

Chapter 11

NATURAL HAZARDS

PREAMBLE

Section 2 of the Act 1991 defines “natural hazard” as meaning:

...any atmospheric, or earth, or water related occurrence (including, earthquake, tsunami, erosion, volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought, fire or flooding), the action of which adversely affects or may affect human life, property or aspects of the environment.

Section 30(c)(iv) of the Act provides that the Regional Council shall have control over the use of land for the purpose of avoiding or mitigating natural hazards. Under section 30(1)(g)(iv), the Act provides that the Regional Council has the function of controlling the introduction or planting of plants on the bed of any water body for the purpose of avoiding or mitigating natural hazards.

Clause 1(e)(iv) of Part I of the Second Schedule of the Act provides that the use of the land for the avoidance or mitigation of natural hazards may be a matter provided for in a RPS.

Section 62(1)(ha)(i) of the Act provides that a RPS shall state:

For the region or any part of the region, which local authority shall have responsibility within its own area for developing objectives, policies, and rules relating to the control of the use of the land for-
(i) the avoidance or mitigation of natural hazards:..
(ii)...and may state particular responsibilities for particular hazards... ...or groups of hazards... ...but if no responsibilities for a hazard... ...are identified in the policy statement, the regional council shall retain primary responsibility for the hazard...

The West Coast presents a range of high risk environments where natural hazards have occurred and will continue to do so. Flood plains are subject to periodic floods. Low lying ground in coastal areas occasionally experiences sea flooding from tsunamis and storm surges. Coastal erosion may cause general problems, particularly through the loss of land and the undermining of structures. Elevated sites can suffer slope failure. A few sites may be at risk from dam failure during extreme events. The region is also seismically active and damaging earthquakes commonly occur.

ISSUE 11. Loss of life and damage to property and environmental values from natural hazards.

Extremes of weather

The West Coast region is often subject to intense and prolonged periods of rain. Surface flooding is common and in recent years there have been a

series of floods which have caused widespread damage. In 1988 major flooding of the Grey River had catastrophic effects on Greymouth.

Historically, flood protection works, formerly funded to a large extent by the Crown, took up a major portion of the resources of the Regional Council's predecessor - the Westland Catchment Board. With the new directions of the Act this is no longer the case with the Regional Council. Although the Crown still provides limited funds for flood protection, in general, a user-pays philosophy applies. Consequently, those who choose to invest in a flood prone area now are responsible for protecting their own investments.

It is possible that the Regional Council will apply restrictions on further development in such areas.

While local knowledge is of great importance in planning activities in flood prone areas, the full extent of risk is not usually known. The Regional Council has mapped flood hazard areas in the Karamea, Buller, Grey, Arahura and Hokitika catchments (Benn 1991a, 1991b, 1992a and 1993a) and may extend this coverage as staffing and funds permit. It has also prepared a chronology of flooding on the West Coast (Benn 1990). It is important that such information be made available to territorial authorities to help them make informed planning and resource consent decisions. In addition the Regional Council operates a flood warning system, which gives West Coast residents, particularly in Westport, Greymouth and Hokitika several hours warning of major flood events.

Electrical storms and high winds cause damage to property and disrupt communications and power. In winter, snow and ice can make driving conditions hazardous, particularly through the alpine routes to Canterbury when road closures due to snow, ice or avalanches can occur.

Earthquakes

Earthquakes on the West Coast are associated with the region's tectonic setting across the boundary of the Indian and Pacific plates. The Alpine Fault - the surface expression of the plate boundary - extends the entire length of the region.

Several large earthquakes have occurred in the region during its short history of human occupation. Earthquakes in the north - at Murchison in 1929 and Inangahua in 1968 - caused human fatalities and widespread damage. Those centred in South Westland this century have produced little damage, a fact partly due to the low population in the south of the region and generally lower earthquake intensities.

Statistical estimates from seismic models show that moderate damage from earthquakes can be expected to occur on the West Coast, on average, about once a decade. This makes the threat of earthquakes very real. The surface geology of the Alpine Fault along the Southern Alps indicates a violent history of surface rupture and associated large magnitude earthquakes. Yet no movement along this part of the fault has been recorded during the last 500 years. A large earthquake along this fault on the West Coast is, however, likely. (Benn 1992b).

Physical phenomena associated with movement on faults include landslides, damming of valleys where landslides have occurred, liquefaction, subsequent mass movement of soils, and tsunamis.

Climate change and possible sea level rise

The West Coast has a long coastline and is subject to natural cycles of erosion and deposition. Scientific research indicates that mean sea levels around the New Zealand shoreline have been rising constantly since the turn of the century at the rate of 1.2 mm per year (Hannah, 1988). However, conclusive evidence has yet to emerge that this is due to global warming and it may be the result of land subsidence through tectonic processes. Nonetheless, the possible consequences of global warming and the postulated link with greenhouse gas emissions are serious enough to deserve the adoption of a precautionary approach to development along the coastline.

Coastal erosion and inundation are covered in Chapter 10 under Issue 10.4 because of their relationship with the coastal environment. The management of these natural hazards has much in common with the management of those in this chapter.

Fire/Dry spells

Although the West Coast has a high rainfall, occasional dry spells do occur, during which there is an increased fire risk.

Land Instability

Inappropriate land development activities, including those on the coastline and the beds of lakes and rivers may cause or aggravate land instability and erosion. Landslides and rockfalls occur in mountainous terrain and hill country, where slopes are unstable. At Little Wanganui, in the north of the region a number of dwellings are under threat from unstable cliffs. These effects are further aggravated during floods, storms and earthquakes.

The combined effects of land instability resulting from earthquakes and high rainfall can cause large quantities of material to be released, causing a rise in the level of riverbeds downstream.

Dam safety

The West Coast Regional Council has recently compiled an inventory of dams (Benn 1993b). The inventory gives details of some previous dam failures including the failure of Bell Dam, Okuku, in 1991 when a 100 m length of State Highway 73 was washed out. Nonetheless, few of the 84 dams recorded in the inventory were considered to present any potential danger of structural failure.

The need for works in an emergency

Apart from the obvious need to safeguard human life, property and environmental values, there will be a need to restore transport routes and communication facilities that have been damaged by natural events. Section 330 of the Act provides for such works to be carried out as a matter of emergency. A retrospective resource consent may be required.

OBJECTIVE 11. The protection of human life and the avoidance or mitigation of damage to property and environmental values resulting from natural hazards.

NATURAL HAZARDS POLICIES

POLICY 11.1 Promote appropriate responses when a natural hazard is possible, likely to occur or imminent including:

- a) Timely warning and advice;***
- b) Evacuation of people and stock from high risk areas;***
- c) Mobilisation of rescue and welfare groups; and***
- d) Identification of at risk areas.***

POLICY 11.2 Recognise the risks to proposed and existing development from natural hazards and promote measures to reduce this risk to an acceptable level. Where necessary further development in hazard-prone areas will be restricted (refer Policy 1.3).

POLICY 11.3 Consult with people and communities directly affected when making decisions on levels of risk from natural hazards. When making decisions on levels of risk matters to be considered will include:

- a) The probability of occurrence, magnitude and location of events;***
- b) The potential consequence of an event including potential loss of life, injury, social and economic disruption, civil defence implications and cost to the community;***
- c) The measures proposed to avoid or mitigate the effects of the event, the degree of mitigation they will provide and effects on the environment from adopting such measures;***
- d) The benefits and costs of alternative mitigation measures; and***
- e) The possibility of locating activities away from areas at risk.***

The Regional Council will carry out a review of particular local authority responsibilities for the development of objectives, policies and methods for the avoidance or mitigation of natural hazards. This review will be carried out in consultation with the region's territorial authorities to determine the need for re-assigning responsibility. Until this review is completed responsibilities for the control of the use of the land for the purpose of the avoidance or mitigation of natural hazards shall remain where they lie. Pending the outcome of the review above, where local authority responsibility for natural hazard management is not clear, the Regional Council shall retain primary responsibility as provided under section 62(1)(ha) of the Act.

The outcome of this review will be notified as a change to this RPS, as provided for in the First Schedule of the Act. Territorial authorities are responsible under section 36 of the Building Act for imposing building

Cross reference policies
Cross Boundary Issues and Integrated Management policies, Soils and Rivers policy 7; Habitat and Landscape policies 9.1 and 9.2; Coastal Environment policies 10.1.1 and 10.1.2 and Air Quality policies 12.1.1 and 12.1.2.

controls in areas known to be subject to natural hazards.

With respect to the CMA, section 30(1)(d) of the Act states that the control of the use of land for the purpose of avoidance and mitigation of natural hazards is a function of the Regional Council, in conjunction with the Minister of Conservation.

POLICY 11.4 *Adopt a user pays approach to hazard avoidance or mitigation.*

Policies 11.1 – 11.4 are intended to correspond with/and or complement Coastal Environment policies 10.4.1 and 10.4.2.

METHODS

- 11.1 Identification of areas at risk from natural hazards by the Regional Council through exchange of information between other agencies and consultation with the public. The Regional Council will liaise with and provide information to territorial authorities and promote the inclusion of natural hazard information in district plans, through the resource consent process and land information memoranda.
- 11.2 Encourage improved public awareness of hazards within the region.
- 11.3 When requested, the Regional Council will provide regional civil defence and disaster recovery assistance to the region's territorial authorities. This will include seeking assistance from the Crown.
- 11.4 Operate a regional flood warning network.
- 11.5 Place controls on development in areas subject to risk from natural hazards, through rules in relevant regional and district plans.
- 11.6 Monitor and review the cost efficiency and effectiveness of catchment flood and channel management in consultation with all parties and rating districts, or as part of the Regional Council's river management responsibilities.

EXPLANATION

Policy 11.1 aims to reduce the risks to people and communities by ensuring that people are aware of risks and able to take appropriate measures, including evacuation, when a damaging natural event is about to occur or has occurred. The flood warning system provides territorial authorities and the residents in low lying areas in the valleys of the Karamea, Buller, Grey, Hokitika, Whataroa and Haast rivers with sufficient warning to adequately respond to the threat of flooding.

Identification of areas that are at risk and the exchange and distribution of natural hazard information are important ways of implementing this policy.

Policy 11.2 recognises the need to provide directions on how to deal with the risks posed by natural hazards to existing and proposed development. Permanent development in some areas may need to be restricted.

Policy 11.3 lists criteria the Regional Council will use for determining the degree of risk from natural hazards for any particular area. It also describes the need to review respective territorial authority and Regional Council functions.

A Court of Appeal decision (CA 99/95) states that regional councils may develop objectives, policies and methods by way of a RPS or regional plan for the avoidance or mitigation of natural hazards in specific areas. When hazards extend across territorial authority boundaries or natural catchments, regional hazard plans may need to be developed to achieve the integrated management of resources. The boundaries of responsibility between the local authorities will need to be defined in a regional natural hazards plan.

A regional civil defence capability will provide people with information on the extent of a large-scale civil emergency and enable informed decisions to be made on how the effects of a hazard can be lessened or avoided. The Regional Council's civil defence function will be limited to a co-ordination role in times of regional emergency. Flood warnings and civil defence assistance to territorial authorities are also appropriate promotion functions for the Regional Council.

Recognition of potential and actual coastal hazards is also important. Some natural systems such as dunes provide a natural defence against erosion. Damage to dunes may cause them to migrate inland. Any proposals for subdivision, use or development should take this into account. There is also the possibility of future sea level rise. This could cause erosion to increase and low lying areas to be inundated.

Policy 11.4 sets out the philosophy of who is responsible for meeting the expenses of hazard avoidance or mitigation.

Natural hazards give rise to emergencies, for example cutting of essential services. In such situations the Act provides for activities to be carried out immediately to alleviate the emergency, with any needs for resource consents to be addressed retrospectively. This applies to network utility operators (See Chapter 15 on Network Utilities) who have responsibilities for the operation and supply of telecommunications, radio, electricity, water supply, sewerage, road and rail networks, airports and other essential services.

Promotion, provision of information and education are the main methods for fulfilling the objectives and policies. Responsibility for control of the use of land for the purpose of avoiding or mitigating natural hazards is shared between the region's four local authorities. The Regional Council also has controls through its Soil Conservation and Erosion Control Plan.

Links between emissions of greenhouse gases, global warming and possible sea level rise have not been conclusively established. It appears premature to plan or implement contingency measures other than limiting the emissions of greenhouse gases (see Chapter 13 on Air Quality under Issue 1). The Regional Council will, however, keep abreast of the latest scientific information in this area and, meanwhile, warn developers of the consequences of possible sea level rise.

The Regional Council is also responsible for the siting of structures in waterways for the purpose of avoiding or mitigating the effects of natural hazards. However the Building Act 1991 places responsibility on territorial authorities to issue consents that ensure the safety of buildings.

The last method recognises that the Regional Council has a major role in river channel management and flood mitigation. Significant funds and time have been invested in achieving the considerable degree of protection that existing works provide to communities and landowners. However natural hazard avoidance and mitigation measures can only be provided on a user pays basis.

ANTICIPATED ENVIRONMENTAL RESULTS

- 11.1 Appropriate development within areas subject to natural hazards provided for in regional and district plans.
- 11.2 An effective response to the threat of flood events and other natural hazards.
- 11.3 Preparation of and dissemination of natural hazard information.
- 11.4 A reduction in actual or potential losses to people, property and the environment from natural hazards.
- 11.5 An increase in community awareness, certainty and responsibility for natural hazard avoidance and mitigation.