

Review of the Management of the Wairoa River Bar by Hawke's Bay Regional Council



Image: Gisborne Herald.

Independent, External Review for Ministry for the Environment

30 August 2024



“The town of Wairoa got its name from the “Te Wairoa Hōpūpū Hōnengenenge Mātangi Rau” river which in Māori language means “the long water which bubbles, swirls and is uneven”. The ancestral canoe Tākitimu travelled up the river and landed near where the Tākitimu marae ...now sits...Tupaheke is the guardian taniwha of the Wairoa River as it enters the sea. He is said to have arms like a great crab and is harmless to local people. However, according to local tradition, if a stranger touches the rock, it is said they will suffer misfortune.”

Wairoa iSite



Acknowledgements

We would like to thank the people of Wairoa for their willingness to contribute to this review and their many constructive suggestions for the way forward. Special thanks to Juanita Savage at Wairoa District Council and Hamish and Sam Pryde.

Our thanks also to the management team, Asset Management and Civil Defence and Emergency Management staff at the Hawke's Bay Regional Council, and in particular, to General Counsel Matt McGrath for his open, prompt and responsive support to our work.

Both councils provided feedback to drafts of this report under tight timeframes, which is appreciated.

We are also indebted to our liaison support from the Ministry for the Environment.

Contents

Terms of Reference and Limitations.....	5
Foreword.....	7
The Wairoa River and bar.....	9
Key findings.....	14
The causes of this event.....	16
What is the statutory framework applying to decisions on management of the bar?	18
Local Government Act 2002	18
Soil Conservation and Rivers Control Act 1941	19
Resource Management Act 1991	20
Regional Policy Statements	20
Regional Plans	21
Hawke’s Bay Instruments	22
Comment	23
What monitoring responsibilities does HBRC have for the state of the bar?	24
Current state	24
Future intentions.....	29
What powers are available to HBRC to make decisions? What actions are available to the HBRC to manage the bar?.....	32
Powers	32
Available Actions	32
Is there recognised best practice for making such decisions and / or taking actions (if any)?	35
What was HBRCs practice relating to engagement with mana whenua/tangata whenua on its management of the bar?.....	37
Any other relevant contextual matters	38
Recommendations	43
Recommendations	43
Appendix One: Summary Event Timeline	45
Appendix Two: Current Wairoa Lagoon and River Mouth Instructions HBRC (SOPs)	63
Appendix Three : HBRC Asset Management Group internal briefing slides June 25, 2024	65
Appendix Four: Technical Report Trigger Action Plan for monitoring and managing the Wairoa River mouth.....	66

Terms of Reference and Limitations

Terms of Reference

On 1 July 2024, Cabinet agreed to an independent, external review of the Hawke's Bay Regional Council's management of the Wairoa River bar following the flooding event in Wairoa in June 2024 .

We were tasked with undertaking an urgent and focused review to be completed within four weeks. Findings and recommendations were presented to the Ministry for the Environment in August 2024.

The purpose of the Review was to urgently assess the current framework for management of the Wairoa River bar by Hawke's Bay Regional Council (**HBRC**), the basis for decision making around monitoring of the bar, and to make recommendations as to future monitoring and management of the bar.

The findings of an initial technical review by Tonkin + Taylor commissioned by HBRC into the flood event which was completed in July 2024 have also been an input to this review (the **Tonkin + Taylor Technical Review**).¹ HBRC expects an additional technical review by Tonkin + Taylor to be finalised shortly, and we have had the benefit of considering that report in draft (the **Second Draft Tonkin + Taylor Review**).²

More specifically, our independent external review was required to address the following specific matters:

General statutory framework:

- What is the statutory framework applying to decisions on management of the bar?

Detailed review questions:

- What monitoring responsibilities does HBRC have for the state of the bar?
- What powers are available to HBRC to make decisions relating to the management of the bar? What actions are available to the HBRC to manage the bar? Is there recognised best practice for making such decisions and / or taking actions?
- What was HBRC's practice relating to engagement with mana whenua / tangata whenua on its management of the bar?

In addition, the review was required to consider any other relevant contextual matters, including the findings of the separate Technical Reviews commissioned by the HBRC.

¹ Tonkin + Taylor *Review of Physical Processes Influencing the 26 June Wairoa Flood* August 2024, job number 1017353.2406 v3. The scope of this review was to identify the physical processes that were likely to have collectively influenced flooding in Wairoa on 26 June 2024. It specifically did not include a review of river mouth management activities.

² Tonkin + Taylor *Wairoa River Mouth: Dynamics, Issues, and Management (Draft)* June 2024, job number 1017353.2405 v1. The scope of this review was to assess the coastal processes and dynamics influencing the river mouth position, and to provide options for improving river mouth management in the context of flood mitigation. The commissioning of this review pre-dated the 26 June 2024 Wairoa flood, and was initiated because HBRC was in the process of designing and implementing an improved flood management scheme for Wairoa.

For clarity, in light of the scope of this review, and the fact it has been commissioned on an urgent basis, we have not commissioned our own independent engineering advice on the technical matters addressed in this report.

In terms of deliverables, we were asked to provide a report focussed on making recommendations relating to the systems and processes and roles and responsibilities of HBRC in the context of the flooding event.

Our methodology has been interview based, along with a review of the available documents relating to the event. We have also considered the findings of the HBRCs technical review. Interviews were conducted in confidence and on a voluntary basis.

While we have made careful efforts to cross check and correlate all information presented to us, as a rapid review this is not a formal investigation and at times we have had to rely on our own experience and judgement.

Our review makes a number of recommendations relating to the systems and processes and roles and responsibilities of HBRC in the context of the flood event.

Administrative support for this review was provided to us by the Ministry for the Environment. We note that the Chief Executive of that agency identified a conflict of interest in regard to this review in light of his previous employment at HBRC between January 2016 and February 2023, including five years as its Chief Executive. He has not been involved in our review process in any way.

The review findings were presented in draft form to the HBRC, Wairoa District Council and Tātau Tātau o Te Wairoa Trust for their checking of factual accuracy and to seek their feedback on any adverse comments about persons or groups. We have carefully considered their feedback and some changes in response have been incorporated in this final version.

Limitations

The terms of reference provided our review was **not** intended to address:

- Civil, criminal, or disciplinary liability of any person or legal entity.
- Local government arrangements and structure.
- Civil defence and emergency management roles, responsibilities and response to the event.
- Any new assessment of the damage caused by the event; and
- Direct engagement with affected communities, as this will be managed by Local Authorities as part of recovery locality planning.

While this review is not a review of civil defence and emergency management (CDEM) roles, responsibilities and response, some of the actions undertaken as a part of the CDEM response are directly relevant to the management of the bar and we have used our judgement to identify where these are relevant matters in respect of this review.

For example, the HBRC staff with flood and asset management responsibilities are also involved in CDEM preparedness, planning and response. When we comment on their actions in their day jobs, these insights may also be relevant to CDEM matters.

As noted above, our findings have taken into account the Tonkin + Taylor Technical Review that HBRC commissioned to understand the events leading up to the flooding. We acknowledge the key finding – that even if the bar had been opened flooding would not have been completely avoided. Wairoa District Council does not accept that finding. However, in the face of increasing frequency and intensity of these types of events our role was to make recommendations that will best prepare the community for the future.

Foreword³

“Mama, Baba! Mama Baba!”

Around 4am on Wednesday 26 June 2024, the Wairoa District Council Civil Defence and Emergency Management (CDEM) Controller was woken by her baby’s cries. The child had lost her ‘Baba’ doll in her cot. As the mother located the doll and soothed the child back to sleep, she decided to check her emails. Rainfall in the district had been heavy overnight. She had been sufficiently worried about the flooding risk to the town the prior day that she had placed local marae on standby for evacuations.

She found an email sent at 3.59 am, shortly prior to her waking, from the Hawkes Bay Regional Council (HBRC) flood forecaster, (who had himself been sufficiently worried during the night to check his models), warning that the Wairoa River *‘has risen higher than expected in the last few hours. It has reached the Orange - 5 year level at the Town Bridge. This could result in flooding along Kopu Road, depending on the condition of the mouth.’*⁴

To the Controller, who knew that the river mouth was in a poor position and that high sea swells were forecast, this email meant she had to move into immediate emergency management and civil defence response. At 4.04am she phoned homeowners on low lying Kopu Road, who told her they were already inundated and self-evacuating. She then phoned emergency responders, sounded the fire station siren, requested an Emergency Mobile Alert (EMA) be issued, and activated an Emergency Operations Centre (EOC), including the establishment of an evacuation centre.⁵ By 6.37am, the Mayor had declared a state of local emergency for Wairoa. A full timeline is set out at Appendix 1 to this report.

The event resulted in considerable trauma to residents still suffering from the prior Cyclone Gabrielle event. It created widespread damage and loss to 400 plus homes and businesses, with 127 homes yellow stickered. The map below shows the extent of the flooding.

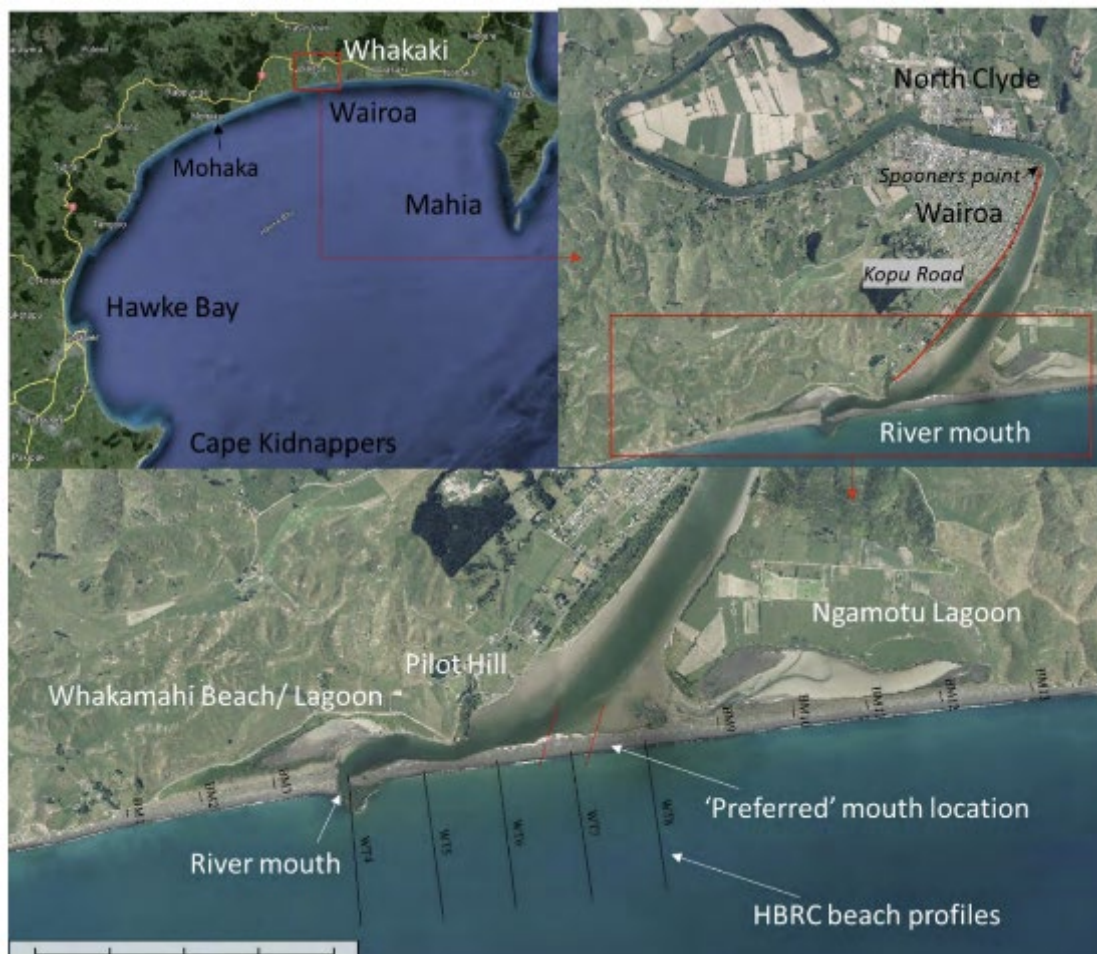


³ We note HBRC’s objection to the inclusion of this foreword on the basis that it is subjective and focuses on the role of the Civil Defence Controller. The CDEM response is outside the scope of the terms of reference for this review. However, we include this foreword as an illustration of the real human impact of the flood.

⁴ Since 1989, the governing authority for the management of the river mouth and bar has been the HBRC.

⁵ The Hawke’s Bay CDEM Group’s actions are outside our Terms of Reference.

The Wairoa River and bar



Images: Location Wairoa and key locations around the river mouth, including breach monitoring profile locations.⁶

The Wairoa River, whose path and location are shown in the images above, is significant to the iwi and hapū of Ngāti Kahungunu. The river is regarded as tapu. The water of the river was used for purification, ancient chants and prayers. It is said that the Tākitimu waka came up the Wairoa River and landed at Makeakea Stream. Te Reinga Falls, the starting point of the river, is associated with Hinekorako and Ruamano, which were taniwha carried to Aotearoa on the Tākitimu waka. The river mouth is associated with two taniwha engaged in an ongoing struggle between Tapuwae and Te Maaha.

In pre European times the river was used as a major avenue for trading and commerce. Several important pā sites are located along and at the mouth of the river including Rangihoua/Pilot Hill, which is sacred to tāngata whenua and is a registered archaeological site.

The river mouth lagoons are also an important mahinga kai for tāngata whenua.⁷

Wairoa township sits on the bank of the Wairoa River just upstream of the river mouth where it discharges into Hawke Bay. The final section of the river is approximately 3.5 kilometres long, from Spooners Point to the river mouth, with Kopu Road extending along the town side riverbank. The river catchment is a semi-circular shaped area in which all major tributaries

⁶From Tonkin and Taylor Ltd. Wairoa River Mouth – Dynamics, issues and management, Report for HBRC, June 2024 DRAFT, p 2.

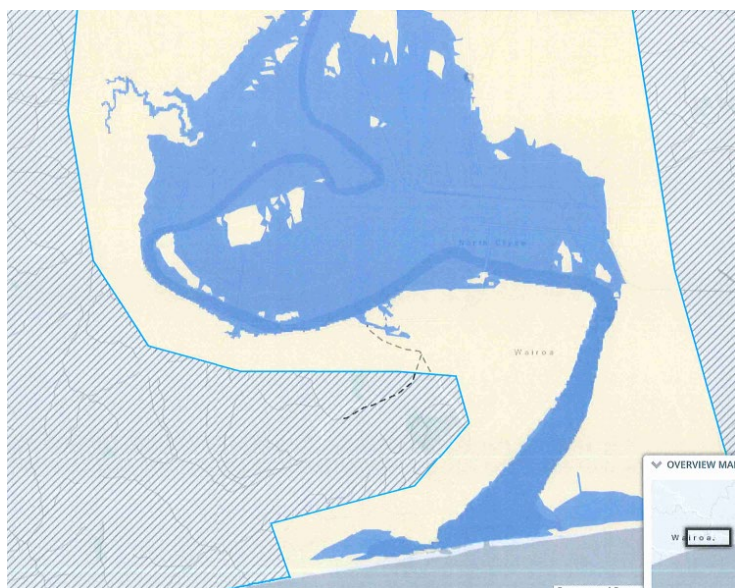
⁷Details are from Wairoa-River-candidate-OWB-report-201807111 PDF (www.hbrc.govt.nz)

converge into the Wairoa River, at the top of a 3000 hectare flood plain, with around a 50 kilometre run to the sea.

The Wairoa River typically carries high volumes of silt and local soil types tend to be thin, which reduces the moisture retention capacity of much of the catchment.

The catchment is prone to frequent flooding and experienced major floods in 1948, 1988 (Cyclone Bola) and in 2023 during ex tropical Cyclone Gabrielle.

The below map, taken from the HBRC Hazard Portal, indicates the flood hazard arising from the Wairoa River.



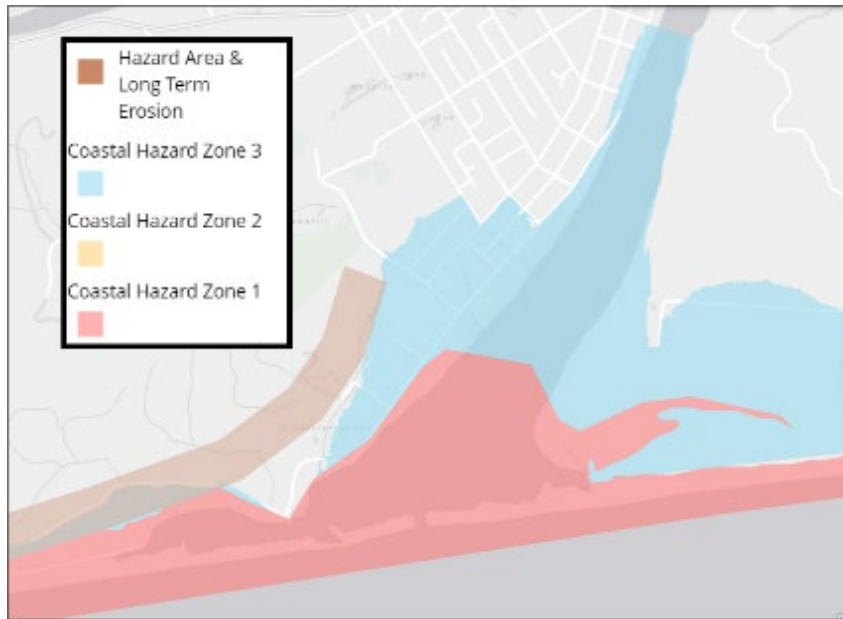
The risks arising from flood events on the Wairoa River are exacerbated by the state of the bar at the river mouth. This is often either closed, or has the opening located south or north of the main body of the river. As one local put it to us:

“The river and lagoon near town are like a bathtub, with the plug being the river bar. If there’s a big enough storm, the plug will pop out like the mouth opening and the flush will mitigate flooding. That’s what happened in Gabrielle, when the mouth was in an optimal position. If the mouth is in the wrong place or really silted up however, the increase in water volume will overflow the bath and impact the town.”

As noted in the image below, the area affected by the June flooding broadly correlates with an area identified as being in Coastal Hazard Zone 3, meaning that it is area of land assessed as being potentially at risk of sea water inundation in a 1 in 50 year combined tide and storm surge event, and includes allowance for sea level rise.⁸

This map shows the relevant area on the HBRC Hazard Portal:

⁸<https://www.hbrc.govt.nz/assets/Document-Library/Plans/Regional-Coastal-Environment-Plan-RCEP/Current-RCEP-Part-I-Glossary.pdf>



Wairoa District Council considers the map showing Coastal Hazard Zone 3 is not relevant to the flooding that occurred. I include it here simply to illustrate the fact that the area that flooded is broadly similar to the zone shown in that map.

The bar at the mouth of the Wairoa River was a constant source of frustration for early European settlers because it regularly was closed by wave action moving sand and gravel into the river's mouth, making it difficult for boats and ships to travel between the river's mouth and Hawke's Bay. Training walls were erected, and channels and new exits were dug, but the river mouth tended to close again at critical points. Even small floods in the river channel would build up against the bar and backflow into low lying areas of the town.



Image: [MTG Hawke's Bay Tai Ahuriri](#), Hawke's Bay Museums Trust/Ruawhoro Ta-u-rangi collection. Reference: 4273

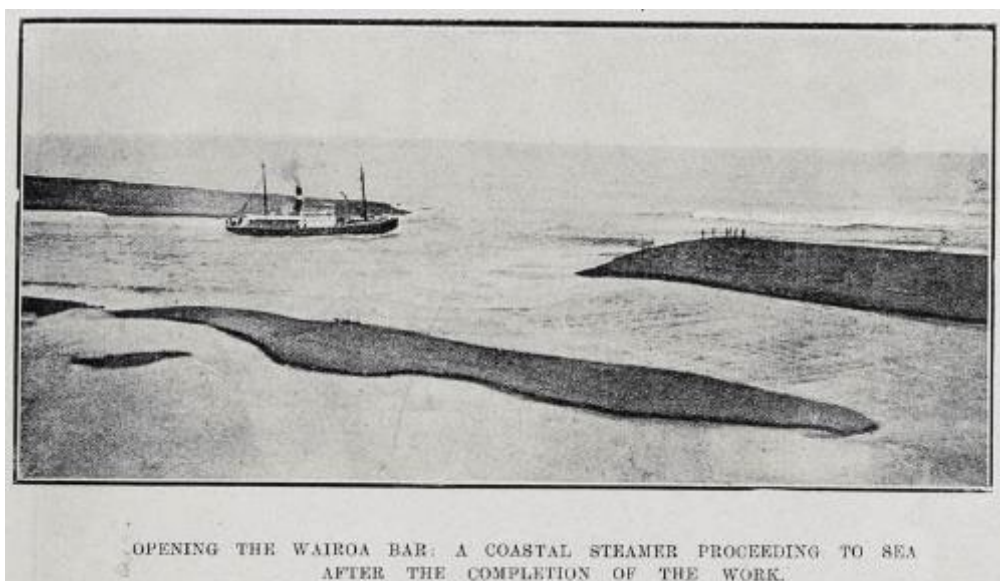


Image: Auckland Libraries Heritage Collections AWNS-19090826-05-03

The mouth has been manually opened since early European settlement, evolving from physical opening as shown above to openings using mechanical diggers.

In the 1990s, the HBRC commissioned engineering studies to assess the feasibility of a range of physical infrastructural options for bar management, including:

- New training walls and moles at the river entrance,
- Coastal groynes,
- Maintenance dredging,
- Excavated backhoe openings; and
- Bank revetment.

In a 1997 report by HBRC Works,⁹ training moles and maintenance dredging were identified as the likely best options, but all options were rejected on the grounds of complexity, cost and uncertainty as to their environmental impacts, sustainability and likelihood of success.

Additional 1999 reports by Tonkin and Taylor¹⁰ presented further options including:

- A pumping system to reduce silt build up the river mouth; and
- A barrier to prevent the mouth migrating to an undesirable location.

Following these investigations, none of the structural options was funded and no additional fieldwork appears to have since been undertaken.

The default current option is to manually open the river mouth at a safe location when it is technically feasible and safe to do so. This is a highly complex, five to seven day exercise provided conditions are favourable. As outlined in more detail below, it has traditionally been undertaken on an as required basis by local contractors, though no standing contract is in place with that company.

⁹ Wairoa River mouth: Stability Investigations and Erosion Control, Technical Report, ISSN 1173-1907, by Works Consultancy Services for HBRC.

¹⁰ Tonkin and Taylor, Wairoa River Mouth Pre-Feasibility design study for HBRC, January 1999 and Tonkin and Taylor, Wairoa River Flood Protection Scheme Cost Benefit Study for HBRC, December 1999.

In short, the Wairoa flood risks as they relate to the bar and river mouth are well known and well-studied. As the operative Wairoa District Council Plan¹¹ outlines them, in the section on natural hazards :

“Flooding is a major hazard in the district. Many lowland areas, including the Wairoa township area itself, are at risk from flooding. Wairoa Township and surrounding areas including Frasertown are at risk from flooding from the Wairoa River for events as frequent as 3.3% probability of occurring annually. Flooding from other sources such as the Awatere Stream and a closed, or practically closed, Wairoa River mouth is also a risk. There are few measures in place to protect the town. It is, however, very expensive to provide effective protection.”

Wairoa township is thus a town in the shadow of a known threat, with complete reliance on mechanical mouth opening as its primary line of flood protection defence.

¹¹ See section 8 of the relevant Wairoa District Plan here: <https://www.wairoadc.govt.nz/assets/Document-Library/District-Plan/Full-Operative-District-Plan.pdf>

Key findings

Wairoa is a remote, vulnerable community that was already grieving the damage wrought by Cyclone Gabrielle. The somewhat sinister river mouth looms over the town.

Wairoa is wholly reliant on a single method of risk mitigation for river mouth driven flooding, and yet:

- No operational plan for the ongoing management and maintenance of the Wairoa River mouth currently exists.
- To widen the bar weather and sea conditions need to be aligned and takes five to seven days. It is not possible to complete the mechanical digging and grading required at short notice when a flooding risk is imminent.
- Management decisions for the river mouth are made in Napier/Hastings by the HBRC, on the basis of infrequent physical inspections of the bar.
- The risks of remote management of the bar were well known prior to this event.

Wairoa's civic leaders, including iwi Māori, hoped that the multiple reviews of the Wairoa River mouth and its impact on flood risk undertaken over the last many years would have informed a proactive and collaborative management plan between the local District Council, iwi and the HBRC.

Instead, locals told us they were saddened by the apparent failure to internalise the insights of prior experience and previous reviews. As with Gabrielle, they felt unheard and isolated from wider support. One said:

"It's only a few months on, so we wouldn't expect everything at HBRC to be perfect. But how hard would it have been to empower a few local decision makers in advance on this? How hard would it have been to clear the bar as a precaution when we had local contractors on standby? To make a phone call on night, rather than sending email? To tell us a simple 'sorry' when it all went pear shaped? It feels disrespectful. It's created real bitterness and more grief we just didn't need."

The way forward seems clear to us and was echoed by most of those we interviewed. An Operational Management Plan for the Wairoa River and bar is essential to support regionally coordinated and locally delivered emergency preparedness, risk reduction and response.

Local and indigenous knowledge must be harnessed in the development of the Plan and practical delegations and standard operating procedures (SOPs) must be agreed.

A long term contract for both regular maintenance and per event work must be in place with expert contractors. In this June weather event, the local contractor was not formally mobilised until late on Monday 24 June for Tuesday prework and a potential opening of the river mouth on Wednesday 26 June. This proved far too late to move the required machinery and undertake the work prior to peak rainfall and poor sea conditions. Once the contractors received the Emergency Mobile Alert on the morning of June 26, they stopped the work for safety reasons.



Photo: New Zealand Herald

In the 1990s, a significant number of engineering based options to manage the Wairoa River bar and mitigate risks were explored but not progressed. A quarter century since the prior investigations, it is also past time that more strategic, infrastructural options for river containment/bar stabilisation were further explored.

The issues we have identified appear to postdate the centralisation of Hawke's Bay local government structures, at which time, the management of the river and bar was transferred from Wairoa authorities to the HBRC. Prior to this, Wairoa respondents told us that the local Council had tended to take a proactive approach to the management of the bar, which regularly moves up and down the coast. As one put it:

“Management of the Wairoa River mouth is complex and an art not a science. It is a dynamic situation in which people on the ground need to use their experience with weather, tide management, current and river height. Timing is key.”

Although HBRC regularly sends staff to Wairoa as noted above, it also relies heavily on river flow telemetry to support modelling and assess risks. Some respondents told us they felt this approach, while vital, was also overly academic with regard to the overall impacts of the mouth and bar on river levels.

We don't think, as some Wairoa locals do, that the core issue here is about which entity has legal or regulatory authority for commissioning the opening of the Wairoa River mouth. Nor do we believe wholesale legislative change is required, beyond some clarification of the existing framework.

Rather, the key solutions we propose here go to repairing and rebuilding critical relationships, lifting the practices of the relevant HBRC teams and to improved partnering and collaborating to develop improved plans and SOPs.

There have been enough reviews. It is now time to act decisively and with urgency.

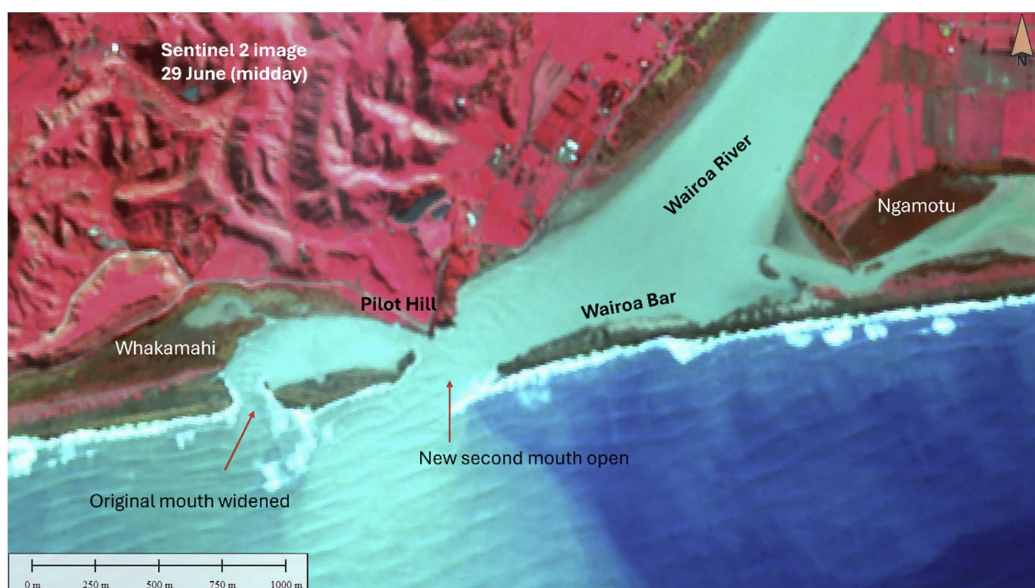
The causes of this event

HBRC has recently commissioned a review of the causes of the June 26 flooding of Wairoa township, with an emphasis on river dynamics and the interplay between river and sea conditions. The report was finalised in August 2024 (– the Tonkin + Taylor Technical Review).

The following image, sourced from the Tonkin + Taylor Technical Review on the physical processes of this event, is a satellite image showing the pre event river mouth and bar position on 24 June 2004.¹²



The next image, from the same report, shows the post storm bar breaches and the new mouth position three days after the flood.¹³



¹² Sourced from <https://browser.dataspace.copernicus.eu/>

¹³ Sourced from <https://browser.dataspace.copernicus.eu/>

The Tonkin + Taylor Technical Review found, in summary that:

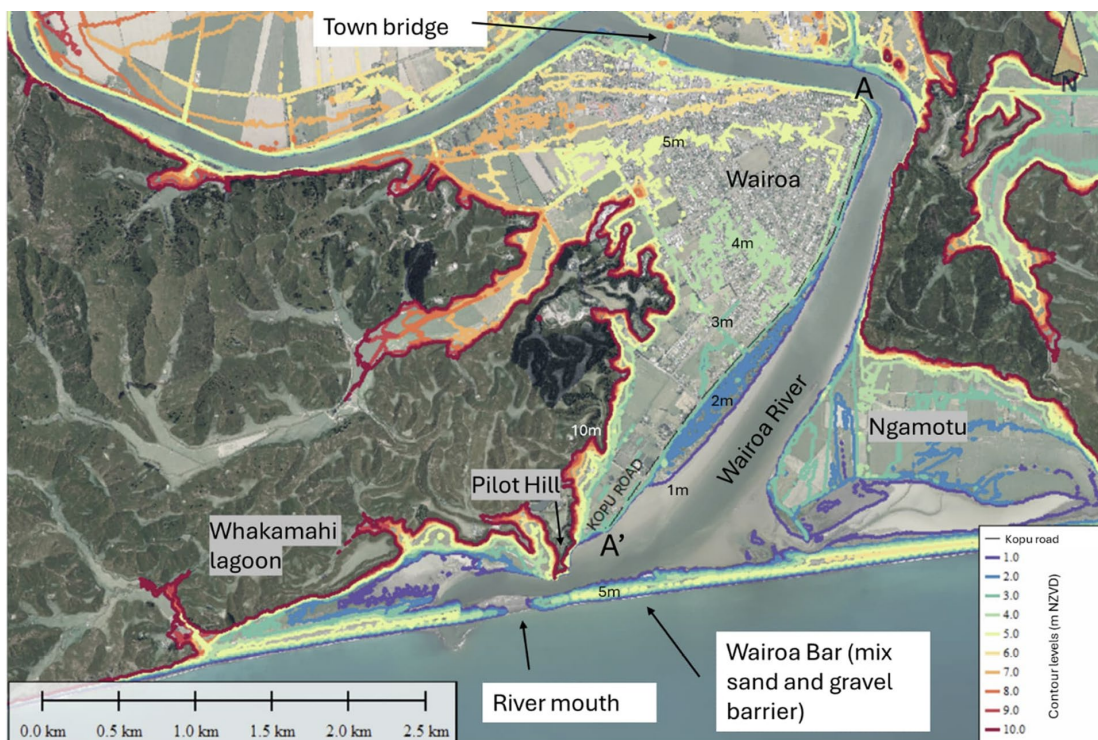
“...the combination of high rainfall, rising river level, spring tides, large waves, storm surge, as well as the position and size of the river mouth through the bar, all coincided to influence the flooding experienced.”¹⁴

In simple, non-technical terms, and for the purpose of the discussion below, it seems clear that the event resulted from a combination of factors, including:

- The non-optimal placement and size of the river mouth and bar, which had migrated south and narrowed in recent months, making it hard for the river to flush to the sea and increasing land side water levels.
- An unusually high sea state, with heavy swell, huge waves and high winds, which pushed surf over the bar and into the river and lagoon; and
- Moderate rainfall, above that predicted by MetService.

This combination of factors caused the ‘bathtub’, as some locals refer to the river near its mouth, to back up and overflow, driving a mix of fresh and salt water into the low lying areas of the town facing the bar. We note the river silt and bathymetric conditions were unknown so it is unclear what role they played.

Particularly impacted in this event was low lying Kopu Road, shown here in a pre-flood Lidar map. Its elevation averages around 3.5 metres above sea level.¹⁵



¹⁴ See Tonkin & Taylor Ltd Review of Physical Processes Influencing the 26 June Wairoa Flood – Data summary and analysis Hawke’s Bay Regional Council August 2024 Job No: 1017353.2406 v3

¹⁵ Sourced from the above report. LINZ data.

What is the statutory framework applying to decisions on management of the bar?

There is no single flood management statute in New Zealand. As such, the framework attaching to decisions on the management of the Wairoa River bar is spread across various Acts and instruments. An overview of the relevant aspects of the general flood management framework is set out below, followed by a description of Hawke's Bay-specific instruments, and our comment on the functionality of the current framework.

Local Government Act 2002

The Local Government Act 2002 (**LGA**) outlines the purpose, framework and powers under which local authorities function. Local authorities may comply with their routine obligations through the various statutory documents required by and produced pursuant to the LGA, such as Long Term Plans, Annual Plans and Asset Management Plans.

In terms of flood protection, the LGA specifically:

1. Allows regional councils to establish bylaws in relation to flood protection and flood control works undertaken by, or on behalf of, the regional council;¹⁶
2. Requires each local authority to prepare a Long Term Plan every three years, providing a strategic outlook of at least 10 years for the local authority's decisions and actions;¹⁷
3. Requires that a Long Term Plan must, to the extent determined appropriate by the local authority, identify:¹⁸
 - a. the local authority's flood protection and control works and the rationale for their delivery;
 - b. the capital expenditure requirements for the flood protection and control works;
 - c. the intended levels of service (design standard) for the flood protection and control works;
 - d. the community outcomes for the district or region;
 - e. steps intended to be taken to foster the development of Māori capacity to contribute to decision-making; and
 - f. a financial strategy and an infrastructure strategy.
4. Mandates that the infrastructure strategy in the Long Term Plan must cover a period of at least 30 consecutive financial years addressing:¹⁹
 - a. significant infrastructure issues over that period,
 - b. options for managing those issues and their implications; and
 - c. how the local authority intends to manage those infrastructure assets (including their renewal, replacement, provision for growth, changes in levels of service and providing for resilience of infrastructure assets to risks relation to natural hazards).

¹⁶ Local Government Act 2002 (**LGA**), s 149(1)(c).

¹⁷ LGA, s 93.

¹⁸ LGA, sch 10, pt 1.

¹⁹ LGA, s 101B.

Civil Defence and Emergency Management Act 2002

Although this review is not focused on the CDEM response, it is important to note the Civil Defence and Emergency Management Act 2002 (**CDEM Act**) as it is a key piece of legislation for flood risk management. One of the purposes of the CDEM Act is to encourage and enable communities to achieve acceptable levels of risk in respect of hazards. This includes:

1. identifying, assessing, and managing risks;
2. consulting and communicating about risks;
3. identifying and implementing cost-effective risk reduction; and
4. monitoring and reviewing the process.

The Act provides at section 64 that local authorities must plan and provide for civil defence and emergency management within their districts.

Soil Conservation and Rivers Control Act 1941

The Soil Conservation and Rivers Control Act 1941 (**SCRCA**) is a 'legacy' statute that assigned powers and duties to catchment boards. While the SCRCA still refers to catchment boards, the role of the catchment boards was assigned to regional councils following their establishment in 1989.

This assignment is difficult for the untrained eye to spot on the face of the SCRCA alone. For example, in the case of HBRC, the answer is found at cl 15 of the Local Government (Hawke's Bay Region) Reorganisation Order 1989. That clause provides that the functions, duties and powers of the newly established HBRC would include the functions, duties, and powers of a catchment board and a regional water board under the SCRCA and the Water and Soil Conservation Act 1967 or any other Act.

One of the key objectives of the SCRCA is the prevention of damage by floods.²⁰ To achieve that objective, the SCRCA:

1. Stipulates that it is a function of every regional council to minimise and prevent damage within its region by floods;²¹
2. Provides regional councils discretionary powers to construct, reconstruct, alter, repair, and maintain flood protection works that they consider necessary or expedient to control or regulate the flow of water towards and into watercourses, control or regulate the flow of water in and from watercourses, prevent or lessen the likelihood of the overflow or breaking of the banks of any watercourse, and prevent or lessen any damage that may be occasioned by any such overflow or breaking of the banks;²² and
3. Allows regional councils to:²³
 - a. cleanse, repair, or otherwise maintain in a due state of efficiency any watercourse or outfall for water, or any bank, dam, groyne, or other defence against water.
 - b. deepen, widen, straighten, divert, or otherwise improve any watercourse or outfall for water, or remove any groynes, stopbanks, dams, weirs, trees, plants, or debris,

²⁰ Soil Conservation and Rivers Control Act 1941 (**SCRCA**), s 10(c).

²¹ SCRCA, s 126(1).

²² SCRCA, s 126(2).

²³ SCRCA, s 133(1).

or any other obstructions whatsoever to watercourses or outfalls for water or to the free flow of flood waters in existing flood channels, or raise, widen, or otherwise improve any defence against water.

- c. in such manner and of such materials as it thinks necessary or proper, make any new watercourse or new outfall for water and cause the same to communicate with the sea or any arm thereof, or with any other watercourse or a lake, or erect any new defence against water, or carry out any other work it thinks necessary or desirable for the purpose of controlling or preventing damage by flood waters; or
- d. divert, impound, or take away any water from any watercourse.

The powers and duties of regional councils under the SCRCA are subject to the Resource Management Act 1991.²⁴

Resource Management Act 1991

The Resource Management Act 1991 (**RMA**) provides a framework for the sustainable management of the environment, including natural hazards.

Regional councils exercising authority under the RMA must recognise and provide for matters of national importance, including the management of significant natural hazards.²⁵ Under the RMA, both regional and territorial authorities have discretionary powers to regulate land use to prevent or mitigate natural hazards, including flood risks.

The functions of a regional council under the RMA include:

1. the establishment, implementation and review objectives, policies and methods to achieve integrated management of the natural and physical resources of the region;²⁶
2. the control of the use of land for the purpose of the avoidance or mitigation of natural hazards;²⁷
3. in respect of any coastal marine area in the region, the control of the taking, use, damming, and diversion of water, and any actual or potential effects of the use, development, or protection of land, including the avoidance or mitigation of natural hazards;²⁸ and
4. the control of the taking, use, damming, and diversion of water, and the control of the quantity, level, and flow of water in any water body, including the setting of any maximum or minimum levels or flows of water, or the control of the range, or rate of change, of levels or flows of water.²⁹

Regional Policy Statements

A Regional Policy Statement (**RPS**) is an instrument under the RMA prepared by regional councils to achieve the purpose of the RMA by providing an overview of the resource

²⁴ SCRCA, s 10A.

²⁵ RMA, s 6(h).

²⁶ RMA, s 30(1)(a).

²⁷ RMA, s 30(1)(c)(iv).

²⁸ RMA, ss 30(1)(d)(iii) and (v).

²⁹ RMA, ss 30(1)(e)(i)-(ii).

management issues of the region and policies and methods to achieve integrated management of the natural and physical resources of the whole region.³⁰

Among other things, an RPS must state:³¹

1. the significant resource management issues for the region;
2. the resource management issues of significance to iwi authorities in the region;
3. the objectives sought to be achieved by the statement;
4. the policies for those issues and objectives and an explanation of those policies;
5. the methods (excluding rules) used, or to be used, to implement the policies;
6. the environmental results anticipated from implementation of those policies and methods;
7. the processes to be used to deal with issues that cross local authority boundaries, and issues between territorial authorities or between regions;
8. the local authority responsible for specifying the objectives, policies, and methods for the control of the use of land to avoid or mitigate natural hazards;
9. the procedures used to monitor the efficiency and effectiveness of the policies or methods contained in the statement; and
10. any other information required for the purpose of the regional council's functions, powers, and duties under the RMA.

An RPS must be considered by local authorities when preparing regional and district plans and must be given effect to by regional and district plans.³²

When considering an application for a resource consent, the consent authority must also have regard to the relevant provisions of the RPS.³³

When preparing or changing an RPS, regional councils must also have regard to the National Adaptation Plan.³⁴

Regional Plans

A regional council may prepare a regional plan for the whole or part of its region, and for any one of the purposes specified at section 65 of the RMA. Those purposes include for the avoidance or mitigation of natural hazards.³⁵ The RMA provides a regional council shall consider the desirability of preparing a regional plan whenever particular circumstances or considerations arise or are likely to arise, including any risks from natural hazards.³⁶

A regional plan must set out the objectives for the region, the policies to implement those objectives, and any rules to implement those policies.³⁷ The plan may also state a number of

³⁰ RMA, s 59.

³¹ RMA, s 62(1).

³² RMA, ss 67(3)(c) and 75(3)(c).

³³ RMA, s 104(1)(b)(v).

³⁴ RMA, s 61(2)(e); The National Adaptation Plan is a guidance document prepared by the Ministry for the Environment under the Climate Change Response Act 2002.

³⁵ By reference to s 30(1)(c)(iv) of the RMA.

³⁶ RMA, s 65(3)(c).

³⁷ RMA, s 67(1).

matters set out in the RMA.³⁸ For the purpose of carrying out its functions under the RMA and achieving the objectives and policies of the regional plan, the regional council may include rules in the regional plan.³⁹

Hawke's Bay Instruments

The Hawke's Bay Regional Resource Management Plan, incorporating the Regional Policy Statement (**RRMP**)⁴⁰ comprises an RPS and regional plan for the Hawke's Bay region. It sets out a policy framework for managing resource use activities in an integrated manner across the Hawke's Bay region. The relevant aspects of the RRMP are as follows.

Chapter 3.12 addresses natural hazards. It aims to avoid or mitigate the adverse effects of natural hazards on people's safety, property, and economic livelihood.⁴¹ In terms of flooding, it provides that there is widespread flooding in the Hawke's Bay region, and "to be truly effective flood protection works must be undertaken in conjunction with better land use planning, and adequate and timely flood forecasting".⁴² It states that the HRBC will use the non-regulatory methods set out in Chapter 4 of the RRMP as the principal means of addressing hazard avoidance and mitigation, in particular:⁴³

1. liaison with territorial authorities to provide information on natural hazard risk and advocate that future development is managed in such a way that the risk of exposure to natural hazards is avoided, remedied or mitigated;
2. works and services to provide hazard mitigation methods, in particular flood mitigation measures, where the benefits can be shown to outweigh the costs and the identified beneficiaries can meet the costs; and
3. natural hazard priorities to focus both hazard avoidance and mitigation on areas of high human population density as a first priority.

Chapter 4.3 addresses liaison with territorial authorities. It provides that due to "the inter-linkages between their responsibilities and decisions it is important that the HBRC and territorial authorities adopt a consistent and co-ordinated approach to resource management issues".⁴⁴ A range of methods are then set out, including communication with territorial authorities through working groups, and liaison with tangata whenua.

In terms of liaison with territorial authorities on natural hazard management more specifically, Chapter 8 addresses how these are managed between HBRC and territorial authorities. The RRMP provides that both the HBRC and territorial authorities are responsible for developing objectives and policies for managing the use of land for the purpose of avoiding and mitigating natural hazards.⁴⁵ While territorial authorities are responsible for developing methods controlling the use of land for the purposes of avoiding or mitigating natural hazards, the RRMP provides HBRC will provide relevant, up to date and accurate data in an appropriate form for the

³⁸ RMA, s 67(2).

³⁹ RMA, s 68.

⁴⁰ Operative as at 28 August 2006 and as subsequently amended.

⁴¹ Objective 31.

⁴² RRMP at 3.12.3.

⁴³ RRMP at 3.12.10.

⁴⁴ RRMP at 4.3.1

⁴⁵ RRMP at 8.4.4.5.1.

territorial authority to use and will be the “key information provider” in order to support the territorial authorities in their role.⁴⁶

The RRMP states that the information and assistance to be provided by HBRC will include particular information as it becomes available, including identification and distribution of information on those parts of the region at risk from flooding (including in relation to the flood risk to Wairoa township from movement of the Wairoa River mouth) and ongoing maintenance and improvement of flood forecasting and assessment data (including provision of models of flood and storm events for emergency management purposes).⁴⁷

The Regional Plan section of the RRMP provides at Rule 70 it is a permitted activity under the RMA for a local authority exercising its powers, functions and duties under the SCRCA and other specified legislation to carry out river mouth openings for the purpose of flood mitigation. The Rule provides a number of conditions, standards and terms, including that the works must comply with the HBRC Environmental Code of Practice for River Control and Drainage Works.⁴⁸ That Code provides that river mouth opening shall be undertaken if one of the specified conditions is made out, including where the river mouth is blocked and the river is at risk of flooding, or where the river mouth is located in an undesirable location due to it migrating too far from an ideal position.⁴⁹

Comment

While the flooding event on 26 June was not caused by the lack of clarity in the legislative framework, we consider the current legislative framework has the potential to create confusion, particularly in relation to jurisdictional responsibility for flood management.

We are not the first to consider the current framework would benefit from clarification. In 2006, a report prepared by Johnson McSweeney Ltd for the Ministry for the Environment considered flood management legislation in New Zealand.⁵⁰ It found that while the legislation provided a comprehensive range of flood management tools, the various statutes “*present a complicated and sometimes confusing legislative picture*”.⁵¹ Further, in light of the “*different intent and purpose of the acts and the age of some of the legislation, ... some of the legislation is difficult to understand and ... inconsistencies exist.*”

Based on this report and other workstreams, the Ministry for the Environment and the Flood Risk Management and River Control Review Steering Group concluded in a 2008 report that while there was legislative uncertainty, that uncertainty was not sufficient “*to warrant undertaking a significant legislative change immediately*”, and that it would be better to pursue amendments as and when legislation was reviewed.⁵²

In 2010, the Ministry for the Environment published ‘Preparing for Future Flooding: A guide for local government in New Zealand’. The guide stated that it was not intended to form comprehensive guidance on how to manage flood risk. Rather, it aimed to provide a picture of the impacts of climate change on river flow and flooding, and provide good practice information

⁴⁶ RRMP at 8.4.4.5.1-8.4.4.5.2.

⁴⁷ RRMP at 8.4.4.5.3.

⁴⁸ RRMP at 187.

⁴⁹ At 4.14.

⁵⁰ Johnson McSweeney Ltd *Overview of Flood Management Legislation in New Zealand* November 2006.

⁵¹ Johnson McSweeney Ltd at 28.

⁵² Ministry for the Environment *Meeting the Challenges of Future Flooding in New Zealand* August 2008 at 36.

and guidance to help local authorities incorporate climate change impacts into flood risk management planning.

We note that on 22 August 2024, the Minister responsible for RMA Reform announced a suite of changes to the RMA. These changes include a new national direction on natural hazards which will provide direction to councils on how to identify natural hazards, assess the risk they pose, and how to respond to that risk through planning controls. An RMA Amendment Bill will also include improved emergency provisions to better enable rapid responses to disasters. The timeframe for this to be implemented is mid-2025.

Although work on the RMA is under way, we consider there is a lack of clarity in the legislation more broadly. There would be value in clarifying flood management legislation at the next available opportunity. Such work need not be wholesale amendment, but targeted at clarifying the existing functions, powers and duties of central, regional and local government so that responsibilities are clear. It may be that the development of the new national direction on natural hazards will be a good opportunity for this broader work.

Wairoa District Council's view is that it cannot afford to wait for legislative change in order to get effective management of the Wairoa bar, because "there are likely to be multiple flooding events" in the meantime. This review does not claim that clarification of the legislative framework is a silver bullet, or that such clarity should be achieved before other action can be taken. Legislative amendment is but one point in a suite of recommendations that we are making, the majority of which are practical actions to be taken by HBRC. However, the current framework has the potential to cause confusion, and should be clarified when there is next an opportunity.

Finally, we note that there are, at present, no national statutory policy instruments available to central government to promote certain flood mitigation outcomes by local government. In view of the increasing frequency of severe flood events related to climate change, this may be a matter our commissioning agency wishes to address.

What monitoring responsibilities does HBRC have for the state of the bar?

Current state

HBRC is the governing authority with accountability for management of the river mouth. The HBRC has a published guide for the 16 or so regional rivers that are periodically opened to alleviate flooding. This guide outlines the general approach to the opening of the bar.⁵³

The previous section of this report sets out HBRC's responsibilities under the RRMP, including the provision of information relating to flood risk to territorial authorities such as Wairoa District Council. Given the identified risk of the Wairoa River mouth, we consider that this means HBRC has an overarching responsibility to monitor and share information on the condition of the mouth.

In terms of how this plays out in practice, this has changed over time. At the formation of the HBRC in 1989, engineering operations were centralised out of Napier and the responsibility for operational mouth opening decisions transferred to other Wairoa-based HBRC staff.

⁵³ This is reproduced at Appendix 2 to this report.

In recent years, the practice has changed, whereby HBRC makes the decisions around the river bar and mouth from the Napier-based Asset Management team.

More specifically, HBRC has a staff member within its Operations team dedicated to the Northern Schemes (a number of drainage schemes in and around Wairoa) and who also has responsibility for making recommendations on operational decisions on the northern river openings.

Supervision and guidance in this work is provided by the HBRC Operations Manager, who makes operational decisions recommended by the scheme managers, and also by the technical engineering team within the Regional Assets team.

The authority to manage schemes and open rivers sits with the Operations Manager, on the recommendation of the Scheme Manager. The financial delegation for a typical bar opening sits with the Operations Manager. Surveillance of river mouths is undertaken by Scheme Managers and Ranger staff.

The annual HBRC budget for river openings is around \$150,000 per year. This is funded from general rates and is not part of any particular scheme. As one HBRC manager put it: *“As river mouth openings are very difficult to predict there is no expectation that the budget performance will be very close. To the best of my knowledge, work to open rivers has not been delayed or deferred due to budget constraints.”*

The bar is physically viewed multiple times per month with a record of that inspection kept on MS Teams. In addition, an HBRC manager told us that *“though Regional Councils have no formal communication requirements with Territorial Authorities specifically on catchment management activities,”* its staff do respond to ad hoc requests from other HBRC staff, the Wairoa District Council, the preferred contractor (Prydes) and the local community to inspect the bar.

There is currently no enduring, multiple year contract in place with the preferred contractor.

At the practical level, the Regional Council’s internal Asset Management Group has personnel with river engineering and modelling skills. The Asset Management team has a range of relevant functions, including:

- Flood protection and control works, comprising of:
 - Flood schemes
 - Drainage and pumping
- Flood risk assessment and warning,
- Coastal hazards; and
- Regional water security.

The HBRC’s new Three Year Plan 2024 - 27 signals renewed investment in building flood resilience, with all existing schemes currently under review in the wake of Cyclone Gabrielle.⁵⁴

The Council has recently received findings and recommendations from the **Hawkes’s Bay Independent Flood Review - Pae Matewai Parawhenua**, which examined the flooding in the region during the Cyclone Gabrielle event.

⁵⁴ This can be found at <https://www.hbrc.govt.nz/assets/Document-Library/Cyclone-Gabrielle/Report-of-the-Hawkes-Bay-Independent-Flood-Review-Digital-Version.pdf>

Directly related to this report, it also commissioned the Second Draft Tonkin + Taylor Review.⁵⁵ The Tonkin + Taylor Technical Review was also recently completed, specifically related to the causation of this event.

Supported by central Government funding from the North Island Weather Event (NIWE) fund, the HBRC is also working with communities to develop new flood protection schemes for Category 2 areas (which include Wairoa) and improve flood management infrastructure. It is unclear to us what this will entail for Wairoa.

In the 2021 HBRC Long Term Plan, additional funding was requested to provide for additional instrumentation, SCADA⁵⁶ and CCTV for a number of river mouths. This was intended to support the creation of trigger points for action, improve record keeping and access to real time information. This was to be implemented over a 10-year period and is currently in the planning stages for the Wairoa River.

There is currently no hazard plan specifically for flooding due to the blockage of the Wairoa River mouth. However, as shown in the hazard map above, coastal inundation maps are available, showing the flooded area in a 1% AEP coastal inundation event.⁵⁷

In addition to the eyes on inspections noted above, monitoring of the bar and river mouth placement by the HBRC Asset Management team is currently based on technical information from:

- A comprehensive network of rainfall and river level records across the region.
- Continuously run flood modelling, which is self-correcting in real time.
- Flood plain mapping.
- Catchment management planning; and
- Reviews of specific flooding issues.

These activities support advice on rainfall and river flows during flood events, in addition to providing hazard information for land use planning and community preparedness and resilience.

Notably, they do not regularly include some monitoring measures that are in use on other New Zealand rivers, including:

- Cameras at the river mouth, (though these are currently being planned).
- River level gauges near the mouth. The nearest gauge (installed in 2023) is currently 5 kilometres upriver from the mouth.
- Bathymetric surveys of river dynamics. The HBRC has twice recently attempted bathymetric surveys on the Wairoa River, but work has been deferred due to technical and health and safety concerns.
- Satellite tracking of river mouth position and movement of the bar; and
- Wave conditions and forecasts.

⁵⁵ As required by our Terms of Reference, we have seen a draft of this report and have utilised a number of its insights to support our own findings. While the report is a technical one, the broad themes it identifies are very similar to those of our own review.

⁵⁶ SCADA Supervisory Control and Data Acquisition systems are used for controlling, monitoring, and analysing industrial devices and processes. The system enables remote and on-site gathering of data, including from water monitoring devices.

⁵⁷ An annual exceedance probability (AEP) is the probability of an event. On average, one event of this size will occur every 100 years.

The flood modelling that occurs for the Wairoa River is also complicated by the fact that the river flood model, which can be run on two scenarios, for an open or restricted mouth, does not currently include:

- Existing sea conditions, other than normal tide ranges. HBRC flood modelers are currently working with NIWA to try to incorporate a method to include sea forecasts in the model.
- Riverbed information near the mouth. This has generally been considered so dynamic as not to be useful for modelling. Riverbed information is located only at cross stream locations, considerably upriver from the mouth; and
- Challenges calibrating the model for river silt scenarios. The Wairoa River has high levels of silt build up and significant floods create scour. This means that, counter intuitively, the town can flood at higher levels from the combination of high seas and low rainfall, than from a major flood.

Many in the Wairoa community told us that, since the centralisation of river mouth management to the HBRC team, they felt decisions were increasingly disconnected from local insights, indigenous knowledge and institutional memory around previous management practices.

Prior to this, Wairoa respondents told us that the local Council had tended to take a more proactive approach to the management of the bar and mouth. As one put it:

“Management of the Wairoa River mouth is complex and an art not a science. It is a dynamic situation in which people on the ground need to use their experience with weather, tide management, current and river height. Timing is key.”

Another said:

“A good analogy to describe the best approach to river mouth management is that the manager has to think the way a farmer thinks about their livestock and crops. At certain times of the year and under some circumstances, it is a 24 hour a day and 7 day a week job until the situation is resolved.”

In spite of the lack of a formal contract, the local contractors monitor and visit the river mouth/bar daily to assess river flow, condition of the bar, the location of the mouth and sea state and wind and wave direction.

This is also common practice amongst Wairoa locals who have lived with the threat of the river for generations.

In the context of this event, we find it surprising that, given the current non optimal location of the bar, the forecast sea state and the weather warnings, a precautionary opening of the bar was not commissioned and attempted well in advance of the forecast rain.

We find it even more surprising that, in a town dominated by such a significant and obvious natural hazard, the bar is not more regularly and proactively planned for and managed based on *local* understanding of threat levels, *in addition* to the available technical data.

HBRC has advised us of a number of reasons for this. First, opening the bar in accordance with HBRC and Pryde’s methodology *requires* an anticipated rise in river levels in order for a new mouth to be sustained and not be overwhelmed by the action of the sea restoring the bar. Accordingly, we are advised undertaking the work ahead of rainfall being forecast is not possible. Secondly, in this case, no notable rainfall was forecast for Wairoa until Monday 24 June, when the works were instigated. Finally, given the forecast rainfall was minimal and the sea state was forecast to be significant at the same time that any increase in the river level was likely, the factors for a successful opening were not anticipated to align. Accordingly, HBRC’s position is that the approach of attempting an opening was precautionary in the circumstances, as the prospect of a successful opening was marginal at best.

Despite HBRC’s position, we consider there is clear scope for improving management of the bar. If anything, HBRC’s position highlights the need for current approaches to change, since mitigation steps may not be able to be taken prior to any immediate threat.

The risks of remote management of the bar were well known prior to this event. Wairoa District Council’s own Cyclone Gabrielle review report found that:

“...there is significant benefit in having local expertise and contractors that are able to monitor and respond to onsite conditions prior to and during any significant flood event. In the absence of more costly infrastructure solutions for the mouth, recent history suggests there is a solution i.e., the use of expert local based staff and contractors being given sufficient discretion to make timely decisions on mouth opening. This approach requires an institutional continuity of approach.”⁵⁸

In April 2024, community concerns about flood risk and the bar were raised with HBRC through the NIWE Flood Resilience project Wairoa Stakeholders Group. Similar issues were also raised by the Matangirau Reserves Board and the HBRC Māori Committee. In response, the Council commissioned several expert reports. These include the Tonkin + Taylor Technical Review, as well as reports on river dredging and upper catchment reforestation.

Local Wairoa District Council staff and expert contractors told us that, while operational relationships with HBRC staff visiting the Wairoa community were good, they regularly felt ‘*not listened to*’ by senior Council staff during planning for and response to flood emergencies. As an example, on the Friday prior to the flooding, the HBRC put the local contractors for the bar on standby but did not let Wairoa District Council staff know about this. Nor did they share their ‘worst case scenario’ regional forecasting in the days immediately prior to the event. The latter clearly showed poor potential outcomes for Wairoa.⁵⁹

⁵⁸ See the review report prepared by Strome Consulting for the District Council at <https://www.wairoadc.govt.nz/assets/Document-Library/Reports/Wairoa-Cyclone-Gabrielle-Review-April-2024.pdf>

⁵⁹ See the relevant PowerPoint slide used to brief the CDEM Group Controller meeting on Tuesday 25 June at Appendix Three below.

We consider HBRC's approach to monitoring the Wairoa River mouth would be strengthened by a focus on building local understanding and trust through inclusive decision-making.⁶⁰

Future intentions

The HBRC's current Wairoa River scheme has a limited scope and is mostly limited to post flood clean up and revegetation. However, post-Cyclone Gabrielle, a number of measures have been undertaken by the HBRC in Wairoa that relate in part to flood protection. These include retaining structures to protect the Yacht Club (located near the river mouth), and walls to protect various public amenities.

Going forward, the new HBRC Three Year Plan 2024 – 27⁶¹ (the **HBRC Plan**) undertakes to deliver the following relevant activities, shown with emphasis added:

- Prepare an annual programme of works, **including a maintenance schedule**, prior to the commencement of each financial year.
- Audit river assets annually by a chartered professional engineer and **make a full assessment of each of the major rivers every 12 years.**
- **Inspect river mouths and lagoon outlets regularly and open when required**, and when river, sea and weather conditions allow, so private land above a specified contour is not flooded by river mouth closure.
- **Maintain rivers and extract gravel to maintain the channel capacity** and integrity of flood protection assets.
- **Conduct research to better understand the impacts of river sediment** management on sediment supply and make changes to the way rivers are managed resulting from this research, where appropriate.
- Monitor flood events in accordance with the Flood Manual.
- Continue to **develop and upgrade flood forecast models** of flood plain areas.
- **Calibrate models to significant storm events.**
- Collect and distribute flood hazard information for identified high and low risk area and;
- Complete and report against annual coastal monitoring and investigation including beach profiling; storm monitoring; sediment transport and processes investigation and modelling; **hazard prediction including tsunami, inundation, erosion and storm surge.**

The HBRC Plan makes little specific reference to Wairoa, except to identify the town as part of a 'key project' to develop new flood protection schemes over the planning period.

Post-Cyclone Gabrielle, the HBRC has also commissioned flood resilience work under the NIWE fund, for a 'comprehensive flood solution' for the North Clyde area of Wairoa. This work is being undertaken under the aegis of HBRC, the Wairoa District Council and Tatau Tatau o te

⁶⁰ See, for example, Greater Wellington Regional Council's guidelines for flood plain management planning (available at <https://www.gw.govt.nz/assets/Documents/2015/06/Guidelines-for-Floodplain-Management-Planning.pdf>), which suggest that fundamental to good engagement for sustainable flood management outcomes are actions such as involving local residents, landowners and key community representatives in the flood planning process, and building understanding and trust locally, particularly through inclusive decision-making.

⁶¹ See 2024-2027 Three-Year Plan - Supporting Our Community's Resilience to Future Events. pp 48-9

Wairoa, and funded by central Government through the NIWE fund. However, the North Clyde area was not the area most affected by the June 2024 flood event.

A number of the generic findings and recommendations of the recent independent flood management review noted above are relevant here with specific reference to the management of the Wairoa River.⁶² That report recommended that:

- HBRC should communicate and collaborate effectively with communities, mana whenua and stakeholders in the development and implementation of flood risk management solutions for areas subject to flood risk.
- HBRC should make more and better use of the local networks and knowledge that exist within communities as it leads the process of developing comprehensive flood risk management solutions and implements the physical works needed to improve flood resilience in Hawke's Bay; and
- HBRC should develop a collaborative process for developing flood scheme design involving the regional and district councils, mana whenua and the wider community.

The Final Tonkin + Taylor Technical Review also traverses these issues, as here:

“At present, management decisions are made from Napier with limited visibility of the site, in terms of knowing the river mouth position and river level.”⁶³

A recent, short review for Te Uru Kahika, the Regional and Unitary Councils of New Zealand peak body, suggested the need for *early involvement with local iwi ... [and] Wairoa District Council staff.*⁶⁴

Thus, multiple reviews have made similar suggestions for closer involvement by the community in decision making.

We do not suggest, as some Wairoa respondents did, that this should entail reversion of control to or full delegation of authority for monitoring and opening to Wairoa District Council. We do not consider that body to hold the expertise, resources or powers to hold that responsibility. Making this change would also require amendments to legislation.

However, core to any programme of future improvement are better relationships and deeper shared understandings between HBRC staff and leaders and Wairoa local leaders, including civic leaders and iwi.

We suggest that, in addition to the longer range solutions indicated in the HBRC Plan, many of which will entail formal community consultation, that practical, short term solutions here are threefold:

- Establish a master contract with the local provider so that a new contract does not have to be formally initiated at each mouth opening, and statements of work can be quickly triggered.

⁶² See <https://www.hbrc.govt.nz/assets/Document-Library/Cyclone-Gabrielle/Report-of-the-Hawkes-Bay-Independent-Flood-Review-Digital-Version.pdf> pages 158/9.

⁶³ At 23.

⁶⁴ HBRC Wairoa Mouth Cutting Procedures, 1 July 2024, prepared by Graeme Campbel, Strategic Advisor Flood Resilience, Te Uru Kahika, page 3.

- Initiative a formalised programme of regular ‘listening’ forums, perhaps quarterly, with local Wairoa community leaders, including iwi, to discuss proactive and precautionary river risk management, including mouth openings; and
- Working in partnership with technical experts and utilising local knowledge, develop a specific Operational Plan for the River, including triggers for clearing the mouth⁶⁵, clear standard operating procedures (**SOPs**), monitoring guidelines and performance key performance indicators (**KPIs**).

The Operational Plan will be of critical importance. The Plan should include:

- Formalised utilisation of indigenous knowledge and kaupapa Māori approaches to river, mouth and bar management.
- Actions to monitor the river bar (both locally and remotely) and to identify the trigger thresholds for action to mitigate and manage risks, including monitoring of mouth placement, sea state and wave conditions, river levels, silt conditions and rainfall forecasts.
- A risk management framework that defines areas of work to maintain the long term integrity of the river and surrounding communities.
- Clear trigger thresholds, delegated authorities and contingency resourcing to mobilise river bar clearing/mouth opening well in advance of potentially high risk events.
- Detailed flow charts showing SOPs and mapping optimal timelines, decision paths and key accountabilities for mouth and bar management. These should take into account the long lead times required for mechanical bar and mouth management.
- KPIs for monitoring and reporting on bar and mouth integrity.
- Clear communications protocols for support to localised and tailored communications; and
- Targeted flood prevention, management and response plans for high risk communities, including those on the Wairoa coastal hazard zone in closest proximity to the river.



The position of the Wairoa River has been shifting west since 2016, reducing the efficiency of the river mouth.
Image: HBRC

⁶⁵ The Tonkin and Taylor Technical Review offers a simple schematic showing how such triggers might be utilised in SOPs, and this is included at Appendix Four below.⁶⁵

What powers are available to HBRC to make decisions? What actions are available to the HBRC to manage the bar?

Powers

As set out earlier in this report, HBRC's function to actively manage the bar for flood protection purposes (including manually re-aligning the river mouth) arises primarily from the Soil Conservation and Rivers Control Act 1941. Those powers are to be exercised in the context of other legislation and policy level instruments such as the Local Government Act 2002, the Resource Management Act 1991, and the guiding principles of the RRMP, which are all relevant considerations for the HBRC's management of the bar as a tool to protect against flooding as a natural hazard.

Opening a new river mouth or floodway is a permitted activity under RRMP Rule 70.

The statutory and regulatory framework enables HBRC to make decisions and undertake works relating to flood protection (in this case, decisions around the management of the bar) while balancing environmental protection, resource use and community interests.

Available Actions

The Wairoa River mouth is one of 16 river mouths for which HBRC have an operational opening guide, (the 'Instructions' at Appendix 2 to this report⁶⁶). The current Wairoa River instructions are high level, and in summary, state that:

- Potential for damage due to flooding caused by river mouth blockage is significant.
- Flooding can block access roads at Whakamahi and Kihitu.
- Opening the river requires a significant head of water in the river, along with favourable sea conditions (e.g. small waves, outgoing or low tide).
- Openings should ideally be undertaken at low tide with small waves.
- Excavated material is to be stockpiled clear of the mouth to minimise chance of re-blocking.
- The river mouth is highly dynamic and migrates east and west depending on swell direction and intensity.
- Erosion is notable under Pilot Hill.
- A successful re-alignment of Wairoa Bar requires the river to first close and a head of water to build, before cutting a new opening using the old piles as a guide for the preferred location.

These instructions, respondents at HBRC told us, have been improved and updated regularly over the last few years. One said, *"Part of the improvements to the River Opening document was to remove subjectivity from decision making, create clear trigger points for action and improve the data gathered by the installation of gauges."*

We do not agree that the current instructions document is clear or specific about the triggers to be used to initiate an opening. We find it unhelpful as an SOP. As the Tonkin + Taylor Technical Review puts it:

⁶⁶ There are three documents that relate to specific instructions about river mouth opening. In this report, we refer to HBRC Document 8.261-004 Lagoon and River Mouth Openings.

“The current opening plan has no clear criteria for when the river should be opened to reduce the risk of flooding. However, there appears to be consensus from council observations and the WSP modelling that river opening can significantly reduce the risk of flooding along Kopu Road and potentially Wairoa Town. Therefore, the level of resources allocated to manual opening of the river mouth can be scaled according to the flood risk reduction benefit.”⁶⁷

River mouth openings for Wairoa are undertaken by local contractors Pryde Contracting, who have significant experience opening the Wairoa River and other river mouths in Hawke’s Bay. They have also documented their methodology, which was supplied to us.

The overall frequency of such opening events over the past decade is hard to determine, but it appears that opening works in 2022 were the only operation undertaken since 2016. The 2022 event used two excavators and one bulldozer (a total of 180 machine hours) and cost HBRC approximately \$30,000 for an initial attempt in January, with additional costs in March 2022 to finish the work.

Pryde Contracting’s advice to us about their preferred method was, in summary, thus:

- Need a lead time of at least five to seven days to plan a successful opening. This allows for mobilisation of equipment that may be deployed across the region, and for a suitable preparation work to be undertaken before the final cut is made for an opening.
- This lead time requires high confidence in rainfall forecasting and an understanding of the hydrology in terms of whether there is a risk to the town flooding if the river mouth is not aligned with the main river channel.
- Depending on the volume of sediment on the bar, the preferred approach is to use two bulldozers and two diggers to open the bar.
- Work is undertaken over a few days to prepare the channel, initially digging out the lagoon side, lowering the berm level and bunding the seaward side to prevent closure overnight from waves.
- Once the site is ready, the final opening is done using a digger to open a new channel on the high tide, allowing maximum head water to push through the new channel on the outgoing tide. As the contractors described it:

“The reason that all these conditions are needed at the same time, is because we essentially need the new river mouth to overwhelm the existing river mouth. These conditions mean the current mouth is blocking up, the time of the tide and the sea’s swell create the best height difference between the sea level and the river level, and then the impending rainfall influx ‘flush’ will cause the water to flow through the new river mouth and erode the new mouth more and more.”

⁶⁷ At 23

- A successful opening requires the water level in the river to be elevated above the water level in the sea, which means timing is critical on a rising flood event. Large waves in the ocean can compromise an opening event, even if tide and river level are otherwise suitable.
- A successful re-alignment of the mouth may require closure of the naturally offset mouth which is complex to do with the available machinery; and
- If the conditions have changed and it is decided that a further attempt will be unsuccessful, a bund or sea wall can be constructed to try preserve the work done, in the hope that it would not fill back in again before the next chance to attempt to do it occurs (as happened in March 2022).The protective bund works created in January 2022 are shown in the image below, courtesy of Pryde Contracting.



With regard to the late attempted opening of the mouth immediately prior to the June event, the contractor told media that:

“In the 30 years I’ve been involved I think we’ve been really lucky in some of the results we’ve got. Mother Nature is a pretty powerful beast, and I think it’s sort of been a bit of a disaster waiting to happen,”⁶⁸

⁶⁸ Radio New Zealand Interview with Hamish Pryde, 22 July 2024.

Is there recognised best practice for making such decisions and / or taking actions (if any)?

Local government operates under a range of principles arising from legislation, good practice and case law. As noted in the Ministry for the Environment's 'Preparing for Future Flooding: A Guide for local government in New Zealand', which addresses flooding risks in a world impacted by climate change and thus more frequent and severe flooding, these principles should now include (in summary paraphrase and with emphasis added):⁶⁹

- Take a **precautionary** approach.
- Use **flexible or adaptive** management options.
- Use **no-regrets options**. For example, *"..if you are already experiencing weather-related problems, then cost-effective actions to deal with them should be no regret options"*.
- Use **low-regrets** options. For example, *"...ensuring that any changing rainfall patterns are taken into account early in the process of maintaining or improving infrastructure is an example of a low regrets option."*
- Avoid making **decisions that will make it more difficult** for you or others to manage climate change flood risks in the future.
- Use **progressive risk reduction**.
- Adopt an **integrated, sustainable approach to the management of flood risk**. *"...this approach aims to consider a wide range of perspectives to decision-making that contributes to the environmental, cultural, social and economic well-being of people and communities."*

In terms of river mouth opening, we cannot comment of the efficacy or relationship to best practice of the current contractor methodology. In our view, the key problems here are:

- Manual river mouth opening should not be the *only* available flood protection measure for Wairoa. Meaningful protection will need to be based on multiple components, with multiple barriers and approaches, particularly with respect to the coastal hazard zone on Kopu Road; and
- The instructions that guide the process are at present insufficiently rigorous with regard to when and how the mouth should be opened and the trigger thresholds and decision pathways that should support the process.

On the first point, we would suggest that river mouth and bar management options should be expanded to include additional engineering based options, such as structures or systems to 'train' or fix the river mouth in a preferred position, and land side resilience enhancement options, such as lifting the level of, or otherwise bolstering at risk roads and amenities. Any further exploration of these broader options will require additional engineering and environmental impact analysis, particularly to understand more about the riverbed and beach profiles at Wairoa.

Any such options will be extremely costly and likely beyond the resources of the HBRC. The Tonkin + Taylor Technical Review describes a like project at the Opotiki Harbour entrance, which is a \$100 million river mouth stabilisation exercise. Any similar project at Wairoa may be further complicated by the not yet fully explored gravel conditions and other river dynamics alluded to in the recent technical reports for HBRC.

⁶⁹ See <https://environment.govt.nz/assets/Publications/Files/preparing-for-future-flooding.pdf>. These bullet points are expressed in full on pages 28-9.

The second point can be addressed by means of the Operational Plan we recommend here and discussed in the earlier section. More detailed, prescriptive and clear SOPs should be an integral part of that Plan.

What was HBRCs practice relating to engagement with mana whenua/tangata whenua on its management of the bar?

HBRC has formal arrangements with a range of tangata whenua groups, including its Taiwhenua groups. It has regular engagement with iwi leaders and local tangata whenua fora and is invested in building these relationships further. Since Cyclone Gabrielle, the Council has made renewed efforts in this regard. However, tangata whenua respondents told us they saw three specific areas for improvement in the wake of this flood event, as follows:

- More formal capture and inclusion of indigenous knowledge into analytical and decision making processes around river mouth and bar management, and into flood management approaches more broadly
- More regular and proactive ‘listening sessions’ with iwi leaders and other representatives of local Māori communities to collaborate and plan for:
 - tactical matters of river mouth and bar management
 - the more strategic issues relating to future flood protection resiliency for Wairoa and its catchment; and
- Broader opportunities to more actively value the granular local knowledge of tangata whenua and incorporate this into planning processes.

We address the second point above in our recommendations section below.

Any other relevant contextual matters

The Wairoa River flood of June 2024 highlights a number of broader issues that extend well beyond the presenting issues of river mouth management and flood protection. Over the course of our review, we made the following observations.

1. **Systematic arrangements for taking local knowledge into account in the management of the river mouth and bar are inadequate.** Management decisions for the river mouth are made in Napier/Hastings by the HBRC, on the basis of infrequent physical inspections of the bar. There is no standing contract for regular and proactive maintenance with the local contractors who open the bar, with all work done on an ad hoc basis. Assessments of risk appear to us to be reliant on river gauges and technical instrumentation, which, if viewed without deep understanding of the state of the river bar/mouth and how it has behaved in the past, can create a misleading picture of local conditions.

In spite of the lack of a formal contract, the local contractors monitor and visit the river mouth/bar daily to assess river flow, condition of the bar, the location of the mouth and sea state and wind and wave direction.

This is also common practice amongst Wairoa locals who have lived with the threat of the river for generations.

Given the current non optimal location of the bar, the forecast sea state and the weather warnings, we were surprised a precautionary opening of the bar was not commissioned well in advance of the forecast rain. As noted above, HBRC advised that this was due to current management approaches, and we consider these need to be updated to address this risk. We find it even more surprising that, in a town dominated by such a significant and obvious natural hazard, the bar is not more regularly and proactively planned for and managed based on local understanding of threat levels.

The risks of remote management of the bar were well known prior to this event. Wairoa District Council's own Cyclone Gabrielle review report found that:

“...there is significant benefit in having local expertise and contractors that are able to monitor and respond to onsite conditions prior to and during any significant flood event. In the absence of more costly infrastructure solutions for the mouth, recent history suggests there is a solution i.e., the use of expert local based staff and contractors being given sufficient discretion to make timely decisions on mouth opening. This approach requires an institutional continuity of approach.”

Local Wairoa Council staff and expert contractors told us that while operational relationships with HBRC staff embedded in the Wairoa community were good, they regularly felt ‘not listened to’ by senior Council staff during planning for and response to flood emergencies. As an example, on the Friday prior to the flooding, the HBRC put the local contractors for the bar on standby but did not let Wairoa District Council staff know about this. Nor, in the days that followed, did they share their ‘worst case scenario’ flood forecasting.

2. Since Cyclone Gabrielle, the HBRC has further upgraded its flood models and is in the process of adding additional cameras and surveillance apparatus. Flood modelling science for the Wairoa River mouth, however, does not presently take into account the sea state. Riverbed information is also only obtained in town locations, a significant distance from the mouth. More importantly than these limitations, however, is the fact that, in our view, **neither the HBRC flood modelling or asset management teams have the relationships and connections at senior levels into communities such as Wairoa to combine their technical information with local insight and or to fully understand the potential human and economic impacts of possible scenarios.** While it is the responsibility of the regional CDEM Group to bring these perspectives together as part of civil defence preparedness, we also suggest that technical staff need to be better tapped into the local networks that would give them insight into granular local factors for river mouth management purposes.
3. The HBRC CDEM Group held a planning meeting for the region's controllers on the afternoon of Tuesday 25 June, in light of the orange rainfall warning, forecast heavy swells and unfavourable sea state. While this review is not focused on the CDEM response, discussions at this meeting reveal a concerning attitude in respect of flood management at the Wairoa River. By this time flood modelling did show a potential worst case scenario of flooding in Wairoa's low lying Kopu Road. At this meeting the Controller for Wairoa also raised the issue of the poor placement of the river mouth and lack of maintenance of the bar. She was told that the planned opening of the bar had been suspended and that river levels were not expected to be high.⁷⁰ A participant mentioned that data from NIWA (National Institute of Water and Atmospheric Research) suggested rainfall predictions that were higher than those of MetService.⁷¹ These concerns were also dismissed. We are concerned this shows optimism bias.

In our previous report on Cyclone Gabrielle, we recommended that worst case scenarios are planned for, exercised and scenario modelled. We consider this recommendation to be relevant here, too, to the extent it applies to HBRC functions (rather than CDEM functions). The fact that the river bar was in an unhelpful place (much worse than during Gabrielle) should have triggered at least discussion of the identified high risk scenario and the development of a contingency plan for Wairoa, particularly given the region's vulnerability, poor outcomes from the earlier storm and long history of significant flood events. Flooding contributed to by the bar has occurred every year for the last three years.

In view of the fact that Wairoa is a town wholly reliant on a single method of risk mitigation for river mouth driven flooding, (mechanical mouth opening) and that the relevant managers knew that method had not had time to be brought to bear, we find these decisions not to act in a precautionary manner on at least the day prior to the event a matter of concern. **The communications from HBRC to Wairoa leaders and the local**

⁷⁰ HBRC has indicated there are no meeting minutes recording that this was said, and has noted that works on the mouth were not in fact suspended and continued through the afternoon.

⁷¹ It is unclear whether this comment related specifically to Wairoa or the region more broadly. HBRC has advised this review that it relies on MetService forecasting, rather than NIWA's, for a number of reasons. First, MetService is contracted to the Ministry of Transport to provide weather forecasts for all of New Zealand, which provides surety that appropriate systems are in place to ensure timely, accurate and appropriate forecasts. Secondly, HBRC are part of the nationwide regional councils' contract to MetService for provision of specific weather products and direct access to severe weather forecasters. Finally, HBRC use the gridded rainfall forecast provided by MetService whereby the data is automatically transferred into the correct format to the HBRC river level forecasting service, however NIWA does not offer a comparable product.

community were slow in the early stages of response to this event. This comment references the CDEM response, but that is unavoidable as it was through that process that Wairoa leaders and the local community appeared to have first become aware of the impending flooding.

As earlier noted, the HBRC Flood Forecaster sent a 4am email advising of river levels and the risk of flooding on Kopu Road. HBRC advised that this email went to some 48 recipients, including the local Wairoa CDEM lead. The Flood Forecaster did not make a phone call, which initially surprised us given the urgency of the situation. HBRC advised this review that it considered the Flood Forecaster acted appropriately and in accordance with protocol, which was for the Flood Forecaster to provide intelligence to the CDEM response via email sent to dedicated channels (which are monitored 24/7, particularly when the Group Emergency Coordination Centre (GECC) is in a state of enhanced monitoring, as was the case in this event). It is then for CDEM to make telephone calls.

It seems to us that this current system does not allow for information to flow as quickly as it needs to, in the context of a river mouth that is known to be difficult to manage and where the risk of flooding is known. Some residents woke to the Wairoa CDEM Controller's calls to find water lapping around their beds. Many struggled to evacuate given the nighttime conditions and the depth of the water. On one Kopu Road property a householder battled to get his pregnant daughter and grandchild over the back fence in the dark.

4. We were also surprised to learn that **no operational plan for the ongoing management and maintenance of the Wairoa River mouth currently exists**, in spite of the known impact of the bar and river mouth placement on flood risks. Such a plan should consider the complex interplay of the range or relevant factors, including mouth position, bar condition, river flows, sea tides, surges and wind and wave conditions. It would include actions to monitor the river bar and identify the triggers for action to mitigate and manage risks. At the moment, the following also appear to be lacking:
 - a. A risk management framework that defines area of work to maintain the integrity of the river and its mouth.
 - b. Delegated authorities and financial delegations to local decision makers to mobilise or trigger local contractors to work on river bar clearing.
 - c. Clear KPIs for effective bar management, with regular monitoring and reporting.
 - d. Detailed flow charts showing SOPs and mapping decision paths and key accountabilities for mouth and bar management.
5. In the 1990s, a significant number of engineering based options to manage the Wairoa River bar and mitigate risks were explored but not progressed. They included examination of maintenance dredging operations and the use of river dykes and groynes. Since that time, **no further field investigations into infrastructural or engineering solutions appear to have taken place**, leaving the default option of manual opening in advance of potential flood events, (a process which takes five to seven days) as the primary method of risk management. In spite of the funding challenges, such an approach appears to reflect a strategy of hope rather than experience.

Overall, we consider the June flooding of the Wairoa River is not just about technical matters – all of which can be solved – but also through the realm of leadership, communication, culture and community relationships.

A solution exists within regional governance and leadership. Whether viewed through the lenses of environmental management, emergency management or local government best practice, the relationship between the HBRC and the Wairoa District Council and Wairoa civic leaders can be strengthened, at least at executive levels.

Many in the Wairoa community – from leaders to people in the street – see HBRC leaders as patronising, technocratic and *'just not listening.'* Whether or not these perceptions are accurate, the reality is that they exist and will have an impact on the relationship and, accordingly, management of flood risk.

Wairoa is a community with unique challenges arising from its relative isolation and dependency on vulnerable transport links, its socio economic deprivation and the fact that it has but a single line of flood defence – mechanical and difficult river mouth management - in a storm event.

Its people and leaders are passionate about their town and region, keen to harness and mobilise local knowledge to find innovative solutions to the periodic misbehaviour of their river mouth taniwha, and hungry to engage with HBRC to chart the way forward. Feeling unheard, however, makes some of them feel deeply offended. This is exacerbated by the residual trauma from the 2023 Cyclone event.

Meanwhile, HBRC leaders and staff are trying hard to deliver on the many recommendations of their various post Gabrielle reviews. They are keen to better understand the complexities of Wairoa River dynamics in order that a wider range of long term solutions can be explored. They are also struggling to do both these things within constrained resources.

Its people and leaders feel they are working hard to address the concerns of the Wairoa community highlighted by this event and during Cyclone Gabrielle. It is also clear to us however, that some HBRC staff are feeling that they can't do anything right. This has created what appeared to us to be a defensive culture and seems to have caused them to bunker down and prioritise technical effort rather than to invest in relationship effort.

We note the recent appointment by the Minister of Local Government of a Crown Manager, whose role is to assist the HBRC to develop and implement flood protection works for Wairoa taking into account the interest of multiple stakeholders. Our hope is that this appointment (which began 15 August 2024) addresses these relationship and communication issues.

As argued earlier, we don't think the solution here is overly complex or that it requires elaborate regulatory instrumentation or wholesale legislative change beyond clarification of the existing framework. While we considered making a recommendation in regard to formal delegations of authority for Wairoa River mouth opening to the Wairoa District Council, we do not believe that the legislative change process that would be entailed is necessary.

We think quarterly HBRC/Wairoa listening sessions with a formally chartered collective group, including iwi, and underpinned by an Operational Plan for which all parties share responsibility, would go a long way to addressing the issues we identify in this report.

In the meantime, it is critically important that the HBRC leaders model active listening and collaborative attributes from the top of the organisation.

We consider this flood event suggests there are issues in regard to the culture and practice of the HBRC at operations level.⁷² Shortfalls surfaced in this event included, as noted at various points in our earlier narrative:

- Lack of a proactive, precautionary approach to potential emergencies in remote and vulnerable communities.
- Related to this, optimism bias and failure to address worst case scenarios early.
- Lack of sufficiently granular, active and well invested local relationships so that informal networks could be activated and local and indigenous knowledge used to help manage and mitigate hazards and risks.
- Overreliance on the National Emergency Management Agency (NEMA) and MetService, when the former was remote and the latter's forecasts had already been shown – during Gabrielle – to underestimate rainfall in this catchment.

There are also some strategic issues raised by the event that have implications for central Government, including:

- It appears to us that individual regional councils lack the resources, incentives and expertise to explore a full range of infrastructural investment options on a proactive basis, outside support from periodic central Government schemes.
- There is little incentive for individual local and regional authorities to collaborate and share best practices. In this case, understanding other river control projects such as those at Opotiki, Te Waihora/Lake Ellesmere and Whakaki Weir, even though the hydrology and other factors in these cases are very different, could assist Asset Management staff at HBRC; and
- While the CDEM response is outside the scope of our terms of reference, we note for completeness that it is clear from this and other recent emergency events across the country that current emergency management arrangements can be improved, and this is currently under work by NEMA and other agencies.

While there remains more to do in the wake of this event to fully understand the particular combination of river and sea dynamics that caused it to be so harmful, the parties should not wait to tackle the recommendations we suggest here, many of which can be progressed with urgency and do not require major additional investment.

The time for more reviews is past. The people of Wairoa want and deserve action. As we suggest in our recommendations, much can be achieved - in regional governance, emergency management and environmental outcomes – simply by repairing and rebuilding critical relationships, lifting the culture⁷³ and practices of the relevant HBRC teams and by collaborating to develop improved plans and SOPs.

⁷² HBRC has objected to the suggestion of issues with culture, given this was not a review by an organisational expert.

⁷³ As above.

Recommendations

Senior leaders at the HBRC need to prioritise their relationships with and communications to the Wairoa community and its leaders in order to rebuild trust and thus enhance future resiliency. Above all, Wairoa locals, including iwi, must feel sincerely listened to, both in advance of and during events. Optimal local government, emergency management and environmental management outcomes are all best secured through positive and trust-based partnerships.

Accordingly, we make the following recommendations.

Recommendations

1. Central government should consider taking steps to **clarify the current legislative framework for flood management**, which is at present spread across multiple pieces of legislation and has the potential to cause confusion. An efficient time to do this may be when the new national direction on natural hazards is developed as part of the government's RMA reforms.
2. The HBRC should develop, implement and communicate a **Wairoa River and Bar Operational Management Plan** in partnership with local partners and communities. The Plan should include:
 - a. Formalised utilisation of indigenous knowledge and kaupapa Māori approaches to river, mouth and bar management.
 - b. Actions to monitor the river bar (both locally and remotely) and to identify the trigger thresholds for action to mitigate and manage risks, including monitoring of mouth placement, sea state and wave conditions, river levels, silt conditions and rainfall forecasts.
 - c. A risk management framework that defines areas of work to maintain the long term integrity of the river and surrounding communities.
 - d. Clear trigger thresholds, delegated authorities and contingency resourcing to mobilise river bar clearing/mouth opening well in advance of potentially high risk events.
 - e. Detailed flow charts showing SOPs and mapping optimal timelines, decision paths and key accountabilities for mouth and bar management. These should take into account the long lead times required for mechanical bar and mouth management.
 - f. KPIs for monitoring and reporting on bar and mouth integrity.
 - g. Clear communications protocols for support to localised and tailored communications; and
 - h. Targeted flood prevention, management and response plans for high risk communities, including those on the Wairoa coastal hazard zone in closest proximity to the river.
3. The HBRC should also:
 - a. Instruct its Asset Management Group to:
 - i. Integrate its various Wairoa River Management instructions into an integrated plan as above.

- ii. Establish improved detection and early warning systems for the Wairoa River mouth and bar that provide adequate warning of potential or impending problems, including camera monitoring of the mouth.
 - iii. Update its river monitoring models to take better account of sea state, bathymetric riverbed profiles and silt levels, and wave and wind conditions.
 - iv. Contract local resources to provide a regular maintenance regime for the Wairoa River mouth and bar, as well as to support prevention and response work when required, according to clear service specifications and standards as above; and
 - v. Develop formal protocols - such as regular collective forums - for the ongoing utilisation of local Wairoa community knowledge in flood hazard preparedness and management.
- b. Take a more proactive and precautionary approach to potential emergencies, reducing the risk of optimism bias. A precautionary approach will ensure the timeliness of preventive work and ensure advance warnings are given to at risk communities.
 - c. Consider utilising weather data from both MetService and NIWA.⁷⁴
 - d. Tailor and upweight its support to Wairoa, given that community's vulnerability and current single line of defence in flood emergencies.
 - e. As recommended in the Tonkin + Taylor Technical Review, revisit past infrastructural options for mouth and bar management and commission the investigation of new technology and physical infrastructure options, including coastal groynes and methods for improving the flood resilience of high risk roads and settlements. This may entail further engagement with central government agencies; and
 - f. Develop better and more responsive partnerships and communications systems to ensure that civic leaders in Wairoa have real time information, delivered in an appropriate manner and which supports them to inform and protect their local communities.

⁷⁴ We note HBRC's comments that NIWA does not provide comparable products to those provided by MetService through the regional councils contract. However, we think there is still benefit in HBRC considering what additional benefit it could gain from also having regard to NIWA data in addition to that already obtained from MetService, in the event the two bureaus produce differing rainfall predictions.

Appendix One: Summary Event Timeline

Note: The following timeline was developed from a timeline and document set prepared by the HBRC, and from the documents, contemporaneous notes and recollections supplied to us by interview respondents.

Pre event



10 January 2024: The adverse position of the Wairoa River mouth was first noted by HBRC's Northern Scheme Manager.⁷⁵ Prior to this, a natural breach of the bar had occurred in November 2023, resulting in a second mouth opening in a better position.⁷⁶



12 January 2024: the Northern Scheme Manager contacted local contractors Prydes to begin identifying opportunities for a mechanical realignment of the mouth:⁷⁷

Just wanted to check in with you to see if you have been assessing conditions to do an opening of the Wairoa River mouth in line with the main channel and closing the existing river mouth.

We had a conversation over the phone last year and haven't been able to catch up with you on the status of this.

Can you please inform me when the conditions are right for an opening so I can get the approval and engineering assessment side of things confirmed?



4 April 2024: Prydes sent the following⁷⁸

I have attached a document that lays out some information about the Wairoa Bar and the information you requested. I finished it last night. I will shoot down to the river mouth now to have a check on it.

The size of the 'flush' I talk about in the document, does need to be substantial and looking at MetService, there doesn't seem to be any rain of note that would fit this bill, and so unlikely will have a chance to try do it in next 5 days or so.



HBRC continued to inspect the condition of the bar on:⁷⁹

- 18 January
- 30 January,
- 12 February
- 5 March
- 12 March
- 2 April
- 20 April
- 23 April
- 21 May (updated 23 May)
- 6 June
- 10 June
- 21 June

Sample excerpt from 30 January inspection report



Over this time, no opportunities were identified where the necessary conditions aligned to allow for a successful mouth realignment in accordance with HBRC instructions.

⁷⁵MS Teams 'Asset Management' Channel Post in 'Surveillance and Field Reports', 10 Jan 2024 2.10pm.

⁷⁶MS Teams 'Asset Management' Channel Post in 'Surveillance and Field Reports', 30 Nov 2023 9.46am.

⁷⁷Email 12 Jan 2024 12:20pm.

⁷⁸Email Apr 2024 7:37pm.

⁷⁹MS Teams 'Asset Management' Channel Posts in 'Surveillance and Field Reports', 18 Jan 2024 – 23 May 2024.

⁸⁰HBRC 2023-24 Budget Manager Detail - Asset Management March 2024.

⁸¹MetService Severe Weather Outlook charts, issued 11.30am 21 June 2024.

⁸²Email, Fri 21-06-2024 8.53am

⁸³Email, Fri 21-6-24, 3.36pm



23 April 2024: HBRC Operations Manager met with Prydes on another job site and verbally confirmed that HBRC supported the methodology outlined in their abovementioned 'Attempting a new river mouth opening on the Wairoa Bar' document and that funding was available for Prydes to proceed when conditions are suitable.

This is confirmed in HBRC's Budget Reporting for Asset Management, which noted (emphasis added) that "River and Lagoon Opening has been undertaken as required.

Wairoa opening scheduled pending suitable conditions."⁸⁰



18 June 2024: The Northern Scheme Manager met with Prydes' at the Wairoa Bar to observe the current state. Together, they called the HBRC Flood Forecaster to discuss the rainfall and swell conditions for the coming week and were advised that the forecast involved a very large swell, and very little rainfall. Based on this information, the conclusion made by the Scheme Manager and Prydes was that these conditions did not favour a successful realignment of the river mouth.

During June Weather Event

Friday 21 June 2024



HBRC began responding to the oncoming weather event, a low to be situated off the east coast of the North Island, on Friday **21 June** 2024, which is when a risk of severe weather affecting the region was first identified. At that stage MetService was forecasting a large swell but a low confidence of heavy rainfall for Wairoa on Tuesday **25 June**.⁸¹



At 8.53am HBRC's Flood Forecaster sent an email to HBRC's Incident Response Manager, the Hawke's Bay Civil Defence Emergency Management Controller and Operations Manager, and the Central Hawke's Bay Civil Defence Controller noting that:⁸²

"There is a substantial low coming across the east coast starting Monday 24 and continuing until around Friday. No Met service warnings yet. We'll do a bit of research and prep. It could end up being a big swell, or possibly heavy rain on southern coast."

The Hawke's Bay Civil Defence Controller responded to note that the National Emergency Management Agency's Monitoring and Alerting Centre had not yet advised of any severe weather concerns for Hawke's Bay.⁸³

As a precaution, HBRC commenced regular Operations Team meetings. These meetings are led by the Operations Manager and include key HBRC operational staff including flood forecasters, scheme managers, communications personnel and duty managers.



02.00pm The first meeting was conducted at 2pm on Friday 21 June. Following discussion on the situation in Wairoa, it was agreed that conditions remained unsuitable for an attempted mechanical realignment of the river mouth, but that HBRC would ask for Prydes to be available to begin work on a mechanical realignment if the situation changed over the weekend.

The situation would be reviewed by the Flood Forecaster in light of updated MetService forecasting over the weekend, and any material changes advised.



At 03.41pm: the Northern Schemes Manager phoned Prydes to confirm these arrangements. The Local Wairoa CDEM Controller was not advised of the standby arrangement.

On this call Prydes advised that key principals were away for the weekend but that workers would be placed on standby over the weekend. Advised that needed about 5 days' notice and 2-3 days preparation based on previous openings.

Sunday 23 June 2024

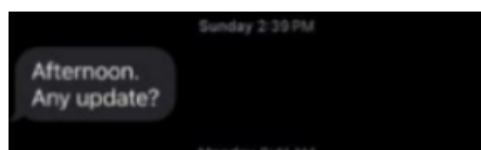


At 11.44am: on Sunday, MetService issued Wave Warning for Cape Turnagain to Mahanga, an area including Wairoa, which was valid 10pm Monday 25 June – 12:00am Thursday 27 June. This warned of an easterly swell and combined wave heights of up to 5m.

The Flood Forecaster monitored the forecast over the weekend and determined that there was no change that would materially affect the prospect of a mechanical opening of the bar being undertaken successfully, with the forecast sea state likely to hinder any such attempt.



At 02.39pm : on Sunday, Prydes reached out to the Northern Schemes Manager by text message (as below) to check whether there had been any update.⁸⁴ By return phone call, it was confirmed that there was no change, and that the situation would be reviewed again on Monday.



Monday 24 June 2024



Monday 24 June: At 9:29am the HBRC Flood Forecaster sent the following update to HBRC Incident Response and Civil Defence Personnel, including the local CDEM Controller in Wairoa:⁸⁵

It looks like the low coming down the east coast will bring rain for a few days. There's no met service watch yet since the total rainfall forecast is still less than 100 mm in 24 hours.

Highest rainfall looks to occur in Wairoa eastern catchment, but the southern coast from Cape Kidnappers down to Porangahau may also get some rain (and wind!).

River level forecasts show almost no rise in levels. At present the rainfall intensities are showing to be just around the infiltration rate, indicating the amount of runoff could be low.

If there's any major change, we'll provide an update.



At 9.30am MetService issued an Orange Severe Rainfall Warning for an area including Wairoa for 9am Tuesday 25 June to 9pm Wednesday 26 June.

⁸⁴ Text message, Sun 23-6-2024 2.39pm

⁸⁵ Email, Mon 24-6-2024 9.29am.



At 9.41am the Northern Schemes Manager received a text message from Prydes but did not respond to the message:⁸⁶

“Morning, Had a look at the river mouth just before. Water level still very low and existing bar is looking more established. Seems at this stage that, if HBRC were wanting to do anything, it’s get a bulldozer into where the potential new bar mouth would be and push excess sand off the top of the bar down near sea level height. That way, it’s closer to being ready. Cheers”



At 10.36am MetService updated their Wave Warning, valid from 3pm Tuesday 25 June – 12am Thursday 27 June. This warned of easterly swell and combined wave heights of up to 6m.



At 11.26am: Wairoa District Council’s Group Manager for Assets & Infrastructure emailed the Northern Schemes Manager and Regional Assets Manager:⁸⁷

Hey team
With the weather set to come in this week, is it an opportunity to get Prydes in to relocate the bar? Some nervous Kopu Road residents.



At 11.41am: the Northern Schemes Manager called Prydes to discuss the earlier (9.41am) text message and advise that no action should yet be taken. During the call, Prydes sent a screenshot of the weather forecast to the Northern Schemes Manager.⁸⁸



At 12.19pm: the Northern Schemes Manager called the Operations Manager, relaying Pryde’s advice.



At 01.15pm the Northern Schemes Manager posted an update to the ‘Surveillance and Field Reports’ discussion in the HBRC MS Teams ‘Asset Management’ Channel, including an update of the state of the river mouth from 10am, and repeating the advice from Prydes earlier conveyed to the Operations Manager. He also noted that the forecast rainfall may now provide the flush required to assist with the opening.



Between 12.50pm and 01.55pm: multiple conversations occurred between the Operations Manager, Regional Asset Manager and Flood Forecaster. It was identified that it was unlikely that the predicted flow in the river would be sufficient to generate the flush required to sustain a new river mouth position. It was also noted that the forecasted extreme sea state was likely to hinder efforts to open the river mouth at a new location and created safety risk for those undertaking the work. The initial view was that, on balance, a mechanical realignment should not be attempted.

However, on further review of the updated forecast rainfall and the consequent impacts on river flow, it was decided that, as it was a marginal call, an attempted mechanical realignment may be warranted as a precautionary approach. That decision was taken at approximately **1.55pm** and communicated to the Northern Schemes Manager on an MS Teams call at **1.59pm**.



At 01.25pm: the Northern Schemes Manager called Prydes to confirm that no decision had yet been made to undertake a mechanical realignment.

⁸⁶ Text message, Mon 24-6-2024 9.41pm.

⁸⁷ Email, Mon 24-6-2024 11.26am.

⁸⁸ Text message, Mon 24-6-2024 11.44am.

⁸⁹ MS Teams ‘Asset Management’ Channel Post in ‘Surveillance and Field Reports’, Mon 24-6-2024 1.15pm.



At 02.01pm he advised that this decision had now been taken, and instructed Prydes to mobilise machinery to the site to start preparatory work on Tuesday and plan for mouth opening low tide Wednesday 26 June 2024. However, it was noted that HBRC may decide to stop works if the situation was deemed to be unsafe for the workers undertaking the mouth opening.



At 02.27pm: the Regional Asset Manager responded to the earlier email from the Wairoa District Council’s Group Manager for Assets & Infrastructure:⁸⁹

[The Northern Schemes Manager] is up in Wairoa organising things at the moment. This is his latest notification:

Based on phone call with James Organised with Sam Prydes to move machinery to site today to attempt for mouth opening tomorrow low tide or the following low tide on Wednesday.

I have advised them to prep the site. Planning to have a couple of diggers and couple of bulldozers to move as much material as quickly as possible to existing mouth and lower the sand bar for new mouth location.

Hopefully that gives you some confidence.

We were a bit unsure, as our modelling suggested that the river may not be high enough to support a mouth opening. However, when rerunning the model we thought it was a 50:50 call and decided to err on the side of caution.

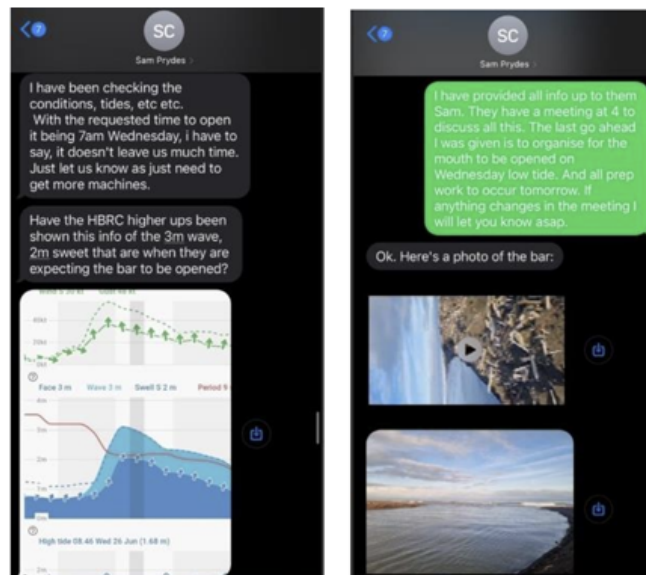
Also, the rock wall at Kopu Rd has been completed [...]



At 02.59pm: Prydes advised HBRC (via text message to the Northern Schemes, and phone call to the Senior Engineering Officer and River Engineer at **3:03pm**) that there may be insufficient time available to prepare for an attempted river mouth opening on Wednesday.⁹⁰



At 03.56pm: Further, Prydes noted in a text message to the Northern Schemes Manager that there were significant waves and swells forecast for the time of the planned attempt to open the mouth in a new position.⁹¹



⁹⁰ Email, Mon 24-6-2024 11.26am.

Note that the reference to “tomorrow low tide or the following low tide on Wednesday” is a copy of a mistake from the notification made by the Northern Schemes Manager. All communications with Prydes and all other internal correspondence refer to planned mouth openings on Wednesday or Thursday.

⁹¹ Text message, Mon 24-6-2024 2.59 pm.



At 04.00pm: HBRC conducted an internal operations meeting. The situation with regard to Wairoa, including the earlier decision to open a new river mouth, was discussed.



At 04.13pm: HBRC's Chair and Chief Executive received a text message from the Mayor of Wairoa:⁹²

Hi Nick and Hinewai, Hey I'm getting calls from concerned residents re the state of the Wairoa river bar and the imminent weather event. Could you please give me some clarification around the status and whether the community should have concerns. Kind regards Craig



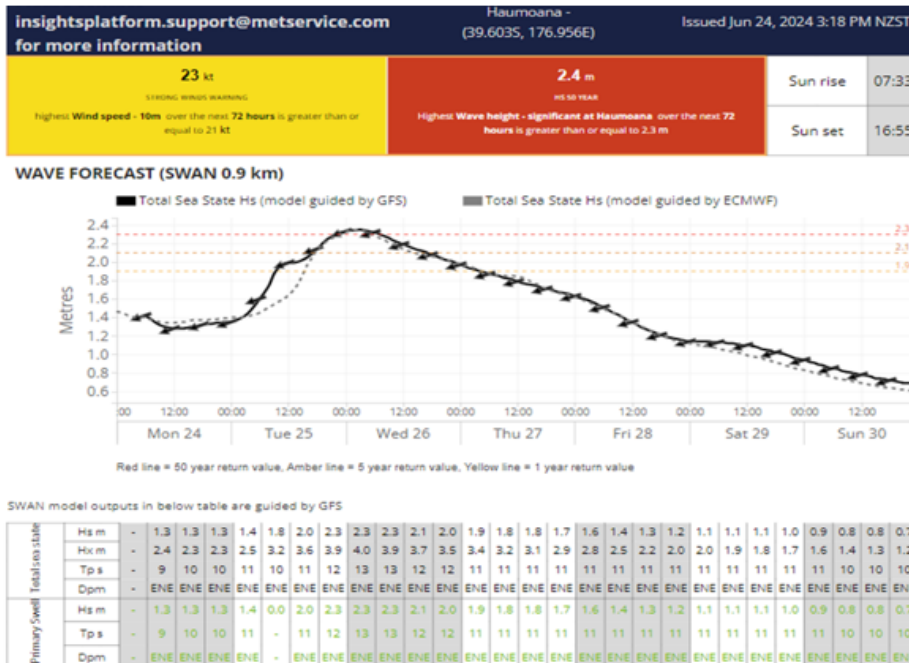
At 04.13pm: the HBRC Flood Forecaster forwarded a mail from the Council's coastal expert.⁹³

We are forecasting a large swell event to hit the coast between Tuesday and Wednesday this week, 25 and 26th of June.

According to the plot and tables below, from Tuesday at 12:00 am the swell will start to build up, peaking at 2.34 metres from 1:00 to 3:00 am at Haumoana. The swell then slowly recedes towards the end of the week.

The wave set-up forecasted is between 0.1 to 0.12 metres and the maximum tidal water levels are 1.5 and 1.39 metres during the event, whilst the wave period is of 12 to 13 seconds.

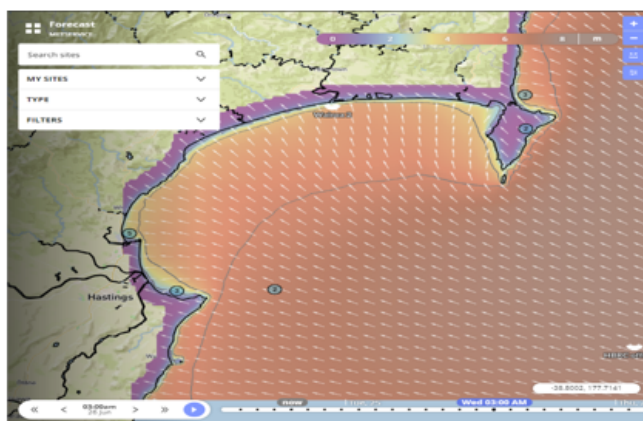
Please note that this is a 1 in 50-years event and that the offshore wave direction is SE, which wraps around Cape Kidnappers and Mahia Peninsula without much sheltering from these landmasses (see map below), therefore there's the potential of significant erosion along the shore.



⁹² Text message, Mon 24-6-2024 3.56 pm.

⁹³Text message, Mon 24-6-2024, 4.13 pm.

⁹⁴ Email to CDEM Controllers and others.



At 04.15pm: the Chief Executive responded to the Mayor of Wairoa: ⁹⁴

Hi Craig, A certain flow is needed for an opening to be successful - the team have an opening plan using local contractors - decision to be made tomorrow on whether to proceed. [Thanks Nic](#)



At 04.16pm: Prydes sent text messages to the Northern Schemes Manager: ⁹⁵

OK. Here's a photo of the bar. [Attaches photos]
 Very wide and deep. Sand pile available is double. But as discussed, we will need to get something delivered.
 double = do able. As in, if the decision is made to start stockpiling it, we can find it, just that [the](#) would require some long pushing



At 04.21pm: The Northern Schemes Manager responded at 4:21pm, stating: ⁹⁶

[River Engineer] has sent you an email confirming the discussed plan, if we need an additional [bulldozer](#) please organise for it to be transported. Is there no other bulldozer available in Wairoa?



At 04.13pm: The email referred to was sent at 4.18pm, which was the action plan for the work to be undertaken: ⁹⁷ This was the first the Wairoa CDEM Controller and Mayor knew of Pryde's involvement.

Kia Ora team,
 Putting down in email form the plan for the next couple of days in regard to moving the Wairoa river mouth from its current location on the western end of the [Whakamahi Lagoon](#) to the more beneficial location closer to the Eastern [Ngamotu Lagoon](#).
 Monday 24/06/2024
 - Decision made by HBRC to attempt a reopening of the mouth
 - Scheme manager in Wairoa to be HBRC primary point of contact (POC)
 - Prydes Contracting engaged to be Contractor for the operation- [Prydes Operations Manager] to be Contractor POC
 - Prydes will start Mobilising equipment to site in afternoon
 - Conversation with [Prydes Operations Manager]
 - Equipment available - 1x Bulldozer D8 - 1x Excavator 20T - 2x Excavator 13T -

⁹⁵ Text message, Mon 24-6-2024, 4.15 pm.

⁹⁶ Text messages, Mon 24-6-2024 4.16 pm.

⁹⁷ Text message, Mon 24-6-2024 2.59 pm.

⁹⁸ Email, Mon 24-6-24 4.21pm.

- Option to organise a secondary Bulldozer from Gisborne- Weather and road condition dependant

- 1600 Meeting regarding Matariki Rain Intel Report

- Email (this one) sent out

- Concerns as of Monday afternoon regarding Wednesday

- Low tide: 0238 - Sea State: 5.5-5.8m - On Shore Wind: 40-50 kts

Tuesday 25/06/2024

- Prydes to start moving Material over the course of the day

- Lowering height of beach crest by the new opening

- Moving material closer to the old mouth for closing

- Meeting will be held in the afternoon to discuss feasibility of continuing with Mouth relocation.

- Depending on decision based on information on Tuesday afternoon the Wednesday timetable will adjust

- Update questions to answer on Tuesday Afternoon 1600

- Low tide, Sea State, On Shore Wind, Earthworks completed (m3), Prydes Comments.

Wednesday 26/06/2024

If approval by HBRC is given on Tuesday afternoon

Opening will commence at Low tide



At 04.22pm: the Wairoa Mayor sent a further text message to the HBRC Chair and Chief Executive, forwarding the concerns of an, unnamed, third party:⁹⁸

FYI latest text received.

It seems that despite the signals to HBRC about the present high risk condition of the Wairoa bar, any action is coming late again. There should have been machines mobilised at least 24 hours ago or more. I understand that WDC has enquired too. This ongoing poor performance is unacceptable for Wairoa. Are they taking us seriously? If Nick Peet is aware of how precarious a situation we're in then Wairoa is in real trouble because the action does not match the knowledge. This can be managed and should be by now given the independent reports and very clear recommendations. I would like to endorse any chance you have to pass the towns extreme concern to the CEO HBRC.



At 04.58pm and 06.36: the HBRC Chair responded:⁹⁹

Thanks Craig for sending this through. Can you relay Nic's feedback and if you need me to call this person to hear them out further than a message, wry happy for you to give them my number.

And

Thanks Craig for sending this through. Nic's reply would be good to share. We will get an update tomorrow that you can pass on also.

During the **afternoon**, Wairoa CDEM Controller puts local iwi on standby for flood recon and possible use of marae as evacuation centres. Iwi began feeding information to her on river condition. CDEM Controller then updated local elected members.

⁹⁹ Text message, Mon 24-6-2024, 4.22 pm.

¹⁰⁰ Text messages, Mon 24-6-2024, 4.58 pm and 6.36pm.



At 08.37pm: MetService updated the Severe Rain Warning:

- Area: Hawke's Bay north of SH5
- Period: 36hrs from 9:00am Tue to 9:00pm Wed
- Forecast: Periods of heavy rain. Expect 180 to 240 mm of rain inland, and 100 to 150 mm of rain about the coast. Peak intensities of 15 to 25 mm/h during Tuesday afternoon and evening.



At 09.48pm: the HBRC Flood Forecaster sent out an updated forecast stating, relevant to Wairoa: ^{100 101}

Met Service has updated the Severe Weather Warnings to now include all of Hawke's Bay in ORANGE, and rainfall forecast totals have increased.

...

Wairoa

100-150 mm over 18 hours starting from 6 am Tuesday morning until midnight, then steady rain all day Wed/Thursday, totals up to 240 mm around Pukeorapa, less by the coast and in western catchments. River levels at Marumaru, Ardkeen and Wairoa at Railway could reach alert levels, (i.e. no immediate issues), however, with the Wairoa River mouth in poor condition, the forecast levels in the lower reach (by the yacht club and Ngamotu Road) will likely be high starting from Thursday morning (possibly earlier). This will of course depend on the actual amount of rain fallen, and we'll provide an update during the day on Tuesday. We are mobilising equipment to attempt opening the mouth in a better location, however, success will depend on factors such as the impact of the swell, and whether enough rain comes down to scour a new mouth. Surface flooding is possible in places like lower Kopuawhara, Nuhaka, Ohuia, Opoho.

Swell

Significant easterly swell. Concerns around Haumoana/Te Awanga coastline, and southern coast from Cape Kidnappers to Porangahau. No new info at present, we'll provide an update on Tuesday morning.

Minor update for CHBDC around Porangahau – forecast chart shows seas rising sharply on Tuesday afternoon, along with strong winds.

Tuesday 25 June 2024



At 08.09am: Northern Schemes Manager phoned Prydes to get an update on their progress. At this stage machinery was being mobilised to site, comprising two excavators and one bulldozer. A further bulldozer was being moved from Gisborne.



At 08.17am: the following text exchange occurred between the HBRC Chair and Mayor of Wairoa: ¹⁰²

HBRC Chair: Wairoa bar equipment mobilised yesterday and underway. Timing is important as needs high flows to have a chance of working ie can't do it a week in advance

Wairoa Mayor: Cheers yes fully aware of the ins and outs, but local knowledge is important too.

HBRC Chair: Agreed

¹⁰¹ Email, Mon 24-6-24 9.48 pm.

¹⁰² Text message exchange, Tue 25-6-2024, from 8.17 am.



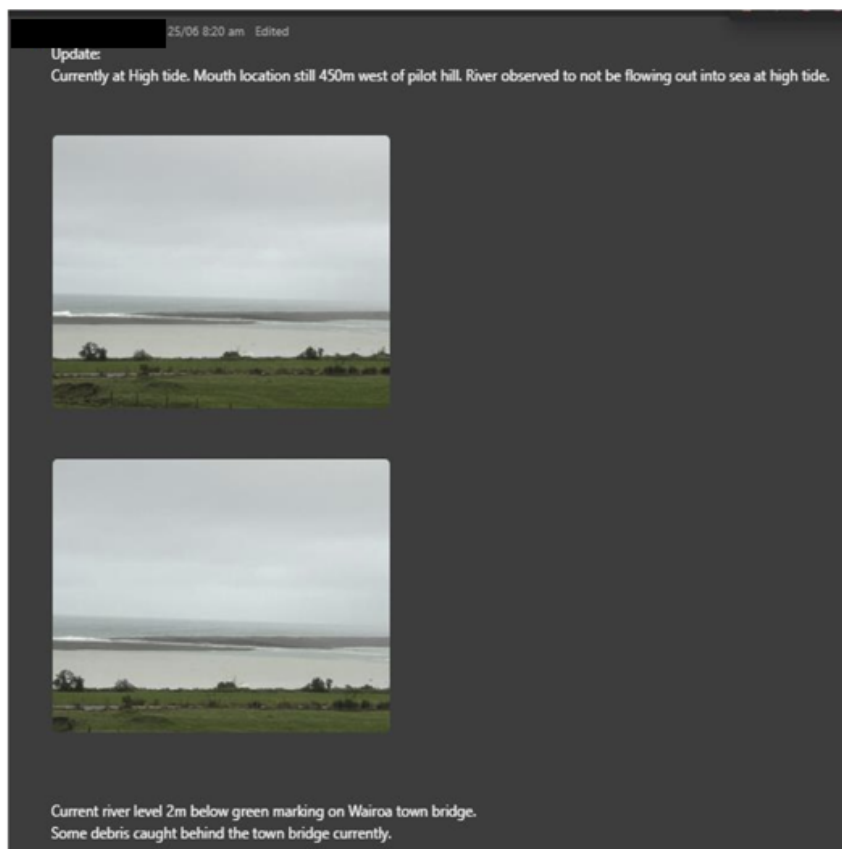
At 08.20am: the Northern Schemes Manager posted an update to the 'Surveillance and Field Reports' discussion in the HBRC MS Teams 'Asset Management' Channel:¹⁰³

Currently at high tide. Mouth location still 450m west of pilot hill. River observed to not be flowing out into sea at high tide.

Current river level 2m below green marking on Wairoa town bridge.

Some debris caught behind the town bridge currently.

Machinery being moved to site. Hoping to have them on site by ~10:30am
Will catch up with contractor after 10am meeting today.



At 09.01am: MetService updated the Orange Severe Rain Warning:¹⁰⁴

- Area: Hawke's Bay north of SH5

- Period: 35hrs from 10:00am Tue to 9:00pm Wed

- Forecast: Expect 180 to 240 mm of rain inland, and 100 to 150 mm about the coast. Peak intensities of 15 to 25 mm/h during this afternoon and evening. Note, further periods of rain or showers are forecast through the remainder of Wednesday, Thursday and Friday, but intensities and amounts are expected to be much lower. Moderate chance of upgrading to a Red Warning.

¹⁰³ MS Teams 'Asset Management' Channel Post in 'Surveillance and Field Reports', Tue 25-6-2024 8.20am.



At 09.57am: HBRC Flood Forecaster sent out an updated forecast:¹⁰⁵

Met Service has reissued the ORANGE warning for all of Hawke's Bay. Conditions look worse for Northern Hawkes Bay, mainly eastern catchment of Wairoa, Nuhaka, Mahia, Kopuawhara. Rainfall chart shows several 3 hour periods with 30 – 40 mm the 3 hours. This will likely cause the Kopuawhara stream to rise sharply later today. Overall effect on Wairoa river is likely to be limited to below alert level apart from near the mouth. The graph below is a forecast model using the river mouth mostly blocked. The reference to ramp and swing set is near the Yacht club along Kopu Road. Esk and coastal north of Napier - Continued rain all day Tues/Wed.

Swell forecast courtesy of [Coastal Specialist] -There was no significant change in the forecast for the next days. The swell peak is still about 2.4 metres at Haumoana with slight increase on maximum wave height (0.1 m) and wave setup (from 0.12 to 0.17 m in total). Other wave characteristics remain unchanged. Wave forecast for Porangahau is further below.



At 10.00am: HBRC conducted an operations meeting. The situation with regard to Wairoa, including the progress toward opening a new river mouth, was discussed.



At 10.30am: Wairoa CDEM Controller sent Facebook notice to community members in low lying areas of town to self-evacuate in advance of the event. Advised them to act during daylight hours.



At 11.32am: Prydes called the Northern Scheme Manager to discuss progress. Northern Scheme Manager advised that a second engineer (HBRC Senior Design Engineer) had been deployed to Wairoa and was available to assist as required.



At 01.00pm: First Group Controller meeting online. Technical expert said of Wairoa: "...looks ok only up to annual level - only issue around river mouth." HBRC advised that "Wairoa river mouth being worked on (probably in the morning)." It appears this anticipated timing referred to the opening itself.

There was a suggestion NIWA data showed different rainfall (it is not clear whether this comment related specifically to the Wairoa forecast).

We understand no regional plan to support Wairoa was discussed. Police/FENZ/St John advised they were on standby. NZDF advised had relocated to Napier and would not send support to Wairoa in advance of the event.



At 01.01pm: Northern Schemes Manager posted an update to the 'Surveillance and Field Reports' discussion in the HBRC MS Teams 'Asset Management' Channel:¹⁰⁶

Update of works at planned new mouth location looking from Kopu road by the sewage outlet. 2 diggers and 2 bulldozer on site prepping new mouth location.



At 01.11pm: Northern Schemes Manager posted a further update to MS Teams:¹⁰⁷

Update:

Current mouth still open. Dozer on site has moved gravel closer to mouth so it can be stockpiled then used to close old mouth.

¹⁰⁴ Email, Tue 25-6-24 9.57am.

¹⁰⁵ MS Teams 'Asset Management' Channel Post in 'Surveillance and Field Reports', Tue 25-6-2024 1.01pm.

¹⁰⁶ MS Teams 'Asset Management' Channel Post in 'Surveillance and Field Reports', Tue 25-6-2024 1.11pm.



At 02.00pm: Wairoa CDEM Controller sent a warning message to community via Facebook. Activated marae. At **3pm** and **4pm** sent updated emails to Controller list.



At 04.00pm: HBRC conducted an operations meeting. The situation with regard to Wairoa, including the progress toward opening a new river mouth, was again discussed.

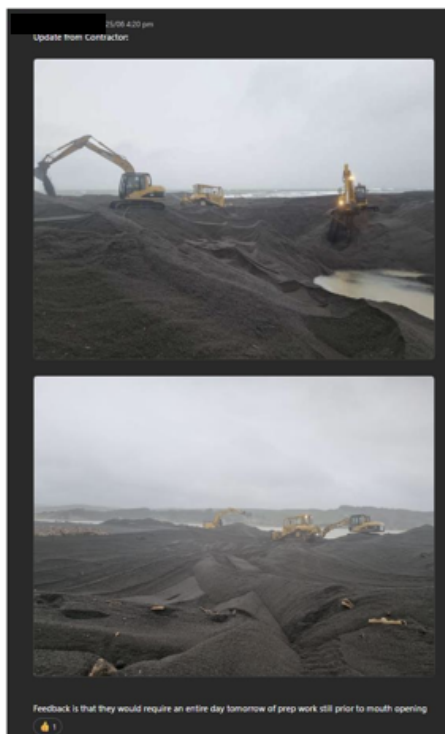


At 04.12pm: Prydes contacted the Northern Scheme Manager via text message with a photo showing progress of the work on the bar and saying:¹⁰⁸

Some photos just taken.
Realistically, we will need another full day tomorrow.



At 04.20pm The Northern Schemes Manager also posted the progress update on the 'Surveillance and Field Reports' discussion in the HBRC MS Teams 'Asset Management' Channel at, during the Operations Meeting.¹⁰⁹ The photos provided by Prydes (below) showed that they had excavated to water level on the upstream side of the beach crest.



At 04.41pm: The Northern Schemes Manager replied to Prydes at 4:41pm, stating:¹¹⁰

Talked to the rest of the team. Let them know the progress of works. River levels are expected to remain high till end of Thursday and swells expected to start dropping after mid-day Wednesday. If we can't aim for opening by low tide tomorrow, carry on and aim for opening on Thursday.

¹⁰⁷ Text message, Mon 24-6-2024 4.12 pm.

¹⁰⁸ MS Teams 'Asset Management' Channel Post in 'Surveillance and Field Reports', Tue 25-6-2024 4.20pm.

¹⁰⁹ Text message, Mon 24-6-2024 4.12 pm.



At 04.55pm: the HBRC River Engineer sent an update on the action plan to Prydes via email.¹¹¹

Kia Ora Team, Following on from the 4pm meeting

Tuesday 25/06/2024

Prydes to start moving Material over the course of the day

- Lowering height of beach crest by the new opening
- Moving material closer to the old mouth for closing

Meeting will be held in the afternoon to discuss feasibility of continuing with Mouth relocation.

Depending on decision based on information on Tuesday afternoon the Wednesday timetable will adjust

Update questions to answer on Tuesday Afternoon 1600

Lowtide: 1300 Wednesday - Sea State: High - On Shore Wind: High - Earthworks completed (m3): Minimal-Moderate –

Prydes Comments: 1 more day of earthworks required

Outcome:

- Further monitoring over the night of river levels and rain
- Decision to carry on with the process of moving the river mouth with below provisions

Wednesday 26/06/2024

0600 With input from flood modeler Decision will be made on site between HBRC POC and Contractor POC to either.

- Option 1; Proceed with Opening and closing the River mouth at Low tide
- Option 2; Proceed with earthworks over the course of the day, and monitor for a Thursday Opening

If Option 2 is the best way to move forward for a successful opening of the bar;

If Over the course of the day due to weather, tide or any other unforeseen event work becomes unsafe to proceed,

All equipment, machinery and personnel are to proceed to a safe location

Over the course of the day, an opportunity to relocate the mouth becomes available

HBRC and Contractor POC will make decision on site to proceed with the opening



At 06.00pm: HBRC sent weather update in relation to other areas. The email indicated other locations would be updated later in the evening.

¹¹⁰ Email, Tue 25-6-24 4.55pm.



At 07.46pm: MetService updated their Orange Severe Rain Warning:

Area: Hawke's Bay north of SH5

- Period: 25hrs from 8:00pm Tue to 9:00pm Wed

- Forecast: Expect a further 120 to 160 mm of rain inland on top of what has already fallen, and 60 to 90 mm about the coast. Peak intensities of 10 to 15 mm/h from this evening to Wednesday morning. Note, further periods of rain or showers are forecast through the remainder of Wednesday, Thursday and Friday, but intensities and amounts are expected to be much lower. Moderate chance of upgrading to a Red Warning. Impact: Streams and rivers may rise rapidly. Surface flooding, slips, and difficult driving conditions possible. Action: Clear your drains and gutters to prepare for heavy rain. Avoid low-lying areas and drive cautiously.



At 09.00pm: Wairoa CDEM Controller advised Mayor that two marae were on standby.



At 09.48pm: the HBRC Flood Forecaster sent an updated forecast via email:¹¹²

Met Service has reissued the ORANGE warnings, similar to previous. Their update is near the bottom of this message. We've had quite a few GREEN level alarms. The summary is below the rainfall charts. This satellite image provides a good overview of the low of the east cape and the effect it has bringing the rain on to the land. Here's a summary of rain that has fallen in the last 12 hours (8am to 8pm June 25). The above rainfalls in 12 hours are generally around a mean annual event, i.e. we'd expect to see this rainfall around once per year, which translates to river levels that are generally within the main channel. There are still a few places to keep closer watch on, since Met Service are predicting continued rain (Wairoa 120-160mm inland, 60-90mm coastal, Rest of Hawkes Bay, 70-100 mm inland, 50-80 mm elsewhere.

Wairoa:

Forecast levels at Town bridge could get up to the playground level on the d/s side, and remain there for most of Wed. Note the forecast is tracing slightly below the observed data. This assumes the mouth is partially blocked, which it is likely to stay in that state due to the high seas. Wairoa at Town Bridge – forecast and observed. Wairoa at Yacht club - Forecast. Kopuawhara – observed only – still below alert level, however additional rain at night could increase sharply. Kaiwaitau Road still at risk.

[...]

Swell - Reports of some waves cresting the beach at Westshore. No damage reported. Swell height around 2.5 m. Forecast is for swell to increase until around midnight – Haumoana to Clifton, as well as Mahanga still at risk.

¹¹¹ Email, Tue 25-6-24 9.48 pm.

Wednesday 26 June 2024



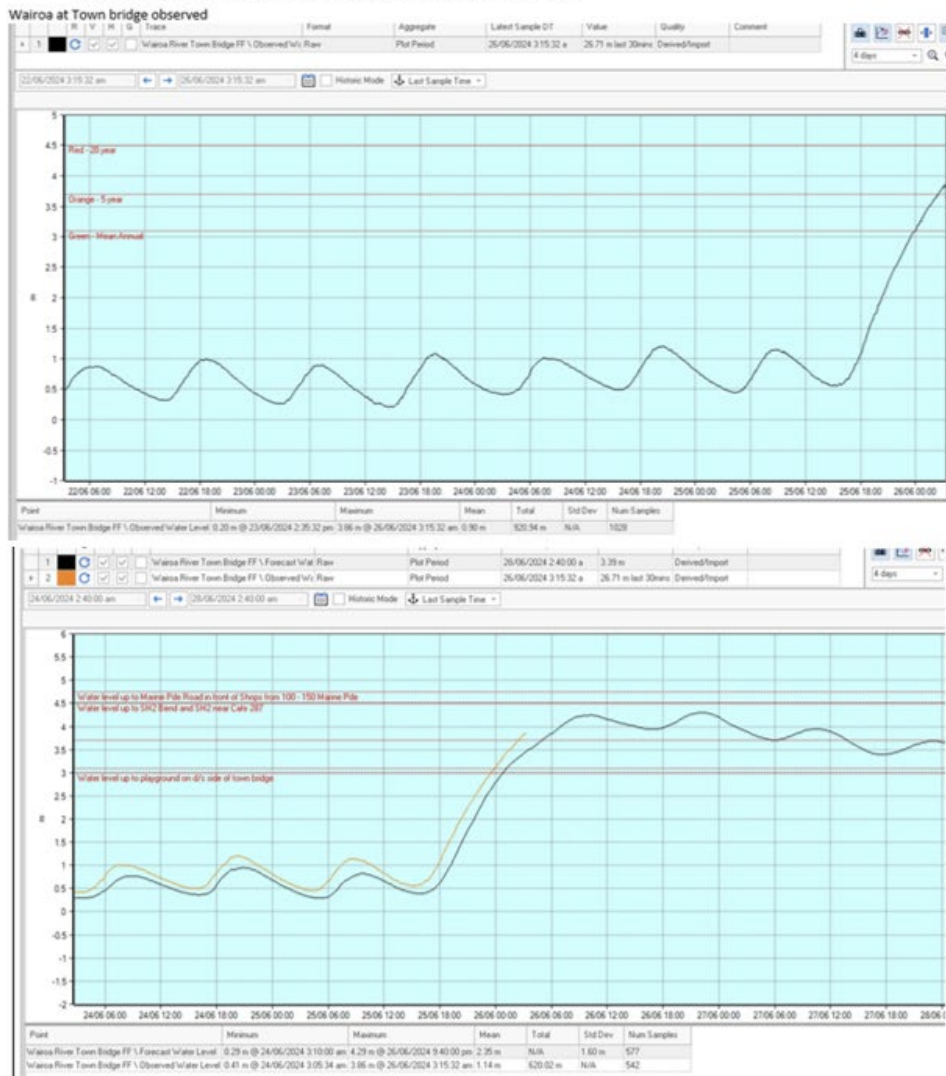
At 03.59am: the HBRC Flood Forecaster, who had been monitoring rivers across the Hawke’s Bay overnight, sent an updated forecast for Wairoa:¹¹³

Wairoa river has risen higher than anticipated in the last few hours. It has reached the Orange – 5 year level at the Town Bridge. This could result in flooding along Kopu Road, depending on the condition of the mouth. Upper catchments are still rising slightly, feeding more water to the lower reaches. Levels in the lower reaches are likely to continue to rise.

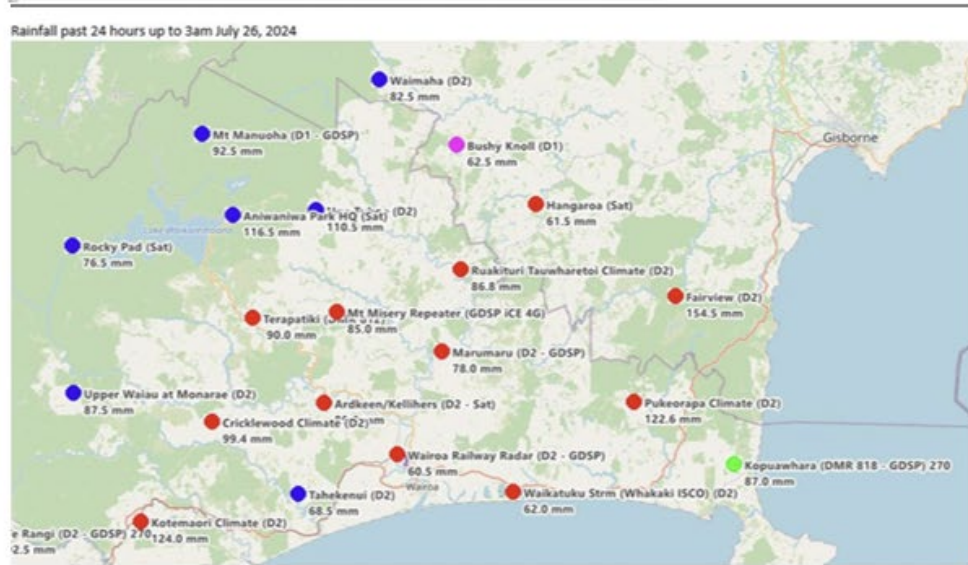
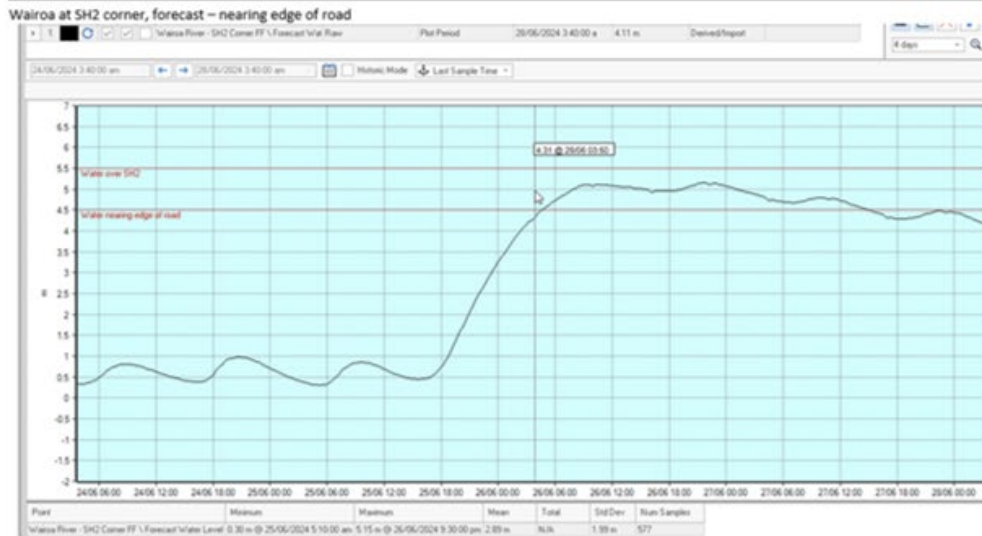
[...]

This is not significant rainfall, and forecast rainfall is to be less intense over Wed. morning, however, the steady rain on Wed. will likely keep the river high for many hours.

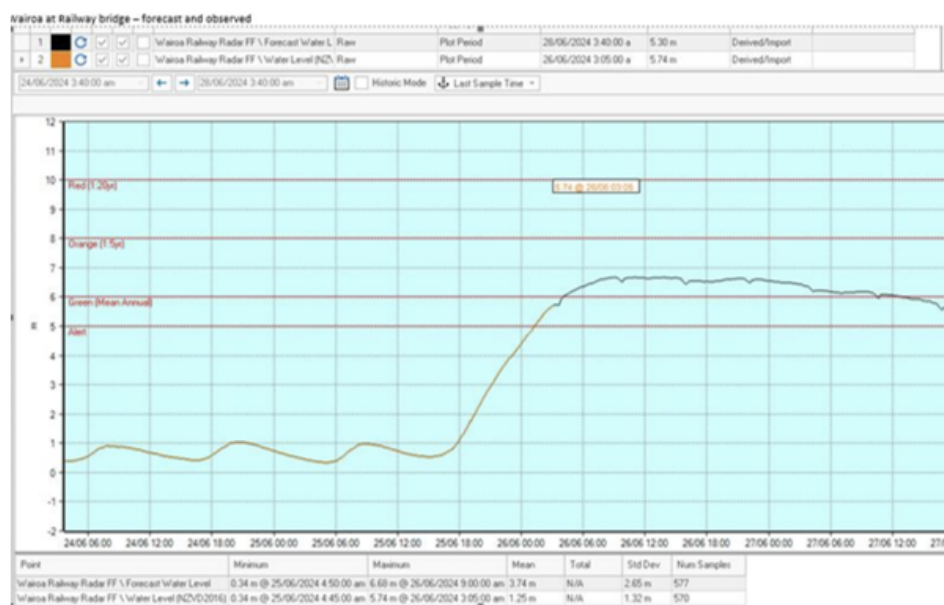
Attachments to the email included the following.



¹¹² Email, Wed 26-6-24 3.59 am.



This is not significant rainfall, and forecast rainfall is to be less intense over Wed. morning, however, the steady rain on Wed. will likely keep the river high for many hours.



At 04.04am: the Wairoa CDEM Controller started to call at risk residents and mobilised first responders and the local CDEM network. An evacuation centre was opened and Facebook messages sent, telling the community to self-evacuate or call 111.



At 04.36am: Email update from HBRC Group Controller re flooding in other areas. No mention of support for Wairoa.



At 04.53am: the Wairoa Controller called the HBRC river modeller and updated him re flooding and evacuations.



At 05.09am: the Wairoa Controller called Mayor and asked him to come to the EOC.



At 05.15am: the Wairoa Controller called 111 to activate the FENZ siren to wake the town residents..



At 06.12am: an Emergency Mobile Alert was sent, advising Wairoa residents:

FLOODING - Evacuate immediately

CIVIL DEFENCE FLOOD WARNING: there is serious flooding in Wairoa. River levels rising rapidly.

LEAVE NOW if you are in MACLEAN STREET, KOUPU ROAD and ALL STREETS IN BETWEEN. If possible, stay with friends or whanau, or go to the CIVIL DEFENCE CENTRE at War Memorial Hall. Call 111 if you are in imminent danger. Take pets with you, take grab bags with supplies for your whole household including pets if safe to do so.

DO NOT DRIVE OR WALK THROUGH FLOOD WATERS. The water may have washed away parts of the road and may contain debris. Treat all flood water as contaminated and unsafe. **STAY AWAY** from flooded areas until Civil Defence gives the all-clear.

<https://www.facebook.com/wairoadistrictcouncil> Issued at 06:10 on June 26, 2024.

Overnight, the observed rainfall exceeded the most recently forecast rainfall at a number of sites and large swells arrived as forecast. High tide occurred shortly before 9am. .



At 06.37am: the Mayor of Wairoa declared a state of local emergency, as a result of significant flooding in the vicinity of Kopu Rd in the lower reaches of the Wairoa River. .



At 06.53am: the HBRC Chair exchanged text messages with the Mayor of Wairoa.¹¹⁴

HBRC Chair: Morena Craig if you need anything today just let me know. Nic is updating me regularly. Aroha to the evacuated whanau.

Wairoa Mayor: Will do just called a state of emergency



At 06.56am: the Northern Schemes Manager posted an update to the 'Surveillance and Field Reports' discussion in the HBRC MS Teams 'Asset Management' Channel.¹¹⁵

Wairoa bar update: Contractor to assess condition this morning. If river level and swell conditions are deemed unsafe for the health and safety of the contractor at site, they will stop works on the Bar opening. Otherwise, the plan is to carry on working towards a planned mouth opening for Thursday around midday. Will get some photos if safe to do so as light comes out.



At 07.42am: the Mayor of Wairoa exchanged text messages with the HBRC Chair and Chief Executive¹¹⁶

Wairoa Mayor: Hey, pass onto [HBRC Flood Forecaster] that his comms are fantastic. I have so much faith in that man

HBRC Chair: Of course he and the rest of the team. Happy to pass on. Keep the faith e hoa.

HBRC CE: If only he could stop it raining

Wairoa Mayor: Exactly, we need to get past high tide and we should see a huge improvement

HBRC CE: Yeah all watching that closely



At 08.19am: Prydes sent a text message the Northern Schemes Manager:¹¹⁷

We are stopping work. Our machines are flooded and it is unsafe to proceed

Immediately following the event, three mouths were open in the Wairoa River bar.¹¹⁸ One of those was to the east of where Prydes had been working (50m wide),¹¹⁹ one opposite Pilot Hill (200m wide) and one where the existing mouth had been (50m wide).



At 03.00pm: CDEM Controllers' meeting Wairoa Controller asked if Wairoa should self-evacuate now. Told that worst had occurred and river mouths had opened.

¹¹³ Text message exchange, Wed 26-6-2024, from 6.53 am

¹¹⁴ MS Teams 'Asset Management' Channel Post in 'Surveillance and Field Reports', Wed 26-6-2024 6.56am

¹¹⁵ Text message exchange, Wed 26-6-2024, from 7.42 am.

¹¹⁶ Text message, Wed 26-6-2024 8.19 pm

¹¹⁷ Email, Wed 26-6-24 6.38pm

¹¹⁸ Confirmed later reviewing arial footage of the bar.

Appendix Two: Current Wairoa Lagoon and River Mouth Instructions HBRC (SOPs)

Lagoon & River Mouth Instructions



8. 261-004 Wairoa River

Definition: Te Wairoa Hōpūpū Hōnengenge Mātangirau.

Contacts

Mouth monitored periodically by Northern Scheme Manager.

Contractors

Pryde Contracting open the mouth (Ph. 06 838 4040 or Ph. 06 837 7805). If they are unable to then it is their responsibility to arrange an alternative contractor (Hamish Pryde, Ph. 027 442 6386 or, Sam Pryde, Ph. 027 585 1766).



Maximum water level

11.65m which is the top of the timber piles of the old pier out by the coast.

Notes

If the mouth is partially closed or restricted, or is not in a very good position, then attention to weather forecasts and sea conditions is required as mechanical openings of this mouth may normally involve quite an extensive operation, sometimes-taking days to complete.

The potential for damage due to flooding caused by a river mouth blockage is significant. Numerous small pastoral and residential properties in the Kihitu and Kopu Road areas are also affected. Access Roads into Whakamahi and Kihitu become blocked.

After taking the above into consideration, a significant head of water in the river along with favourable sea conditions is required for a successful mechanical opening. Ideally, all openings should be undertaken at low tide with a relatively flat sea.

Excavated material is to be stockpiled clear of the mouth to minimise chances of re-blocking.

The mouth's position is highly dynamic, generally migrates west of centre toward Pilot Hill. Notable erosion occurs when mouth is at Pilot hill carpark.

For a successful realignment of the Wairoa bar, river needs to completely close, gain a substantial head of water, and then we recut to the old pile lines.

*"The shingle was readily scoured out with a flood but was quickly dammed back by heavy seas sweeping in during gales from the south, the direction from which the East Coast gets its worst weather. Continuous efforts were made to improve the situation, usually consisting of waiting for a complete block, and then, when the river was banked up, making a new cut and letting the water go. This however would usually only last a few weeks or months before the shingle would pile up again and the bar would be blocked again."*⁹



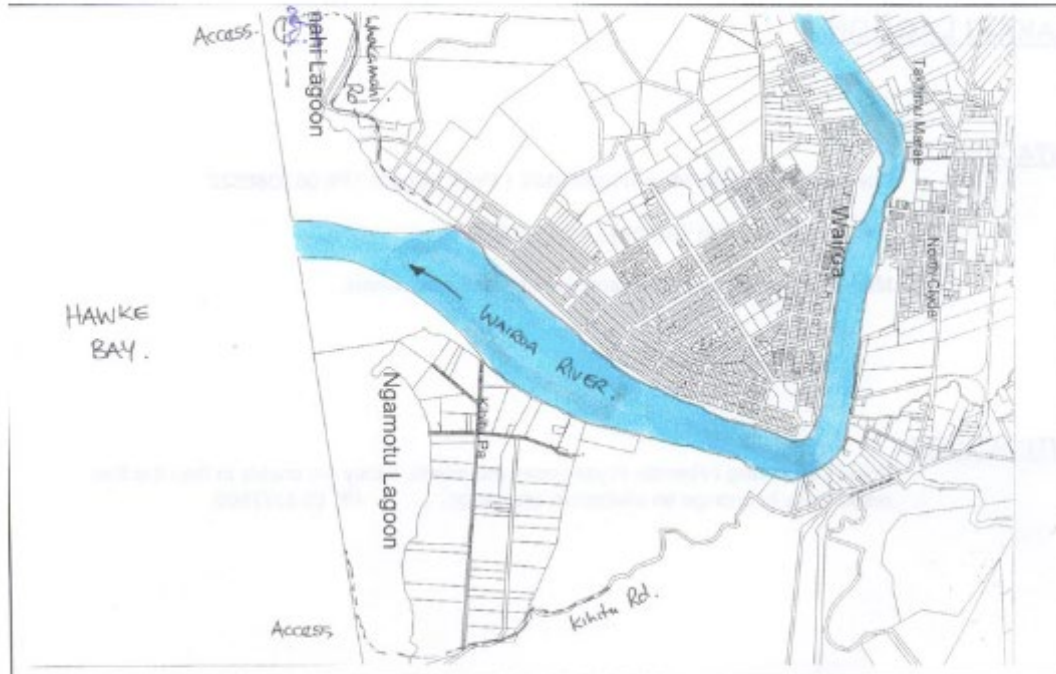
⁹ **Crossing the Bar**, Joy Hippolite, August 1999. Chapter 3 – Land Taken For Harbour Purposes, page 33 (https://forms.justice.govt.nz/search/Documents/WT/vs_DOC_93955202/Wai%20201%2C%20X047.pdf) from Lambert, p 469; S D Waters, Richardsons of Napier, **A Century Of Coastal Shipping 1859-1959**, Richardson and Company Ltd, Napier 1959, pp 31-32.

Lagoon & River Mouth Instructions



Wairoa River

Location and Access



Access is available from both sides of the river. From the Northern side go through the gate and follow the track off Kihitu Road (it follows around the toe of the hill). Southern side access is off the end of Whakamahi Road.

Ideal Location of Mouth



Appendix Three : HBRC Asset Management Group internal briefing slides June 25, 2024

MOST LIKELY SCENARIO

<Populations likely to be affected>

- With to Silt
- Mangrove Channel blocked – drains – implications (WDC)
- Wairoa
- Wairoa Mouth closing
- Esk/Te Ngarue – flooding lower parts
- Wairoa Domain – safety
- Wairoa
- Wairoa – and other – green – red – areas – low – high – sea – level
- Haumoana – blocks us – impact to campground
- Southern Coast (Kopu) – impact to – impact to – impact to – impact to – impact to

<Lifeline Assets at risk>

Haumoana Domain – impact to – impact to – impact to – impact to – impact to

Haumoana Domain – impact to – impact to – impact to – impact to – impact to

Wairoa Domain – impact to – impact to – impact to – impact to – impact to

<Flood Protection status>

Flood gates recently installed – including Haumoana HP

Overtopping crest at Haumoana

[Hide this slide if not required]

HAWKES BAY REGIONAL COUNCIL

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WORST CASE / MOST DANGEROUS SCENARIO

<Populations likely to be affected>

Swell blocks river mouth and significant rain behind – inland – Wairoa.

Esk/Te Ngarue – flooding lower parts.

Haumoana blocks – Grange Creek houses. Overtopping into Haumoana Domain.

Impact Wairoa and Southern Coast over HP.

A lot of rain in Southern Coast eg Waimarama. High winds – power out.

CHBDC coastal exposure to high winds, seas and erosion.

<Lifeline Assets at risk>

<Flood Protection status>

[Hide this slide if not required]

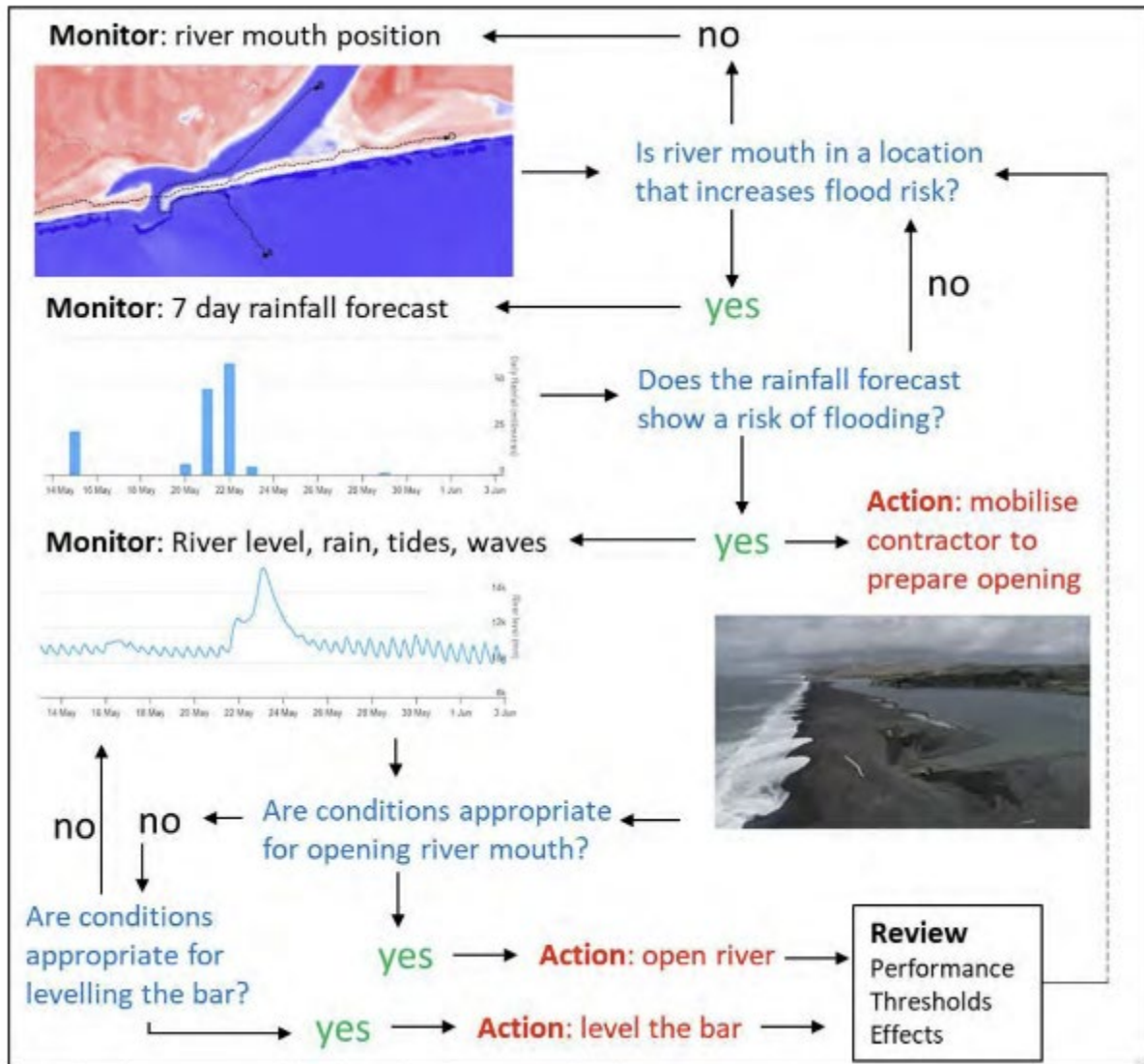
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RECOMMENDED ACTIONS

- <Summary of recommended actions>
- Deploy pumps to Haumoana
- Wairoa River mouth relocation (Hari, JS)
- Monitoring assets.

Appendix Four: Technical Report Trigger Action Plan for monitoring and managing the Wairoa River mouth.¹¹⁹



¹¹⁹ Second Draft Tonkin + Taylor Review, p 24.