IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of a hearing for The Proposed Waitomo District Plan

---

STATEMENT OF EVIDENCE OF SARAH KNOTT AND LUIS ALEJANDRO CIFUENTES
For the Waikato Regional Council
DATED 21 JUNE 2024

Table of Contents

Discouraging seawalls for the protection of private property 4

Adverse effects on areas of indigenous vegetation in the coastal environment 5

Extreme coastal inundation events 6

Consistency of natural hazards terminology 6

Environmental standards for permitted earthworks activities. 7

References to Highly Productive Soils 9

Proposed rural lifestyle areas subject to natural hazards 9

Proposed future urban zone areas subject 11

Timeframes in which future urban areas are expected to develop 14

Managing natural hazard risk generally 14

Introduction

1. This evidence was prepared jointly by Sarah Knott and Luis Alejandro Cifuentes on behalf of the Waikato Regional Council (WRC).

2. Luis Alejandro Cifuentes holds a Bachelor of Social Sciences from the University of Waikato. He has worked providing policy advice in the local government context since 2017 and has been an associate member of the New Zealand Planning Institute since December 2021. Alejandro specialises in natural hazards and adaptation planning, contributing to the development of the 2018 Waikato Regional Council risk assessment methodology and the 2019 Waikato Regional Policy statement guidance note on natural hazards. Alejandro is currently the team leader for the Waikato Regional Council's Policy Implementation team.

3. Sarah Knott holds a Bachelor of Environmental Planning degree from the University of Waikato. She has two years' experience in the field of regional policy implementation. As a member of the Policy Implementation team at WRC she is involved in working with the territorial authorities of the Waikato Region and with neighbouring regional councils to assist in the development of consistent integrated regional policy. She is also in the project team for Waikato Regional Policy Statement Plan Change 2 to incorporate the National Policy Statement for Highly Productive Land.

4. We confirm that we are both familiar with the Code of Conduct for Expert Witnesses as set out in the Environment Court Practice Note 2023. We have both read and agree to comply with the Code. Except where stated that we rely upon the specified evidence or advice of another person, this statement is within our area of expertise. We have not omitted to consider material facts known to us that might alter or detract from the opinions expressed.

Scope of evidence

1. This statement is given on behalf of WRC, reinforces the WRC submissions and reflects our professional opinions as a policy advisors. We also rely on the opinions of Rick Liefting to support our opinions in matters related to natural hazards, climate change and natural hazards risk management.

2. WRC made a submission and further submission on the Proposed Waitomo District Plan (PWDP). The submission made by WRC addressed alignment of the proposed plan change with the Waikato Regional Policy Statement (WRPS) and national direction, with key areas of interest relating to the provisions for vegetation clearance, coastal hazards, erosion within the district, and the rezoning of land subject to natural hazard risk for future urban development.

3. Our evidence focuses on:
    - The responses to WRC's submission points by the s42A authors
    - The approach to managing land use and development in areas subject to natural hazard risk.

4. WRC staff were proactively involved with Council staff in developing the plan change providing hazards technical information and engaged in the pre-notification stages of the plan change in matters related to indigenous biodiversity, highly productive land and natural hazards risk management.

5. Our assessment is based on information supplied in the plan change document, the policy direction set out in the Waikato Regional Policy Statement, national policy direction including the National Policy Statement for Indigenous Biodiversity (NPS-IB), the National Policy Statement for Highly Productive Land (NPS-HPL) and the New Zealand Coastal Policy Statement (NZCPS), local knowledge of events and experience in other districts, and the s32 analyses.

6. Our statement of evidence relates to all planning aspects of the first tranche of hearing topics for the PWDP. Technical natural hazard aspects are addressed by Mr Liefting in his statement of evidence. We support the conclusions and recommendations of Mr Liefting and do not intend to repeat them within this statement.

7. We have not prepared extensive evidence for matters for which it was noted in a s42a report that further assessment would be provided in the second tranche of topics. We anticipate preparing supporting evidence for those matters once the next set of s42a reports have been released.

Summary of evidence

8. We support all recommendations of the section 42A authors which accept WRC's submission points and align with the relief sought through the WRC further submission. We generally do not address these points further in this evidence.

9. We address the submission points which were either rejected or not fully accepted by the section 42A authors in the sections of our statement below.

Discouraging seawalls for the protection of private property

10. The WRC submission point 10.113, concerning policy CE-P1.8 of the PWDP sought an amendment to expressly exclude the provision of seawalls for the protection of private property. We consider the relief sought in the submission is stronger than necessary to ensure policy alignment with the WRPS and NZCPS, and note that the intention of the submission point is to reduce the reliance on seawalls to protect private properties.

11. We agree with the coastal environment s42a comments within paragraph 63 that while discouraged, Policy 25(e) and Policy 27 of the NZCPS still acknowledge that in some circumstances, hard protection (including seawalls) has a role in protecting private properties. However, we note that CE-P1.8 needs to clearly spell out the policy direction and set out clear expectations around the use of seawalls to protect private property.

12. This is the approach in the proposed Waikato Regional Coastal Plan, which was notified after WRC made a submission on the PWDP. At the policy level, the proposed Waikato Regional Coastal Plan discourages the use of new or extended hard protection structures and gives priority to the use of soft protection measures to manage natural hazard risks, except where certain conditions are met; including that the hard protection structures are associated with areas of existing urban development or physical access to property and form part of a long-term adaptive management strategy.

13. We also recognise that the information requirements for all resource consent applications undertaken within or partially within a hazard area or a coastal hazard area requires a site-specific coastal hazard assessment for seawalls protecting private property that demonstrates that the seawall is part of an agreed adaptive management strategy for the site (Appendix 1 of the PWDP APP-1.3(h)(i)).

14. Taking the s42a comments into account, we recommend alternative wording to provide for clearer direction to discourage the use of seawalls to protect private property:

    14.1. "8. Allowing for seawall maintenance and repair and enabling seawalls where they protect public infrastructure, <u>but discouraging the use of new or extended seawalls for the protection of private property except where they are part of an agreed adaptive management strategy for the site.</u>"

15. We consider that this alternative amendment, when read in conjunction with CE-P1.9 of the PWDP for Encouraging alternatives to hard protection structures, would better align with the NZCPS while still reducing reliance on hard protection structures and achieving the clearer direction for plan-users that our submission sought to achieve in the PWDP.

Adverse effects on areas of indigenous vegetation in the coastal environment

16. The WRC submission sought an amendment to CE-P3.2(i) to remove the word "predominately".

17. We agree with the statement of paragraph 76 of the coastal environment s42a report, that the proposed policy is consistent with Policy CE-P2.2(f) of the WRPS. However, we disagree with the s42a recommendation to retain the word "predominantly" and consider that the relief sought in WRC's submission would more closely align with the higher order NPS-IB.

18. Provision 3.16 of the NPS-IB for indigenous biodiversity outside significant natural areas (SNAs) guides the management of adverse effects on indigenous biodiversity. We highlight that this provision applies to all indigenous biodiversity outside SNAs. In the case of indigenous vegetation, we interpret that the direction of provision 3.16 would apply to all areas of indigenous vegetation, including remnants of indigenous vegetation in largely exotic matrices which can be significant.

19. Although the WRPS talks about areas of predominately indigenous vegetation in the coastal environment, it does so in the context of maintenance and enhancement. In our opinion,

this direction is broadened by the NPS-IB Policy 13 (restoration of indigenous biodiversity is promoted and provided for), which is reflected in principle 4 of the assessment criteria (appendix 1 NPS-IB) that provides for the inclusion of depleted ecological districts in the assessment of representativeness. We consider that a test of predominance is likely to limit the ability of the plan to provide for the restoration of those depleted ecosystems.

Extreme coastal inundation events

20. The WRC submission 10.118 sought an amendment to CE-P14.4 of the PWDP, to either provide a definition for an 'extreme coastal inundation event' or removing the word 'extreme' from the policy. We consider that the proposed policy lacks necessary clarity for plan-users interpreting the policy and subsequent rules and information requirements that give effect to it.

21. For example, implications arise in Appendix 1 (APP-1.3(j) and APP-1.2(g)) where information requirements for resource consents in coastal hazard areas are required to include site-specific coastal hazard assessment undertaken by an appropriately qualified and experienced coastal scientist or coastal engineer demonstrating that minimum floor levels or building platforms will provide protection from flooding during an extreme coastal inundation event, including 1.0 m of sea level rise and a freeboard suitable to the setting. In the absence of a definition for 'extreme coastal inundation event' we do not consider that this assessment can be appropriately undertaken. If it is anticipated that the appropriately qualified and experiences coastal scientist or engineer is to determine what qualifies as an 'extreme' event on a case-by-case basis, then this should be explicitly mentioned for clarity.

22. We acknowledge the s42a response that the term 'extreme coastal inundation' has been used by experts in the advice received in preparing the PWDP, but disagree that the WRC relief sought should be rejected on that basis. If it is not appropriate to remove the word 'extreme', we consider an alternative could be to seek that the experts who provided advice during drafting of this plan could support the provision by defining what was meant by an extreme coastal inundation event to provide certainty for plan-users when preparing information requirements for land use and subdivision consents in coastal hazard areas.

Consistency of natural hazards terminology

23. In relation to WRC's submission point 10.61 we note Mr Liefting's recommendation in paragraph 65 of his technical evidence and ask the hearings panel to recommend WRC's submission be accepted. This will ensure a higher degree of consistency with the WRPS and established technical good practice.

24. We consider that the approach suggested by WRC in their submission (10.64) related to the "building platform suitability area" remains valid. Mr Liefting's technical evidence points at the inconsistency in determining minimum floor levels (MFL) in the natural hazards provisions of the PWDP.

25. WRC's requested relief would so some way to make it clearer for plan users (both consenting officers and applicants) that certain areas will require different levels of assessment to determine MFL, based on the use of different methodologies to inform plan provisions.

26. Regarding WRC's submission for the coastal flood hazard area in Awakino (10.111), we refer to Mr Liefting's recommendation in paragraph 76 of his evidence to address the request the extent of the hazard area.

27. In addition, WRC' submission requested and changes to the wording for the Coastal Erosion Hazard Area 2. We consider these changes would indeed ensure the plan provides for changes in the projected sea level rise, thus aligning with the WRPS risk-based approach to managing natural hazards.

28. Further, we disagree with the s42a position that it is not the place of the District Plan to ensure consistency. Although we recognise it is challenging, district plans should provide an adequate level of alignment and certainty for plan users, which is possible through the careful assessment of technical information applied to the local context.

Environmental standards for permitted earthworks activities.

29. The WRC submission sought better tailored rules for earthworks. The reasoning behind this was that the proposed earthworks rules effectively permit all earthworks for certain purposes, or in certain zones provided they do not exceed certain scale thresholds. WRC cautioned that the PWDP should address the potential risks associated with earthworks in certain locations and conditions.

30. The s42a reporting officer notes in paragraph 23 of the earthworks s42a report that the environmental standards are found in the performance standards (EW – table 2 PWDP). However, we disagree with the recommendation to reject WRC's submission on two counts:

    30.1. The rule does not provide a clear enough reference to the performance standards;

    30.2. The current rule framework does not set any criteria/environmental standards to measure non-compliance. This approach fails to account for the nuances of managing earthworks in different zones. Under this rule any activity meeting the PA threshold could discharge any amount of sediment to a watercourse for example.

31. There are recent examples in the Waikato region on management of earthworks which we consider offer a better approach to provide for earthworks as permitted activity. EW-R7 for the general residential zone of the proposed Waikato District Plan[1] – copied below:

[1] https://eplan.waikatodistrict.govt.nz/?docId=M0Jo0YIdigg%3d

EW-R7 Earthworks - general **[000078] {000036, 000047, 000051}**		
GRZ - General residential zone	**(1) Activity status: PER** **Where:** (a) Earthworks (excluding the use of cleanfill material or fill material) within a site must meet all of the following standards: (b) Be located more than 1.5m horizontally from any waterway, open drain or overland flow path; (c) Not exceed a volume of 250m^3 and an area of not more than 1,000m^2 over any consecutive 12 month period; (d) The total depth of any excavation or filling does not exceed 1.5m above or below ground level; (e) The slope of the resulting cut, filled areas or fill batter face in stable ground, does not exceed a maximum of 1:2 (1 vertical to 2 horizontal); (f) Earthworks are set back at least 1.5m from all boundaries; (g) Areas exposed by earthworks are stabilised to avoid runoff within 1 month and re-vegetated to achieve 80% ground cover within 6 months of cessation of the earthworks; (h) Sediment resulting from the earthworks is retained on the site through implementation and maintenance of erosion and sediment controls and does not enter waterways, open drains or overland flow paths; (i) Do not divert or change the nature of natural water flows, water bodies or established drainage paths; and	**(2) Activity status where compliance not achieved: RDIS** **Council's discretion is restricted to the following matters:** (a) Amenity values and landscape effects; (b) Volume, extent and depth of earthworks; (c) Nature of fill material; (d) Contamination of fill material; (e) Location of the earthworks in relation to waterways, significant indigenous vegetation and habitat; (f) Compaction of the fill material; (g) Volume and depth of fill material; (h) Protection of the Hauraki Gulf Catchment Area; (i) Geotechnical stability; (j) Flood risk, including natural water flows and established drainage paths; (k) Land instability, erosion and sedimentation; and (l) The risk of earthworks exacerbating Kauri dieback disease.

	(j) Provided they are not within a kauri root zone	

32. The performance standards for permitted activities in all zones should be more extensive, and address concerns such as: distance from waterways and boundaries, slope of the resulting cut, filled areas or fill batter face in stable ground, re-vegetation timeframes, erosion and sediment controls. Inclusion of such performance standards would allow for non-compliance to be measured and manage risks associated with earthworks activities.

References to Highly Productive Soils

33. The WRC submission sought that a definition for "highly productive soils" based on the definition provided in the WRPS be included in the PWDP. This submission point was made on the basis that two terms, "highly productive soils" and "highly productive land" are used synonymously in the plan while their differentiation or relationship is not explained.

34. There is no explanation why two definitions were used. The general rural zone s32 report references both the NPS-HPL and WRPS requirements to manage land and soil resources.

35. We agree with the general rural zone chapter s42a author in paragraph 157 that 'High class soils' is the only relevant definition in the WRPS at this stage. WRC is in the process of amending the WRPS to align with national direction of the NPS-HPL and as such, we further agree with the s42a recommendation that it is preferable to rely on the National Policy Statement provisions.

36. We recommend using one term throughout the PWDP to improve clarity for plan-users.

37. We recommend using the term 'highly productive land' rather than highly productive soils to ensure consistency with the NPS-HPL. We consider that the definition for highly productive land provides for a wider range of soils to be protected that might not necessarily meet LUC requirements of High Class Soils as defined in WRPS. Guidance for the definition of this term can be taken from the NPS-HPL directly. A suggested definition could read:

    37.1. "Highly Productive Land has the same meaning as in Part 1 of the National Policy Statement for Highly Productive Land 2022."

Proposed rural lifestyle areas subject to natural hazards

38. WRC submitted (10.145) that the proposed rural lifestyle zoned area north of Te Kuiti on the eastern side of the river should not be rezoned for residential uses. The proposed zoning is within the Building Platform Suitability Area C overlay and the High Risk Flood Zone overlay which suggest it may not be an appropriate site for residential development.

39. In respect to achieving appropriate outcomes for development, we disagree with paragraph 49 of the rural lifestyle zone s42a. The s42a recommends that development in a hazard area can be managed through provisions in the proposed Natural Hazards chapter. However, we

consider that if there are constraints around rezoning linked to natural hazards, then it is not appropriate to rezone that area in the first place.

40. UFD-M1 f the WRPS directs local authorities to have regard to the principles in APP11 when preparing, reviewing or changing regional plans, district plans and development planning mechanisms such as structure plans. Under principle (h) new development should be directed away from identified natural hazards.

41. WRPS method IM-M7 (planning approach) directs district plans to adopt a precautionary planning approach to any activity where the effects may be significant but are uncertain. Criterion 3 indicates that district plans 'shall' adopt a precautionary approach towards any proposed activity whose effects may be significant or irreversible but are as yet uncertain, unknown or little understood, including the use and management of coastal resources particularly vulnerable to effects from climate change.

42. Further, WRPS Policy HAZ-P2 provides for a reduction of the risks to the regional community from natural hazards by ensuring that development is appropriate with respect to the level of risk posed. Subdivision, use and development are required to be managed in a way that reduce the risks from natural hazards to an acceptable or tolerable level and reduces the reliance on hard protection structures (or other engineering solutions) to enable development. Under HAZ-P1, natural hazard risks are to be managed using an integrated and holistic approach that enhances community resilience and avoids the creation of new intolerable risk, among other things.

43. We caution against relying on provision to mitigate future natural hazard risk in an area subject to flooding. The Waikato District and Regional Councils have been managing community complaints as a result of flooding in Te Kowhai Estate – an area rezoned for rural residential use in 2017 under Plan Change 17 (PC17). Repeated flooding has affected the community and their resilience. Similar to the proposed rezoning in the PWDP, technical information available at the time of preparing Waikato District's PC17 noted the presence of flooding hazards which noted the need to manage certain constraints through land use policies and/or rules in the district plan[2].

44. It is different to enable new development contrary to WRPS provisions and responsibilities under the RMA than to manage development in areas already zoned through the Natural Hazards chapter. We strongly recommend that the area north of Te Kuiti on the eastern side of the river, subject to the Building Platform Suitability Area C overlay and the High Risk Flood Zone overlay, should not be rezoned as rural lifestyle.

45. WRC also submitted that the PWDP did not rezone any other area that could represent potential losses of biodiversity and highly productive land as rural lifestyle zone.

[2] https://www.waikatodistrict.govt.nz/docs/default-source/your-council/plans-policies-and-bylaws/plans/catchment-management-plans/ngaruawahia-surrounds/catchment-management-plan---ngaruawahia-surrounds-structure-plan-area.pdf?sfvrsn=65836ac8_1

46. Based on direction issued in respect to hearings, we understand that matters for indigenous biodiversity and site specific NPS-HPL assessment will be managed in the second tranche of s42a reports. Therefore, WRC will assess if we need to provide specific evidence in relation to ecological considerations and HPL for the points related to rezoning of the RLZ at the later date.

Proposed future urban zone areas subject

47. WRC sought that the PWDP did not rezone any area subject to natural hazards risks as 'Future Urban Zone' (10.146) and did not rezone any other area that could represent potential losses of biodiversity and highly productive land as 'Future Urban Zone'.

48. We do not consider that the current level of assessment outlined in the future urban zone s32 and s42a reports is adequate to support future rezoning of these areas. We consider the level of information provided is inadequate to determine the appropriateness of the proposed future urban zone to give effect to the WRPS.

49. UFD-M1 Local authorities shall have regard to the principles in APP11 when preparing, reviewing or changing regional plans, district plans and development planning mechanisms such as structure plans.

50. In respect to the part of our submission which seeks that areas which could represent a potential loss of highly productive land are not rezoned as 'Future Urban Zone', we draw on the assessment of the proposed future urban zone sites against the NPS-HPL found in section 4.1.4 of the s42a report.

51. Collaboration regarding regional HPL mapping is ongoing, however, through communications to this date we understood that there were no areas that met the definition of 'identified for future urban development' under the NPS-HPL in the Waitomo District, and thus no areas to be exempt from HPL provisions through clause 3.4(2).

52. As described in paragraph 34 of the future urban zone s42a report, a plan change progressed under Schedule 1 of the RMA will enable the zone to change and development to occur consequently. We therefore understand that rezoning the land to FUZ in itself will not exempt the areas from NPS-HPL provisions as the zone would still be regarded as rural or rural production in nature.

53. Unless the assessment within section 4.1.4 of the s42a is confirmed to be satisfactory, there is uncertainty around whether some portion of the proposed future urban zone areas could potentially be mapped as highly productive land and be subject to NPS-HPL provisions.

54. Rezoning of highly productive land for urban development that meets requirements of NPS-HPL clause 3.6, must be supported by an adequate assessment on matters including development capacity across the district and to show thorough consideration of all practicable and feasible options.

55. Pending the outcome of an NPS-HPL assessment for the sites proposed to be rezoned, until the WRPS has been updated to incorporate NPS-HPL provisions, the existing objective LF-O5 and policy LF-P11 to safeguard land available for primary production against inappropriate subdivision, use or development, continue to apply to highly productive land – which also encompasses high class soils as defined under the WRPS.

56. In respect to natural hazards, we strongly recommend avoiding rezoning areas subject to natural hazards as FUZ. As outlined in our comments on proposed rural lifestyle areas subject to natural hazards, the WRPS has a risk-based approach to manage natural hazards and favour the avoidance of risk. This is further supported by the WRC's experience in dealing with rezoning that results in increased exposure to natural hazards for some communities.

57. WRPS method IM-M7 directs district plans to adopt a precautionary planning approach to any activity where the effects may be significant but are uncertain. Criterion 3 indicates that district plans 'shall' adopt a precautionary approach towards any proposed activity whose effects may be significant or irreversible but are as yet uncertain, unknown or little understood, including the use and management of coastal resources particularly vulnerable to effects from climate change.

58. We do not consider that rezoning land as future urban zone without a complete assessment of natural hazard risk is in alignment with this method of the WRPS.

59. We understand the intent of the future urban zone to appropriately mange land until such time as a structure plan is developed and a plan change is notified to change the zone to its intended final form. In our opinion all matters under the RMA need to be identified to support rezoning of any areas, even these are to be enabled in the future via a structure plan. Additional to our support for WRC's request to not rezone areas with known constrains we also note the following:

    59.1. The operation of the rules for the general urban zone is unlikely to realise the aim stated in the PWDP to ensure that "land use and development for non-farming related industry and commercial activities are discouraged in the future urban zone because it is critical that current land use practices do not conflict with the intended future land use."

    59.2. Therefore, we recommend introducing zone specific rules to fmanage land use within the current rural area and consider introducing a plan change at a later stage, based on a suitable assessment of constraint and future needs under operative regional policy and national direction.

60. Nonetheless, we consider that future zoning subject to a structure plan might be possible, if as a result of this plan making process WDC identifies suitable areas for future urban development – using what we've noted in this evidence as an appropriate process under existing national and regional policy.

61. A Structure Plan is an appropriate tool to refine boundaries and determine the final form of the future urban area. However, we do not consider that the Structure Plan requirements of Appendix 5, are strong enough in their direction concerning natural hazard identification to be relied on to avoid the rezoning of land subject to an identified natural hazard for development. We recommend following an approach similar to the one in the structure plan guidelines[3] for H18[4] (future urban zone) of the Auckland Unitary Plan. These provide more comprehensive set of considerations to support future zoning, which should be used to complement known information.

62. We caution that once a future urban zone area has been mapped, a community expectation will be set for it to be rezoned to its final form sometime in the future. It is therefore necessary to have a suitable level of certainty before rezoning an area to FUZ to ensure alignment with the WRPS.

63. As previously noted, the intention of WRPS Policy HAZ-P2 is to reduce the risks to the regional community from natural hazards by ensuring that development is appropriate with respect to the level of risk posed. Subdivision, use and development are required to be managed in a way that reduce the risks from natural hazards to an acceptable or tolerable level. Fundamental to this policy is criterion 1 which requires that risk is assessed for proposed activities on land subject to natural hazards.

64. The future urban zone s42a report goes some way to identifying the risks present on the site in section 4.1.2, however, as acknowledged in paragraph 35, the analysis does not contain enough detail to fully understand all the risks and constraints. A level of uncertainty remains as to whether any portion of the land will be suitable for urban development.

65. In order to maintain consistency with WRPS policy HAZ-P2, it is integral that the risk level is identified and understood prior to the rezoning of areas as FUZ so that informed decisions can be made concerning the suitability of the sites for future urban development zoning.

66. On this basis we support the s42 recommendation in paragraph 46 to reduce the proposed future urban zone area to align with Flooding Hazard overlay due to the uncertainty with the data.

67. Finally, we reiterate our recommendation to not rezone any area with a natural hazards overlay as future urban zone. This recommendation would constitute a precautionary approach consistent with the approach required to achieve integrated management under WPRS IM-M7 and contribute to avoiding intolerable risk in new development.

---

3 https://unitaryplan.aucklandcouncil.govt.nz/Images/Auckland%20Unitary%20Plan%20Operative/Chapter%20M%20Appendices/Appendix%201%20Structure%20plan%20guidelines.pdf

4 https://unitaryplan.aucklandcouncil.govt.nz/Images/Auckland%20Unitary%20Plan%20Operative/Chapter%20H%20Zones/H18%20Future%20Urban%20Zone.pdf

Timeframes in which future urban areas are expected to develop

68. We accept the concerns of s42a report regarding the WRC submission point 10.149 on FUZ-P2. We understand that it would not be appropriate to define a timeframe under which an activity can occur. We suggest that the policy wording could be amended to offer clearer direction for plan users, a note that the change of zone will occur when circumstances warrant it appropriate to start the structure plan process, or when there is enough demand to commence structure plan process and then rezone.

Managing natural hazard risk generally

69. The WRC submission 10.60 sought overall provisions for the natural hazards chapter that consider and address flooding in areas that are not mapped.

70. The PWDP does not include any overall provisions to address flooding in areas that are not mapped. We are concerned that in the absence of such provisions, outside of identified hazard areas, a change in land use could occur with no consideration of potential natural hazard risk.

71. We agree that, as outlined in paragraph 25 of the natural hazards s42a report, the site suitability and hazard assessments that are undertaken for all subdivisions go some way to addressing the assessment of flood hazards outside of mapped areas.

72. Further, we understand, as outlined by the s42a author, that the PWDP cannot impose rules relating to flooding for areas that are not mapped, as there would be no trigger for a land use consent and no clarity for landowners regarding consenting requirements.

73. The WRPS promotes a risk based approach to managing subdivision, use and development through policy HAZ-P2, including by ensuring risk is assessed for proposed activities on land subject to natural hazards.

74. There are recent examples in the Waikato region on managing natural risk hazard generally. To align with WRPS HAZ-P2, we suggest that following an approach similar to that in the proposed Waikato District Plan – Appeals version to manage natural hazard risk generally, would be appropriate to help achieve the outcomes sought in our submission.

75. Managing natural hazard risk generally in the proposed Waikato District Plan[5] – copied below:
(1) Outside of high risk natural hazard areas, provide for subdivision, use and development where:

(a) Natural hazard risk has been appropriately identified and assessed;
(b) The risk can be adequately avoided, remedied or mitigated;
(c) The risk does not transfer to adjoining sites; and
(d) The risk is not exacerbated.

[5] https://eplan.waikatodistrict.govt.nz/?docId=M0Jo0YIdigg%3d

Conclusion

76. We support all recommendations of the section 42A authors which accept WRC's submission points and align with the relief sought through the WRC further submission.

77. We recommend further amendments to give effect to the relief sought by our submission as outlined in this document, supported by the technical advice provided by Mr Liefting in his technical evidence concerning matters related to natural hazards, climate change and natural hazards risk management.

78. We encourage WDC to work with WRC in areas related to indigenous biodiversity, natural hazards and highly productive land to develop a collaborative approach that will result in an effective and efficient approach to resource management under the PWDP.

Sarah Knott
Policy Advisor
Waikato Regional Council

Luis Alejandro Cifuentes
Team Leader Policy Implementation
Waikato Regional Council

21 June 2024

File No: 25 10 00
Document No: 29469537

21 June 2024

Waikato Regional Council
Te Kaunihera ā Rohe o Waikato

Private Bag 3038
Waikato Mail Centre
Hamilton 3240, NZ

waikatoregion.govt.nz
0800 800 401

Proposed Waitomo District Plan – Evidence for Natural Hazards and Coastal Environment Chapters.

1 Rick Liefting Background

1. My Name is Rick Liefting, I am Team Leader of Regional Resilience in the Integrated Catchment Management (ICM) Directorate of Waikato Regional Council (WRC). I have a Master of Science degree (Coastal Processes) from Waikato University (1998) and have been working in the natural hazards field for over 20 years. I have been working for WRC since 2013, firstly as Senior Regional Hazards Advisor, then team leader from 2016.

2. I am a WRC Regional Flood Coordinator and Subject Matter Expert (SME) on Natural Hazards, risk management and response.

3. I am a member of the New Zealand Coastal Society (Committee member 2005 to 2017, Chair 2014 to 2017), member of NZ Flood Warning Steering Group and member of Regional Hazard and Emergency Management Special Interest Group.

4. I have been involved with providing, reviewing, assessing information and assisting staff from Territorial Authorities on natural hazard and risk data to inform District Plan objectives, policy and rules. The Territorial Authorities I have directly assisted include:
    - Thames Coromandel District Council
    - Taupo District Council
    - Waikato District Council

5. I have also been a key information provider to the Waikato Regional Policy Statement (WRPS) practice note on Natural Hazards as well as the Proposed Regional Coastal Plan.

6. The Regional Resilience team I lead identifies, analyses, collates and provides natural hazard and risk information to ensure that natural hazard risk is reduced over time and sound decisions are made regarding current and future development of hazard prone areas.

7. The Regional Resilience team provides access to natural hazard information held by WRC primarily through the Waikato Regional Hazards Portal[1] (which includes access to the Coastal Inundation Tool[2]. I initiated and led the Coastal Inundation Tool development and implementation.

8. A key role that the Regional Resilience team provide is to review and assess natural hazard and risk data for:

1. Waikato Regional Hazards Portal: https://waikatoregion.maps.arcgis.com/apps/MapSeries/index.html?appid=f2b48398f93146e8a5cf0aa3fddce92c
2. Coastal Inundation Tool: https://waikatoregion.govt.nz/services/regional-hazards-and-emergency-management/coastal-flooding-inundation/coastal-inundation-tool/

- Resource Consent applications for new development, including Subdivisions
- District Plan Zone changes
- Structure plans and growth strategies
- Community Adaptation/Resilience Plans
- Community Response Plans (CDEM)
- Projected impacts from Climate Change

9. Specifically for Waitomo District Council I have been involved with the following datasets used to inform the Proposed Waitomo District Plan (PWDP):
    - Flood hazard mapping (Tonkin & Taylor 2019).
        - The Flood Hazard Mapping assessment was undertaken for Waitomo District Council, but funded and facilitated by WRC.
        - WRC provided information, guidance and review to the flood modelling methodology/outputs, mapping and final report.
        - WRC provided guidance to Waitomo District Council on applying the outputs for a district plan.
    - Coastal Hazards (Focus 2020)
        - Provided initial assistance and guidance on Coastal inundation and erosion to the authors
        - Provided informal review, guidance on outputs and application into district plan.
    - Te Kuiti Landslide Susceptibility (Tonkin & Taylor 2019)
        - Provided and facilitated initial review of assessment and report
        - Note, review primarily undertaken by Dr Phil Mourot (Geophysicist) of WRC Regional Resilience team.

10. More recently I have provided assistance and guidance to Waitomo District Council on flood hazards and setting of minimum floor levels for a proposed subdivision (Resource Consent Application) in Te Kuiti and also coastal hazard management concerning coastal erosion and Mokau.

11. I have been asked by WRC to provide technical evidence for the Natural Hazards chapter, and Coastal Environments chapter for the Proposed Waitomo District Plan (PWDP).

2 Natural Hazard Risk Information and Management within Waikato Region and Waitomo District

2.1 Overview

12. While this evidence is to address WRC submission points, I would be remiss not to provide general context and relevance of natural hazard risk information and management that is likely to have significant implication to the effectiveness of the Waitomo District Plan, once operative.

13. Understanding and managing natural hazard risk is an ever changing and developing discipline. Our understanding of natural hazards increases over time through better data and technology that informs how best to manage risks. As such, what is considered 'best practice' for natural hazard management is also evolving and changing over time.

14. WRC is proactively increasing knowledge and understanding of natural hazards across the region, including the Waitomo District. Advances in data coverage/accuracy and modelling techniques will enable greater spatial coverage of flood hazard, land instability and coastal hazards. Collaboration with Territorial Authorities, iwi partners and communities on managing natural hazard risks also enhances our understanding to inform best practice.

15. A District Plan should recognise current best practice, based on best information available at the time, but be cognisant that the information to inform natural hazards and risk will change over the operational term of the plan.

2.2 Natural Hazard information

16. The PWDP has identified three primary natural hazards, Flooding (Fluvial (river) and Pluvial (ponding) flooding), Coastal hazards (erosion and inundation) and Land instability (landslides) at specific locations for management through respective policy, objectives and rules.

17. The natural hazard assessments and mapping undertaken are a snapshot of understanding from 2019 (Flooding and Landslide hazard) and 2020 (Coastal hazards), for specific key areas. However, while the assessments were undertaken in 2019 and 2020, the key data used (primarily topographical), was obtained earlier.

18. The LiDAR data used for the Flood and Landslide hazard assessments was obtained in 2007. The LiDAR data used for the Coastal Hazard assessment was obtained in 2015. I also note that the 2007 and 2015 LiDAR coverage is limited and a combination of topographical datasets were used for the Flood Hazard assessment. The LINZ derived 20 m contour topographical dataset used for the Flood hazard assessments is considered a course and much less accurate dataset than a LiDAR derived dataset.

19. LiDAR information used in the Natural Hazard assessments is now at least 17 years old.

20. New LiDAR data covering the entire Waitomo District, obtained by WRC in 2021, is now available that would likely enhance and refine the outcomes of the natural hazard assessments. Due to time and financial constraints, re-assessing the natural hazard assessments for the PWDP was not practical.

21. While the topographical data used to inform the natural hazard assessments are now superseded, however at the time of the assessments, the data was the best available. Prior to the natural hazards assessments undertaken in 2019 and 2020, there was either limited or no information on natural hazards for the specific locations assessed, therefore the understanding of natural hazards was significantly improved.

2.3 Natural Hazard terminology

22. Nationally and regionally, there are inconsistencies in natural hazard risk and management terminology and definitions within regulatory documents. The inconsistencies are unfortunate but can be communicated and clarified through the PWDP to ensure consistency on the intent of the wording and definitions.

2.4 Climate Change Scenarios

23. Since the assessments for Flooding and Coastal Hazards, guidance on Climate change has been updated. The natural hazard assessments referenced climate change information from (then current) guidance documents that downscaled Intergovernmental Panel on Climate Change (IPCC) Assessment Report 5 (AR5) data. Updated guidance now refers to AR6 data.

24. The IPCC provides information on the projections of climate change every 6 or 7 years. Key updated guidance includes the updated Ministry for the Environment (MfE) Coastal Hazards and Climate Change Guidance[3].

25. The latest AR6 IPCC information introduced changes from the previous AR5 information on how climate change projections are described and potential impacts assessed. Key changes between AR5 and AR6 for the New Zealand context are:
    a. Use of new climate change scenarios
    b. New zero baseline for sea level rise projections.

26. The most significant changes in describing climate change (including sea level rise) in AR6 is the use of Shared Socio-economic Pathways (SSPs) scenarios, rather than the previous use of Representative Concentration Pathways (RCPs). Each SSP has two sets of projections labelled 'medium confidence' (out to 2150) and 'low confidence' (out to 2300).

27. The updated MfE Guidance provides the following recommended SSPs for planning and assessment, using the 'medium confidence' projection (out to 2150) and relationship to the previous RCPs:
    c. SSP1-2.6 M ⇔ NZ RCP2.6 M
    d. SSP2-4.5 M ⇔ NZ RCP4.5 M
    e. SSP3-7.0 M ⇔ n/a (fills the sizeable gap between SSP2-4.5 and SSP5-8.5)
    f. SSP5-8.5 M ⇔ NZ RCP8.5 M
    g. SSP5-8.5 H+ [83rd percentile (p83); top of shaded "likely range"] ⇔ NZ RCP8.5 H+.

28. The other change is the use of a new baseline for projected sea level rise. The latest projections now reference a zero baseline for the period 1995 – 2014 (mid-point 2005). The previous baseline period was 1986 – 2005 (mid-point at 1996). The difference between the two baselines across New Zealand is on average 3cm.

29. The updated MfE Guidance provides revised Sea Level Rise Projections, shown in Table 1.

3. Ministry for the Environment Coastal Hazards and Climate Change Guidance: https://environment.govt.nz/assets/publications/Coastal-hazards-and-climate-change-guidance-2024-ME-1805.pdf

Table 1 Summary of approximate year when absolute sea-level rise (SLR) heights could be reached using the recommended projections for a central location in Aotearoa New Zealand. Source (https://environment.govt.nz/assets/publications/Coastal-hazards-and-climate-change-guidance-2024-ME-1805.pdf, Table 6, page 49).

SLR (metres)	Year achieved for SSP5-8.5 H+ (83rd percentile)	Year achieved for SSP5-8.5 (median)	Year achieved for SSP3-7.0 (median)	Year achieved for SSP2-4.5 (median)	Year achieved for SSP1-2.6 (median)
0.2	2035	2040	2045	2045	2050
0.3	2050	2055	2060	2060	2070
0.4	2055	2065	2070	2080	2090
0.5	2065	2075	2080	2090	2110
0.6	2070	2080	2090	2100	2130
0.7	2080	2090	2100	2115	2150
0.8	2085	2100	2110	2130	2180
0.9	2090	2105	2115	2140	2200
1.0	2095	2115	2125	2155	>2200
1.2	2105	2130	2140	2185	>2200
1.4	2115	2145	2160	>2200	>2200
1.6	2130	2160	2175	>2200	>2200
1.8	2140	2180	2200	>2200	>2200
2.0	2150	2195	>2200	>2200	>2200

Notes: Approximate year (to the nearest five-year value) when each absolute sea-level rise (SLR) height could be reached from a central location from the NZ SeaRise platform, under the *medium confidence* SLR projections, relative to the 1995–2014 baseline (mid-point 2005). Excludes vertical land movement and the *low confidence* SLR projections. The table uses 0.1 metre SLR height increments up to 1 metre, thereafter 0.2 metre height increments.

Can be considered broadly representative across Aotearoa New Zealand, because the absolute SLR from north to south only varies by ± 0.025 metres by 2150 (relative to the central location).

30. Therefore, the PWDP is referencing superseded climate change information.

2.5 New regional scale flood, land slide and coastal hazard information.

31. WRC has commenced undertaking regional scale natural hazard assessments to provide regional exposure to flooding, coastal inundation and landslides. The regional scale assessments are intended to be completed by June 2025 (draft datasets for flood and landslide are currently available) and will provide spatial layers showing exposure across the region, including Waitomo District.

32. How or if the new data can inform or compliment the PWDP is still to be determined. However, I am confident that new natural hazard data will at least increase understanding of natural hazard exposure across Waitomo District. In some areas such as Waitomo Valley, the new flooding information may supersede the robustness of the flood extents mapped in 2019, simply because LiDAR (from 2021) is used in the modelling.

33. For coastal inundation hazards, water levels representing current and future AEP scenarios will be incorporated into the Coastal Inundation Tool. The AEP scenarios will provide more appropriate guidance than the existing scenarios of MHWS, Max Tide, Lower Storm Tide and Upper Storm Tide. The Upper Storm Tide Range scenario was used to represent the 'rare extreme storm surge event' used in determination of the Coastal Flood Hazard Area (CFHA).

34. Regional landslide susceptibility mapping will provide increased awareness of landslide hazard across the district. The regional scale landslide susceptibility mapping will unlikely supersede the landslide hazard mapping undertaken for the PWDP, even though will be using more recent LiDAR data.

35. The new natural hazard information will also provide better understanding of the viability of proposed future land use changes change areas identified in the PWDP.

2.6 Recommendation to resolve outdated data, guidance and future natural hazard information.

36. Base data and best practice guidance used by the natural hazard assessments to inform the PWPDP is now outdated. New information will also be available, likely before the PWDP becomes operative, that will further increase understating of natural hazards across the Waitomo District.

37. With existing District Plan processes, there is always a time lag from when technical information is obtained, to when Objectives, Polices and Rules become operative. The time lag is an accepted outcome of the District Planning process and generally does not result in significant impact.

38. While the timing of the WPDP process is not extra ordinary, the relative changes in available data, soon to be available natural hazard information and new national guidance that have occurred since the start of the process in 2019, in my opinion are extra ordinary.

39. Therefore, in my opinion the availability of more recent data, upcoming natural hazard information and updated national guidance would likely provide a significant increase in the understanding and robustness of natural hazard information used in the WPDP. Specifically, the mapped extents of the natural hazard areas for flooding, coastal hazards and landslides.

40. For each natural hazard dataset, there are options available to address inconsistencies and superseded data including (but not limited to):
    - Retain natural hazard data, but acknowledge data is superseded and ensure clear process for using new/updated information
    - Remapping and amending natural hazard data
    - Removing mapped natural hazard data from the PWDP and refer to mapped data outside of District Plan.

41. I recommend a collaborative approach between Waikato District Council and Waikato Regional Council to resolve inconsistencies with best practice guidance and utilising latest information to provide a more robust and relevant Waitomo District Plan.

3 WRC Submission information

42. Notwithstanding the recommendations in Section 2, the WRC submission points are still valid and will be discussed in the following section. However, for simplicity, reference to RCP's will remain, but subject to further discussion with Waitomo District Council.

3.1 Natural Hazards Chapter

3.1.1 Definitions for flood risk management

43. The WRC submission sought a review of the naming terminology used throughout the natural hazards chapter of the PWDP to ensure consistency of use, and to provide definitions for terminology not yet defined to aid the interpretation of policies and rules.

44. WRC has updated terminology and definitions regarding flood protection and land drainage assets and infrastructure to inform the WRC Regional Asset Management Plan (RAMP) and Infrastructure Strategy 2024 – 2074. The RAMP and Infrastructure Strategy will be publicly available from July 1, 2024.

45. All flood protection and land drainage assets/infrastructure are to manage flood risk, but at varying Levels of Service. Also, managing flood risk for a community does not necessarily require a structural asset, such as a stopbank, flood gate etc. Managing flood risk for a community can also include education, response plans or other non-structural assets.

46. Therefore, to align with WRC RAMP and Infrastructure Strategy, I suggest incorporating where appropriate the following terminology and associated definitions within the PWDP.

47. **<u>WRC proposed Terminology and Definitions (Source: WRC RAMP 2024):</u>**

Annual Exceedance Probability (AEP)	The probability of a storm event being exceeded in any one year
Embankment	In the Waikato Regional Council context, the term 'Embankment' is used to refer to earth structures used to control flood waters. This includes the following asset types: Stopbanks, Spillways and Detention Dams
Flood	A flood is when a water level, flow or extent exceeds an agreed threshold causing an adverse effect to people, property or the environment requiring flood risk management.
Flood Risk Management	Managing the risk of flood impacts on people and property using a variety of mechanisms such as infrastructure, planning, modelling, emergency management and education.
Flood Infrastructure	Built (e.g., stopbanks, floodgates and pumpstations) or natural assets (e.g., wetlands) used to manage agreed risk thresholds (level of service) from flood waters on private and public property or the environment.
Level of Service	Outputs a customer or community receives from the organisation. They should describe what the organisation is agreed to deliver, including attributes relating to risk threshold, quality, reliability, responsiveness, sustainability, timeliness, accessibility, and cost.
Risk threshold	The point at which a community can no longer tolerate the impacts of a natural hazard event. Adaptation actions or pathways should be implemented prior to a community risk threshold being reached.
Stopbank	An embankment adjacent to a river or watercourse, which retains floodwaters from flowing onto a floodplain.
Structural measures	Structures or physical works constructed to keep floodwaters away from existing development e.g. stopbanks

48. In addition to the terminology and definitions above, I suggest the following definition is also incorporated to provide consistency and clarity between the PWDP and technical reports:

Average Return Interval (ARI) The average time period between an event of a certain size. An ARI and AEP are both terms to describe the probability of a certain size of event occurring. The table below provides the probability of certain size events and relationship between ARI and AEP.

ARI	AEP	In any 1 year period	In any 10 year period	In any 30 year period	In any 70 year period
50 years	2%	1 chance in 50	1 chance in 5.5 (18%)	1 chance in 2.2 (45%)	1 chance in 1.3 (76%)
100 years	1%	1 chance in 100	1 chance in 10 (10%)	1 chance in 4 (26%)	1 chance in 2 (51%)
200 years	0.5%	1 chance in 200	1 chance in 20 (5%)	1 chance in 7 (14%)	1 chance in 3.3 (30%)
500 years	0.2%	1 chance in 500	1 chance in 50 (2%)	1 chance in 17 (6%)	1 chance in 7.7 (13%)

49. I recommend that any other terminology and definitions not included above are consistent with the Waikato Regional Policy Statement and retained in the PWDP.

3.1.2 Natural Hazard management in areas that are not mapped

50. The PWDP manages new development through either Rules within a mapped natural hazard area or the Subdivision provisions.

51. However, development (additions or new building housing a sensitive activity) could occur on existing, appropriately zoned land subject to natural hazards that is outside of a mapped hazard zone and does not require a Subdivision Consent.

52. This concern was addressed in the WRC submission, which sought new overall provisions that consider and address flooding in areas that are not mapped in the natural hazards chapter.

53. I recommend that the PWDP is amended to ensure additions to an existing building, or construction of a new building housing a sensitive activity are constructed to manage risk from natural hazards.

3.1.3 Building Platform Suitability Area C

54. WRC sought amendment to paragraph on page 2 of the proposed Natural Hazards chapter to define Building Platform Suitability Area C, on the grounds that the current wording does not clarify whether the modelling is for the current climate or for an RCP 8.5 climate.

55. I consider that the revised wording from Waitomo District Council in the Natural Hazards Section 42a Report, to define Building Platform Suitability Area C, is confusing due to incorporation of current climate conditions and projected rainfall based on a climate change scenario. The scenario used for Building Platform Suitability Area C is a climate change scenario and is not a current climatic condition.

56. There is also confusion in using two different assessment types for Te Kuiti and Waitomo Valley Road within Building Platform Suitability Area C.

57. The Building Platform Suitability Area C for Te Kuiti and Piopio is derived from hydraulic modelling.

58. The Building Platform Suitability Area C for Waitomo Valley Road area was derived from a qualitative assessment of floodplain extent, estimated, based by:
    - Hydraulic constriction at the Waitomo Valley Road bridge over the Waitomo Stream.
    - Vegetation types and observed drainage network.

59. The Building Platform Suitability Area C for Waitomo Valley Road is therefore considered a less robust and less accurate methodology than the method used for Te Kuiti.

60. The recommended wording from the Natural Hazards Section 42a Report author is:

Building Platform Suitability Area C which is the floodplain area in Te Kūiti and Piopio identified on the planning maps for 100 year ARI events (current climatic conditions) with rainfall projected to a 2120 future time horizon based on RCP 8.5. It is also the floodplain area identified in Waitomo Valley Road by a qualitative assessment.

61. I suggest revised wording for Building Platform Suitability Area C below:

Building Platform Suitability Area C is comprised of:

1) *The floodplain area in Te Kūiti and Piopio identified on the planning maps for 1% AEP events with rainfall projected to a 2120 future time horizon based on RCP 8.5.*
2) *The floodplain area identified in Waitomo Valley Road, estimated by a qualitative assessment.*

3.1.4 Preference and consistency in describing flood event size and probability.

62. In their submission, WRC sought that all references of "100-year ARI" be changed to 1% AEP (Annual Exceedance Probability).

63. The PWDP uses both ARI (Average Return Interval) and AEP (Annual Exceedance Probability) to describe the probability of a certain size of flood event.

64. An example of the inconsistency is highlighted below:

In Te Kūiti and Piopio, Building Platform Suitability Area C is the 100 year average recurrence interval (ARI) events for current climatic conditions with rainfall projected to a 2120 future time horizon based on a Representative Concentration Pathway (RCP) of 8.5. These areas were identified through detailed hydraulic 2D modelling. In Te Kūiti, High Risk Flood Zone also been identified. These are areas within the flood plain where the depth of flood water in a 1% Annual Exceedance Probability (AEP) flood event exceeds 1 metre and the speed of flood water exceeds 2 metres per second, which is considered to put the community at an unacceptable (or intolerable) level of risk in terms of the potential for loss of life, injury or serious damage to property. Subdivision and new activities within the High Risk Flood zone are carefully regulated.

65. I recommended using one term consistently through the PWDP and that term to be AEP. AEP should be used for consistency with the Waikato Regional Policy Statement as a regulatory document guiding the PWDP.

66. I do note that using AEP is inconsistent with the ARI terminology used in the technical documents (e.g. Tonkin & Taylor 2019). However, the suggested definition for ARI (section 3.1.1) will provide clarity to the reader and relevancy to AEP.

3.2 Coastal Environments Chapter

3.2.1 Intent and definitions for Coastal Hazard Areas.

67. The intent behind the WRC submission concerning the CEHA-2 and CFHA area was to ensure consistency with the policies and provide clarity to plan users.

68. There is inconstancy between definitions and intent of CEHA-2, CFHA, CE-P13.2, CE-P14.4 and CE-P22.2.1. I have highlighted below inconsistencies in determining the size/probability of a coastal erosion or inundation hazard event.

69. From the PWDP:

The Coastal Erosion Hazard Area 2 (CEHA 2) which is the area likely to be affected by coastal erosion over the next 100 years to 2120 assuming a continuation of existing coastal trends and the likely impact of projected sea level rise of 1.0 m.

The Coastal Flood Hazard Area (CFHA) which is the extent of land likely to be vulnerable in a rare extreme storm surge event, including the effect of a projected sea level rise (1.0 m to 2120).

CE-P13. Reduce the risk to people's safety and the potential for damage to buildings located in the Coastal Erosion Hazard Area 2 by:

2. Consenting a building only where its design ensures the risk of material damage during an coastal erosion event is minimised;

CE-P14. Reduce the risk to people's safety and the potential for damage to buildings located in the Coastal Flood Hazard Area by:

4. Requiring minimum floor levels and a freeboard suitable to the setting that will provide protection from flooding during an extreme coastal inundation event, including 1.0 m of sea level rise;

CE-P22. Increase resilience to the projected effects of climate change by:

1. Requiring assessment for new development where relevant, that provides for a projected increase in sea level, as determined <u>by national guidance, but being not less than 1 m by 2120</u>;

70. Having clear and consistent determination of water levels and/or events is desirable to have a consistent approach to managing coastal hazard risks. I acknowledge that the information to determine a specific water level, ideally relative to a specific AEP, was not available at the time of the coastal hazard assessment work.

71. CE-P14.4 is also not consistent with NH-R5.3 with regard to setting of minimum floor levels. The methodology for determining minimum floor levels to mitigate water levels should be consistent, regardless of the location or driver of water levels such as river flooding, ponding or coastal inundation.

72. Notwithstanding my recommendations on NH-R5.3 in Section 3.5 of this evidence, key differences between CE-P14.4 and NH-R5.3 include:
    - Use of a defined AEP in NH-R5.3, no AEP defined in CE-P14.4
    - No inclusion of climate change in NH-R5.3 whereas climate change is included in CE-P14.4
    - No defined freeboard or clear methodology to inform a finished floor level in CE-P14.4

73. I refer to Section 2.6 of this evidence to work collaboratively with Waitomo District Council on a resolution in lieu of new coastal water level and hazard information.

3.2.2 Coastal flood hazard area in Awakino

74. The WRC submission sought an explanation for why only a part of the coastal hazard area is considered and included for Awakino.

75. The wording to describe the CFHA for Awakino is confusing, specifically the terminology '…estimated in part…' as highlighted below:

In Kiritihere and Marokopa, a simplified 2D model is employed to identify these areas and in Awakino the area is estimated in part, by referencing to the downstream floodplain extent and extending this upstream

76. To reduce confusion, I recommend the below:

In Kiritihere and Marokopa, a simplified 2D model is employed to identify these areas and in Awakino the area is estimated ~~in part,~~ by referencing to the downstream floodplain extent and extending this upstream

3.3 Determination of Minimum Floor Levels

77. An element of relief sought in the WRC submission concerning CE-P14.4, to provide a definition for an 'extreme coastal inundation event', is that people's safety and protection of property should be provided for regardless of the intensity of the flood event.

78. There is inconsistency in determining Minimum Floor Levels (MFL) through NH-R5.3. between piled foundations and concrete foundations. There is also inconsistency with application of freeboard with NZS 4404: 2010 Land development and Subdivision.

79. I am not an expert in building construction and the below evidence is based on information contained in NZS 4404: 2010 Land development and Subdivision as well as examples from other Territorial Authorities.

80. NH-R5.3 states:

3. Any new building housing a sensitive activity must achieve:

(i) A finished floor level located 0.5 above the 1% AEP flood level, where this level taken from the bottom of the floor joists; or

(ii) Where concrete, the top of the finished floor level must be at least 0.5 m above the 1% AEP flood level;

81. Clarification is sought as to whether the 1% AEP flood level includes or excludes climate change. If not explicitly stated, the 1% AEP flood level is assumed to not include climate change. However, the Building Platform Suitability Area C that the rule applies to is defined using 1% AEP flood levels that include climate change.

82. I agree with the determination of MFL for piles foundations (NH-R5.3.(i)) where the freeboard is measured to the bottom side of the joists, however I recommend that the level is referred to as a building platform level, rather than a finished flood level.

83. I do not agree with the determination of MFL for concrete foundations (NH-R5.3.(ii)), where the freeboard is measured to the top of the finished concrete level.

84. The reason for measuring freeboard to the base of floor joist for piled foundations is to ensure water does not impact the services and insulation contained in the cavity between the bottom of the floor joists and bottom of the floor.

85. However, the result of different application of freeboard is a lower floor level in a flood zone for concrete foundations.

86. There is likely to be greater impact, damage and loss from flood waters exceeding the finished floor levels in either the piled or concrete foundation dwelling. However, using the method of NH-R5.3 the finished floor levels for concrete foundation will be less and more susceptible to flood impacts than a piled foundation.

87. Figure 1 shows an example of determining building platform levels and freeboard.

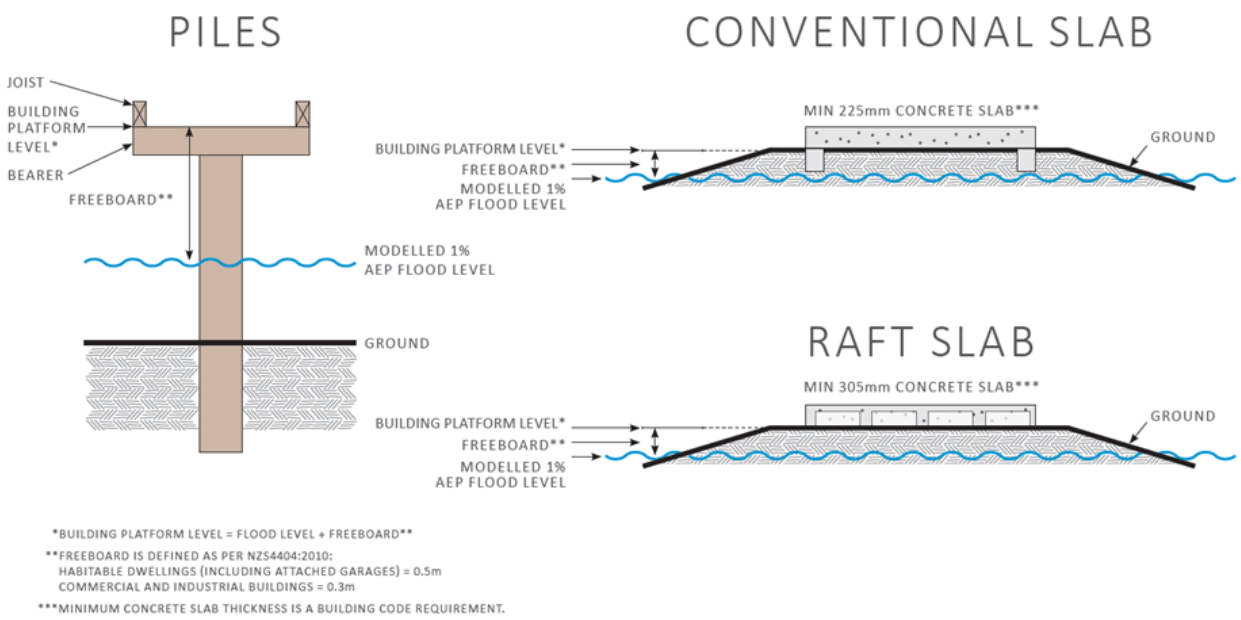
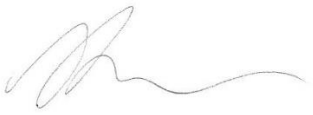


Figure 1 Example of determining building platform level and freeboard. Source (https://www.whakatane.govt.nz/services/building-and-planning/minimum-building-platform-level)

88. I recommend that NH-R3 is amended to be consistent with NZS 4404: 2010 Land development and Subdivision.

Yours faithfully



Rick Liefting
Team Leader, Regional Resilience, Integrated Catchment Management Directorate, Waikato Regional Council.