SECTION 32 REPORT
Natural Hazards

Te Kaunihera-ā-Rohe o Ngāmotu
New Plymouth District Council

1 Executive Summary

A wide range of natural hazards have the potential to adversely affect the New Plymouth District. These include flooding, coastal erosion and inundation, slope instability, earthquakes and volcanic eruptions.

The Operative District Plan identifies flood hazards, volcanic and fault hazards, and coastal hazards on the planning maps. It regulates buildings, structures, earthworks, establishment of hazardous facilities, and subdivision of land in these areas within the Overlays section of the plan. Land instability is addressed within the rules for each Environment Area.

Although the number of resource consents granted under the natural hazards rules is quite low, managing the significant risks from hazards is a very important function of the Council. Failure to avoid or mitigate the risks is failure to protect people, property and the environment, which does not provide for the social, economic, or health and safety of the community.

Over the life of the Operative District Plan the following implementation issues with the current approach to managing Natural Hazards have been identified:

- A need to review the approach to ponding areas, due to stormwater management improvements resolving the flooding issues in a number of locations.
- The earthworks provisions to address land instability are difficult to interpret and administer.
- Coastal hazards data is out-of-date.

In general, the Proposed District Plan aims to provide stronger direction in terms of activities in hazard areas, including indicating where avoiding activities is appropriate. The key changes introduced to address the risks associated with Natural Hazards are:

- Introduction of a risk-based approach for existing development and infrastructure, and a risk reduction approach to new development (including avoidance where appropriate).
- An activities-based approach to avoiding increases in the number of people exposed to risk, and to avoid more vulnerable and less mobile people establishing new activities in hazard-prone areas.

The Proposed District Plan provisions will reduce the potential for risks to people's health and safety and avoid exposure of increased numbers of people to risks related to Natural Hazards.

2 Introduction and Purpose

This report contains a summary Section 32 evaluation of the objectives, policies and methods in relation to the Natural Hazards chapter of the Proposed New Plymouth District Plan. It is important to read this report in conjunction with the Section 32 Overview Report which contains further information and evaluation about the overall approach and direction of the District Plan review and Proposed District Plan.

The New Plymouth District is subject to a range of natural hazards, and people in the district live and own property in areas susceptible to their effects. Effective planning for and management of natural hazards reduces the negative impacts of natural hazards on people, property and other aspects of the environment. A key focus of natural hazard planning is risk reduction. By identifying significant risks, the Council aims to ensure communities can make well informed and active decisions about the risks they are prepared to carry. Through the District Plan, the Council also takes steps to eliminate these risks where practicable or otherwise reduce the likelihood and magnitude of their impact.

The Proposed District Plan takes a flexible, risk-based approach to existing development and infrastructure, and a risk reduction approach to new development within identified hazard areas (including avoidance where appropriate). The Plan also advocates an adaptive management approach to manage hazards and the effects of climate change. Not all natural hazards as defined in the RMA are significant in the New Plymouth District; therefore it is not appropriate or necessary for the District Plan to manage all natural hazards. The Natural Hazards chapter and this report detail management of risks that present the greatest risk to the district in terms of likelihood and consequence, as follows:

1. Flood Plain Areas (specifically the lower Waitara and lower Waiwhakaiho Rivers).
2. Flood Detention Areas/Spillways (areas designed to contain floodwaters).
3. Stormwater Flooding Areas (including surface stormwater flooding and overland flows).
4. Fault Hazard Areas (Inglewood and Norfolk fault lines).
5. Volcanic Hazard Areas (particularly areas at high risk of lahars and associated flooding).
6. Land Instability (through Earthworks and Coastal Environment provisions).
7. Coastal Flooding Hazard Areas (through Coastal Environment provisions).
8. Coastal Erosion Hazard Areas (through Coastal Environment provisions).

The Proposed Plan does not include identification and management of the following potential hazards, for reasons outlined in this report: tsunami; liquefaction; sedimentation; high winds; tornadoes; drought and fire. Effects of these risks may be considered in future planning applications such as plan changes and resource consents, including subdivision assessments under Section 106 of the RMA.

Civil Defence Emergency Management (CDEM) also plays a role in hazard management. The effects of risks from events with low probability but potentially high impact (such as eruptions, tsunami and earthquakes) are better addressed through CDEM measures. The Council also has functions under the Building Act 2004 in relation to hazard management, including regulating buildings in wind zones and building on land subject to natural hazards.

The Council uses the best information available in relation to natural hazards. However the quality and detail of information varies and NPDC is working to gather, assess and refine information so that subdivision, use and development can be well managed. The Council expects management of natural hazard risks to have increased focus in the coming decades, particularly as the uncertainties around the effects of climate change become better understood by territorial authorities and their communities.

This report outlines the planning provisions relevant to Hazards 1-5 above with a focus on:

- Identification and mapping of natural hazards.
- Managing activities to minimise risk.

It provides an overview of the statutory and policy context, sets out the trends and issues, and summarises specific consultation carried out. It also includes a review of the existing plan provisions and evaluation of alternatives to arrive at recommendations for the most appropriate way(s) to achieve the purpose of the Resource Management Act 1991 (RMA) in relation to natural hazards.

Coastal Hazards risks such as Coastal Flooding and Erosion (7 and 8 above) are addressed in the Coastal Environment chapter and related Section 32 Report. Land Instability will be addressed in the Earthworks chapter and summary Earthworks Section 32 Report.

3 Statutory and Policy Context

3.1 Resource Management Act

The Resource Management Act (RMA) sets out the functions of regional councils under Section 30, and the functions of territorial authorities under Section 31. The RMA requires the Council, along with the Taranaki Regional Council (TRC), to control any actual or potential effects of the use, development, or protection of land for the purpose of the avoidance or mitigation of natural hazards.

In undertaking its functions, the RMA requires NPDC to recognise and provide for the management of significant risks from natural hazards as a matter of national importance (Section 6). It also requires NPDC to have particular regard to the maintenance and enhancement of the quality of the environment, and the effects of climate change (Section 7). Section 106 requires the consideration for all risks from natural hazards in subdivision consent applications, and the Council has the ability to refuse subdivision consent if there is significant risk from natural hazards.

The RMA also states that district plans must give effect to the New Zealand Coastal Policy Statement (NZCPS) and the TRC's Regional Policy Statement.

These functions essentially direct Council to consider how future development may be impacted by natural hazards (including those intensified by climate change) while also avoiding or mitigating natural hazards by recognising that inappropriate land use and development can exacerbate natural hazards and put more people and properties at risk. These matters are relevant when considering natural hazards issues in the District Plan Review.

The RMA, particularly sections 6 and 106, and the NZCPS, encourage taking a risk-based approach to managing natural hazard planning and decision-making under the RMA, taking into account both the likelihood and consequences of natural hazards.

3.2 Statutory Planning Documents

3.2.1 National Planning Standards 2019

Gazetted in April 2019, the purpose of the National Planning Standards is to improve consistency in plan and policy structure, format and content.

The standards were introduced as part of the 2017 amendments to the RMA. Their development is enabled by sections 58B-58J of the RMA. They support implementation of other national direction such as national policy statements and help people to comply with the procedural principles of the RMA.

The standards outline the spatial layers that can be used in a District Plan, including zones, overlays, precincts, special controls, development areas and designations. Natural Hazards are an overlay, which is a mechanism that spatially identifies distinctive values, risks or other factors which require management in a different manner from underlying zone provisions. Natural Hazards fall under the prescribed heading of "Hazards and Risks". The planning standards specify that coastal hazards must be located in the "Coastal Environment" chapter, rather than the "Natural Hazards" chapter.

3.2.2 National Policy Statements

Section 75(3)(a) of the RMA requires that the District Plan give effect to any National Policy Statement ("NPS"). A NPS is a document prepared under the RMA to help local government decide how competing national benefits and local costs should be balanced2. Five National Policy Statements have been gazetted to date, being:

- NPS on Electricity Transmission (2008).
- NPS for Renewable Electricity Generation (2011).
- NPS for Freshwater Management (2011).
- NPS on Urban Development Capacity (2016).
- New Zealand Coastal Policy Statement (2010).

These documents have been actively considered by the District Plan Review project.

3.3 Taranaki Regional Policy Statement

The Regional Policy Statement for Taranaki 2010 (RPS) contains a suite of policies requiring the identification and management of natural hazards. Under Section 75(3)(c) of the RMA, the District Plan must give effect to the RPS. The RPS recognises the significant issues relating to reducing the risks to the community from natural hazards, particularly:

- The modifying of natural hazard processes and taking into account potential changes in the frequency and intensity of natural hazards in the future.
- The need to increase public awareness of and planning for natural hazards, to reduce the costs of natural hazard events, emergencies or disasters.

The RPS outlines the role and responsibility of the District Council to control the effects of the use, development or protection of land for the avoidance or mitigation of natural hazards. In accordance with section 62(1)(i)(i) of the RMA, NPDC is responsible for specifying the objectives, policies and methods for the control of the use of land to avoid or mitigate natural hazards, except where the control of the use of land relates to the TRC's functions under the RMA regarding:

- The coastal marine area.
- The beds of rivers, lakes and other waterbodies.

The key directions from the RPS for the District Plan are as follows:

- New subdivision, use and development should be located and designed so that the need for hazard protection works is avoided.
- Take into account the effects of climate change when planning for the avoidance and mitigation of natural hazards.
- May include methods for natural hazards such as:
  - Special hazard zones and rules.
  - Identification of natural hazards on maps and registers.
  - General building and development controls or criteria.
  - Subdivision controls.
  - Designations or other provision for public works.

3.3.1 Taranaki Regional Plans

The TRC administer the following Regional Plans:

- Regional Fresh Water Plan.
- Regional Soil Plan.
- Regional Coastal Plan.
- Regional Air Quality Plan.

Section 75(4)(b) of the RMA states that any District Plan must "not be inconsistent with" a regional plan for any matter stated in s30(1) (functions of regional councils, including the avoidance or mitigation of natural hazards). The above four plans have been considered by the District Plan Review project, and their main relevant parts in respect of natural hazards under the RMA include:

- The Regional Fresh Water Plan contains "Objective 6.6.2: To avoid, remedy or mitigate the adverse effects of flooding and erosion on land uses in floodplains". This plan controls soil disturbance activities with potential effects on natural hazards, and the use of the beds of rivers and lakes which may result in increased flood hazard as a result of placing structures, excavation and/or the removal of vegetation.
- Direction through the RPS that the management of natural hazards in respect of hazardous substances has been assigned to district councils.
- The Regional Soil Plan contains "Objective 1: To maintain and enhance the soil resource of the Taranaki region by avoiding, remedying or mitigating accelerated erosion." This plan controls vegetation disturbance over five hectares in area, on land with a slope greater than 28º.
- The Proposed Regional Coastal Plan Objective 13 relates to coastal hazard risk and public health and safety; avoidance of increasing coastal hazard or public safety risks, and natural hazard defences.

- The Regional Air Quality Plan for Taranaki contains provisions that address discharges to air, including agrichemical spraying and the burning of vegetation.

3.4 Iwi Environmental Management Plans

For the purposes of the District Plan Review, Iwi Environmental Management Plans must be taken into account under Section 74 (2A) of the RMA. The following iwi management plans have been considered:

3.4.1 Taiao, Taiora: An Iwi Environmental Management Plan for the Taranaki Iwi Rohe (2018) (lodged with Council).

- Taiao, Taiora identifies that natural hazards such as flooding and erosion are becoming an increasing threat because of climate change, likely to affect the iwi's resources and land, and their health and wellbeing. Taranaki Iwi do not support development that will result in people and structures unnecessarily put at risk in areas susceptible to natural hazards, especially coastal areas and flood prone areas. They identify that marae and pā need to be aware of natural hazards in their area to be prepared in the event of a disaster.

3.4.2 Ngāti Mutunga Iwi Environmental Management Plan (final draft provided; still under revision).

- Seeks to avoid development in natural hazard areas, and to recognise the role that natural features have in mitigating potential hazards. It anticipates storms becoming more frequent and powerful, sea level rise and increasing coastal erosion. This erosion endangers many sites of significance and may make it harder for the iwi to access mahinga kai.

3.4.3 Te Kotahitanga o Te Ātiawa, 2019, Tai Whenua, Tai Tangata, Tai Ao: Te Ātiawa Iwi Environmental Management Plan (draft provided; still under revision).

- Considers the impacts of climate change.

3.4.4 The Maniapoto Iwi Environmental Management Plan (Ko Tā Maniapoto Mahere Taiao) (2016). Still under revision.

- "Part 13.0 – Climate Change" and "Part 20.0 – Natural Hazards" of this plan identify a number of issues and contain a number of objectives and policies relating to land use activities, preparedness and resilience.

3.4.5 Te Korowai o Nga Ruahine – Strategic Plan 2040.

- Includes self-resilience, kaitiakitanga, and ensuring whānau have healthy, self-sufficient and sustainable homes.

3.5 Other Legislation and Policy Documents

3.5.1 Building Act 2004

In addition to the RMA responsibilities, District Councils also have responsibilities relating to natural hazards under the Building Act 2004. In the Building Act, a Natural Hazard includes "erosion (including coastal erosion, bank erosion, and sheet erosion), falling debris (including soil, rock, snow, and ice), subsidence, inundation (including

flooding, overland flow, storm surge, tidal effects, and ponding), and slippage" which differs slights from the RMA definition.

Section 71(1) of the Building Act requires councils to refuse a building consent for building work if the land is subject to one or more natural hazards, or if the building work will accelerate or worsen the adverse effects because of the natural hazard on that land or other property. However, section 71(2) need not apply if an applicant can satisfy the Council that the land and building will be protected from the hazard. In these cases, under Section 72 of the Building Act, where the Council issues a building consent for building work on land subject to a natural hazard, it must impose a condition on the building consent and notify the Director-General of Land, resulting in a notation being placed on the Certificate of Title that the hazards exist. This process ensures Councils are indemnified of liability when granting consent to build on land subject to a natural hazard.

The Building Act also requires new buildings to meet the performance requirements of the Building Code (these requirements are designed to protect against certain hazards (ground shaking and flooding)). In addition, the Building Act also includes provisions in relation to earthquake-prone buildings (sections 122- 132A). Those provisions provide a threshold to define whether an existing building is earthquake prone and provide the Council with the power to require owners to reduce or remove the danger their earthquake-prone building presents. Councils are required to develop an earthquake-prone building policy setting out how they will exercise the various powers available to them.

3.5.2 Civil Defence Emergency Management Act 2002

The Civil Defence Emergency Management Act 2002 is based on reduction of risk, readiness for an event, response when an event occurs, and recovery post event (the "four Rs"). This Act puts in place the framework for action pre and post a natural hazard event, and complements the responsibilities in other legislation. A key feature of implementing this Act is the establishment of Civil Defence Emergency Management (CDEM) groups in each region with representatives from the Regional Council, District Council, Police, Fire Serve and Health Services.

3.5.3 Local Government and Official Information and Meetings Act 1987

Under the Local Government and Official Information and Meetings Act 1987 (LGOIMA), District Councils are obligated to issue Land Information Memoranda (LIM) on request. A LIM must include information known to the District Council on (amongst other things) the potential erosion, avulsion, falling debris, subsidence, slippage, alluvion, or inundation related to the site.

3.5.4 Local Government Act 2002

Under the Local Government Act 2002 (LGA 2002) District Councils must have particular regard to the contribution that the core service of "the avoidance or mitigation of natural hazards" make to their communities. In preparing its Long Term Plan (LTP), the District Council plans its activities (expenditure) over a 10 year planning horizon. This includes financial strategies for asset management planning (i.e. what the expected capital expenditure for network infrastructure, flood protection and flood control works is to maintain existing levels of service). Through the LTP and asset management planning process, the Council decides what level of natural hazard protection their assets are to provide (in the case of flood protection and erosion

control works) or what level of event they are to withstand (in the case of network infrastructure).

3.6 Local Policies, Plans and Strategies

3.6.1 New Plymouth District Strategic Framework

The vision for the New Plymouth Strategic Framework is Building a Lifestyle capital (He Whakatutu Haupu Rawa Hei Ahua Noho). The community outcomes this will achieve are: Putting people first (Aroha kit e Tangata), Caring for our place (Manaaki whenua, manaaki tangata, haere whakamua) and Supporting a prosperous community (Awhi mai, Wahi atu, tatou katoa).

3.6.2 The New Plymouth District Blueprint

First adopted in June 2015, the Blueprint is a 30-year spatial plan that provides eight key directions for Council. The relevant part of the Blueprint relating to natural hazards is:

- Citizens: Enable engaged and resilient citizens.

The District Plan is a key tool with respect of natural hazards to reduce vulnerability risk, to increase the communities' resilience to disasters and the effects of disasters, and to encourage connectedness and well-being.

3.6.3 New Plymouth District Council 10 Year Plan 2018-2028

The 10 Year Plan notes "Climate change, and the hazards and weather extremes that come with it, will continue to pose challenges for our communities and the infrastructure that supports them. Resilience planning and infrastructure investment over the next 10 years will provide us with the opportunity to lay the foundations for our future responses to climate change related events."[1]

A guiding theme within the Infrastructure Strategy section of the 10 Year Plan is the district's resilience. The Infrastructure Strategy includes adequate provision for stormwater and flood protection services that safeguard life, property and public health, particularly at times of extreme rainfall events, and it identifies climate change projections and what this might mean for the district.[2]

3.6.4 Regional Economic Development – Tapuae Roa

Tapuae Roa–Make Way for Taranaki: Taranaki Regional Economic Development Strategy, August 2017 (Tapuae Roa) is a culmination of work undertaken by the district councils and regional council of Taranaki in partnership with Ngā Iwi o Taranaki. It is designed to feed into the Long-Term Plans of all the councils in the region, and influence public and private sector investment decision-making on future activities.

Tapuae Roa identifies the values of environmental sustainability, preparedness for future generations, liveability and resilience.

[1] New Plymouth District Council 10 Year Plan 2018-2028, p8
[2] New Plymouth District Council 10 Year Plan 2018-2008: Infrastructure Strategy, p52-56

3.6.5 Civil Defence Emergency Group Plan for Taranaki 2012

This Plan sets out the strategic direction that the CDEM Group and wider community will take to ensure the effective and efficient management of hazards and risk within the Taranaki Region, to provide a resilient and secure regional community. This plan directs District Councils to incorporate knowledge about natural hazards risks into land use planning decisions, such as the District Plan.

3.6.6 Land Development and Subdivision Infrastructure Standard

This is the key technical standard that is applied when new infrastructure assets are constructed and existing infrastructure assets are upgraded. As the Council's adopted standard it is applied through the Operative New Plymouth District Plan. This standard has been developed for use in both the New Plymouth District and South Taranaki District and more recently Stratford District Council.

The Council adopted Land Development and Subdivision Infrastructure Standard based on NZS4404:2010 (Amended 2019) with local amendments, sets out the minimum standards of technical performance and quality for the subdivision and development of land and infrastructure. Section 4.3.5.2 establishes minimum freeboard height requirements, computed above the 1% AEP flood heights for habitable buildings and other buildings.

3.6.7 New Plymouth District Council Bylaw 2008 Part 14

Under the New Plymouth District Council Bylaw 2008 Part 14: Water, Wastewater and Stormwater Services[3] the Council provides stormwater services in accordance with the level of service contained in the Council's Long-Term Plan and NZS4404:2010.

Section 11.2 of this Bylaw relates to flow paths, and is a regulatory tool for the Council to ensure primary or secondary flow paths are not blocked.

4 Context, Research and Trends

4.1 Operative District Plan Approach

4.1.1 Context

The Operative District Plan contains a specific 'management strategy' for natural hazards, which identifies a range or natural hazards with the potential to adversely affect the New Plymouth District; flooding and river bank erosion, coastal erosion and inundation, slope instability, earthquakes and volcanic eruption. The Management Strategy addresses these hazards under Natural Hazards, Issue 12: Actual and potential adverse effects of natural hazards on people, property and the environment. For the most part these hazards are identified on the planning maps as overlays and have associated rules.

4.1.2 Plan Changes

Since the District Plan became operative in 2006, no plan changes relating to natural hazards have been proposed. However, natural hazards have been considered within zoning change plan changes, such as:

[3] as amended and readopted, September 2014

- PLC10/00025 which updated the ponding area and flood detention areas and spillways overlays in the rezoned area in the vicinity of the Mangaotuku Stream (Cowling Road, Tukapa Street and Frankley Road area in New Plymouth); and
- PLC08/00007 which related to zoning of land in Waitara including land used for flood protection purposes.

4.1.3 Operative District Plan Provisions

Management Strategy
The Operative District Plan contains the following relevant 'Management Strategy' for natural hazards.

Issue 12: Actual and potential adverse effects of natural hazards on people, property and the environment.

Objective 12: To avoid or mitigate any actual or potential adverse effects of natural hazards on people, property and the environment.

Policy 12.1: Subdivision, land use and development should be designed and located to avoid or mitigate the adverse effects of natural hazards on human life, property, infrastructure and the environment.

Policy 12.2: The ability of natural features and systems to provide a defence against natural hazards should be recognised and the integrity of these features and systems protected where appropriate.

Issue 13: Aggravation of natural hazard events by inappropriate land use practices and activities.

Objective 13: To ensure that land use activities do not increase the likelihood or magnitude of natural hazard events.

Policy 13.1: Subdivision, development and other land uses should not result in aggravation of natural hazards.

Policy 13.2: Works designed to protect infrastructure, development, land and other assets from natural hazards will only be allowed where they are the best practicable option and should be designed and located so as to avoid adverse effects on other environmental values.

The operative District Plan identifies and maps the following "hazard areas":

- Flood hazards; Ponding Areas, Flood Detention Areas, Spillways and Flood Plains (lower Waitara and Waiwhakaiho Rivers).
- Inglewood and Norfolk Fault Lines.
- Coastal Hazard Area.
- Volcanic Hazard (high risk areas for lahars and associated flooding).

Within these mapped areas, with the exception of the Volcanic Hazard, rules apply to the erection of structures and buildings, earthworks, establishment of hazardous facilities, clearance of vegetation and subdivision. Within the Volcanic Hazard areas restrictions only apply to the establishment of hazardous facilities.

Rules

The following rules apply in the Operative District Plan, to the hazards relevant to this report:

Fault line:
OL23 - erection of a communication facility; of pipelines for the distribution or transmission of natural or manufactured gas, petroleum or geothermal energy; or of transformers, lines and necessary associated equipment for conveying electricity on or within 20m of a fault line.
OL24 - erection of buildings on or within 20m of a fault line.
OL25 & OL26 – establishment of hazardous facilities.
OL27 – subdivision of land.

Flood hazard:
OL28 - erection of structures (includes buildings) within a flood detention area or spillway.
OL29 - erection of structures (includes buildings) within a ponding area.
OL30 – excavation and filling within a flood detention area or spillway.
OL31 – excavation and filling within a ponding area.
OL32 - establishment of hazardous facilities within an identified ponding area, flood detention area, spillway or flood plain.
OL33 - subdivision of land.

Volcanic hazard:
OL80 - establishment of hazardous facilities.

Activities close to rural watercourses:
For activities in close proximity to rural watercourses, rules apply to the erection of structures or excavation and filling within 6m of the bank of any watercourse or within 3m above the normal level in water flow of any such watercourse.

The relevant rules are Rur4, Rur5, Rur60 and Rur61, and they require that structures or earthworks that do not create a barrier to flood flows or reduce the capacity of the area to contain stormwater, and do not redirect flood onto, or increase the impact of the flood event on, another property.

These rules refer to Diagram 10.2 in Appendix 10: Natural Hazards (discussed in more detail in the Section 32 summary report for waterbodies).

Planning Maps and definitions

Fault Line Hazard overlay
The operative District Plan management approach to the risk of earthquakes includes mapping the only known fault lines (Inglewood and Norfolk faults), shown on the planning maps with an approximate line and relying on a 20m or 30m buffer (depending on the rule) either side of the mapped line.

Fault Line is defined in the operative plan as *"a fracture in the earth's crust resulting in relative displacement of the ground on either side of it and in the context of this plan refers to the Inglewood fault and the Norfolk fault as identified on the planning maps"*.

Flooding Hazard overlays

The operative District Plan addresses flooding with three flood hazard overlays, identified on the planning maps as H2a-c, and defined in the plan as follows:

H2a – *Flood Detention Areas & Spillways*

- FLOOD DETENTION AREA means any property or part thereof specifically designated to contain floodwaters in the 1% ANNUAL EXCEEDENCE PROBABILITY (100-year return) rainfall event, and is identified on the planning maps as FLOOD DETENTION AREA.
- SPILLWAY means any property or part thereof specifically designated as the spill route for a flood detention dam in a probable maximum precipitation rainfall event, and is identified on the planning maps as FLOOD DETENTION AREA.

H2b – *Ponding Areas*

- PONDING AREA means any property or part thereof identified as filling with floodwater in the 1% ANNUAL EXCEEDENCE PROBABILITY (100- year return) rainfall event, and is identified on the planning maps as a PONDING AREA.

H2c – *Flood Plain*

- FLOOD PLAIN means that area of land likely to be covered by water in the event that the stopbanks of the lower Waitara River or the lower Waiwhakaiho River flood control schemes are breached and is identified on the planning maps as FLOOD PLAIN.

Volcanic Hazard overlay

The only volcanic hazard the operative District Plan seeks to manage the risks of is along the likely lahar flows, identified on the planning maps as H3, and with one rule (OL80) applying to the establishment of hazardous facilities. The following definition is contained in the operative plan:

Volcanic Hazard Area is defined in the Operative Plan as *"that area around Mount Taranaki/ Egmont where the COUNCIL considers it is appropriate to control activities to avoid the adverse effects of a volcanic eruption, and identified on the planning maps as VOLCANIC HAZARD AREA. The volcanic hazard information mapped is based on the highest risk hazard zone (lahars and associated floods)."*

Land instability

In addition to mapped hazards, the Council under the operative plan often requires hazard assessments under the subdivision and earthworks rules, to be carried out by suitably qualified professionals for building and development on steep slopes, and for development in all environment areas, and within the 6m building setback from water courses in rural areas.

4.2 Other Methods

The Council also applies a number of other methods to manage the risk of natural hazards. These include:

- The use of Section 73 of the Building Act in relation to the construction of buildings within identified hazard areas.
- Placing any known hazard information, including in relation to the locations of overland flow paths (which are not currently addressed in the District Plan) on LIMs and PIMs.

- Education and community conservation efforts, such as in relation to the retention of coastal dunes as a natural barrier against coastal erosion.
- Supporting a Civil Defence response for hazards such as fire, tsunami, hurricanes, flooding, windstorms and any other hazards requiring a response.

4.3 State of the Environment

A wide range of natural hazards have the potential to adversely affect the New Plymouth District. These include flooding, coastal erosion and inundation, tsunami, slope instability, earthquakes and volcanic eruptions.

4.3.1 Flood Hazard

Flooding has occurred throughout New Plymouth's history. Because of its proximity to Mt Taranaki and the Pouakai Ranges, our district can experience some of the highest intensity rainfall in New Zealand. The impacts of flooding in New Plymouth District are usually within defined and specific areas; widespread areas are not considered to be susceptible to flooding. The greatest flood risk is associated with the major river systems, and localised flooding or ponding occurs during and following high and intensive rainfall events which exceed the capacity of overland flow paths and stormwater systems.

Flooding is one of the most expensive and common hazards in the district. Taranaki is prone to high rainfall and also storms, particularly northerly cyclonic storms, which periodically cause localized flooding problems. Although the numerous waterways in the district are relatively small in size and length and our flood plains are small, high rainfall results in frequent high flows. The Regional Council has primary responsibility for flood prevention and damage, and TRC owns and maintains flood protection schemes on the Waiwhakaiho and Waitara Rivers. Once floodwaters enter a watercourse constructed as part of a storm water system, however, they become the responsibility of the NPDC. NPDC controls and manages stormwater infrastructure including the New Plymouth detention dam scheme.[4]

Urban New Plymouth

As New Plymouth and surrounding urban areas have grown, development within the stream catchments has meant that business and residential properties are exposed to flooding during extreme rainfall events. New Plymouth experienced major floods in 1935, the 1970s and the 1980s.

The largest flood was in 1971 when 290mm of rain fell in 24 hours. Several shop windows in Devon Street had to be smashed by civil defence workers to relieve pressure inside the buildings - goods were then swept into the street by the floodwaters. Homes and businesses were ruined and shops incurred hundreds of thousands of dollars in damage.

In the 1980s three major earth flood protection dams were built on the Huatoki, Waimea and Mangaotuku streams to detain flood flows and to limit the flows into the central business district of New Plymouth. Since that time additional flood diversion tunnels and earth detention bunds (smaller than dams) have been constructed as part of the city's flood protection scheme. New Plymouth's flood protection network includes

[4] Civil Defence Emergency Management Group Plan for Taranaki 2018-2023, p79.

three major detention dams (Huatoki, Mangaotuku and Waimea) and two tributary detention dams (Huatoki and Fernleigh streets) along with culverts and diversion tunnels within the developed area.

The excess water, which previously would have flooded inner city areas, is detained by the dams. While ponding may still occur on some properties after heaving rainfall, our flood protection network means that water should not well up above the habitable floor level. For example, in 1990 rainfall equivalent to that experienced in the 1971 flood caused widespread flooding elsewhere in Taranaki. However, flood flows in New Plymouth were controlled by the dam system, with no flood damage to the central business area.

Regional Council flood protection schemes

TRC has significant flood protection schemes on the Waiwhakaiho and Waitara Rivers. The following information about these schemes is sourced from the TRC website.5 Flood control measures have also been taken along the Hangatahua (Stony) River and Kaihihi Stream, Okato in the 1990s, consisting of guide banks, minor stopbanks, and rock lining of the riverbanks.

Waitara

Whereas events in 1965 and 1971 caused flooding of much of Waitara, the 1990 rainfall event did not inundate the town due to new defences. Additionally, new major flood control work was carried out in 1993, including realignment of the Waitara River channel. The scheme was upgraded again in a three-year project that finished in 2017, and it now offers protection against a 'one in 100-year' flood (that is, a flood that has a 1% chance of occurring in any one year). This calculation takes into account the expected effects of climate change.

The scheme consists of:

- Floodwalls and stopbanks to contain floodwater in the Waitara River channel.
- Rock lining and rock groynes on the riverbanks, to help prevent erosion that might damage the floodwalls and stopbanks.
- Floodgates to prevent floodwater travelling up stormwater pipes into the township.
- Temporary barriers for use when there is a risk of flooding.

TRC note that the Waitara scheme is now very resilient, but risk does remain that damage could occur with a very large flood.

Lower Waiwhakaiho River (The Valley)

This scheme was originally built in 1996 and 1997 following 'the big wet' in 1995 and large flooding of the Mangaone Stream. It was designed to reduce the risk of flooding of "The Valley" shopping precinct and the surrounding industrial area. It involves defences along this stream as well as the Waiwhakaiho River itself. It was upgraded in a three-year project that ended in 2013, and now offers protection against a 'one in 100-year' flood. This calculation takes into account the expected effects of climate change.

[5] https://www.trc.govt.nz/environment/hazards-and-protection/river-and-flood-control/you-and-your-river/

The scheme consists of:

- Floodwalls and stopbanks to contain floodwater in the Waiwhakaiho River and Mangaone Stream.
- Rock lining of the river and stream banks to protect them from erosion that might damage the floodwalls and stopbanks.
- Floodgates to prevent floodwater travelling up stormwater pipes into the protected area.

As with the Waitara scheme, there remains a small risk that damage could occur during a very large flood, which might compromise the level of protection afforded to The Valley.

Recent flooding events

A number of extreme weather events have impacted New Plymouth District over the life of the Operative District Plan, for example:

- Flooding in Waitara in June 2015.
- Stormwater flooding in New Plymouth city in August 2017.
- King tides and storm surges affecting Port Taranaki on 5 January 2018, followed by Ex-Cyclone Fehi at the end of January/beginning of February 2018 (coastal inundation).

Coastal inundation flooding and stormwater system flooding (caused by high intensity, localised rainfall events) are expected to increase with climate change.

Ponding

A review of the Ponding Area data found that the information currently showing on planning maps is outdated. Since 2005 the Council has had a continual work programme to improve stormwater management via the preparation and up-dating of stormwater management plans and physical works to improve stormwater management throughout the district.

This on-going programme of infrastructure improvement across the District is difficult and challenging to update on static planning maps. There have been implementation issues as the rules in the District Plan will still require resource consent even though the hazard has been mitigated.

The Council's "Stormwater Management Plan" data is held and updated on the Council's GIS system, by the Council's Infrastructure Team. This data not only includes the most up to date information about ponding hazards but also includes known information about overland flowpaths.

4.3.2 Climate change

A likely effect of climate change is the exacerbation of natural hazards. The general consensus of scientific opinion is that the world is getting warmer causing its climate to change. Global temperatures today are about 0.6 degrees celsius higher than they were in the early 1900s. At a regional level, research indicates that over the next 70-100 years, Taranaki's temperatures could be up to 3˚C warmer, the climate could be up to 20% wetter with more varied rainfall patterns, and localised flooding is likely to

become more frequent and severe. Winter rainfall in New Plymouth is projected to increase by 5 to 9 per cent by 2090.[6]

In rural areas, if extreme events such as floods and droughts become more severe and frequent, there will be increased land instability, damage and disruptions to farm operations, and associated increased costs to farmers dealing with stock losses. In urban areas, heavier rainfall may put added pressure on drainage and stormwater systems and increase flooding risks. Housing areas near river banks are likely to become more prone to floods. Roading infrastructure might need more maintenance work and new structures such as bridges may need to accommodate higher flood peaks in their design. Council's Infrastructure planning now considers climate change as an accepted requirement in hazard and planning modelling. Similarly, through the District Plan Review, where the Council has updated the science (specifically for coastal hazards), a range of climate change scenarios are included in the modelling.

Effects of climate change is now a matter which District Councils must give particular regard to under the RMA. This includes taking into account the effects of climate change in the District Plan review, by planning and preparing for the anticipated effects of climate change. It also means that decision-making on proposed subdivision and land developments should consider climate change effects; especially where those effects are likely to exacerbate natural hazards.

Inglewood and Norfolk Fault Lines

The TRC 2015 State of the Environment Report states that Taranaki is less likely to experience earthquakes than other regions due in part of the geographical distance from New Zealand's major fault lines. According to the CDEM Taranaki website:

"GNS Science calculates the annual likelihood of a magnitude 6.0 earthquake (large enough to damage buildings and move furniture) to be 5% in South Taranaki and 3% in the north. However, a large, damaging earthquake could occur at any time, and may be followed by aftershocks that continue for weeks or months.
Ruptures on the Inglewood fault have seen vertical movements of 1-2 metres whilst the Waverley fault can produce vertical movements of more than 3 metres. The likelihood of these events is described in the hazard and risk analysis as 'possible'."[7]

No new information has come to light to indicate that the risk of seismic hazards have increased since when the current operative District Plan was made operative in 2005. CDEM (October 2018) Taranaki Lifelines Vulnerability Study includes earthquakes as one of the main 4 hazards addressed.

4.3.3 Volcanic Hazard

According to GNS[8], Mt Taranaki eruptions began about 130,000 years ago, and large eruptions occur on average every 500 years with smaller eruptions about 90 years apart. At least 5 eruptions have involved cone collapse, creating the extensive ring plain, and huge landslides have reached as far as 40km from the cone. The mountain's eruptive material has included lava flows (reaching up to 7km from the cone),

[6] Ministry for the Environment (31/05/2018) https://www.mfe.govt.nz/climate-change/likely-impacts-of-climate-change/how-could-climate-change-affect-my-region/taranaki
[7] https://cdemtaranaki.govt.nz/taranaki-hazards/natural-hazards/earthquakes/
[8] https://www.gns.cri.nz/Home/Learning/Science-Topics/Volcanoes/New-Zealand-Volcanoes/Taranaki-Egmont

pyroclastic flows (travelling up to 15km), and tephra ranging from dust (ashfall) to bombs and blocks. The last eruptive activity was an explosive medium sized ash eruption in approximately 1755, and minor volcanic events (including the creation of a lava dome in the crater and its collapse) occurred in the 1800's. The last major eruption was around 1655. It is considered to be a "sleeping" active volcano that is likely to erupt again. Other identified volcanic hazards include lahars, debris avalanches and floods. GNS monitor the mountain for activity, using web camera and 9 seismographs.

The TRC 2015 State of the Environment Report states that *"an eruption of Mount Taranaki is potentially the most significant geological hazard the region faces. In 2008, GNS forecast the probability of an explosive eruption over the next 50 years to be 49% (a 1.5% chance in any one year). In 2013, following further research, GNS estimated the probability that Mount Taranaki will have at least one eruption in the next 50 years to be about 81% or 3% in any one year, which equates to about a 50:50 chance within 23 years. This is double the former annual probability estimates and significantly increases the risk of potential eruption. The estimated risk is also cumulative and will increase each year."*[9]

CDEM (October 2018) Taranaki Lifelines Vulnerability Study includes volcanic eruption as one of the main 4 hazards addressed.

4.3.4 Tsunami

The New Plymouth District is at low risk of susceptibility to tsunami due to the physical nature of the coast line which is predominately steep cliffs. According to a 2012 report[10], *"there are many areas along the Taranaki Coast that would only suffer very localised threat and minor damage from even the largest plausible tsunami."* However the 2012 report did conclude that low lying communities including, Tongaporutu, Urenui, Onaero and river mouths in Waitara, Bell Block, Fitzroy and Ōākura are at some risk of a tsunami.

The 2012 report was commissioned for CDEM purposes and while some mapping is available, further modelling would be required to quantify this risk to a level which is necessary to determine land use controls at the individual property level.

4.3.5 Liquefaction

A GNS 2013 study found that due in part to the Taranaki region's geology, the low earthquake risk, and that only a few coastal areas have the soil types that might liquefy, the risk of liquefaction in the District is low and restricted to a few locations such as Port Taranaki, Tongaporutu, Waitara, Onaero and Urenui. This information is currently provided by the Council on Land Information Memoranda (LIMs).

4.3.6 Effects based planning

Managing the risk of hazards includes understanding the likelihood of a hazard occurring and the consequences. The Operative District Plan has an effects based approach, which does not consider that different types of activities could potentially increase the potential for people's health and safety to be at risk from natural hazards. For example, siting a new hospital or school within an area subject to natural hazards is likely to increase the exposure to a large amount of people to natural hazard risk.

[9] Taranaki Regional Council (2015) "TARANAKI AS ONE—Taranaki Tāngata Tū Tahi, p247.
[10] Goodier, C. (2012) 'Taranaki Tsunami Inundation Analysis'; Hawke's Bay Regional Council, p23.

Fortunately the effects based plan has not seen a proliferation of significant activities locating in hazard areas (an exception is The Valley commercial development in the Waiwhakaiho Flood Plain Area).

4.3.7 Atmospheric related hazards

The New Plymouth District is subject to a number of weather related hazards including high winds, tornado, drought and fire, which are likely to become more severe and frequent as a result of climate change. As the effects of climate change are dependent on a number of complex issues, including the ability of humankind to mitigate greenhouse emissions, atmospheric hazards (except flooding) and the impact of these are not able to be quantified.

The Building Act goes some way to managing fire risk (in relation to buildings) and winds (by ensuring design is appropriate to wind zones). It is not possible to predict the locations tornados are likely to impact, to the extent that land use controls can be applied in the District Plan to avoid, remedy or mitigate tornado risk. Drought is more appropriately addressed through infrastructure planning and water allocation planning. CDEM (October 2018) Taranaki Lifelines Vulnerability Study includes severe weather as one of the main 4 hazards addressed.

4.3.8 Quantifying the risk

There are some natural hazards, as defined in the RMA, where the risk, including the likelihood and consequences are extremely problematic to quantify or map. For example, while a severe tornado occurs about once every four years in Taranaki[11], it is difficult to predict where the impact will be. For hazards likely to result in a civil defence emergency, such as a large earthquake or volcanic event, the impact could be district wide, however applying district wide responses through land use planning is likely to result in inflexibility and inefficiency for use and development.

As well as difficulties inherent in quantifying the risk of some hazard types, there are other hazards which may be quantifiable. However, there is always a cost to obtain or update the science. The RMA requirement to manage the significant risks of natural hazards requires some prioritisation of hazards in terms of the significance of the risks, and the District Plan response must consider whether the risks are quantifiable, and the cost of such quantification. It is not economically feasible to obtain new and updated science for all hazards defined in the RMA (or NZCPS) for the Proposed District Plan.

The focus for natural hazards management through the District Plan Review has been on coastal hazards (flooding and erosion) and stormwater flooding; these are identified as hazards that may pose significant risk to a large but identifiable number of people and properties; these hazards are quantifiable but the science relied on in the operative plan is outdated. The coastal hazards are assessed in detail in the Coastal Environment Section 32 Evaluation Report, and stormwater flooding ("Ponding Areas" under the operative plan) is considered later in this report.

[11] Taranaki Lifelines Vulnerability Study (October 2018)

4.3.9 Land Instability

In terms of land instability in the New Plymouth District, some areas are susceptible to landslides, and development or earthworks on steep slopes can increase the risk. An increase in rainfall as a result of climate change may also increase this risk. No scientific work has been commissioned to map the higher risk areas, but the Council does have other methods to assist management of land instability, as follows, which are further evaluated in the Earthworks Section s32 Report:

- To some extent the areas more suitable for growth have been identified through the growth planning process.
- Contours exist to inform developers and the Council as to the location of steep slopes.
- Some areas of unstable land are known to the Council and records are attached to specific properties.

To address the risk of instability a precautionary approach is proposed with an effects standard requiring that earthworks or land disturbance must not result in any instability of land or structures at or beyond the boundary of the site where the earthworks occur. In addition, resource consents are required for earthworks or buildings in close proximity to waterbodies. Technical assessments are required if a risk of instability is identified (This is addressed in the Earthworks Section 32 Evaluation Report and within the proposed provisions for earthworks).

Coastal erosion is related to land instability, and the management of this hazard is addressed in the Coastal Environment Section 32 Evaluation Report.

4.3.10 Sedimentation

TRC have primary responsibility for this natural hazard under the Regional Soil Plan and Regional Freshwater Plan.

4.3.11 Summary of risk of natural hazards

In conjunction with risk assessment work undertaken by CDEM Taranaki, the Council undertook a review of the accuracy of the information contained in the Operative District Plan.

For the following hazards no new information was available and the risk of the hazard has not anecdotally or evidentially increased since when the current District Plan was made operative in 2005. In these cases the currently mapped hazard layers were carried over into the proposed plan:

- Flood Detention Areas and Spillways
- Flood Plains (lower Waitara and Waiwhakaiho Rivers)
- Volcanic Hazard – (high risk areas which would trigger lahars and flooding).
- Inglewood and Norfolk Fault Lines

As already stated, the Ponding Areas in the operative plan are outdated and the Council has funding and intentions to continue to make stormwater improvements which will be reflected in the Stormwater Management Plans. It is considered that stormwater flooding hazards (ponding areas and overland flows) are not as efficiently and effectively managed by the District Plan as they could be, and in particular the overlay

approach to ponding areas is inappropriate as the overlay is not responsive to the most up to date information Council has on stormwater management.

Mapping updates

No new data is available for the mapping of the first three bullet pointed hazards above. However, GNS have updated their data set for fault lines and made this available at a smaller scale. The data is generally aligned to the previous version used in the Operative District Plan.

4.3.12 Resource Consent Trends/Data

As part of the District Plan Review, building consent and resource consent data was looked at to understand trends and how much development activity has been occurring in the Natural Hazards overlay areas under the Operative District Plan. Between 2008 and 2018, the number of resource consent applications for rules pertaining to the flood, fault line and volcanic hazard overlay areas is shown in Table 1 below:

Table 1: Number of Resource Consent Applications under the Natural Hazards rules of the Operative New Plymouth District Plan

Number of Resource Consent Applications - By Rule											
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Fault Line Area											
OL23 - Land Use - erection of a communication facility; energy pipelines; electricity equipment				1							
OL24 – Land Use – Erection of Buildings				4		1					
OL27 – Subdivision	1		1	1		1				1	
Flood Hazard Areas											
OL28 – Land Use - structures in a flood detention area or spillway									1		
OL29 - Land Use - structures in a ponding area	5	4	6	3	6	2	1	2	4		2
OL30 – Land Use - earthworks in a flood detention area or spillway									2		1
OL31 – Land Use – earthworks in a ponding area		1	3						2		
OL32 – Land Use – hazardous facilities in a ponding area									1		
OL33 - Subdivision	4	2	4	1	2	4	5	4	7	1	6
Volcanic Hazard											
OL80 – Land Use – hazardous facility					1		1	4	4		

Of the six Land use consents within the Fault Line Area, five were for garages or workshops or outbuildings. The sixth was for a replacement dwelling. There is therefore no evident trend of increasing the number of people living in the fault hazard, under the Operative Plan.

The majority of consents issued under the Natural Hazards rules of the Operative District Plan between 2008 and 2018 related to subdivision and the erection of

structures and buildings in Ponding Areas. This may reflect the inefficiency of the operational ponding rules. Other than this inefficiency, the statistics in Table 1 do not raise any significant trends.

Between 2008 and 2018 28 section 73 notices were issued for building consents. Many of these related to building on land subject to coastal hazards.

4.4 Effectiveness of the Operative District Plan Approach

The Operative District Plan is generally effective in avoiding, remedying and mitigating the significant risks of flooding, fault line and volcanic hazards. However, the existing plan is not efficient with regard to stormwater flooding. On occasion, the Operative Plan has also been less than effective in managing establishment of new activities in hazard areas.

Issue	Comment	Response
Issue 1: Ponding data will be regularly updated and refined over the next 5 years to reflect stormwater management.	Stormwater management introduced since the Operative Plan came into force has resolved many of the mapped ponding areas. A number of resource consents have been triggered in identified ponding areas that no longer have ponding issues. The Council's Infrastructure team maintains a Stormwater Management Plan GIS layer, which is regularly updated with more accurate data.	Adopt a flexible approach by applying rules directly to the Stormwater Management GIS layer to ensure consent is only required in the necessary areas.
Issue 2: Lack of precaution to development within hazard areas, and lack of consideration of the potential increased flood risk associated with climate change.	When resource consents are required for activities in flood hazard areas, they are typically assessed as Restricted Discretionary activities, and the assessment criteria does not specify the need to consider the effects of climate change. For Example, the Valley development at Waiwhakaiho has established in a flood plain but the activity did not trigger rules requiring consent under the Operative Plan.	Ensure provisions require consideration of climate change and its impact on flood hazards, to meet the requirements of RMA Section 6(h) and Section 7(i). Support an adaptive management approach to responding to increased hazard risks in the future.
Issue 3: Plan does not recognise that some activities are more sensitive to hazards than others. Current policy approach does not take a risk based approach as required by RMA	The policies in the Operative Plan do not asses the risk, including the likelihood and consequences of locating sensitive activities in hazard prone areas. The Operative Plan does not recognise, for example, that siting a new hospital or school within an area subject to natural hazards is likely to increase the exposure to a large number of people with reduced mobility to natural hazard risk.	Apply an activities-based approach, and a flexible risk-based approach. Take a precautionary approach to hazard sensitive activities establishing in hazard areas. Ensure resource consent process requires a robust assessment of the likelihood and consequences of hazards in relation to the nature of the activity.

4.5 Effectiveness of Other Methods

The use of Section 73 of the Building Act is seen as a highly effective method of allowing landowners to develop residential dwellings in a hazard prone area at their own risk, within specified circumstances, and the Council is indemnified of liability when granting consent to build on land subject to a natural hazard.

CDEM Taranaki plays a vital role in supporting the community in emergencies. This includes education on preparedness, ongoing research into hazards relevant to the District (such as CDEM (October 2018) Taranaki Lifelines Vulnerability Study), and responding during and after civil defence emergencies to keep people safe, effectively mitigating many of the effects of Natural Hazards.

4.6 Other Relevant Research/Documents

In December 2017 the Ministry for the Environment published the Coastal Hazards and Climate Change Guidance for Local Government. The guidance updates the scientific understanding and the legal framework relating to coastal hazards. It also introduced new material on hazard, risk and vulnerability assessments and collaborative approaches to engaging with communities. It introduced a new concept of dynamic adaptive pathways planning. This approach recognises that climate change effects vary from place to place and that decision-makers face unavoidable uncertainty about ongoing sea-level rise. In the Proposed District Plan, this adaptive management approach is also adopted with respect to flooding hazards and the uncertainty regarding climate change and increased weather events.

The research and documents used to inform the evaluation of the effectiveness of the Operative District Plan and review natural hazards provisions are listed below (and mentioned where relevant throughout this report):

- CDEM (October 2018) Taranaki Lifelines Vulnerability Study.
- Dellow, G. D.; Ries, W. 2013. 'Liquefaction hazard in the Taranaki Region', GNS Consultancy Report. 2013/57.
- Goodier, C. (2012) 'Taranaki Tsunami Inundation Analysis'; Hawke's Bay Regional Council.
- Goodier, C. (Update 2017) 'Taranaki Tsunami Inundation Analysis'; Hawke's Bay Regional Council.
- Johnston, D.; Jolly, G.; Wilson, T.; Cronin, S.; Becker, J.; Potter, S.; Steward, C. October 2011. 'Volcanic Hazard Management at Taranaki Volcano: Information Source Book', GNS Science Consultancy Report 2011/37.
- Ministry for the Environment (31/05/2018) https://www.mfe.govt.nz/climate-change/likely-impacts-of-climate-change/how-could-climate-change-affect-my-region/taranaki.
- Taranaki CDEM (October 2017) Civil Defence Emergency Management Group Plan for Taranaki 2018 – 2023.
- Taranaki CDEM (October 2018) Taranaki Lifelines Vulnerability Study.
- Taranaki Regional Council (2015) "TARANAKI AS ONE—Taranaki Tāngata Tū Tahi: State of the Environment Report 2015"

Current practice around New Zealand has been considered in respect of the topic, including review of the Auckland Unitary Plan and Kapiti Coast District Plan; both plans which have moved to a non-District Plan layer to manage some flooding hazards. South Taranaki District Council's second generation plan was also considered with respect of regional consistency.

5 Consultation

The District Plan review process included extensive consultation with key stakeholders and the local community. Refer to the General Overview Section 32 Report for details on the methods used in consultation.

Feedback from consultation to the Natural Hazards section, from consultation on the Draft District Plan 2016 and Draft Digital District Plan 2018, is summarised below.

When the Council consulted with the community, coastal hazards were contained within the Natural Hazards chapter. Many comments received on natural hazards related to coastal hazards. The following comments were received in relation to the Natural Hazards Chapter:

- Comments from Port Taranaki Limited relating to the port's activities.
- Comments from CDEM Taranaki, including statutory requirements and legislative changes, requesting a wider range of hazards be identified (including landslide and tsunami), and providing a list of known reference material.
- Comments from TRC relating to consistency between Regional and District Plans, integrated management, hard protection structures, other legislation and functions (Building Act 2004 and CDEM Act 2002), and subdivision.
- Comments from Federated Farmers relating to the practical requirements of farming.
- Comments from Department of Conservation and Nga Motu Marine Reserve Society, related to the NZCPS.
- Comments from Powerco relating to the functional requirement for infrastructure to be located in hazard areas.
- Comments from Z Energy Limited, BP Oil New Zealand Ltd and Mobil Oil NZ Ltd relating to acceptable levels of risk and activity status for rules.
- Comments from Trustpower relating to functional requirements of infrastructure providers and a definition of regionally significant infrastructure.
- 13 comments (12 from Onaero and one from Ōākura) related to coastal erosion.
- A comment from Radio New Zealand about existing network utilities in hazard areas.
- A general comment from a planning consultant about the rules relating to the expansion of existing activities which involved the use and storage of hazardous substances.
- A comment from a planning consultant regarding subdivision in hazard areas.
- A comment from Todd Energy seeking clarification of hazard areas and definitions.
- A comment from PEPANZ questioning activity status for hazardous substances in the volcanic hazard area.
- Comments from GE Free NZ, which are unclear as to how they relate to Natural Hazards as defined in the RMA or managed in the District Plan.
- Comments from Climate Justice Taranaki encouraging greater consideration of climate change.

Many of the comments received are relevant to the Coastal Environment and Hazardous Substances chapters.

5.1 Consultation with Iwi Authorities

Iwi Authorities were invited to engage throughout the review of the District Plan via a specific and mandated Ngā Kaitiaki forum. Some Iwi Authorities elected to devolve this position to hapū.

Ngā Kaitiaki provided feedback on the Draft District Plan. The comments from Ngā Kaitiaki on Natural Hazards in the Draft Plan related to:

- The cumulative effects of multiple activities on the risks associated with natural hazards.
- Support for regular review of risks posed from natural hazards, to help understand the long term effects on hazard risk or the functioning of a natural system, and support for an adaptive management approach to managing the risks of hazards.
- Ensuring that new works do not result in adverse effects on adjoining land.

6 Key Resource Management Issues

The key resource management issue for natural hazards is that there are significant risks to people, property and the environment from natural hazards.

Natural hazard risks are difficult to predict with certainty, and can be exacerbated by inappropriate land use and development. Some types of hazards may be exacerbated by climate change, can be mitigated by protections works (such as flood control schemes), and can be reduced through the protection and restoration of natural defences.

7 Proposed District Plan Provisions (Objectives, Policies and Methods/Rules)

The proposed provisions are set out in the Natural Hazards section of the Proposed District Plan. These provisions should be referred to in conjunction with this evaluation report.

7.1 Strategic Objectives

The applicability/relevance of all the proposed Strategic Objectives will need to be considered for all development proposals requiring resource consent under the Proposed District Plan. Of particular relevance to Natural Hazards provisions are the following proposed Strategic Objectives:

NE-5 A well-functioning and resilient natural environment is sustained that provides for the social, economic and cultural well-being of communities and for the needs of future generations.

NE-6 An integrated management approach is taken where land use activities impact on waterbodies and coastal environment, in collaboration with government, councils and tangata whenua.

7.2 National Planning Standards

The proposed Natural Hazards chapter aligns with the National Planning Standards by:

- Sitting beneath the "Hazards and Risks" heading, within "Part Two – District Wide Matters".
- The provisions relating to natural hazards (except coastal hazards) are located in the Natural Hazards chapter.
- The Natural Hazards chapter includes cross-references to coastal hazards provisions in the Coastal Environment chapter.
- The planning standards states if provisions relating to natural hazards are addressed (except coastal hazards), they must be located in the Natural hazards chapter and if provisions relating to hazardous substances are addressed, they must be located in a chapter titled Hazardous Substances under the Hazards and risks heading. Rules relating to significant hazardous facilities in natural hazard areas are contained in the Hazardous Substances chapter, and the Natural Hazards chapter includes cross-references to the Hazardous Substances chapter.

7.3 Management Approach

In general, the approach used in the Operative District Plan is similar to that used in the Proposed District Plan, in that Natural Hazards are identified as overlays and activities within the overlay areas are regulated in the rules. Policies, Objectives and Rules are relevant to activities within Natural Hazard areas. A difference between the Proposed Plan and the Operative Plan in that the Proposed Plan includes activities based planning.

The main changes to the existing identified hazards for the Proposed Plan are:

- Ponding will not be shown as a District Plan overlay; although it will be shown in the e-plan, it will be a non-statutory layer that may be more regularly updated and not subject to the Schedule One RMA process.
- In the Coastal Environment, the District Plan will now include the Coastal Flooding Hazard Area, separate from the Coastal Erosion Hazard Area (see the Coastal Environment Section 32 Evaluation Report).

The Natural Hazards chapter includes an overview, objectives, policies, and then rules. The rules apply to the following hazards:

- Flood Plain Area.
- Flood Detention Area/Spillway.
- Fault Hazard Area.
- Volcanic Hazard Area.
- Stormwater Flooding Area.

The Proposed Plan provides stronger direction to hazard sensitive activities, and other activities such as large scale developments and new infrastructure, proposing to locate in hazard areas. The Proposed Plan recognises that activities vary greatly in terms of the types of property or development that may be involved and number of people who are present and what their needs may be. The activities considered hazard sensitive typically involve less mobile people such as the young, elderly, or sick, and activities that include larger numbers of people.

Methods outside of the District Plan including the Building Act and emergency management of Civil Defence response were considered appropriate for the following hazards:

- Tsunami.
- Volcanic activity other than high risk lahar/flooding.
- Liquefaction.
- Drought, and high winds.

7.4 Objectives and Policies

The Objectives and Policies set a framework which seeks to recognise, avoid, remedy and mitigate the significant risks of natural hazards on the environment, people and property, by:

- Managing activities based on sensitivity to hazards, with consideration of the likelihood and consequences.
- Restricting certain activities in identified hazard areas.
- Controlling the design and location of activities to minimise exposure to risk.
- Encouraging the use of natural defences against natural hazards.
    - Requiring consideration of:
    - Technical expert inputs
    - Level of exposure of people to risk, and minimising exposure
    - Climate change
    - Cumulative effects
    - Functioning of natural systems
    - Whether activities are relocatable, should adaption be required
    - Monitoring
    - Adaptive management planning to find sustainable, long-term solutions.

7.5 Rules

The rules that apply to Natural Hazards have been refined and are more directive than in the Operative District Plan. While the rules provide for some activities to occur in hazard areas (where this is appropriate), hazard sensitive activities proposing to establish in mapped hazard areas would be assessed as a non-complying activity. Subdivision of land and network utilities in hazard areas will also need to be assessed by way of resource consent. Existing activities have existing use rights, and the Proposed Plan allows for the maintenance required to continue existing operations.

The management of any significant hazardous facility located within a hazard area identified on the planning maps is subject to the relevant objectives, policies, rules and associated effects standards contained in the Hazardous Substances chapter of this District Plan, as outlined in the Hazardous Substances Section 32 Evaluation Report.

7.5.1 Flooding hazard rules

For development in flood hazard areas, the Proposed Plan allows for some activities to occur as a permitted activity, but requires particular design considerations. Demolition and removal of, and alterations to, buildings and structures are permitted activities. New buildings are permitted in flood hazard areas where:

- Floor levels are managed (with the minimum floor level being above the flooding predicted to occur in a one percent AEP flood event, plus 500mm freeboard).
- Buildings are relocatable.
- Buildings do not impact flood water.

7.5.2 Fault hazard rules

New buildings (excluding accessory buildings) and structures (including network utilities) will require a Restricted Discretionary resource consent within the Fault Hazard Area. Building additions in this area will only trigger resource consent if the building changes result in intensified use of the site, or the number of people likely to occupy the site.

7.5.3 Volcanic hazard rules

Given the probability of volcanic activity (as outlined in Section 4.3.3 above), and the high potential impact an event could have, careful consideration has been given to what role land use planning should play in managing activities in order to limit the exposure of people, property and the environment to significant volcanic risk. Should Taranaki Maunga erupt, such an event would have widespread impacts, potentially over the entire region and beyond.

A GNS report (Johnston et.al. 2011) states:
"While some volcanic hazards cannot easily be planned for in a land-use sense (e.g. pyroclastic flows), other can. For example lahars are strongly controlled by topography and most likely flow paths can be incorporated in hazard or planning maps. As a consequence of recognising lahar hazard zones around Taranaki, these could be designated as areas of low density development (…). (…)
Policies and methods within the New Plymouth District Plan already reflect some aspects of land use planning for volcanic hazards. In particular the plan identifies "Volcanic Hazard Areas" on land use planning maps (primarily in lahar zones) (…). Few other plans across New Zealand specifically address volcanic hazards in such a way."[12]

This GNS report considers there are a range of other land use measures that can be taken to mitigate volcanic hazards, including pitched roofs so that ash slides off, ensuring water supplies are covered in the event of ash fall, siting key facilities and critical infrastructure out of hazardous areas, and others. Such additional measures to mitigate the effects of a hazard which may have district-wide impact, would require the Council of apply additional controls, which could create inflexibility and inefficiency for land use and development.

Auckland Council's approach in the Unitary Plan was that volcanic hazards cannot be addressed through land use planning and may be better addressed through measures put in place by Civil Defence. Neighbouring South Taranaki District Council also determined in their recent District Plan review that for volcanic hazards, community awareness and preparedness is likely to be a highly effective approach; no rules are contained in their District Plan, rather they rely on Section 106 of the RMA when assessing subdivision applications, and rely on CDEM measures.

[12] Johnston et.al. (2011), p35.

In weighing up volcanic hazard likelihood and risk, with flexibility and efficiency for development, and following from other second generation plans in areas with volcanic hazard risk, the Proposed District Plan does not include additional land use measures such as controls on roof pitches. However the overall new approach in the proposed plan does include increased restrictions on the siting certain of activities, particularly in respect of hazardous facilities and hazard sensitive activities.

7.6 Definitions

The Proposed Plan contains a number of definitions. Those particularly relevant to the Natural Hazards chapter are as follows:

Adaptive Pathway Approach: means the development of a planning strategy, which includes triggers and decision points to address natural hazards which may be exacerbated by climate change, such as accelerated sea level rise.

Fault Hazard Area: means a fracture in the earth's crust resulting in relative displacement of the ground either side. In the New Plymouth District this area includes land which is 20m either side of the Inglewood and Norfolk faults and is identified on planning maps as the Fault Hazard Area.

Flood Detention Area/Spillway: means any property or part thereof specifically designated to contain floodwaters in the 1 per cent annual exceedance probability (100-year return) rainfall event, and is identified on the planning maps as Flood Detention Area/Spillway.

Flood Plain Area: means any land likely to be covered by water in event that the stopbanks of the lower Waitara or lower Waiwhakaiho River flood control schemes are breached and which is identified on planning maps as a Flood Plain.

Flood Protection and Drainage Works: means buildings, structures and other activities including vegetation clearance and earthworks for the purposes of flood protection and drainage, and includes stormwater control and Hard Protection Structures.

Hard Protection Structures: means structures made up of hard materials for the purpose of stabilising or preventing erosion or flooding beyond the foreshore of the coast, and the edges of lakes or rivers.

Hazard Area: means any land identified on planning maps as:

- Faultline Hazard Area.
- Volcanic Hazard Area.
- Coastal Flooding Hazard Area.
- Coastal Erosion Hazard Area.
- Stormwater Flooding Area.
- Flood Plain Area.
- Flood Detention Area/Spillway.

Hazard Sensitive Activities: are activities that are particularly vulnerable to exposure to a significant risk of damage from one or more identified natural hazard areas, including:

- Major healthcare activities and facilities.

- Medical and health services.
- Emergency service facilities.
- Educational facilities.
- Retail activities.
- Entertainment and hospitality activities.
- Community facilities.

(Note: the above activities are also defined in the Proposed District Plan)

Operational need: is the need for a proposal or activity to traverse, locate or operate in a particular environment because of technical, logistical or operational characteristics or constraints.

Overland Flow Path: means the route along which stormwater flows overland. These routes carry water which cannot flow through the primary stormwater system (usually piped) due to the water flow exceeding the capacity of the network. It excludes permanent watercourses or intermittent rivers or streams.

Spillway: means any land specifically designated as the spill route for a flood detention dam in a probably maximum precipitation rainfall event, and which is identified on the planning maps as Flood Detention Area/Spillway.

Stormwater Flooding Area: means any property or part thereof that typically experiences surface floodwater ponding and/or overland flows in a one percent annual exceedance probability (100-year return) rainfall event. Surface floodwater ponding relates to intensive rainfall events that exceed the soil's surface infiltration rate or where the soil is saturated to the point that restricts drainage of water. On sloping land ponded floodwater will move downslope which creates surface runoff or overland flow. Stormwater Flooding Areas are identified in a non-District Plan layer of the District Plan Maps.

Volcanic Hazard Area: means land at high risk of lahars and flooding associated with a volcanic event, identified on the planning maps as Volcanic Hazard Area.

7.7 Planning maps

The following overlays will be on by default when users enter the e-Plan, will be visible on sites where they apply, being referenced in the e-Plan legend. They will also show up on the left-hand panel for any particular site that is clicked on:

- Flood Plain Area
- Flood Detention Area/Spillway
- Fault Hazard Area
- Volcanic Hazard Area

The electronic nature of the Proposed District Plan means that individual layers, including individual hazards can be turned on and off on the planning maps.

In addition, the Proposed Plan takes a different approach to Stormwater Flooding Areas (previously "Ponding Areas"). Rather than mapping these areas as an overlay, it maps them as a "non-statutory layer". This is visible on the e-Plan and like the hazard 'overlays' is able to be turned on and off, with the default to be turned off.

This approach to site hazard data on dynamic GIS layers outside of the District Plan is becoming an emerging practice within local government. Through the Proposed Auckland Unitary Plan process, the Council sought non-statutory layers to enable the early identification of likely flooding, to enable to Council to regularly update the information to ensure it is accurate (without the expense and delay associated with a plan change), and it was argued that this assisted the Council to carry out its functions and achieve the purpose of the Act. While the non-statutory layers sit outside the District Plan, they are referred to in District Plan provisions.

While there is the potential for riverbank erosion on all rivers in the District, these risks are considered less significant than the more susceptible Waitara and Waiwhakaiho Rivers. The Waterbodies chapter of the Proposed Plan includes provisions for setbacks from waterbodies, for a range of reasons including mitigation of natural hazards. All waterbodies are shown on the planning maps.

The Earthworks Section 32 Summary Evaluation Report addresses land instability as a Natural Hazard, but this is not expressed on the planning maps in any way.

8 Approach to Evaluation

Section 32(1)(a) of the RMA requires that this report contain a level of detail that corresponds with the scale and significance of the environmental, economic, social and cultural effects that are anticipated from the implementation of this proposal. Natural Hazards are potentially a high risk area for Councils, due to the important role hazards planning plays in protecting people, property and the environment from harm.

The section of the RMA requires that:

- New proposals must be examined for their appropriateness in achieving the purpose of the RMA.
- The benefits and costs, and risks of new policies and rules on the community, the economy and the environment need to be clearly identified and assessed.
- All advice received from iwi authorities and the response to the advice needs to be summarised.
- The analysis must be documented, so stakeholders and decision-makers can understand the rationale for policy choices.

8.1 Evaluation of Scale and Significance

	Minor	Low	Medium	High
Degree of change from the Operative Plan		✓		
Effects on matters of national importance			✓	
Scale of effects – geographically (local, district wide, regional, national).		✓		
Scale of effects on people (how many will be affected – single landowners, multiple landowners, neighbourhoods, the public generally, future generations?).		✓		
Scale of effects on those with specific interests, e.g., Tangata Whenua		✓		

	Minor	Low	Medium	High
Degree of policy risk – does it involve effects that have been considered implicitly or explicitly by higher order documents? Does it involve effects addressed by other standards/commonly accepted best practice?			✓	
Likelihood of increased costs or restrictions on individuals, communities or businesses.		✓		

8.2 Explanation Summary

In summary:

- The degree of change from the Operative District Plan is low. The hazards managed by the Proposed Plan are those currently managed by the Operative Plan. Compared to the Operative Plan, the Proposed Plan is more restrictive in some respects (such as specifying hazard sensitive activities and avoid their locating in hazard areas) and less restrictive in other respects (such as allowing buildings in flood areas providing certain conditions are met).
- The proposal relates to the required recognition and provision for management of the significant risks from natural hazards as a matter of national importance (Section 6). It also requires NPDC to have particular regard to the maintenance and enhancement of the quality of the environment, and the effects of climate change (Section 7). Section 106 requires the consideration for all risks from natural hazards in subdivision consent applications.
- The proposal relates to *Citizens: Enable engaged and resilient citizens"*, which is a specific key direction in the Blueprint. The District Plan is a key tool to reduce vulnerability to risk, to increase the communities' resilience to disasters, and the effects of disasters, and encouraging connectedness and well-being.
- The scale of effects on people is low, given the degree of carryover from the Operative Plan. Buildings and land affected by the proposed mapped areas are owned by private landowners who may raise concerns with the restrictions on their private property rights, and with hazards identified on their properties due to resale and insurance implications. However, the District Plan restrictions only come into effect if the landowners are proposing activities that trigger rules in the District Plan. In the majority of instances, the restrictions will have little effect on the day to day operation and function of businesses and residences. Many of the hazard areas have not changed and landowners are already aware of being within a hazard area. From a public good perspective, future generations will benefit greatly from the improved management of natural hazards.
- Tangata whenua have not identified natural hazards in the District Plan Review as a key area of interest, unlike the Coastal Environment and Waterbodies chapters, however through Nga Kaitiaki some helpful comments were made. It is also noted that Iwi Environmental Management Plans identify natural hazards and climate change as resource management issues of relevance to them.
- Overall, it is considered that the scale and significance of the proposal is medium to low. The level of detail in this report corresponds with the scale and significance of the environmental, economic and cultural effects that are anticipated from the implementation of the Natural Hazards provisions.

9 Evaluation of Objectives

Existing Objective(s)	Appropriateness to achieve the purpose of the Act
Objective 12 To avoid or mitigate any actual or potential adverse effects of natural hazards on people, property and the environment.	These objectives generally address the key resource management issues identified, the Council's position and the statutory and policy context. In particular, they address the matter of national importance in Section 6(h) of the RMA and providing for the protection, health and safety of communities, for their social, economic and cultural wellbeing (Section 5 – Sustainable Management Purpose). However, the existing objectives are not considered far reaching enough. They do not take a long-term view and do not consider climate change; therefore, fail to have particular regard to climate change, as required by Section 7(i) of the Act. The objectives are effects based and fail to acknowledge that certain activities are more vulnerable to risks, due to the nature of the activities and the people involved in particular activities. They do not identify that design and location of activities are important. It is also deficient in that there is no recognition of hazard areas in the objectives. Although 'likelihood and magnitude' is included, the objectives do not direct a risk-based approach to the management of natural hazards. The objectives do not consider the importance of functioning natural systems in providing people and property with natural defences from hazards. Therefore, the existing objectives are not considered effective in managing the effects of natural hazards or the requirements of the RMA.
Objective 13 To ensure that land use activities do not increase the likelihood or magnitude of natural hazard events.	

Proposed Objective(s)	Appropriateness to achieve the purpose of the Act
Natural Hazards Chapter NH-01 - The risks associated with natural hazards and their impact on people, property and the environment are recognised and avoided or mitigated, including the likely long-term effects of climate change. NH-02 - Activities do not create new or exacerbate existing natural hazards. NH-03 - Activities are designed and located to minimise exposure to a significant risk of damage from natural hazards. NH-04 - Natural defences against natural hazards are protected and restored.	The purpose of the RMA is to promote the sustainable management of natural and physical resources by managing the use, development and protection of natural and physical resources in a way which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety. Given some of the recent changes to the RMA and the Council's role and function in respect of natural hazards under Section 6, 7, 31, and Section 106, it is appropriate that the revised objectives include wording derived from the RMA, that the significant risks from natural hazards are managed, and that climate change is factored into this management. Objective NH-01 allows for the recognition (identification) of higher risk natural hazards, rather than a broad reference to all natural hazards. Objective NH-01 recognise that climate change could potentially increase both the frequency and magnitude of natural hazard events. Long-term planning needs to take account of expected long-term shifts and changes in climate extremes and patterns to ensure future generations are adequately prepared for predicted climate conditions, and that a precautionary approach is taken to hazard mitigation and avoidance. This is consistent with RMA Section 6(h), 7(i) and Section 31. The Proposed District Plan advocates an adaptive management approach to hazards and the effects of climate change, reflected in NH-01. Proposed objective NH-03 considers design and location, which at the rule level encourages suitable floor levels in flood areas and buildings being relocatable. At the policy level NH-P4 supports adaptive management; or dynamic adaptive pathways planning (DAPP) as encouraged by recent MfE guidance for Council's managing coastal hazards. This allows for the efficient use of the built environment while circumstances allow, but in the medium to longer term adaptation may be required to ensure communities remain safe and sustainable. The objectives are appropriate in terms of Section 5 of the RMA, which recognises that sustainable management includes meeting the economic, social and health and safety needs of people and communities, including future generations. This includes consideration of the effects management tools specified in Section 5(c), as well as the Council's function under Section 31 to avoid or mitigate natural hazards. It also seeks to deliver resilient communities where development does not result in an increase in risk to life property from natural hazards, and to sustain the physical resources of the community. Reducing the exposure of people and property to risk from natural hazard events and potential climate change will

Proposed Objective(s)	Appropriateness to achieve the purpose of the Act
	result in less impact on people and communities, and enable the natural environment to respond and adjust in a natural way, safeguarding the life supporting capacity of ecosystems. A flexible risk-based approach is considered appropriate, with a risk management approach to existing development and infrastructure, and a risk reduction approach to new development (including avoidance where appropriate). This acknowledges that some activities and people are currently lawfully established within areas potentially subject to natural hazards. It would be inefficient and inappropriate to disallow continuing (or minor expansion) of such activities. However it is prudent to avoid significantly increasing activities, the number of people, and the value of property in hazard areas. For example, an extension to an existing house is a different matter to a greenfield subdivision, or a new hospital or school proposing to locate in a hazard area. The nature and scale of activities is a consideration when planning for sustainable and safe communities. NH-02 seeks to avoid new exposure to hazard risk, and together with NH-03 recognises risk already exists, which should be managed, and not increased. Hazards can be accelerated and magnified by inappropriate land use and development. Activities can cause aggravation of slope instability, flooding and erosion through inappropriate design, construction or location. Management of land use factors that could contribute to the occurrence of natural hazards can, through appropriate standards, avoid or reduce the frequency and magnitude of risk. NH-02 and NH-03 thus respond to Section 31(b)(i) of the RMA. NH-03 seeks to maintain the safety and integrity of the built environment from natural hazards and recognises that the location and design of activities can reduce risks of natural hazards. It also seeks to ensure the safety and resilience of people and communities by minimising exposure to natural hazards. Natural hazards have the potential to not only threaten the safety of the community but also integral structural components such as roading, electricity, telecommunications etc. that are critical elements for a community to function and provide for community wellbeing, particularly in a civil defence emergency. NH-04 recognises the importance of natural processes and systems, and the role they can play in the safety and resilience of people and communities. Natural hazards are natural processes and it is only where the human environment intersects that natural hazards create issues. The objective recognises that managing what is essentially a natural process through managing the built environment should reduce the level of risk from such events for future generations. Recognising the importance of natural processes and systems also safeguards the life-supporting capacity of natural assets. (Section 5(b)).

Proposed Objective(s)	Appropriateness to achieve the purpose of the Act
	Objective NH-04 also directs that new developments sited inappropriately in relation to natural hazards are to be avoided. Attempts to control natural hazard events with protection works are expensive, may increase natural hazard effects or risks elsewhere, and they are often only short to medium term solutions. Where existing development is at risk from exacerbated natural hazards there is a need to consider whether protection works are the best practicable solution to the natural hazard problem as opposed to other options such as abandonment, relocation of existing structures and restoration of natural systems. This addresses the Section 5 principle of safeguarding life supporting ecosystems, and enables natural processes to play a role in protecting community wellbeing. The proposed objectives are considered appropriate and efficient in achieving the purpose of the Act

Evaluation of Alternative Options	Appropriateness to achieve the purpose of the Act
Retain the approach of the Operative Plan	Failure to take a risk-based approach to natural hazards fails to protect people, property and the environment from likelihood and consequences of natural hazards occurring and its impact on environment, including people and property. Not taking an activities based approach could result in activities involving larger numbers of people, and people more vulnerable to hazards, being exposed to risk. It is short sighted to ignore consideration of the long term effects of climate change and not appropriate for sustainable management. The status quo in terms of Ponding Areas is based on outdated data and modelling and is problematic for Council delivering on its role and function in managing the significant risks of stormwater flooding. It creates unnecessary inefficiencies for land development and fails to identify new known flood areas.
Remove hazard provisions from the District Plan and rely on other methods, including the Building Act and Building Code, Emergency Management/Civil Defence planning and response, infrastructure planning including physical hazard protection works	While the Council and other organisations have roles outside of the RMA to address the risks of natural hazards, and the other methods are considered effective in many ways, it is inappropriate not to include provisions in the District Plan given the roles and functions appointed to Council's under the RMA, and appointed to NPDC from the RPS. While not the sole method, land use planning is a key component in hazard management.
Summary The proposed objectives and policies set a framework that seeks to recognise, avoid, remedy and mitigate the significant risks of natural hazards on the environment, people and property by managing activities based on sensitivity to hazards, with consideration of the likelihood and consequences;	

restricting certain activities in identified hazard areas; controlling the design and location of activities to minimise exposure to risk; and encouraging the use of natural defences against natural hazards. They also require broader consideration of a wider range of issues related to hazard risks.

The proposed objectives are in accordance with the purpose and principles of the RMA, and reflect the Council's role and functions in respect of Natural Hazards. They support a long-term and manageable flexible risk-based approach, including a precautionary approach to new development and hazard sensitive activities and are aligned with best-practice throughout New Zealand.

10 Evaluation of Options to Achieve the Objectives

Options to achieve the District Plan objectives relating to Natural Hazards	Benefits	Costs	Efficiency and Effectiveness	Risks of acting/not acting
Option A: Proposed approach – Risk based approach, with both mapped hazards and catch all rules • Identify (map) areas at risk from natural hazard and apply rules requiring resource consent for development. • Carry over mapping for Flood Detention / Spillways / Flood Plains, Volcanic and Fault Line Hazards, but apply an activities based and risk management approach to provisions.	• Known properties which are prone to natural hazards are identified via maps both in the District Plan and on a non-statutory GIS layer visible on the eplan. This ensures property owners, developers and the community has access to the most up-date information about the risk of natural hazards. • Fewer resource consents required in stormwater flooding areas, due to using the most up-to-date information available and allowing	• Similar or smaller number of resource consents required, but increased costs of obtaining technical expertise to assess compliance with permitted standards, and in assessing development in hazard prone areas. • Reduced development opportunities and potential constraint on some activities for areas identified at risk from natural hazards.	• More efficient and effective in flood hazard areas, where more up to date information can be relied on, reducing the need for consents in areas where stormwater management has resolved flooding issues. • Provisions allow structures to be built subject to standards for minimum floor levels and appropriate consideration of flood waters, but requires resource consent for those not meeting these standards. Decision-makers can make	• There is no indication of significant increase in risk since the current plan became operative, in regards to Flood Detention / Spillways / Flood Plains, Volcanic and Fault Line Hazards. Therefore the mapping of these hazards may be carried over from the Operative District Plan. However, it is considered the proposed provisions that apply within these mapped areas will improve managing the risks. • The risk of not relying on the most up-to-date

• Use the regularly updated Stormwater Management Plan data as a non-statutory layer, visible on the eplan. • Have catch-all rules for earthworks because land slide hazards cannot be mapped at this time. • Take a risk reduction approach to existing activities that already exist within hazard areas. • Take a precautionary approach to new development: – Ensure subdivision only occurs when there are suitable building platforms. – Avoid hazard sensitive activities from establishing in areas prone to natural hazards. – Avoid hazardous facilities from establishing in areas prone to natural hazards.	some activities provided permitted standards are met. • Building activities in flood areas ensure floor levels are managed, flood waters are not impacted, and adaptation (relocation) can occur. • Avoiding the establishment of hazard sensitive activities in areas at risk from natural hazards will limit exposure of additional people and property to significant risk. • Avoiding hazardous facilities in hazard prone areas will reduce the risk of harm to people and the environment, in hazard events. • Clearly set out information requirements and considerations when assessing applications within hazard areas, including the need to factor in climate change.		informed decisions based on clearer provisions and quality technical information. • Having the Stormwater Flooding Area as a non-District Plan layer is considered a good approach because it means the most up-to-date information is easily accessible by the community. This enables the on-going improvement of the accuracy and reliability of our stormwater hazard data.	stormwater flooding data is that properties may be flooding or that the Proposed Plan is inefficiently triggering resource consent where stormwater issues have been resolved.

Option B: Status quo – effects based regulatory approach with Maps • Identify (map) areas at risk based on out-dated (stormwater flooding) science and information • Regulation controls effects of activities, not activities themselves • Little consideration of climate change or emphasis on long term planning	• There is no increase in the number of properties identified as being impacted by hazards. • More flexibility in what type of activities can take place in a hazard area.	• Using out-dated science means a number of properties which are potentially at risk from natural hazards are not identified. • Approach doesn't recognise that allowing hazard sensitive activities (i.e. school or hospital) to locate in an area prone to natural hazards will increase the consequences of natural hazards. • The limited consideration of climate change and the need to plan for the long term, including adaptive management could result in increased exposure of people and property to risk in the future. This could result in increased costs to the community.	• In respect of ponding areas, the status quo is ineffective because it does not include some areas known to be subject to stormwater flooding, and is inefficient because many properties are identified within the ponding overlay that are no longer considered vulnerable due to stormwater fixes. • The ponding overlay makes no provision for overland flow paths, whereas the velocity of water can create a hazard. Council has some information on this in the Stormwater Management Plans and it is ineffective to not use this information in land use planning.	• The risk of continuing the status quo in terms of ponding/stormwater flooding areas, is that this hazard is not being efficiently and effectively managed under the operative provisions (the 'overlay' mapping approach). It is considered that the Council's Infrastructure team has a robust understanding of the current stormwater flooding areas (including overland flow paths to some extent) and not using this up to date information for land use planning carries some risk.
Option C: Methods outside the District Plan (e.g. Building Act/ Code, emergency management/civil defence planning and response,	• Provides flexibility for use of land. • Sharing information increases community preparedness for a natural hazard event.	• Cost on ratepayers to fund initiatives. • Potential damage to some activities and development in natural hazard areas where the building regulations and	• While this could be efficient in the land use planning context, it is not recommended to fully rely on other methods, as this would be ineffective in	• Allowing development to occur in hazard areas is likely to have legal and financial risk. It would be a failure to meet Council's obligations under the RMA.

physical hazard protection works	• Avoid duplication of controls between Regional Council and District Councils, as well as where other legislation/ regulations may effectively address the risk.	other non-regulatory methods do not effectively avoid or mitigate the risks.	managing the significant risks of natural hazards.	
Quantification Section 32(2)(b) requires that if practicable the benefits and costs of a proposal are quantified. Given the assessment of the scale and significance of the proposed changes above it is considered that quantifying costs and benefits would add significant time and cost to the s32 evaluation processes. The evaluation in this report identifies where there may be additional cost(s), however the exact quantification of the benefits and costs discussed was not considered necessary, beneficial or practicable.				
Summary The above table has demonstrated that Option A (Proposed Approach) is the most appropriate method for managing the Natural Hazards addressed in this report. Other methods, such as the role of the Building Act and CDEM complement the proposed land use measures.				

11 Summary

This evaluation has been undertaken in accordance with Section 32 of the Act in order to identify the need, benefits and costs and the appropriateness of the proposal having regard to its effectiveness and efficiency relative to other means in achieving the purpose of the RMA. The evaluation demonstrates that this proposal is the most appropriate option as:

- It manages the significant risk of the hazards considered most likely to impact the District.
- The change to the identification of the stormwater flooding hazard, will mean that the most up to date information Council has on stormwater management can be relied upon, to better meet Council's obligations under the RMA and other legislation.
- For development in flood hazard areas, the Proposed Plan allows for some activities to occur as a permitted activity, but requires particular design considerations including the management of floor levels and buildings being relocatable, and buildings not impacting flood water. This is expected to be more efficient than the Operative Plan which has required resource consents in areas which are no longer subject to stormwater flooding.
- It recommends a risk-based approach to address the risks associated with natural hazards, an activities-based approach, and a more precautionary approach, to avoid increasing the number of people exposed to risk, and to avoid more vulnerable and less mobile people establishing new activities in hazard-prone areas.
- It ensures climate change and long term adaptation options are considered when planning activities in hazard areas.
- It protects people, property and the environment, which in turn should provide for the social, economic, or health and safety of the community.