

Q&A SHEET

What are the goals for managing natural hazards in the Second Generation Plan (2GP)?

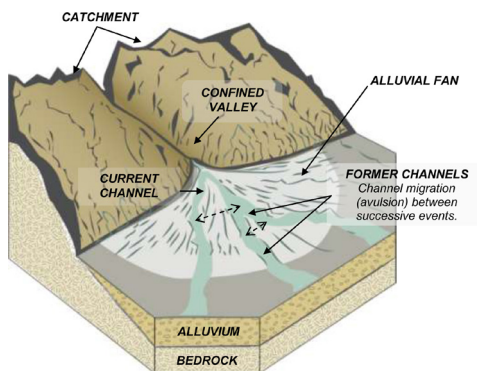
Natural hazards include flooding, sea-level rise, storm surge, tsunami, earthquakes, alluvial fans¹, landslides and subsidence², wind, snow, fire and drought. Under the Resource Management Act 1991, the DCC is responsible for managing land-use to avoid or mitigate the actual or potential effects of natural hazards, and is required to consider the effects of climate change. The DCC is also required to keep records of natural hazards.

Natural hazards vary in terms of both their frequency and degree of effect. Some hazards, such as flooding, may occur relatively frequently and may damage property. Other natural hazards, such as tsunami, occur infrequently – often not within a lifetime or several lifetimes – but when they do occur, they pose serious risks to life.

Our preferred approach to managing the risks from hazards is based on considering the overall risk from the hazard, in terms of both frequency and effect. We also try to strike a balance between enabling people to use their property while protecting people and property from risk.

Our key priority in managing the risks from natural hazards is to protect people, including loss of life, injury, the risk of being cut off from Civil Defence assistance, or the failure of key infrastructure required to ensure the health and safety of our communities (such as wastewater treatment systems). After this the focus is on risk to property, such as loss of, or damage to, buildings.

Overall, our aim is to create liveable communities where stress and fear due to the threat of natural hazards is minimised.



¹ Alluvial fans are made up of sediment deposited from streams at the exit of confined valleys that fan out over the base of valley floors. Alluvial fans are a flood risk and may be dominated and exacerbated by significant amounts of debris.

² Subsidence occurs when earth and rock fall into a cavity that has formed below the ground's surface. It is a natural process, although it can also occur as a result of people's activities (for example, landfills and mining).

Figure 1: An alluvial fan. Otago Regional Council.

What changes are being proposed in the 2GP?

Creation of Hazard Overlay Zones

In conjunction with our review of the 2GP, the Otago Regional Council (ORC) has identified and assessed Dunedin's vulnerability to natural hazards (including the effects of climate change) and then mapped areas that are at risk from natural hazards. Based on this technical analysis, the preferred option is for the 2GP to manage natural hazards through a set of Hazard Overlay Zones.

Hazard Overlay Zones are areas identified on the 2GP maps, with special rules aimed at reducing the potential adverse effects of, and risk from, natural hazards.

The potentially affected areas will be identified within the Hazard Overlay Zones as being vulnerable to one or more of the following types of hazards:

- *Flood – including areas subject to overland flow, areas where water may pond, and alluvial fans*
- *Coast – including areas at risk from tsunami, storm surge, erosion and sea level rise*
- *Land – including unstable areas at risk from landslides, rockfall or subsidence, including from man-made hazards such as mine shafts.*

Different areas are exposed to different levels of risk from these hazards based on a variety of factors, including topography, proximity to water bodies, buffering by natural features and flood protection works.

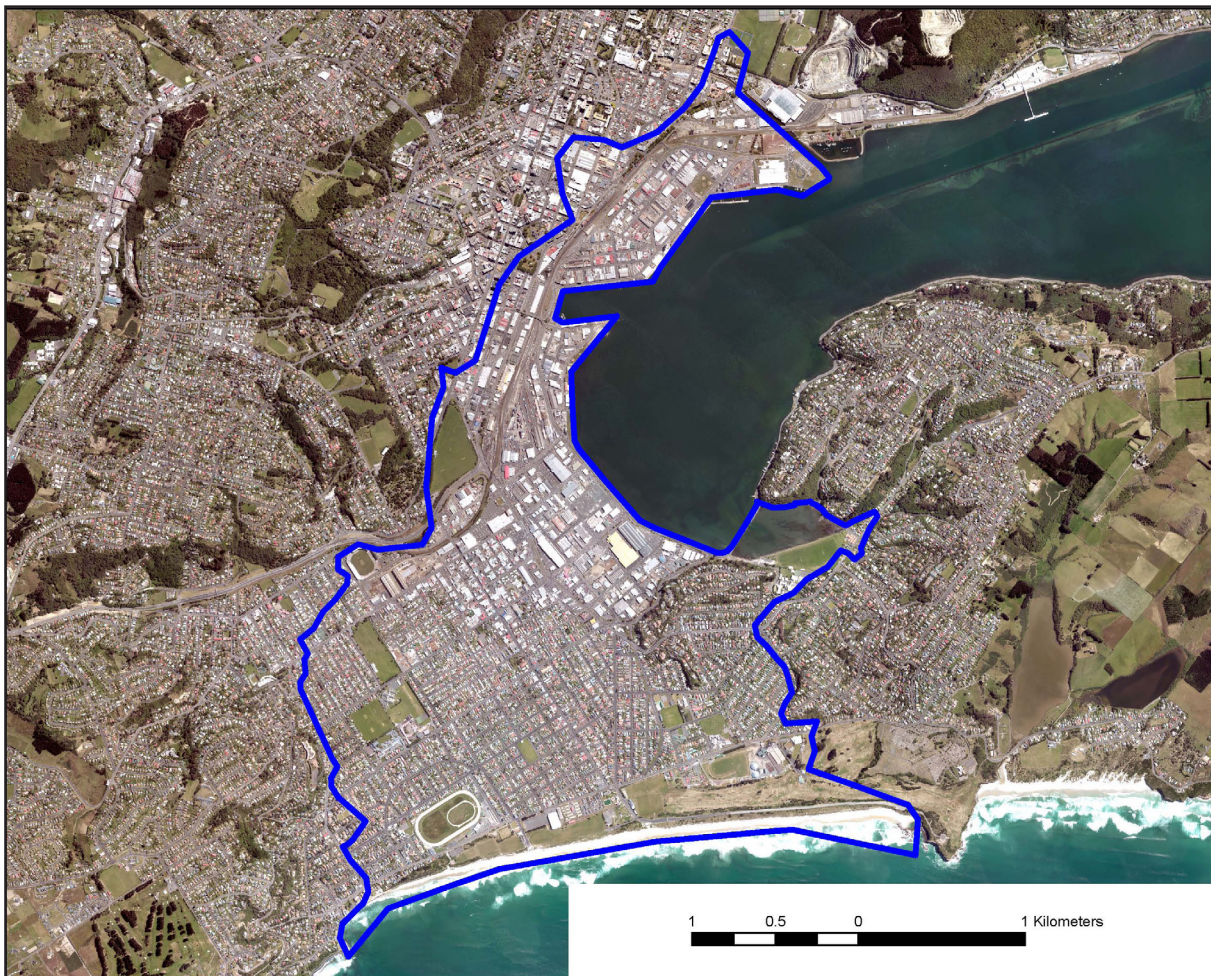
The ORC's assessment of natural hazards in Dunedin includes maps of hazard vulnerable locations and divides these into different areas, based on the potential characteristics and consequences of hazards in each area (for example the Taieri has been split into about 16 areas).

The 2GP will condense this information and categorise each hazard prone area into the following Hazard Overlay Zones based on the level of risk an area is exposed to from a hazard or hazards:

- *Extreme Risk Hazard Overlay*
- *High Risk Hazard Overlay*
- *Moderate Risk Hazard Overlay*
- *Low Risk Hazard Overlay*

The 2GP maps relating to areas identified as vulnerable to natural hazards are available at www.dunedin.govt.nz/2gp.

Figure 2: Harbourside and South City



Harbourside and South City

The major issues for this area relate to infrastructure constraints, exacerbated by the area being low-lying and having a high water table. The challenges created by these issues may worsen over time due to climate change. The 2GP preferred option is to manage these risks through the underlying zone of the area, rather than through a Hazard Overlay Zone. This is because the area exposed to natural hazards is large and highly developed.

The 2GP approach to the Harbourside and South City area is to continue providing for industrial and commercial uses in the areas zoned for this use such as the Industrial, Commercial - Centres (Principal), and Trade-related zones, in line with the approach taken for similar zones elsewhere in Dunedin.

However, in the South Dunedin Residential Zone, we propose to take an adaptive management approach. Residential development will be managed so that development does not significantly increase from existing levels. This means that no medium density housing or family flats will be permitted in this zone. The minimum site size will remain at 300m² except for the St Clair area, which will remain at 500m².

As new information becomes available and the DCC, with the community, makes decisions about what interventions it may take, the District Plan approach to the Harbourside and South City area will be reviewed.

Seismic hazards

GNS Science has recently refined the classification of risk from earthquakes based on a more detailed assessment of the geology of different areas in Dunedin.

The DCC will use GNS's assessment of liquefaction risk to inform the zoning of Future Urban Development Zones in the 2GP and evaluate any greenfield development proposals.

A geotechnical assessment will be required for applications and proposals to convert land from rural to urban use via a plan change or subdivision in areas identified as being highly or moderately at risk of liquefaction by GNS. This information will be on the DCC's hazard register, now known as the Hazard Information Management System (HIMS), and will be available upon request.

Building safety for new buildings in existing developed areas will be addressed primarily through application of the Building Code under the Building Act. The safety of existing buildings is being addressed at a national scale through measures such as those relating to earthquake strengthening of buildings.

How are we proposing to manage activities in Hazard Overlay Zones?

The preferred option is to manage development in Hazard Overlay Zones by taking into account both the risk posed by the relevant hazard with the vulnerability of the proposed activity. In high risk areas, for instance, establishing sensitive activities such as new houses, rest homes, commercial accommodation, schools and healthcare-related activities would be considered non-complying activities, while less sensitive activities such as farming would be permitted (see Table 1 for an explanation of activity status types). This approach is summarised in Table 2 on page 5.

It should be noted that Table 2 provides an overview of common activities and activity statuses proposed for activities in Hazard Overlay Zones, as well as the relevant activity status in the underlying Residential, Centres and Rural Zones (note that other zones will also be affected by the Hazard Overlay Zones - these zones are used as an example only).

The proposed activity status does not distinguish between the type of hazard (ie Flood or Coast). However, different performance standards and assessment matters may apply to different types of hazards, as outlined in more detail below.

When the activity status of the underlying zone and the overlay zone differ, the most restrictive status will apply. Developments must also meet the performance standards relating to both the underlying zone and overlay zone.

Lawfully established activities would be able to continue operating based on existing use rights.

TABLE 1. ACTIVITY STATUS TYPES

ACTIVITY STATUS	SYMBOL
Permitted Activity	P
No resource consent is required, provided that any performance standards associated with the permitted activity in the District Plan are complied with. The ability to undertake an activity as a permitted activity is often referred to being 'provided for as of right'.	
Controlled Activity	C
Resource consent is required, but must be granted. Conditions can be imposed on the consent, but can only relate to matters that the DCC has specified in the District Plan.	
Restricted Discretionary Activity	RD
Resource consent is required, and can be granted or declined on a case-by-case basis. If the consent is granted conditions can be imposed, but can only relate to the matters that the DCC has specified in the District Plan.	
Discretionary Activity	D
Resource consent is required, and may be granted or declined on a case-by-case basis. If the consent is granted conditions can be imposed on any matters that the DCC considers necessary to address effects on the environment.	
Non-complying Activity	NC
Resource consent is required, and can only be granted if the effects are minor or the activity is consistent with the objectives and policies of the District Plan. If the consent is granted, conditions can be imposed on any matters that the DCC considers necessary to address effects on the environment.	
Prohibited Activity	Pr
No resource consent will be granted for a prohibited activity.	

TABLE 2a: LAND USE ACTIVITY STATUS TABLE

ACTIVITY	RESIDENTIAL ZONE	RURAL ZONE	CENTRES	EXTREME RISK HAZARD OVERLAY	HIGH RISK HAZARD OVERLAY	MODERATE RISK HAZARD OVERLAY	LOW RISK HAZARD OVERLAY
All residential activities	P	P	P	Pr	NC	RD	P
Early childhood Centres	RD	D	P	Pr	NC	RD	P
Farming & Forestry	NC	P	NC	P	P	P	P
Industry	NC	NC	P	Pr	P	P	P
		Rural Industry - D					
Retail & Office	NC	NC	P	Pr	P	P	P
Service Station	NC	NC	D	Pr	Pr	Pr	D
Subdivision creating new vacant lot	RD	RD	RD	Pr	NC	NC	RD

TABLE 2b: BUILDING, STRUCTURE AND SITE DEVELOPMENT ACTIVITY STATUS TABLE

ACTIVITY	RESIDENTIAL ZONE	RURAL ZONE	CENTRES	EXTREME RISK HAZARD OVERLAY	HIGH RISK HAZARD OVERLAY	MODERATE RISK HAZARD OVERLAY	LOW RISK HAZARD OVERLAY
Accessory buildings/ Garages and Car Ports	P	P	P	RD	P	P	P
Building additions that increase footprint	P	P	P	RD	P	P	P
New Residential Building	P	P	P	Pr	NC	RD	P
All other buildings	D	P	P	NC	RD	RD	P
Earthworks	P	P	P	RD	RD	P	P

NOTE 1. The underlying zone may have a stricter activity status that will apply eg in a residential zone industry would be a non-complying activity.

NOTE 2. Activities may also be subject to performance standards.

How will performance standards be used to manage the risks of natural hazards?

The 2GP will manage a range of effects related to building design and site development through the use of performance standards, which can be applied to permitted, controlled or restricted discretionary activities. If a permitted activity complies with relevant performance standards, it may proceed without the need for resource consent. If an activity is a restricted discretionary activity subject to performance standards, it means that the activity will need to obtain consent and comply with performance standards, as well as being considered by a decision maker against specified assessment criteria.

The preferred option is for activities falling within a Hazard Overlay which are permitted or restricted discretionary to be subject to performance standards relating to managing the risks associated with the hazards.

Some of the performance standards being considered for the different types of hazard overlays are:

Coast Hazard Overlay

- Minimum floor levels
- Relocatable residential buildings
- Earthworks thresholds
- Limiting vegetation clearance

Flood Hazard Overlay

- Minimum floor levels
- Earthworks thresholds
- Fence design
- Limiting vegetation clearance

Land Instability Overlay

- Earthworks thresholds
- Limiting vegetation clearance

Where an area is subject to more than one hazard (eg flooding and coast) the strictest performance standard will apply. For example, a minimum floor level for a flood hazard may be higher than a minimum floor level for coastal hazards, and this will apply.

Requiring minimum floor levels for dwellings

A minimum floor level is a standard for how high a building platform or floor level should be to reduce the risk of damage to buildings and property contained in buildings. There is always a risk that an extreme event can cause water to exceed a specified minimum floor level, and that other adverse effects will be experienced during an extreme event.

To reduce the risk of flooding from the sea, the DCC already requires all new dwellings in low-lying coastal areas to comply with a minimum floor level (except for the Harbourside and South City area). The preferred option is to incorporate these minimum floor levels into the 2GP. These levels can be viewed at www.dunedin.govt.nz/council-online/webmaps/minimum-floor-levels.

The 2GP preferred option is to extend this approach to flood hazard areas also, in order to protect dwellings from flooding from rivers in flood or rainfall events.

However, setting a minimum floor level will not be practical in all flood vulnerable areas, due to the inability to accurately predict flood levels due to data limitations.

Where it is practical to do so, the use of a minimum floor level would avoid the need for each applicant to pay a consultant to determine an appropriate minimum floor level for a dwelling, and would keep down the costs and uncertainty associated with resource consent applications.

The DCC has engaged consultants to assist in identifying appropriate minimum floor levels. This work is likely to be completed in August 2014, and submissions will be invited on any proposed minimum floor levels for flood hazard areas when the proposed 2GP is notified.

Requiring dwellings to be relocatable in coastal hazard areas

In areas identified as being vulnerable to coastal hazards, the preferred approach is to require new dwellings to be constructed so that they can be relocated. In coastal hazard areas, sea-level rise is projected to increase over the next 100 years and beyond. Once the effects of sea-level rise and climate change (including more intense storm events, which may increase erosion and reduce the buffering effects of dunes) begin to be felt by vulnerable coastal communities, relocatable dwellings may help people to move away from these areas in the future.

Setting earthworks thresholds

Depending on the scale and nature of earthworks undertaken, earthworks may exacerbate the risks from natural hazards. In unstable areas, earthworks may increase the potential for a landslide. In a flood-prone area, earthworks may redirect or exacerbate flood flows. In coastal areas, earthworks may reduce the buffering capabilities of natural features such as dunes.

The preferred option for the 2GP is to manage this risk by permitting earthworks as long as they do not exceed a certain scale or change ground levels significantly, as specified in a performance standard.

The DCC has engaged a consultant to assist in identifying appropriate thresholds beyond which earthworks will not be permitted, but would require resource consent. This work is likely to be completed in August 2014, and submissions can be made on any proposed thresholds when the proposed 2GP is notified.

Limiting hazardous substances in extreme and high risk areas

Activities involving more than domestic quantities of hazardous substances may not be appropriate in hazard areas, due to the potential for contamination or risk to public health and safety in a natural hazard event.

The preferred option for the 2GP is to manage this risk by permitting the use and storage of hazardous substances at quantities normally associated with domestic use in high and extreme risk areas.

Managing fence design

Fences, and in particular solid fences, can create or exacerbate risks from floodwaters by either impeding or redirecting flood flows. The 2GP preferred approach in extreme and high risk areas at risk of flooding is to permit fences subject to compliance with a performance standard requiring fences to be designed in a manner where more than 80% of the surface will permit the unobstructed passage of water. Examples of this include post and wire fences, deer fences, and pool fences.

Managing the extent of vegetation clearance

Vegetation clearance on the banks of waterways can cause erosion which can in turn cause redirection of flood paths or land instability. In coastal areas, vegetation removal in dunes can also cause erosion which can in turn decrease the buffering capabilities of dunes from storm surge, sea level rise and tsunamis. In areas prone to land instability, vegetation clearance may increase the risk of a landslide.

The 2GP preferred option is to permit vegetation clearance in extreme and high risk areas subject to compliance with a performance standard which would limit the size of area cleared and require replanting within a certain timeframe, such as within one month.

How are other natural hazards being dealt with by the DCC?

Dunedin can be vulnerable to other natural hazards such as snow, ice, drought, strong winds and fire.

While these types of natural hazards may result in adverse effects on people and property, the 2GP is not necessarily the most appropriate means to manage them. For example, the risks from snow and strong winds are managed through application of Building Act provisions. Other mitigation measures are taken in relation to snow and ice by the DCC's Transportation Group.

Wildfires are a possibility in Dunedin. New dwellings in the rural zone must be setback from any boundary (including sites which are adjacent to forestry) by at least 40 metres. This setback distance will provide some protection to dwellings from the risks of wildfires.

The DCC will continue to compile information about these other kinds of hazards on its Hazard Register.