

27. Natural Hazards

27.1 Introduction

27.1.1 Section 31(b) of the Resource Management Act 1991 states that one of the Council's functions is:

"the control of any actual or potential effect of the use, development, protection of land, including for the purpose of the avoidance or mitigation of natural hazards...."

27.1.2 Accordingly, the inclusion of a strategy to avoid or mitigate the adverse effects of natural hazards is an integral component of the District Plan.

27.1.3 Many natural hazards are difficult to predict because of their link with natural processes which are not fully understood.

However in order to manage natural hazards an appreciation of the risk is required. The concept of risk includes:

- ♦ the physical characteristics of natural events
- ♦ the probability of the event occurring
- ♦ the existence of something of value that is under threat from the event
- ♦ the vulnerability of that value to damage or destruction.

An assessment of risk is a means of comparing relative risks with each other and with other resource issues. This helps decide what management approach to take. However it also depends on the availability of good information. In the Waitomo District the availability of information on hazards and risks is uneven and the management response set out in this plan is related to the currently available information.

27.1.4 The Regional Councils also have responsibilities for management of natural hazards under the Resource Management Act. Environment Waikato is preparing a natural hazards management strategy for the Waikato Region. Much of the information used in this section of the Plan is from Environment Waikato. It is important that a co-ordinated approach is taken with the Regional Councils in relation to management of natural hazards.

27.1.5 The main forms of natural hazards that affect the Waitomo District are:

- ♦ Coastal erosion
- ♦ Land instability
- ♦ Flooding
- ♦ Land Erosion

In addition the District is exposed to risks of less frequent natural hazards such as volcanic eruption, tsunamis and earthquakes.

Coastal Erosion

27.1.6 Coastal erosion is a natural coastal process and is part of the normal dynamic behaviour of the coastline. However development has occurred in some coastal areas that now conflicts with these natural processes. Most dynamic shoreline fluctuations do not cause permanent long term retreat if they are averaged over a period of several decades. However the fluctuations can still affect human development. The sand spit at Mokau for example is particularly dynamic and may be extensively destroyed and rebuilt by river mouth changes over centuries.

27.1.7 Predictions of coastal erosion also needs to take into account the likely effects of predicted global warming, which includes an acceleration in the rate of sea level rise. The New Zealand Coastal Policy Statement and existing best practice in other countries suggests that the effects of rising sea levels needs to be included when assessing coastal erosion hazard.

27.1.8 In the past communities have sometimes used shoreline armouring to manage coastal erosion hazard. However these methods are often ineffective and do not provide a long-term solution to erosion hazard. They also often have adverse effects on the natural character of the coast. A more appropriate strategy to recognise coastal erosion hazard is to avoid development in areas that are subject to coastal erosion.

27.1.9 Environment Waikato has developed categories of risk to classify coastal erosion as it effects coastal communities in the Waikato Region. These categories of risk range from Category 1 (least risk) to category 5 (most risk - meaning a current threat to private property and development).

In the Waitomo District the Mokau Estuary and river spit fall into Category 5. Specific information is available on erosion rates and risks at Mokau, and this information along with the Category 5 classification have been converted to Coastal Hazard Area A in this plan. The heavily eroded Mokau spit is subject to rules prohibiting further development.

The hazard rules for Mokau are based on the following rationale:

- The ocean shoreline of the spit experiences reasonably frequent periods of severe coastal erosion, with intervening periods dominated by accretion.
- These periods of erosion and accretion result in the ocean shoreline being very dynamic with maximum shoreline fluctuations of at least 50 metres having been experienced over the full length of the spit and in excess of 100 metres in areas nearest to the river entrance.
- Three periods of severe erosion (1962/3, 1975/6, and 1993-6) have been experienced since the houses on the spit were built – with significant loss of property and some relocation of dwellings required in all three of these periods.
- The periods of erosion appear to be related to changes on the offshore bar, possibly sediment bypassing events in which large pulses of sediment moving northward along the coast are bypassed across the entrance, although further investigation is required to confirm this.
- Available information suggests that each of the last three periods of erosion has impacted property and development further landward than the preceding period, providing some (though not conclusive) evidence that erosion of the spit is becoming more severe over time. As such, a precautionary approach is required until better information is available.
- Geological evidence also suggests that the spit is completely eroded and rebuilt over time – though it does appear that such changes occur over periods of at least several hundred years. This evidence also reinforces the need for a precautionary approach to the management of subdivision and development on the spit.
- The low land on the southern bank of the river and seaward of the State Highway is also extremely dynamic. Most of this area is vulnerable to erosion over periods of several decades. There is also lesser risk from coastal inundation (in some areas) during major storm events.

Due to lack of specific hazard information for the remaining coastline of the District, different building setbacks restrictions apply to areas adjacent to estuaries or harbours, and the open coast. The setback for estuaries and harbours is 25m and for the open coast is 50m. Coastal Hazard Area A restrictions apply to these setback strips – see Rule 27.5.2 of this section.

Flooding

- 27.1.10 Flooding is a common hazard throughout the Waikato Region. Similar issues as for coastal hazards arise with the conflict created by development having taken place in areas that are prone to flooding.
- 27.1.11 In Te Kuiti there is some hazard from overbank flow of the Mangaokewa Stream. This risk has been reduced significantly over recent years with flood control works with latest assessments indicating that the central business area is safe from a 50 year return period flood. Local areas of nuisance flooding will still occur upstream and downstream of the central business area.

27.2 Resource Management Issues

- 27.2.1 Coastal erosion that forms part of normal coastal processes threatens existing infrastructure and private property at several locations on the coast, particularly at Mokau, the Mokau-Awakino Coast (especially at Seaview), Te Waitere, Te Maika and Marokopa.
- 27.2.2 Coastal erosion that forms part of normal coastal processes could cause conflict with development if structures were established in the future close to the coastline.
- 27.2.3 Structures and activities close to the coast including coastal armouring, can adversely affect the natural character of the coastal environment, and interfere with public access to the coast.
- 27.2.4 There is relative lack of understanding of and a lack of full information on coastal processes and the effects of activities on them.

- 27.2.5 Some areas of Te Kuiti are subject to flooding from the Mangaokewa Stream. While flood control works have reduced the risk of flooding there is still some conflict between existing development and areas where flooding could occur.
- 27.2.6 There is potential for development to occur in areas that are subject to risk from flooding.
- 27.2.7 Some parts of the District experience land stability problems. Such problems occur on the fringes of Te Kuiti on land which might be seen as attractive for residential development.
- 27.2.8 Clearance of large areas of vegetation on steep hill country in the District has the potential to cause increased runoff, erosion and land slip with consequent potential increase in flooding and adverse effects on water quality.

27.3 Objectives

- 27.3.1 To protect and enhance the natural character of the coastal environment. *Issue 27.2.3*
- 27.3.2 To protect and enhance public access to the coast. *Issue 27.2.3*
- 27.3.3 To avoid conflict between natural coastal processes, including coastal erosion, and activities and development in the coastal environment. *Issues 27.2.1, 27.2.2*
- 27.3.4 To ensure that people are well-informed of the nature and extent of natural hazards in the District so that they can be taken into account in development decisions. *Issue 27.2.6*
- 27.3.5 To protect the communities safety, health and well being from the effects of natural hazards wherever practicable. *Issues 27.2.1, 27.2.2, 27.2.3, 27.2.4, 27.2.8*

27.4 Policies

- 27.4.1 To avoid the siting of new development on land that is subject to flooding, coastal erosion or slope instability. *Objective 27.3.3*
- 27.4.2 To ensure that where development is to take place within areas of potential suspect stability, and within coastal areas where there is some risk of hazards that each such proposal and its implications is individually assessed. *Objectives 27.3.3, 27.3.5*
- 27.4.3 To provide information as it becomes available to inform the public of the nature and extent of natural hazards in the District. *Objective 27.3.4*
- 27.4.4 To liaise with the Regional Councils in the provision of information and the development of appropriate natural hazards management strategies. *Objective 27.3.4*
- 27.4.5 To recognise and maintain, and where appropriate enhance, the ability of natural features such as beaches, sand dunes, and wetlands to protect subdivision, use and development. *Objectives 27.3.1, 27.3.3*
- 27.4.6 To recognise that some natural features may migrate inland as the result of natural coastal processes. *Objectives 27.3.3, 27.3.4*

27.5 Rules

27.5.1 General

All applications for resource consents that include land that is subject to identified hazards identified in this District Plan shall include information to show how these hazards are to be avoided, remedied or mitigated. *Policy 27.4.2*

27.5.2 Hazard Areas

- 27.5.2.1 (a) Any building to be located within the Prohibited Activity Area at Mokau identified on Planning Maps 33A and 33B shall be a Prohibited Activity. *Policies 27.4.1, 27.4.2*
- (b) Any building to be located within an area identified on the Planning Maps or within Rule 27.5.2.2 as Coastal Hazard Area A shall be a Non-complying Activity.
- (c) Any building to be located within an area identified on Planning Map 33A and 33B at Mokau as Hazard Area B shall be a Discretionary Activity.
- (d) Any building to be located within an area identified on Planning Map 39, Te Kuiti Hazard Areas, as Hazard Area A, shall be a Non-complying Activity, except as provided for by Rule 27.5.2.3.
- (e) Any building to be located within an area identified on Planning Map 39, Te Kuiti Hazard Areas, as Hazard Area B shall be a Discretionary Activity .

Note: Te Kuiti Hazard Area A relates to known areas of significant instability. Te Kuiti Hazard Area B relates to areas of potential suspect stability, and some limited flood prone areas.

27.5.2.2 Coastal Hazard Area A

- (a) No building shall be erected within 25 metres of any estuary or harbour. Provided that this rule shall not apply to external alterations to existing buildings or replacement of existing buildings with new buildings within Residential Clusters 1 and 9 in the Te Maika Zone when such work complies with all of the requirements of Rule 14A.6.3.2.
- (b) No building shall be erected within 50 metres of the open coast.
- (c) Where a river meets the open coast no building shall be erected within 25 metres of the river upstream to the boundary of the Coastal Marine Area as defined in the Waikato Regional Council Regional Coastal Plan dated 28 August 1997.

For the purposes of this rule the 25 metre or 50 metre building restriction shall be measured from the toe of the nearest natural bank adjoining the sea or river, or where that is not able to be defined, from the edge of common terrestrial vegetation.

- 27.5.2.3 (a) Any existing lawfully established building within
- (i) the Prohibited Activity Area at Mokau, or
 - (ii) Coastal Hazard Area A, or
 - (iii) Hazard Area A at Te Kuiti,
- which is threatened by the identified hazard may be relocated to a safer position on the same site as a permitted activity. For the purposes of this rule front yard requirements shall not apply.
- (b) Any wharf, jetty, boat ramp, carparking area, toilet facility or other utility building associated with the use of the coast shall be a Discretionary Activity in Coastal Hazard Area A.
- (c) Any building which is specifically designed to be able to be readily relocated shall be a Discretionary Activity in the Coastal Hazard Area A and Hazard Area A at Te Kuiti.

27.5.2.4 Any application for a proposed development within the Te Kuiti Hazard Area B in accordance with Rule 27.5.2.1(e) shall include an assessment of the following matters and shall take into account the matters set out in Rule 27.5.3, Good Practice Guide for Development in Te Kuiti Hazard Area B.

- (a) the slope of the land,
- (b) any local areas of known instability,
- (c) the extent of cut earthworks and remaining unsupported cuttings,
- (d) the extent of fillings that may be placed,
- (e) the method of undertaking earthworks,
- (f) the extent of any retaining walls,
- (g) the alteration to drainage patterns,
- (h) disposal of stormwater and sewage,
- (i) access to site,
- (j) destruction of established vegetation,
- (k) proposed establishment of improved drainage,

- (l) proposed establishment of soil conservation methods and planting,
- (m) where relevant, the relationship of proposed floor levels to an anticipated 50 year flood event.

27.5.3 Good Practice Guide for Development in Te Kuiti Hazard Area B

27.5.3.1 In Te Kuiti, rolling hills slope up to sandstone or ignimbrite bluffs to the east and west. Hard limestone outcrops occur to the north, east and south. Overlying the limestone and forming the bulk of the western slopes, together with substantial areas on the eastern hillside, is a sequence of blue-grey calcareous mudstones. The dominant clay material is montmorillonite, averaging 55% , but up to 80%. This high content of swelling clays has resulted in the mudstone having notoriously unstable slope characteristics with earth flow erosion, often on a large scale. Short steep slopes are common, frequently with benches above and below forming pronounced terraces, especially on the western slopes. Longer slopes characterised by a broken hummocky surface are also typical of the western mudstone area. In their lower parts the hummocky slopes tend to become gentler and broad, relatively stable rolling spurs are common. Similarly on some of the south eastern slopes the mudstone underlies a more rounded topography mantled by a deep layer of ash and showing few signs of deep seated slope instability.

27.5.3.2 Only the limestone and ignimbrite can be considered to pose few if any problems in terms of slope stability, though some of these areas are too steep for housing. Conversely the areas underlain by mudstone can be considered as posing risks in terms of potential slope stability. The clay rich materials readily take up moisture with an associated increase in volume. Strength is reduced. Seasonal drying out leads to shrinkage and cracking, which in turn allows deeper and more rapid penetration of water during rainfall.

27.5.3.3 Earthworks involving cutting into slopes will almost certainly disrupt a precarious and usually temporary equilibrium. Interference with natural water movements always accompanies a development phase. Large impervious areas such as roofs, courtyards and roads will lead to increased and concentrated runoff.

27.5.3.4 Nevertheless some sites within the area underlain by mudstone lithologies may be suited to limited development provided adequate controls are exercised. Such sites may include the terrace landforms, the crests of the lower spurs, and parts of the rolling landscape south east of Te Kuiti. Any subdivision or development in these areas would need to be subject to site specific stability investigations. The hummocky surfaced slopes, and the steeper slopes dropping away from the benched areas, remain suspect.

27.5.3.5 The following factors represent good practice for development in these areas, and are provided for the guidance of developers:

- ♦ reduce the water available for uptake by the clays.
- ♦ Improve drainage.
- ♦ eliminate all ponding.
- ♦ avoid concentration of water flows.
- ♦ protect existing conservation planting and native bush areas.
- ♦ establish new conservation planting.
- ♦ minimise earthworks.
- ♦ minimise placement of fill.
- ♦ minimise impervious surfaces.

27.5.4 Assessment Criteria for Discretionary Activities

- (a) The severity of the past natural hazards which have affected the site and the potential for the hazard to reoccur.
- (b) The measures proposed to avoid, remedy or mitigate the effects of the natural hazard.
- (c) The likely risk to people and property from the natural hazard.
- (d) The extent and nature of information available to assess risks.
- (e) The effect of the development on the natural character of the coastal environment.
- (f) The availability of alternative siting options outside the hazard area.

27.6 Anticipated Environmental Outcomes

27.6.1 An environment where:

- (a) The effects of natural hazards are lessened through greater public awareness and the use of mitigation/remedy measures, where appropriate.
- (b) The threats posed by existing natural hazards are not increased through continued development of areas prone to natural hazards.