20	Capital funding	5,608	3,686	(1,922)	Lower		Delays in formalising process and agreement with Central Government.	8,816
21	Total capital revenue	5,608	3,686	(1,922)	Lower			8,816
22	Total surplus (deficit)	6,755	4,001	(2,754)	Unfavourable			10,729

Capital expenditure by project

23	Rangitaiki Floodway	3,195	2,504	691	Lower		Construction works well on-track. Stage 6a is near completion and Stage 6b about to commence.	12,262
24	Rangitaiki Tarawera Flood Damage Repairs	2,400	1,542	858	Lower			7,300
25	Rangitaiki Floodwalls	64	1,068	64	Higher		Note: Work brought forward from 2021/22 to 2020/21 on Eastbank floodwall Transferred to 2021/22 financial year	1,200
26	Rangitaiki River (Stopbank upgrade)	250	0	250	Lower			950
27	Rangitaiki River modelling	0	0	0	-			76
28	Total capital expenditure	5,909	5,114	795	Lower			21,788

Bay of Plenty Regional Council - Toi Moana - Rivers Advisory Group

Statement of revenue and expense: Rangitaiki-Tarawera Rivers Scheme

For the 6 months ending 31 December 2020

Rangitaiki-Tarawera Rivers Scheme

Variance Indicators					
Low <10%		Medium 10% to 30%		High >30%	

		Variance			Variance comments	
Budget	Actual	\$	Variance indicator			2020/21 Total AP Budget Budget
\$000						

	Opening Balance \$000	Movement \$000	Closing Balance \$000	
Reserves				
30 Flood Damage Reserve	193	39	232	Funds available
31 Asset Replacement Reserve	1,790	83	1,873	Reduction in reserve for repayment of external borrowings
32 Works Reserve	743	221	964	Funds available
Total Reserves	2,727	342	3,069	Funds available

	Opening Balance \$000	Movement \$000	Closing Balance \$000	
Internal Loans				
33 Loans	39,733	(312)	39,421	

	1/07/2019 \$000	Movement \$000	1/07/2020 \$000	
34 Asset Revaluation	105,560	9,743	115,303	

MEMORANDUM



To: Rangitāiki-Tarawera Rivers Scheme
Advisory Group Members

From: Kirsty Brown
Rivers and Drainage Assets Manager

Date: 8 March 2021

File Ref:

Subject: General Business Update

Following items are to be discussed under the General Business section:

1 **Infrastructure Insurance Review**

Council obtains its insurance through the Bay of Plenty Shared Services Ltd (BOPLASS) joint insurance procurement forum. This includes covering the 40% local authority share of infrastructure restoration costs resulting from a natural disaster.

Due to the steady increase in infrastructure insurance premiums over the years and the likelihood this pattern will continue, a review of how we insure our flood protection and drainage assets is currently underway. This review is being led by our insurance broker's Aon.

The main objectives of the review include:

- Quantifying the frequency and financial consequences of flood damage to flood protection assets and clean-up costs.
- Identifying flood protection assets most at risk of damage from flood to inform asset management, resilience strategies and risk financing.
- Ensuring cost-effective and sustainable flood risk financing by reviewing financial risk tolerance, flood risk retention and disaster reserving strategies.

In the meantime, staff have secured savings for the 2020/21 premiums by:

- Initiating a successful review of the BOPLASS allocation formula.
- Reducing the contingency sum built in for all assets.

Group members will be kept up-to-date as this project develops.

2 **Flood Protection and Drainage Bylaws 2020**

The Flood Protection and Drainage Bylaws are regulations that safeguards Council's flood protection and land drainage assets from damage and

misuse. The bylaws only apply to assets managed by Council as part of the region's flood protection and land drainage schemes.

Following a comprehensive review of the 2008 Bylaws, the 2020 Bylaws were formally adopted by Council on 17 December 2020 and became operative on 1 February 2021.

In summary, the key changes include:

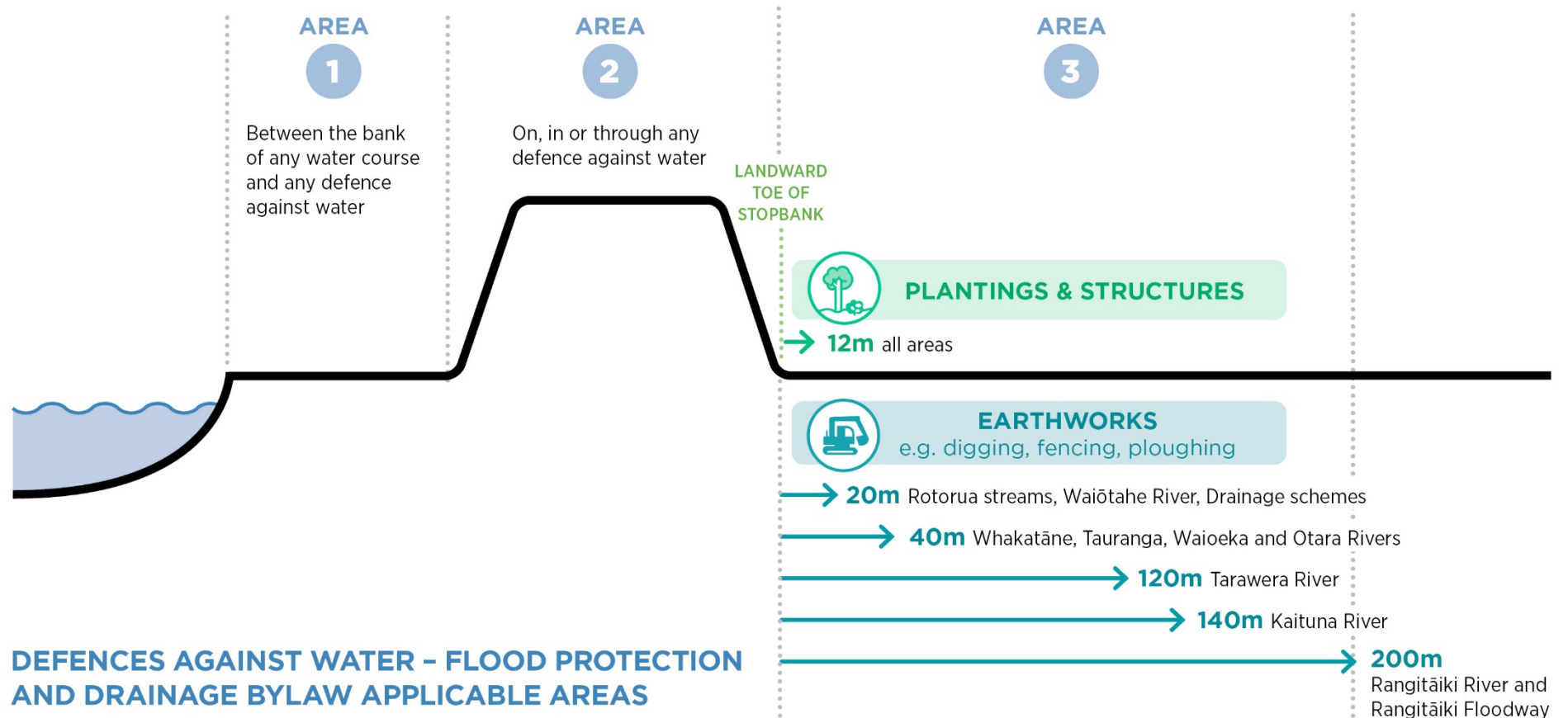
- Strengthening clauses relating to stock access to drains.
- Extending the bylaw applicable areas (where a bylaw authority may be required) for earthworks in relation to defences against water (see appendix 1 attached).
- Additional clauses related to fencing, ploughing and land use intensification in areas with pumiceous soils e.g. lower reaches of the Kaituna, Tarawera and Rangitāiki.
- Identification of additional floodways.
- Additional clauses relating to written authority management plans for multiple bylaw authority applications e.g. routine maintenance, seasonal activities and cultural practices.

More information on the Bylaws 2020 can be found on our website at <https://www.boprc.govt.nz/our-projects/flood-protection-and-drainage-bylaws>, including the online form to find out whether a property is within the bylaw applicable area.

A handwritten signature in black ink, appearing to read 'Kirsty Brown', with a stylized initial 'K' and 'B'.

Kirsty Brown
Rivers and Drainage Assets Manager

Appendix 1 - Bylaw applicable areas for defences against water (stopbanks, floodgates, pump station) and drains without stopbanks



Floodway and Drainage Bylaw applicable areas - drainage scheme drains without stopbanks

