

Report No.	20-73
Information Only - No Decision Required	

RIVER AND DRAINAGE ENGINEERING REPORT

1. PURPOSE

- 1.1. The purpose of this item is to report on progress with river and drainage activities for the period March to May 2020.

2. RECOMMENDATION

That the Committee recommends that Council:

- a. receives the information contained in Report No. 20-73.

3. FINANCIAL IMPACT

- 3.1. Funding provision for all activities reported on in this item is either included in the River and Drainage General or River and Drainage Schemes Activity sections of the 2018-28 **Long-term Plan (LTP)**; is covered by an approved carry-forward of unexpended budget from the 2018-19 financial year; or additional approval will be specifically sought by way of recommendation in the item.

4. SIGNIFICANT BUSINESS RISK IMPACT

- 4.1. There are no significant risks relating to the adoption of the recommendations contained in this report.

5. DISCUSSION

- 5.1. The emphasis with this update to Committee is on the resourcing pressures within River Management – specifically the Investigations and Design team. Those pressures cover a wide range of areas such as scheme reviews and the various modelling and other related projects currently underway, but also less visible requirements related to other activities across the organisation.
- 5.2. One notable resourcing demand that impacts both River Management and the Science Team within the Natural Resources and Partnerships Group relates to resource consents. **Assessment of Environmental Effects (AEEs)** that accompany resource consent applications require review – whether the AEE captures / addresses the full suite of potential effects, whether the conclusions reached around likely effects and their severity / persistence are reasonable and whether mitigation measures / conditions proposed adequately / practically address those effects.
- 5.3. Often those applications have a degree of complexity and adequate due diligence can be a time-consuming exercise – the thorough / comprehensive application submitted by the New Zealand Transport Agency for Te Ahu a Turanga is a good example, where the ripple effects around resourcing are much wider than the regulatory team. The related gravel extraction consent applications have proved, for various reasons, to be equally time-consuming.

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- 5.4. Various models have been tried in the past, including outsourcing to consultants. Often the effects related to a particular proposed activity can be subtle / esoteric and where schemes are involved the amount of staff input required might alter very little with the engagement of a consultant – building the requisite understanding to enable sound judgement to be applied.
- 5.5. Equally the Hazard Mapping project lead by Emergency Management (the database of information drawn on by District Advice staff) requires significant input from Investigation and Design staff; hydraulic modelling input / expertise required to underpin floodplain mapping.
- 5.6. Resource pressures in this area are also manifest in a range of other ways – delays with the programme of scheme reviews and delays to other investigations projects, compounded this reporting period by the loss of key asset management staff to central government. Ultimately those delays are reflected in the relatively high number of not achieved KPI results recorded against the River and Drainage activity area identified in the Annual Report.
- 5.7. An additional potential demand on staff time are the ‘shovel ready’ funding applications. Staff have, along with most other infrastructure asset owners in the country, submitted a list of ‘shovel ready’ infrastructure projects for consideration by central government as part of the post-lockdown stimulus package. Five projects with a total request of \$31.9M were submitted on 14 April. Acknowledgement emails have been received and relatively minor clarifications requested to date.
- 5.8. One of the discussions progressed over the lockdown was with the **New Zealand Transport Agency (NZTA)** and their consultants around the Ōtaki to north of Levin (O2NL) highway project and the overlap that has with Horizons’ river management responsibilities. The proposed corridor intersects three schemes, Ohau-Manakau, Hokio and Koputaroa, and presents an opportunity to address a range of problematic local issues e.g. Kuku Stream flooding of Tukorehe Marae.
- 5.9. Staff have also been working closely with NZTA, contractor Fletcher Construction and representatives from Ngāti Raukawa on the use of demolition material from the old Whirokino Bridge for bank protection works, specifically the potential to address sizeable river bank erosion issues along the Manawatu River downstream of the bridge. These issues fall outside the mandate of the Lower Manawatu Scheme as it does not threaten any flood protection asset but staff have been assisting with trying to find a win-win solution for both the agency and affected landowners.
- 5.10. However the volume of material required to make a difference at those locations is orders of magnitude larger than the volume of rip-rap that the bridge demolition is likely to yield; estimates are that the cost of the work would run well into the millions of dollars, well beyond the good will that could reasonably be expected of NZTA. The LMS will look to take and stockpile some of the demolition material for future scheme-related bank protection work.
- 5.11. Staff have continued to progress the review of the Koputaroa Scheme – the intention was to present this to the June meeting but the intent is now the September meeting. Focus with this review is to establish a template for the reviews to follow, with the focus on strategy; articulating the vision and the steps toward that vision. The review will, in a similar vein to the 30 year Infrastructure Strategy, identify a group of significant issues to give focus to that strategy.
- 5.12. Current thinking is that environmental enhancement, climate change, land use change and renewal / replacement are the four focus areas. Land use change captures the changing operating context for the scheme - increased flows, shorter catchment response times and higher sediment loads. The renewal / replacement strategy is centered on defining an optimal network configuration and working toward that vision - most efficient configuration

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that provides the required level of service, principally targeting high cost elements such as the number of pump stations the scheme has.

- 5.13. In keeping with all things Horowhenua one focus over the period has been on iwi relationships – discussions with Raukawa hapū around both Foxton and matters relating to the Ōhau River (specifically gravel management). An assessment of the awa's gravel resource is intended to be presented to the September committee meeting, and that assessment will hopefully include input from a number of hapū.
- 5.14. Another impact of the lockdown and the necessary amendments to the consultative process for 2021 Annual Plan process was around informing Foxton residents of changes to the flood mitigation plan for the town. Staff had prepared an information sheet on those changes intended to be distributed to coincide with the consultation period; it is intended to distribute that information sheet (with some format changes) shortly. At the same time a letter will be sent to Whirokino Scheme ratepayers outlining changes in the mitigation approach for Foxton and what that means for the Whirokino Scheme.
- 5.15. The annual programme of scheme meetings was also impacted by the lockdown. Scheme meetings are timed to coincide with annual plan consultation and although a number did take place (eastern area meetings, Lower Whanganui and Matarawa) most were cancelled with the lockdown. A complication with those meetings that did take place was that the presentations made contained financial information superseded by the more austere assessments of the revenue required for the 2021 financial year with the post-lockdown economic environment.
- 5.16. The matter of how to address all of the lockdown effects on scheme meetings was discussed with Cr Cotton and Cr Benbow – summary is as follows:
 - No further information will be circulated for those meetings already held;
 - Presentations already prepared for meetings that were cancelled will be updated to align with the final form of the 2021 Annual Plan and sent to the address / contact lists held for those schemes;
 - Where presentations have not been prepared a summary sheet of key information will be compiled and sent to address / contact lists;
 - Lower Manawatu and Rangitikei scheme meetings will be re-scheduled for July.
- 5.17. Staff have also progressed the development of a flood risk reduction strategy for Anzac Parade in Whanganui over the period. Professor Bruce Glavovic, EQC Chair in Natural Hazards Planning at Massey University has been engaged to assist with the development of this strategy, intended to be completed in early 2021. Cr Patrick and Whanganui Mayor Hamish McDouall are assisting as governance representatives from both Councils with the community forums planned with the strategy development.
- 5.18. Finally reference is made in Section 6 to asset revaluation work and input from consultants AECOM. AECOM were engaged to review the valuation methodology applied by Horizons and in general their comments reflect favorably on our approach. They did however also concur with the staff view around the valuation methodology applied to Horizons detention dams – “the current valuation is significantly undervaluing the 54 dams”. AECOM are currently undertaking that revaluation process but preliminary estimates suggest the current \$12.4M valuation will likely end up close to \$30M.

6. INVESTIGATIONS AND DESIGN

- 6.1. The Investigations and Design team has a large and complex programme of works for delivery this financial year. As well as a programme of Scheme and classification reviews, there are also a number of design tasks that are required to support the Area River Management Teams.
- 6.2. This reporting period has seen some significant staff changes in the team. Hinewai Pouwhare-Anderson (River Management Analyst) left Horizons to take on another challenge, while Claire Platts (Senior Project Engineer) has started her maternity leave. At the time of writing an appointment has been made to back fill the Projects role to ensure that the resource is available to continue work on the Rural Upgrade Project.
- 6.3. Recruitment is also underway to fill the vacant River Management Analyst position but has been redefined to Assets and Environmental Engineer. As well as continuing the asset management work that the team is responsible for, the new person will also be tasked with assisting the wider River Management Group with managing environmental compliance.
- 6.4. During this reporting period, the COVID-19 lockdown had an impact on the Investigations and Design Team's work programme. Whilst, all of the team were able to work from home effectively, some of the tasks that were able to be undertaken were limited by the accessibility of certain specialist software packages. Despite this, staff were able to refocus on other tasks, ensuring that their time was well spent.
- 6.5. The following summarises the work that the team has undertaken during this reporting period.

SEDIMENTATION IN THE LOWER MANAWATŪ AND OROUA RIVERS

- 6.6. In partnership with the Science and Innovation Team, this work seeks to develop a Sedimentation Response Strategy for the long term management of sediment in the Lower Manawatu and Oroua Rivers.
- 6.7. The request for 'shovel ready' projects during the lockdown period has seen staff re-focus, in the short-term, on looking into some responses to sedimentation that could potentially receive financial support from central government.

ARAWHATA STREAM & HOKIO DRAINAGE NETWORK STUDY

- 6.8. This project looks at the Hokio Drainage network with a view to both improving and broadening levels of service, identifying opportunities to reduce sediment load in the drains that eventually flow into Lake Horowhenua, in addition to the mitigation measures already completed.
- 6.9. The Horizons team working on this project has been made up of staff from the Investigations & Design Team and the Southern Area Team, as well as from the Science & Innovation Team.
- 6.10. During this reporting period, our consultants have delivered a draft of the initial data review which staff have provided comment on. Consultants Tonkin and Taylor have also begun the technical work associated with identifying the range of mitigation measures that provide the best outcomes.
- 6.11. As part of the request for 'shovel ready' projects, staff have been able to leverage some of the work previously undertaken in this workstream to inform the development of a potential Arawhata wetland.

KOPUTAROA SCHEME REVIEW

- 6.12. Following consultation with a number of landowners, Iwi groups, and other key stakeholders, an initial draft of the Scheme Review has been completed.

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- 6.13. Progress on this review was somewhat slowed by the COVID-19 shutdown and staff changes within the Investigations and Design Team. The review of the Koputaroa Scheme is a significant piece of work, as it seeks to understand the multiple issues and drivers that will shape the Scheme's operations and management well into the future.

POHANGINA GRAVEL RESOURCE STUDY

- 6.14. The reporting of this study was completed during this reporting period and is presented as a separate item to this committee.

HAZARD MAPPING – UPPER MANGAONE & EAST OF LEVIN MODELLING

- 6.15. This modelling work is being done as part of the Hazard Mapping Project that is led by the Emergency Management Team. Jacobs have been engaged to undertake this work, which will provide modelled information about the Flood Hazard in these two areas.
- 6.16. Staff have been working with the consultants who have updated their delivery programme to ensure that this work is completed within this financial year.

MOUTOA FLOODWAY

- 6.17. During this reporting period, staff have analysed cross-sectional survey data from the Moutoa Floodway. This work will be presented to this committee meeting as a separate item.

HAZARD MAPPING – OHURA

- 6.18. This modelling work is also being done as part of the Hazard Mapping Project. This model is being developed internally and staff have been working with the Survey and Information Management Teams to assemble and process the topography and elevation data that will underpin the model.
- 6.19. Progress on this work was hindered, by the accessibility of modelling software, over the lockdown period. Staff are currently picking this work back up with the aim of completing the work by the end of June.

MANAWATU DRAINAGE SCHEME MODELLING

- 6.20. Consultants Tonkin and Taylor have been awarded a contract for the modeling of this ~170 km² catchment. This will utilize the latest advances in modeling approaches and technology to map out an investment plan to address both current level of service issues but also to provide some resilience to future catchment changes. Where possible the work will utilize the findings from a study done after the 2004 floods, as well as taking on board the experiences of the June 2015 flood, when floodwater effects, in some locations, were actually more extensive than in 2004.
- 6.21. Considerable effort has gone into working with the consultant to understand and provide all of the pertinent information and data required to enable the construction of a comprehensive and credible model of the Drainage Scheme. The consultants have made good progress in terms of building this model.
- 6.22. Consultants will be attending the re-organised Scheme meeting to provide an update on their progress, and also to seek valuable inputs from landowners and ratepayers.

ASSET MANAGEMENT

- 6.23. During the lockdown period significant work was put into the revaluation of our infrastructural assets following the review work that was undertaken by consultants AECOM. This work has been undertaken to ensure that the year-end processes are undertaken as smoothly and robustly as possible, taking into account the resourcing issues within the Investigations and Design Team.

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REGULATORY ADVICE

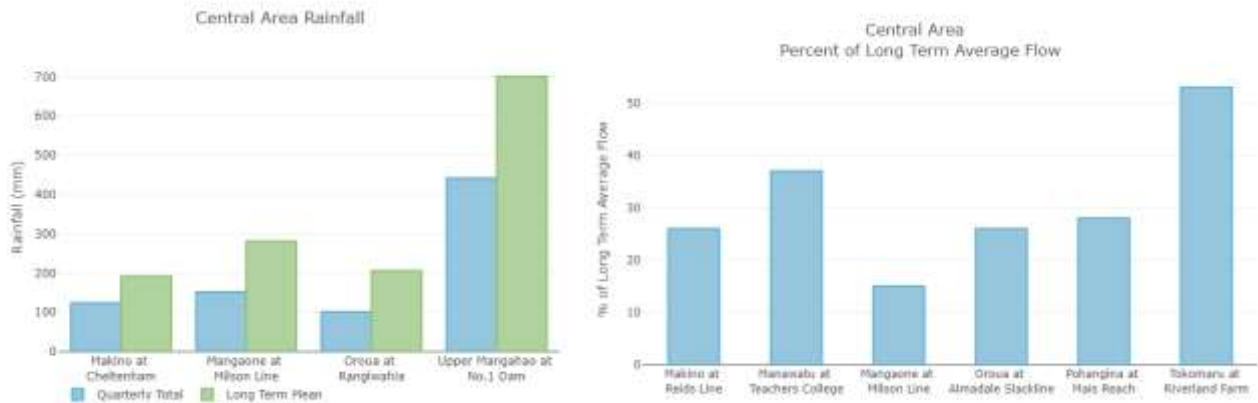
6.24. During this reporting period, advice was provided on a number of substantive matters. This regulatory work has included specialist advice on flood risk and the production of technical reports for consent applications, rezoning and subdivisions.

LOWER MANAWATU SCHEME RURAL FLOOD PROTECTION UPGRADE PROJECT

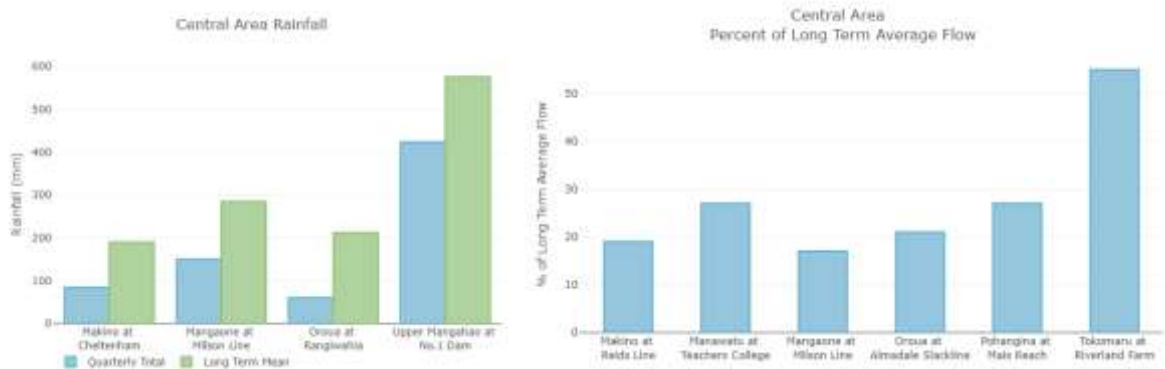
6.25. This project is discussed in detail in a separate item to this committee meeting.

7. CENTRAL

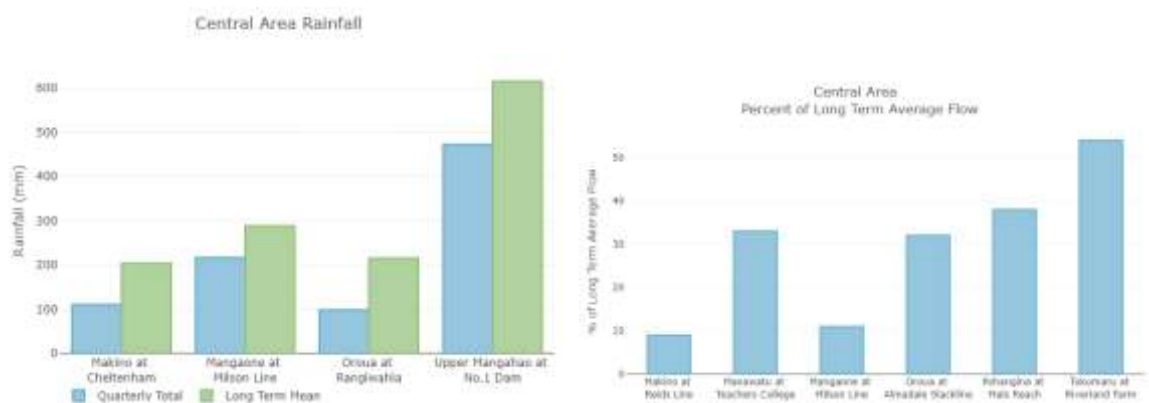
7.1. February Rainfall/Flow



7.2. March Rainfall/Flow



7.3. April Rainfall/Flow



7.4. This reporting period has seen very little rain through the system, with only a few periods of rain it is still exceptionally dry for this time of year. While this weather is good for earthworks, going into Level 4 lockdown due to Covid-19 means some work for this year has been reprogrammed into next year. There were no flood events of note over the period.

7.5. The **River Asset and Amenity Partnership (RAAP)** meetings between Scheme staff and **Palmerston North City Council (PNCC)** was held in late February with the next meeting

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planned for June. These meetings provide a valuable opportunity for staff of both councils to stay up to date with activities planned for the city area, particularly those happening in and around the river corridors. They provide opportunity to meet with different staff members and build effective working relationships to assist both councils in undertaking their work successfully.

- 7.6. Enquires received from the public around various topics has continued throughout this reporting period. These have included information requests around the city willow mulching programme, black berry and weed control, pest control, fencing, tree removal requests and works near or on the secondary stopbank, as well as supporting the PNCC with their development plans within the city.

LOWER MANAWATU SCHEME

- 7.7. Works undertaken on the various rivers within the Scheme this period include the following:

MANAWATU RIVER

- 7.8. Vegetation mulching and layering of the true left bank between ANZAC Cliffs and Staces Road in Aokautere commenced before lockdown and will be completed by the end of May. A section of tied tree works was constructed along a short section at ANZAC Cliffs where the gravel bund was located during construction of the rock lining. Previous willow pole plantings had not been successful.
- 7.9. The city rock spraying programme that saw delays earlier in the year has caught up, with only the rock at ANZAC cliffs remaining to be completed. This is planned to be completed in the coming weeks.
- 7.10. The spray programme that keeps the vegetation off the inside of the bends and keeps the beaches clear of vegetation commenced one week prior to lockdown. Unfortunately the programme was cut short due to the Covid-19 shutdown and has been reprogrammed for next year.
- 7.11. Several rope, rail and tree groynes have been constructed on the Manawatu River adjacent to the Ashhurst Domain, complementing the other works constructed since 2017, funded jointly by Horizons, PNCC and NZTA. While onsite, steel debris from the old Ashhurst Bridge were removed. These navigational obstructions had reappeared as a result of low water levels and changing beach topography in the area. That work is funded by the Regional River and Drainage rate.
- 7.12. PNCC have completed their works to replace the lime pathway along the river berm at Dittmer Drive with concrete. Scheme staff visited the site for monitoring and continue to do so for the construction of a new path downstream of Albert Street. A further area of river pathway that is in line for some improvement is the area above the Fitzherbert Bridge. This will be widened to provide a larger hard faced surface for the weekly Park Run events that start and finish there.
- 7.13. PNCC have begun the resource consent process for the entranceway development at the Victoria Esplanade with Scheme staff assisting with preliminary mitigation advice.
- 7.14. The small remaining amount of the rural willow mulching and vegetation maintenance programme along the Manawatu River was completed early this reporting period. Mulching then commenced and continued within the city reaches. This work involves the layering and / or mulching of the existing willows to control their size while maintaining a strong root structure. This live vegetation provides cost-effective bank stability and is the first line of protection against river edge erosion.

OROUA RIVER

- 7.15. No issues to report.

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MANGAONE STREAM

- 7.16. Upgrade works involving the extension of existing culverts, new drainage pipes and the Stopbank along the rear of the houses on Benmore Avenue Palmerston North was completed. This work was necessary to prevent the floodwater which is discharged from the Mangaone Stream down the floodway, from entering the city from the Benmore Avenue location.
- 7.17. A section of slumping above Pioneer Highway has been repaired with rock rip rap and rock material has been placed in a hole that had formed behind the adjacent timber retaining wall.
- 7.18. Efforts to eradicate or reduce the rabbit population above Rangitikei Line are still continuing. The number of rabbits this year is significantly higher than in recent years. Repairs and fumigation of the burrows were initially undertaken in August and more recently in early May. Poisoning has continued throughout. There have also been recent reports of a rabbit population boom near the Awapuni greyhound track.

MAKINO STREAM

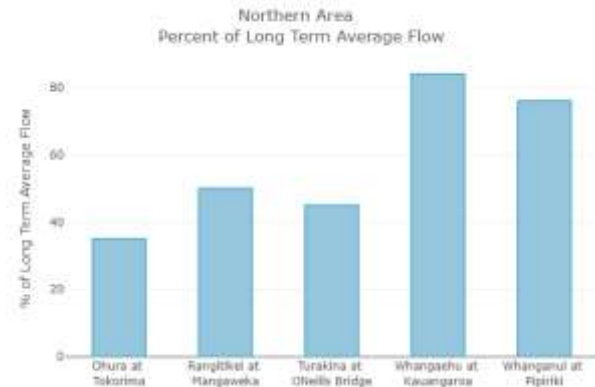
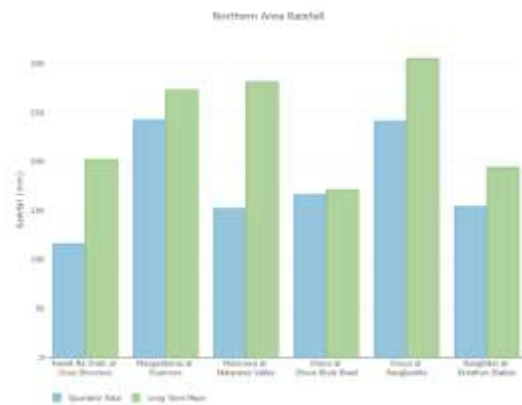
- 7.19. Gravel was extracted from the Makino Stream at the Duke Street Bridge to allow the design flood flow to pass, remaining within the stream channel.
- 7.20. The annual channel maintenance programme on the Makino Stream was also completed. Works commenced South of Boness Road and continued upstream to South Street, Feilding. Feilding Township was by-passed, with works commencing again at North Street, continuing upstream to Port Street, Root Street, Reids Line West and finishing at the upper reach of the scheme responsibility. Works consisted of either layering or mulching of existing vegetation, and the re-locating of gravel build up or point bars which were causing poor stream alignment and / or erosion problems.
- 7.21. Due to the shutdown for Covid-19 the programmed maintenance works could not be completed by 1 May, the trout spawning period when machinery is not permitted within the channel. An application was made to the Wellington Fish and Game Council, to postpone the start of the trout spawning period restrictions by three weeks to allow us to complete the programmed works. This was granted.
- 7.22. Discussions held with **Manawatu District Council (MDC)** regarding the proposed walkway along the Makino Stream in the vicinity of Rata Street Feilding are on-going.

LOWER KIWITEA STREAM SCHEME

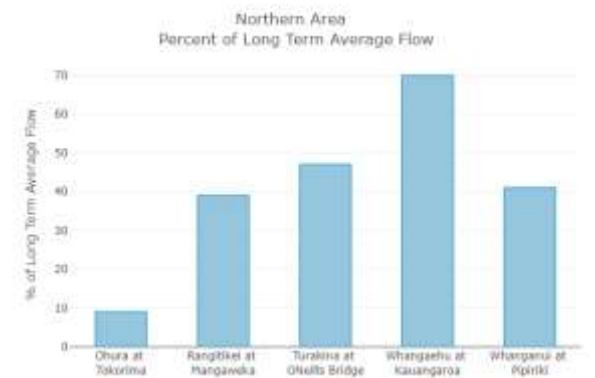
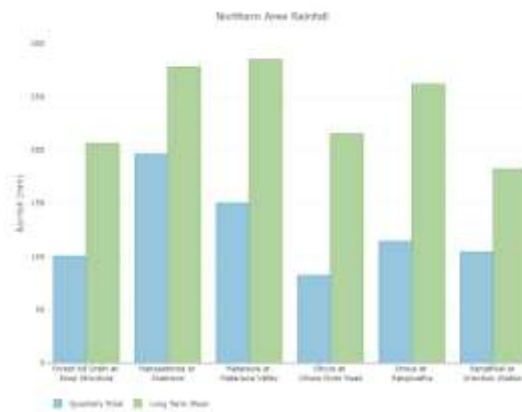
- 7.23. The Scheme Annual General Meeting was held on 18 March 2020. Attendance at this meeting was poor. This is likely to be an indication that rate payers are happy with how the scheme is performing, with no problems or demands to attend to. Last year's works programme and the closing scheme balance was discussed. The current year's programme of works and costs to date were explained. No major floods over the last twelve months has meant more funds available to undertake maintenance type works. The stream channel is in excellent condition ready to cope with most floods which may eventuate this winter

8. NORTHERN AREA

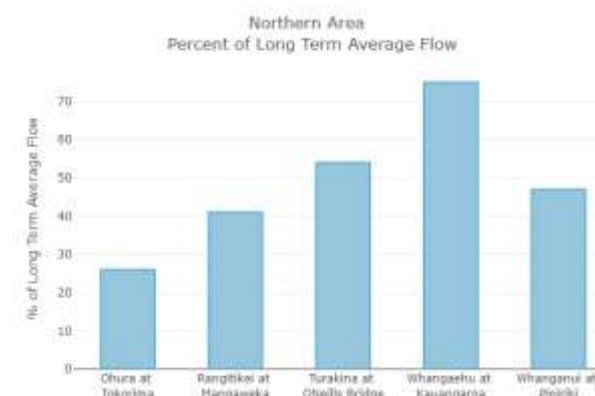
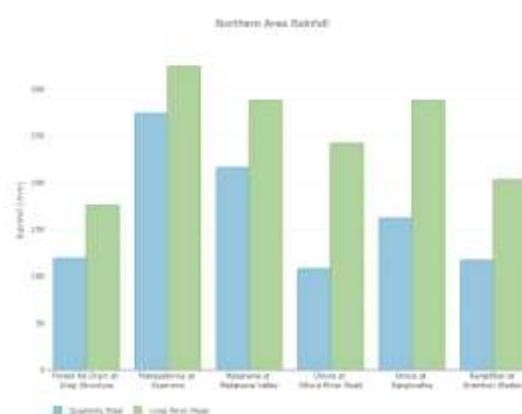
8.1. February Rainfall/Flow



8.2. March Rainfall/Flow



8.3. April Rainfall/Flow



8.4. Work programming and implementation was severely interrupted during the COVID-19 lockdown period with staff operating from home to the best of their ability. Good stable weather conditions as we come out of our restrictive environment is enabling progress on scheme maintenance tasks, with their completion being seen as essential to ensure we enter the winter period with confidence our assets are effective against expected high river flows.

8.5. Noting the following staff training and development:

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In late February a group (Melissa Churchouse, Julia Jung, Wayne Spencer & Jordan Taylor) attended a three-day technical workshop on the West Coast of the South Island run by West Coast Regional Council with a range of invited speakers.

Targeted specifically at Regional Council River Management Technical Staff the workshop included two field trips one around Greymouth to look at the Cobden concrete flood wall, and coastal erosion at the Cobden Rubbish Dump and Jellyman Park. The other south along the coast to Franz Josef, the Waiho River and in particular the Waiho Bridge Bailey Bridge reconstruction project, the Milton stopbank, and Fox River rubbish dump.

RANGITIKEI RIVER CONTROL SCHEME

8.6. The aerial spray of the entire Rangitikei River scheme was completed in early March.

POHANGINA-OROUA RIVER CONTROL SCHEME

8.7. Work has concentrated on completing landowner subsidized river bank erosion repair work before winter. A 40m tree bank erosion job has been completed at the Eales property with an upstream section still to finish. These works involve rope and rail groyne installation and some tree work. The site at the Eales repair has also been planted with 300 willow poles to consolidate the erosion repair works.

OROUA RIVER

8.8. Work on the Oroua is complete for the year.

TOTARA RESERVE

8.9. Nothing to report at Totara Reserve.

MATARAWA URBAN

8.10. A combined vegetation removal project with Whanganui District Council was completed on the Matarawa stream through Kowhai Park.

8.11. Willow regrowth on a few properties were sprayed and there have been numerous phone calls regarding engineering advice for bank protection and tree blockages and weed growth following the clearance of many over storey cover trees.

WHANGAEHU MANGAWHERO RIVER MANAGEMENT SCHEME

8.12. Strong winds throughout the latter summer period prevented the commencement of the planned aerial spraying programme. Calm weather conditions are required to enable the precise and accurate placement of spot spraying from a helicopter that is essential for a successful operation. Unspent funds this year will divert to scheme reserves at year end to allow for an extended spray programme in February 2021.

8.13. Spray trials have been done via ground spraying at two sites, targeting Acacia trees. This is to gain some knowledge about the best practice for spraying Acacia trees should the scheme decide to more actively control Acacia trees in the future.

LOWER WHANGANUI RIVER TRAINING STRUCTURES

8.14. The North Mole and South Spit Interface Wall investigations have been completed with design of both commencing in July 2018. PGF funding is still uncertain but project work is continuing as if construction were to occur in summer 2020 – 21. To that end:

- Investigation and surveying of existing rock structure below and above water has been completed;
- Wave height modelling and assessment for rock sizing calculations has been completed;
- Conceptual design profile sketches for various batter treatment of the North Mole have been completed;
- Development of plans for the repair / strengthening of the South Spit Interface Wall and the reinstatement of the Tanae Groyne have been completed;
- The survey and associated construction drawings for the interface wall and Tanae Groyne are completed;
- Public consultation has commenced;
- Terrestrial and Aquatic Ecological Assessments have been completed with final reports received in May 2019;
- The identification of resource consent requirements is completed and the draft consent application is complete;
- Consultation with Maritime NZ is substantially complete;
- Final design of the North Mole and revetment;
- Construction methodologies and estimates have been finalised;
- A PGF funding application has been submitted with an update expected from the Ministry in June.

Tasks that will continue to be progressed over the next two months include:

- Progressing the development of the Waitahinga Quarry with WDC;
- Notification of identified claimants for customary marine title and seek opinions.

OHAKUNE SCHEME

8.15. Work this year will largely focus on a resource consent application to allow scheme work to be undertaken.

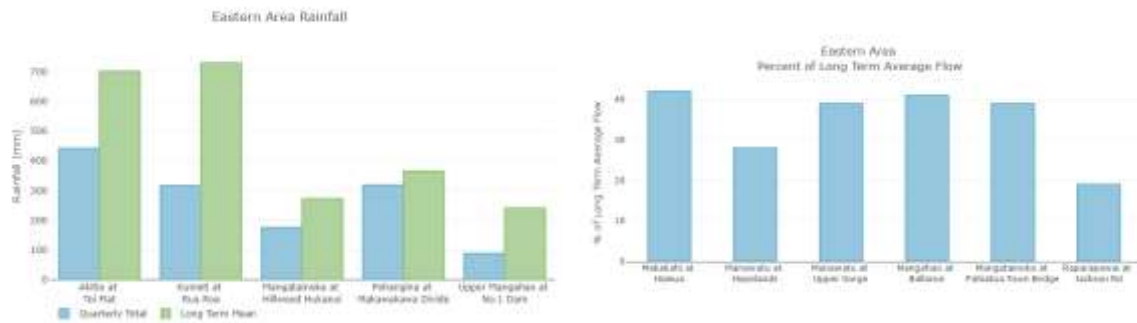
8.16. Channel clearance along the urban section of the Mangawhero River through Ohakune was completed in partnership with the Ohakune Community Group to ensure flood flow capacity for the coming winter months.

RUAPEHU DISTRICT WIDE SCHEME

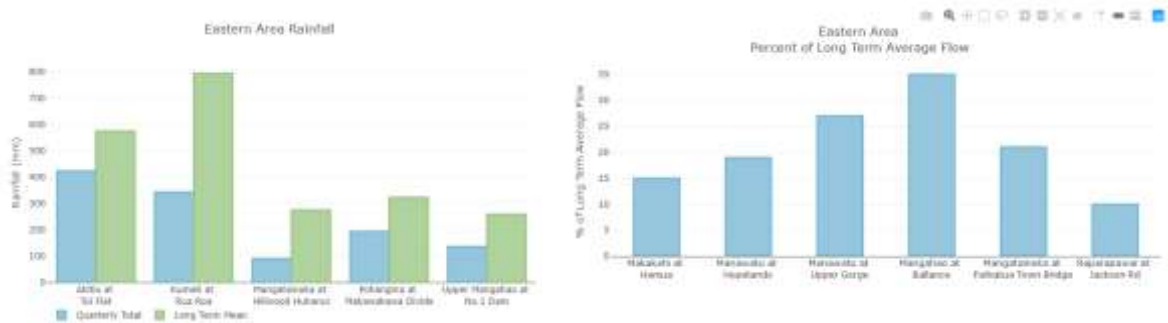
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EASTERN AREA

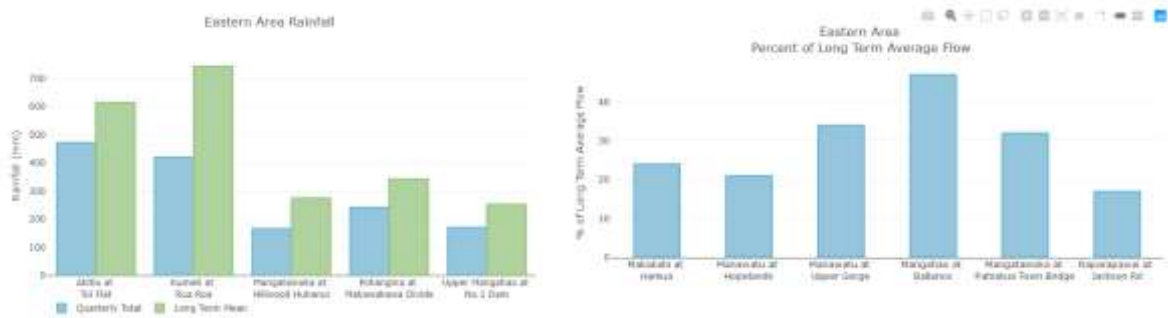
8.18. February Rainfall/Flow



8.19. March Rainfall/Flow



8.20. April Rainfall/Flow



8.21. The start of this period saw a continuation of the extremely dry weather which has been a feature of the Tararua District for the last few months. River levels have been extremely low and all municipal water supply zones started the period with heavy water use restrictions.

8.22. Towards the end of March, the region saw a change in weather patterns with regular weekly rainfall events becoming normal. This has led to a marked ‘greening’ of the area and significant grass growth. River levels have come up – not to that normally experienced for this time of the year – but enough that water use restrictions have ended in all municipal supply zones.

8.23. The COVID-19 Level 4 and Level 3 restrictions to movement have had a significant effect on the works programmes for all schemes during this period. Work, when it restarted has been focused on those areas which had trout spawning restriction, which started at the beginning of May.

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- 8.24. The Annual Catchment meetings for the Mangatainoka, South Eastern Ruahine and Upper Manawatū – Lower Mangahao Schemes were held in Mid-March, just ahead of the COVID-19 Level 4 restrictions. These were generally well attended, though mostly by members of the scheme committees. Good discussion was had on a range of topics that were applicable to each scheme and a number of actions were generated for follow-up.
- 8.25. Requests for miscellaneous issues and engineering advice has continued over the period, with significant request for advice around well and water management prior to the rainfall in March. Staff received very few requests during the Level 3 and 4 restrictions.

TARARUA DISTRICT RIVER MANAGEMENT SCHEME

- 8.26. A number of works were in planning stage when the Level 4 restrictions came into effect, and as such essentially no work was progressed on this scheme during that period.
- 8.27. Channel clearance works were undertaken at Tautane Station on the Tautane Stream, north east of Herbertville, over a 500m distance, as soon as contractors were available in April. The stream bed was blocked by willows growing within the bed of the stream slowing down water flow and increasing flooding around the station house.

MANGATAINOKA SCHEME

- 8.28. The Covid-19 lockdown saw all scheme works shut down for several weeks. Works that were able to be deemed essential commenced again just before Level 3 restrictions were reintroduced. These works include finishing off reinforcing several sections of tied tree works in the Hamua-Nireaha area of the scheme, as well as bank strengthening works and channel clearing along the Makakahi.
- 8.29. Due to the pause in the works programme, this scheme will end the financial year with a large surplus that can be put into emergency reserves.
- 8.30. We were fortunate through the shut-down period to have very little rainfall for this time of year. This has kept the rivers at levels that make work possible.
- 8.31. The scheme drains are still in line to be mechanically cleaned this financial year.

SOUTH EASTERN RUAHINE SCHEME

- 8.32. Extensive channel clearing was undertaken on the Tapuata Stream as it runs through Dannevirke Township. This is probably the largest clearing work this stream has seen in many years and the extent of work required was not able to accurately predict at the time of planning.
- 8.33. Due to COVID-19 Alert Level 4 works planned for channel clearing on the Mangatera were unable to start. With the Alert Level 3 change, and only three business days before Trout Spawning period was to begin on this stream, a small amount of channel clearing was undertaken to remove the biggest blockages (fallen trees across stream).
- 8.34. Drain spraying has not been undertaken on the scheme due to COVID-19 delays.
- 8.35. Preparation is underway for an Environment Grant work on the Tapuata Stream – this may be completed in the next financial year.

TAWATAIA - MANGAONE SCHEME

- 8.36. Monthly dam inspections are continuing, however, due to the shutdown period planned overflow channel maintenance has had to be postponed until next financial year. This means we will have surplus budget at the end of this year but it should mean that we have a slightly larger budget to get the works completed next year.

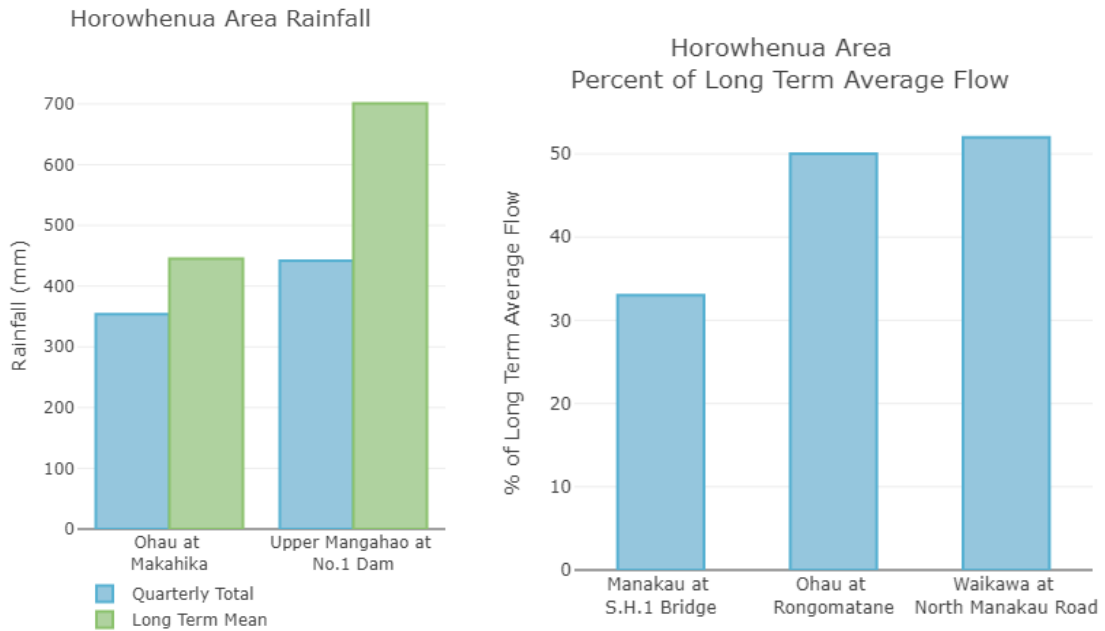
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UPPER MANAWATŪ– LOWER MANGAHAO SCHEME

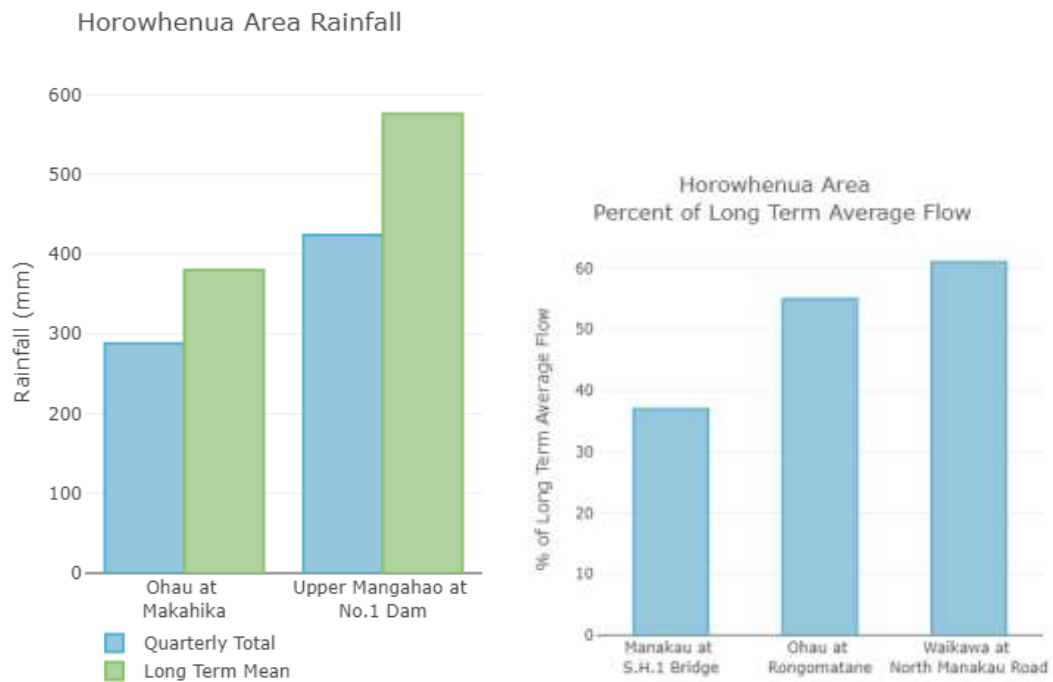
- 8.37. The majority of works haven't been undertaken on this scheme due to the Lockdown period interrupting the start of works. There are no fish spawning restrictions on the Upper Manawatū, so works are able to progress until the end of the financial year, weather permitting.
- 8.38. Preparations are underway to start a new rock lining to protect the Haukopuapua Reserve entrance at Oete Road, with the outer bend encroaching on the road. A total of 450 tonne of rock has been delivered to site in preparation for this work.
- 8.39. Further works are planned in the Managahao River for May and bank protection work in the upper scheme area of the Manawatū River will be completed once this work has finished.

SOUTHERN AREA

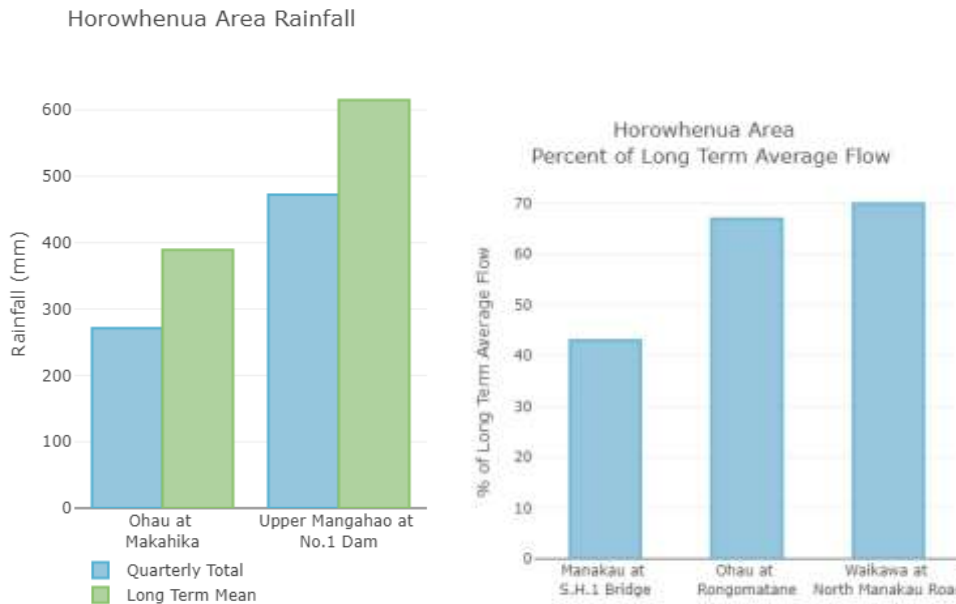
8.40. February Rainfall/Flow.



8.41. March Rainfall/Flow



8.42. **April Rainfall/Flow**



- 8.43. Settled weather and good ground conditions have allowed our spray contractors complete the majority of the autumn spray programme for both the Makerua, Manawatū, Foxton East, Himatangi and Te Kawau Schemes. With most of the drains on their second spray of the season. Some isolated section of drains where access had been problematic still need to be completed but we are working with the landowners in these areas and these should be completed
- 8.44. The dry warm weather has seen a substantial increase in the growth of submerged weed in a numbers of the schemes larger drains. Failure to remove the submerged weed would adversely impact both gravity and pumped drainage and ultimately it could be washed down stream into the floodgates potentially impacting on the gates ability to close during flood events. As a result a long reach machine has been operating in a number of schemes to remove this weed build-up.

OHAU-MANAKAU SCHEME

- 8.45. This period has been very mild with only small flows through all the channels. With no high flows there has been very little erosion in the rivers and streams, this has enabled work to focus on the maintenance of the drainage channels with 6km machine cleaned and 6km sprayed.

MANAWATU DRAINAGE SCHEME

- 8.46. In February this year staff worked with the Freshwater Team to sign off a fencing and planting project for a section of Chittack’s drain overgrown with pampas and willows. The section runs through Fonterra’s new farm in Longburn with Fonterra staff working alongside Horizons staff. This will make a big difference in the maintenance of the scheme drain and will be a great example of a native planting plan. The plants will be planted this winter.
- 8.47. A long reach machine has been cleaning Burkes Drain from the pumpstation up to Lockwood Road Bridge.
- 8.48. Staff have had preliminary discussions with the Environmental Data team and a consultant regarding the potential installation of a “Scada PLC system” into Burkes Pumpstation which

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will enable data from the pump station to be accessed live from the councils Hilltop Telemetry System, with the ability for the public to access the data via the website.

MAKERUA DRAINAGE SCHEME

8.49. This period has seen the pump stations up and running keeping staff busy with manual and machine cleaning of the weed build up at the pump station screens to ensure the pumps can operate efficiently.

KOPUTAROA DRAINAGE SCHEME

8.50. The No.2 pump at Koputaroa No.1 pump station was removed for servicing and has since been reinstalled after replacing all of the bearings and seals which is common for this type of servicing.

8.51. This period saw 22km of drain sprayed and 2km machine cleaned.

MOUTOA - WHIROKINO DRAINAGE SCHEME

8.52. A long reach excavator has machine cleaned Cooks Drain and the Main Floodway Drain.

TE KAWAU DRAINAGE SCHEME

8.53. Nothing to report.

HŌKIO CATCHMENT DRAINAGE SCHEME

8.54. Nothing to report.

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9. ENVIRONMENTAL GRANT WORKS AND ENGINEERING ADVICE

9.1. The status of all Environmental Grant works is as follows:

2019 – 2020 Environmental Grant work

<i>Name</i>	<i>River or Stream</i>	<i>Job No.</i>	<i>Type of work</i>	<i>Work status</i>	<i>Estimated work cost (\$)</i>	<i>Value of grant (\$)</i>
D Lyons	Tapuata Stream	IN1506	Bank Protection through the construction of a timber wall on the Tapuata Stream	Completed September 2019 and Invoiced	\$6,323	\$1,896.9
Manning	Kiwitea		Tree work groynes	Approved	\$15,304	\$4,592
Cvitanovech	Makiriki		Tree work groynes	Pending approval	\$20,572	\$6,172
Turakina Church	Kahuraponga		Retaining Wall	Pending Approval	\$9,115	\$2,735
Murphy	Ohakune		Retaining Wall	Declined	\$7,720	\$2,316
Tripe	Mangatipona		Grade Control	Approved	\$25,000	\$7,500
Waller	Taringamotu		Rock Lining	Cancelled		
Te Rongaroa Marae	Ongarue		Rock Lining, Layering Planting	Approved		
Morrison	Mangara		Vege Clearance	Application being prepared		
Palmer	Okahukura Saddle Road		Vege Clearance	Application being prepared		
RuDC	Mangahowhi			Application being prepared	\$11,600	\$3,480
RuDC	Mangateitei		Erosion Repair	Application being prepared	\$7,000	\$2,100
Hilton Shane	Tapuata Stream		Bank Protection	Approved	\$4600	\$1380

10. SIGNIFICANCE

10.1. This is not a significant decision according to the Council's Policy on Significance and Engagement.

Ramon Strong

GROUP MANAGER RIVER MANAGEMENT

ANNEXES

There are no attachments to this report.