

Chairperson and Committee Members
REGULATORY MANAGEMENT COMMITTEE

30 AUGUST 2012

Meeting Status: **Public**

Purpose of Report: For Decision

COASTAL HAZARD ASSESSMENT AND PREDICTED SHORELINES

PURPOSE OF REPORT

- 1 This report presents new coastal hazard risk assessments and outlines a public communications and information programme about these hazard risks.

SIGNIFICANCE OF DECISION

- 2 This report does not trigger the Council's Significance Policy

BACKGROUND

General

- 3 The complex nature of the coastal environment means that managing the effects of coastal hazards is challenging. Coastal erosion and flooding are natural coastal processes which become hazards where they pose a threat to human property and/or life. The risk from coastal hazards is being exacerbated by increasing development along coastal margins affected by climate change effects, such as sea level rise, unsettled weather resulting in more storms, surges and coastal erosion. There is a general concern about natural hazards which has been highlighted by recent events in Christchurch.
- 4 Most of the Kapiti coastal edge is within permanent residential areas. Residential development in coastal areas has occurred rapidly with little consideration of coastal hazard risks. The increased risk of coastal erosion and inundation to these communities will be exacerbated as a result of climate change. Residential development along dunes reduces the ability of natural coastal processes, such as accretion and attrition and the function of dunes as a natural barrier to reduce the risk of coastal hazards.
- 5 The Council is required by the New Zealand Coastal Policy Statement (NZCPS) to assess the coastal hazard risk using at least a 100 year assessment for the District Plan. The NZCPS must be given effect to in the District Plan review. In order to understand and respond to coastal hazard risk the Council has commissioned a coastal hazard risk assessment.
- 6 The coastal hazard assessment has now been completed. It is important to note that the assessment is not the coastal hazard setback line for the District Plan Review but is the scientific assessment which will be used, in conjunction with NZCPS requirements, to determine the setback lines and associated policies.

These shoreline assessments are currently being used to develop Coastal Erosion Setbacks for consideration as part of the District Plan Review.

- 7 Coastal hazard assessment reports and predicted shoreline scenarios need to be included in Land Information Memoranda (LIM) reports for coastal properties as it is property specific information relating to “*potential erosion...or inundation*” as required in section 44A(2) (a) of the Local Government Official Information and Meetings Act(LGOIMA). The Act is very clear that Council does not have any discretion about whether or not to provide this type of property specific hazard information it holds on LIM reports, it must be provided.

History

- 8 The Kāpiti Coast experienced severe coastal erosion in Paekākāriki and Raumati in 1968. The southern part of the coast has continued to experience consistent erosion. As a result of this erosion, coastal setbacks have been in the District Plan for southern parts of the District since 1981.
- 9 In 2003 Council released a set of proposed Coastal Hazard Setback Lines as part of a review of the hazard setbacks. The proposed setbacks were developed for the whole coastline, and sent to affected landowners for public submissions in 2004 with an extensive report titled “Coastal Erosion Strategies for the Kapiti Coast” by John Lumsden. Council received a number of responses challenging the science behind the setback lines.
- 10 As a result of this criticism the Council commissioned Coastal Systems Ltd to peer review the hazard risk assessment that led to the setback lines. The reviewer concluded that the lines had been derived via a non-standard methodology which was different from the methodology used in other parts of New Zealand, contained several assumptions which could not be measured, and therefore could not be robustly defended. Council then commissioned Coastal Systems Ltd. to develop a standard methodology for coastal hazard assessment.
- 11 The report outlining the standard methodology, described below, was released to the general public and sent to all the 2003 Setback Line submitters for comment in 2005. Few comments were received, most seeking clarification, and general support for the methodology was expressed by one submitter.
- 12 Council then commissioned Coastal Systems to undertake a reassessment of the coastal hazard risk using the agreed standard methodology. The initial assessment, started in 2005, was undertaken by Coastal Systems using a 50 year planning horizon and was completed in 2008.
- 13 Meanwhile, a review of the New Zealand Coastal Policy Statement (NZCPS) began in 2003 and the proposed NZCPS was released for submissions in 2007 including a new requirement that Council to use a 100 year timeframe for hazard assessments used for District Plans. Council submitted that 50 years was a more appropriate length of time as given the uncertainties associated with climate change for 100 years. The Council then waited to see whether the submission to only require a 50 year assessment for coastal hazards was adopted.
- 14 In 2010 the NZCPS became operative with a requirement of a 100 year timeframe for coastal hazard assessments.

- 15 Council then commissioned Coastal Systems to undertake a 100 year assessment in addition to the 50 year assessment, using the same methodology. This work has now been completed and is attached as Appendix 1 and 2 to this report.

CONSIDERATIONS

Methodology

- 16 The methodology for the coastal hazard risk assessment uses the following formula to derive coastal erosion predicted shorelines(CEPL):

$$CEPL = LT + ST + SLR + DS + CU$$

Where:

LT = longer-term historic shoreline change.

This component was derived for a 50 yr period using statistical analysis of shorelines derived from cadastral maps and aerial photographs using up to 135 years of data (depending on location);

ST = Shorter-term shoreline fluctuation.

This component was derived using statistical analysis of the historic shoreline data;

SLR = Shoreline retreat associated with sea-level rise (SLR) induced by global warming which was derived via a shoreline adjustment model that utilized the substantial beach profile data. This component was derived for a 50 and 100yr period based on the shoreline response model deemed to be most appropriate for the Kapiti Coast, and using the most recent Sea Level Rise estimates;

DS = Dune stability.

This component accounts for scarp retreat to achieve a stable slope following storm erosion of the foredune, which is based on a slope stability model that utilized three- dimensional LIDAR (Light Detecting and Ranging) data.

CU = Combined uncertainty

This refers to the precautionary safety margin derived by combining the *measurement errors* associated with the other four components.

- 17 A separate risk assessment was required for areas of coast which are influenced by stream or river mouths. These were defined as inlets. The figure below (extracted from the inlet assessment) shows the difference between the open coast and inlet areas.

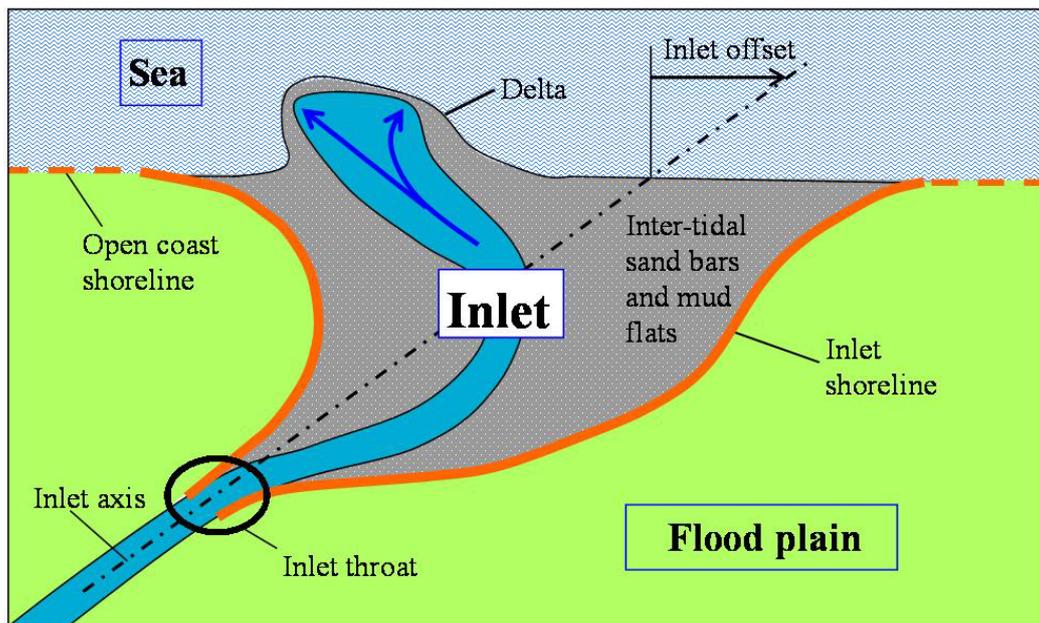


Figure 2 Schematic diagram and associated notation for morphological features found with inlets typical of those on the Kapiti Coast.

- 18 The same equation and factors are used in this inlet assessment however the Shorter-term shoreline fluctuation (ST) is derived from a shoreline envelope (based on historic shorelines) to determine the landward-most inlet migration.

Assessment

Scenarios

- 19 The coastal hazard risk assessment was carried out using two time scales (50 and 100 years) and two management scenarios (managed and unmanaged). The scenarios are explained below.
- 20 Along the southern coast, three seawall management options were considered for the 50 year assessment:
- *seawalls hold*, where the current public seawalls successfully maintain integrity and remain fully functional;
 - *seawalls repair*, where the current public seawalls fail locally but are quickly repaired; this scenario forms part of the managed 50 year scenario
 - *seawall removal*, where widespread failure occurs and the remnants are then removed.
- 21 The final (2012) assessment uses the *seawalls repair* option as the managed scenario for 50 years. This scenario was selected because the current sea wall structures are very unlikely to remain fully functional in a 50 year timeframe, given the current need to undertake emergency works following storm damage..
- 22 An unmanaged scenario was undertaken for the entire open coast for both 50 and 100 years. Where public coastal protection structures exist this reflects the seawall removal scenario. The reason of the unmanaged is that it is estimated that none of the existing structures would survive in excess of 50 years.

- 23 In addition there were two scenarios assessed in relation to inlets. Currently some inlets are managed by Greater Wellington by “cutting” a new straight channel at the mouth when the river/stream reaches a flood trigger point. Where this occurs and where there are engineered structures such as stopbanks limiting the river/stream mouth a “managed inlet” scenario has been assessed. Both the 50 and 100 year assessments include a scenario where currently managed inlets are still managed, as well as an unmanaged scenario for all inlets.
- 24 The managed scenarios are based on existing management. It is important to note that there is no long term commitment from the Council or Greater Wellington to continue with the current management. The Council has identified its approach in the Long Term Plan that it intends to move away from the management of seawall and other hard coastal protection structures over time, as they fail.

Review

- 25 The hazard assessment reports have been peer reviewed by Dr Mike Shepherd (coastal geomorphologist, Massey University), Mr John Lumsden (coastal engineering consultant) and Dr S Ganesalingham (mathematician). Further peer review relating to specific aspects of the hazard assessment was received from practitioners who have had direct involvement with coastal process or management investigations on the Kapiti Coast over the past 30 years: Dr Jeremy Gibb (coastal management consultant), Professor Bob Kirk and Dr Martin Single (coastal geomorphologists, University of Canterbury), and Mr Richard Reinen-Hamill, Senior Coastal Engineer with Tonkin and Taylor Ltd. The peer reviewers’ comments have been incorporated into the final reports attached as Appendix 1 to this report.
- 26 The 50 year risk assessments in 2008 identified that there were some specific issues which could be improved upon to refine the assessment, so further scientific work has since been undertaken to address these issues. These include additional beach profile information and bathymetric studies to better understand the effects of the currents between Kāpiti Island and Paraparaumu. The assessment reports have been available on request but have not been provided in Land Information Memoranda (LIM) while this work has been occurring, as the information has been changing regularly and has not yet been deemed to be a final analysis. Due to this work occurring there has been a note on LIM reports since 2004 advising that the coastal hazard information is currently being reviewed.
- 27 The 100 year timeframe is indicative only, given the uncertainties associated with sea level rise. A recent report released by NIWA identified that sea level rise, which is one of the factors used to derive the predicted shorelines, is increasing, and a factor range of 0.7 to 1.4m should be considered for 100 year assessments in urban areas with a consideration of 1.5m in greenfield areas.
- 28 The work done by Coastal Systems uses 0.9m of sea level rise for the 100 year assessment and the consultants consider it is sufficiently robust in relation to the NIWA range above.

District Plan Review

- 29 The Council is required by the New Zealand Coastal Policy Statement (NZCPS) to assess the coastal hazard risk using at least a 100 year assessment for the District Plan. The NZCPS must be given effect to in the District Plan review.
- 30 The coastal hazard assessment has now been completed. It is important to note that the assessment is not a coastal hazard setback line for the District Plan Review but is the scientific risk assessment which will be used, in conjunction with NZCPS requirements, to determine the setback lines rules and associated policies.

Communications

- 31 There are approximately 1800 properties which are located in areas identified as being subject to potential erosion or inundation from coastal hazards within 100 years under the unmanaged scenario with approximately 1000 of these affected by the 50 year unmanaged scenario. The 1800 properties have a current market value of approximately \$1.6B. The rates from these properties for 2012 will be 4.8 million dollars.
- 32 This type of information is of wide interest to the general public as well as having a direct impact on coastal property owners. There will be concerns from property owners about whether having this information on LIM reports will affect their property values or insurance. The LIM report is to inform prospective property purchasers so that they are able to make an informed choice about whether or not to purchase a property.
- 33 It is important be proactive in informing the affected landowners about the coastal hazard risk information. This report recommend a comprehensive approach be adopted including briefing the media, sending out letters and holding drop in sessions for residents as well as providing the assessment reports on the Council's website and in District Libraries.
- 34 A letter has been sent to let all affected landowners to let them know that this information will be used on LIMs and give them the opportunity to ask questions and seek further detail in one of four information sessions on the 15th (two sessions), 16th and 22nd of September. These sessions will have representatives from Greater Wellington and Quotable Value as well as staff and coastal scientists available to answer questions from residents. All sessions will cover the whole district. For most affected landowners this letter will reach them prior to a LIM report with this information being issued in relation to their property.

Financial Considerations

- 35 There will be a small cost to send out letters and maps to affected landowners and hold public information sessions. These costs can be met from existing budgets.

Legal Considerations

- 36 The relevant legislation relating to LIM reports is the Local Government Official Information and Meetings Act (LGOIMA). Section 44A(2)(a) requires that property specific information relating to "*potential erosion...or inundation*" be

included in LIM reports. Council is required to provide all information relating to erosion hazards that it holds. Council now holds this information

- 37 Council is also required to give effect to the New Zealand Coastal Policy Statement (NZCPS) when undertaking a review of the District Plan. The NZCPS requires that a 100 year assessment of coastal hazards be undertaken and a precautionary approach be taken to avoiding development in areas prone to high hazard risk.

Delegation

- 38 This decision relates to information required to be provided for LIM reports and which will be used in relation to the District Plan, therefore it is appropriate for this committee to make the decision about how this information will be communicated with the public
- 39 The Committee may consider this matter under clause 7.22 of Section B Governance Structure and Delegations (5 April 2012):

7.22 Authority to monitor and report to Council on the suitability of the District Plan, its policies, procedures and provisions... .

Consultation

- 40 The methodology for undertaking the assessment was consulted on in 2005, and the way this information will be used in the District Plan will be consulted on as part of the District Plan Review.
- 41 A draft version of the hazard risk scenarios was shown to participants in the Natural Hazard Information exchange sessions held across the District in May and June 2012. The draft maps were provided by Coastal Systems in advance of the report to allow them to be shown in these sessions.
- 42 Council has no discretion about providing this information on LIM reports and therefore cannot consult on the information prior to inclusion on LIM reports. However it is important that the public and affected property owners are informed about the hazard risks and that they have an opportunity to seek clarification and explanation of the assessment methodology. It is not appropriate to wait to inform residents until the District Plan Review consultation.

Policy Implications

- 43 This provision of this information both on LIM reports and proactively to coastal landowners is consistent with the Council's approach to natural hazards and coastal processes and the principle of having an open dialogue with an informed community.
- 44 It is Council's policy outlined in the leadership areas on page 37 of the Long Term Plan to not protect private assets and in the long term to gradually move public health infrastructure away from areas at high risk from coastal hazards. This information will assist in developing policies and associated development restrictions in the District Plan Review.

Publicity Considerations

- 45 This issue requires significant publicity to inform property owners of this information and explain the assessment.

Tāngata Whenua & Other Considerations

- 46 There are no tangata whenua or other considerations at this time.

CONCLUSION

- 47 The Council must include the latest coastal hazard risk information on hazards in Land Information Memoranda. This report outlining a proactive programme to explain the new hazard information to residents.

RECOMMENDATIONS

- 48 That the Committee notes that the natural hazard information in Appendix 1 and 2 has been received and finalised and will need to be released on Land Information Memoranda, as per the requirement of section 44A(2)(a) of the Local Government Official Information and Meetings Act.

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ATTACHMENTS:

Appendix 1: Coastal Hazard Assessment reports

- Kāpiti Coast Erosion Hazard Assessment 2012 Update
- Kāpiti Coast Erosion Hazard Assessment Part 1(Open Coast) and Part 2 (Inlets)

Appendix 2: Combined Predicted Shoreline Maps

Appendix 1-Hazard assessment reports

Appendix 2