

B10. Ngā tūpono ki te taiao - Environmental risk

Kia o-whiti, kia mahara te ao tūroa

Vigilance and consideration of the natural environment.

B10.1. Issues

Natural hazards and climate change

Auckland's growth will increase pressure to develop areas more susceptible to natural hazards. There may be conflict between where people want to live and where they can live safely, particularly in some coastal areas. Some existing development, including infrastructure, is already located on land that may be subject to natural hazards. This needs managing to ensure that the risk is not increased.

Climate is changing, in both the short and long term. This creates significant risks, (including exacerbating natural hazards), uncertainties and challenges for Auckland. How the region manages land use in response to climate change will determine the resilience of Auckland's economy, environment, and communities in the future.

Hazardous substances

Auckland contains the largest quantities of hazardous substances of any region in New Zealand. In many instances, these are located close to residential areas and valued environmental areas such as the groundwater aquifer system, and the Waitemātā and Manukau harbours

If hazardous substances are not stored, handled, located or transported with proper care they can affect the health and safety of people working and living in these areas and the natural environment.

Contaminated land

The use of chemicals and hazardous substances in a range of industries and activities has resulted in the contamination of sites within the region.

Contamination of soil or groundwater can affect people's health and safety, limit land use, reduce land value, and degrade ecosystems.

Contaminated sites need to be identified, assessed, managed and where necessary remediated to minimise risks to public health and the environment.

Genetically modified organisms

The outdoor use of genetically modified organisms could adversely affect the environment, economy and social and cultural resources and values.

There is disagreement concerning the effects of genetically modified organisms in the environment and the level of risk of irreversible adverse effects.

There is also disagreement concerning the relationship between and demarcation of the management regimes for genetically modified organisms under the Hazardous Substances and New Organisms Act 1996 and the Resource Management Act 1991.

Given the potentially broad range of possible genetically modified organisms, the range of risks could be substantial and may be irreversible.

In these circumstances a cautious approach to managing the risks associated with the outdoor use of genetically modified organisms is appropriate.

B10.2. Natural hazards and climate change

B10.2.1. Objectives

- (1) Communities are more resilient to natural hazards and the effects of climate change.
- (2) The risks to people, property, infrastructure and the environment from natural hazards are not increased in existing developed areas.
- (3) New subdivision, use and development avoid the creation of new risks to people, property and infrastructure.
- (4) The effects of climate change on natural hazards, including effects on sea level rise and on the frequency and severity of storm events, is recognised and provided for.
- (5) The functions of natural systems, including floodplains, are protected from inappropriate subdivision, use and development.
- (6) The conveyance function of overland flow paths is maintained.

[PC 80 \(see Modifications\)](#)

B10.2.2. Policies

Identification and risk assessment

- (1) Identify areas potentially affected by natural hazards, giving priority to those at high risk of being affected, particularly in the coastal environment.
- (2) Undertake natural hazard identification and risk assessments as part of structure planning.
- (3) Ensure the potential effects of climate change are taken into account when undertaking natural hazard risk assessments.
- (4) Assess natural hazard risks:
 - (a) using the best available and up-to-date hazard information; and
 - (b) across a range of probabilities of occurrence appropriate to the hazard, including, at least, a 100-year timeframe for evaluating flooding and coastal hazards.
- (5) Manage subdivision, use and development of land subject to natural hazards based on all of the following:
 - (a) the type and severity of potential events, including the occurrence natural hazard events in combination;

[PC 80 \(see Modifications\)](#)

[PC 80 \(see Modifications\)](#)

- (b) the vulnerability of the activity to adverse effects, including the health and safety of people and communities, the resilience of property to damage and the effects on the environment; and
- (c) the cumulative effects of locating activities on land subject to natural hazards and the effects on other activities and resources.

(6) Adopt a precautionary approach to natural hazard risk assessment and management in circumstances where:

PC 80 ([see Modifications](#))

- (a) the effects of natural hazards and the extent to which climate change will exacerbate such effects are uncertain but may be significant, including the possibility of low-probability but high potential impact events; or
- (b) the level of information on the probability and/or impacts of the hazard is limited.

Management approaches

- (7) Avoid or mitigate the effects of activities in areas subject to natural hazards, such as earthworks, changes to natural and built drainage systems, vegetation clearance and new or modified structures, so that the risks of natural hazards are not increased.
- (8) Manage the location and scale of activities that are vulnerable to the adverse effects of natural hazards so that the risks of natural hazards to people and property are not increased.
- (9) Encourage activities that reduce, or do not increase, the risks posed by natural hazards, including any of the following:
 - (a) protecting and restoring natural landforms and vegetation;
 - (b) managing retreat by relocation, removal or abandonment of structures;
 - (c) replacing or modifying existing development to reduce risk without using hard protection structures;
 - (d) designing for relocatable or recoverable structures; or
 - (e) providing for low-intensity activities that are less vulnerable to the effects of relevant hazards, including modifying their design and management.
- (10) Encourage redevelopment on land subject to natural hazards to reduce existing risks and ensure no new risks are created by using a range of measures such as any of the following:
 - (a) the design and placement of buildings and structures;
 - (b) managing activities to increase their resilience to hazard events; or
 - (c) change of use to a less vulnerable activity.

Role of natural systems

- (11) Strengthen natural systems such as flood plains, vegetation and riparian margins, beaches and sand dunes in preference to using hard protection structures.

Infrastructure

- (12) Minimise the risks from natural hazards to new infrastructure which functions as a lifeline utility by:

PC 80 ([see Modifications](#))

- (a) assessing the risks from a range of natural hazard events including low probability but high potential impact events such as tsunami, earthquake and volcanic eruptions;
- (b) utilising design, location and network diversification to minimise the adverse effects on infrastructure and to minimise the adverse effects on the community from the failure of that infrastructure.

Coastal hazards

- (13) Require areas potentially affected by coastal hazards over the next 100 years to do all of the following:

PC 80 ([see Modifications](#))

- (a) avoid changes in land use that would increase the risk of adverse effects from coastal hazards;
- (b) do not increase the intensity of activities that are vulnerable to the effects of coastal hazards beyond that enabled by the Plan;
- (c) in the event of redevelopment, minimise natural hazard risks through the location and design of development; and
- (d) where it is impracticable to locate infrastructure outside of coastal hazard areas, then ensure coastal hazard risks are mitigated.

B10.3. Land – hazardous substances

B10.3.1. Objectives

- (1) The environment is protected from adverse effects associated with the storage, use, disposal and transport of hazardous substances.
- (2) The storage, use, disposal and transport of hazardous substances are provided for and the social and economic benefits of these activities are recognised.

B10.3.2. Policies

- (1) Manage the use and development of land for hazardous facilities and industrial or trade activities to avoid adverse effects on human health and the environment and remedy or mitigate these effects where they cannot be avoided.
- (2) Manage the use and development of land for hazardous facilities:

PC 80 ([see Modifications](#))

- (a) so that such facilities are resilient to the effects of natural hazards;
 - (b) to avoid, remedy or mitigate adverse effects on people and property;
 - (c) to avoid as far as practicable the contamination of air, land, and water; and
 - (d) to minimise risks caused by natural hazards.
- (3) Manage the effects associated with use and development of land for hazardous facilities by all of the following:
- (a) restricting the establishment of sensitive activities near hazardous facilities or areas identified for hazardous facilities if the activities are likely to be adversely affected by a hazardous facility or if they have the potential to limit the operation of the hazardous facility;
 - (b) ensuring new hazardous facilities are not located near sensitive activities unless significant adverse effects, including cumulative effects, are avoided and other adverse effects are mitigated; and
 - (c) providing areas for hazardous facilities away from sensitive activities so that the facilities may carry out their operations without unreasonable constraints.

B10.4. Land – contaminated

B10.4.1. Objective

- (1) Human health and the quality of air, land and water resources are protected by the identification, management and remediation of land that is contaminated.

B10.4.2. Policies

- (1) Identify land that is or may be contaminated based on:
- (a) sites known to have supported contaminating land use activities in the past;
 - (b) sites with a significant potential risk to human health; or
 - (c) sites having significant adverse effects on the environment.
- (2) Land which may be contaminated due to having supported contaminating land use activities in the past but has not been investigated will be identified as being potentially contaminated.
- (3) Manage or remediate land that is contaminated where:
- (a) the level of contamination renders the land unsuitable for its existing or proposed use; or
 - (b) the discharge of contaminants from the land is generating or is likely to generate significant adverse effects on the environment; or

(c) development or subdivision of land is proposed.

B10.5. Genetically modified organisms

B10.5.1. Objective

(1) The natural and physical resources of Auckland are protected from adverse effects of the outdoor use of genetically modified organisms.

B10.5.2. Policy

(1) Adopt a cautious approach, including adaptive responses, to the outdoor use of genetically modified organisms.

B10.6. Explanation and principal reasons for adoption

Natural hazards and climate change

Auckland is affected by a wide range of natural hazards, including:

- those that occur frequently such as flooding (coastal and freshwater) and land instability; and
- those that occur less frequently including volcano activity, tsunami, earthquakes, meteorological hazards (cyclones, tornadoes, drought) and fire.

The risk that these hazards pose is not just a reflection of the frequency of these events, rather it is made up of a number of factors including:

- the nature and likely scale of the hazard;
- the likelihood of the hazard occurring; and
- the exposure and vulnerability of the things at risk – people, buildings, infrastructure or natural resources.

Predicted changes in climate could have an effect on the environmental processes that cause natural hazard events and should be taken into account when assessing these factors.

Each of these factors needs to be considered to determine the most effective way to reduce or otherwise manage the risks from natural hazards. Some risks can be effectively managed through land use planning and are addressed through objectives, policies and rules in the Unitary Plan or under the building control regime. Some are appropriately addressed through the provision of new or upgraded infrastructure. Other risks are better managed through public education, emergency preparedness, early warnings and insurance.

Existing land use activities in areas prone to natural hazards may cause or worsen risk. New growth and intensification may also cause or worsen risk, depending on the degree to which natural hazards are avoided, mitigated or accepted during planning and development.

The objectives and policies seek to ensure adequate spatial planning to reduce the risk from natural hazards. They also seek to ensure that new development (including

infrastructure) is located and designed to deal with the impacts from hazards that may be experienced over their lifetime.

Land - hazardous substances

Industry and commercial activities (including the energy sector), farms and homes may all use, store, transport or dispose of hazardous substances, including fuels, fertilisers, agrichemicals, industrial and commercial gases, solvents, cleaners, oils and corrosive substances. Some of these activities rely on bulk storage and distribution facilities. All activities involving hazardous substances have the potential to create adverse effects if they escape into the environment, burn, explode, or react with each other. Adverse effects resulting from inadequate management or an accidental release or spill, can include contamination of water, soil and air, damage to ecosystems, human health and property.

The storage, use, disposal and transport of hazardous substances are subject to minimum performance requirements that are set by regulations under the Hazardous Substances and New Organisms Act 1996. These requirements apply regardless of circumstances such as activity and location.

Additional land use controls may also be made under the Resource Management Act 1991 for the prevention or mitigation of any adverse effects of the storage, use, disposal and transport of hazardous substances. Land use controls may manage the risk, likelihood and consequence, of adverse effects, such as those resulting from spills, fires and explosions, having regard to the site-specific circumstances of an activity.

To manage the effect of hazardous substances, the Unitary Plan focuses on the facilities and activities which use, store or dispose of hazardous substances, rather than on the substances themselves. New hazardous facilities should not be located near sensitive activities or other hazardous facilities where significant cumulative effects may occur.

Land - contaminated

Contaminated land is an area where the quality of the soil, groundwater or surface water has been compromised by human activities, usually from the manufacture, use, storage, transport and disposal of hazardous substances.

Land contamination can limit the use of land, cause corrosion that may threaten building structures, reduce land value, and directly endanger the health and safety of people through contact with contaminated soil, swallowing food or water from contaminated environments, or breathing vapours or contaminated dust.

Contaminants leaching from soil into groundwater or running off into surface water and eventually into the coastal marine area affect water quality, ecosystems and flora and fauna.

Auckland has a legacy of soil contamination from past activities including:

- use of agrichemicals;
- storage and use of petroleum products;

- timber treatment; and
- sheep-dipping.

Identification of contaminated sites is the first step in any management regime. Initial assessments conducted on behalf of the Ministry for the Environment suggest Auckland may have more than 1700 contaminated sites. This assessment has only targeted sites that are, or have been, occupied by activities historically associated with site contamination, rather than sites that have actually been confirmed as contaminated. Systematic identification of sites needs to continue.

To protect human health, the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health was issued in January 2011. This has established soil contaminant standards that protect human health for a range of land uses. It aims to identify and assess land affected by contaminants in soil when the land use changes, or the land is being subdivided, and, if necessary, require the remediation of the site or the containment of the contaminants to make the land safe for human use.

Genetically Modified Organisms

Genetic modification refers to a set of techniques that alter genetic makeup by adding, deleting or moving genes (within or between species) to produce new and different organisms. Genetically modified organisms are products of genetic modification.

The benefits and risks of genetically modified organisms are continually being redefined as biotechnology advances. However, there remains disagreement about the potential adverse effects of genetically modified organisms on natural resources and ecosystems. The risks could be substantial and certain consequences could be irreversible. Once released into the environment, most genetically modified organisms would be very difficult to eradicate. For these reasons, the activity status of genetically modified organism field trials is discretionary and that of genetically modified organisms' releases is prohibited.

The regulation of genetically modified organisms in New Zealand is under the Hazardous Substances and New Organisms Act 1996. The Hazardous Substances and New Organisms Act 1996 establishes a framework for assessment of genetically modified organisms by the Environmental Protection Authority. This Act sets minimum standards for the creation and use of genetically modified organisms and enables the Environmental Protection Authority to set additional conditions for a particular genetically modified organism.

The Council also has jurisdiction under the Resource Management Act 1991 to control discharges of contaminants and land use, including genetically modified organism field trials and genetically modified organism releases. In exercising this jurisdiction, the Council will seek to ensure that adverse effects on the environment are appropriately avoided, remedied or mitigated, including:

- to ensure that those who are using land to release genetically modified organisms are fully accountable for all costs associated with the genetically modified organism activity including taking all practicable steps to avoid unintentional contamination, and to undertake appropriate clean-up, monitoring and remediation;
- to adopt a cautious approach to the management of potential risks (economic, environmental, social and cultural) associated with the outdoor use of genetically modified organisms;
- to address cultural concerns of Mana Whenua.

The Council does not seek to foreclose potential opportunities associated with a particular genetically modified organism that could benefit the community or the area. If it became evident during field trials or in light of new information that release would be of benefit to Auckland and that potential risks can be managed satisfactorily, the status of a particular activity involving a genetically modified organism could be assessed as part of a plan change.