Appendix L Preferred option MCA scoring memos

Memorandum

To:	Waipoua Project Team
From:	**Mark Hooker (Tonkin + Taylor - writer), Andrew Donald, Matt Gardner (Land River Sea - flooding criterion only)**
Date:	**5 March 2024**
Subject:	**Multi-criteria analysis – Waipoua River Shortlist** **Impacts group of criteria (flooding and economic impacts)**

1 Introduction

The Waipoua Project Team (WPT) is tasked with recommending a preferred option for flood management in the Masterton urban reach of the Waipoua River. This recommendation will be made to Greater Wellington Regional Council (GWRC). Four concepts have been shortlisted, and multicriteria analysis (MCA) will be used as a tool to compare and rank the four concepts against eight different criteria. Each criterion is being scored prior to the workshop. These scores will be discussed, possibly adjusted, and agreed at an MCA workshop to be held with the wider Waipoua Project Team (WPT).

2 Background

This report summarises the evaluation of the concepts for the effects/impact group of criteria. These comprise:

- Flooding behaviour/impacts
- Economic

The report records the scores and the approach taken to scoring.

True Left Bank (TLB) or TRB refer to the side of the river when facing downstream.

Scoring took place at a meeting on 5 March 2024. Scorers were Matt Gardner (flooding impacts only), Mark Hooker and Andrew Donald.

3 Methodology

As decided at the WPT meeting of 25 February 2025, a scoring scale of -5 to +5 has been adopted. We have defined this as follows:

-5 large negative impact, or risk

-3 moderate negative

-1 slight negative

0 neutral

1 slight positive

3 moderate positive

5 large positive impact or risk

Data / Information used:

- The scoring team's existing knowledge of the project and concepts formed to date (shortlist options maps and options descriptions were available but did not need to be referred to).
- Flood Damage Assessment report broad outcomes.
- Previous work by WPT on Pros and Cons.
- Input from Matt and Susan from Land River Sea, in terms of interrogating model results during the meeting.

To assess the **flooding behaviour/impacts** of each of the proposed concepts, consideration has been given to the following aspects:

- The reduction in flooding, and what is still exposed to flooding.
- The degree to which the concept addresses residual risk or over-design event, i.e. likelihood of failure and/or potential to fail safely.
- Impacts upstream or downstream of the urban reach.

To assess the **economic impacts** of each of the proposed concepts, consideration has been given to the following aspects:

- High level commentary and provisional scoring only, as the group has no specific expertise or information to support detailed scoring of economic assets.
- We expect that affordability of the proposed works will be discussed under "cost" at the MCA workshop and this is not considered here.

4 Key assumptions

As part of the assessment, the following assumptions have been made:

Assessment Assumptions (flooding behaviour/impacts)

- That 5% reduction in flow for Option 4 can be achieved. Work is still outstanding (Waipoua Nature-Based Solutions, NBS, project) as to whether NBS can be effective and what might be involved.
- Option 3 has not been thoroughly defined, in terms of what it might look like exactly at Mawley Park (access and impact), and whether existing stopbanks close to river will be retained in some form, and if so, to what level of service.
- Assumed that all stopbanks/flood walls are feasible to construct on the alignments shown – and that any feasibility issues have been picked up under the 'feasibility' criterion.

Assessment Assumptions (economics)

- Option 3 has not been thoroughly defined, in terms of what it might look like exactly at Mawley Park (access and impact), and whether existing stopbanks close to river will be retained in some form, and if so, to what level of service.
- No-one can say what the insurance industry will do, but we have assumed that the level of protection of all Options 1-4 will remove the uncertainties and increased costs around insurance.
- We understand that MDC will carry out its own scoring of this criterion and we would value its input to be considered alongside our assessment.

5 Scoring

See the following tables which Include:

- Score (-5 to +5) negative score of -5 reflects a strong negative, a positive score of +5 reflects a strong positive.
- Key reasons for score.

5.1 Flooding behaviour/impacts

Besides the "do nothing" option, Options 1 to 4 have very similar impacts on flooding overall. We have taken the approach of assigning Options 1 to 4 a "base score" and then focussing on differences between the options. The following apply to all four options:

- Flood impacts downstream on Ruamāhanga flood levels are very small (around 3 cm on the Ruamāhanga floodplain)
- Flood impacts from the golf course upstream on the Waipoua River are negligible (reduce to zero). There is a small water level increase at Mahunga Farm under all four options.
- All options remove flooding in Masterton in a 1%AEP + CC beneficially affecting large numbers of residential, commercial and industrial properties.
- Berm widening and lowering for all options at the bridges, has made a significant impact on freeboard available, compared to not doing this.

We note that Mawley Park has a residual risk whatever option is proposed and poses a significant loss-of-life risk in case of breach or over design event. This is currently managed through flood warnings.

Our base score for Options 1 to 4 is **+4**. It could have been higher, but all four options channel and concentrate flows through the town with a consequent residual risk from failure or overtopping, especially at the bridges. The road bridges have little freeboard in a 1%AEP + CC scenario and have not been modelled in detail – this risk is present to some extent in all options.

Flooding behaviour/Impacts

Concept	Name	Score	Reasons for score
-	Do nothing	-4	• There is existing flood protection, and Masterton is at risk only in a large flood. • A flood risk exists already and will worsen over time. Flooding and the threat of flooding cause major impacts on the town that will be reflected in other criteria. • On the plus side, this option doesn't further channelise/concentrate the flow like Options 1 to 4 do, which could have unforeseen consequences and leads to greater residual risk (development in areas still at risk of flooding in an overdesign event or stopbank failure).
1	Improving and extending existing banks	+3	• This option results in the highest stopbanks so increased risk (mainly the consequence) of failure, also the least freeboard at the bridges. • May result in larger stopbanks needing to have footprints closer to river, which may increase risk.
2	Undertaking extensive work in the river channel	+4	• Greater capacity in the channel leads to lower stopbanks, more capacity at bridges, possibly less risk of failure. • This option is more reliant on being able to maintain the channel capacity, which may or may not pose a risk long term to this flood impact being achieved (berm buildup after lowering). • This option would be more sensitive to aggradation, although noting that degradation has been a consistent trend (earthquake?). • The score has not considered operational impact, geomorphology or feasibility aspects here beyond the risk to success of this flood benefit being achieved. The scorers suggest revisiting this score downwards if these aspects are not adequately captured elsewhere.
3	Retreat some stopbanks	+4	• Doesn't protect the Sports Bowl area and Mawley Park from floods bigger than 10%/5% AEP (10-year to 20-year). The exact level of protection to these sites has not been well enough defined. • Also results in lower stopbanks compared to Option 1, but impact on water levels at bridges compared to Option 1 is negligible. • This option provides more room in places so would be less vulnerable to aggradation occurring. • Provides a route for water on the TLB if Colombo Road bridge blocks/backs up. • Presumably results in greatly reduced loss-of-life risk at Mawley Park from residual risk, as we assume permanent occupancy would no longer be possible (social, economic etc. impacts of this not assessed here). Noting that how this option is scored depends heavily on how the impacts on Mawley Park/Sports Bowl area are weighted.

Concept	Name	Score	Reasons for score
4	Implement nature-based solutions in the upper catchment	+5	Improved compared to Option 1 due to lower stopbanks and greater freeboard. Less flow through town reduces the risks of failure. We have not assessed the feasibility of achieving this 5% reduction in flow, but note concerns about how it may be achieved, timeframes and maintaining it long-term.

5.2 Economics

We adopted a base score of **+4** for Options 1 to 4, reflecting our understanding of the scale of benefit due to increased investment/confidence and reduced insurance cost/uncertainty. We also expect a short-term economic boost to be generated by the construction itself, particularly if local contractors are used.

Economics

Concept	Name	Score	Reasons for score
-	Do nothing	-5	Huge impacts on future development and investment in Masterton. Effects have been felt already in terms of insurance concerns and delayed/missed investment.
1	Improving and extending existing banks	+4	Base score applies.
2	Undertaking extensive work in the river channel	+4	Base score applies.
3	Retreat some stopbanks	+2/3	Impact is unclear on Mawley Park and Sports Bowl/deer park/BMX track/sports field. Fewer visitors and/or less money spent. We have assumed that Mawley Park is no longer viable under this scenario but this is open to discussion. As with our scoring of flood benefits, scoring of this option depends largely on the value that is put on protecting Mawley Park and the Sports Bowl area.
4	Implement nature-based solutions in the upper catchment	+4	Noting that the NBS (afforestation? Wetlands? Room for River? etc.) will have economic impacts but we have not sought to score these.

6 Additional matters

We note that spilling water preferentially on the TLB upstream of Colombo Road may be a sensible component of the preferred option, whichever concept is selected.

Available freeboard at the bridges is a major issue and will need to be investigated (modelled) in more detail in the next stage of development/design.

Residual risk at Mawley Park emerged as a topic of conversation. There is a risk to life here because:

- The stopbank is close to the river,
- The park is immediately upstream from the SH2 bridge (which could block)
- Water could pond quickly to a considerable depth.

We wonder if there could be a compromise in Options 1, 2 or 4 that would allow for a degree of stopbank retreat while still allowing a feasible amount of protected land for Mawley Park at an acceptable risk.

Regards

[Signature]

Mark Hooker	Andrew Donald	Matthew Gardner (flooding only)
T+T	WPT team member	Land River Sea consulting

Memorandum

To:	Waipoua Project Team
From:	Daphne Te Whare, Jimmy Haeata, Garry Foster & Ella Boam
Date:	7 March 2024
Subject:	**Multi-criteria analysis – Waipoua River Flood Mitigation Optioneering** Te Mana o Te Wai

1 Introduction

The Waipoua Project Team (WPT) is tasked with recommending a preferred option for flood management in the Masterton urban reach of the Waipoua River. This recommendation will be made to Greater Wellington Regional Council (GW). Four concepts have been shortlisted, and multicriteria analysis (MCA) will be used as a tool to compare and rank the four concepts against eight different criteria. Each criterion is being scored prior to the workshop. These scores will be discussed, possibly adjusted, and agreed at an MCA workshop held with the WPT.

2 Background

This report summarises the evaluation of the concepts for the Te Mana o Te Wai criteria.

The report records the scores and the approach taken to scoring.

3 Methodology

Data / Information used (valid for all criteria): shortlist options descriptions.

To assess the consideration of Te Mana o Te Wai for each of the proposed concepts, consideration has been given to the following:

- Does this concept enhance the mana, mauri and wairua of the river? *NB: see assumptions.*
- Does the option meet the hierarchy of obligations?
    - First, the health and well-being of water bodies and freshwater ecosystems
    - Second, the health needs of people (such as drinking water)
    - Third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.
- Does the option meet the principles of Te Mana o Te Wai?
    - Mana whakahaere: the power, authority, and obligations of tangata whenua to make decisions that maintain, protect, and sustain the health and well-being of, and their relationship with, freshwater

- Kaitiakitanga: the obligations of tangata whenua to preserve, restore, enhance, and sustainably use freshwater for the benefit of present and future generations
- Manaakitanga: the process by which tangata whenua show respect, generosity, and care for freshwater and for others
- Governance: the responsibility of those with authority for making decisions about freshwater to do so in a way that prioritises the health and well-being of freshwater now and into the future
- Stewardship: the obligations of all New Zealanders to manage freshwater in a way that ensures it sustains present and future generations
- Care and respect: the responsibility of all New Zealanders to care for freshwater in providing for the health of the nation.

4 Key assumptions

As part of the assessment, the following assumptions have been made:

Assessment Assumptions

- It is acknowledged that while there are definitions of mana, mauri and wairua, their true meanings and value can be difficult to articulate. For this work, the mana, mauri and wairua of the river been considered by reflecting on the following:
  - I am the river and the river is me.
  - Step into the life of the river. What is the river saying?
  - How is this concept helping the river live its own life?
  - Does this concept let the river realise its potential?
  - What is the history of the river? What is its experience?
  - How does this concept affect the environment surrounding the river?
  - The river is part of a wider interconnected environment. These interconnected natural processes occur on a scale much larger than just the urban reach. The river is a stream of debris transported by water. It connects to the mountains and changes gravel to sand.
  - The river has natural fluctuations. The water levels increase and decrease with the seasons and on longer time scales.
  - The river should be free and dynamic. It should be self-determining and choose its own path. The river should be able to express itself.
  - Species diversity contributes to the river's mauri. This is both flora and fauna.
  - The river should be revered. It was here before us and will be here after we're gone.
  - We're not in charge of the river.
  - If the river dies, we die.
- The scoring is largely based on the extent and frequency of anthropogenic intervention required to 'manage' the river.
- A score of zero reflects the present situation with no degradation or enhancement of mana, mauri and wairua.
- The scoring takes into account the potential impacts to Te Mana O Te Wai in the future from the decisions we make today.

- Under concept 3, is it assumed that erosion is more tolerable on the true left bank and the river has the ability to erode and change course (this may mean that the existing stopbanks are no longer maintained).

Mitigation Assumptions

- N/A

5 Scoring

See the following tables which include:

- Score (-5 to +5) negative score of -5 reflects a strong negative, a positive score of +5 reflects a strong positive.
- Key reasons for score, including mitigation taken into account.

5.1 Te Mana o Te Wai

A high score would reflect the concept supporting Te Mana o te Wai values and principles and that it enhances the mana, mauri and wairua of the Waipoua (generally positive). A low or negative score would reflect that the concept does not meet these values or degrades the mana of the Waipoua (generally negative).

Concept	Name	Score	Reasons for score
1	Improving and extending existing stopbanks	-3	• This concept is an extension of the existing situation and does not enhance the mana, mauri or wairua of the river. • The river will continue to be confined in the future, probably for many decades. The nature of the floodplain in which the river could develop its own course will not be determined by the river. The confinement of the river restricts natural processes and reduce self-healing of the river and surrounding environment. • This concept will commit future resources to maintain the rivers confinement, continuing an ongoing cycle of dictating the nature and path of the river. • This concept presents a continuation of the status quo (restricting the river) which may present a barrier to any future opportunities to give the river more room.
2	Undertaking extensive work in the river channel (and upgrading the stopbanks)	-4	• This concept is an extension of the existing situation and does not enhance the mana, mauri or wairua of the river. • The river will continue to be confined in the future, probably for many decades. The nature of the floodplain in which the river could develop its own course will not be determined by the river. The confinement of the river restricts natural processes and reduce self-healing of the river and surrounding environment. Although it is noted that there is better opportunity for flood flows to rejuvenate soil of the floodplain on the lowered berms • This concept will commit future resources to maintain the rivers confinement, continuing an ongoing cycle of dictating the nature and path of the river. • This concept presents a continuation of the status quo (restricting the river) which may present a barrier to any future opportunities to give the river more room. • While the river channel (wetted area) may have more ability to wander across the widened areas, this will remain within the confines dictated for the river, not by the river. The river is not free to decide its own path. • The works to both construct and maintain this concept are more extensive than Concept 1.

3	Retreat some stopbanks (and upgrading remaining stopbanks)	+3	• This concept presents the opportunity for enhanced mana, mauri and wairua of the river. • It signals a long-term commitment to give the river more room to move and that the river is valued as an entity with its own life force. • The river has more choice in its flow direction and the potential to reduce straightening with time. • There is better opportunity for flood flows to rejuvenate soil which could influence changes to vegetation types, proving opportunity for self-healing of the surrounding environment.
4	Implement nature-based solutions in the upper catchment (and upgrading the stopbanks)	+3	• This concept allows the opportunity for enhanced mana, mauri and wairua of the river. The benefits will occur in the upper catchment but will impact the wider environment and the urban reach. • This concept signals the start of the journey for the river to be enhanced and valued. It is a nod to future generations that the river is life. • Nature based solutions are likely to encompass a larger area than the other concepts, which will enable river to self-heal over a greater area. • This concept allows for benefits to the river and surrounding environment while not in flood, which is the majority of the time. • It is noted that the score is not higher given the timeframes associated with significant change to the upper catchment and the need to combine nature-based solutions with stopbanks in the urban reach.

6 Additional matters

Any comments

Regards

[Signature]

Daphne Te Whare	Jim Haeata	Garry Foster	Ella Boam
WPT team member	WPT team member	WPT team member	GW

Memorandum

Waipoua Project Team

Garry Foster, Des Peterson, Ian Gunn. 10th March 2024

1 Introduction

The Waipoua Project Team (WPT) is tasked with recommending a preferred option for flood management in the Masterton urban reach of the Waipoua River. This recommendation will be made to Greater Wellington Regional Council (GWRC). Four concepts have been shortlisted, and multicriteria analysis (MCA) will be used as a tool to compare and rank the four concepts against eight different criteria. Each criterion is being scored prior to the workshop (by the authors noted in this memo). These scores will be discussed, possibly adjusted, and agreed at an MCA workshop held with the WPT. This is one of a number of approaches to assist in making a recommendation.

2 Background

This report summarises the evaluation of the concepts for the environmental group of criteria. These comprise:

- Cultural
- Social
- Environmental

The report records the scores and the approach taken to the scoring.

3 Methodology

Data / Information used (valid for all criteria): shortlist options descriptions.

To assess the environmental considerations of each of the proposed concepts, consideration has been given to the following criteria:

Social

- Impact on public access to the river
- Impact on the ability for the community to swim
- Impact on social relationships (connection with each other)
- Impact on the psychological and physical wellbeing of the community
- Does it enhance social fabric
- Does it lower the community's perception of risk
- Does the community approve
- Does it improve recreation opportunities
- Will it require the community to accept some measure of change of use of some areas adjacent to the river

Cultural

- Impact on the identity of the community
- Does it support community building

- Does it affect cultural opportunities
- Does it impact our kiwi culture

Environmental

- Impact on habitat and ecology
- Impact on natural systems
- Does it improve landscape values
- Impact on water quality
- Does it support the concept of slow, spread and soak
- Does it give the river more room to move
- Are there geomorphological considerations

4 Key assumptions

As part of the assessment, the following assumptions have been made:

Mitigation assumptions (environmental)

5 Scoring

See the following tables which Include:

- Score (-5 to +5) We have defined this as follows:
- -5 large negative impact, or risk
- -3 moderate negative
- -1 slight negative
- 0 neutral
- 1 slight positive
- 3 moderate positive
- 5 large positive impact or risk
- Key reasons for score, including mitigation taken into account.

5.1

Social / Cultural			
Concept	**Name**	**Score**	**Reason for score**
1	Improving and extending existing stop banks	0	As this concept uses the existing footprint of the current stop banks it is likely to have little improved or detrimental effect to the cultural and social values as they exist today.
2	Undertaking extensive work in river channel	-3	This concept requires the most amount of work in the river bed and is likely to detract from the perception of it being a natural area and be a barrier for community connecting and identifying with the river.
3	Retreat some stop banks	+3	This concept increases room to implement the lineal park concept and creates additional room in the retreated areas for community involvement with environmental enhancements.
4	Implement nature-based	+4	This concept supports the growing kiwi culture of working in, for and with nature. It has the greatest potential to inspire future work to create

	solutions in upper catchment		a nature corridor that brings more native plants and animals into our urban environment and enhances the feeling that are identity is connected to the river.

Environmental			
Concept	**Name**	**Score**	**Reason for score**
1	Improving and extending existing stop banks	+1	Improving stop banks on their existing footprint reduces the need for disturbance in the river bed allowing for the development of a modest amount of additional habitat.
2	Undertaking extensive work in the river channel	-2	Extensive changes in the river / flood channel come with additional unpredictability due to increased water velocity. It is likely that ongoing work would need to be undertaken to maintain the changes. Ongoing work in the channel may limit the establishment of natural habitat and ecology.
3	Retreat some stop banks	+2	This concept may reduce flood volumes and velocity as it gives the river more room to move. It creates additional room for natural areas to establish and therefore is likely to create additional habitat.
4	Implement nature-based solutions in the upper catchment	+3	Implementing nature-based solutions in the upper catchment is likely to have substantial benefits to habitat extent and diversity and will improve downstream water quality and consistency of volume due fluctuating seasonal effects.

Regards

[Signature]

Garry Foster, Ian Gunn, Des Pederson

Memorandum

To:	Waipoua Project Team
From:	**Michael Hewison, Andrew Donald and James Flanagan (note taker)**
Date:	**10th March 2024**
Subject:	**Multi-criteria analysis Scoring – Waipoua River Flood Mitigation Optioneering** [**Constructability**] *Implementation (consentability), Practicality / feasbility*

1 Introduction

The Waipoua Project Team (WPT) is tasked with recommending a preferred option for flood management in the Masterton urban reach of the Waipoua River. This recommendation will be made to Greater Wellington Regional Council (GWRC). Four concepts have been shortlisted, and multicriteria analysis (MCA) will be used as a tool to compare and rank the four concepts against eight different criteria. Each criterion is being scored prior to the workshop (by the authors noted in this memo). These scores will be discussed, possibly adjusted, and agreed at an MCA workshop held with the WPT.

2 Background

This report summarises the evaluation of the concepts for the constructability group of criteria. These comprise:

- Implementation (consentability)
- Practicality / feasibility

The report records the scores and the approach taken to the scoring.

3 Methodology

Data / Information used (valid for all criteria): shortlist options descriptions

To assess the **consentability** of each of the proposed concepts, consideration has been given to the following aspects:

- The challenges of working in the river channel.
- The challenges when working on the stopbanks in the berms.
- Any landowner issues and key issues for other stakeholders.

To assess the **practicality / feasibility** of each of the proposed concepts, consideration has been given to the following aspects:

- The challenges of working in the river channel.
- The challenges when working on the stopbanks in the berms.
- The challenges of interface with TA services.

4 Key assumptions

As part of the assessment, the following assumptions have been made:

Assessment Assumptions (Implementation - consentability)

- That the possibility of not being able to achieve resource consent should be expressed as a % risk for each of the concepts and reasons given.
- That the extent of work in the river channel is proportional to the consenting effort required.
- That the consentability includes the amount of disruption to the local community (truck movements to and from site) for each of the concepts.
- The in-channel works will be the main area of concern for consenting requirements, the works in the dry will be of less concern.

Assessment Assumptions (practicality / feasibility)

- That the works can proceed as a main contract or in parts and can be implemented with adequate supervision without additional issues.
- There are no special or additional access requirements to complete the works.

- That the pedestrian access control and alternatives diversions are included in the main works.
- That the works areas can hold the required materials without additional compensation and land being necessary.
- All vegetation clearance is included in the lump sum listed under the cost scenarios and these works will take place before the stopbanking is completed.
- The works include the cost for permanent environmental enhancement.

Mitigation Assumptions (Implementation - consentability)

- Minimise the amount of disturbance to the river channel. Is there the possibility to minimise this, can the in-channel work be staged or completed in a lower impact manner? The first option maybe to limit the length of bank exposed to river flows to one side of the river and limited lengths of bank being modified or berms lowered at any one time. This should minimise sediment mobilized in a fresh or flood.
- Use of sprayed dust suppressant can minimise dust from the work (assuming summer working).
- On site silt and erosion control measures should be able to mitigate sediment from the berm works (stopbanks).
- Traffic management can be used to minimize disruption from truck movements.
- Use of river gravel bunds will be effective in isolating riverbank / channel works from flowing water.
- Monitoring will be suitable to establish the effectiveness of the above measures during construction works.
- Corrective/reactive actions are able to be made successfully for bad weather and flooding.

Mitigation Assumptions (practicality / feasibility)

- The affected MDC infrastructure can be replaced / upgraded with the minimum of disruption to their operation.
- In -situ temporary stopbanking can be put in place for the upgrading of existing stopbanks (maintaining current levels of protection for the duration of the works).
- That traffic management and sediment management will be effective enough to ensure construction will not be limited or restricted by consent issues.

5 Scoring

See the following tables which Include:

- Score (-5 to +5) We have defined this as follows:
- -5 large negative impact, or risk
- -3 moderate negative
- -1 slight negative
- 0 neutral
- 1 slight positive
- 3 moderate positive
- 5 large positive impact or risk
- Key reasons for score, including mitigation taken into account.

5.1 Implementation - consentability

Concept	Name	Score	Reasons for score
		e.g. between -5 and +5	*e.g. would have significant impact on a wetland of significant value* *key benefits / advantages or effects / risks*
1	Improving and extending existing banks	-1	• Existing stopbanks will require temporary works and in places additional rock protection • Dust and disruption from stockpiling and removing excess materials offsite • New bunds upstream and downstream of the bridges • In channel works around the SH and Colombo Road bridges • Some limited rock protection to be included in the channel Overall, with the upgrading of the existing banks more rock work is required than for concept 3 but the same as concept 4

2	Undertaking extensive work in the river channel	-2/3	• Existing stopbanks will require temporary works and in places additional rock protection. • Dust and disruption from stockpiling and removing excess materials offsite. • New bunds upstream and downstream of the bridges. • In channel works around the SH and Colombo Road bridges and along length of river between the bridges, the most out of all of the concepts. • Secondary overflow channel. • The most rock protection to be included in the channel out of all the concepts. Overall, in comparison to the other concepts the additional berm lowering, secondary channel and materials to be disposed off site make this the hardest to consent and has the highest risk of not getting a consent. The increased amount of in-stream works mean that this should score less than concept 1 as it constitutes a harder to consent package of work overall.
3	Retreat some stopbanks	-1	• Existing stopbanks will require temporary works and in places additional rock protection • New banks will be on property boundaries • Dust and disruption from stockpiling and removing excess materials offsite • New bunds upstream and downstream of the bridges • In channel works around the SH and Colombo Road bridges • Some limited rock protection to be included in the channel Overall, it is considered that due to the amount of instream (approx. half that of concept 2) that this balances any issues relating to building closer to property boundaries giving a score the same as concepts 1 and 4.
4	Implement nature-based solutions in the upper catchment	-1	• Existing stopbanks will require temporary works and in places additional rock protection • Dust and disruption from stockpiling and removing excess materials offsite • New bunds upstream and downstream of the bridges • In channel works around the SH and Colombo Road bridges • Some limited rock protection to be included in the channel Overall, with the upgrading of the existing banks more rock work is required than for concept 3 but the same as concept 1

5.2 Practicality / feasibility

Concept	Name	Score	Reasons for score

		e.g. between -5 and +5	*e.g. would have significant impact on a wetland of significant value* *key benefits / advantages or effects / risks*
1	Improving and extending existing banks	+2	• Upgrading the existing stopbanks between SH and rail bridges, reasonably straightforward. Will require increased rock protection over concept 3. These could be completed in one construction season. • In-channel works around the bridges will be straightforward and has been completed in other areas. Possibility that these works could be staged and implemented in two separate phases over a longer period of time (possibly with the downstream ones first). • New Bunds upstream and downstream of the bridges could completed in parallel with the main stopbanking works, or they could be implemented at a different stage in following years (within 5 years). • Rock protection works can be staggered across construction seasons, it would seem logical to complete these works over two construction seasons, possibly those upstream of the SH one season and those downstream of the SH the following season. Overall, generally positive with lots of flexibility with regards to implementation ability and the ability to package up the works.
2	Undertaking extensive work in the river channel	+1	• Upgrading the existing stopbanks between SH and Rail bridges, reasonably straightforward will require increased rock protection over concept 3. These could be completed in one construction season. • In-channel works around the bridges and in the river are extensive, these works would need to be staged, and implemented in two separate phases over a longer period of time (possibly with the downstream ones first) • New Bunds upstream and downstream of the bridges could be completed in parallel with the main stopbanking works, or they could be implemented at a different stage in following years (within 5 years?). • Secondary overflow channel can be mostly excavated in the dry with wet work only in the deepest part of the channel. Increased need for stockpiling of materials with this option is 3 times more than the other options. • Rock protection works will need to be staggered across construction seasons, it would seem logical to complete these works over two construction seasons, possibly those upstream of the SH one season and those downstream of the SH the following season in parallel with the channel widening and berm lowering? Overall, this concept requires that the work be phased and spread out over several construction seasons. Less flexibility with regards to how this can be implemented compared to the other concepts, increased in channel works.
3	Retreat some stopbanks	+2	• Upgrading the existing stopbanks between SH and Rail, reasonably straightforward will require increased rock protection over concept 3. These could be completed in one construction season. • New stopbanks will require additional tree removal at the property boundaries

			• In-channel works around the bridges will be straightforward and has been completed in other areas. Possibility that these works could be staged, and implemented in two separate phases over a longer period of time (possibly with the downstream ones first). • New Bunds upstream and downstream of the bridges could be completed in parallel with the main stopbanking works, or they could be implemented at a different stage in following years (within 5 years?). • Rock protection works can be staggered across construction seasons, it would seem logical to complete these works over two construction seasons, possibly those upstream of the SH one season and those downstream of the SH the following season. Overall, the increased working area is a positive and the flexibility to work across seasons is the same as for concept 1 and 4
4	Implement nature-based solutions in the upper catchment	+2	• Upgrading the existing stopbanks between SH and Rail bridges, reasonably straightforward will require increased rock protection over concept 3. These could be completed in one construction season. • In-channel works around the bridges will be straightforward and has been completed in other areas. Possibility that these works could be staged, and implemented in two separate phases over a longer period of time (possibly with the downstream ones first). • New Bunds upstream and downstream of the bridges could be completed in parallel with the main stopbanking works, or they could be implemented at a different stage in following years (within 5 years?). • Rock protection works can be staggered across construction seasons, it would seem logical to complete these works over two construction seasons, possibly those upstream of the SH one season and those downstream of the SH the following season. Overall, this concept has the same flexibility as concepts 1 and 3 probably could have been +3 but the uncertain nature of the proposed NBS brought it back to the same as concepts 1 and 3

6 Additional matters

N/A

Regards

[Signature]

Michael Hewison WPT team member	Andrew Donald WPT team member	James Flanagan T+T working for GWRC

Memorandum

To:	Waipoua Project Team
From:	**Sarah Bevin**
Date:	**10th March 2024**
Subject:	**Multi-criteria analysis – Waipoua River Flood Mitigation Optioneering** Consentability

1 Introduction

The Waipoua Project Team (WPT) is tasked with recommending a preferred option for flood management in the Masterton urban reach of the Waipoua River. This recommendation will be made to Greater Wellington Regional Council (GWRC). Four concepts have been shortlisted, and multicriteria analysis (MCA) will be used as a tool to compare and rank the four concepts against eight different criteria. Each criterion is being scored prior to the workshop. These scores will be discussed, possibly adjusted, and agreed at an MCA workshop held with the WPT.

The four concepts overall generally propose construction of bunds at the western extent of the Masterton township, upgrades to existing stopbanks, in river works and gravel extraction, swales, channel widening. The extent of works proposed for each concept varies.

This report summarises the evaluation of the concepts under the consentability criterion.

2 Background

2.1 Wairarapa District Plan

The Wairarapa Combined District Plan (District Plan) applies to the entire project area. The District Plan sets out provisions for managing land use, subdivision and development. The project site has various zoning in the District Plan, and therefore the relevant rules vary. Various GW flood protection

and erosion control structures and areas are designated in the District Plan, including at some locations of the proposed works. Therefore, we have considered the requirements under both the designation and the District Plan zone and other relevant rules as part of this assessment.

Further, the Wairarapa Councils are currently undertaking a full District Plan review. The Proposed District Plan was notified late 2023, with further submissions invited in May 2024. Hearings are expected to commence in 2025. We have considered both the provisions of the Operative District Plan and the Proposed District Plan.

2.2 Natural Resources Plan

Greater Wellington Regional Council's (GWRC) Natural Resources Plan (NRP) was made operative on 28 July 2023. The NRP manages natural and physical resources in the region, including water, air, soil, land and the coastal marine area. The NRP manages activities on the beds of rivers and lakes, along with earthworks, land disturbance and discharges to land and water.

Proposed Change 1 to the NRP (PC1) was notified in October 2023, and includes implementation of some regulatory and non-regulatory recommendations from Te Awarua-o-Porirua (TAoP) and Te Whanganui-a-Tara (TWT) Implementation Programmes, and other regulatory amendments to the NRP.

3 Methodology

The MCA scores the consentability based on zones and overlays within the regional and district plans, the potential consent rule triggers and activity status, the potential for notification, and any other major consenting impediments.

Each option has been assessed with respect to these elements and has been scored on a scale between – 5 and 5.

The MCA has drawn from the following statutory plans and information sources:

- National Policy Statement for Freshwater Management 2020 (October 2024).
- Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (October 2024).
- Natural Resources Plan for the Wellington Region and Plan Change 1.
- Operative and Proposed Wairarapa Combined District Plan (District Plan).
- GWRC's Selected Land Use Registrar (SLUR) database.
- The New Zealand Archaeological Authority's (NZAA) 'ArchSite'.

To assess the **consentability** of each of the proposed concepts, consideration has been given to the following aspects:

- Can it be consented?
- How complex will the consenting process be?

  - Will the application likely be publicly notified or limited notified?
  - Amount of in-channel works
  - Amount of earthworks required
  - How extensive are the areas where vegetation may have to be removed
  - How much noise and disruption will construction cause
  - Ownership of the land on which the works are proposed
- Consideration of implementation as well as long-term maintenance and on-going monitoring

4 Key assumptions

As part of the assessment, the following assumptions have been made:

Assessment assumptions

- The consentability assessment is based on the consenting process only which relies on the overall assessment of effects from the relevant areas (freshwater ecology, erosion and sediment effects and others).
- Any material in excess to that required on site will be disposed of at an appropriate/consented facility (i.e. no additional consents for offsite disposal of soil or other material will be required).
- There are no natural wetlands within, or within a 100 m setback of the footprint of any option.
- Consent under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations 2011 (NES-C) may be required for some or all of the options. This assessment is undertaken on the basis that if consent is required under the NES-C, then this can be addressed through a PSI/DSI and associated Contaminated Land Management Plan (CLMP) and will not pose any particular consenting hurdle.
- Where a designation is in place and the works can be undertaken within the extent of the designation boundary the works will be authorised under the designation, and where no designation is in place the work may require a resource consent under the District Plan.
- All approvals of any private property owners are able to be obtained.
- The cost of the work is commensurate with the extent of disturbance to the local community – construction traffic, noise, dust, vibration.

Mitigation assumptions

- Best practice construction methodologies will be employed including in relation to erosion and sediment control, noise and vibration management, and traffic management.

- All concepts would require some sort of monitoring and operational management following granting of consent and completion of the works.
- Early and regular engagement with mana whenua on the concept(s).
- Early and regular consultation with Fish and Game and the Department of Conservation.

5 Scoring

See the following tables which Include:

- Score (-5 to +5) negative score of -5 reflects a strong negative, a positive score of +5 reflects a strong positive
- Key reasons for score, including mitigation taken into account

5.1 Consentability

Concept	Name	Score	Reasons for score
			A high score here would reflect a straightforward consenting requirement, possibly could reflect less in-channel work and a reduced need for ongoing monitoring (generally positive). A low or negative score would reflect challenging consenting requirements or exhaustive and expensive monitoring (generally negative).
1	Improving and extending existing stopbanks	-2	Minimal in channel works required In channel works likely only required in one season Construction mostly outside the flowing stream Some disruption to the local community during works – traffic, noise, dust, vibration Earthworks requirements and erosion and sediment control
2	Undertaking extensive work in the river channel (and upgrading the stopbanks)	-4	Large amount of works in the riverbed, significant effects Extent of works means that works required over more than one construction season, and therefore additional works monitoring required Potential for significant ecological effects resulting from in channel works over multiple seasons Earthworks requirements and erosion and sediment control would be significant Significant disruption to the local community during works (over multiple construction seasons) – traffic, noise, dust, vibration
3	Retreat some stopbanks	-2	Building new retreated stopbank will result in some erosion and sediment effects, but outside of flowing waters Minimal in channel works required

			Works to lower the existing stopbanks may result in sedimentation effects into the river Some disruption to the local community during works – traffic, noise, dust, vibration
4	Implement nature-based solutions in the upper catchment (and upgrading the stopbanks)	-3	Options for nature based solutions up catchment are still unknown and will occur over a longer timeframe Still some works in the flowing channel Still requires works on the stopbanks even with intervention upstream Some disruption to the local community during works – traffic, noise, dust, vibration

6 Additional matters

Any comments

Regards

[Signature]

Sarah Bevin
T+T working for GWRC