



## Meeting of the Clifton to Tangoio Coastal Hazards Strategy Joint Committee

**Date:** Tuesday 5 December 2017  
**Time:** 10.00am  
**Venue:** Council Chamber  
 Hawke's Bay Regional Council  
 159 Dalton Street  
 NAPIER

### Agenda

| ITEM   | SUBJECT  | PAGE |
|--|--|------|
| 1.   | Welcome/Notices/Apologies  |      |
| 2.   | Conflict of Interest Declarations  |      |
| 3.   | Confirmation of Minutes of the Clifton to Tangoio Coastal Hazards Strategy Joint Committee held on 6 June 2017 |      |
| 4.   | Actions from Previous Clifton to Tangoio Coastal Hazards Strategy Joint Committee                              | 3    |
| <b>Decision Items</b>                        |  |      |
| 5.   | Integrating The Coastal Hazards Strategy Into Council Long Term Plans  | 7    |
| 6.   | Council Roles And Responsibilities   | 9    |
| <b>Information or Performance Monitoring</b> |  |      |
| 7.   | Stage 3 Progress Update  | 15   |
| 8.   | Coastal Hazards Strategy – High Level Cost Estimates   | 29   |
| 9.   | Coastal Response Contributory Fund   | 39   |
| 10.  | Project Manager Update   | 51   |
| 11.  | Current Coastal Projects Update  | 53   |
| 12.  | Other Matters for discussion   |      |



# CLIFTON TO TANGOIO COASTAL HAZARDS STRATEGY JOINT COMMITTEE

Tuesday 05 December 2017

## SUBJECT: ACTIONS FROM PREVIOUS CLIFTON TO TANGOIO COASTAL HAZARDS STRATEGY JOINT COMMITTEE

Item 4

### Reason for Report

1. In order to track items raised at previous meetings that require action, a list of outstanding items is prepared for each meeting. All action items indicate who is responsible for each, when it is expected to be completed and a brief status comment.
2. Once the items have been completed and reported to the Committee they will be removed from the list.

### Decision Making Process

3. Staff have assessed the requirements of the Local Government Act 2002 in relation to this item and have concluded that, as this report is for information only, the decision making provisions do not apply.

### Recommendation

That the Clifton to Tangoio Coastal Hazards Strategy Joint Committee receives and notes the "*Actions from previous Clifton to Tangoio Coastal Hazards Strategy Joint Committee Meetings*" report.

### Authored by:

**Simon Bendall**  
**PROJECT MANAGER**

### Approved by:

**Graeme Hansen**  
**GROUP MANAGER ASSET**  
**MANAGEMENT**

### Attachment/s

- [1](#) Agreed Actions from 6 June 2017 Joint Committee Meeting



Agreed actions from 6 June 2017 Joint Committee

| Task | Meeting / Agenda Item  | Actions  | Resp. | Status/Comment  |
|------|------------------------|--|-------|---|
| 1.   | 6 June 2017<br>Item 8  | That TAG work with MTT / MAI / HTT to confirm the appointment of a peer reviewer(s) to confirm Aramanu Ropiha's Cultural Values Assessment Report prior to release | TAG   | – Completed.  |
| 2.   | 6 June 2017<br>Item 6  | That the Edge report on feedback received from Workshop 5 is circulated to the Joint Committee when available  | TAG   | – Completed. Circulated to the Joint Committee and Panel Members 19 October 2017. |
| 3.   | 6 June 2017<br>Item 11 | That TAG develop a proposal for the management of a contributory fund and associated decision making for discussion at the next Joint Committee meeting            | TAG   | – Completed, on the agenda 5 December 2017.                                       |

Item 4

Attachment 1



### Subject: INTEGRATING THE COASTAL HAZARDS STRATEGY INTO COUNCIL LONG TERM PLANS

#### Reason for the Report

1. The Hawke's Bay Regional Council, Hastings District Council and Napier City Council ("Partner Councils") are currently developing draft Long Term Plans ("LTPs") for consultation purposes. The draft LTPs are due to be released for public consultation in March / April 2018.
2. Detailed costings for physical works under the Clifton to Tangoio Coastal Hazards Strategy 2120 ("the Strategy"), and a confirmed funding model, will not be available in time to inform draft LTP's. However, it is considered important that each Council's LTP includes an allocation of funding to enable the Strategy to advance.
3. This report sets out the timing matters, and recommended approach for integrating the Strategy into Partner Council LTPs.

#### Discussion

4. The Northern and Southern Cell Assessment Panels ("the Panels") are currently expected to deliver their recommendations to the Joint Committee at their next meeting on 20 February 2018. The Joint Committee will then make recommendations back to each Partner Council, and it is expected that planned actions under the Strategy will be confirmed for each priority unit by March 2018. This will complete Stage 3 of the Strategy.
5. Each Council's LTP process meanwhile is well underway, with draft LTPs due to be released for public consultation in March / April 2018.
6. This timing means that there is not sufficient scope to include detailed planned expenditure for significant physical works programmes in LTP's, particularly considering that elements of the funding model for such expenditure are still in development.
7. However, there are a range of other activities that it will be important to progress with some urgency under Stage 4 of the Strategy, once an agreed approach for each priority unit has been determined. These include:
  - Implementation planning to establish timing and order of works programmes in each priority unit;
  - Technical studies and detailed design work for prioritised physical works programmes;
  - Consenting costs for prioritised physical works programmes;
  - Policy and planning framework review and possible changes; and
  - The continued operation and support of the Joint Committee.
8. The Panels have committed to a significant process and there is a strong sense of urgency and requirement for action once their recommendations have been delivered. It is important that each Partner Council's LTP recognise this, and explicitly provide for work to be initiated under Stage 4 of the Strategy as a matter of priority.
9. At the time of writing, all Council's have made an allocation in their draft LTP's, but these have yet to be workshopped with or confirmed by Councillors.
10. To facilitate the expedient commencement of Stage 4, and to achieve consistency between all Partner Councils, the Technical Advisory Group ("TAG") suggests that the Joint Committee make a recommendation to each Partner Council to allocate at least \$100,000 per year for the duration of the LTP period to Strategy implementation.

11. This recommendation can be delivered to each Partner Council as part of upcoming LTP workshops where the content of draft LTPs will be confirmed.
12. It is further recommended that, once detailed costings have been developed and the funding model confirmed, a special consultative procedure is initiated under the Local Government Act. TAG will discuss this matter further with the Joint Committee as Stage 4 of the Strategy progresses.

### Recommendations

That :

1. The Clifton to Tangoio Coastal Hazards Strategy Joint Committee receives and notes the report ***Integrating the Coastal Hazards Strategy into Council Long Term Plans***.
2. The Clifton to Tangoio Coastal Hazards Strategy Joint Committee makes the following recommendation to the Hawke's Bay Regional Council, Hastings District Council and Napier City Council:
  - a. That each Partner Council identify in their draft Long Term Plans an allocation of \$100,000 each per year for the duration of each Long Term Plan to commence Stage 4 of the Clifton to Tangoio Coastal Hazards Strategy 2120, including the following activities:
    - Implementation planning to establish timing and order of works programmes in each priority unit;
    - Technical studies and detailed design work for prioritised physical works programmes;
    - Consenting costs for prioritised physical works programmes;
    - Policy and planning framework review and possible changes; and
    - The continued operation and support of the Joint Committee.

**Authored and Approved by:  
Technical Advisory Group**

### Attachment/s

There are no attachments for this report.



### Subject: COUNCIL ROLES AND RESPONSIBILITIES

#### Reason for Report

1. The purpose of this paper is to consider options for sharing roles and responsibilities for funding between the Hawke's Bay Regional Council, Napier City Council and Hastings District Council ("the Partner Councils") in the implementation of the Clifton to Tangoio Coastal Hazards Strategy 2120 (the Strategy).
2. While the Assessment Panels are in the process of selecting the preferred options for each Priority Unit, the final decision and implementation of options must be made by the Partner Councils. This paper considers the impacts and options for the share of responsibilities for funding the implementation of actions identified by the Strategy.
3. The allocation of responsibilities for other aspects of implementing the Strategy, namely investigation, consenting implementation, and monitoring, will be considered and established as part of stage four of the Strategy.
4. A separate paper has been prepared on the establishment, governance, management and operation of the proposed Coastal Response Contributory Fund.

#### Approach

5. This paper has been prepared in consideration of the requirements of the Local Government Act 2002 (LGA) which requires all local authorities<sup>1</sup> to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses.
6. In addition, where a local authority has a significant change in a relevant service<sup>2</sup> including the development of a new activity or extended activity, then that local authority must consider cost-effective mechanisms for the delivery of that activity. Included in that assessment is the consideration of responsibility for governance and funding. Options that are provided in the LGA include a joint committee or other shared governance arrangements.
7. Furthermore, a local authority must manage its revenues, expenses, assets, liabilities, investments and general financial dealings prudently<sup>3</sup>.

#### Background

8. The Clifton to Tangoio Coastal Hazards Strategy 2120 (the Strategy) is to provide a framework to guide and direct the assessment and implementation of preferred options for the long term management of the coast between Clifton and Tangoio. The long term vision for the Strategy is that  
*"Coastal communities, businesses and critical infrastructure from Tangoio to Clifton are resilient to the effects of coastal hazards".*
9. The New Zealand Coastal Policy Statement requires Local Authorities to consider and plan for coastal hazards risks. Under Policy 24 (1), Local Authorities are required to:  
*"Identify areas in the coastal environment that are potentially affected by coastal hazards (including tsunamis), giving priority to the identification of areas at high risk of being affected. Hazard risks, over at least 100 years, are to be assessed."*
10. This Strategy is being developed to provide a framework for assessing coastal hazards risks and identifying options for the management of those risks out to the year 2120.

---

<sup>1</sup> Section 10 LGA

<sup>2</sup> section 17 A LGA

<sup>3</sup> Section 101 (1) LGA

11. Currently neither Wairoa nor Central Hawke's Bay District Councils are part of the Strategy, however the intention is to have the ability to expand the Strategy in future to include further stretches of Hawke's Bay coastline. The principles that are considered as part of this report provide for the inclusion of additional Local Authorities in the future.

### Funding

12. The role of the funder would need to be responsible for the following functions:
- 12.1. Completion of section 101(3) requirements including assessment of public versus private good and identifying the different levels of benefits within each of the units. For example allocating a higher degree of benefit and therefore rates to the properties that are receiving a direct benefit compared with other properties that receive a lesser benefit. This would involve modification through a public consultation process to the local authority's Revenue & Financing Policy.
  - 12.2. Raising the appropriate debt and recovering that debt through rates and any funding that may be available.
  - 12.3. Setting budgets through the Long Term and Annual Plans processes to fund both debt repayment and ongoing operational costs.
  - 12.4. Setting, assessing and collecting rates.
  - 12.5. Financial reporting.

### Overall impact

13. While the costs and timings of the preferred options are not yet confirmed, there will be additional costs even if the final option is to do nothing.
14. All local authorities in the region face fiscal pressures, and any increase in the requirements for funding will increase this pressure.
15. Based on the 2017/18 Annual Plans set out below is the total revenue<sup>4</sup> (excluding vested assets and development contributions) and total rate revenue of the three local authorities. These have been divided by total rating units to provide a comparison. (Note these are not averages).

|                         | Hawke's Bay<br>Regional | Hastings<br>District | Napier City |
|-------------------------|-------------------------|----------------------|-------------|
| Total rates (\$0,000)   | 19,124                  | 72,742               | 53,319      |
| Total Revenue (\$0,000) | 49,949                  | 110,700              | 109,346     |
| Total rating units      | 70,745                  | 30,644               | 25,181      |
| Rates per rating unit   | \$ 270.32               | \$ 2,373.78          | \$ 2,117.43 |
| Revenue per rating unit | \$ 706.04               | \$ 3,612.45          | \$ 4,342.40 |

16. To demonstrate the impact on each Council if the total funding required was \$3M<sup>5</sup> and payable equally (\$1m each) by each Council, the increase for each council is set out below.

<sup>4</sup> This is the approach used in the Local Government (Financial Reporting and Prudence) Regulations 2014

<sup>5</sup> This is NOT a recommended amount nor a recommend allocation.

|                                       | Hawke's Bay<br>Regional | Hastings<br>District | Napier City  |
|---------------------------------------|-------------------------|----------------------|--------------|
| Impact of additional \$500K           |                         |                      |              |
| Total rates (\$0,000)                 | 20,124                  | 73,742               | 54,319       |
| Total Revenue (\$0,000)               | 50,949                  | 111,700              | 110,346      |
| Total rating units                    | 70,745                  | 30,644               | 25,181       |
| Rates per rating unit                 | \$ 284.46               | \$ 2,406.41          | \$ 2,157.14  |
| <b>Percentage increase in rates</b>   | <b>5.23%</b>            | <b>1.37%</b>         | <b>1.88%</b> |
| Revenue per rating unit               | \$ 720.18               | \$ 3,645.09          | \$ 4,382.11  |
| <b>Percentage increase in Revenue</b> | <b>2.00%</b>            | <b>0.90%</b>         | <b>0.91%</b> |

17. The following options for allocating funding responsibilities are available for consideration:
- 17.1. The Hawke's Bay Regional Council has the responsibility for the setting and collecting of coastal hazard rates.
  - 17.2. The territorial local authorities (Napier City and Hastings District) have the responsibility for the setting and collecting of coastal hazard rates.
  - 17.3. The Hawke's Bay Regional Council and the territorial local authorities (Napier City and Hastings District) share the responsibility for the setting and collecting of coastal hazard rates.
18. Set out in the table below is commentary identifying issues and risks associated with these options.

| <b>1. The Hawke's Bay Regional Council (HBRC) has the responsibility for the setting and collecting of coastal hazard rates</b> |  |
|---|--|
| <b>Impacts of options</b>   | <b>Commentary</b>  |
| Impacts on current rating levels  | HBRC currently has a comparatively low level of rating. Any rates increase of this low base will have a negative effect on the Council's ratepayers and could appear as a proportionally large increase. However, the potential increases for individual properties will be significant irrespective of the local authority undertaking the rating activity. |
| Impacts of cross boundary funding   | Eliminates the risk of cross boundary funding issues where expenditure in one TLA's jurisdiction benefits properties in another jurisdiction (e.g. Bayview and Whirinaki).   |
| Consistency of Rating policies  | Eliminates the of risk of inconsistent rating policies for the same perceived benefit/works  |
| Efficiency  | Is the most efficient mechanism compared with a shared system  |
| Regional ownership  | Risk that there would not be support for ongoing projects from the TLAs.   |

| <b>2. The territorial local authorities (TLAs) have the responsibility for the setting and collecting of coastal hazard rates</b> |                   |
|---|-------------------|
| <b>Impacts of options</b>   | <b>Commentary</b> |

| 2. The territorial local authorities (TLAs) have the responsibility for the setting and collecting of coastal hazard rates |  |
|--|--|
| Impacts of options   | Commentary   |
| Impacts on current rating levels   | While the initial rate increase will not be perceived as proportionally large for each TLA, once the full costs of all options have been included there will be a significant rate increase for individual ratepayers. However, the potential increases for individual properties will be significant irrespective of the local authority undertaking the rating activity. |
| Impacts of cross boundary funding  | With each of the TLAs being responsible for rating within their own areas, cross-boundary issues may arise where expenditure in one TLA's jurisdiction benefits properties in another jurisdiction (e.g. Bayview and Whirinaki).   |
| Consistency of Rating policies   | High degree of risk of inconsistent rating policies for the same perceived benefit/works between different parts of the coast  |
| Efficiency   | Both local authorities would have to set up a similar approach, presenting risk of duplication and inefficiency  |
| Regional ownership   | If the TLAs were to be the sole funder then there is a risk that the responses may significantly differ and it also risks discouraging participation by other local authorities within the region in the future.   |

19. The majority of risks identified above can be eliminated if there is a joint approach to rating. This joint approach will then remove the risks of cross boundary funding and inconsistent rating policies and increasing efficiency. It is important to note that if there is a consistent rating approach developed, there is a higher degree of success due to this consistency between the three local authorities.

### Conclusions

20. It must be remembered that whether the HBRC or the TLA's undertake the recovery of costs to implement works under the Strategy, these will be paid by the same ratepayers. Regardless, the rationale for rating must be based on efficiency and transparency.
21. While the Strategy is yet to deliver a final set of recommendations for the Joint Committee to consider, we do have some indication of likely costs of options, however more work is required (once options are confirmed) to develop detailed costings and proposals for how those costs should be shared between those receiving benefits from them.
22. All funding options, including government support and assistance, will be considered as part of the analysis of strategy affordability.
23. On this basis, it is proposed that it would be premature to make a determination now on whether or not there should be a primary funder (and if so, who that is) or if the role should be shared (and if so, in what proportions). This is, however, an important conversation to advance at least in an 'in principle' manner. A final agreement on funding roles and responsibilities needs to be determined prior to any significant physical works programmes commencing.
24. It is noted that the paper "Integrating the Coastal Hazards Strategy into Council Long Term Plans" provided with this agenda proposes an interim approach to sharing costs while this more substantive matter is resolved.
25. It is also noted that the paper "Coastal Response Contributory Fund options" recommends the commencement of a Coastal Response Contributory Fund which will be used initially for recovery of extreme weather events in the coastal environment,

making safe and good areas of abandoned land and district/regional planning costs relating to possible changes from the Coastal Hazard Strategy. These are all public good elements. The paper does not recommend how each Council funds the proportion as this is a decision for each Council.

### **Recommendations**

1. The Clifton to Tangoio Coastal Hazards Strategy Joint Committee receives and notes the **“Council Roles and Responsibilities”** report.
2. The Clifton to Tangoio Coastal Hazards Strategy Joint Committee:
  - 2.1. Explore options and ideas for the role of funder and seek to make a determination following confirmation of pathways in each Priority Unit.
  - 2.2. That in the interim, until final options have been selected and further analysis undertaken, each local authority contribute equally to the on-going funding of the strategy and implementation of Stage 4.
  - 2.3. Explore options to establish and commence contributions to the Coastal Response Contributory Fund as soon as possible.

### **Authored by:**

**Philip Jones**  
**P J & ASSOCIATES**

### **Approved by:**

**Simon Bendall**  
**PROJECT MANAGER**

**Graeme Hansen**  
**GROUP MANAGER ASSET**  
**MANAGEMENT**

### **Attachment/s**

There are no attachments for this report.



# CLIFTON TO TANGOIO COASTAL HAZARDS STRATEGY JOINT COMMITTEE

Tuesday 05 December 2017

Item 7

## Subject: STAGE 3 PROGRESS UPDATE

### Reason for Report

1. This report provides an update to the Joint Committee on progress made in Stage 3 of the Clifton to Tangoio Coastal Hazards Strategy 2120 ("the Strategy").

### Progress Update

2. Both the Northern and Southern Panels have completed Workshops 1 – 10 of an 11 workshop programme that forms Stage 3 of the Strategy.
3. In summary, the process to date has included the following steps:
  - Panel formation and confirmation of Terms of Reference;
  - Presentation of information on coastal erosion and coastal inundation hazards and risks;
  - Site visits to the coast;
  - Confirmation of priority units that would be the focus for this iteration of the Strategy;
  - Presentation of information on social impact assessment and cultural values assessment;
  - Identification of potential coastal hazards response options;
  - First community feedback meeting;
  - Confirmation of criteria to apply through Multi-Criteria Decision Analysis ("MCDA");
  - A cultural values hikoī along the coast;
  - Refining potential hazard response options and combining them into pathways (short 0 – 20 years, medium 20 – 50 years, long 50 – 100 years);
  - Evaluation of pathways through MCDA;
  - Application of economic analysis; and
  - Confirmation of preferred pathways considering MCDA scores and economic analysis.
4. The Panels are now in the process of testing their preliminary findings with their respective communities, ahead of confirming their recommendations to the Joint Committee.
5. For reference, **attached** to this report is a summary of the assessment outcomes for all pathways as developed by the Panels. It outlines the pathways assessed in each unit, and for each pathway the MCDA results and the results of economic analysis. The Panel's preferred pathway for each priority unit is highlighted.
6. It is stressed that these are interim results only, and may change following the Panel's consideration of public feedback and any other matters Panel Members may raise in their final Workshop 11.
7. In summary, the preliminary preferred pathways for the Southern Cell are:

| Unit           | Preferred Pathway | Short Term (0-20 yrs)              | → | Medium Term (20 – 50 yrs)          | → | Long Term (50 – 100 yrs)           |
|----------------|-------------------|------------------------------------|---|------------------------------------|---|------------------------------------|
| Clifton (L)    | Pathway 5         | Sea wall                           | → | Sea wall                           | → | Managed Retreat                    |
| Te Awanga (K2) | Pathway 3         | Renourishment + Control Structures | → | Renourishment + Control Structures | → | Renourishment + Control Structures |
| Haumoana (K1)  | Pathway 2         | Renourishment + Control Structures | → | Renourishment + Control Structures | → | Managed Retreat                    |
| Clive (J)      | Pathway 1         | Status Quo                         | → | Renourishment + Control Structures | → | Retreat the Line / Managed Retreat |

8. The preliminary preferred pathways for the Northern Cell are:

| Unit          | Preferred Pathway | Short Term (0-20 yrs)     | → | Medium Term (20 – 50 yrs)          | → | Long Term (50 – 100 yrs)           |
|---------------|-------------------|---------------------------|---|------------------------------------|---|------------------------------------|
| Ahuriri (E1)  | Pathway 6         | Status quo                | → | Sea wall                           | → | Sea wall                           |
| Pandora (E2)  | Pathway 3         | Inundation Protection     | → | Inundation Protection              | → | Inundation Protection              |
| Westshore (D) | Pathway 3         | Renourishment             | → | Renourishment + Control Structures | → | Renourishment + Control Structures |
| Bayview (C)   | Pathway 3         | Status Quo/ Renourishment | → | Renourishment + Control Structures | → | Renourishment + Control Structures |
| Whirinaki (B) | Pathway 4         | Status quo/ Renourishment | → | Renourishment + Control Structures | → | Sea wall                           |

9. At the time of writing, the Southern Panel had held their community feedback meeting, with the Northern Panel due to hold theirs on 29 November.
10. At Workshop 11 (on 5 December for Southern and 7 December for Northern) the Panels will consider a report detailing their process, its outcomes, and their final recommendations.
11. These recommendations will be presented to the Joint Committee at the next meeting on 20 February 2018.
12. The Joint Committee will then form its recommendations back to each Partner Council, which will conclude Stage 3 of the Strategy.

### Recommendation

That the Clifton to Tangoio Coastal Hazards Strategy Joint Committee receives and notes the “**Stage 3 Progress Update**” report.

### Authored by:

**Simon Bendall**  
**PROJECT MANAGER**

### Approved by:

**Graeme Hansen**  
**GROUP MANAGER ASSET**  
**MANAGEMENT**



**Attachment/s**

- [!\[\]\(c8dce68b26731c7aa5915072fc9d68dd\_img.jpg\) 1](#) Northern Cell - Assessment Results and Recommendations
- [!\[\]\(76b3245de86167eba9fcdc9cc9f32aa4\_img.jpg\) 2](#) Southern Cell - Assessment Results and Recommendations



## Northern Cell – Assessment Results and Recommendations (preferred pathway highlighted)

| Unit E1: Ahuriri |                           |   |                                    |   |                 |            |              |                                |                                  |                                 |                          |   |
|------------------|---------------------------|---|------------------------------------|---|-----------------|------------|--------------|--------------------------------|----------------------------------|---------------------------------|--------------------------|---|
| Pathway          | Short term                | → | Medium term                        | → | Long term       | MCDA Score | MCDA Ranking | Cost + Loss <sup>1</sup> (\$m) | Cost + Loss <sup>1</sup> Ranking | VFM <sup>2</sup> (\$'000/point) | VFM <sup>2</sup> Ranking | Short Term build costs <sup>3</sup> (\$m) |
| PW 1             | Status quo                | → | Retreat the Line                   | → | Managed Retreat | 54         | 4            | 15.31                          | 4                                | 211                             | 6                        | 0.29 (0.02 / yr)                          |
| PW 2             | Status quo                | → | Retreat the Line                   | → | Sea wall        | 51         | 5            | 10.72                          | 3                                | 111                             | 3                        | 0.29 (0.02 / yr)                          |
| PW 3             | Status quo/ Renourishment | → | Renourishment + Control Structures | → | Managed Retreat | 58         | 3=           | 16.08                          | 6                                | 205                             | 5                        | 1.30 (0.08 / yr)                          |
| PW 4             | Status quo/ Renourishment | → | Renourishment + Control Structures | → | Sea wall        | 58         | 3=           | 10.16                          | 2                                | 81                              | 2                        | 1.30 (0.08 / yr)                          |
| PW 5             | Status quo                | → | Sea wall                           | → | Managed Retreat | 65         | 1            | 15.43                          | 5                                | 173                             | 4                        | 0.29 (0.02 / yr)                          |
| PW 6             | Status quo                | → | Sea wall                           | → | Sea wall        | 61         | 2            | 8.93                           | 1                                | 57                              | 1                        | 0.29 (0.02 / yr)                          |

<sup>1</sup>Cost + loss is equal to the total cost estimate (operational + capital costs) for the full 100 year pathway + residual losses due to events that exceed a 1 in 100-year chance of occurrence.

<sup>2</sup>Value for Money measure – how much it costs to “purchase” each MCDA point based on the MCDA score and total cost estimate (operational + capital) of each 100 year pathway

<sup>3</sup>Mid-point cost scenario (including operational costs) for the first stage of each pathway (i.e the short term option). Numbers in brackets are the annual rating cost of the short term option over 20 years.

Northern Panel Workshop 10 – 7 November 2017

Item 7

Attachment 1

## Northern Cell – Assessment Results and Recommendations (preferred pathway highlighted)

| Unit E2: Pandora |                       |   |                                    |   |                                    |            |              |                                |                                  |                                 |                          |   |
|------------------|-----------------------|---|------------------------------------|---|------------------------------------|------------|--------------|--------------------------------|----------------------------------|---------------------------------|--------------------------|---|
| Pathway          | Short term            | → | Medium term                        | → | Long term                          | MCDA Score | MCDA Ranking | Cost + Loss <sup>1</sup> (\$m) | Cost + Loss <sup>1</sup> Ranking | VFM <sup>2</sup> (\$'000/point) | VFM <sup>2</sup> Ranking | Short Term build costs <sup>3</sup> (\$m) |
| PW 1             | Status quo            | → | Inundation Protection              | → | Managed Retreat                    | 51         | 2            | 12.36                          | 2                                | 193                             | 2                        | 0.00 (0.00 / yr)                          |
| PW 2             | Inundation Protection | → | Inundation Protection              | → | Managed Retreat                    | 54         | 1            | 13.39                          | 3                                | 202                             | 3                        | 2.00 (0.16 / yr)                          |
| PW 3             | Inundation Protection | → | Inundation Protection              | → | Inundation Protection              | 49         | 3            | 10.08                          | 1                                | 138                             | 1                        | 2.00 (0.16 / yr)                          |
| PW 4             | Inundation Protection | → | Inundation Protection + Flood Gate | → | Inundation Protection + Flood Gate | 45         | 4            | 19.05                          | 4                                | 349                             | 4                        | 2.00 (0.16 / yr)                          |
|                  |                       |   |                                    |   |                                    |            |              |                                |                                  |                                 |                          |   |
| PW11             | Status quo            | → | Inundation Protection              | → | Inundation Protection              | -          | -            | 9.05                           | -                                | -                               | -                        | -   |

<sup>1</sup>Cost + loss is equal to the total cost estimate (operational + capital costs) for the full 100 year pathway + residual losses due to events that exceed a 1 in 100-year chance of occurrence.

<sup>2</sup>Value for Money measure – how much it costs to “purchase” each MCDA point based on the MCDA score and total cost estimate (operational + capital) of each 100 year pathway

<sup>3</sup>Mid-point cost scenario (including operational costs) for the first stage of each pathway (i.e the short term option). Numbers in brackets are the annual rating cost of the short term option over 20 years.

## Northern Cell – Assessment Results and Recommendations (preferred pathway highlighted)

| Unit D: Westshore |                                    |   |                                    |   |                                    |            |              |                                |                                  |                                  |                          |   |
|-------------------|------------------------------------|---|------------------------------------|---|------------------------------------|------------|--------------|--------------------------------|----------------------------------|----------------------------------|--------------------------|---|
| Pathway           | Short term                         | → | Medium term                        | → | Long term                          | MCDA Score | MCDA ranking | Cost + Loss <sup>1</sup> (\$m) | Cost + Loss <sup>1</sup> ranking | VFM <sup>2</sup> (\$'000/ point) | VFM <sup>2</sup> ranking | Short Term build costs <sup>3</sup> (\$m) |
| PW 1              | Renourishment                      | → | Managed Retreat                    | → | Managed Retreat                    | 65         | 1            | 91.6                           | 6                                | 1392                             | 6                        | 13.26 (0.71 / yr)                         |
| PW 2              | Renourishment                      | → | Renourishment + Control Structures | → | Managed Retreat                    | 60         | 2            | 53.2                           | 5                                | 839                              | 5                        | 13.26 (0.71 / yr)                         |
| PW 3              | Renourishment                      | → | Renourishment + Control Structures | → | Renourishment + Control Structures | 51         | 4=           | 25.2                           | 1                                | 387                              | 1                        | 13.26 (0.71 / yr)                         |
| PW 4              | Renourishment                      | → | Renourishment + Control Structures | → | Sea wall                           | 54         | 3            | 28.9                           | 2                                | 432                              | 2                        | 13.26 (0.71 / yr)                         |
| PW 5              | Renourishment + Control Structures | → | Renourishment + Control Structures | → | Sea wall                           | 51         | 4=           | 29.0                           | 3                                | 459                              | 3                        | 16.17 (1.09 / yr)                         |
| PW 6              | Sea wall                           | → | Sea wall                           | → | Sea wall                           | 47         | 5            | 31.2                           | 4                                | 546                              | 4                        | 21.96 (1.59 / yr)                         |
|                   |                                    |   |                                    |   |                                    |            |              |                                |                                  |                                  |                          |   |
| PW9               | Renourishment + Control Structures | → | Renourishment + Control Structures | → | Renourishment + Control Structures | -          | -            | 25.3                           | -                                | -                                | -                        | -   |

<sup>1</sup> Cost + loss is equal to the total cost estimate (operational + capital costs) for the full 100 year pathway + residual losses due to events that exceed a 1 in 100-year chance of occurrence.

<sup>2</sup> Value for Money measure – how much it costs to “purchase” each MCDA point based on the MCDA score and total cost estimate (operational + capital) of each 100 year pathway

<sup>3</sup> Mid-point cost scenario (including operational costs) for the first stage of each pathway (i.e the short term option). Numbers in brackets are the annual rating cost of the short term option over 20 years.

Northern Panel Workshop 10 – 7 November 2017

Item 7

Attachment 1

### Northern Cell – Assessment Results and Recommendations (preferred pathway highlighted)

| Unit C: Bayview |                            |   |                                    |   |                                    |            |              |                                |                                  |                                 |                          |   |
|-----------------|----------------------------|---|------------------------------------|---|------------------------------------|------------|--------------|--------------------------------|----------------------------------|---------------------------------|--------------------------|---|
| Pathway         | Short term                 | → | Medium term                        | → | Long term                          | MCDA Score | MCDA ranking | Cost + Loss <sup>1</sup> (\$m) | Cost + Loss <sup>1</sup> ranking | VFM <sup>2</sup> (\$'000/point) | VFM <sup>2</sup> ranking | Short Term build costs <sup>3</sup> (\$m) |
| PW 1            | Status quo                 | → | Managed Retreat                    | → | Managed Retreat                    | 62         | 2            | 21.34                          | 6                                | 336                             | 6                        | 0.44 (0.03 / yr)                          |
| PW 2            | Status quo / Renourishment | → | Renourishment + Control Structures | → | Managed Retreat                    | 64         | 1            | 19.06                          | 5                                | 280                             | 5                        | 3.84 (0.20 / yr)                          |
| PW 3            | Status Quo/ Renourishment  | → | Renourishment + Control Structures | → | Renourishment + Control Structures | 51         | 5            | 12.70                          | 2                                | 207                             | 2                        | 3.84 (0.20 / yr)                          |
| PW 4            | Status Quo/ Renourishment  | → | Renourishment + Control Structures | → | Sea wall                           | 57         | 4            | 14.68                          | 3                                | 220                             | 3                        | 3.84 (0.20 / yr)                          |
| PW 5            | Status quo                 | → | Sea wall                           | → | Managed Retreat                    | 60         | 3            | 17.32                          | 4                                | 270                             | 4                        | 0.44 (0.03 / yr)                          |
| PW 6            | Status quo                 | → | Sea wall                           | → | Sea wall                           | 48         | 6            | 11.10                          | 1                                | 187                             | 1                        | 0.44 (0.03 / yr)                          |

<sup>1</sup>Cost + loss is equal to the total cost estimate (operational + capital costs) for the full 100 year pathway + residual losses due to events that exceed a 1 in 100-year chance of occurrence.

<sup>2</sup>Value for Money measure – how much it costs to “purchase” each MCDA point based on the MCDA score and total cost estimate (operational + capital) of each 100 year pathway

<sup>3</sup>Mid-point cost scenario (including operational costs) for the first stage of each pathway (i.e the short term option). Numbers in brackets are the annual rating cost of the short term option over 20 years.

Northern Panel Workshop 10 – 7 November 2017

## Northern Cell – Assessment Results and Recommendations (preferred pathway highlighted)

| Unit B: Whirinaki |                           |   |                                    |   |                                    |            |              |                                |                                  |                                  |                          |   |
|-------------------|---------------------------|---|------------------------------------|---|------------------------------------|------------|--------------|--------------------------------|----------------------------------|----------------------------------|--------------------------|---|
| Pathway           | Short term                | → | Medium term                        | → | Long term                          | MCDA Score | MCDA ranking | Cost + Loss <sup>1</sup> (\$m) | Cost + Loss <sup>1</sup> ranking | VFM <sup>2</sup> (\$'000/ point) | VFM <sup>2</sup> ranking | Short Term build costs <sup>3</sup> (\$m) |
| PW 1              | Status quo                | → | Managed Retreat                    | → | Managed Retreat                    | 59         | 3=           | 32.29                          | 6                                | 515                              | 6                        | 0.48 (0.03 / yr)                          |
| PW 2              | Status quo/ Renourishment | → | Renourishment + Control Structures | → | Managed Retreat                    | 60         | 2            | 25.39                          | 5                                | 363                              | 5                        | 4.12 (0.21 / yr)                          |
| PW 3              | Status quo/ Renourishment | → | Renourishment + Control Structures | → | Renourishment + Control Structures | 56         | 4            | 15.76                          | 2                                | 189                              | 2                        | 4.12 (0.21 / yr)                          |
| PW 4              | Status quo/ Renourishment | → | Renourishment + Control Structures | → | Sea wall                           | 62         | 1            | 17.74                          | 3                                | 203                              | 3                        | 4.12 (0.21 / yr)                          |
| PW 5              | Status quo/ Renourishment | → | Sea wall                           | → | Managed Retreat                    | 59         | 3=           | 23.64                          | 4                                | 340                              | 4                        | 0.48 (0.03 / yr)                          |
| PW 6              | Status quo                | → | Sea wall                           | → | Sea wall                           | 55         | 5            | 14.16                          | 1                                | 163                              | 1                        | 0.48 (0.03 / yr)                          |

<sup>1</sup> Cost + loss is equal to the total cost estimate (operational + capital costs) for the full 100 year pathway + residual losses due to events that exceed a 1 in 100-year chance of occurrence.

<sup>2</sup> Value for Money measure – how much it costs to “purchase” each MCDA point based on the MCDA score and total cost estimate (operational + capital) of each 100 year pathway

<sup>3</sup> Mid-point cost scenario (including operational costs) for the first stage of each pathway (i.e the short term option). Numbers in brackets are the annual rating cost of the short term option over 20 years.

Northern Panel Workshop 10 – 7 November 2017

Item 7

Attachment 1





## Southern Cell – Assessment Results and Recommendations (preferred pathway highlighted)


| Unit L: Clifton |                                    |   |                                    |   |                                    |            |              |                                |                                  |                                 |                          |   |
|-----------------|------------------------------------|---|------------------------------------|---|------------------------------------|------------|--------------|--------------------------------|----------------------------------|---------------------------------|--------------------------|---|
| Pathway         | Short term                         | → | Medium term                        | → | Long term                          | MCDA Score | MCDA ranking | Cost + Loss <sup>1</sup> (\$m) | Cost + Loss <sup>1</sup> ranking | VFM <sup>2</sup> (\$'000/point) | VFM <sup>2</sup> ranking | Short Term build costs <sup>3</sup> (\$m) |
| PW 1            | Renourishment                      | → | Managed Retreat                    | → | Managed Retreat                    | 67         | 2            | 12.20                          | 6                                | 173                             | 5                        | 7.12 (0.44 / yr)                          |
| PW 2            | Renourishment + Control Structures | → | Renourishment + Control Structures | → | Managed Retreat                    | 59         | 3            | 10.47                          | 5                                | 159                             | 4                        | 6.25 (0.40 / yr)                          |
| PW 3            | Renourishment + Control Structures | → | Renourishment + Control Structures | → | Renourishment + Control Structures | 52         | 4            | 9.60                           | 3                                | 156                             | 3                        | 6.25 (0.40 / yr)                          |
| PW 4            | Renourishment + Control Structures | → | Renourishment + Control Structures | → | Sea wall                           | 43         | 6            | 10.29                          | 4                                | 205                             | 6                        | 6.25 (0.40 / yr)                          |
| PW 5            | Sea wall                           | → | Sea wall                           | → | Managed Retreat                    | 70         | 1            | 8.83                           | 2                                | 110                             | 1                        | 5.23 (0.38 / yr)                          |
| PW 6            | Sea wall                           | → | Sea wall                           | → | Sea wall                           | 49         | 5            | 7.65                           | 1                                | 126                             | 2                        | 5.23 (0.38 / yr)                          |

<sup>1</sup>Cost + loss is equal to the total cost estimate (operational + capital costs) for the full 100 year pathway + residual losses due to events that exceed a 1 in 100-year chance of occurrence.

<sup>2</sup>Value for Money measure – how much it costs to “purchase” each MCDA point based on the MCDA score and total cost estimate (operational + capital) of each 100 year pathway

<sup>3</sup>Mid-point cost scenario (including operational costs) for the first stage of each pathway (i.e the short term option). Numbers in brackets are the annual rating cost of the short term option over 20 years.

## Southern Cell – Assessment Results and Recommendations (preferred pathway highlighted)


| Unit K2: Te Awanga   |                                    |   |                                    |   |                                    |            |              |                                |                                  |                                  |                          |   |
|--|------------------------------------|---|------------------------------------|---|------------------------------------|------------|--------------|--------------------------------|----------------------------------|----------------------------------|--------------------------|---|
| Pathway  | Short term                         | → | Medium term                        | → | Long term                          | MCDA Score | MCDA ranking | Cost + Loss <sup>1</sup> (\$m) | Cost + Loss <sup>1</sup> ranking | VFM <sup>2</sup> (\$'000/ point) | VFM <sup>2</sup> ranking | Short Term build costs <sup>3</sup> (\$m) |
| PW 1   | Renourishment                      | → | Retreat the Line                   | → | Managed Retreat                    | 50         | 4            | 24.15                          | 6                                | 403                              | 6                        | 8.84 (0.55 / yr)                          |
| PW 2   | Renourishment + Control Structures | → | Renourishment + Control Structures | → | Retreat the Line                   | 58         | 2            | 17.08                          | 2                                | 194                              | 2                        | 8.98 (0.60 / yr)                          |
|  PW 3 | Renourishment + Control Structures | → | Renourishment + Control Structures | → | Renourishment + Control Structures | 62         | 1            | 16.77                          | 1                                | 171                              | 1                        | 8.98 (0.60 / yr)                          |
| PW 4   | Renourishment + Control Structures | → | Renourishment + Control Structures | → | Sea wall                           | 53         | 3            | 18.48                          | 3                                | 232                              | 3                        | 8.98 (0.60 / yr)                          |
| PW 5   | Renourishment                      | → | Sea wall                           | → | Retreat the Line                   | 43         | 5=           | 20.00                          | 5                                | 329                              | 5                        | 8.84 (0.55 / yr)                          |
| PW 6   | Sea wall                           | → | Sea wall                           | → | Sea wall                           | 43         | 5=           | 18.67                          | 4                                | 291                              | 4                        | 9.08 (0.66 / yr)                          |
|  |                                    |   |                                    |   |                                    |            |              |                                |                                  |                                  |                          |   |
| PW 30  | Retreat the Line                   |   |                                    |   |                                    | --         | --           | 14.94                          | --                               | --                               | --                       |   |

<sup>1</sup> Cost + loss is equal to the total cost estimate (operational + capital costs) for the full 100 year pathway + residual losses due to events that exceed a 1 in 100-year chance of occurrence.

<sup>2</sup> Value for Money measure – how much it costs to “purchase” each MCDA point based on the MCDA score and total cost estimate (operational + capital) of each 100 year pathway

<sup>3</sup> Mid-point cost scenario (including operational costs) for the first stage of each pathway (i.e the short term option). Numbers in brackets are the annual rating cost of the short term option over 20 years.

## Southern Cell – Assessment Results and Recommendations (preferred pathway highlighted)

| Unit K1: Haumoana  |                                    |   |                                    |   |                                    |            |              |                                |                                  |                                   |                          |   |
|--|------------------------------------|---|------------------------------------|---|------------------------------------|------------|--------------|--------------------------------|----------------------------------|-----------------------------------|--------------------------|---|
| Pathway  | Short term                         | → | Medium term                        | → | Long term                          | MCDA Score | MCDA ranking | Cost + Loss <sup>1</sup> (\$m) | Cost + Loss <sup>1</sup> ranking | VFM <sup>2</sup> (\$'000 / point) | VFM <sup>2</sup> ranking | Short Term build costs <sup>3</sup> (\$m) |
| PW 1   | Renourishment                      | → | Managed Retreat                    | → | Managed Retreat                    | 61         | 3=           | 24.15                          | 6                                | 682                               | 6                        | 10.55 (0.70 / yr)                         |
|  PW 2 | Renourishment + Control Structures | → | Renourishment + Control Structures | → | Managed Retreat                    | 72         | 1            | 17.08                          | 2                                | 360                               | 3                        | 12.90 (0.85 / yr)                         |
| PW 3   | Renourishment + Control Structures | → | Renourishment + Control Structures | → | Retreat the Line                   | 61         | 3=           | 16.77                          | 1                                | 256                               | 2                        | 12.90 (0.85 / yr)                         |
| PW 4   | Renourishment + Control Structures | → | Renourishment + Control Structures | → | Renourishment + Control Structures | 62         | 2            | 18.48                          | 3                                | 233                               | 1                        | 12.90 (0.85 / yr)                         |
| PW 5   | Renourishment + Control Structures | → | Renourishment + Control Structures | → | Sea wall                           | 50         | 4            | 20.00                          | 5                                | 362                               | 4                        | 12.90 (0.85 / yr)                         |
| PW 6   | Sea wall                           | → | Sea wall                           | → | Sea wall                           | 46         | 5            | 18.67                          | 4                                | 404                               | 5                        | 15.74 (1.15 / yr)                         |
|  |                                    |   |                                    |   |                                    |            |              |                                |                                  |                                   |                          |   |
| PW 30  | Retreat the Line                   |   |                                    |   |                                    | --         | --           | 14.94                          |                                  | --                                | --                       |   |

<sup>1</sup> Cost + loss is equal to the total cost estimate (operational + capital costs) for the full 100 year pathway + residual losses due to events that exceed a 1 in 100-year chance of occurrence.

<sup>2</sup> Value for Money measure – how much it costs to “purchase” each MCDA point based on the MCDA score and total cost estimate (operational + capital) of each 100 year pathway


<sup>3</sup> Mid-point cost scenario (including operational costs) for the first stage of each pathway (i.e the short term option). Numbers in brackets are the annual rating cost of the short term option over 20 years.

Southern Panel Workshop 10 – 2 November 2017

Item 7

Attachment 2

## Southern Cell – Assessment Results and Recommendations (preferred pathway highlighted)

| Unit J: Clive / East Clive   |            |   |                                    |   |                                    |            |              |                                |                                  |                                  |                          |   |
|--|------------|---|------------------------------------|---|------------------------------------|------------|--------------|--------------------------------|----------------------------------|----------------------------------|--------------------------|---|
| Pathway  | Short term | → | Medium term                        | → | Long term                          | MCDA Score | MCDA ranking | Cost + Loss <sup>1</sup> (\$m) | Cost + Loss <sup>1</sup> ranking | VFM <sup>2</sup> (\$'000/ point) | VFM <sup>2</sup> ranking | Short Term build costs <sup>3</sup> (\$m) |
|  PW 1 | Status Quo | → | Renourishment + Control Structures | → | Retreat the Line / Managed Retreat | 78         | 1            | 40.78                          | 3                                | 403                              | 3                        | 1.35 (0.07 / yr)                          |
| PW 2   | Status Quo | → | Renourishment + Control Structures | → | Renourishment + Control Structures | 76         | 2            | 18.61                          | 1                                | 76                               | 1                        | 1.35 (0.07 / yr)                          |
| PW 3   | Status Quo | → | Sea wall                           | → | Retreat the Line / Managed Retreat | 62         | 3            | 43.25                          | 4                                | 546                              | 4                        | 1.35 (0.07 / yr)                          |
| PW 4   | Status Quo | → | Sea wall                           | → | Sea wall                           | 50         | 4            | 21.77                          | 2                                | 178                              | 2                        | 1.35 (0.07 / yr)                          |

<sup>1</sup>Cost + loss is equal to the total cost estimate (operational + capital costs) for the full 100 year pathway + residual losses due to events that exceed a 1 in 100-year chance of occurrence.

<sup>2</sup>Value for Money measure – how much it costs to “purchase” each MCDA point based on the MCDA score and total cost estimate (operational + capital) of each 100 year pathway

<sup>3</sup>Mid-point cost scenario (including operational costs) for the first stage of each pathway (i.e the short term option). Numbers in brackets are the annual rating cost of the short term option over 20 years.

**Subject: COASTAL HAZARDS STRATEGY – HIGH LEVEL COST ESTIMATES****Reason for the Report**

1. In support of the reports provided in this agenda relating to the development of the funding model, this report provides an overview for the Joint Committee of:
  - 1.1. The economic costs of unmitigated coastal hazards impacts, and
  - 1.2. The construction and maintenance costs of coastal hazard response options (pathways) as developed by the Assessment Panels.

**Potential Economic Loss (Do Nothing)**

2. A coastal hazard and risk assessment has been produced by Tonkin and Taylor for the Hawkes Bay region for three time epochs; present day, 2065 and 2120.



Coastal Erosion – Westshore – 2120



Inundation– Ahuriri / Pandora – 2120

*Figure 1: Examples of coastal hazard maps for erosion and inundation.*

3. Using this information, Tonkin and Taylor have assessed the potential economic losses associated with these hazards. Note that this assessment does not include social or cultural losses, which have been considered by others.
4. For the purposes of attributing economic loss from erosion, any property, land or asset within the coastal erosion hazard zones was deemed to be completely lost and 100% of the current value included in the total figure.
5. For economic loss from inundation, it is unlikely that properties would be completely written off, but they would sustain damage. As such a fragility curve has been applied that equates the depth of water and asset type to a repair cost based on a percentage of the asset value.
6. The economic loss figures calculated by Tonkin and Taylor represent the values of physical assets directly affected by the hazards. They do not account for any economic impacts to other areas, for example through loss of road access, or blight on neighbouring property values. Any impact on amenity, cultural values, tourism and willingness to invest in the area are also excluded from this analysis.
7. There is uncertainty with regards climate change, sea level rise, storm frequency and magnitude. These factors are reflected in the figures as a probability of occurrence.
8. Total loss figures could potentially run into \$100's of millions over the strategy timeframe (Figures 2& 3), which should be used to put the cost of defence options in context.

9. Priority units have been assessed as, from North to South, Whirinaki (B), Bayview (C), Westshore (D), Pandora & Ahuriri (E), Clive (J), Haumoana & Te Awanga (K) and Clifton (L).

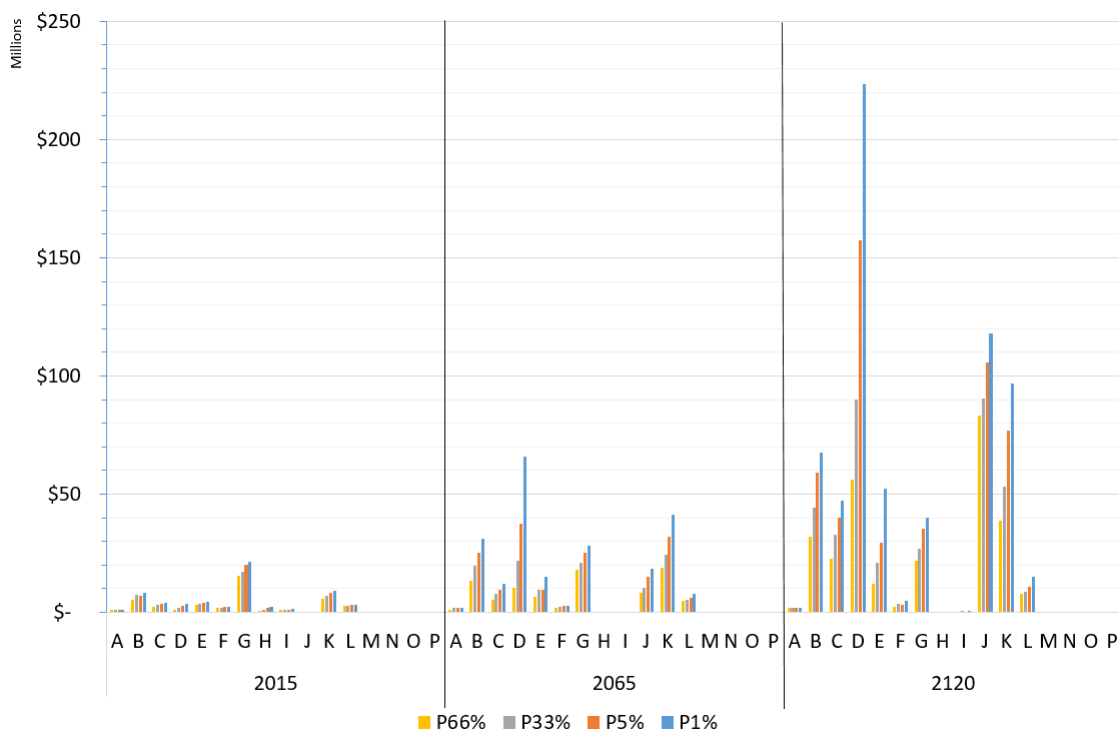


Figure 2: Potential economic loss resulting from erosion (\$ Millions)

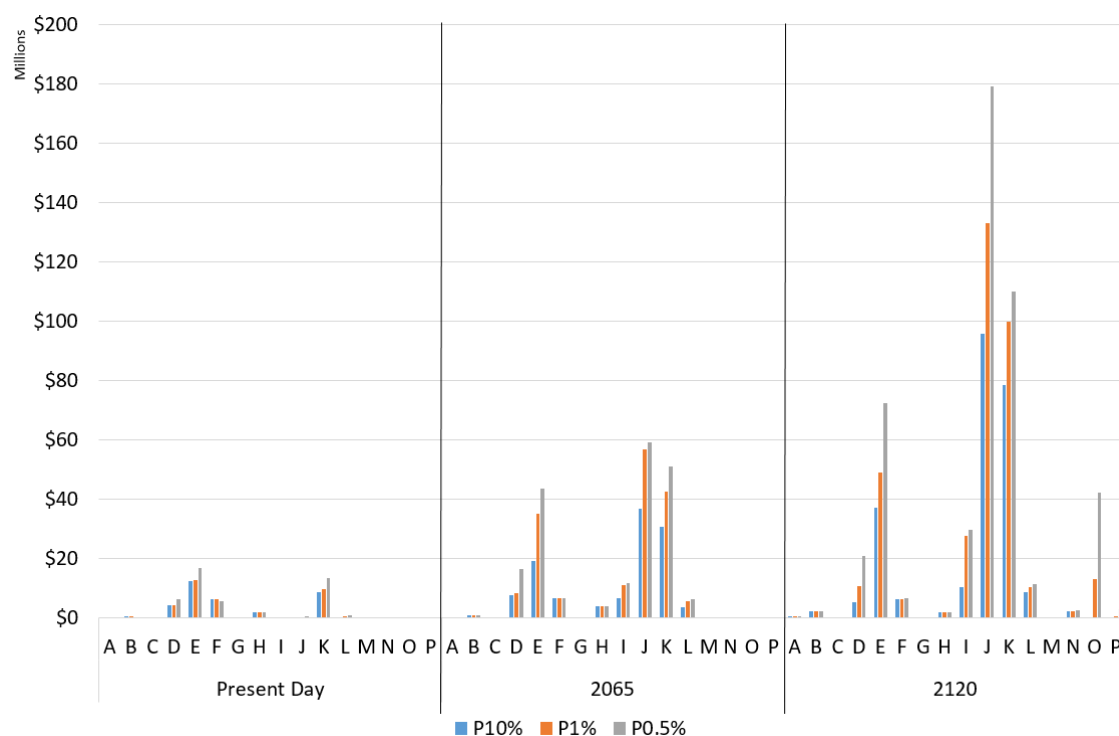


Figure 3: Potential economic loss resulting from inundation (\$ Millions)

### Cost of Implementing Pathways

10. For each priority unit, six coastal defence pathways were developed and evaluated on a number of criteria by the panels.

11. A range of options were considered ranging from soft engineering, to harder defence options such as control structures and seawalls. Managed retreat was also assessed and at different time epochs.
12. For each pathway three time epochs were considered, short term (0-20 years), medium term (20-50 years) and long term (50-100 years). Consideration was given to changing the strategy option between each epoch.
13. To simplify the cost estimate process, all options were assumed to commence in year 1 and be maintained for the duration of each epoch. It is recognised that in reality a staged approach may be taken.
14. There is uncertainty with regards the timing and trigger points that would necessitate moving between short, medium and long term strategies. These include climate change impacts, material availability and legislative restrictions such as consenting and political will. For the purposes of high level costs each option is assessed based on the timeframes defined above.
15. A presumption is made that each option would be applied to the whole unit, no work has been done to calculate the costs for a partial implementation or staged approaches, although this should be assessed as part of the detailed design process.

### High Level Cost Estimates

16. Cost estimates were generated for each pathway in each unit after consideration of the following;
  - Similar projects in Hawkes Bay Region
  - Council rates for similar work
  - Experience elsewhere in NZ
  - International Examples
  - Proposed work, historic reports and cost estimates
17. Costs developed for each unit reflect estimates for capital work and maintenance for the duration of each time epoch. Additional work identified in the pathways, such as planting and beach maintenance are also included.
18. Cost estimates are provided as a high to low range, this reflects the uncertainty which includes, but is not limited to;
  - Material rates, sources and transport costs
  - Available material size, density and grading curves
  - Structure configuration to be confirmed in detailed design
  - Contingency and contractor rates
  - 100 year planning horizon
  - Climate change/sea level rise
  - Strategies adopted in neighbouring units

### Priority Unit Cost Estimates

19. As outlined in the report “**Stage 3 Progress Update**” provided in this agenda, the Assessment Panels have identified a preliminary preferred pathway for each priority unit. While these should not be considered final recommendations as the Panels have yet to conclude their process, for the purposes of this paper **Table 1 attached** summarises the cost estimates for the preferred pathways as currently identified by the Panels.
20. **Attached** to this paper are tables providing costs estimate for all pathways developed by the Assessment Panels.
21. Rough order costs are provided based on the assumptions outlined in this paper.



22. Cost estimates are presented as a low to high range, which reflects the uncertainty detailed in the assumptions.
23. For the purposes of economic analysis and funding models, the midpoint of the estimates has been used.
24. Further work into material sources, availability, consenting feasibility and detailed scheme design will allow for cost estimates to be refined to a smaller range.

### **Recommendation**

That the Clifton to Tangoio Coastal Hazards Strategy Joint Committee receives and notes the “**Coastal Hazards Strategy – High Level Cost Estimates**” report.

### **Authored by:**

**Jon Clarke**

### **Approved by:**

**Simon Bendall**

**Graeme Hansen  
GROUP MANAGER ASSET  
MANAGEMENT**

### **Attachment/s**

- [1](#) Table 1: Rough order cost estimates for each units chosen pathway.
- [2](#) Costs estimates for all pathways developed by the Assessment Panels.



Table 1: Rough order cost estimates for each units chosen pathway

| Pathway   | Description       | ST (0-20)     |               | MT (20-50)    |               | LT (50-100)     |               | TOTAL         |               |
|-----------|-------------------|---------------|---------------|---------------|---------------|-----------------|---------------|---------------|---------------|
|           |                   | Low           | High          | Low           | High          | Low             | High          | Low           | High          |
| Whirinaki |                   |               |               |               |               |                 |               |               |               |
| 4         | PW4: SQ/R+RCS+SW  | \$ 2,380,200  | \$ 5,855,400  | \$ 10,048,500 | \$ 26,250,000 | \$ 20,370,000   | \$ 32,707,500 | \$ 32,798,700 | \$ 64,812,900 |
| Bayview   |                   |               |               |               |               |                 |               |               |               |
| 3         | PW3: SQ/R+RCS+RCS | \$ 2,125,200  | \$ 5,560,400  | \$ 7,314,000  | \$ 21,880,000 | \$ 4,590,000    | \$ 15,050,000 | \$ 14,029,200 | \$ 42,490,400 |
| Westshore |                   |               |               |               |               |                 |               |               |               |
| 3         | PW3: R+RCS+RCS    | \$ 10,427,200 | \$ 16,098,400 | \$ 9,272,000  | \$ 23,306,000 | \$ 8,451,900    | \$ 27,439,500 | \$ 28,151,100 | \$ 66,843,900 |
| Pandora   |                   |               |               |               |               |                 |               |               |               |
| 3         | PW3: IP+IP+IP     | \$ 1,539,560  | \$ 2,460,680  | \$ 4,519,920  | \$ 7,352,820  | \$ 8,306,464.00 | \$ 13,473,864 | \$ 14,365,944 | \$ 23,287,364 |
| Ahuriri   |                   |               |               |               |               |                 |               |               |               |
| 6         | PW6: SQ+SW+SW     | \$ 193,200    | \$ 380,400    | \$ 3,290,000  | \$ 6,020,000  | \$ 4,756,000    | \$ 8,113,450  | \$ 8,239,200  | \$ 14,513,850 |
| Clive     |                   |               |               |               |               |                 |               |               |               |
| 1         | PW1: SQ+RCS+MR    | \$ 986,000    | \$ 1,722,000  | \$ 4,492,500  | \$ 10,952,500 | \$ -            | \$ -          | \$ 5,478,500  | \$ 12,674,500 |
| Haumoana  |                   |               |               |               |               |                 |               |               |               |
| 2         | PW2: RCS+RCS+MR   | \$ 6,552,000  | \$ 19,240,000 | \$ 2,250,000  | \$ 3,750,000  | \$ -            | \$ -          | \$ 8,802,000  | \$ 22,990,000 |
| Te Awanga |                   |               |               |               |               |                 |               |               |               |
| 3         | PW3: RCS+RCS+RCS  | \$ 5,182,000  | \$ 12,770,000 | \$ 2,250,000  | \$ 3,750,000  | \$ 7,560,000    | \$ 14,940,000 | \$ 14,992,000 | \$ 31,460,000 |
| Clifton   |                   |               |               |               |               |                 |               |               |               |
| 5         | PW5: SW+SW+MR     | \$ 3,850,000  | \$ 6,600,000  | \$ 525,000    | \$ 900,000    | \$ -            | \$ -          | \$ 4,375,000  | \$ 7,500,000  |

<sup>1</sup> Timeframes defined as ST: Short Term (0-20 years), MT: Medium Term (20-50 years), LT: Long Term (50-100 years)

<sup>2</sup> Pathway selection process detailed in accompanying paper

<sup>3</sup> Pathway Description Key:

SQ = Status Quo, R = Renourishment, RCS = Renourishment & control structures, IP = Inundation Protection, SW = Seawall, MR = Managed Retreat



| Whirinaki |                   |              |              |               |               |               |               |               |               |
|-----------|-------------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Pathway   | Description       | ST           |              | MT            |               | LT            |               | TOTAL         |               |
|           |                   | Low          | High         | Low           | High          | Low           | High          | Low           | High          |
| 1         | PW1: SQ+MR+MR     | \$ 355,200   | \$ 605,400   | \$ -          | \$ -          | \$ -          | \$ -          | \$ 355,200    | \$ 605,400    |
| 2         | PW2: SQ/R+RCS+MR  | \$ 2,380,200 | \$ 5,855,400 | \$ 10,048,500 | \$ 26,250,000 | \$ -          | \$ -          | \$ 12,428,700 | \$ 32,105,400 |
| 3         | PW3: SQ/R+RCS+RCS | \$ 2,380,200 | \$ 5,855,400 | \$ 10,048,500 | \$ 26,250,000 | \$ 5,985,000  | \$ 17,062,500 | \$ 18,413,700 | \$ 49,167,900 |
| 4         | PW4: SQ/R+RCS+SW  | \$ 2,380,200 | \$ 5,855,400 | \$ 10,048,500 | \$ 26,250,000 | \$ 20,370,000 | \$ 32,707,500 | \$ 32,798,700 | \$ 64,812,900 |
| 5         | PW5: SQ+SW+MR     | \$ 355,200   | \$ 605,400   | \$ 17,710,000 | \$ 30,992,500 | \$ -          | \$ -          | \$ 18,065,200 | \$ 31,597,900 |
| 6         | PW6: SQ+SW+SW     | \$ 355,200   | \$ 605,400   | \$ 19,320,000 | \$ 33,810,000 | \$ 5,250,000  | \$ 9,187,500  | \$ 24,925,200 | \$ 43,602,900 |

| Bayview |                   |              |              |               |               |               |               |               |               |
|---------|-------------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Pathway | Description       | ST           |              | MT            |               | LT            |               | TOTAL         |               |
|         |                   | Low          | High         | Low           | High          | Low           | High          | Low           | High          |
| 1       | PW1: SQ+MR+MR     | \$ 325,200   | \$ 560,400   | \$ -          | \$ -          | \$ -          | \$ -          | \$ 325,200    | \$ 560,400    |
| 2       | PW2: SQ/R+RCS+MR  | \$ 2,125,200 | \$ 5,560,400 | \$ 7,314,000  | \$ 21,880,000 | \$ -          | \$ -          | \$ 9,439,200  | \$ 27,440,400 |
| 3       | PW3: SQ/R+RCS+RCS | \$ 2,125,200 | \$ 5,560,400 | \$ 7,314,000  | \$ 21,880,000 | \$ 4,590,000  | \$ 15,050,000 | \$ 14,029,200 | \$ 42,490,400 |
| 4       | PW4: SQ/R+RCS+SW  | \$ 2,125,200 | \$ 5,560,400 | \$ 7,314,000  | \$ 21,880,000 | \$ 12,804,000 | \$ 20,559,000 | \$ 22,243,200 | \$ 47,999,400 |
| 5       | PW5: SQ+SW+MR     | \$ 325,200   | \$ 560,400   | \$ 11,132,000 | \$ 19,481,000 | \$ -          | \$ -          | \$ 11,457,200 | \$ 20,041,400 |
| 6       | PW6: SQ+SW+SW     | \$ 325,200   | \$ 560,400   | \$ 12,144,000 | \$ 21,252,000 | \$ 3,300,000  | \$ 5,775,000  | \$ 15,769,200 | \$ 27,587,400 |

| Westshore |                 |               |               |              |               |               |               |               |               |
|-----------|-----------------|---------------|---------------|--------------|---------------|---------------|---------------|---------------|---------------|
| Pathway   | Description     | ST            |               | MT           |               | LT            |               | TOTAL         |               |
|           |                 | Low           | High          | Low          | High          | Low           | High          | Low           | High          |
| 1         | PW1: R+MR+MR    | \$ 10,427,200 | \$ 16,098,400 | \$ -         | \$ -          | \$ -          | \$ -          | \$ 10,427,200 | \$ 16,098,400 |
| 2         | PW2: R+RCS+MR   | \$ 10,427,200 | \$ 16,098,400 | \$ 9,272,000 | \$ 23,306,000 | \$ -          | \$ -          | \$ 19,699,200 | \$ 39,404,400 |
| 3         | PW3: R+RCS+RCS  | \$ 10,427,200 | \$ 16,098,400 | \$ 9,272,000 | \$ 23,306,000 | \$ 8,451,900  | \$ 27,439,500 | \$ 28,151,100 | \$ 66,843,900 |
| 4         | PW4: R+RCS+SW   | \$ 10,427,200 | \$ 16,098,400 | \$ 9,272,000 | \$ 23,306,000 | \$ 22,062,750 | \$ 38,279,300 | \$ 41,761,950 | \$ 77,683,700 |
| 5         | PW5: RCS+RCS+SW | \$ 9,294,000  | \$ 23,050,000 | \$ 5,177,000 | \$ 10,181,000 | \$ 22,062,750 | \$ 38,279,300 | \$ 36,533,750 | \$ 71,510,300 |
| 6         | PW6: SW+SW+SW   | \$ 15,972,000 | \$ 27,951,000 | \$ 2,178,000 | \$ 3,811,500  | \$ 14,138,500 | \$ 24,152,500 | \$ 32,288,500 | \$ 55,915,000 |

<sup>1</sup> Timeframes defined as ST: Short Term (0-20 years), MT: Medium Term (20-50 years), LT: Long Term (50-100 years)

<sup>2</sup> Pathway Description Key: SQ = Status Quo, R = Renourishment, RCS = Renourishment & control structures, IP = Inundation Protection, SW = Seawall, MR = Managed Retreat

## Attachment 2

## Costs estimates for all pathways developed by the Assessment Panels.

| Pandora |               |              |              |               |               |                 |               |               |               |
|---------|---------------|--------------|--------------|---------------|---------------|-----------------|---------------|---------------|---------------|
| Pathway | Description   | ST           |              | MT            |               | LT              |               | TOTAL         |               |
|         |               | Low          | High         | Low           | High          | Low             | High          | Low           | High          |
| 1       | PW1: SQ+IP+MR | \$ -         | \$ -         | \$ 5,919,480  | \$ 9,589,275  | \$ -            | \$ -          | \$ 5,919,480  | \$ 9,589,275  |
| 2       | PW2: IP+IP+MR | \$ 1,539,560 | \$ 2,460,680 | \$ 4,519,920  | \$ 7,352,820  | \$ -            | \$ -          | \$ 6,059,480  | \$ 9,813,500  |
| 3       | PW3: IP+IP+IP | \$ 1,539,560 | \$ 2,460,680 | \$ 4,519,920  | \$ 7,352,820  | \$ 8,306,464.00 | \$ 13,473,864 | \$ 14,365,944 | \$ 23,287,364 |
| 4       | PW4: IP+FG+FG | \$ 1,539,560 | \$ 2,460,680 | \$ 17,460,000 | \$ 34,836,000 | \$ 5,499,560.00 | \$ 10,296,680 | \$ 24,499,120 | \$ 47,593,360 |

| Ahuriri |                  |            |              |              |              |                 |               |               |               |
|---------|------------------|------------|--------------|--------------|--------------|-----------------|---------------|---------------|---------------|
| Pathway | Description      | ST         |              | MT           |              | LT              |               | TOTAL         |               |
|         |                  | Low        | High         | Low          | High         | Low             | High          | Low           | High          |
| 1       | PW1: SQ+RTL+MR   | \$ 193,200 | \$ 380,400   | \$ 783,000   | \$ 1,432,500 | \$ -            | \$ -          | \$ 976,200    | \$ 1,812,900  |
| 2       | PW2: SQ+RTL+SW   | \$ 193,200 | \$ 380,400   | \$ 1,353,000 | \$ 2,431,500 | \$ 6,478,500.00 | \$ 10,742,500 | \$ 8,024,700  | \$ 13,554,400 |
| 3       | PW3: SQ/R+RCS+MR | \$ 763,200 | \$ 1,830,400 | \$ 3,178,500 | \$ 5,725,000 | \$ -            | \$ -          | \$ 3,941,700  | \$ 7,555,400  |
| 4       | PW4: SQ/R+RCS+SW | \$ 763,200 | \$ 1,830,400 | \$ 3,178,500 | \$ 5,725,000 | \$ 6,839,820    | \$ 11,488,980 | \$ 10,781,520 | \$ 19,044,380 |
| 5       | PW5: SQ+SW+MR    | \$ 193,200 | \$ 380,400   | \$ 3,290,000 | \$ 6,020,000 | \$ -            | \$ -          | \$ 3,483,200  | \$ 6,400,400  |
| 6       | PW6: SQ+SW+SW    | \$ 193,200 | \$ 380,400   | \$ 3,290,000 | \$ 6,020,000 | \$ 4,756,000    | \$ 8,113,450  | \$ 8,239,200  | \$ 14,513,850 |

| Clive   |                 |            |              |                 |               |                 |               |               |               |
|---------|-----------------|------------|--------------|-----------------|---------------|-----------------|---------------|---------------|---------------|
| Pathway | Description     | ST         |              | MT              |               | LT              |               | TOTAL         |               |
|         |                 | Low        | High         | Low             | High          | Low             | High          | Low           | High          |
| 1       | PW1: SQ+RCS+MR  | \$ 986,000 | \$ 1,722,000 | \$ 4,492,500    | \$ 10,952,500 | \$ -            | \$ -          | \$ 5,478,500  | \$ 12,674,500 |
| 2       | PW2: SQ+RCS+RCS | \$ 986,000 | \$ 1,722,000 | \$ 4,492,500    | \$ 10,952,500 | \$ 6,300,000.00 | \$ 13,650,000 | \$ 11,778,500 | \$ 26,324,500 |
| 3       | PW3: SQ+SW+MR   | \$ 986,000 | \$ 1,722,000 | \$ 8,740,000.00 | \$ 15,295,000 | \$ -            | \$ -          | \$ 9,726,000  | \$ 17,017,000 |
| 4       | PW4: SQ+SW+SW   | \$ 986,000 | \$ 1,722,000 | \$ 8,740,000.00 | \$ 15,295,000 | \$ 9,141,000.00 | \$ 14,974,000 | \$ 18,867,000 | \$ 31,991,000 |

<sup>1</sup> Timeframes defined as ST: Short Term (0-20 years), MT: Medium Term (20-50 years), LT: Long Term (50-100 years)

<sup>2</sup> Pathway Description Key: SQ = Status Quo, R = Renourishment, RCS = Renourishment & control structures, IP = Inundation Protection, SW = Seawall, MR = Managed Retreat, RTL = Retreat the Line, FG = Flood Gate

| Haumoana |                  |               |               |              |              |               |               |               |               |
|----------|------------------|---------------|---------------|--------------|--------------|---------------|---------------|---------------|---------------|
| Pathway  | Description      | ST            |               | MT           |              | LT            |               | TOTAL         |               |
|          |                  | Low           | High          | Low          | High         | Low           | High          | Low           | High          |
| 1        | PW1: R+MR+MR     | \$ 7,252,500  | \$ 13,837,500 | \$ -         | \$ -         | \$ -          | \$ -          | \$ 7,252,500  | \$ 13,837,500 |
| 2        | PW2: RCS+RCS+MR  | \$ 6,552,000  | \$ 19,240,000 | \$ 2,250,000 | \$ 3,750,000 | \$ -          | \$ -          | \$ 8,802,000  | \$ 22,990,000 |
| 3        | PW3: RCS+RCS+RTL | \$ 6,552,000  | \$ 19,240,000 | \$ 2,250,000 | \$ 3,750,000 | \$ 1,386,000  | \$ 2,079,000  | \$ 10,188,000 | \$ 25,069,000 |
| 4        | PW4: RCS+RCS+RCS | \$ 6,552,000  | \$ 19,240,000 | \$ 2,250,000 | \$ 3,750,000 | \$ 8,490,000  | \$ 17,660,000 | \$ 17,292,000 | \$ 40,650,000 |
| 5        | PW5: RCS+RCS+SW  | \$ 6,552,000  | \$ 19,240,000 | \$ 2,250,000 | \$ 3,750,000 | \$ 21,312,000 | \$ 36,775,000 | \$ 30,114,000 | \$ 59,765,000 |
| 6        | PW6: SW+SW+SW    | \$ 11,440,000 | \$ 20,020,000 | \$ 1,560,000 | \$ 2,730,000 | \$ 10,900,000 | \$ 18,600,000 | \$ 23,900,000 | \$ 41,350,000 |

| Te Awanga |                  |              |               |              |               |               |               |               |               |
|-----------|------------------|--------------|---------------|--------------|---------------|---------------|---------------|---------------|---------------|
| Pathway   | Description      | ST           |               | MT           |               | LT            |               | TOTAL         |               |
|           |                  | Low          | High          | Low          | High          | Low           | High          | Low           | High          |
| 1         | PW1: R+RTL+MR    | \$ 5,970,000 | \$ 11,700,000 | \$ 920,000   | \$ 1,375,000  | \$ -          | \$ -          | \$ 6,890,000  | \$ 13,075,000 |
| 2         | PW2: RCS+RCS+RTL | \$ 5,182,000 | \$ 12,770,000 | \$ 2,250,000 | \$ 3,750,000  | \$ 1,250,000  | \$ 1,870,000  | \$ 8,682,000  | \$ 18,390,000 |
| 3         | PW3: RCS+RCS+RCS | \$ 5,182,000 | \$ 12,770,000 | \$ 2,250,000 | \$ 3,750,000  | \$ 7,560,000  | \$ 14,940,000 | \$ 14,992,000 | \$ 31,460,000 |
| 4         | PW4: RCS+RCS+SW  | \$ 5,182,000 | \$ 12,770,000 | \$ 2,250,000 | \$ 3,750,000  | \$ 12,300,000 | \$ 21,220,000 | \$ 19,732,000 | \$ 37,740,000 |
| 5         | PW5: R+SW+RTL    | \$ 5,970,000 | \$ 11,700,000 | \$ 6,900,000 | \$ 12,080,000 | \$ 1,250,000  | \$ 1,870,000  | \$ 14,120,000 | \$ 25,650,000 |
| 6         | PW6: SW+SW+SW    | \$ 6,600,000 | \$ 11,550,000 | \$ 900,000   | \$ 1,575,000  | \$ 13,295,000 | \$ 22,965,000 | \$ 20,795,000 | \$ 36,090,000 |

| Clifton |                  |              |              |              |              |              |               |               |               |
|---------|------------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|
| Pathway | Description      | ST           |              | MT           |              | LT           |               | TOTAL         |               |
|         |                  | Low          | High         | Low          | High         | Low          | High          | Low           | High          |
| 1       | PW1: R+MR+MR     | \$ 4,687,500 | \$ 9,562,500 | \$ -         | \$ -         | \$ -         | \$ -          | \$ 4,687,500  | \$ 9,562,500  |
| 2       | PW2: RCS+RCS+MR  | \$ 4,350,000 | \$ 8,150,000 | \$ 2,835,000 | \$ 4,950,000 | \$ -         | \$ -          | \$ 7,185,000  | \$ 13,100,000 |
| 3       | PW3: RCS+RCS+RCS | \$ 4,350,000 | \$ 8,150,000 | \$ 2,835,000 | \$ 4,950,000 | \$ 6,900,000 | \$ 11,900,000 | \$ 14,085,000 | \$ 25,000,000 |
| 4       | PW4: RCS+RCS+SW  | \$ 4,350,000 | \$ 8,150,000 | \$ 2,835,000 | \$ 4,950,000 | \$ 7,150,000 | \$ 12,000,000 | \$ 14,335,000 | \$ 25,100,000 |
| 5       | PW5: SW+SW+MR    | \$ 3,850,000 | \$ 6,600,000 | \$ 525,000   | \$ 900,000   | \$ -         | \$ -          | \$ 4,375,000  | \$ 7,500,000  |
| 6       | PW6: SW+SW+SW    | \$ 3,850,000 | \$ 6,600,000 | \$ 525,000   | \$ 900,000   | \$ 3,650,000 | \$ 6,000,000  | \$ 8,025,000  | \$ 13,500,000 |

<sup>1</sup> Timeframes defined as ST: Short Term (0-20 years), MT: Medium Term (20-50 years), LT: Long Term (50-100 years)

<sup>2</sup> Pathway Description Key: SQ = Status Quo, R = Renourishment, RCS = Renourishment & control structures, IP = Inundation Protection, SW = Seawall, MR = Managed Retreat



# CLIFTON TO TANGOIO COASTAL HAZARDS STRATEGY JOINT COMMITTEE

Tuesday 05 December 2017

Item 9

## Subject: COASTAL RESPONSE CONTRIBUTORY FUND

### Reason for Report

1. The Joint Committee has previously supported in principle the establishment of a Coastal Response Contributory Fund to assist with meeting the costs of responding to coastal hazards.
2. The Joint Committee further requested that a working paper be developed to further scope the practicalities and legalities of establishing, operating and governing such a fund.
3. **Attached** to this report is a discussion paper on the contributory fund concept prepared by Philip Jones of PJ & Associates. Mr Jones has been engaged by TAG to assist with the development of the funding model and contributory fund concept.
4. A range of recommendations are set out in the discussion paper for the Joint Committee to consider.
5. Mr Jones will be in attendance at the meeting to talk to his paper and answer questions from Joint Committee members

### Recommendation

That the Clifton to Tangoio Coastal Hazards Strategy Joint Committee receives the report **Coastal Response Contributory Fund**.

### Authored by:

**Simon Bendall**  
**PROJECT MANAGER**

### Approved by:

**Graeme Hansen**  
**GROUP MANAGER ASSET**  
**MANAGEMENT**

### Attachment/s

- [1](#) Coastal Response Contributory Fund report - P J & Associates
- [2](#) Appendix 1 - Map of the Northern and Southern Assessment Cell Evaluation Panel
- [3](#) Appendix 2 - Contributory Fund





## Reason for Report

1. This paper is the first of a series of work on funding in response to the Coastal Hazard Strategy. The subsequent work will concentrate on the funding of the response to Northern Assessment Cell Evaluation Panel (Tangoio the Port of Napier) and the Southern Assessment Cell Evaluation Panel (Napier CBD to Clifton) recommendations.
2. The purpose of this report is to consider options in the development of a Coastal Response Contributory Fund (contributory fund) supporting the Clifton to Tangoio Coastal Hazard Strategy 2120 (coastal hazard strategy). The areas of the Coastal Hazard Strategy are set out in appendix 1.
3. The proposal for a contributory fund was first raised in February 2017 at a funding workshop in Wellington. This paper explores the options in developing such a fund.
4. This report is based on the following principles:
  - Establish a sound methodology for how coastal hazard responses will be funded;
  - Funding that is sought from local authorities is consistent with the requirements of the Local Government Act 2002;
  - Set in place a framework to provide certainty for the community;
  - A collaborative approach between Councils;
  - Survive political cycles; and
  - Be durable over a very long timeframe (Strategy horizon = 100 years).
5. A pragmatic use of the fund would be to develop a contributory fund to be able to fund the expenditure resulting from unforeseen circumstances as well as public good expenditure.
6. In the first instance the funding should come from the following areas:
  - All rateable properties within the Hawke's Bay
  - All rateable properties within the two extended zones as set out on appendix 1
  - All rateable properties within the zone A to P as set out on appendix 1
7. As costs are further refined, other funding sources must be sought including Central Government funding.

## Background

8. The proposal is based on a probability scenario analysis for the timing of expenditure, and relies on funding from general ratepayers and a contribution from private property owners. An outline of that proposal is included in appendix 2.
9. One of the possible intentions of the proposed fund was to develop a fund to assist property owners with the eventual costs of adaptation or relocation. The fund would accumulate with the specific property regardless of the owner. This is effectively a self-insurance scheme managed by the Council. For this to be effective the following needs to occur:
  - Relative certainty as to the likely costs
  - Buy in from a sufficient number of ratepayers to enable the fund to be sustainable
  - Relative certainty over when adaptation or relocation is required

Item

Attachment 1

- A willingness from the Councils and the ratepayers to contribute to what is effectively private benefit
  - The ability of a Council or other entity to manage such a fund
10. The principle of a contributory fund has significant merit and therefore this paper continues to examine how a contributing fund could be developed without the self-insurance component.

### Types of Expenditure

11. Before any fund can be established, it is essential that the types of expenditure that the fund will be used for must be clearly identified. At this stage the Coastal Hazard Strategy is not sufficiently advanced to identify all types of expenditure that will be necessary over the life of the strategy.
12. There are two types of expenditure that need to be considered. The first is the short to medium term in response to known problems/issues. The second is the response to the longer term impacts of climate change. The longer term expenditure relating to the effects of climate change are not well known, however rising sea levels will have a major and increasing impact on the built environment in the coastal regions within the life of this strategy.
13. It is likely that over time these two types of expenditure will combine into one.

| Options   | Private costs                     | Elements of both private and public             | Public costs  |
|---|-----------------------------------|---|---|
| <b>Managed retreat</b> <ul style="list-style-type: none"> <li>• Withdrawing; or</li> <li>• Relocation; or</li> <li>• Abandonment</li> </ul> | Existing house and land value     | Replacement existing utility services           | District/regional planning costs  |
|   | Relocation costs to higher ground | Making safe & good the areas of managed retreat | Replacing stormwater, roads, park infrastructure, and public amenities. |
|   |                                   |   | Social impact - environmental, cultural and social costs                |
|   |                                   |   |   |

| Options   | Private costs   | Elements of both private and public   | Public costs   |
|---|---|---|--|
| <b>Hold-the-line</b><br>Defend / manage natural processes with protection works     |   | Options include: <ul style="list-style-type: none"> <li>• Hard engineering structures e.g. seawall/groynes</li> <li>• Soft engineering options e.g. Beach Nourishment</li> <li>• Inundation protection</li> <li>• Infrastructure raising</li> <li>• Land filling/reclamation</li> </ul> |  |
| <b>Maintain status quo</b><br>Do nothing / monitor / private owner's responsibility | Temporary protection works (may be unconsented)<br>Repairs and maintenance<br>Eventual relocation | Adaptation costs, over time, of local services including water & sewerage   | Adaptation costs, over time, of local services, stormwater, roads and parks, public amenities. |
|   |   | Making safe & good the areas of managed retreat   | Social impact – environmental, cultural and social costs                                       |

Item 9

Attachment 1

14. While the preferred options for the various cells have yet to be fully developed, it is likely that the public good components of each cell should be recovered by rating principles and the local government agency setting these would normally recovered by way of a general rate, using land or capital value.
15. In addition it is highly likely that there will be unanticipated expenditure and expenditure relating to recovery from extreme weather events that have not been adequately predicted or funded for.
16. Therefore the contributory fund should initially be set up to fund the following types of expenditure:
  - Recovery from extreme weather events relating to the coastal environment in the region.
  - Making safe & good the areas of abandoned and or unmanaged retreat
  - District/regional planning costs relating to possible changes to the coastal hazard strategy.
17. In addition territorial local authorities are responsible for the following activities which will be effected by coastal erosion and inundation:

- Water supply
  - Sewerage
  - Stormwater
  - Roads
  - Park infrastructure
  - Other public amenities
18. These activities are funded from a mix of public and private good tools. Therefore the issue needs to be resolved as to what funding mechanisms will be used to fund the adaptation costs of these assets. Currently if there was a natural disaster and these assets needed to be replaced, then the relevant territorial local authorities have funding arrangements (insurance) to replace these assets.
19. Therefore in summary the principles of expense recovery should be based on the following:
- Social impact outcomes arising from different coastal hazard responses must be clearly understood and measured as part of any decision making process;
  - Collaboration between partner Councils (and as much as possible other stakeholders) will provide the optimal and most equitable funding model for coastal hazard responses;
  - The apportionment of costs to respond to natural hazards must fairly reflect the public / private benefit of each response; costs should be borne by those who benefit (Clause 101 (3) (a) (ii));
  - Proportion of cost to be met by current generation, its assessment/ apportionment, and its management. Current generations of ratepayers should bear a reasonable share of funding responsibility for future coastal hazard responses. Funding of infrastructure responses to coastal hazards should be matched as closely as possible to the long term nature of such expenditure. (Clause 101 (3) (a) (iii));
  - Funding opportunities from sources other than local authorities; and
  - The approach be must adaptive to include additional areas in the future.

#### **Management of Coastal Response Contributory Fund**

20. The decision relating to the operations and administering of the fund must be made by the Joint Committee.
21. The expenditure from the fund should be made by the Joint Committee based on the following criteria:
- Recovery from extreme weather events relating to the coastal environment in the region.
  - Making safe & good the areas of abandoned and or unmanaged retreat
  - District/regional planning costs relating to possible changes to the coastal hazard strategy.
22. That funds will be available once the timing and costs of the preferred options and the confirmation of the public good component are known.

**Estimated need for initial funding**

23. While the specific detail is still being developed for the strategy the principles for a contributory fund are well founded and it would be prudent to develop the fund and begin accumulating funds now.
24. The Joint Committee needs to determine an appropriate annual contribution to the Contributory Fund from each of the partner Councils.

**Recommendation**

1. That the Clifton to Tangoio Coastal Hazards Strategy Joint Committee receives and notes the “**Contributory Fund**” report.
2. That the Clifton to Tangoio Coastal Hazards Strategy Joint Committee recommend to the three local authorities to:
  - 2.1. Establish a Coastal Response Contributory Fund.
  - 2.2. Determine an annual contributing amount from each Authority.
  - 2.3. Determine the administering Authority.
  - 2.4. That the Joint Committee be given delegated authority to allocate the funds for the following purposes and conditions:
    - 2.4.1. Recovery from extreme weather events relating to the coastal environment in the region.
    - 2.4.2. Making safe & good the areas of abandoned and or unmanaged retreat
    - 2.4.3. District/regional planning costs relating to possible changes to the coastal hazard strategy.

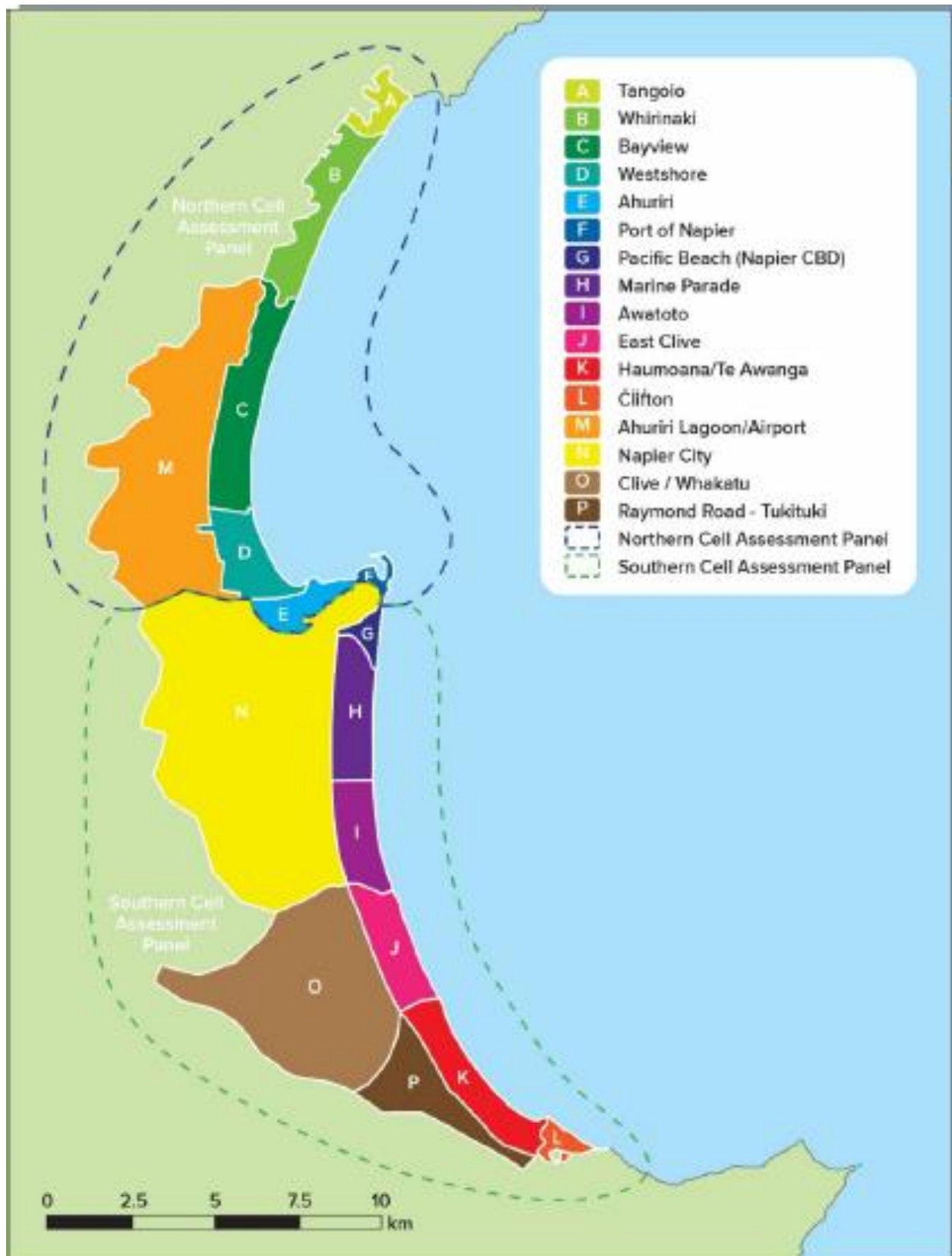
**Authored and Approved by**

**Philip Jones**  
**P J & Associates Ltd**



## Appendix 1

Map of the Northern Assessment Cell Evaluation Panel (Tangoio the Port of Napier) and Southern Assessment Cell Evaluation Panel (Napier CBD to Clifton)



Item 9

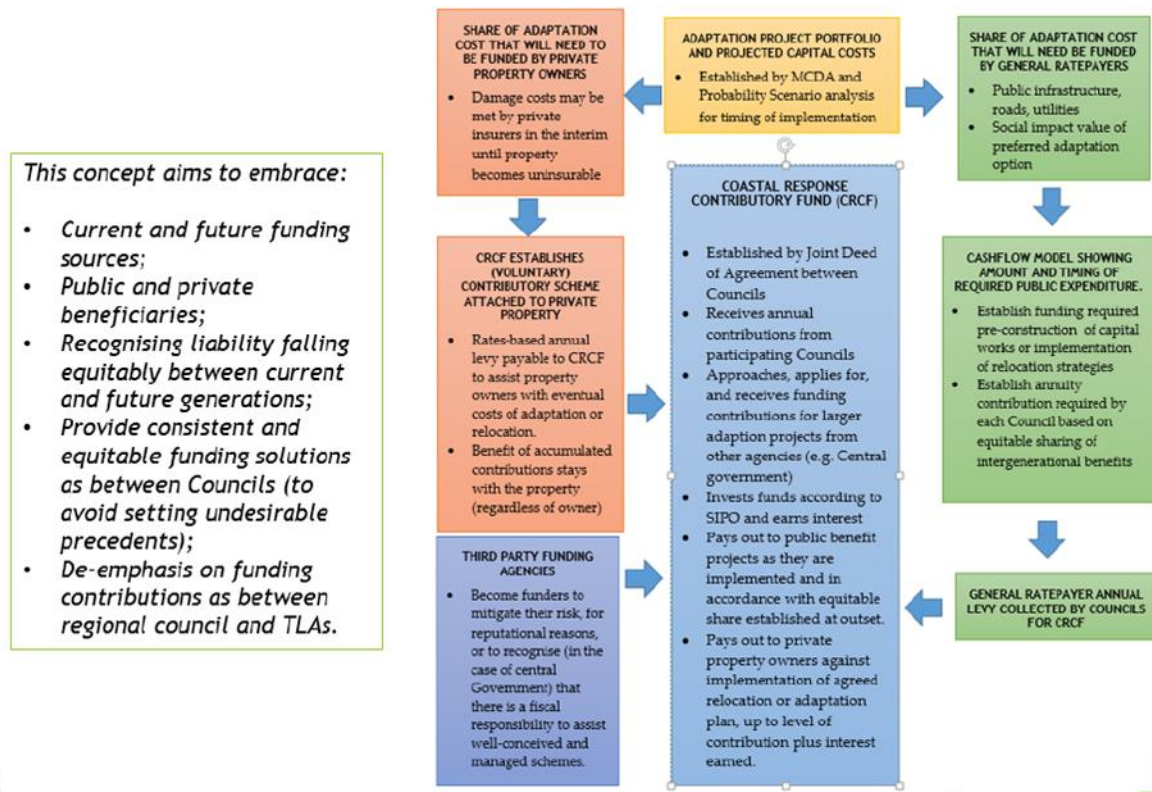
Attachment 2





## Appendix 2

## Coastal Response Contributory Fund



Item 9

Attachment 3



# CLIFTON TO TANGOIO COASTAL HAZARDS STRATEGY JOINT COMMITTEE

Tuesday 05 December 2017

## Subject: PROJECT MANAGER UPDATE

### Reason for Report

1. In accordance with instructions from the Joint Committee, this report is provided in place of the written report required from the Project Manager in accordance with the Terms of Reference for the Joint Committee.
2. It provides an opportunity for the Project Manager to present a verbal update to the Committee and answer any questions on general project matters including tracking against timeframes, milestone achievements and project risks. The Project Manager will provide a verbal update at the meeting.

### Recommendation

That the Clifton to Tangoio Coastal Hazards Strategy Joint Committee receives and notes the ***Project Manager Update*** report.

### Authored by:

**Simon Bendall**  
**PROJECT MANAGER**

### Approved by:

**Graeme Hansen**  
**GROUP MANAGER ASSET**  
**MANAGEMENT**

### Attachment/s

There are no attachments for this report.



# CLIFTON TO TANGOIO COASTAL HAZARDS STRATEGY JOINT COMMITTEE

Tuesday 05 December 2017

## Subject: CURRENT COASTAL PROJECTS UPDATE

Item 11

### Reason for the Report

1. This report provides an opportunity for the Technical Advisory Group ("TAG") to provide an update on various coastal projects the Joint Committee have expressed an interest in keeping abreast of, namely:
  - 1.1. Whakarire Ave Revetment Works.
  - 1.2. Port of Napier Capital Works Programme.
  - 1.3. Proposed Revetment Works at Clifton being led by Hastings District Council.
  - 1.4. Proposed Revetment Works at Haumoana being led by property owners.
2. TAG members will provide a verbal update on each of these projects at the meeting.

### Recommendation:

That the Clifton to Tangoio Coastal Hazards Strategy Joint Committee receives and notes the verbal ***Current Coastal Projects Update*** report.

### Authored by:

Simon Bendall  
PROJECT MANAGER

### Approved by:

Graeme Hansen  
GROUP MANAGER ASSET  
MANAGEMENT

### Attachment/s

There are no attachments for this report.