



Clifton to Tangoio Coastal Hazards Strategy Joint Committee

Date: Friday 5 December 2014

Time: 9.00am – 3.00pm

**Napier City Council
Council Chambers
231 Hastings Street
Napier**

Agenda

1. Welcome / Apologies
2. Appointment of Deputy Chair
3. November 10th Field Trip Debrief
4. Finalise and adopt Terms of Reference
5. Hazards to be included in the Strategy
6. Strategy Vision
7. Draft Project Plan
8. Stakeholder Engagement
9. Coastal Hazards Stocktake
10. Other matters for discussion

Attachments

1. Final Draft Terms of Reference (item 4)
2. Coastal Hazards and Drivers Summary (item 5)
3. Draft Strategy Vision and Outcomes (item 6)
4. Draft Project Plan (item 7)
5. Stakeholder Engagement Plan (item 8)
6. Coastal Hazards Mitigation Stocktake (item 9)



ITEM 3 NOVEMBER 10 FIELD TRIP DEBRIEF

Report to: Clifton to Tangoio Coastal Hazard Strategy Joint Committee

Report from: Coastal Hazard Management Strategy TAG

Lead author(s): Mike Adye, Group Manager, Asset Management HBRC

Meeting date: Friday 5th December 2014

Reason for report

1. This item is an opportunity to debrief on the November 10th Field trip and recap on key messages / outcomes.
2. This item will be delivered verbally. No attachments are provided.



ITEM 4 FINALISE AND ADOPT TERMS OF REFERENCE

Report to: Clifton to Tangoio Coast Hazard Strategy Joint Committee

Report from: Coastal Hazard Management Strategy TAG

Lead author(s): Mike Adye, Group Manager, Asset Management HBRC

Meeting date: Friday 5th December 2014

Reason for report

1. The TAG group have updated the terms of reference document following discussion at the last Joint Committee meeting on 19 September, 2014.
2. A legal review of the document has also been completed by Lara Bloomfield of Sainsbury Logan & Williams
3. This item presents the proposed final Terms of Reference for review.

Recommendation(s)

- A. That the terms of reference for the Clifton to Tangoio Coast Hazard Strategy Joint Committee be adopted

Terms of Reference for the Clifton to Tangoio Coastal Hazards Strategy Joint Committee

December 2014

1. Definitions

For the purpose of these Terms of Reference:

- **“Act”** means the Local Government Act 2002.
- **“Administering Authority”** means Hawke’s Bay Regional Council.
- **“Coastal Hazards Strategy”** means the Coastal Hazards Strategy for the Hawke Bay coast between Clifton to Tangoio¹.
- **“Council Member”** means a representative appointed by a Partner Council.
- **“Hazards”** means natural hazards with the potential to affect the coast, coastal communities and infrastructure over the next 100 years, including, but not limited to, coastal erosion, storm surge, flooding or inundation of land from the sea, and tsunami; and includes any change in these hazards as a result of sea level rise.
- **“Joint Committee”** means the group known as the Clifton to Tangoio Coastal Hazards Strategy Joint Committee set up to recommend both draft and final strategies to each Partner Council.
- **“Member”** in relation to the Joint Committee means each Council Member and each Tangata Whenua Member
- **“Partner Council”** means one of the following local authorities: Hastings District Council, Napier City Council and Hawke’s Bay Regional Council.
- **“Tangata Whenua Appointer”** means:
 - The trustees of the Maugaharuru-Tangitu Trust, on behalf of the Maugaharuru-Tangitu Hapu;
 - Mana Ahuriri Incorporated, on behalf of Mana Ahuriri Hapu;
 - He Toa Takitini, on behalf of the hapu of Heretaunga and Tamatea.
- **“Tangata Whenua Member”** means a member of the Joint Committee appointed by a Tangata Whenua Appointer

2. Name and status of Joint Committee

- 2.1 The Joint Committee shall be known as the Clifton to Tangoio Coastal Hazards Strategy Joint Committee.

¹ The Coastal Hazards Strategy is further defined in Appendix 1 to these Terms of Reference.

- 2.2 The Joint Committee is a joint committee under clause 30(1)(b) of Schedule 7 of the Act.

3. Partner Council Members

- 3.1 Each Partner Council shall appoint two Council Members to the Joint Committee. Those Council Members must be:
- A councillor of the holding office; or
 - The Chairperson of the particular Partner Council; or
 - The Mayor.
- 3.2 Under clause 30(9) Schedule 7 of the Act, the power to discharge any Council Member on the Joint Committee and appoint his or her replacement shall be exercisable only by the Partner Council that appointed the Member.

4. Tangata Whenua Members

- 4.1 Each Tangata Whenua Appointer may appoint one member to sit on the Joint Committee.
- 4.2 Each Tangata Whenua Appointer must make any appointment before the first Joint Committee meeting and notify all Tangata Whenua Appointers and Partner Councils in writing of the appointment.
- 4.3 The Tangata Whenua Members so appointed shall:
- Be entitled to vote; and
 - Give consideration to the interests of Mana Whenua and/or Tangata Whenua throughout the Strategy area when exercising their vote.
- 4.4 Under clause 30(9) Schedule 7 of the Act, the power to discharge any Tangata Whenua Member on the Joint Committee and appoint his or her replacement shall be exercisable only by the Tangata Whenua Appointer that appointed the Member.

5. Purpose of Terms of Reference

- 5.1 The purpose of these Terms of Reference is to:
- 6.1.1 Define the responsibilities of the Joint Committee as delegated by the Partner Councils under the Act.
- 6.1.2 Provide for the administrative arrangements of the Coastal Hazards Strategy Joint Committee as detailed in Appendix 2.

6. Meetings

- 6.1 Members will attend all Joint Committee meetings.
- 6.2 Where a Member cannot attend a meeting, he or she may with the prior approval of the Partner Council or Tangata Whenua Appointer (as the case may be) send an alternate representative in his or her place. In the case of a Council Member, the alternate representative must meet the requirements of clause 3.1 above.

7. Delegated authority

7.1 The Joint Committee has the responsibility delegated by the Partner Councils for:

- Considering and recommending a draft strategy to each of the Partner Councils for public notification;
- Considering comments and submissions on scenarios and the draft strategy and making appropriate recommendations to the Partner Councils;
- Considering and recommending a final strategy to each of the Partner Councils for approval.

8. Powers not delegated

8.1 The following powers are not delegated to the Joint Committee:

- Any power that cannot be delegated in accordance with clause 32 Schedule 7 of the Local Government Act 2002.
- The determination of funding for undertaking investigations, studies and/or projects to assess options for implementing the Coastal Hazards Strategy.

9. Remuneration

9.1 Each Partner Council shall be responsible for remunerating its representatives on the Joint Committee and for the cost of those persons' participation in the Joint Committee.

9.2 The Administering Authority shall be responsible for remunerating the Tangata Whenua Members.

10. Meetings

10.1 The New Zealand Standard for model standing orders (NZS 9202:2003), or any New Zealand Standard substituted for that standard, will be used to conduct Joint Committee meetings as if the Joint Committee were a local authority and the principal administrative officer of the Hawke's Bay Regional Council or his or her nominated representative were its principal administrative officer.

10.2 The Joint Committee shall hold all meetings at such frequency, times and place(s) as agreed for the performance of the functions, duties and powers delegated under this Terms of Reference.

10.3 Notice of meetings will be given well in advance in writing to all Joint Committee Members, and not later than one month prior to the meeting.

10.4 The quorum shall be 5 Members.

11. Voting

11.1 In accordance with clause 32(4) Schedule 7 of Act, at meetings of the Joint Committee each Council Member has full authority to vote and make decisions within the delegations of this Terms of Reference on behalf of the Partner Council without further recourse to the Partner Council.

- 11.2 Where voting is required, all Members of the Joint Committee have full speaking rights.
- 11.3 Each Member has one vote.
- 11.4 Best endeavours will be made to achieve decisions on a consensus basis.
- 11.5 Standing Orders 2.5.1(2) and 3.14.2 which state: The Chairperson at any meeting has a deliberative vote and, in the case of equality of votes, also has a casting vote” do not apply to the Joint Committee.

12. Election of Chairperson and Deputy Chairperson

- 12.1 On the formation of the Joint Committee the members shall elect a Joint Committee Chairperson and may elect a Deputy Chairperson. The Chairperson is to be selected from the group of Council Members.
- 12.2 The mandate of the appointed Chairperson or Deputy Chairperson ends if that person through resignation or otherwise ceases to be a member of the Joint Committee.

13. Reporting

- 13.1 All reports to the Committee shall be presented via the Technical Advisory Group² or from the Committee Chairperson.
- 13.2 Following each meeting of the Joint Committee, the Project Manager shall prepare a summary report of the business of the meeting and circulate that report, for information to each Member following each meeting. Such reports will be in addition to any formal minutes prepared by the Administering Authority which will be circulated to Joint Committee representatives.

14. Good faith

- 14.1 In the event of any circumstances arising that were unforeseen by the Partner Councils, the Tangata Whenua Appointers, or their respective representatives at the time of adopting this Terms of Reference, the Partner Councils and the Tangata Whenua Appointers and their respective representatives hereby record their intention that they will negotiate in good faith to add to or vary this Terms of Reference so to resolve the impact of those circumstances in the best interests of the Partner Councils and the Tangata Whenua Appointers collectively.

15. Variations to these Terms of Reference

- 15.1 Any Member may propose a variation, deletion or addition to the Terms of Reference by putting the wording of the proposed variation, deletion or addition to a meeting of the Joint Committee.
- 15.2 Amendments to the Terms of Reference may only be made with the approval of all Members.

² A description of the Technical Advisory Group and its role is included as Appendix 2 to these Terms of Reference.

16. Adopted by

16.1 The Coastal Hazards Strategy Joint Committee made up of the following:

Napier City Council represented by

Hastings District Council represented by

Hawke's Bay Regional Council represented by

Maungaharuru-Tangitū Trust (MTT) represented by

Mana Ahuriri Inc represented by

He Toa Takitini represented by

Appendix 1 – Project Background

Project Goal

A Clifton to Tangoio Coastal Hazards Strategy will be developed in co-operation with the Hastings District Council (HDC), the Hawke's Bay Regional Council (HBRC), the Napier City Council (NCC), and groups representing Mana Whenua and/or Tangata Whenua. This strategy will be developed to provide a framework for assessing coastal hazards risks and options for the management of those risks for the next 105 years from 2015 to 2120.

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.

Project Assumptions

The Coastal Hazards Strategy will be based on and influenced by:

- The long term needs of the Hawke's Bay community
- Existing policies and plans for the management of the coast embedded in regional and district council plans and strategies.
- Predictions for the impact of climate change
- The National Coastal Policy Statement

Project Scope

The Coastal Hazards Strategy is primarily a framework for determining options for the long term management of the coast between Clifton and Tangoio. This is expected to include:

- An assessment of the risk from natural hazards with the potential to impact on the coastal environment. This may include a range of return periods for each hazard and a determination of acceptable risk to the community for various return period events.
- Sea level rise and increased storminess predicted to occur as a result of climate change and a determination of acceptable risk to the community for various scenarios.
- Identification of areas of community risk and/or specific community risks and opportunities for improving community resilience. This may include a protocol for assessing community consequences and comparing and prioritising mitigation approaches.
- Approaches to quantify the potential impacts including computer modelling and specific underlying parameters and assumptions that are used in the development of those models.
- Stakeholder involvement and participation.
- Protocols for expert advice and peer review.
- An action plan of ongoing activity assigned to various Members.

The Strategy will:

- Describe a broad vision for the coast in 2120, and how the Hawke's Bay community could respond to a range of possible scenarios which have the potential to impact the coast by 2120.
- Propose policies to guide any intervention to mitigate the impact of coastal processes and hazards through the following regulatory and non-regulatory instruments:
 - Regional Policy Statement
 - District Plans
 - Council long-term plans
 - Infrastructure Development Planning (including both policy and social infrastructure networks).

Appendix 2 - Administering Authority and Servicing

The administering authority for the Coastal Hazards Strategy Joint Committee is Hawke's Bay Regional Council.

The administrative and related services referred to in clause 16.1 of the conduct of the joint standing committee under clause 30 Schedule 7 of the Local Government Act 2002 apply.

Until otherwise agreed, Hawke's Bay Regional Council will cover the full administrative costs of servicing the Coastal Hazards Strategy Joint Committee.

A technical advisory group (TAG) will service the Coastal Hazards Strategy Joint Committee.

The TAG will provide for the management of the project mainly through a Project Manager. TAG will be chaired by the Project Manager, and will comprise senior staff representatives from each of the participating Councils and other parties as TAG deems appropriate from time to time. TAG will rely significantly on input from coastal consultants and experts.

The Project Manager and appropriate members of the TAG shall work with stakeholders. Stakeholders may also present to or discuss issues directly with the Joint Committee.

Functions of the TAG include:

- Providing technical oversight for the study.
- Coordinating agency inputs particularly in the context of the forward work programmes of the respective councils.
- Ensuring council inputs are integrated.



ITEM 5	TYPES OF HAZARDS WITHIN STRATEGY SCOPE
Report to:	Clifton to Tangoio Coastal Hazard Management Strategy Joint Committee
Report from:	Coastal Hazard Management Strategy TAG
Lead author(s):	Belinda Riley, Senior Planner HBRC
Meeting date:	Friday 5 th December 2014
File reference:	

REASON FOR REPORT

1. This report presents the TAG’s recommendation for preparation of a Coastal Hazard Management Strategy to focus on coastal hazards, as opposed to all types of natural hazards at the coast, between Tangoio and Clifton.

DISCUSSION

2. The coastal area between Tangoio and Clifton is at risk of numerous natural hazards. Many of those natural hazards feature in the Hawke’s Bay CDEM Group Plan Top Ten Hazards (see Table 1). If a clear strategy is to be developed and implemented for managing hazards, then the scope of the strategy needs to be clearly articulated.

Table 1 - HBCDEM Group Plan 2014: Top Ten Hazards

1.	Earthquake	6.	Animal epidemic, plant and animal pests
2.	Tsunami	7.	Urban fire (multiple)
3.	Volcanic (ashfall)	8.	Lifeline failure
4.	Human pandemic	9.	Rural fire
5.	Flood/storm event	10.	Hazardous substances event

3. There are substantial areas of existing development at risk from coastal hazards with the stretch of coast from Tangoio to Clifton. Without appropriate management these areas will experience far greater impacts from erosion and flooding than has occurred in the last 100 years as a result of climate change.
4. The Tangoio to Clifton coastline is defined by a gravel barrier beach which provides a vital defence to the sea. Activity occurring on part of the ridge can potentially affect another part which is why this initiative of preparing a joint strategy is underway for the long term management of that coastline.
5. The strategy needs to be clear on the hazards which will be managed and planned for. This will assist in ensuring strategy development occurs in a coordinated and collaborative manner and accommodate stakeholders’ reasonable expectations.
6. The TAG recommends that the strategy focus on coastal hazards (as opposed to a broader range of natural hazards which can occur at the coast, such as surface water flooding, landslides, liquefaction).
7. The TAG’s recommended approach would involve the strategy project addressing:
 - a) coastal erosion
 - b) coastal inundation from storm surge
 - c) tsunami

d) and implications of sea level rise.

8. In addition to those hazards listed in paragraph 7, the TAG recommends intensities of storms and increased wave heights, should also be considered. Specific coastal formations such as rivermouths would also warrant consideration of risk from coastal erosion and coastal inundation.
9. A number of international, national and local studies have been undertaken analysing the predicted tsunami wave heights, coastal erosion, inundation and changing sea levels and the potential impact on the Tangoio to Clifton coastline. These hazards are discussed further in the sections to follow. The report by Komar (2014) is often referenced. That report is a comprehensive assessment of many factors specifically driving coastal change along the Tangoio to Clifton shoreline (whereas some of the national and international literature deal with national and international averages and trends that do not readily translate to the Tangoio-Clifton coastline).
10. Appendix 1 sets out a summary of those hazards identified in paragraphs 7 and 8 in table form, outlining a brief description of the hazard and future projections. The 'consequences' and 'management options' columns have been deliberately left blank at this time. The Strategy project will inevitably need to analyse potential scenarios associated with each hazard, potential consequences, and the associated options for future management of the hazard.
11. While it is recognised that rising sea levels may exacerbate other natural hazards such surface water and groundwater flooding, landslides and the consequence of earthquakes including liquefaction, including them will almost certainly increase the array of issues to be considered, the time to consider them and also increase the overall complexity of the strategy project. On this basis, the TAG does not recommend these other types of hazards be evaluated and be part of the strategy's focus.

FACTORS FOR FURTHER CONSIDERATION

A. Timeframe

12. To date, Joint Committee members and the Partner Councils have conveyed a preference for the strategy to take a long term approach to issues arising. The Joint Committee's draft terms of reference (see separate agenda item) refers to coastal hazards "over the next 100 years."
13. In addition to this, the NZCPS requires coastal hazards to be considered for at least the next 100 years. The TAG recommends that the strategy take a view of coastal hazards up to 2120. In this way, the Strategy has a built-in lead time (2015-2020) for development and initial implementation planning rather than assuming 100 years commences from the current day (2015). Shorter milestone timeframes (e.g. 2050 or 2070) could be assessed within this overall timeframe if appropriate for any particular issues.

B. Tectonic setting

14. The coast of Hawke's Bay is located on the tectonically active Hikurangi Margin, where the oceanic Pacific plate collides with and is being subducted beneath the continental Australian plate. There is a history of subduction earthquakes occurring within the area.
 15. This tectonic setting is important in producing changes in land elevations along this shore, with some areas along the Hawke's Bay coastline experiencing a net uplift spanning thousands of years, whereas other stretches of this coast have experienced net subsidence.
 16. During the 1931 earthquake sections of this coastline were uplifted by more than two metres. However, this is a geologically rare event and the evidence indicates this section of coast line is undergoing long term subsidence.
 17. GNS estimates that the Tangoio to Cape Kidnappers coastline is experiencing land subsidence of between 0 and 1 mm/yr. Subsidence at this rate is expected to exacerbate the effects of sea level rise, but will be a relatively small component if sea levels continue to rise at the present rate of 2 mm/yr or accelerates to 3 mm/yr or more as suggested by some projections.
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18. It is important to have an understanding of the tectonic setting and its relevance to the range of natural hazards impacting on the Hawke's Bay coastline. Although rare, Komar predicts that the greatest future hazard comes from a major earthquake and accompanying tsunami.
19. In context, this tectonic setting in Hawke's Bay is very similar to those along the coasts of Sumatra and Japan. Both areas provide recent examples of the extreme hazards of subduction earthquakes and tsunami.

C. Erosion

20. Within the study area, there are a few discrete parts of the coastline where measured shoreline movement is relatively stable (e.g. Marine Parade beach). However, much of the coastline has recorded an erosion trend. These historic trends are unlikely to continue at similar rates. In the next century, sea level rise in combination with increased wave heights and storm intensities is expected to significantly impact on the gravel barrier ridge protecting the Tangoio to Clifton coastline.
21. Solely as a result of rising sea levels, Komar anticipates that there will be a 10 – 15 metre retreat of the gravel barrier beach along the Tangoio to Clifton coastline by 2100. Accounting for more intense storms and higher wave heights, Komar advises that the Bay View cell shoreline could retreat 15 to 20 m, with the northern end of the Haumoana Cell potentially retreating 30 m.
22. In addition to shoreline retreat, there is increased likelihood of 'over wash' events during major storms which could occur along the southern shores the Haumoana Cell. Here the total water levels could potentially exceed the low elevations of the gravel ridges leading to flooding of low lying inland properties and infrastructure.
23. In Komar's view, these enhanced effects from erosion and flooding will most likely occur gradually over the next 25 plus years. Given this, there may be merit in some circumstances to wait for research advances and data collection to provide improved projections.
24. The following points will also need to be taken into account when making future decisions:
 - a) erosion rates are predicted to continue to accelerate past 2100 if sea level rise occurs at the predicted rate. It will not stop due the lag effects associated with warming climates.
 - b) the local extent of erosion (or accretion) also depend on the budget of beach sediments, the net gains or losses in the total volumes of sand and gravel contained within that beach
25. As part of preparing the strategy, reassessment of the areas at risk of coastal erosion and storm surge inundation ought to be done. This would update earlier assessments and incorporate contemporary understanding of shoreline movements, recent investigations and improved projections of sea level rise. The reassessed hazard areas may, if necessary, be incorporated into the Regional Coastal Environment Plan and/or district plans. Erosion risks over at least 100 years should be considered. This timeframe is directed by Policy 24 in the 2010 New Zealand Coastal Policy Statement ('NZCPS'). Assessments may also be carried out for smaller time intervals, say 20 or 50 years, if appropriate.

D. Inundation - storm surge events

26. The changing water levels and elevations of tides combined with storm surges are a major factor in causing coastal erosion and flooding. Storm surges can raise water levels significantly exacerbating erosion and inundation by increased wave heights and swash up levels. Coastal flooding is further exacerbated when a storm surge coincides with a high tide, and especially so if the high tide is one of the 'king' tides that occur a few times a year.
27. In the next 100 years, the intensity and frequency of storms will result in more severe coastal erosion and inundation. By way of example, NIWA predicts that in some areas of New Zealand in 30 years' time, a 1 in 100 year storm will occur every 10 years, and a few decades later the same storm will occur yearly¹. In other words, what we know today as a 100 year storm will become a more frequent storm event in the decades to come.

¹ For example: the 1 in 100 storm surge event which hit downtown Auckland, flooding shops, homes, and roads (Jan 2011).

Existing inundation risk assessments

28. In the 2004 Regional Coastal Hazard Assessment Study by Tonkin and Taylor Ltd, low lying parts of the coastline were assessed for inundation risk (but not tsunami). That 2004 Study assessed two types of inundation risk zone and their respective levels²:
- a) **Extreme inundation risk zone:** those areas within [CHZ 1] below the calculated 2% AEP (1/50 yr event) combined high tide and storm surge event including run up with Sea Level Rise of 0.5 m to 2100.
 - b) **Moderate inundation risk zone:** those areas landward of [CHZ 1] below the calculated 2% AEP (1/50 yr event) combined high tide and storm surge event excluding run up with Seas Level Rise of 0.5 m to 2100.

Future inundation risk assessment

29. Inundation risks over at least 100 years should be considered. This timeframe is directed by NZCPS Policy 24. As discussed in paragraph 25 as part of preparing the strategy, reassessment of the areas at risk of coastal erosion and storm surge inundation ought to be undertaken to incorporate contemporary understanding of the future inundation risks.
30. Komar (2014) predicts that with rising sea levels, and increasing wave heights generated by a 1% AEP storm, total water levels by 2100 will be:
- 2 m above the present day levels on Bay View Cell shore; and
 - 1.5 m above the present day levels on the Haumoana Cell shore.
31. This essentially doubles the increase contributed by the rise in sea levels acting alone.
32. Komar also undertook an extreme scenario in which the most severe event and hazard was based on a combination of an extreme tide elevated by a 100 year surge, together with extreme swash run up levels from waves generated by a severe storm. The result represents a rare occurrence (likely return period much longer than 100 years) that while extreme in its components is still possible. The predicted outcome was total water levels of 4 m and 3.5 m above the present day levels on Bay View Cell and Haumoana Cell shore, respectively. This extreme scenario represents a worst case storm event faced on the coast and would result in over wash of the gravel barrier beaches along the entire length of the Haumoana Cell's shore and at least the southern half of the Bay View Cell shore.

E. Inundation - tsunami

33. The Hawke's Bay Regional Council has been developing tsunami hazard maps to help communities prepare for a large tsunami. Much of this work has been initiated by the Hawke's Bay CDEM Group based on tsunami wave height research recently completed by GNS. HBRC has completed two-dimensional tsunami hazard mapping for the coastline between Tangoio and Clifton. This mapping shows two tsunami scenarios:
- a) a distant tsunami – starting across the Pacific Ocean (eg. South America) when there will be time for an official warning and evacuation;
 - b) a near source tsunami – starting near the coast (e.g. Hikurangi Trough 120 km east offshore) when there will be no time for an official warning.
34. In the case of a distant tsunami, the mapping applied a 5 metre wave – being the highest credible wave height generated from a distant source. A 5 m wave height has a statistical probability of occurring approximately once every 500 years). For a near source tsunami, the mapping applied a 10 metre wave (having a statistical probability of occurring approximately once in 2,500 years). The NZCPS is silent in terms of directing a suitable timeframe for assessing tsunami risk.

² Inundation risk levels assessed in the 2004 Study were subsequently mapped once HBRC had acquired LiDAR data for the region's coast (c. late 2004).

F. Sea level rise

35. Rising sea levels increases the likelihood and severity of erosion and inundation along the coast. For this reason projections of future sea level rise along the coast of Hawke’s Bay is critical to the analysis of future potential erosion and inundation risk.
36. The actual rise in the sea levels along the Hawke’s Bay coast has been analysed based on the Port of Napier’s tide-gauge record. Those records show an increase in sea levels of about 2.0 millimetres per year. This amounts to a rise of 20 cm over a 100 year period. However, many experts agree that future sea levels are expected to keep rising in accordance with increased global warming. On this basis, a sea level rise of only 20 cm over the next 100 years is extremely unlikely.
37. While experts may agree that future sea levels will keep rising, the rate and magnitude of the predicted sea level rise differ. Table 2 outlines several of the key international and national documents providing guidance on sea level rise figures.

Table 2 - sea level rise guidance figures

	Predicted average sea level rise by 2100 (m)
IPCC (2007)	0.2 to 0.6
IPCC (2014)	0.24 to 0.63
MfE (2008)	0.5 - 0.8 (+ 10 mm per year after 2100)
HBRC (2003)	0.5
Komar (2014)	0.95 – 1.3

38. The predicted sea levels by Komar was derived from a “consensus” scenario after assessing recent analyses on sea levels undertaken by climatologists³. Komar then applied this specifically to Hawke’s Bay with the resulting projected relative sea levels taking into account its changing land elevations, and the Port of Napier’s tide gauge records.
39. Komar concludes that by the year 2050 sea level could be expected to rise 30 cm above its elevation in 2000, by the year 2100 a sea level rise of 90 cm is considered likely in Hawke’s Bay. However, Komar notes that in an extreme high assessment case, sea levels could reach 50 cm by 2050 and 130 cm by 2100.
40. The intensities of storms and the heights of their generated waves will further exacerbate erosion and inundation along the coast.
41. While most sea level projections do not venture beyond 2100, MfE have specifically recognised that unless global warming stops, sea levels will continue to rise. Consequently, MfE (2008) recommends that for planning and decision timeframes beyond 2100 an additional allowance for sea level rise of 10 mm per year be used. It should be noted that MfE are engaging with local government and other interests about the need to review their 2008 Guidance document in light of recent international reviews and local practices.

Hazard Likelihoods

42. In preparing the coastal hazard management strategy, clear descriptions of assumed likelihood of each agreed coastal hazard event occurring will be needed, together with a good understanding of each event’s associated potential consequences.
43. For each of the hazard types recommended to be the focus of this strategy project (refer paragraph 7), there are a multitude of different event scales (or likelihoods of occurrence) that could be selected for further examination during strategy development. For example, inundation in the event of a 1 in 200 year storm could be assessed. Similarly, a 1 in 20 year event could also be assessed. The scenarios are almost limitless. Consequently the TAG recommends that a small range of scenarios (with defined timeframes where relevant) need to be agreed for the strategy to focus on. Without such focus, there is increased risk that the Strategy will suffer ‘paralysis by analysis’ with countless scenarios to each be evaluated.

³ See Komar report March 2014

44. The TAG has scanned a variety of current statutory and non-statutory planning documents that are likely to have a material influence on development of this strategy (refer Item 9 in agenda). Consequently, the TAG recommend at least the following event likelihoods and/or timeframes are to be the focus of this strategy:
- a) Coastal erosion – erosion to 2120
 - b) Storm surge inundation – (with SLR upto to 2120)
 - c) Tsunami – 10 m wave for near source tsunami and 5 m wave for distant tsunami
 - d) Sea level rise 1 m by 2120 and 10 mm per year thereafter

RECOMMENDATION(S)

That the Committee:

1. Agree that the Coastal Hazards Management Strategy will focus on the following types of hazards and other natural hazards are incidental to this primary focus:
 - 1.1 Coastal erosion
 - 1.2 Coastal storm surge inundation
 - 1.3 Tsunami
 - 1.4 Sea level rise.
 2. Agree that when preparing the Coastal Hazards Management Strategy, increased storm intensities and increased wave heights should also be considered.
 3. Consider and provide direction to the TAG on the following coastal hazard event parameters will at least be the focus of developing the Coastal Hazards Management Strategy:
 - 3.1 coastal erosion over at least 100 years to 2120
 - 3.2 coastal storm surge inundation over at least 100 years to 2120, including assessments of implications of increased storm intensities and increased wave heights arising from a changing climate
 - 3.3 distant tsunami with a wave height up to 5 metres
 - 3.4 near source tsunami with a wave height up to 10 metres
 - 3.5 sea level rise over at least 100 years to 2120 up to 1 metre and 10 mm per year beyond 2120.
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Hazard / Hazard driver	Projections / scenarios	Consequences	Management options	Additional comments
Erosion				
<p>The majority of the Tangoio to Cape Kidnappers coastline is experiencing an erosion trend. This is currently expected to worsen in the future with increased storm surges, wave heights and sea level rise.</p> <p>Rivermouths are particularly susceptible to erosion due to the additional hydraulic forcing of the river or estuary system.</p>	<p><u>Gravel barrier beach</u></p> <p>Komar (2014) predicts by 2100:</p> <ul style="list-style-type: none"> • 10 – 15 m retreat of the gravel barrier ridge along the Tangoio to Cape Kidnappers coastline solely as a result of sea level rise (likely scenario).. • 15 to 20 m retreat of the Bay View cell shoreline when accounting for more intense storms and higher wave heights (extreme scenario).. • 30 m retreat of the northern end of the Haumoana Cell shoreline when accounting for more intense storms and higher wave heights (extreme scenario). <p><u>Rivermouth areas</u></p> <ul style="list-style-type: none"> • In 2006 and 2012 Tonkin and Taylor identified and mapped separate rivermouth hazard areas which would likely be at risk of erosion and extreme inundation. 			<ul style="list-style-type: none"> • The purpose of assessing and identifying Rivermouth Hazard Areas was to differentiate between the more uniform coastal areas that were less likely to be affected by flows from the catchment, with those areas that were likely to be susceptible to both coastal hazards and catchment derived flows.
Inundation				
<p>Coastal inundation is the flooding of low lying coastal areas with seawater.</p> <p>Coastal flooding generally occurs during large storms as a result of high tides, storm surges and large waves or in the event of a tsunami.</p> <p>Low lying areas around</p>	<p>Tonkin and Taylor (2004) assessed inundation levels around the coast into the following two coastal inundation zone: These levels were subsequently mapped with LiDAR land elevation data.</p> <ul style="list-style-type: none"> • Extreme inundation risk zone: those areas within CHZ 1 below the calculated 2% AEP (1/50 yr event) combined high tide and storm surge event <u>including</u> run up with Sea Level 			<ul style="list-style-type: none"> • Flooding is worse when a storm surge coincides with a high tide, and especially so if the high tide is one of the ‘king’ tides that occur a few times a year.

<p>rivermouths are particularly susceptible to inundation due to the additional hydraulic forcing of the river or estuary system. High tides can also increase water levels some way up a river from where it flows into the sea.</p> <p>Sea level rise will exacerbate coastal inundation.</p>	<p>Rise of 0.5 to 2100.</p> <ul style="list-style-type: none"> • Moderate inundation risk zone: those areas landward of CHZ 1 below the calculated 2% AEP (1/50 yr event) combined high tide and storm surge event <u>excluding</u> run up with Seas Level Rise of 0.5 to 2100. <p><u>Rivermouth areas</u></p> <p>In 2006 and 2012 Tonkin and Taylor identified and mapped separate rivermouth hazard areas which would likely be at risk of erosion and extreme inundation.</p>			
<p>Tsunami</p>				
<p>Tsunami can be generated from many sources, such as earthquakes on nearby faults, submarine landslides or large earthquakes at distant locations (e.g. south America).</p>	<p>HBRC has developed tsunami hazard maps based on two scenarios:</p> <ul style="list-style-type: none"> • 5 m wave (a distant source): 1 in 500 year return period). • 10 m wave (a near source): 1 in 2,500 year return period). <p>Tonkin and Taylor (2004) note that local tsunamis can generate waves higher than 10 m. The 1931 earthquake generated a 15.3 m wave.</p>			

Sea level rise				
<p>Rising sea levels increases the likelihood and severity of erosion and inundation along the coast.</p> <p>This projections of future sea level rise is critical to the analysis of future potential erosion and inundation risk.</p>	<p>Sea level rise (m) predictions to 2100:</p> <ul style="list-style-type: none"> • IPCC (2014): 0.24 – 0.63 (at least 30 cm by 2050) • MfE(2008) - 0.5 - 0.8 (+10 mm per year beyond 2100) • HBRC (2005) – 0.5 • Komar(2014): 0.95-1.3 • Rahmstorf (2009): 0.75 – 1.9 <p>Rahmstorf - included to represent a more extreme climatologist's projection.</p>			<ul style="list-style-type: none"> • The IPCC's prediction of a 30 cm rise in average sea level by 2050 is 'locked in' – it is expected to occur regardless of action taken to reduce greenhouse gas emissions. It is not until the second half of the century that the effect of any such action will be seen. • The Tangoio to Cape Kidnappers coastline is subsiding at a rate of between 0 and 1 mm/yr, which will exacerbate sea level rise. • The impacts of a rise in sea level are most evident during storm surges when wind and waves pile up water against the coast.
Tides and total water levels				
<p>The changing water levels and elevations of tides are a major factor in causing beach and property erosion. Storm surges can raise water levels exacerbating erosion and inundation by increased wave heights and swash up levels.</p>	<p>Komar (2014) predicts Total Water Levels in 2100 to be :</p> <ul style="list-style-type: none"> • 2 m above the present day levels on the Bay View Cell shore • 1.5 m above the present day levels on the Haumoana Cell shore <p>This essentially doubles the increase contributed by the rise in sea levels acting alone.</p> <p>Komar's predicted TWL are based on a 1% AEP storm. However, NIWA and Komar (2014) predict that storms will increase in frequency and intensity over the next 100 years. In some areas of New Zealand NIWA has predicted that in 30 years time a 1 in a 100 year storm will occur every 10 years, and a few decades later the same storm will occur yearly. This is assuming</p>			<ul style="list-style-type: none"> • Increased wave heights result in greater wave breaking heights and swash run up levels on its beaches, with enhanced run up combining with increasing sea levels to produce elevated total water levels.

	<p>no action to reduce greenhouse gas emissions is undertaken.</p> <p>MfE (2008): assume storm tide levels will rise at the same rate as mean sea level.</p>			
Land subsidence				
<p>The tectonic setting of the Hawkes Bay Coastline is important in producing changing in land elevations along this shore.</p> <p>Land subsidence or uplift will exacerbate or mitigate the effects of future sea level rise.</p>	<p>GNS (2009): the Tangoio to Cape Kidnappers coastline is subsiding between 0 and 1 mm/yr.</p> <p>Uplift experienced in parts of Hawke's Bay during the 1931 earthquake went against the subsidence trend and considered an anomaly.</p>			



ITEM 6 STRATEGY VISION

Report to: Clifton to Tangoio Coastal Hazard Strategy Joint Committee

Report from: Coastal Hazard Management Strategy TAG

Lead author(s): Simon Bendall, Environmental Management Services Ltd.

Meeting date: Friday 5th December 2014

Reason for report

1. The TAG have prepared a draft vision for the Coastal Hazard Strategy, and a series of supporting outcome statements.
2. The intention is to set the vision and outcome statements at this early stage to guide ongoing strategy development.
3. The draft vision and outcome statements are provided at **Attachment 1**.

Recommendation(s)

- A. That the Vision and Outcomes for the Clifton to Tangoio Coastal Hazard Strategy be adopted.

Draft Vision and Objectives for the Tangoio to Clifton Coastal Hazard Strategy 2120

Vision:

That coastal communities, businesses and critical infrastructure from Tangoio to Clifton are resilient to the effects of coastal hazards.

Outcomes:

1. Coastal hazards risks associated with the following processes occurring over the period 2016 to 2120 are assessed:
 - Coastal erosion;
 - Storm surge inundation;
 - Tsunami;
 - Climate change (including increased storm severity); and
 - Sea level rise.
2. Practicable adaptation options that respond to these coastal hazards risks are identified and evaluated.
3. Key stakeholders are identified and engaged in the development of adaptation options.
4. A Strategy is developed to implement the best practicable adaptation option(s) in a coordinated and planned manner.



ITEM 7 DRAFT PROJECT PLAN

Report to: Clifton to Tangoio Coastal Hazard Strategy Joint Committee

Report from: Coastal Hazard Management Strategy TAG

Lead author(s): Simon Bendall, Environmental Management Services Ltd.

Meeting date: Friday 5th December 2014

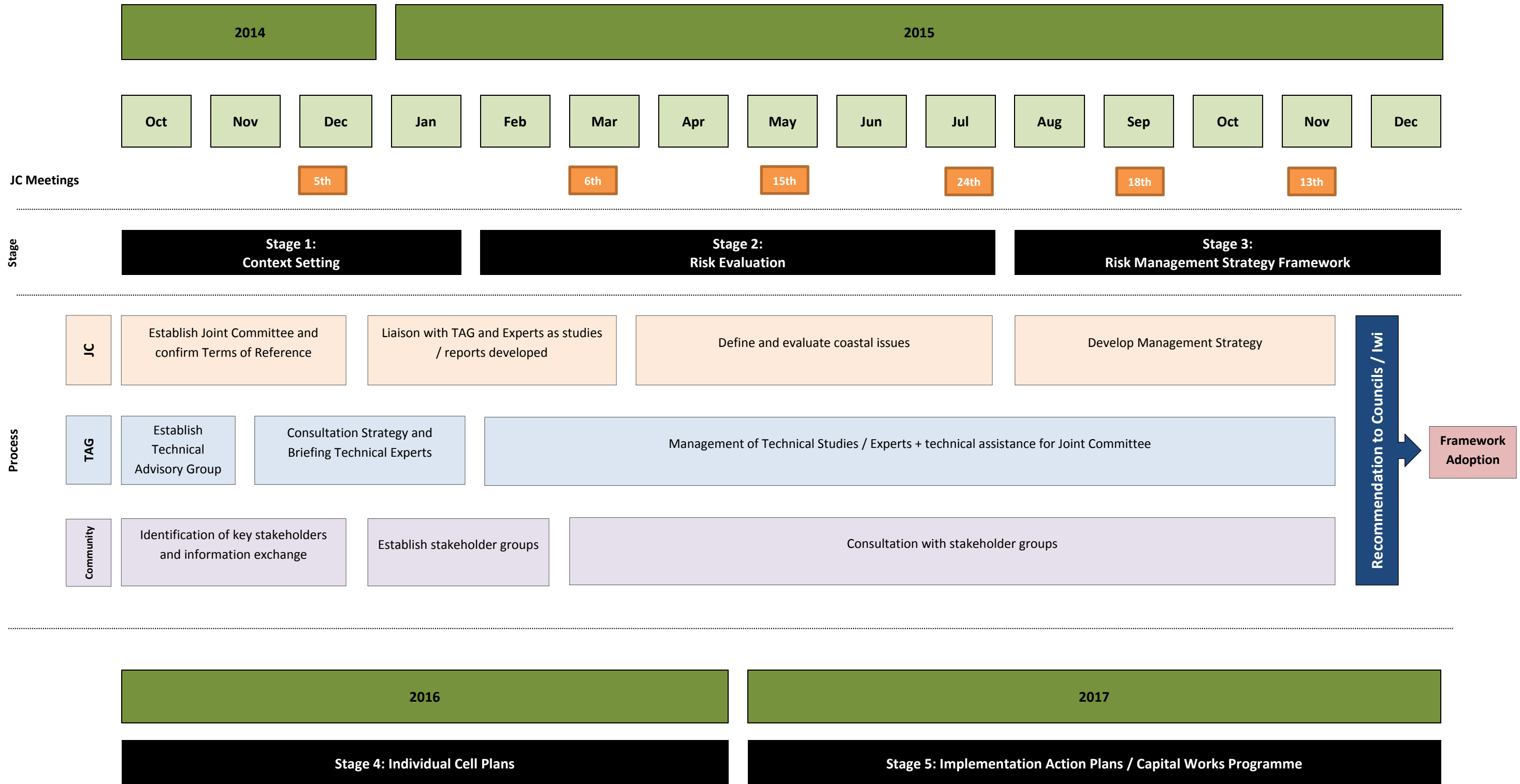
Reason for report

1. The TAG have prepared a high level project plan to guide strategy development.
2. This plan presents the Strategy in 5 stages:
 - Stage 1 – Context Setting
 - Stage 2 – Risk Evaluation
 - Stage 3 – Risk Management Strategy Framework
 - Stage 4 – Individual Cell Plans
 - Stage 5 – Implementation Action Plans / Capital Works Programme
3. The first 3 stages are planned to conclude at the end of 2015 with the completion of the Framework. Detailed project plans for each of these first 3 stages will be prepared by TAG.
4. The draft Project Plan is provided as **Attachment 1**.

Recommendation(s)

- A. That the Project Plan for the Clifton to Tangoio Coastal Hazard Strategy be adopted.

Tangoio to Clifton Coastal Hazard Strategy





ITEM 8 DRAFT STAKEHOLDER ENGAGEMENT PLAN

Report to: Clifton to Tangoio Coastal Hazard Strategy Joint Committee

Report from: Coastal Hazard Management Strategy TAG

Lead author(s): Simon Bendall, Environmental Management Services Ltd.

Meeting date: Friday 5th December 2014

Reason for report

1. The TAG have prepared a draft Stakeholder Engagement Plan to guide consultation through Strategy development.
2. The draft plan:
 - a. Identifies key stakeholders that will be engaged as part of Strategy development; and
 - b. Proposes an engagement approach for each stakeholder.
3. The draft Plan is provided as **Attachment 1**.

Recommendation(s)

- A. That the Stakeholder Engagement Plan for the Clifton to Tangoio Coastal Hazard Strategy be adopted.

Tangoio to Clifton Coastal Hazard Strategy 2120: Stakeholder Engagement Plan (Draft)

1. Purpose

This Stakeholder Engagement Plan will:

1. Identify the stakeholders to be engaged as part of the Tangoio to Clifton Coastal Hazard Strategy (“Strategy”);
2. Outline the approach to be taken in engaging with each stakeholder / stakeholder grouping and;
3. Programme consultation and engagement processes.

2. Engagement Objectives

This Stakeholder Engagement Plan seeks to achieve the following objectives:

1. All key stakeholders are identified and appropriately engaged in Strategy development;
2. Information from Stakeholders on coastal use and values is incorporated into the Strategy; and
3. The Strategy is adopted and implementation measures are commenced with maximum community buy-in and support.

3. Parties / Stakeholders

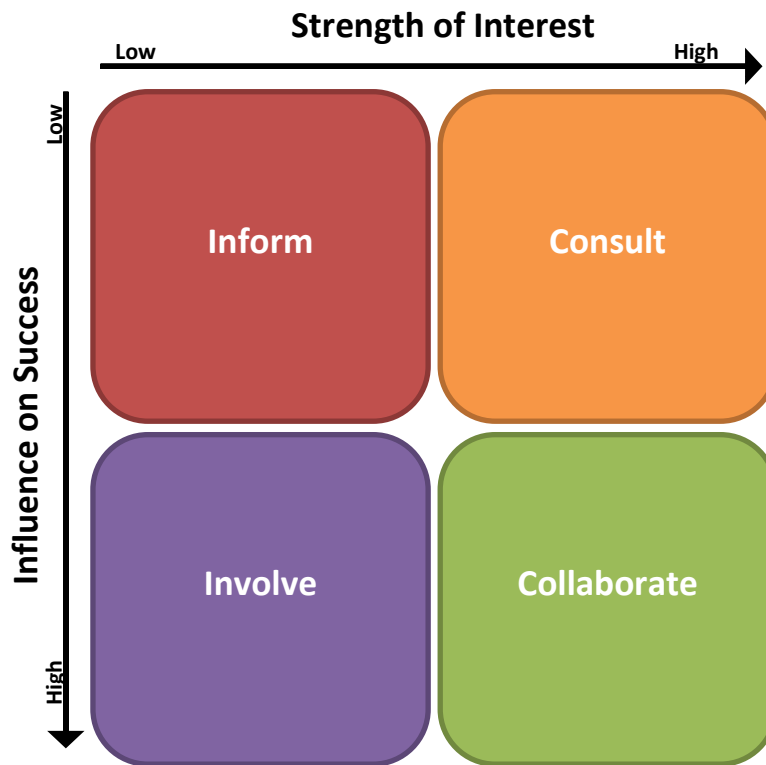
The table on the following page identifies key stakeholders / stakeholder groupings that may have an interest in Strategy development. They have been grouped into the following categories:

1. **Individual Stakeholders:** individual entities who have a specific or discrete set of interests in the coastal environment such that engagement is appropriate on an individual basis.
 2. **Stakeholder Groups (Established):** existing representative groups that can be engaged with directly in strategy development.
 3. **Stakeholder Groups (To be established):** proposed representative groups that would need to be established as part of this Plan to engage during strategy development.
-

Individual Stakeholders	Stakeholder Groups (established)	Stakeholder Groups (to be established)
<ul style="list-style-type: none"> • Port of Napier • Iwi • Department of Conservation • KiwiRail • Ministry of Primary Industries • District Health Board • New Zealand Transport Agency • Napier City Council (Works & Tourism) • Hastings District Council (Works) • HBRC (Works) • Clifton Motor Camp • Te Awanga Holiday Park • Winstone Aggregates • NZ Historic Places Trust • Insurance Council of New Zealand 	<ul style="list-style-type: none"> • Walk on Water (WOW) • Westshore Residents Association • Te Awanga Progressive Association • Haumoana and Districts Residents and Ratepayers Association Incorporated • East Clive Residents Association 	<ul style="list-style-type: none"> • Coastal Business and Industry Interests Group <ul style="list-style-type: none"> ○ PanPac ○ Contact Energy ○ Awatoto Businesses ○ Chamber of Commerce ○ Ahuriri Business Association • Recreational User Group <ul style="list-style-type: none"> ○ Surf Live Savers ○ Pania Surfcasting Club ○ Ocean Beach Kiwi Surf Life Saving Club ○ Westshore Surf Life Saving Club ○ Hawke's Bay Board Riders Club ○ Surfbreak Protection Society ○ LegaSea Hawke's Bay • Inner Harbour Users Group <ul style="list-style-type: none"> ○ Commercial Fishing ○ Napier Sailing Club ○ Hawke's Bay Sports Fishing Club ○ Hawkes Bay Coastguard • Other community groupings TBD

4. Stakeholder Mapping

A stakeholder mapping approach assists to tailor engagement processes at an appropriate level for each stakeholder. The following matrix is used to divide stakeholders into 4 categories:



The approach to engagement for each category of stakeholder is summarised below:

Category	Engagement Approach
Inform	<p>Primary method of communications: Website</p> <p>Engagement Process:</p> <ul style="list-style-type: none"> • Initial letter sent advising of process and directing to website • Added to newsletter distribution list • Accept written comments / feedback from stakeholder if provided • Attend face to face meetings if requested by stakeholder
Consult	<p>Primary method of communications: Written correspondence</p> <p>Engagement Process:</p> <ul style="list-style-type: none"> • Initial letter sent advising of process and directing to website • Added to newsletter distribution list • Invited in writing to attend any public meetings • Advised in writing of progress at milestone points in strategy development and invited to submit written feedback / comments • Attend face to face meetings if requested by stakeholder

Category	Engagement Approach
<p style="text-align: center; font-weight: bold; color: white;">Involve</p>	<p>Primary method of communications: Written correspondence</p> <p>Engagement Process:</p> <ul style="list-style-type: none"> • Initial letter sent: <ul style="list-style-type: none"> ○ advising of process; ○ directing to website, and ○ inviting stakeholder to attend a face to face meeting to discuss process of engagement • Added to newsletter distribution list • Advised in writing of progress at milestone points in strategy development and invited to face to face meeting to discuss and input to strategy development.
<p style="text-align: center; font-weight: bold; color: white;">Collaborate</p>	<p>Primary method of communications: Face to face meetings</p> <p>Engagement Process:</p> <ul style="list-style-type: none"> • Initial letter sent: <ul style="list-style-type: none"> ○ advising of process; ○ directing to website, ○ highlighting the stakeholders role in strategy development; and ○ inviting stakeholder to attend a face to face meeting to discuss process of engagement • Added to newsletter distribution list • Key inputs sought from stakeholder (via process to be agreed) at regular intervals to inform strategy development • Feedback loop established with stakeholder to provide regular process of feedback and response. • All meetings held with stakeholder are recorded through minutes and agreed actions

5. Engagement Approach

The following presents an outline consultation strategy in relation to each of the identified stakeholder groups.

5.1 Individual Stakeholders

Stakeholder	Engagement Approach
Port of Napier	Collaborate
Iwi	Collaborate
Department of Conservation	Consult
KiwiRail	Inform
Ministry of Primary Industries	Inform
District Health Board	Inform
New Zealand Transport Agency	Involve
Napier City Council (Works & Tourism)	Collaborate
Hastings District Council (Works)	Collaborate
HBRC (Works)	Collaborate
Clifton Motor Camp	Consult
Te Awanga Holiday Park	Consult
Winstone Aggregates	Collaborate
NZ Historic Places Trust	Inform
Insurance Council of New Zealand	Inform

5.2 Established Stakeholder Groups

Stakeholder	Engagement Approach
Walk on Water (WOW)	Inform
Westshore Residents Association	Inform
Te Awanga Progressive Association	Inform
Haumoana and Districts Residents and Ratepayers Association Incorporated	Inform
East Clive Residents Association	Inform

5.3 Stakeholder Groups (to be established)

Stakeholder	Engagement Approach
Coastal Business and Industry Interest Group	Inform
Recreational User Group	Inform
Inner Harbour Users Group	Inform

6. Engagement Timeline (draft)

2014	
December	<ul style="list-style-type: none"> ○ Website established ○ Joint Committee Meeting – 5 December ○ Initial letter sent to all stakeholders ○ First newsletter released ○ Face to face meetings held with Collaborate Stakeholders
2015	
January	<ul style="list-style-type: none"> ○ Website updated ○ Follow up communications / meetings with Collaborate Stakeholders in accordance with process / timeframe of engagement as agreed with Stakeholder (ongoing through 2015)
February	<ul style="list-style-type: none"> ○ Website updated ○ Follow up writing communications with Collaborate and Involve Stakeholders ○ Community meetings held
March	<ul style="list-style-type: none"> ○ Website updated ○ Joint Committee Meeting – 6 March ○ Second newsletter released (indicative)
April	<ul style="list-style-type: none"> ○ Website updated
May	<ul style="list-style-type: none"> ○ Website updated ○ Joint Committee Meeting – 15 May
June	<ul style="list-style-type: none"> ○ Website updated ○ Milestone progress meetings and communications – Stage 2 (Risk Evaluation)
July	<ul style="list-style-type: none"> ○ Website updated ○ Joint Committee Meeting – 24 July ○ Third newsletter released (indicative)
August	<ul style="list-style-type: none"> ○ Website updated ○ Community meetings held
September	<ul style="list-style-type: none"> ○ Website updated ○ Joint Committee Meeting – 18 September
October	<ul style="list-style-type: none"> ○ Website updated
November	<ul style="list-style-type: none"> ○ Website updated ○ Joint Committee Meeting – 13 November ○ Milestone progress meetings and communications – Stage 3 (Risk Management Strategy Framework) ○ Fourth newsletter released (indicative)
December	<ul style="list-style-type: none"> ○ Website updated ○ Strategy adopted
2016	
February	<ul style="list-style-type: none"> ○ Stakeholder Engagement Plan reviewed and updated to address implementation phases



ITEM 9 PRELIMINARY STOCKTAKE OF COASTAL HAZARD MITIGATION WORKS AND POLICIES

Report to: Coastal Hazard Management Strategy Joint Committee

Report from: Coastal Hazard Management Strategy TAG

Lead author(s): Gavin Ide, Manager Strategy and Policy HBRC

Meeting date: Friday 5th December 2014

File reference:

Reason for report

1. This report presents a preliminary stocktake of the following matters within the Coastal Hazard Management Strategy ('CHMS') study area (i.e. the coastline between Tangoio and Clifton):
 - a) Physical works and structures;
 - b) Plans, policies, strategies and guides etc which are likely to materially influencing the manner in which coastal hazards are managed within the study area.

Comment

2. An awareness of a basic 'baseline' or stocktake of existing physical mitigation works and policies will be beneficial to the Committee's upcoming work in developing a coastal hazard management strategy.
3. The TAG has compiled a preliminary stocktake in two parts (see Attachment 1):
 - a) Part 1 - existing physical works and structures that serve to mitigate the effects of coastal hazards (e.g. seawalls, revetments, renourishment schemes, groynes, etc);
 - b) Part 2 – outline of key policy documents. These include statutory planning instruments and various non-statutory (i.e. optional) documents. This is by no means an exhaustive list of documentation relating to the management of coastal hazards. Documents that are identified in the stocktake include those prepared by local authorities as well as various other parties.

4. This stocktake builds on the earlier summary of issues which featured in briefing papers presented to the three respective councils prior to formation of the Joint Committee. A number of the physical mitigation works were also mentioned in staff's commentary during the recent bus tour of locations within the study area.
5. It is apparent from the stocktake of physical works that there are numerous legacies of attempts to halt or slow shoreline retreat over the years. Some works are more recent than others. Funding and responsibility for the works is also variable. A number of the works exist to protect or maintain operating requirements of activities and infrastructure located at coastal sites (e.g. Port breakwater, groynes for rivermouth and flood control scheme stability).
6. From the range of policy documents, it is apparent that the statutory documents will certainly need to be given due consideration whereas the non-statutory documents do not necessarily carry the same obligations.
7. This stocktake does not attempt to assess the value (that is economic or other values) that the physical works estimated to protect. Similarly, the stocktake does not attempt to outline consequences in the event of failure of any physical works or structure. Future deliberations by the Committee may identify this type of information as being necessary. If so, then that will need to be factored into the TAG's future work programme.
8. On 27 November 2014, (just one day prior to this report being published and circulated), the Parliamentary Commissioner for the Environment ('PCE') released her report titled '*Changing climate and rising seas: understanding the science.*' Due to timing, that report is not featured in the preliminary stocktake. The PCE has intentions to release a subsequent report on sea level rise vulnerabilities and infrastructural consequences. That follow-up report is anticipated to be released mid-late 2015.

Recommendation(s)

- A. That the report be received.

Coastal Hazard Management Strategy: A preliminary stock-take of existing coastal erosion and inundation 'strategies'

Physical mitigation works						
REF#	Location (if relevant to a particular geographic location/vicinity)	Type/form [EG: seawall/revetment; groyne; gravel barrier; nourishment; dune/barrier stabilisation; etc]	Who is responsible for works [EG: council; community project; private person; other]	Date of construction (approx) <i>Design lifespan (if assessed)</i>	Significant conditions for operating [EG: consent duration and other notable consent conditions if any]	Additional comments (if any)
	Westshore Beach	Renourishment Scheme (deposition)	HBRC and NCC	Since 1987 on average 12-15 000m ³ pa of predominantly fine gravel sourced from Marine Parade. Material used to construct an artificial gravel barrier and then replenished annually. (Alternative source sites have included the wildlife ponds, Ahuriri Entrance, Spirit of Napier).	Resource consent from HBRC allows deposition of up to 30,000m ³ of sediment from Marine Parade source. Consent expires May 2017. Maximum take permitted is 50,000m ³ pa under NCC rules with spatially defined extraction and deposition areas.	Renourishment has held most of the coast seaward of where it was in 1986. Successful means of mitigating erosion at Westshore. However considerable debate on this and effectiveness/sustainability of ongoing renourishment. Result = approximately 160 residential properties not included in CHZ compared to if nourishment scheme not in operation. Benefits extend right up to Bay View (net northerly drift). Doesn't benefit Whakarire Avenue. PD Komar report recommends re-think about longer-term sustainability of material being sourced from Marine Parade beach. Need to review source of material as a first step, but longer term will need to review approach.
	Westshore (Whakarire Avenue)	Rock revetment	NCC	1909 -1923 protection works constructed to combat erosion. 1994 sea wall constructed of concrete rubble. 1995 15 000m ³ of fine gravel and sand placed behind seawall. 1997 sea wall was dressed with rock armour (mainly leeward side).	No consent for original works but consents obtained for 1994- 1997 works. 2013 R/C consent application now on hold by NCC to re-evaluate options.	2013 NCC lodged resource consent application to HBRC for "H" shape breakwater and associated works Pre-hearing mediation held and expert conferencing (Stephen Priestly of BECA for NCC and Richard Reinen-Hamill for HBRC). Application is currently on hold by NCC to re-evaluate options.
	Ahuriri (Scapa Flow/Inner Harbour)	Rock revetments	NCC responsible for dredging and shoreline protection work (repairs and rock armoury work) HBRC responsible for navigation safety (via Harbour Master)	Harbour opening pre-European Pre 1931 earthquake Tutaekuri River discharged keeping it clear Today dredging required (every 3-4 years combined with Port operations) Also shoreline protection work and rock armoury work on-going as required.	Repair and maintenance on-going	Possible to dump/pump dredged material so that it benefits Westshore, however material is generally fine sand that is readily moved by the sea.
	Ahuriri (Hardinge Road)	Rock revetment		Long standing protection works.	Repair and maintenance on-going	Prior to 2013, no work/maintenance

				2013 approximately \$400 000 spent on (deferred) repair and maintenance		undertaken for at least 20 years.
Port of Napier ('breakwater beach')	Revetment, Groyne					Small beach to north of groyne well used by public. Beach is generally fine sand which remains on beach as a result of shelter by Groyne. A larger beach between the groyne and PONL also gets significant public use. This beach is however within the area designated for PONL development. The beach is not a public reserve space.
Port of Napier	Breakwater	Port of Napier Limited		Long standing protection works. Ongoing maintenance and repair. Series of capital works to extend breakwater from time to time.	Regional Coastal Environment Plan permits maintenance and repair works on this existing structure.	PONL have long term development plans for the port. If these are progressed significant investigation/modelling will be required. This work could be aligned to long information needs for effective management of coast and therefore joint approach with Local government should be considered.
Port of Napier (southern entrance), aka 'Spur Breakwater'	Groyne	Port of Napier Limited		Long standing protection work.	Regional Coastal Environment Plan permits maintenance and repair works on this existing structure.	
Port of Napier	Fairway dredging and deposition	Port of Napier Limited			Deposition to occur within deposition areas defined in consents and RCEP. Dredged materials to be screened for key contaminants before nearshore deposition. Multiple consents in place for maintenance dredging activities in parts of Fairway and Swinging Basin, each with different consent expiry dates, but typically 20-30y duration.	Dumping close to shore is more expensive than off shore dumping. Investigation work could be done to determine optimum dumping site(s) for dredged material to benefit the coast.
Esk Rivermouth	Revetment (?)	Routinely opened by HBRC				Code of practice exists for rivermouth opening operations
Marine Parade Beach	Renourishment Scheme (extraction)	HBRC and NCC			Resource consent from HBRC allows taking up to 30,000m ³ of sediment per annum for Westshore Renourishment Scheme purposes. Resource consent expires May 2017.	Since 1993 primary source of material for the Westshore renourishment scheme. Beach at this point experiences long term trend of accretion at a rate of 0.8m pa (expected to be 1.5 m pa if Awatoto extraction ceased). PD Komar report recommended re-think about longer-term sustainability of material being sourced from Marine Parade beach.

	Ngaruroro River Mouth		River mouth routinely opened by HBRC			Code of practice exists for rivermouth opening operations
	East Clive	2 groynes and sea exclusion bank	HBRC	Constructed around 1980	Repair and maintenance on-going	Effectiveness of sea exclusion bank is dependent on gravel barrier beach being the primary protection from the sea. If the integrity of the beach barrier is compromised then risk of breach of sea exclusion bank is significantly higher.
	Tukituki Rivermouth	Groynes	HBRC River mouth routinely opened by HBRC	Originally constructed 1999. – concrete blocks assembled and placed.	Riverbank protection groyne consent expires May 2044.	Code of practice exists for rivermouth opening operations
	Haumoana	Sea exclusion bank and associated works	HBRC	Constructed probably in 1970s or 80s. Maintained as part of Haumoana drainage area by HBRC		In storm events the sea overtops the beach crest. These structures provide a line of defence against flooding of Haumoana. The design standard (ie likely return period for flooding of Haumoana) is unknown. Flooding risk is increasing as integrity of gravel beach barrier is reduced.
	Haumoana (1-41 Clifton Road)	Various ad-hoc structures and debris	Landholders	Various	Refer RCEP rules re works for maintenance, upgrading, replacement etc of such structures NB: some consents for more recent works may also specify limited life and expiry terms.	
	Clifton Motorcamp entrance	Rock revetment/seawall	Hastings DC	Concrete rubble in place for many years. c.2011 - Rubble removed. 2013 – 80m long seawall construction (in latest form) comprised of limestone boulders	Resource consent allows construction, repair, maintenance and removal of rock revetment structure. Consent expires August 2018. Structure to be removed and land reinstated prior to August 2018. Earlier removal may be required if monitoring reveals structure worsening erosion.	
	Waimarama (Harper Road)	Rock revetment/seawall	Hastings DC	1980 (HB Catchment Board)		Significant rebuild to toe of seawall structure in 1992-95

Local authority plans, policies and strategies						
REF#	Document type [e.g. document required by (if relevant to a particular geographic location/vicinity)]	Statutory origins [i.e. is the document required by law / does the document have the effect of a rule or regulation; etc?]	Who is responsible for document: (A) Preparation (B) Implementation	Timeframe for document review (if any)	What are document's key themes / messages re coastal hazards?	Additional comments (if any)
	Regional Policy Statement (RPS), included in HB Regional Resource Management Plan (RRMP)	Mandatory under RMA	HBRC (A & B)	Commence review by August 2016 (i.e. 10 years after becoming operative). Some provisions are younger than 10 years so need not be reviewed (e.g. Urban development provisions in Chapter 3.1B).	<ul style="list-style-type: none"> To achieve integrated management of region's natural and physical resources; Urban development avoids or mitigates increasing frequency or severity of natural hazard risks. Natural character of coastal environment is protected from inappropriate developments. Avoidance of further permanent development in areas prone to coastal erosion or inundation. 	<p>Policy content pre-dates 2010 NZ Coastal Policy Statement. Change(s) to RPS required so it gives effect to NZCPS.</p> <p>Regional plans and district plans must give effect to RPS.</p> <p>RMA consent authorities must have regard to relevant RPS provisions when making decisions on consent applications.</p>
	Regional coastal plan (aka 'HB Regional Coastal Environment Plan' (RCEP))	Mandatory under RMA	HBRC (A & B)	November 2024 (i.e. 10 years after becoming operative). Policy 15.1.5 refers to reviews of coastal hazard zones no less than every six years to coincide with sea level rise scenarios reviewed by the IPCC and any subsequent NZ Government guidance.	<ul style="list-style-type: none"> Avoidance of new and further development in hazard areas. Natural values and features providing buffer against erosion and inundation are maintained and enhanced. Relocation and removal of existing uses for risky areas will be evaluated and implemented if appropriate. Soft-engineering options (eg: beach renourishment) may be evaluated and implemented if appropriate. Permanent coastal protection structures will be considered <i>inter alia</i> when it is the best practicable option, no other non-structural alternative is effective (i.e. evaluation of the above priorities). A precautionary approach will be adopted in assessment of areas at risk of erosion and inundation; and potential effects of coastal subdivision, use and development. A 100-year planning horizon should be used in coastal hazard assessments. Tsunami events are not within the RCEP's meaning of a coastal hazard. 	<p>Policy content pre-dates 2010 NZCPS. Change(s) are likely to be required so RCEP gives effect to NZCPS's coastal hazard policies etc.</p> <p>RCEP is silent in terms of NZCPS's inclusion of tsunami within meaning of 'coastal hazard.'</p> <p>District plans must not be inconsistent with regional plans.</p> <p>RMA consent authorities must have regard to relevant regional plan provisions when making decisions on consent applications.</p> <p>Coastal hazard zones were typically based on a series of assessments by Tonkin & Taylor Ltd. Key parameters applied by T&T in those assessments were:</p> <ul style="list-style-type: none"> Sea level rise 1999 to 2060 = 0.2 m Sea level rise 1999 to 2100 = 0.5 m (where 1999 sea levels used as 'baseline') Sea level rise beyond 2100 – n/a Storm event probability for inundation assessments = 2%AEP (i.e. 1 in 50 chance of a storm event occurring in any given year) Storm surge for inundation assessments = 0.9 m Future tectonic movement = nil
	Regional plan (included in RRMP)	Optional under RMA, but common	HBRC (A & B)	Commence review by August 2016 (i.e. 10 years after becoming operative)	<ul style="list-style-type: none"> Refer to RCEP above 	<p>District plans must not be inconsistent with regional plans.</p> <p>RMA consent authorities must have regard to relevant regional plan provisions when making decisions on consent applications.</p>

2010 Heretaunga Plains Urban Development Strategy (HPUDS)	Optional. LGA as basis	(A) HBRC; HDC; NCC (B) HBRC; HDC; NCC via HPUDS Implementation Working Group	2016	<ul style="list-style-type: none"> Sequencing of land use, infrastructure in funding is fundamental to successful growth management and integrated planning. HPUDS identifies a preferred settlement pattern based on several considerations. One consideration for suitability of growth areas was likelihood of natural hazards. For coastal locations, this included coastal erosion and inundation. Action 5.15.4.1 = "provide limited coastal development in the areas identified in the strategy already compromised by existing development and away from coastal hazard zones." Action 5.15.4.4 = "Consider the managed retreat of settlements affected by coastal erosion/inundation." Action 5.29.4.1 = "provide sufficient buffer zones to allow for natural coastal processes and inland migration of coastal ecosystems." Action 5.29.4.2 = "Promote the RPS, regional plans, district plans and development manuals to ensure new development proposals are subject to a hazard risk assessment." 	Key principles for settlement pattern, appropriate and inappropriate greenfield growth areas etc have been embedded into RPS. Some principles related to consideration of 'at risk' areas.
Hastings District Plan (operative)	Mandatory under RMA		Currently subject to review (refer proposed Hastings District Plan)	•	RMA consent authorities must have regard to relevant district plan provisions when making decisions on consent applications.
Hastings District Plan (proposed)	Mandatory under RMA			•	Most rules in proposed district plan do not have immediate legal effect. Rules will have legal effect when plan becomes operative. RMA consent authorities must have regard to relevant district plan provisions when making decisions on consent applications.
Napier District Plan	Mandatory under RMA			•	RMA consent authorities must have regard to relevant district plan provisions when making decisions on consent applications.
HB Civil Defence Emergency Management Group Plan	Mandatory under CDEM Act	Hawke's Bay Civil Defence Emergency Management Group (HBCDEM)		•	
HB Conservation Management Strategy 1994	Mandatory under Conservation Act	Department of Conservation (A & B)	Scheduled for review to commence 2012/13.	<ul style="list-style-type: none"> Overall vision for the 'coast' is "The natural character of the Hawke's Bay coastline, with its sweeping beaches, cliffs and important estuarine areas, is maintained and enhanced. Only sensitive uses and developments which are in harmony with nature will occur." Management objectives include: <ul style="list-style-type: none"> Protect natural and historic values of areas managed by DOC Advocate protection and enhancement of 	

					<p>areas and habitats of high natural or historic values on lands not managed by DOC</p> <ul style="list-style-type: none"> ○ Advocate maintenance and enhancement of legal public access to the coast ○ Ensure local authorities have regard for natural and other values when making plans, strategies and other decisions ○ Advocate for protection of all areas of high natural or historic value in the Conservancy ○ Opposing consent applications that are contrary to policies in the NZCPS. 	
	Hastings Coastal Environment Strategy	Optional. LGA as basis	HastingsDC		<ul style="list-style-type: none"> ● An objective to ensure that all subdivision, use and development has regard to natural hazards and the need to maintain and enhance natural systems for protection. ● Policies to: <ul style="list-style-type: none"> ○ Avoid development in areas subject to natural hazards. ○ In areas where development has already taken place, to investigate measures to remedy or mitigate potential hazards, taking into account the value of the properties to be protected. ○ To ensure integration of coastal protection methods with natural and physical resources of the coastal environment. ● Specific policies for Tangoio, Whirinaki, Waitangi/Ngaruroro, Clive/Waipereku, Haumoana, Te Awanga and Clifton 	
	New Zealand Coastal Policy Statement 2010 (NZCPS)	Mandatory under RMA	Minister/Department of Conservation (A & B)		<ul style="list-style-type: none"> ● States numerous objectives and policies dealing with resource management issues in the coastal environment. ● There is a risk-based approach to coastal hazard management in the NZCPS 2010 (see policies 24-27). This reflects well-established international best practice for natural hazard management. This approach is reinforced by the requirement to apply a precautionary approach to address climate change and its uncertain, but potentially significant, adverse effects (NZCPS 2010, Policy 3). All coastal hazard policies flow from NZCPS Objective 5. 	

	ISO 31000: 2009, Risk Management – Principles and Guidelines	Optional	ISO (A)		<ul style="list-style-type: none"> • provides principles, definitions and a process for managing risk. Key steps in the process include establishing context, risk identification, analysis, and evaluation. • The remainder of the guidance note focuses on ways to manage or treat natural hazard risks (including the RMA tools to manage specific hazards). 	
	Coastal Adaptation to Climate Change: Pathways to Change (Nov 2011)	Optional	NIWA et al (A)		<ul style="list-style-type: none"> • The Coastal Adaptation to Climate Change project is a three year study undertaken by NIWA and partners, funded by the [then] Ministry of Science and Innovation (MSI). • Pathways to Change is a synthesis of the overall programme’s findings. • The project had three key components: <ul style="list-style-type: none"> - Building a national coastal vulnerability profile - Engaging communities and institutional decision-makers - Encouraging best practice planning. • A key outcome of this research is to enable more informed proactive communities and to assist local authorities to develop local adaptation plans that encompass community values. 	
	Preparing for coastal change: A guide for local government in New Zealand (March 2009)	Optional	Ministry for the Environment (A)		<ul style="list-style-type: none"> • Preparing for Coastal Change is a summary of the Ministry’s technical report, Coastal Hazards and Climate Change – A Guidance Manual for Local Government in New Zealand (2nd ed) released in July 2008. • It highlights the impacts that climate change is expected to have on coastal hazards. It details the climate change impacts that are expected not only through sea-level rise but also through storm surge, wind and waves. The publication also discusses a risk management framework in which to consider the consequences of these hazards. • MfE have published six Fact Sheets associated with this Guidance: <ul style="list-style-type: none"> Factsheet 1: Components of sea level Factsheet 2: Tides Factsheet 3: Storm surge Factsheet 4: Waves Factsheet 5: Coastal erosion Factsheet 6: Coastal inundation 	