Napier District Plan – Natural Hazard Chapter Issues and Options

District Plan Team
Napier City Council

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To whom it may concern,

RESPONSE TO NAPIER CITY COUNCIL'S NATURAL HAZARDS CHAPTER ISSUES AND OPTIONS PAPER

Thank you for the opportunity to provide a response to the Napier City Council Natural Hazards Chapter Issues and Options Paper.

This response provides an overview of the opportunities that EQC has identified for embedding a risk-based framework into natural hazard management in Napier. A risk-based framework will enable decisions to better reduce the risk to people and property from natural hazards. First, we summarise the natural hazards in Napier, followed by our responses to the issues and options questions, which includes our key recommendations for managing natural hazard risk.

In September 2021, EQC made a submission on the Napier District Plan. This submission made detailed recommendations to request that a risk-based framework was embedded within the District Plan, given the significant natural hazard risk to Napier City.

Why is EQC making this submission?

EQC is a Crown Entity responsible for providing insurance to residential property owners against the impact of natural hazards[1]. We also invest in and facilitate research and education about natural hazards, and methods of reducing and preventing natural hazard damage.

The contingent liability associated with natural hazard risk in New Zealand is high. EQC carries much of this liability on behalf of the Crown, through its provision of 'first-loss' insurance coverage. EQC therefore, has a strong interest in reducing risk from, and building resilience to, natural hazards in Aotearoa New Zealand.

EQC has an increasingly active role in cross-government efforts to build New Zealand's resilience to natural hazard events. In recent years we have also invested time in better leveraging our research,

[1] The EQC scheme insures against damage to residential buildings and land resulting from earthquakes, landslips, volcanic eruptions, hydrothermal activity, tsunamis, or natural hazard fire; and damage to residential land caused by storm or flood.

transforming it into useful tools and products, and getting it into the hands of people who can make a difference.

EQC operates in a unique position between central and local government, financial institutions, science and research institutions, and communities – and we have the ability to move between them and make connections. We have a rich source of information and data on natural hazard risks, impacts and loss modelling that can inform housing and urban development decisions. We would welcome the opportunity to use this expertise to help support the further development and implementation of the Natural Hazards Chapter of the Napier District Plan.

Natural hazards of Napier

Napier is exposed to a range of different natural hazards, including earthquake shaking, liquefaction, coastal hazards including coastal erosion and inundation, flood risk, tsunami inundation, and landslide risk. Napier has a history of natural hazard events, the largest being the 1931 earthquake which destroyed the city and the most recent being the impacts from Cyclone Gabrielle in 2023. Land use planning provides the most proactive method to manage the risks from natural hazards, for both existing and new developments.

Earthquake and Liquefaction

There are no known surface rupturing faults in urban areas in Napier, however the risk of amplification of shaking caused by an earthquake on a regional crustal fault or the Hikurangi Subduction Zone is high (Figure 1). The chance of a large magnitude earthquake on the Hikurangi Subduction zone is currently estimated as 20% within the next 50 years[2]. In Napier, the Central Business District, town centre, port, and industrial areas are built on unconsolidated estuarine sediment and reclaimed land which is very likely to amplify earthquake shaking[3]. The suburbs south of Taradale and Greenmeadow are located in a lower (but still medium-high) area for earthquake shaking amplification hazard, being built on alluvial sand and gravel.

[2] Pizer, et al, Paleotsunamis on the Southern Hikurangi Subduction Zone, New Zealand, Show Regular Recurrence of Large Subduction Earthquakes. The Seismic Record 2021;; 1 (2): 75–84.

[3] Hawke's Bay Regional Council Earthquake Hazard Analysis Program: Stage III - Evaluation of ground shaking amplification potential, Volume 1, by Hengesh, J.V., Dellow, G.D., Heron, D.W., McVerry, G.H., Stephenson, W.R., Institute of Geological and Nuclear Sciences, Client Report 40652B, June 1998.

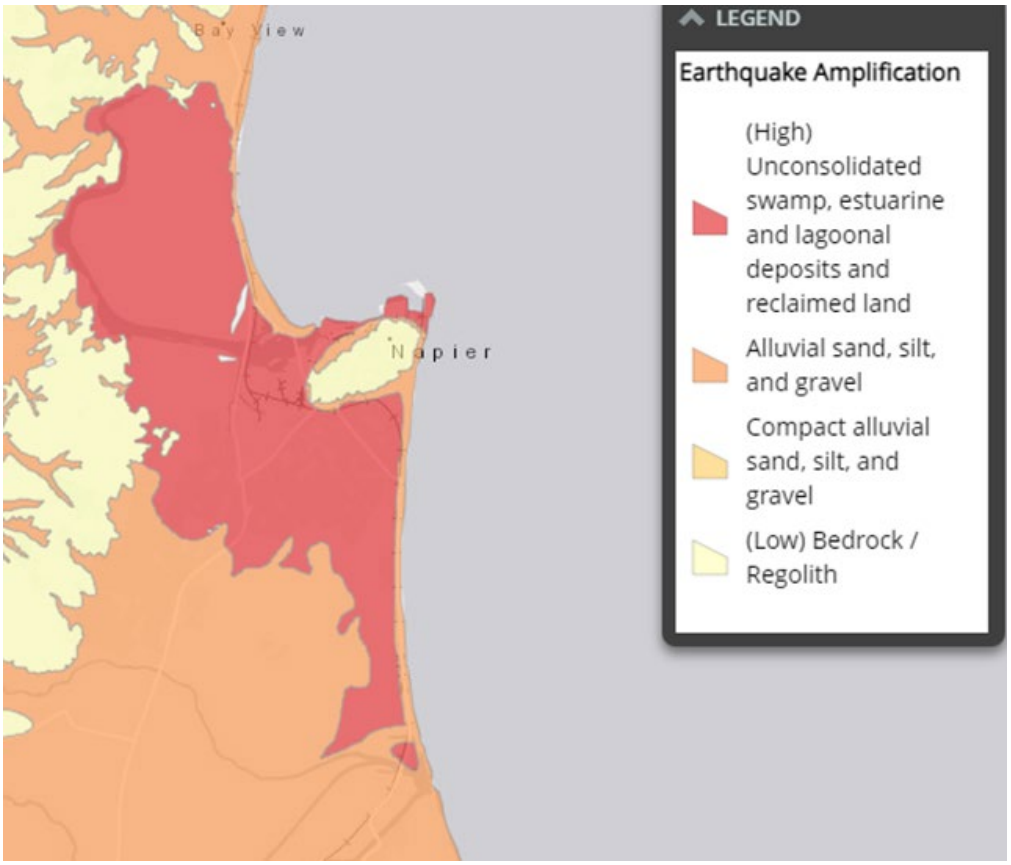


Figure 1: Earthquake shaking amplification hazard for Napier, from the Hawke's Bay Natural Hazard Portal.

Liquefaction is likely to be a significant issue for Napier. The city is largely built on highly liquefiable unconsolidated estuarine sediment and alluvial silt and sand, with the exception of Scinde Hill. As such moderate to severe liquefaction damage is likely in many areas of the city[4] (Figure 2) in the event of a large earthquake. Groundwater levels (which will be impacted by sea level rise) are a critical factor in determining liquefaction potential, along with soil type and the size of the earthquake.

[4] Rosser BJ, Dellow GD, compilers. 2017. Assessment of liquefaction risk in the Hawke's Bay Volume 1: The liquefaction hazard model. Lower Hutt (NZ): GNS Science. 108 p. (GNS Science consultancy report; 2015/186).

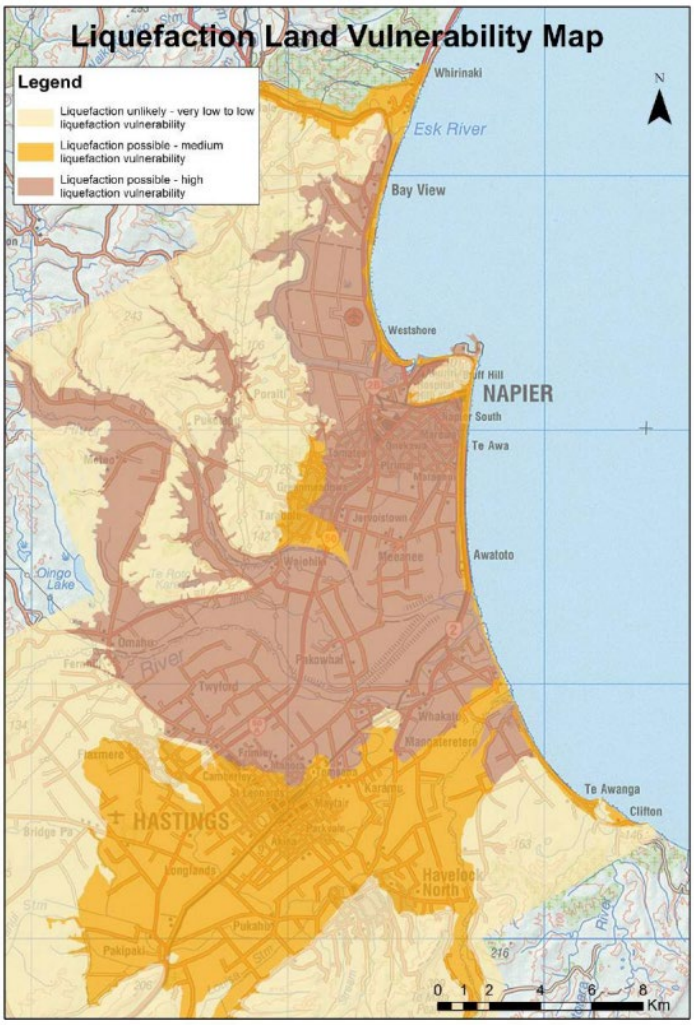


Figure 2: Liquefaction land vulnerability map showing areas of high, medium and low vulnerability (GNS Science, 2007, p87).

EQC analysis of insurance claims from the Canterbury Earthquake Sequence shows that while liquefaction damage claims only amounted to around 15% of all claims (Figure 3), they accounted for approximately 55% of the total losses, which means that while fewer properties were affected by liquefaction than ground shaking alone, they suffered significant damage where it was present. This suggests that the **biggest determinant of loss was therefore not so much *how* a structure was built, but *where* it was built**. Properties sited on land subject to the highest cumulative hazard, usually ground shaking plus liquefaction, or ground shaking plus topographic amplification in the case of the Port Hills, suffered the highest losses.

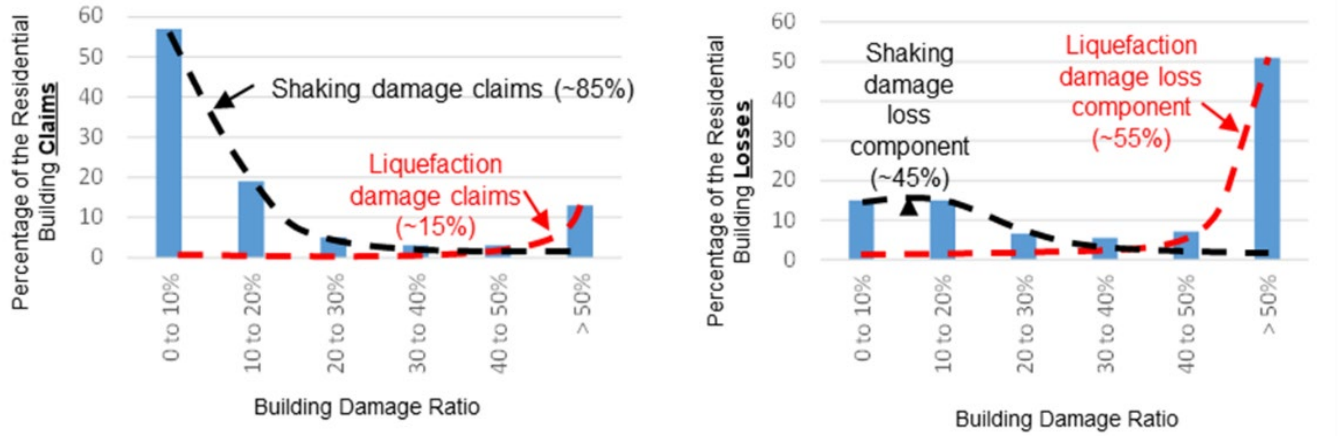


Figure 3: EQCover Claims showing the percentage of residential building claims (left) and percentage of residential building losses (right) for liquefaction and shaking damage during the 2010 to 2011 Canterbury Earthquake Sequence.

Because of the high levels of earthquake shaking and liquefaction risk in Napier***, EQC strongly recommends that earthquake shaking hazard is managed within the District Plan and not just through the Building Act*** as is stated on Page 1 of the Issues and Options Paper.

There are a range of planning options available to manage earthquake and liquefaction within the District Plan. The soil in both mapped shaking amplification areas is classified as equally liquifiable, however, lower amplification of shaking may correspond to less intense liquefaction of those soils. As such discouraging development of hazard sensitive activities and infrastructure in the area with higher shaking amplification hazard may reduce the risk of the structure being severely impacted by liquefaction. There is an opportunity for the district plan to also require infrastructure and subdivision consents to have pre-event land use plans for earthquake shaking and liquefaction (i.e. what planning process(es) would need to change to enable a faster recovery?). EQC are currently working on guidance to support the creation of pre-event recovery plans. This type of planning can result in potential issues being addressed before an event occurs and a faster recovery after an event[5].

Slope Instability (Landslide)

There is limited modelled hazard information for slope instability and landslide hazard in Napier city. However, EQC claims information can be used as a proxy for landslide hazard. Figure 4 shows EQCover claims from 1997 to 2021 by event type. The distribution of claims shows a similar density of earthquake related claims, but much higher density of landslide, storm and flood claims on the hill Mataruahou (known variously as Scinde Hill, Bluff Hill, Napier Hill and Hospital Hill), totalling 755 claims, as opposed to the flat areas of the city. This indicates that high frequency, lower consequence natural hazards events like flooding and landslides are much more common on Mataruahou than the rest of the urban areas of Napier.

[5] Becker et al., 2008: Pre-event recovery planning for land-use in New Zealand: An updated methodology. *GNS Science Report 2008/11*

EQC recommends that slope instability hazard on Mataruahou is mapped and managed within the District Plan, where it is included within multi hazard risk assessments and risk tolerance assessments[6]. Mataruahou is the only place in Napier that is outside of other hazard zones such as tsunami, liquefaction, flooding, coastal inundation, and high earthquake shaking amplification zones, so risk tolerance assessment is necessary to determine how acceptable landslide risk is to the community is in contrast to other hazards.

Risk tolerance is our willingness to bear a risk and will vary according to a range of factors including culture, prior exposure. Understanding our level of risk tolerance can influence the ways potential hazard impacts are managed by acknowledging how they could affect the things we value. EQC has developed a methodology for assessing risk tolerance[7], which includes considering the timeframe the level of risk will be present for, what is being impacted and to what extent, and who will bear the consequence of the risk or risk treatment option.

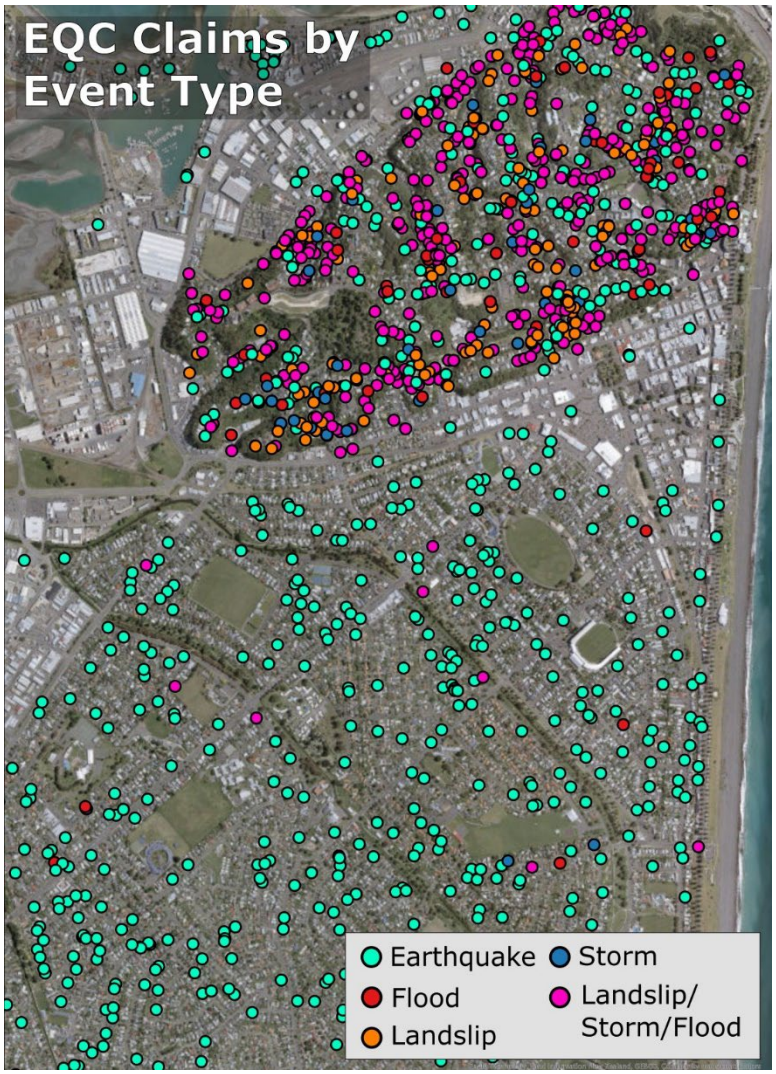


Figure 4: EQCover claimd from 1997 to 2021 on Mataruahou and central Napier. It is probable that the majority of the claims for Landslip/Storm/Flood are Landslip claims, and have been aggregated due to the way EQCover claims have been categorised differently over time.

[6] https://www.eqc.govt.nz/resilience-and-research/reducing-risk/risk-tolerance-methodology/
[7] https://www.eqc.govt.nz/resilience-and-research/reducing-risk/risk-tolerance-methodology/

Tsunami

All of Napier is at risk of local, regional and distant source tsunami. The greatest risk to Napier is from a tsunami generated by rupture of the Hikurangi Subduction zone. Modelling on the Hawke's Bay Natural Hazards Portal indicates that the whole of Napier is at risk from a very large tsunami[8]. According to 2018 statistics[9], Napier has a total population of 49,111 in all its tsunami evacuation zones (i.e. red, orange, yellow). Of this population, approximately 22 are in the red zone, 11,431 are in the orange zone, and 37,658 are in the yellow zone. Research published in 2014 showed that 25-30% (i.e. 15,000-19,000) of Napier residents cannot get a safe location in time after a strong or long earthquake[10]. This is compounded by research[11] that shows that the probability of an earthquake of at least magnitude 8 on the southern end of the Hikurangi subduction zone in the next 50 years is about 26%. The high levels of tsunami risk in Napier mean it is essential to manage this risk through the District Plan as well as through the Civil Defence and Emergency Management structures in New Zealand.

Tsunami modelling conducted for Hawkes Bay Regional Council by GNS Science[12] contains a range of different modelled scenarios that could be used to conduct risk-based planning through the sensitive activities framework[13]. This process would involve classifying the modelled scenarios as either low, medium, or high hazard and then controlling hazard sensitive activities so that the most hazard sensitive activities would be prohibited in high hazard zones. An example of this risk-based planning for tsunami hazard can be seen in both the latest Wellington City and Porirua City District Plan reviews, wherein a 1:100 year inundation event is classified as high hazard, 1:500 year inundation event as medium hazard, and 1:1000 year inundation event as low hazard[14] (Figure 5).

[8] https://gis.hbrc.govt.nz/Hazards/
[9] Sourced from Hawke's Bay Regional Council, 15 September 2021
[10] Fraser, et al, 2014: Variable population exposure and distributed travel speeds in least-cost tsunami evacuation modelling. *Natural Hazards and Earth Systems Sciences*, 14, 2975-2991
[11] Pizer, et al, Paleotsunamis on the Southern Hikurangi Subduction Zone, New Zealand, Show Regular Recurrence of Large Subduction Earthquakes. The Seismic Record 2021;; 1 (2): 75–84.
[12] Level 3 Tsunami Modelling in Hawke's Bay Final Report, Burbidge et al 2022 – https://www.eqc.govt.nz/resilience-and-research/research/search-all-research-reports/level-3-tsunami-modelling-in-hawkes-bay-final-report/
[13] https://www.ehinz.ac.nz/assets/Social-Vulnerability-Indicators/Incorporating-Vulnerability-into-Land-use-Planning-Final.pdf
[14] https://eplan.wellington.govt.nz/proposed/

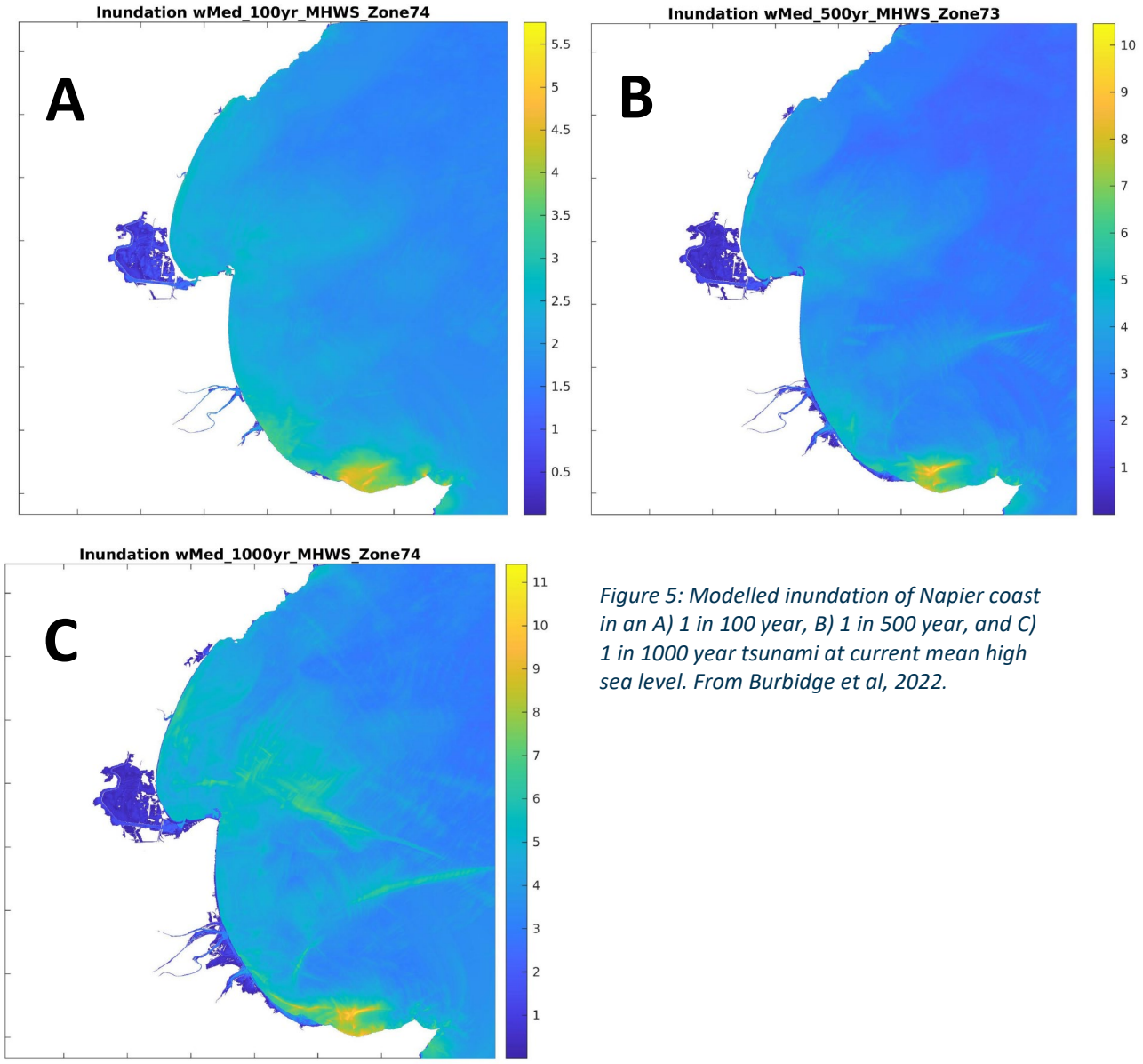


Figure 5: Modelled inundation of Napier coast in an A) 1 in 100 year, B) 1 in 500 year, and C) 1 in 1000 year tsunami at current mean high sea level. From Burbidge et al, 2022.

There are other planning options that could be incorporated into the District Plan, such as requirements to keep evacuation routes clear and unobstructed, and requirements that infrastructure and multistorey buildings incorporate engineering/construction elements that mitigate tsunami risk, for example lower levels which allow water to easily pass through them so as to reduce the force of water on the structure of the building. These options and others are described in Beban et al's 2019 update guidelines for integrating tsunami modelling into risk-based land use planning[15].

[15] Beban et al, 2019 - https://www.eqc.govt.nz/resilience-and-research/research/search-all-research-reports/integrating-tsunami-inundation-modelling-into-risk-based-land-use-planning-an-update-of-guidance/

Flood

Napier City is exposed to a range of different flood types including fluvial, pluvial, and coastal inundation[16]. Flood is the most frequent hazard in the Hawke's Bay region with approximately one significant flood occurring every 10 years[17]. Flooding is a hazard that is expected to get worse with climate change as the frequency and intensity of these types of events is predicted to increase[18]. The current flood modelling available through the Hawke's Bay Hazard Portal[12] shows that the Napier CBD has not been included in the study area, and that the remaining parts of the district are in either high flood zones or low flood zones. These modelled flood zones, however, do not account for climate change. ***EQC recommends that more comprehensive modelling is undertaken, as already indicated in the Natural Hazards Issues and Options Paper, and then risk-based planning is conducted through the hazard sensitive activities methodology[19] to ensure the flood risk in Napier in managed in the most appropriate way.***

Coastal hazards

Napier has a range of different coastal hazards that it is exposed to including coastal inundation, coastal erosion, and tsunami. The Hawke's Bay Hazard Portal has a range of different hazard layers including coastal inundation, coastal erosion for 2065, and coastal erosion for 2120[12]. However, in the current operative plan only a small section of the coastline is managed as part of a generic 'coastal hazard zone'[20]. Tsunami is a key coastal hazard that should be managed within the district plan (as noted above), and not just through multi-hazard assessments. ***EQC therefore recommends that the most up to date hazard information is used within the Napier District Plan to manage coastal hazards, including tsunami.***

[16] https://gis.hbrc.govt.nz/Hazards/
[17] https://www.hbemergency.govt.nz/hazards/storms-and-floods/
[18] https://environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-gisborne-hawkes-bay-region/
[19] https://www.ehinz.ac.nz/assets/Social-Vulnerability-Indicators/Incorporating-Vulnerability-into-Land-use-Planning-Final.pdf
[20] https://napier.isoplan.co.nz/eplan/property/1939000/1926000/5633000/5612000/0/42

Issues and Options Paper responses

Mapping

1. Status quo: Keep the maps fixed in the district plan and initiate plan changes to update the maps; OR,
2. Fix the rules in the Plan but sit the maps in a separate portal, which can be updated as soon as new information becomes available

EQC supports Option 1, status quo: keep the maps fixed in the District Plan.

Our support for Option 1 is due to concerns over natural justice and prior use rights. The two fundamental principles of natural justice are that affected parties should be given the opportunity to be heard, and that decision makers should be unbiased[21]. Having natural hazard maps outside the district plan brings up concerns that the maps could be changed without notifying or consulting with residents as required for a district plan change, therefore breaching the first fundamental principle of natural justice.

Natural hazard information is constantly being updated and although we believe it is important to have access to the most up-to-date information (especially in regard to natural hazards that will be impacted by climate change), we also believe that requiring consultation is crucial for delivering natural justice in regard to property, existing use rights as well as delivering robust scientific information. The consultation process that is required for a plan change undertaken to update natural hazard maps provides a mechanism for assessing the scientific rigour of the information included in the maps, which will then go on to inform planning decisions. The ability to view any natural hazard maps before they are used for decision making provides the opportunity for discussion and feedback to ensure that the best information is being used for planning decisions. If option 2 is preferred, these issues of natural justice and assessing the scientific rigour of any new information needs to be addressed.

Hazard Sensitivity

1. Status quo – hazard sensitivity is considered sometimes with no clear policy direction; OR,
2. Change to including hazard sensitivity as a criteria.

EQC supports Option 2, changing to include hazard sensitivity as a criteria.

The inclusion of hazard sensitive activities is an effective way to incorporate risk-based planning into the management of natural hazard risk because hazard sensitivity can be used as a proxy for risk. In the Civil Defence and Emergency Management Act 2002 risk is defined as the likelihood and

[21] Parliamentary Practice in New Zealand 2023 – Chapter 31 Natural Justice

consequence of a hazard[22]. The consequences of a particular hazard are influenced by the characteristics or 'sensitivities' of the exposed environment. Risk-based planning accounts for the magnitude of the impact of a natural hazard event on the community, not only the likelihood and extent of an event. This is particularly beneficial when it comes to hazards that are considered low probability but high impact such as tsunami, which are often excluded from land use planning when only the likelihood of an event is considered.

EQC recommends that a clear methodological approach is adopted when including hazard sensitivity as a criterion in the District Plan. The adoption of a clear methodological approach ensures the consistent applications of rules and policies***. EQC further recommends that the hazard sensitive activities follow the approach taken by Beban and Gunnell (2019)[23],*** which includes the following:

- Assisted living facilities;
- Schools and early childhood education centres;
- Hospices;
- Marae;
- Medical and health service facilities;
- Mental health facilities;
- Pharmacies;
- Retirement villages/aged care facilities;
- Social housing or residential units constructed by social housing providers.

As part of determining hazard sensitivity, ***EQC also recommends that risk tolerance assessments are completed***.

Risk tolerance assessment considers who will bear the consequences of hazards and how they perceive and engage with risk. The EQC risk tolerance methodology is useful for Napier due to its exposure to a large number of interacting and compounding natural hazards, which can make management and land use planning challenging. Risk tolerance assessments could be used to understand if there are any natural hazards that the community would be more tolerant of for hazard sensitive activities. For example, would well informed people be more tolerant of hazard sensitive activities being exposed to landslide risk, if it means being out of the high-risk zones for higher impact hazards such as tsunami and liquefaction? Understanding the tolerability of different risks for a particular community would then be able to inform planning decisions.

[22] https://www.legislation.govt.nz/act/public/2002/0033/latest/whole.html

[23] Incorporating social vulnerability into land use planning and local government processes for managing natural hazards and climate change in New Zealand, Beban J and Gunnell, S. 2019 - https://www.ehinz.ac.nz/assets/Social-Vulnerability-Indicators/Incorporating-Vulnerability-into-Land-use-Planning-Final.pdf

Multi-Hazard Assessment

1. Status quo: do not consider cumulative effect of hazards when assessing resource consent applications; OR
2. Include cumulative effect as a matter of discretion when considering resource consent applications.

EQC supports Option 2, including the cumulative effect of hazards as a matter of discretion when considering resource consent applications.

When managing risk from natural hazards it is important to consider all the natural hazards that a development is exposed to, to ensure the best decision is made. Considering the cumulative effect of natural hazard impacts may result in different risk management decision-making when compared to just considering the impacts of one natural hazard. The cumulative effect of natural hazard impacts may result in risk tolerance thresholds that are different to thresholds for an event involving a single natural hazard, and this should result in different risk management decision-making.. Completing a multi-hazard assessment for natural hazards requires that all potential hazard impacts are considered so that the most appropriate decisions are made. ***EQC recommends that the list of hazards considered within multi-hazard assessment is extended to include earthquake and slope instability to ensure that the full range of natural hazard risk in Napier is considered.***

Many parts of Napier are in the high earthquake shaking amplification zone, but the southern residential areas are in medium shaking amplification hazard (Figure 1). Earthquake shaking hazard should be considered in multi-hazard assessments to assess the benefit of developing more outside the high shaking area, and whether that will conflict with any other natural hazard overlay, as the area with lower shaking risk is closer to the river and has higher flood risk. There may be an opportunity to disaggregate sensitivity, so that types of buildings which are more vulnerable to earthquake shaking but are more resilient to flood, for example multi-storey concrete or masonry buildings can be encouraged in areas which have higher flood risk but lower risk from earthquake shaking amplification. The opposite – buildings which are shaking resilient but vulnerable to flood, for example single story wooden dwellings with floating foundations, are encouraged where shaking amplification is highest and flood risk lowest.

Mataruahou has a history of landslides and slope instability, which can cause damage and disruption to assets including residential properties. Since1997, EQC has received a total of 755 claims for landslide, flood or storm damage to residential properties located on Mataruahou (Figure 4). Slope instability and landslides should be included in multi-hazard assessments to assess the benefits of developing away from areas that are at risk of landslide and slope instability and whether that will conflict with other hazards. For example, restricting development on Mataruahou may result in more development being located in tsunami zones. Therefore, hazard sensitive activities and risk tolerance assessments (that include considerations for the cumulative effective of multiple hazards) should also be used to inform decisions about the location of development.

Coastal Erosion

1. Status quo – continue to manage development within the coastal erosion hazard zone from the Inner Harbour entrance to Esk River mouth and leave HBRC to manage the rest of the coast as they see fit; OR
2. Change to manage the whole coast using the 2016 modelling for the coast from the Inner Harbour entrance to the Tutaekuri River mouth, outside of the areas already managed by the HBRC, aligning our approach for the entire coast

EQC recommends a 3rd option whereby NCC and HBRC partner together to co-manage the coast.

Under the Resource Management Act 1991 S30 and S31[24] both the district and regional councils have responsibility for managing natural hazards. Through a district and regional council partnership for co-management, resources could be shared, allowing for more effective management of the coastal erosion hazard. Having all areas of the coastline in Napier City area managed by the same plan also brings consistency to residents and users and ensures consistent application of rules and policies. Effective management of coastal erosion now will have positive impacts in the future. These include limiting the number of properties that are damaged by coastal erosion and coastal inundation, as well as reducing the likelihood of needing to introduce managed retreat as coastal erosion has the potential to make coastal developments uninhabitable in the future. This is especially important to consider as climate change and associated sea level rise is likely to increase the frequency and intensity of coastal hazards such as erosion[25].

The current method for managing coastal erosion for the region has led to inconsistent approaches and a reliance on out-of-date hazard information. According to Carter et al.[26], Napier City Council manages coastal erosion based on modelling that was completed in 2002. Relying on modelling from 2002 has resulted in different management outcomes to areas of the coast managed by HBRC and Hastings District Council, and could be leading to ineffective management decisions if the areas at risk of coastal erosion have changed in the 12 years since 2002. Therefore, partnering with the regional council would be an effective way to share resources and improve the management of coastal erosion.

Coastal Inundation

1. Status quo – manage coastal inundation risk by setting floor heights under the Building Act; OR
2. Change to manage coastal inundation risk in the District Plan including setting floor heights

EQC supports Option 2, change to manage coastal inundation risk in the District Plan including setting floor heights.

[24] https://www.legislation.govt.nz/act/public/1991/0069/latest/whole.html#whole
[25] https://environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-gisborne-hawkes-bay-region/
[26] Carter, J.; Evans, R.; Belgrave, B.; Beck, F.; Cook, K. 2021 Discussion paper of Building Act and Resource Management Act tensions and issues. Lower Hutt, N.Z.: GNS Science. GNS Science report 2021/21. 48 p.; doi: 10.21420/YY44-HW15

EQC believes that 1% AEP is a more suitable hazard level to manage coastal inundation risk than a 2% AEP event. Climate change is likely to increase the frequency and severity events which cause coastal inundation[27], meaning that storm events which are currently regarded as a 1% AEP may happen more frequently and sea level rise will increase the depth of inundation.

Managing coastal inundation in the district plan also allows for risk-based land use planning, where development is avoided in the highest hazard areas and managed in medium hazard areas. The modelled coastal inundation data from HBRC[28] identifies the depth of potential coastal inundation for three different scenarios including worst case sea level rise scenarios for the region. Access to this type of modelling means that Napier City Council could apply a management technique similar to that from Porirua City Council which classes current inundation for a 1% AEP coastal inundation event as high hazard areas and the modelled inundation extents that account for sea level rise as medium hazard areas[29]. Development is then managed by avoided the high hazard areas and managing the developments located in the medium hazard areas. If this approach was used in the Napier District Plan ***EQC recommends that it should be applied alongside multi-hazard assessments, hazard sensitive activities methodology, and a risk tolerance assessment.***

Pluvial Flooding (stormwater)

1. Status quo – manage pluvial flood risk by setting floor heights under the Building Act; OR
2. Change to manage pluvial flood risk in District Plan, including setting floor heights

EQC supports Option 2, change to manage pluvial flood risk in the District Plan including setting floor heights.

The Building Act 2004[30] requires floor levels to be built for a 2% AEP event (with no need for any building work to apply extra mitigations), however, this can be contravened by another act. The Resource Management Act (1991) does not specify a required floor level for flood management but this has not prohibited councils requiring floor heights to be raised for 1% AEP events (or higher) within their District Plans. For example, the Christchurch District Plan requires floor levels to be raised for a 0.5% AEP flood event[31], although it should be noted that in some cases this has led to some perverse outcomes. Existing use rights has meant that some property owners have been able to rebuild their properties without needing to account for the higher floor level requirements, which has resulted in cases where floor levels are different in the same street[32].

[27] https://environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-gisborne-hawkes-bay-region/
[28] https://hbrc.maps.arcgis.com/apps/webappviewer/index.html?id=2a84aad5798c4e588554ae09bd79aa87
[29] https://eplan.poriruacity.govt.nz/districtplan/rules/0/192/0/0/0/154
[30] https://www.legislation.govt.nz/act/public/2004/0072/latest/whole.html#DLM306036
[31] https://districtplan.ccc.govt.nz/pages/plan/book.aspx?exhibit=DistrictPlan
[32] https://ccc.govt.nz/services/water-and-drainage/stormwater-and-drainage/flooding/floor-level-requirements

EQC believes that 1% AEP is a more suitable hazard level to manage pluvial flood risk compared to a 2% AEP event. Climate change is likely to increase the frequency and severity of pluvial flood events[33], which will require properties to have an increased level of resilience.

Managing pluvial flood risk in the district plan also allows for risk-based land use planning, where development is avoided in the highest hazard areas and managed in medium hazard areas. High hazard areas are the locations where the flood level is expected to be very deep, and in the overland flow stream corridors where the flow will be fast. Figure 6 provides a general flood vulnerability curve, which can be used to understand the thresholds for determining which areas might be considered high hazard. ***EQC recommends that pluvial flood risk should be managed within the District Plan by raising floor levels and conducting risk-based planning, which includes multi-hazard assessments, hazard sensitive activities methodology, and a risk tolerance assessment.***

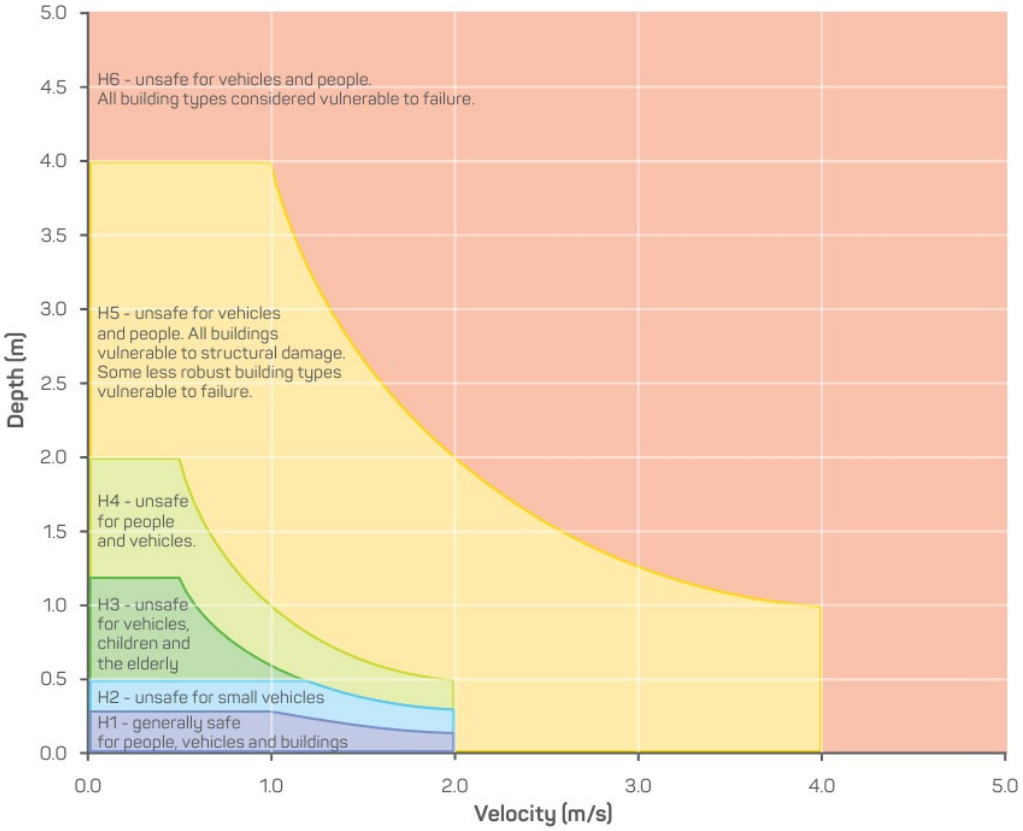


Figure 6: Flood hazard curve from the Australian Institute for Disaster Resilience[34]

[33] https://environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-gisborne-hawkes-bay-region/

[34] Australian Disaster Resilience Handbook Collection - Flood Hazard chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://knowledge.aidr.org.au/media/3518/adr-guideline-7-3.pdf

Fluvial Flooding (river)

1. Status quo: continue to allow network utilities to locate structures in river hazards zones as a controlled activity and continue to require a resource consent for all other developments (where these can be declined) within river hazard zones; OR
2. Change to a nuanced approach, which requires resource consents for all activities within a defined high risk zone and allows development to go ahead, subject to mitigation in lower risk zones.

EQC supports option 2, change to a nuanced approach, but recommends that low, medium and high fluvial flood hazard zones based on the depth and velocity of the water in the modelled flood extent. Flood vulnerability (see Figure 6) should be incorporated to determine the level of risk in each zone.

Determining whether the risk from river flooding is "significant" when considering resource consent, as stated in the Issues and Options paper, is imprecise and open to interpretation. Multiple people may have different concepts of what "significant" flood risk is.

As such network utilities should be considered using the same risk based planning framework as other developments. If they are expected to increase the risk to communities in the event of a flood then they should be classed as sensitive activities and restricted in areas which are at higher levels from flood hazard. Effective management of flood risk is important as climate change is likely to increase the frequency and severity of these types of events. To be more consistent with other flood hazard layers (pluvial and coastal) we recommend tying the flood hazard risk layers to a 1% AEP fluvial flood, or making it clear if this is already the modelling used.

Summary

EQC is committed to reducing risk from, and building resilience to, natural hazards in Aotearoa New Zealand. We strongly support the use of risk-based land use planning in district and regional plans and using New Zealand's strong base of natural hazard science to make informed decisions to reduce natural hazard risk across the country.

In response to Napier City Council's Issues and Options paper to discuss options for natural risk reduction in the District Plan we:

1. Agree with keeping the natural hazard maps within the District Plan,
2. Agree that a hazard sensitive activities framework should be included in the District Plan,
3. Agree that cumulative effects should be included as a matter of discretion when considering resource consent applications,
4. Recommend that NCC and HBRC should work together when managing coastal hazards,
5. Agree that coastal inundation hazard should be managed in the District Plan,
6. Agree that pluvial flooding should be managed in the District Plan,

7. Agree that fluvial flooding should be managed in the District Plan,

In addition, we recommend the following hazards should also be managed using a risk-based framework within in the District Plan:

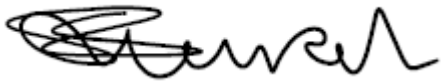
1. Tsunami hazard,
2. Earthquake hazards, including ground shaking and liquefaction,
3. Slope instability hazards, particularly on Mataruahou,

An appendix is included listing national and regional guides for land use planning for natural hazard risk reduction.

Thank you for the opportunity to provide input into your decision making process for the Napier District Plan Natural Hazards Chapter.

Please do not hesitate to contact us at resilience@eqc.govt.nz if you have any questions about this submission or if you would like to discuss it with us.

Ngā Mihi Nui



Sarah-Jayne McCurrach,
Head of Risk Reduction and Resilience, EQC

Appendix 1 – National and regional guidelines for land use planning around natural hazards

Year	Name	Publisher	Commentary
	Various **Stormwater** guidelines	Councils	
2024	**Landslide** Planning Guidance: Reducing Landslide Risk through Land-use Planning	GNS Science	Comprehensive risk assessment process based on ISO 310000
2019	Integrating **tsunami** inundation modelling into risk-based land-use planning: an update of guidance	GNS Science	Targets on part of the risk management system – modelling. Underpinned by risk-based approach (ISO 310000)
2024	**Coastal hazards** and climate change: Guidance for local government	MfE	Risk assessment process based on ISO 310000
2017	Planning and engineering guidance for potentially **liquefaction**-prone land: Resource Management Act and Building Act aspects	MBIE/MfE/EQC Toka Tū Ake	Risk assessment process based on ISO 310000
2013	Risk-based land use planning for natural hazard risk reduction	GNS Science	Takes an all-hazard approach based on IDO 31000. A review was undertaken in 2022, needs updating
2010	Preparing for future **flooding**: a guide for local government	MfE	Needs an urgent review and update. Risk assessment process based on ISO 310000
2003	Planning for development of land on or close to **active faults**: a guideline to assist resource management planners in New Zealand	MfE	Needs an urgent review and update. Risk assessment process based on AS/NZ 4360:1999 (now superseded by 310000)
*Currently being finalised for consultation **Currently being revised updated, due for release in 2023			