
PREFERRED OPTION REPORT TO DISTRICT PLAN COMMITTEE

DATE: 28 November 2018

TOPIC NAME: Natural hazards

SCOPE DESCRIPTION: Coastal hazards

TOPIC LEAD: Rachael Carruthers

PREPARED BY: Rachael Carruthers

EXECUTIVE SUMMARY

<i>Issue(s)</i>	<i>The management of significant risks from natural hazards, including coastal hazards, is a matter of national importance that must be recognised and provided for when achieving the purpose of the RMA.</i>
<i>Preferred Options</i>	<u><i>Coastal erosion:</i></u> <i>Option 2 – to replace the existing RPS Coastal Hazard Lines 1 and 2 with the potential coastal erosion area identified in the screening assessment.</i> <u><i>Coastal inundation:</i></u> <i>Option 4 – include the coastal inundation area identified in the screening assessment in the PDP as a coastal high hazard overlay.</i> <u><i>Tsunami:</i></u> <i>Option 7 – include the tsunami evacuation zones identified as a coastal hazard overlay in the PDP, together with consideration of tsunami risk for developments that involves vulnerable groups, or critical facilities.</i> <u><i>Rakaia Huts:</i></u> <i>Option 9 – the development of additional modelling at Rakaia Huts to take account of the interaction between the coast, the hāpua and the river in the identification of high hazard and hazard areas.</i>
<i>Recommendation to DPC</i>	<i>That the Committee endorses the Preferred Options for ‘Coastal Hazards’ for further development and engagement, Section 32 evaluation and drafting phases.</i>
<i>DPC Decision</i>	<i>That the Committee endorses the Preferred Options for ‘Coastal Hazards’ for further development and engagement, Section 32 evaluation and drafting phases.</i>

1.0 Introduction

1.1 Previous reports to DPC

As part of the District Plan Review, Council needs to undertake investigations to understand coastal hazards, and to manage those risks to people and property. This is to give effect to the Canterbury Regional Policy Statement (CRPS) and New Zealand Coastal Policy Statement (NZCPS), and is also a matter of national importance under s6(h) to the RMA. This was the subject of Issues and Options reports on flooding and coastal hazards considered by DPC at its meeting on 22 February 2017 and again on 6 December 2017.

In relation to coastal hazards, DPC agreed to the following on 22 February 2017, and confirmed on 6 December 2017:

‘That in relation to the scale, timing and cost of the technical investigations relating to flood risk and coastal hazards the Committee Adopts:

Coastal hazards – Option 6:

- *Incorporate coastal hazard lines contained in Appendix 5 to the Canterbury Regional Policy Statement into the district plan.*
- *The district plan to manage development seaward of these coastal hazard lines instead of the Regional Coastal Environmental Plan.’*

A key factor in recommending the above options was the anticipation that guidance was due to be published by the Department of Conservation (DOC) on implementing Policy 24 to the NZCPS, including guidance on the scale and methodologies for investigation of coastal hazards and processes. It was also anticipated the Ministry for the Environment’s (MfE) guidance on climate change would also soon be published.

Since the matter of coastal hazards was last considered by DPC, the DOC guidance on implementing Objective 5 and Policies 24 – 27 of the NZCPS (relating to coastal hazards) and the MfE guidance for local government on coastal hazards and climate change have been published, both in December 2017.

1.2 Purpose of this report

The purpose of this report is to:

- update the DPC with the coastal hazard work that has been undertaken by Environment Canterbury since the release of the DOC and MfE guidance notes; and
- identify preferred options for further development, including landowner and stakeholder engagement, s32 analysis and drafting.

2.0 Statement of Operative Plan approach to issue

As noted in the 22 February 2017 report to DPC, the Operative Selwyn District Plan (SDP) currently maps the Coastal Hazard 1 line. Development seaward of the line is managed by way of an assessment of natural hazard risk through consenting processes. The line itself is based on that contained in the Regional Coastal Environment Plan (RCEP), which was made operative in 2005. The mapping of this line and the information on which it is based are therefore over 10 years old and pre-date the requirements of the NZCPS, including taking into account the effects of climate change.

At Rakaia Huts, the erection of any new dwelling, part dwelling or other principal building on the lower river terrace (shown as Lots 58-108 in Appendix 24 of the SDP, Appendix A) is a non-complying activity. This control manages inundation from both the Rakaia River and the coast.

The SDP does not manage coastal hazards in any other way. In particular, coastal inundation other than at Rakaia Huts is not addressed, and tsunami risk is not addressed at all.

3.0 Summary of relevant statutory and/or policy context and other background information

3.1 Resource Management Act 1991

As noted in earlier reports to DPC related to natural hazards, the management of significant risks from natural hazards is a s6 matter of national importance that must be recognised and provided for when achieving the purpose of the RMA. As such, coastal hazards must be addressed through the Proposed District Plan (PDP) to a much greater extent than they are currently.

3.2 New Zealand Coastal Policy Statement (NZCPS)

Section 75(3)(b) of the RMA directs that a district plan must give effect to any New Zealand coastal policy statement.

Objective 5 and Policies 24 – 27 of the NZCPS are the most relevant to natural hazards. They are attached as Appendix B to this report. Objective 5 seeks to ensure that the management of coastal hazards is risk-based and takes account of climate change. It requires proactive management: locating new development away from hazard-prone areas; considering managed retreat for existing hazard-prone development; and protecting and restoring natural defences.

Policy 24 lays the foundation for risk-based coastal hazard management. Areas that will potentially be affected by coastal hazards are to be identified (giving priority to high-risk areas). Hazard risks over at least the next 100 years are to be assessed for those areas (having regard to a range of factors that affect hazard risks and the effects of climate change on each of those factors). The identification of these risks is to take into account national guidance and the best available information on the likely effects of climate change on the district.

Policy 25 is the overarching policy for managing the risk of social, environmental and economic harm from coastal hazards. It applies to all areas in the coastal environment that are potentially affected by coastal hazards.

Policy 26 addresses the management of the large range of natural coastal landforms and features that provide natural defences, including beaches, estuaries, wetlands, intertidal areas, coastal vegetation, dunes and barrier islands.

Policy 27 specifically addresses areas with significant existing development. The opportunity to avoid the risks from coastal hazards has already passed for such areas. Under this policy, local authorities are encouraged to develop sustainable risk-reduction strategies in a way that includes assessing the range of strategic options as set out in Policy 27(1) and evaluating strategic options as set out in Policy 27(2). Policies 27(3) and (4) address the use of hard protection structures.

Department of Conservation guidance on the NZCPS

The December 2017 DOC guidance on Objective 5 and Policies 24 – 27 of the NZCPS (the DOC Guidance) provides more detailed advice about how to give effect to these requirements. The coastal hazard screening assessment undertaken by Environment Canterbury and discussed in Section 5 of this report has been undertaken in accordance with the requirements of NZCPS Policy 24.

In addition to the coastal erosion and inundation risks addressed in the coastal hazard screening assessment, the NZCPS includes a requirement to consider tsunami risk. The DOC Guidance recommends that, when considering targeted land-use planning provisions for tsunami, the Ministry of Civil Defence and Emergency Management Director's guidelines be followed. In line with the MCDEM guidance, Selwyn District has been assessed as containing Red and Orange Evacuation Zones (Appendix C). Within these areas, the DOC guidance recommends restricting:

- development that involves vulnerable groups, eg rest homes, pre-schools and schools
- critical facilities eg hospitals, emergency services and key infrastructure

Ministry for the Environment guidance for local government on coastal hazards and climate change

The Ministry for the Environment publication *Coastal Hazards and Climate Change: guidance for local government* (the MfE Guidance) was formally published in December 2017 and launched in mid-2018.

This guidance sets out a step-by-step approach to assessing, planning and managing the increasing risks facing coastal communities, along with an updated synthesis of information and tools and techniques to underpin the process. It also supports the implementation of relevant objectives and policies in the NZCPS and is complementary to the DOC Guidance.

The approach differs from previous editions, and from current coastal hazard management practice, in two significant ways – first, in how it deals with uncertainty and risk, and second, by placing community engagement at the centre of decision-making processes.

The approach is called *dynamic adaptive pathways planning*. As its name suggests, it identifies ways forward (*pathways*) despite uncertainty, while remaining responsive to change should this be needed (*dynamic*).

In the approach, a range of responses to climate change are tested against possible future scenarios. Pathways are mapped that will best manage, reduce or avoid risk. A plan is developed, with short-term actions and long-term options, and includes pre-defined points (triggers) where decisions can be revisited. This flexibility allows the agreed course of action to change if the need arises – such as if new climate change information becomes available.

By accommodating future change at the outset, this approach is intended to help avoid locking in investments that could make future adjustments difficult and costly. As such, it assists both longer-term sustainability and community resilience.

The dynamic adaptive pathways planning approach recognises that, first, climate change effects vary from place to place, and second, that decision-makers face unavoidable uncertainty about ongoing sea level rise. It is usually not possible, practical or sensible for them to wait until uncertainties are reduced before making decisions.

3.3 Canterbury Regional Policy Statement

Section 75(3)(c) of the RMA directs that a district plan must give effect to any regional policy statement.

The objectives and policies of the Canterbury Regional Policy Statement (RPS) relating to natural hazards are set out in Chapter 11. Those relevant to Selwyn District are attached as Appendix D to this report.

As the whole of Selwyn District is located within greater Christchurch (as opposed to Greater Christchurch, which encompasses the smaller RPS Map A area), the RPS requires the Proposed District Plan (PDP) to include objectives, policies and methods to give effect to RPS Policy 11.3.1 – avoidance of inappropriate development in high hazard areas, in relation to coastal hazards. The RPS definition of a high hazard area includes land likely to be subject to coastal erosion including the cumulative effects of sea level rise over the next 100 years, together with land subject to sea water inundation (excluding tsunami) over the next 100 years.

Council is directed to have particular regard to the effects of climate change when considering natural hazards, and to limit physical works to mitigate natural hazards to situations only where the natural hazard risk cannot reasonably be avoided, and any adverse effects of the works on the natural and built environment and on the cultural values of Ngāi Tahu are avoided, remedied or mitigated.

3.4 Canterbury Regional Coastal Environment Plan

Section 75(4)(b) of the RMA directs that a district plan must not be inconsistent with a regional plan for any matter specified in s30(1). This includes the control of the use of land for the purpose of avoiding or mitigating natural hazards (s30(1)(c)(iv)).

The objectives, policies and rules relating to natural hazards are set out on Chapter 9 of the Canterbury Regional Coastal Environment Plan (RCEP), and those that relate to Selwyn are attached as Appendix E to this report.

The RCEP identifies two coastal hazard areas – the area seaward of Coastal Hazard Line 1, and the area inland of Coastal Hazard Line 1 to Coastal Hazard Line 2. Coastal Hazard Line 1 is approximately parallel with the shoreline, set inland from mean high water mark springs, which contains the current active beach system and land that is at risk from coastal erosion within 50 years of the RCEP being produced. Coastal Hazard Line 2 marks land that is at risk from coastal erosion in the period 50 to 100 years of the RCEP being produced. The lines were last reviewed and updated for Selwyn in 2015, but the updated Coastal Hazard 1 Line has not been incorporated into the SDP maps.

Within both Coastal Hazard Line areas, permitted activities are limited to the following:

- the reconstruction or replacement of existing buildings and structures (including roads and rail lines) in limited circumstances
- the installation, maintenance, extension to, or removal of, network utility services, subject to standards
- fences
- disturbance of vegetation for the customary use of Rūnanga within their rohe

Within both Coastal Hazard Line areas, the following are restricted discretionary activities:

- The erection, reconstruction, placement, alteration, or extension of any structure;
- The disturbance (burning, grazing, or removal) of vegetation within active beach systems;
- The formation of access tracks (including board walks) across an active beach system;
- The artificial adjustment of a beach profile, (including dune re-contouring), within an active beach system;
- The excavation, filling, or disposal of spoil in volumes greater than 5 cubic metres per 100 square metres of land area;
- The removal of sand, rocks, shingle, shell, or other natural material from an active beach system in volumes greater than 5 cubic metres by any person within any 12 month period.

The matters for discretion consider: the effect of the proposal on coastal erosion; the transference of adverse effects onto any other property; and providing for removal of any structure that is rendered unusable through coastal erosion.

Within both Coastal Hazard Line areas, the following activities are prohibited:

- the construction of a landfill or the use of a landfill for the disposal of solid or hazardous waste;
- the construction of a new road or railway, but not including:
 - the reconstruction or realignment of an existing road or railway within the hazard zone; or

- the construction of a new road or railway that provides an access route to the Coastal Marine Area.

Within the Coastal Hazard Line 1 area, the following activities are also prohibited:

- the erection or placement of any habitable building with a floor area greater than 25 square metres, except where permitted
- the extension or alteration of any habitable building with a floor area of 25 square metres or less such that it causes the building to have a floor area greater than 25 square metres, except where permitted
- The production or storage of any hazardous substance, except in limited circumstances

3.5 Mahaanui Iwi Management Plan

Section 74(2A) RMA requires that a territorial authority, when preparing or changing a district plan, must take into account any relevant planning document recognised by an iwi authority and lodged with the territorial authority, to the extent that its content has a bearing on the resource management issues of the district. The Mahaanui Iwi Management Plan 2013 (IMP) is such a document.

As emphasized in the NZCPS (2010), tāngata whenua have a traditional and continuing cultural relationship with areas of the coastal environment, including places where nana whenua have fished and lived for generations. The association of Ngāi Tahu to the Canterbury coast is acknowledged through the listing of Te Tai o Mahaanui (the Selwyn Banks Peninsula Coastal Marine Area) as a coastal statutory acknowledgement area.

The objectives and policies relating to the coastal environment and Te Waihora seek to protect or improve the coastal environment, with an emphasis on cultural and ecosystem health, including water quality. Although the objectives and policies do not directly address coastal hazards, measures to manage coastal hazards would limit development in the coastal area and thereby assist in the achievement of the IMP objectives.

3.6 NES for Telecommunications Facilities

Regulation 57 of the Resource Management (National Environmental Standard for Telecommunication Facilities) Regulation 2016 (Appendix F) (the NESTF) prevents Council from making natural hazard rules that relates to an activity subject to the NESTF. This is on the basis that resilience is already factored into telecommunication industry practice, and that they will either avoid hazard areas or engineer structures to be resilient to the hazard risk.

As such, activities subject to the NESTF will not be subject to the rules of the PDP. However, should a resource consent be required under the NESTF, then district plan objectives and policies do apply, including those relating to natural hazards.

4.0 Summary of alternative management responses – other districts

4.1 Christchurch District Plan

As a consequence of the withdrawal of the coastal hazard provisions from the proposed Christchurch District Plan in November 2015, the provisions of the Christchurch City Plan and the Banks Peninsula District Plan that relate to coastal hazards still apply in Christchurch.

Within the area subject to the Christchurch City Plan, general objectives and policies relating to natural hazards are supplemented by specific policies seeking to avoid increased risk resulting from sea level rise, coastal erosion and coastal flooding. Buildings, earthworks and subdivision are managed to allow coastal hazards to be assessed.

Within the area subject to the Banks Peninsula District Plan, coastal hazard provisions relate only to subdivision, where the shape, size, orientation of sites and their access in relation to natural hazards is a matter for control or discretion.

Tonkin & Taylor have undertaken a coastal hazard assessment for Christchurch and Banks Peninsula, completed in October 2017. This report updates their original 2015 report and addresses the 2016 recommendations of the peer review panel, and will be used to inform a Plan Change to incorporate coastal hazards into the Christchurch District Plan.

4.2 Waimakariri District Plan

As noted in the report to DPC on 22 February 2017, Waimakariri District have prepared a draft plan change addressing natural hazards. In relation to coastal hazards, the draft plan change proposes to use the Coastal Hazard lines identified in the CRPS, with an option to review the mapped coastal hazard areas if and when the proposed National Policy Statement on managing natural hazard risk comes into effect. This draft plan change has not yet progressed to notification.

4.3 Hurunui and Ashburton District Plans

As noted in the report to DPC on 22 February 2017, the RPS only requires territorial authorities outside of Greater Christchurch to manage subdivision in relation to coastal hazards. For all other activities the RCEP remains the statutory plan.

5.0 Coastal hazard screening assessment

In line with the “regional-hazard screening” process recommended in the MfE Guidance to identify areas where further investigation is warranted, Environment Canterbury have undertaken a high-level, coastal hazard-exposure screening assessment for the Selwyn District coastline, entitled *A coastal hazard screening assessment for Selwyn District* (the screening assessment) and attached as Appendix G to this report. Its purpose is to summarise the existing

knowledge of contemporary and future coastal hazards in the District and to determine whether any additional information or more detailed assessments may be required to inform the DPR process.

The coastal hazard screening broadly identifies areas potentially exposed to coastal hazards and where more detailed assessments may need to be undertaken. It does not assess in any detail what settlements, land uses, assets (including cultural assets), infrastructure or future growth areas may be exposed to future coastal hazards.

The assessment is a collation of existing coastal hazard information for the District. The available information concerns both what is known about historic and contemporary coastal hazards, coastal processes and shoreline behaviour and an assessment of the potential future exposure of coastal land to climate change effects on coastal hazards.

A zone of potential coastal erosion hazard for the next 100-years was created. The extent of this zone extends approximately 120 metres from the current shoreline and includes productive land, coastal wetland areas, coastal drainage systems and important coastal culvert structures. The coastal culverts which drain spring water (and flood waters) to the sea are the assets most at risk from future coastal erosion and may require more regular maintenance and repair as sea levels rise. The eroding beach barrier will progressively overwhelm parts of the lowland drainage system which will have future implications for local land drainage.

The report notes that the prediction of future stability of the landward part of the coastline fronting the north Rakaia Huts hāpua, due to future climate change, needs to be treated differently than the open coastline of the District due to river and coastal process interactions.

An area of coastal land potentially exposed to coastal inundation from extreme storm events over the next 100 years has been identified by mapping low-lying land below a 4m mean sea level elevation contour. This is an indication of where low-lying land with potential for being affected by future sea level rise might be. Potential inundation exposure is greatest around the low-lying margins of Coopers Lagoon/Muriwai, including Tentburn and some parts of Taumutu.

The lower parts of the north Rakaia Huts settlement are currently susceptible to combined river and coastal flooding events and future sea level rise is likely to increase this susceptibility.

The report recommends that a more detailed coastal hazard assessment be carried out for the north Rakaia Huts settlement to better identify the future coastal hazard risk (erosion and inundation) and vulnerability.

The report also recommends that consideration could also be given to enhancing an existing open coastal erosion model to incorporate possible climate change-induced variability of other weather and oceanic coastal hazard drivers and coastal sediment supply, although this is not considered to be a priority.

The high-level coastal inundation assessment in this report does not consider detailed hydraulic connections between the open coast and inland areas and considers the areas mapped to be

conservatively high. A possible refinement to develop a “connected bath-tub¹” inundation model could be considered if more site-specific information at sensitive sites was required, for example around Taumutu and Ngāti Moki marae, which are within the potential 100-year inundation exposure area.

6.0 Summary of options to address issues

6.1 AREA OF POSSIBLE COASTAL EROSION

OPTION 1 – Incorporate the existing RCEP coastal hazard lines and provisions into the Proposed District Plan

Option 1 is to continue the interim approach selected at the 22 February 2017 DPC meeting, namely to incorporate the existing RCEP Coastal Hazard Lines 1 and 2 into the PDP, and to manage development seaward these lines in a manner consistent with the existing RCEP requirements (Appendix E).

Effectiveness in Addressing Issue:

Option 1 would give limited effect to the RPS, by transferring the existing Coastal Hazard Lines to the PDP. However, these lines were not calculated using the most recent projections of likely sea level rise, and so may provide a lower level of protection than required by the RPS and s6(h) RMA.

This approach was approved on 22 February 2017 on the basis that it was an interim measure until the DOC and MfE Guidance was available and considered.

Risks:

The Coastal Hazard Lines 1 and 2 do not take into account the most recent (December 2017) MfE Guidance projections of sea level rise. As such, Option 1 carries the risk that coastal high hazard areas are not identified and the roll-over of existing provisions into the PDP will be insufficient to meet Council’s s6(h) RMA obligations.

Budget or Time Implications:

The Coastal Hazard Line areas have already been identified and so, while there would be time and cost involved in developing appropriate objectives, policies and rules for incorporation in the PDP, this would be limited. As there would be no change from the existing provisions (other than the plan in which they sit), direct landowner engagement would not be required before notification of the PDP.

¹ A “bath-tub” model identifies all land that may be inundated if water levels rise, but assumes that all land would be affected evenly, regardless of its distance from the coast. A “connected bath-tub” model extrapolates the storm inundation level inland where there is a connection to the open coast i.e. natural or artificial drainage systems

Stakeholder and Community Interests:

This option essentially transfers existing provisions from the CREP to the PDP. As such, provided that the change is appropriately communicated to landowners, there is a reasonable likelihood of acceptance from this group.

Recommendation:

As Option 1 is considered insufficient to meet Council's obligations under s6(h) of the RMA, and would not give full effect to the RPS, and is not recommended for progression to the next stage of PDP development.

OPTION 2 – Incorporate the potential future coastal erosion area into the Proposed District Plan

Given the release of the DOC and MfE Guidance and the work that has been undertaken since, Option 2 is to replace the existing RPS Coastal Hazard Lines 1 and 2 with the potential coastal erosion area identified in the screening assessment as a coastal high hazard overlay, with the seaward boundary being the district boundary (mean high water springs).

The potential coastal erosion area identified in the screening assessment extends approximately 120m inland from the current shoreline and includes productive land, coastal wetland areas, coastal drainage systems and important coastal culvert structures. The area is similar to the existing Coastal Hazard 1 line for much of the district's coastline, but extends further inland in some areas.

Subdivision, use and development within the whole of this area would be subject to constraints broadly equivalent to the RCEP requirements (Appendix E).

Effectiveness in Addressing Issue:

The RPS definition of high hazard areas includes land within greater Christchurch likely to be subject to coastal erosion including the cumulative effects of sea level rise over the next 100 years. This includes (but is not limited to) the land located within Hazard Zone Lines 1 and 2. The screening assessment uses the updated projections for sea level rise included in the MfE Guidance, and so identifies a slightly larger area than the Hazard Zone Lines.

Using the potential coastal erosion area identified in the screening assessment to identify a coastal high hazard overlay would therefore give better effect to the RCPS and the NZCPS than Option 1.

Risks:

There is a potential for landowner disquiet if the change and the reasons for it are inadequately communicated.

Budget or Time Implications:

The potential coastal erosion area has already been identified therefore, while there would be time and cost involved in stakeholder engagement and developing appropriate policies for incorporation in the PDP, this would be limited.

Stakeholder and Community Interests:

There is a potential for landowner disquiet if the proposed change and the reasons for it are inadequately communicated.

Option 2 is supported by the Canterbury Regional Council.

Option 2 is supported by the Department of Conservation. The reasons for this support are that the proposed areas:

- implement the NZCPS; and
- accurately reflect the coastal hazards whereas the old coastal hazard line 1 in parts bisected wetlands behind the gravel beach barrier. The hazard line did not take into account storm surge and wave run over of the gravel beach barrier causing the shoreline to move onshore.

Recommendation:

That in relation to coastal erosion, Option 2 be adopted for targeted landowner and stakeholder engagement, s32 analysis and drafting.

6.2 COASTAL INUNDATION

OPTION 3 – Do not address in the Proposed District Plan

Almost none of the coastal inundation area identified in the screening assessment (land below 4m above mean sea level) is currently recognised within the SDP as a flood hazard area, although some is seaward of the Coastal Hazard 1 line and so is subject to development controls. Option 3 would continue the approach of not addressing risks associated with coastal inundation through the PDP.

Effectiveness in Addressing Issue:

The NZCPS requires coastal hazard risks to be managed, by locating new development away from areas prone to such risks. This includes the potential for inundation of the coastal environment, taking into account potential sources, inundation pathways and overland extent, over at least 100 years.

The RPS requires the PDP to include objectives, policies and methods to give effect to RPS Policy 11.3.1 – avoidance of inappropriate development in high hazard areas. The RPS definition of a high hazard area includes land likely to be subject to sea water inundation (excluding tsunami) over the next 100 years.

As such, Option 3 would not give effect to the NZCPS or the RPS.

Recommendation:

For the reasons outlined above, Option 3 is not recommended for progression to the next stage of PDP development.

OPTION 4 – Incorporate the modelled coastal inundation area as a coastal inundation high hazard overlay in the Proposed District Plan

Option 4 would see the coastal inundation area identified in the screening assessment included in the PDP as a coastal high hazard overlay, with associated provisions to limit development in the area.

Effectiveness in Addressing Issue:

As noted above, the RPS requires the PDP to include objectives, policies and methods to give effect to RPS Policy 11.3.1 – avoidance of inappropriate development in high hazard areas. At a national level, Policy 25 of the NZCPS seeks to avoid increasing the risk of social, environmental and economic harm from coastal hazards in areas potentially affected within the next 100 years, including avoiding redevelopment or land use change that would increase the risk of adverse effects from coastal hazards.

The NZCPS takes a fairly precautionary approach, in requiring activities to be managed within areas that are only potentially affected – a high level of certainty is not required. Option 4 would give effect to the NZCPS and the RPS.

Risks:

There is potential for landowner disquiet if the change and the reasons for it are inadequately communicated.

The screening undertaken has been at a high level, and does not incorporate hydraulic connections between the open coast and inland areas during extreme storm events.

Budget or Time Implications:

The potential coastal inundation area has already been identified so, while there would be time and cost involved in undertaking stakeholder engagement and developing appropriate provisions for incorporation in the PDP, this would be limited.

Stakeholder and Community Interests:

Option 4 is supported by the Canterbury Regional Council.

The Department of Conservation considers that Option 4 is appropriate as it gives effect to the NZCPS. The 4m above mean sea level coastal inundation line is strongly supported because of the uncertainties of future coastal geomorphology including the future gravel beach barrier breaches caused by storm waves rolling gravel over the gravel beach and into the backshore wetlands. At the mouth of Te Waihora at Taumutu, there is considerable uncertainty over the next 100 years whether the gravel beach barrier will remain as it part of eroding foreshore of Canterbury Bight. That is with sea level rise, Te Waihora could become an estuary. If the gravel beach barrier

remained, with rising sea levels, the opening of the Te Waihora mouth will become more difficult because of the reduction in the fall between the Te Waihora lake level and sea level on the open coast. The difficulties in opening the mouth could be compounded by high river inputs of freshwater into Te Waihora caused by strong southerly storm with large waves. That is, lake level peaks could be much higher.

Recommendation:

That in relation to coastal inundation, Option 4 be adopted for targeted landowner and stakeholder engagement, s32 analysis and drafting.

OPTION 5 – Undertake additional research to identify a coastal inundation hazard overlay in the Proposed District Plan

Rather than relying on the modelling that has already been undertaken, Option 5 would involve undertaking additional work to incorporate hydraulic connections between the open coast and inland areas during extreme storm events. This revised model would then identify the area to be included in the PDP as a flood high hazard overlay.

Effectiveness in Addressing Issue:

Selwyn's coastal environment is of limited distance and contains limited development opportunities, given the rural zoning everywhere except Rakaia Huts, and the Kāinga Nohoanga zoning proposed by Mahaanui Kurataiao Ltd for Taumutu. As such, additional research into coastal inundation would be of limited value to the District as a whole at this time.

The Regional Coastal Environment Plan was made operative in 2005, and is due for review. As the territorial authority with primary responsibility for coastal hazard management, Environment Canterbury will therefore be likely to review provisions relating to coastal inundation as part of that process.

It is considered that it would be ineffective and unnecessary to undertake additional modelling of areas that may be subject to coastal inundation at this time.

Budget or Time Implications:

Undertaking additional research and modelling would have significant additional budget and time implications which may have an adverse effect on Council's ability to deliver the PDP as planned.

Stakeholder and Community Interests:

By incorporating additional factors into the model, Option 5 would provide additional certainty for landowners and residents about the extent of the area that may be subject to coastal inundation within the next 100 years.

Recommendation:

Option 5 does not form part of the recommended approach.

6.3 TSUNAMI

The identification of the existing Orange and Red Zone tsunami evacuation areas for Selwyn District (Appendix C) was not undertaken with the same level of robustness as the evacuation areas for Christchurch. Environment Canterbury staff² have advised that the existing zones were based on a precautionary approach (that it is better to over-evacuate than under-evacuate), but that there was limited science associated with their identification.

A review and update by Environment Canterbury of the tsunami evacuation areas for Selwyn is currently planned for next year, and is anticipated to be completed before notification of the PDP. It is currently considered likely that the review will result in a reduction of the evacuation area.

OPTION 6 – Do not address in the Proposed District Plan

Option 6 would continue the current approach of not addressing risks associated with tsunami through the PDP. Tsunami risk would only be addressed through Council's Civil Defence and Emergency Management functions.

Effectiveness in Addressing Issue:

In addition to the coastal erosion and inundation risks addressed in the coastal hazard screening assessment, the NZCPS includes a requirement to consider tsunami risk. Option 6 would result in tsunami risk not being considered by the PDP, and so would not give effect to the NZCPS.

Recommendation:

Option 6 does not form part of the recommended approach.

OPTION 7 – Incorporate as a coastal hazard overlay in the Proposed District Plan

Option 7 would see the Orange and Red tsunami evacuation zones identified as a hazard overlay in the PDP, together with consideration of tsunami risk for developments that involves vulnerable groups, such as rest homes, pre-schools and schools, or for critical facilities such as hospitals, emergency services and key infrastructure.

Using the current evacuation zones as an interim measure, this would include amending the coastal hazard overlay area when Environment Canterbury have completed their planned 2019 review of the evacuation zones, such that the PDP includes the most recent information at the time of notification.

² Helen Jack, *pers comm* 26 October 2018

Effectiveness in Addressing Issue:

The sorts of activities that would require an assessment of tsunami implications are likely to require resource consent under the general rules of the PDP. As such, specific rules to require consent for identified activities, to allow tsunami risk to be considered, would not be necessary.

However, the area where tsunami needs to be considered would be shown on the planning maps as a coastal hazard overlay, with associated policy support for specific consideration of tsunami risk for activities in this area where the activity warrants it. This specific policy would be supported by the general natural hazard objectives and policies.

This approach would enable the PDP to give effect to the NZCPS and the RPS without creating additional rules that replicate other rules that have wider effect.

Risks:

Limiting the PDP provisions to policies only runs the risk that activities where tsunami needs to be considered could be permitted by wider zone rules and therefore not subject to consideration through the consent process. Care will therefore need to be taken with integration through the s32 and drafting process, to ensure that either: all such activities are subject to a consent process where tsunami can be considered without additional rules (discretionary or non complying status); or that rules are developed to require consideration of tsunami risk of a proposed activity if it is otherwise permitted.

Budget or Time Implications:

The initial Red and Orange evacuation areas have already been developed, and a review and update by Environment Canterbury is already planned for next year. There would therefore be no additional cost in identifying the policy area. While there would be time and cost involved in stakeholder engagement and developing appropriate provisions for incorporation in the PDP, this would be limited.

Stakeholder and Community Interests:

The Orange and Red evacuation zones were not developed with land use controls in mind. The extent of the evacuation zones will therefore need to be reviewed and the limited extent of the proposed controls would therefore need to be carefully communicated.

Option 7 is supported by the Canterbury Regional Council.

Option 7 is supported by the Department of Conservation, as it recognises the risk to vulnerable groups or critical facilities. DOC advises that Council should consider managing intensification of development in these areas – for example new subdivision under s106 RMA.

Recommendation:

That in relation to coastal inundation, Option 7 be adopted for targeted landowner and stakeholder engagement, s32 analysis and drafting.

6.4 RAKAIA HUTS

At Rakaia Huts the erection of a dwelling, part of a dwelling, or other principal building, is a non-complying activity on the lower river terrace, shown as Lot 58 – 108 in Townships Appendix 24 of the SDP (Appendix A). The existing provisions extend further upstream than the screening indicates is likely to be subject to coastal inundation, because of the risk of river flooding, but the screening indicates more extensive areas of vulnerability nearer the lagoon, including all of some properties, the carpark, and approximately half the campground.

All but one of the properties at Rakaia Huts already have a dwelling erected on them. The single bare section is identified in the screening assessment as subject to coastal inundation but not currently subject to any natural hazard constraints under the district plan, as it is on the eastern side of Pacific Drive.

There are three properties with sufficient land for subdivision, of which two are partly within the area identified in the screening assessment as potentially subject to coastal inundation. In both these cases it is unlikely that subdivision could result in a second building platform outside the lower terrace. The third is outside the area identified in the screening assessment as potentially subject to coastal inundation.

The screening assessment recommends that a more detailed coastal hazard assessment be undertaken for Rakaia Huts, to better identify coastal hazard risk and vulnerability.

OPTION 8 – Use the same provisions at Rakaia Huts as the rural area, without additional modelling

Consistent with Option 4 for the rural area, Option 8 would use the screening assessment modelling (land below 4m above mean sea level) to identify a coastal high hazard area.

There are limited additional development opportunities at Rakaia Huts. Reflecting this limited development potential, Option 8 is the ‘least cost’ option.

Effectiveness in Addressing Issue:

In contrast to the significant restrictions on subdivision, use and development of high hazard rural areas, the RPS anticipates some subdivision, use and development of high hazard areas in townships, provided that the hazard is avoided or appropriately mitigated.

Option 8 would identify areas where additional site-specific assessment and mitigation would be required as part of a development.

Risks:

The coastal erosion model used for the screening assessment was not considered appropriate to use for the coastal frontage adjacent to Rakaia Huts, as it does not take into account the interactions between the river and the coast. As such, coastal erosion has not been considered at Rakaia Huts.

Likewise, areas likely to be subject to inundation may not be identified, as the model does not take account of the interaction between the coast, the hāpua and the river.

Option 8 would be more open to challenge, as the screening assessment explicitly states that the modelling used was not appropriate for the more complex environment at Rakaia Huts.

However, there is only one section in Rakaia Huts that has not been built on.

Budget or Time Implications:

The screening assessment has been completed, and so while time and cost would be associated with landowner engagement, there would be limited additional time and cost associated with undertaking a s32 assessment and drafting of provisions.

Stakeholder and Community Interests:

The members of the Rakaia Huts community will have a significant stake in the provisions relating to the management of natural hazards in their community.

Recommendation:

On its own, Option 8 does not form part of the recommended approach. However, it may form part of a staged development of more targeted provisions, as outlined below.

OPTION 9 – Undertake additional modelling for Rakaia Huts as part of the DPR

Option 9 would see the development of additional modelling at Rakaia Huts to take account of the interaction between the coast, the hāpua and the river. This modelling would be used to identify high hazard and hazard areas where development controls might be required. In order to fulfil Council's RPS requirements in relation to high hazard and hazard areas, Environment Canterbury staff³ have advised that the additional work to identify land likely to be subject to coastal erosion and inundation over at least the next 100 years would involve:

- an analysis and evaluation of existing information and literature on contemporary and historic processes which shape the morphology of the Rakaia hāpua and have influenced any historic erosion and inundation events
- identifying and filling any knowledge gaps in physical processes that would better inform our understanding of the river mouth and hāpua dynamics in relation to river mouth behaviour, particularly any gaps which would be required to be filled to understand future river mouth morphology and associated shoreline movement
- incorporating the most recent national climate change and sea level rise guidance into an analysis of how contemporary processes (e.g. waves, river flows, river and longshore sediment, lagoon level variability) may change under future climate scenarios (as identified in the MfE Guidance)

³ Justin Cope, 21 November 2018

Once these areas have been identified through the further modelling, they would be subject to controls to avoid or mitigate risk, consistent with the approaches developed for other parts of the district.

Option 8 could be used as an interim 'holding pattern' measure until the additional modelling was completed.

Effectiveness in Addressing Issue:

Option 9 would enable the PDP to meet Council's RPS obligations in relation to coastal hazards, and would provide a basis to initiate engagement with the Rakaia Huts community to determine longer-term management options as anticipated by the NZCPS and outlined in more detail in the MfE Guidance.

Risks:

The additional complexity of the modelling proposed may make it more open to challenge of the component parts.

Budget or Time Implications:

Option 9 has not been costed, but would extend the timeframe before proposals for the management of natural hazards at Rakaia Huts were ready for inclusion into the PDP. However, objectives and policies about the management of high hazard and hazard areas in general could proceed with development in the meantime. Option 9 would also have increased costs over Option 8.

Stakeholder and Community Interests:

The members of the Rakaia Huts community will have a significant stake in the provisions relating to the management of natural hazards in their community.

Option 9 is supported by the Canterbury Regional Council.

Option 9 is supported by the Department of Conservation.

Recommendation:

That in relation to Rakaia Huts, Option 9 be adopted, followed by targeted landowner and stakeholder engagement, s32 analysis and drafting.

OPTION 10 – Undertake additional modelling for Rakaia Huts outside the DPR process

Option 10 is similar to Option 9 in undertaking additional modelling specific to Rakaia Huts, but Option 10 would see this undertaken outside the DPR process and incorporated into either the RCEP or the PDP, as appropriate to the outcome and timing of the results, through a variation or plan change.

Option 8 could be used as an interim measure until this additional work was completed.

Effectiveness in Addressing Issue:

Option 10 would allow more time to be taken to develop an appropriate model and for the Rakaia Huts community to consider the implications and options available to them. This option would enable Council to give best effect to both the RPS and the NZCPS requirements to avoid inappropriate development in areas subject to coastal hazards.

Risks:

As for Option 9. In addition, there is a risk with Option 10 is that the work would not be progressed if it is not subject to the same impetus as the full DPR.

Budget or Time Implications:

Option 10 would sit outside the DPR process and budget, and so would need to be provided for as a separate project with its own budget and timeframe.

Stakeholder and Community Interests:

The members of the Rakaia Huts community will have a significant stake in the provisions relating to the management of natural hazards in their community.

Recommendation:

Option 10 does not form part of the recommended approach.

7.0 Summary of partner/stakeholder engagement

7.1 Department of Conservation

The Department of Conservation supports each of the preferred options.

7.2 Canterbury Regional Council

The Canterbury Regional Council supports each of the preferred options.

7.3 Mahaanui Kurataiao Ltd

Mahaanui Kurataiao Ltd had not provided feedback by the time this report was finalised.

8.0 Conclusion

The SDP gives only limited consideration to coastal hazards, reflective of the legislative environment in which it was prepared. Since then, there have been significant changes to what is expected of district plans in relation to coastal hazards.

In order to give the required effect to higher order documents, provisions relating to:

1. coastal erosion need to be updated;

2. coastal inundation need to be expanded beyond the incidental protection provided at Rakaia Huts; and
3. tsunami need to be introduced, at a level reflective of the generally rural character and limited development opportunities within the affected area.

In addition, further work is required at Rakaia Huts to enable coastal high hazard and coastal hazard areas to be identified in accordance with the requirements of the RPS.

9.0 Preferred Option for further engagement

The Project Team recommends that the following options be adopted for targeted landowner and stakeholder engagement, s32 analysis and drafting:

1. In relation to coastal erosion, Option 2, being the replacement of the RPS Coastal Hazard Lines 1 and 2 with the potential coastal erosion area identified in the screening assessment.
2. In relation to coastal inundation (other than tsunami), Option 4, being the incorporation of the coastal inundation area identified in the screening assessment in the PDP as a coastal high hazard overlay, with associated provisions to limit development in the area.
3. In relation to tsunami, Option 7, being the inclusion of the existing tsunami evacuation zones identified as a coastal hazard overlay in the PDP, together with consideration of tsunami risk for developments that involve vulnerable groups or critical facilities.

The Project Team also recommends that:

4. in relation to Rakaia Huts, Option 9 be adopted, being the development of additional modelling at Rakaia Huts to take account of the interaction between the coast, the hāpua and the river in the identification of high hazard and hazard areas.

Appendix A Appendix 24 of the Selwyn District Plan

Appendix B New Zealand Coastal Policy Statement 2010

Objective 5

To ensure that coastal hazard risks taking account of climate change, are managed by:

- locating new development away from areas prone to such risks;
- considering responses, including managed retreat, for existing development in this situation; and
- protecting or restoring natural defences to coastal hazards.

Policy 24 Identification of coastal hazards

- (1) Identify areas in the coastal environment that are potentially affected by coastal hazards (including tsunامي), giving priority to the identification of areas at high risk of being affected.

Hazard risks, over at least 100 years, are to be assessed having regard to:

- (a) physical drivers and processes that cause coastal change including sea level rise;
- (b) short-term and long-term natural dynamic fluctuations of erosion and accretion;
- (c) geomorphological character;
- (d) the potential for inundation of the coastal environment, taking into account potential sources, inundation pathways and overland extent;
- (e) cumulative effects of sea level rise, storm surge and wave height under storm conditions;
- (f) influences that humans have had or are having on the coast;
- (g) the extent and permanence of built development; and
- (h) the effects of climate change on:
 - (i) matters (a) to (g) above;
 - (ii) storm frequency, intensity and surges; and
 - (iii) coastal sediment dynamics;

taking into account national guidance and the best available information on the likely effects of climate change on the region or district.

Policy 25 Subdivision, use, and development in areas of coastal hazard risk

In areas potentially affected by coastal hazards over at least the next 100 years:

- (a) avoid increasing the risk of social, environmental and economic harm from coastal hazards;
- (b) avoid redevelopment, or change in land use, that would increase the risk of adverse effects from coastal hazards;

- (c) encourage redevelopment, or change in land use, where that would reduce the risk of adverse effects from coastal hazards, including managed retreat by relocation or removal of existing structures or their abandonment in extreme circumstances, and designing for relocatability or recoverability from hazard events;
- (d) encourage the location of infrastructure away from areas of hazard risk where practicable;
- (e) discourage hard protection structures and promote the use of alternatives to them, including natural defences; and
- (f) consider the potential effects of tsunami and how to avoid or mitigate them.

[The NZCPS glossary states that 'Risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated likelihood of occurrence (AS/NZ ISO 31000:2009 Risk management-Principles and guidelines, November 2009).]

Policy 26 Natural defences against coastal hazards

- (1) Provide where appropriate for the protection, restoration or enhancement of natural defences that protect coastal land uses, or sites of significant biodiversity, cultural or historic heritage or geological value, from coastal hazards.
- (2) Recognise that such natural defences include beaches, estuaries, wetlands, intertidal areas, coastal vegetation, dunes and barrier islands.

Policy 27 Strategies for protecting significant existing development from coastal hazard risk

- (1) In areas of significant existing development likely to be affected by coastal hazards, the range of options for reducing coastal hazard risk that should be assessed includes:
 - (a) promoting and identifying long-term sustainable risk reduction approaches including the relocation or removal of existing development or structures at risk;
 - (b) identifying the consequences of potential strategic options relative to the option of doing nothing;
 - (c) recognising that hard protection structures may be the only practical means to protect existing infrastructure of national or regional importance, to sustain the potential of built physical resources to meet the reasonably foreseeable needs of future generations;
 - (d) recognising and considering the environmental and social costs of permitting hard protection structures to protect private property; and
 - (e) identifying and planning for transition mechanisms and timeframes for moving to more sustainable approaches.
- (2) In evaluating options under (1):

- (a) focus on approaches to risk management that reduce the need for hard protection structures and similar engineering interventions;
 - (b) take into account the nature of the coastal hazard risk and how it might change over at least a 100-year timeframe, including the expected effects of climate change; and
 - (c) evaluate the likely costs and benefits of any proposed coastal hazard risk reduction options.
- (3) Where hard protection structures are considered to be necessary, ensure that the form and location of any structures are designed to minimise adverse effects on the coastal environment.
- (4) Hard protection structures, where considered necessary to protect private assets, should not be located on public land if there is no significant public or environmental benefit in doing so.

Appendix C Tsunami evacuation zones

Appendix D Canterbury Regional Policy Statement (Revised 2017)

Chapter 11 – Natural Hazards

Statement of local authority responsibilities

Section 62 of the Resource Management Act 1991 (RMA) requires that a regional policy statement must state the local authority responsible in whole or any part of the region for specifying the objectives, policies and methods for the control of the use of land to avoid or mitigate natural hazards.

Local authority responsibilities for the control of the use of land for natural hazards in the Canterbury Region are as follows:

1. The Canterbury Regional Council

Will be responsible for specifying the objectives, policies and methods for the control of the use of land in the following areas:

- (a) within the 100-year coastal erosion hazard zones outside of greater Christchurch, as defined by maps in the Canterbury Regional Coastal Environment Plan.
- (b) within areas in greater Christchurch likely to be subject to coastal erosion and sea water inundation including the cumulative effects of sea level rise over the next 100 years where provisions are not specified in an operative district plan; and
- (c) within the beds of rivers and lakes; and
- (d) within the coastal marine area for the purpose of avoiding or mitigating natural hazards.

2. Territorial authorities

Will be responsible for specifying the objectives, policies, and methods for the control of the use of land, to avoid or mitigate natural hazards in their respective areas excluding those areas described in 1(a), 1(c) and 1(d) above.

3. Joint Responsibilities

Local authorities will have joint responsibility for specifying the objectives, policies, and methods for the control of the use of land, to avoid or mitigate natural hazards in areas subject to seawater inundation. The Canterbury Regional Council will be limited to developing objectives, policies and non-regulatory methods. Territorial authorities will develop objectives, policies and methods which may include rules.

Objective 11.2.1 Avoid new subdivision, use and development of land that increases risks associated with natural hazards

New subdivision, use and development of land which increases the risk of natural hazards to people, property and infrastructure is avoided or, where avoidance is not possible, mitigation measures minimise such risks.

Objective 11.2.2 Adverse effects from hazard mitigation are avoided or mitigated

Adverse effects on people, property, infrastructure and the environment resulting from methods used to manage natural hazards are avoided or, where avoidance is not possible, mitigated.

Objective 11.2.3 Climate change and natural hazards

The effects of climate change, and its influence on sea levels and the frequency and severity of natural hazards, are recognised and provided for.

Objective 11.2.4 Effective integration of the management of, and preparedness for, natural hazards

The level of cooperation between agencies and organisations necessary to achieve integrated management of Canterbury's natural hazards, and preparedness for natural hazards is maintained or enhanced.

Policy 11.3.1 Avoidance of inappropriate development in high hazard areas

To avoid new subdivision, use and development (except as provided for in Policy 11.3.4) of land in high hazard areas, unless the subdivision, use or development:

1. is not likely to result in loss of life or serious injuries in the event of a natural hazard occurrence; and
2. is not likely to suffer significant damage or loss in the event of a natural hazard occurrence; and
3. is not likely to require new or upgraded hazard mitigation works to mitigate or avoid the natural hazard; and
4. is not likely to exacerbate the effects of the natural hazard; or
5. Outside of greater Christchurch, is proposed to be located in an area zoned or identified in a district plan for urban residential, industrial or commercial use, at the date of notification of the CRPS, in which case the effects of the natural hazard must be mitigated; or
6. Within greater Christchurch, is proposed to be located in an area zoned in a district plan for urban residential, industrial or commercial use, or identified as a "Greenfield Priority Area" on Map A of Chapter 6, both at the date the Land Use Recovery Plan was notified in the Gazette, in which case the effects of the natural hazard must be avoided or appropriately mitigated; or
7. Within greater Christchurch, relates to the maintenance and/or upgrading of existing critical or significant infrastructure.

Methods – the Canterbury Regional Council

Will

5. Identify areas subject to coastal erosion through the provisions of its Regional Plans until areas subject to coastal erosion in greater Christchurch are identified in an operative district plan.

Methods – Territorial authorities:

Will

7. (b) Within greater Christchurch: Within 5 years of Policy 11.3.1 becoming operative set out objectives, policies and methods, in district plans to give effect to Policy 11.3.1.

(c) Within greater Christchurch: Within 5 years of Policy 11.3.1 becoming operative identify high hazard areas through the provisions of their district plans. When identifying land likely to be subject to coastal erosion and sea water inundation over the next 100 years, may take into account the following criteria:

- (i) The effects of climate change including associated sea level rise.
- (ii) The location of areas subject to coastal erosion and sea water inundation including the cumulative effects of sea level rise over the next 100 years identified in district plans of neighbouring territorial authorities.

Should:

- 8. Promote the use of guidelines developed pursuant to Method 11.3.1(5) to guide the design and assessment of new development.

Methods – Local authorities:

Will:

- 9. Work together to investigate and define potential high hazard areas where information is uncertain or insufficient.

Policy 11.3.2 avoid development in areas subject to inundation

In areas not subject to Policy 11.3.1 that are subject to inundation by a 0.5% AEP flood event; any new subdivision, use and development (excluding critical infrastructure) shall be avoided unless there is no increased risk to life, and the subdivision, use or development:

- 1. is of a type that is not likely to suffer material damage in an inundation event; or
- 2. is ancillary or incidental to the main development; or
- 3. meets all of the following criteria:
 - (a) new buildings have an appropriate floor level above the 0.5% AEP design flood level; and
 - (b) hazardous substances will not be inundated during a 0.5% AEP flood event;

provided that a higher standard of management of inundation hazard events may be adopted where local catchment conditions warrant (as determined by a cost/benefit assessment).

When determining areas subject to inundation, climate change projections including sea level rise are to be taken into account.

Methods – Territorial authorities:

Will:

- 4. Set out objectives and policies, and may include methods in district plans to avoid new subdivision, use and development of land in known areas subject to inundation by a 0.5% AEP flood event, other than in the circumstances determined in Policy 11.3.2 clauses (1) to (3).

5. Ensure that flooding hazards are assessed before any new areas are zoned or identified, in a district plan, in ways that enable intensification of use, or where development is likely to cause adverse effects.
6. Where there is a known flooding risk, include provision in their district plans that require a 0.5% AEP flood event to be determined, and its effects assessed, prior to new subdivision, use or development of land taking place. Where the territorial authority has adopted a standard less frequent than a 0.5% AEP flood event, the expected flow and effects of that less frequent AEP flood event will be determined.

Policy 11.3.4 Critical infrastructure

New critical infrastructure will be located outside high hazard areas unless there is no reasonable alternative. In relation to all areas, critical infrastructure must be designed to maintain, as far as practicable, its integrity and function during natural hazard events.

Methods – Territorial authorities:

Will:

5. Set out objectives and policies, and may include methods in district plans to ensure that new critical infrastructure is located outside known high hazard areas, unless there is no reasonable alternative.

Should:

6. Where critical infrastructure is located in high hazard areas, encourage the provider to ensure that it will be able to be maintained and reinstated, if necessary, within a reasonable timeframe.
7. Ensure the potential effects of natural hazards are taken into account in the development of any new critical infrastructure.

Policy 11.3.5 General risk management approach

For natural hazards and/or areas not addressed by policies 11.3.1, 11.3.2, and 11.3.3, subdivision, use or development of land shall be avoided if the risk from natural hazards is unacceptable. When determining whether risk is unacceptable, the following matters will be considered:

1. the likelihood of the natural hazard event; and
2. the potential consequence of the natural hazard event for: people and communities, property and infrastructure and the environment, and the emergency response organisations.

Where there is uncertainty in the likelihood or consequences of a natural hazard event, the local authority shall adopt a precautionary approach.

Formal risk management techniques should be used, such as the Risk Management Standard (AS/NZS ISO 31000:2009) or the Structural Design Action Standard (AS/NZS 1170.0:2002).

Methods – Territorial authorities:*Will:*

3. Ensure that natural hazards are assessed before any new areas are zoned or identified in a district plan, in ways that enable intensification of use, or where development is likely to cause adverse effects.
4. Set out objectives and policies, and may include methods in district plans to ensure that subdivision, use or development of land will be avoided if the risk from natural hazards is unacceptable.
5. Set out objectives and policies, and may include methods in district plans to ensure that where subdivision, use or development occurs in an area where there is residual risk from natural hazards, appropriate mitigation is required to manage that risk.

Should:

6. Request applicants for privately initiated plan changes or resource consents, where relevant, to provide baseline information or fund investigation on risks or impacts of natural hazards such as flooding, land instability, coastal hazards or active faults at a local scale, in order that the environmental effects of the proposal or change can be adequately assessed at an appropriate level of detail. This may include working with the Canterbury Regional Council to gather information.

Policy 11.3.6 Role of natural features

The role of natural topographic (or geographic) and vegetation features which assist in avoiding or mitigating natural hazards should be recognised and the features maintained, protected and restored, where appropriate.

Methods – Local authorities:*Will:*

1. When setting out objectives, policies or methods in their regional and district plans, recognise the role of natural features in providing mitigation for the adverse effects of natural hazards and provide for the maintenance and protection of those features where appropriate.
2. Work with stakeholders; including Ngāi Tahu as tāngata whenua and landowners to encourage and promote the maintenance and enhancement of natural features that assist in the avoidance or mitigation of the effects of natural hazards.

Policy 11.3.7 Physical mitigation works

New physical works to mitigate natural hazards will be acceptable only where:

1. the natural hazard risk cannot reasonably be avoided; and
2. any adverse effects of those works on the natural and built environment and on the cultural values of Ngāi Tahu, are avoided, remedied or mitigated.

Alternatives to physical works, such as the relocation, removal or abandonment of existing structures should be considered.

Where physical mitigation works or structures are developed or maintained by local authorities, impediments to accessing those structures for maintenance purposes will be avoided.

Methods – Territorial authorities:

Will:

2. Set out objectives and policies, and may include methods in district plans to avoid impediments to accessing community owned mitigation structures for maintenance purposes.

Methods – Local authorities:

Will:

3. Set out objectives and policies, and may include methods in regional and district plans to ensure new hazard mitigation works will only be undertaken in accordance with the provisions of Policy 11.3.7.
4. Use iwi management plans and engage with Ngāi Tahu as tāngata whenua and papatipu rūnanga to assist when determining actual or potential adverse effects of hazard mitigation works.

Policy 11.3.8 Climate change

When considering natural hazards, and in determining if new subdivision, use or development is appropriate and sustainable in relation to the potential risks from natural hazard events, local authorities shall have particular regard to the effects of climate change.

Methods – Local authorities:

Will:

1. When setting out objectives, policies or methods in regional and district plans, take into account the current projections on the effects of climate change.

Policy 11.3.9 Integrated management of, and preparedness for, natural hazards

To undertake natural hazard management and preparedness for natural hazard events in a coordinated and integrated manner by ensuring that the lead agencies have particular regard to:

1. the investigation and identification of natural hazards;
 2. the analysis and mapping of the consequential effects of the natural hazards identified;
 3. the effects of climate change and resulting sea level rise;
 4. the setting of standards and guidelines for organisations involved in civil defence and emergency management;
 5. the development and communication of strategies to promote and build community resilience;
- and

6. any other matters necessary to ensure the integrated management of natural hazards in the Canterbury region.

Methods – Territorial authorities:

Should:

5. Work with the Canterbury Regional Council, other partner organisations and members of their communities to address the matters relating to natural hazards identified in Policy 11.3.9 (1) to (6) which are of particular relevance to the areas for which each is responsible.

Methods – Local authorities:

Will:

6. Work with emergency response organisations and critical infrastructure providers, to prepare and implement emergency readiness plans pursuant to the Civil Defence Emergency Management Act 2002.

Should:

7. Raise public awareness of natural hazards, including provision and publicising of information about what natural hazards exist in various localities and what people can do to be prepared.
8. Initiate, coordinate and promote activities that assist communities to build resilience to the effects of natural hazards.
9. Assist vulnerable communities to adapt to the consequences of natural hazards, including those that are likely to be adversely affected by climate change and resultant sea level rise.

Glossary and Definitions

Critical infrastructure

Infrastructure necessary to provide services which, if interrupted, would have a serious effect on the communities within the Region or a wider population, and which would require immediate reinstatement. This includes any structures that support, protect or form part of critical infrastructure.

Critical infrastructure includes:

1. regionally significant airports
2. regionally significant ports
3. gas storage and distribution facilities
4. electricity substations, networks, and distribution installations, including the electricity distribution network
5. supply and treatment of water for public supply
6. storm water and sewage disposal systems
7. telecommunications installations and networks

8. strategic road and rail networks (as defined in the Regional Land Transport Strategy)
9. petroleum storage and supply facilities
10. public healthcare institutions including hospitals and medical centres
11. fire stations, police stations, ambulance stations, emergency coordination facilities.

High hazard area

High hazard areas are:

1. flood hazard areas subject to inundation events where the water depth (metres) x velocity (metres per second) is greater than or equal to 1 or where depths are greater than 1 metre, in a 0.2% annual exceedence probability flood event;
2. land outside of greater Christchurch subject to coastal erosion over the next 100 years; and
3. land within greater Christchurch likely to be subject to coastal erosion including the cumulative effects of sea level rise over the next 100 years. This includes (but is not limited to) the land located within Hazard Zones 1 and 2 shown on Maps in Appendix 5 of this Regional Policy Statement that have been determined in accordance with Appendix 6; and
4. land subject to sea water inundation (excluding tsunami) over the next 100 years. This includes (but is not limited to) the land located within the sea water inundation zone boundary shown on Maps in Appendix 5 of this Regional Policy Statement.

When determining high hazard areas, projections on the effects of climate change will be taken into account.

Appendix 6 – greater Christchurch Coastal Hazard Zones: Definitions and explanations

Hazard Zone 1

(a) For stable or accretionary shorelines:

Where there is no evidence of shoreline erosion, the width of Hazard Zone 1 is the area landward of the Coastal Marine Area boundary to the landward limit of the active beach system. This position is determined either by ground survey, or from aerial photography.

(b) For most eroding shorelines:

The width of Hazard Zone 1 includes the active beach system and the area landward of this, which is likely to be part of the active beach system if contemporary erosion processes continue unaltered for the next 50 years. Hence, the landward limit of Hazard Zone 1 corresponds to the projected position of the landward toes of the active beach system.

The width of hazard zones has been determined by interpolating the rate of shoreline retreat between fixed determination points. For all determination points, except for some special situations listed below,

there was no evidence of a change in the longterm rate of shoreline retreat. Therefore, the longest term historical erosion rates have been used. These will include short term fluctuations.

Special situations where these factors do not apply:

(i) South Brighton Spit.

Hazard Zone 2

No Hazard Zone 2 is defined for stable or accreting shorelines.

For eroding shorelines, Hazard Zone 2 is landward of Hazard Zone 1, and covers areas that could become part of the active beach system within 50 to 100 years if the erosion rates used to calculate Hazard Zone 1 were to continue unaltered for 100 years.

Appendix E Regional Coastal Environment Plan

Chapter 9 Coastal hazards

Objective 9.1

- (a) To minimise the need for hazard protection works, and avoid or mitigate the actual or potential effects of coastal hazards by locating use and development away from areas that are subject to coastal erosion and sea water inundation.
- (b) To avoid, remedy or mitigate significant adverse effects on the environment as a result of measures used to manage coastal hazards.

Policy 9.1

- (a) New habitable buildings should be located away from areas of the coastal environment that are, or have the potential to be, subject to sea water inundation or coastal erosion.
- (b) Any new development in the coastal environment should be designed or located in such a way that the need for coastal protection works, now and in the future, is minimised.
- (c) The continued use and protection of essential infrastructure and services should be provided for, where no reasonable alternative exists, in areas subject to coastal hazards, provided adverse effects on the coastal environment are avoided, remedied or mitigated.
- (d) New coastal protection works for existing use and development should only be considered where they represent the best practical option for natural hazard mitigation or avoidance, and adverse effects can be avoided, remedied or mitigated.
- (e) Natural features that buffer the effects of coastal hazards should be protected.
- (f) Any significant adverse effects from the location, type and design of coastal hazard damage minimisation measures should be avoided, remedied or mitigated.
- (g) Environment Canterbury will provide information, including information on the incidence of natural occurrences, to encourage people to avoid locating in hazard prone areas.
- (h) New coastal protection works should be assessed, and measures taken or advocated as appropriate, to remedy or mitigate any significant adverse effects or remove redundant structures, to assist in restoration and rehabilitation of the natural character of the areas concerned.

Rule 9.1 Permitted Activities

The following activities are Permitted Activities within Hazard Zone 1 or within Hazard Zone 2:

- (a) The reconstruction or replacement of any structure, other than a structure damaged or destroyed by the action of the sea, provided that:
 - (i) the structure shall be reconstructed or replaced with one of the same or similar specifications; and
 - (ii) the structure shall not be reconstructed or replaced in a position that is further seaward than the original structure; and
 - (iii) if the structure is a habitable building, the floor area shall not be increased; and

- (iv) where the habitable building is reconstructed or replaced in a different position on the site pursuant to this rule, the habitable building shall be erected in accordance with the requirements of the zone (within Christchurch City the zone shall be the Living 1 Zone) in the Proposed or Operative District Plan with respect to site coverage, recession planes and setbacks.
- (b) The reconstruction or replacement of a habitable building damaged or destroyed by the action of the sea provided:
 - (i) the site (see definition) on which the habitable building is to be reconstructed or replaced has not eroded to less than 450m²; and
 - (ii) the habitable building shall be reconstructed or replaced with one of the same or similar specifications; and
 - (iii) the habitable building shall not be reconstructed or replaced in a position that is further seaward than the original habitable building; and
 - (iv) the floor area shall not be increased; and
 - (v) where the habitable building is reconstructed or replaced in a different position on the site pursuant to this rule, the habitable building shall be erected in accordance with the requirements of the zone (within Christchurch City the zone shall be the Living 1 Zone) in the Proposed or Operative District Plan with respect to site coverage, recession planes and setbacks.
- (c) In those parts of the coastal settlements of Gore Bay, Motunau Beach and Amberley Beach [as shown on planning maps]:
 - (i) The extension or alteration of a habitable building, providing that the floor area does not increase by more than 25 square metres over and above the floor area which existed at 1 July 1994;
 - (ii) The erection or placement of a non-habitable building that is 25 square metres or less in floor area and accessory to a residential building;
 - (iii) The extension or alteration of a non-habitable building, accessory to a residential building, provided that the floor area does not increase to more than 25 square metres over and above the floor area which existed at 1 July 1994.
- (d) The erection, reconstruction, placement, alteration, or extension of any fence;
- (e) The repair or maintenance of any structure, (including a road or railway and its associated protection works), provided that:
 - (i) all disturbed land not physically covered by a structure shall be reinstated to conform to the natural or physical state pertaining in the area before the activity permitted by this rule commenced; and
 - (ii) the structure shall substantially retain the same form and dimensions; and
 - (iii) if the structure is a habitable building the floor area shall not increase;
- (f) The disturbance of vegetation for the customary use of Runanga within their rohe;
- (g) The excavation, filling, or disposal of spoil, or the removal of sand, rocks, shingle, shell, or other natural material and associated vegetation clearance, in order to undertake earthworks for the installation, maintenance, extension to, or removal of, network utility services, excluding the cutting of an access track across an active beach system, provided that all disturbed land not

physically covered by any structure shall be reinstated to conform to the natural or physical state pertaining in the area before the activity permitted by this rule commenced.

Rule 9.2 Discretionary Activities for which Discretion is Restricted

Except where the activity is a Permitted Activity in accordance with Rule 9.1 of this Plan, or a Prohibited Activity in accordance with Rules 9.3 or 9.4 of this Plan, the following activities within Hazard Zone 1 or within Hazard Zone 2 are Discretionary Activities for which Environment Canterbury has restricted the exercise of its discretion:

- (a) The erection, reconstruction, placement, alteration, or extension of any structure;
- (b) The disturbance (burning, grazing, or removal) of vegetation within active beach systems;
- (c) The formation of access tracks (including board walks) across an active beach system;
- (d) The artificial adjustment of a beach profile, (including dune re-contouring), within an active beach system;
- (e) The excavation, filling, or disposal of spoil in volumes greater than 5 cubic metres per 100 square metres of land area;
- (f) The removal of sand, rocks, shingle, shell, or other natural material from an active beach system in volumes greater than 5 cubic metres by any person within any 12 month period.

Restriction of Discretion for Rule 9.2

Environment Canterbury restricts its discretion to the following matters when considering an application for a resource consent in accordance with Rule 9.2 of this plan and in imposing conditions in accordance with Section 108 of the Act:

- (a) whether the activity is likely to exacerbate coastal erosion; and
- (b) whether the activity is likely to lead to adverse effects from natural hazards on any other property, (where property has the same meaning as in Section 2 of the Building Act 1991);
- (c) provision for the removal of any structure or parts of any structure that are rendered unusable through coastal erosion.

Notification

In accordance with Section 94D(2) of the Act, an application for a resource consent for an activity that is sought in accordance with Rule 9.2 of this plan need not be notified in accordance with Section 93 of the Act, and in accordance with Section 94D(3) of the Act, notice of such an application does not need to be served.

Rule 9.3 Prohibited Activities for which no resource consent shall be granted

The following activities are Prohibited Activities within Hazard Zone 1:

- (a) the erection or placement of any habitable building with a floor area greater than 25 square metres, except as provided in rules 9.1(a) and 9.1(b) of this plan;
- (b) the extension or alteration of any habitable building with a floor area of 25 square metres or less such that it causes the building to have a floor area greater than 25 square metres, except as provided in rules 9.1(a) and 9.1(b) of this plan;
- (c) the construction of a landfill or the use of a landfill for the disposal of solid or hazardous waste;

- (d) The production or storage of any hazardous substance, except where:
- (i) The hazardous substance is being carried as cargo on a vehicle, rail wagon, vessel or aircraft; or
 - (ii) The storage is on a vehicle, rail locomotive, vessel or aircraft and is for the purpose of fuelling that vehicle, rail locomotive, vessel or aircraft; or
 - (iii) The storage is on a crane, or in or on a conveyor, or in a pipe or hose, that is being used to load or unload a vehicle, rail wagon, vessel, aircraft or storage container; or
 - (iv) The storage is such that the amount of the hazardous substance stored in any container, or stored in any building, or stored on or in any structure, is less than 1000 litres or less than one cubic metre in volume; or
 - (v) The production is such that the amount of the hazardous substance produced in any twelve-month period is less than 1000 litres or less than one cubic metre in volume.
- (e) the construction of a new road or railway, but not including:
- (i) the reconstruction or realignment of an existing road or railway within the hazard zone; or
 - (ii) the construction of a new road or railway that provides an access route to the Coastal Marine Area.

Notes

1. Hazard Zone 1 is shown on the Coastal Hazard Zone Maps in Volume 3 of this Plan.

2. Paragraph (d) of this rule shall only apply to the following Hazardous Substances:

- pesticides including: herbicides, insecticides and fungicides;
- chlorinated hydrocarbons including: bromodichloromethane, trichloroethene, chlorodibromomethane, 1,1,1 - trichloroethane, tetrachloroethene, trichloromethane, tetrachloromethane and tribromomethane;
- timber preservatives including: copper chromium, arsenic formulations, those using boron, other water-borne preservatives, light organic solvent preservatives and antisapstain chemicals;
- petroleum products including: petrol, waste oil, diesel, aircraft fuel, kerosene, heating oil; but not including liquefied petroleum gases; and compounds containing: benzene, xylenes, toluene or ethylbenzene;
- any substance containing one or more of the following chemicals: arsenic, cadmium, chromium, cyanide, lead, mercury, nickel or selenium.

Rule 9.4 Prohibited Activities for which no resource consent shall be granted

The following activities are Prohibited Activities within Hazard Zone 2:

- (a) the construction of a landfill or the use of a landfill for the disposal of solid or hazardous waste;
- (b) the construction of a new road or railway, but not including:
 - (i) the reconstruction or realignment of an existing road or railway within the hazard zone; or
 - (ii) the construction of a new road or railway that provides an access route to the Coastal Marine Area.

Appendix F NES for Telecommunications Facilities

Regulation 57 District rules about natural hazard areas disapplied

- (1) A territorial authority cannot make a natural hazard rule that applies to a regulated activity.
- (2) A natural hazard rule that was made before these regulations came into force, does not apply in relation to a regulated activity.
- (3) In this regulation, natural hazard rule means a district rule that prescribes measures to mitigate the effect of natural hazards in an area identified in the district plan as being subject to 1 or more natural hazards.

Appendix G A coastal hazard screening assessment for Selwyn District