BEFORE THE INDEPENDENT HEARING PANEL APPOINTED TO HEAR AND MAKE DECISIONS ON SUBMISSIONS AND FURTHER SUBMISSIONS ON PROPOSED DISTRICT PLAN CHANGE 56

IN THE MATTER	of the Resource Management Act 1991 (the Act)
	AND
IN THE MATTER	of Hearing of Submissions and Further Submissions on Proposed District Plan Change 56 to the Operative District Plan under Schedule 1 of the Act

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STATEMENT OF EVIDENCE OF RICHARD CAMERON SHEILD

ON BEHALF OF WELLINGTON REGIONAL COUNCIL

29 MARCH 2023

Executive Summary

1 The National Policy Statement for Freshwater Management 2020 (NPS-FM 2020) requires that territorial authorities adopt an integrated approach to freshwater management, including the management of adverse effects of urban development on freshwater bodies. There is similar direction in Greater Wellington's Proposed RPS Change 1 and in the Te Whaitua Te Whanganui a Tara Whaitua Implementation Programme and Te Mahere Wai o Te Kāhui Taiao that Hutt City Council has committed to implementing.

2 Taking an integrated approach to the management of freshwater that incorporates the adverse effects of urban development is essential if the health of water bodies within Hutt City is to be improved. It is also essential to achieve the new urban environment objective in this plan change of a well-functioning urban environment that enables all people and communities to provide for their social, economic, and cultural wellbeing, and for their health and safety, now and into the future.

Qualifications and experience

3 My full name is Richard Cameron Sheild. I am a senior policy advisor in the Environmental Policy team at the Wellington Regional Council (Greater Wellington).

4 I hold a Bachelor of Arts with Honours in Politics and International Relations from Massey University and Master of Planning from Lincoln University.

5 I am a full member of the New Zealand Planning Institute and have been since December 2021.

6 I have over 5 years of experience in resource management planning, all spent at Greater Wellington. I have previously prepared Council's s42A report on natural hazards during the development of the Natural Resources Plan and have presented to hearings panels and been involved in mediation on this topic. More recently, I have been involved in providing planning advice to the Te Whanganui a Tara Whaitua process (a catchment committee process to implement section 3.2(1) of the NPS-FM 2020) and was the planning lead on water allocation plan changes to the proposed Natural Resources Plan.

Code of conduct

7 I have read the Code of Conduct for Expert Witnesses set out in the Environment Court's Practice Note 2023 (Part 9). I have complied with the Code of Conduct in preparing this evidence. My experience and qualifications are set out above. Except where I state I rely on the evidence of another person, I confirm that the issues addressed in this evidence are within my area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from my expressed opinions.

Scope of evidence

8 My evidence addresses Greater Wellington's submission points that seek amendments to Proposed District Plan Change 56 (PC56) relating to the integration of urban intensification and freshwater management. Greater Wellington's proposed amendments seek to ensure that PC56 appropriately integrates the management of intensification and effects on freshwater, and in doing so helps to give effect to the NPS-FM 2020 and achieve a well-functioning environment.

Background – integrated management & the NPS-FM 2020

9 Section 3.5 of the NPS-FM 2020 includes direction for territorial authorities regarding their roles in freshwater management.

10 Section 3.5(1) requires of local authorities (underlined emphasis my own):

> Adopting an integrated approach, ki uta ki tai, as required by Te Mana o te Wai, requires that local authorities must:
>
> (a) recognise the interconnectedness of the whole environment, from the mountains and lakes, down the rivers to hāpua (lagoons), wahapū (estuaries) and to the sea; and
>
> (b) recognise interactions between freshwater, land, water bodies, ecosystems, and receiving environments; and
>
> (c) manage freshwater, and land use and development, in catchments in an integrated and sustainable way to avoid, remedy, or mitigate adverse effects, including cumulative effects, on the health and well-being of water bodies, freshwater ecosystems, and receiving environments; and
>
> (d) encourage the co-ordination and sequencing of regional or urban growth.

11 Furthermore, Section 3.5(4) requires that "every territorial authority must include objectives, policies, and methods in its district plan to promote positive effects, and avoid, remedy, or mitigate adverse effects (including cumulative effects), of urban development on the health and well-being of water bodies, freshwater ecosystems, and receiving environments" (emphasis my own).

12 The NPS-FM 2020 makes it clear that Hutt City Council has a statutory role in managing and protecting freshwater within its district. This is not disputed by Hutt City Council officers[1]. The section 42A report seems to state that Hutt City Council intends to give effect to the NPS-FM 2020 through its full district plan review, but there does not seem to be a timeframe set out for this. I note that section 4.1(1) of the NPS-FM 2020 directs that every local authority must give effect to the NPS-FM 2020 as soon as reasonably practicable.

13 I acknowledge that there is more limited scope to fulfil this role within an IPI, but I consider that it is appropriate and necessary to fulfil some of this role now to the extent that Hutt City Council can within the scope of PC56.

Background – Proposed RPS Change 1 & Whaitua Te Whanganui a Tara

14 Proposed RPS Change 1 was notified on August 19th, 2022. This change includes significant new regional direction on several topics – climate change, urban development, indigenous biodiversity, and freshwater. In the context of the impacts of urban development on freshwater, Policy FW.3 articulates Greater Wellington's method to give effect to section 3.5(4) of the NPS-FM 2020.

15 Hutt City Council was a committee member in the Whaitua Te Whanganui a Tara process. This is the process used by Greater Wellington to implement section 3.2(1) of the NPS-FM

[1] https://hccpublicdocs.azurewebsites.net/api/download/7210cb015bf3423eb849e753bed7dbae/_districtplann/b636dbb428182517a45848d56a7d00b578420, paragraph 370

2020, which required engagement with communities and tangata whenua to determine how Te Mana o te Wai applies to water bodies and freshwater ecosystems within the Greater Wellington region.

16 The visions and aspirations of communities and tangata whenua as distilled through this process are captured by the Te Whaitua te Whanganui-a-Tara Implementation Programme[2] and Te Mahere Wai o Te Kāhui Taiao[3], which include several recommendations relating to reducing the adverse impacts of urban development and intensification on water bodies.

17 While these documents do not have statutory weight, they were developed as part of the process of giving effect to section 3.2 of the NPS-FM 2020 - engaging with communities and tangata whenua to determine how Te Mana o te Wai applies to water bodies and freshwater ecosystems in the region.

The importance of an integrated approach

18 The problem with the approach being taken by Hutt City Council in decoupling urban intensification and freshwater management is that is treats the environment as siloed and unintegrated when it is not. Once built, infrastructure and development is often 'baked-in' for decades.

19 The scale of urban intensification required to meet the Housing Bottom Lines in Hutt City means that it is critical that Hutt City Council takes an integrated approach to urban development and intensification that manages adverse effects on freshwater. The housing bottom lines mandated by the National Policy Statement on Urban Development 2020 (NPS-UD) requires that Hutt City Council provides capacity for at least an additional 9,708 dwellings by 2031 and 15,064 dwellings by 2051 – the second largest number of additional dwellings in the Wellington region, surpassed only by Wellington City.

20 As part of the Whaitua Te Whanganui a Tara process, the current state of waterbodies within Hutt City were established. Tables 1-3 below shows the current state and current trends (where applicable) of several NPS-FM attributes that were established during the whaitua process for waterbodies within the area affected by Plan Change 56[4].

Table 1: Ecological and human health indicators

Sub-catchment areas	**Macroinvertebrates**		**Periphyton**		**Fish**		**Human health *(E. coli)***	
	Current	Trend	Current	Trend	Current	Trend	Current	Trend
Te Awa Kairangi Lower mainstem	B	Worsening	C	Worsening	A		D	

[2] https://www.gw.govt.nz/assets/Documents/2021/12/Te-Whaitua-te-Whanganui-a-Tara-Implementation-Programme_web.pdf

[3] https://www.gw.govt.nz/assets/Documents/2021/12/te_mahere_wai_20211028_v32_DIGI_FINAL.pdf

[4] https://www.gw.govt.nz/assets/Documents/2021/12/Te-Whaitua-te-Whanganui-a-Tara-Implementation-Programme_web.pdf

Te Awa Kairangi urban streams	C	Worsening	C	Worsening	B		E	
Waiwhetū Stream	D		C	Worsening	A		E	
Wainuiomata urban steams	D	Worsening	C	Worsening	A		E	

Table 2: Ecological toxicity indicators

Sub-catchment areas	**Copper**		**Zinc**		**Nitrate**		**Ammonia**	
	Current	Trend	Current	Trend	Current	Trend	Current	Trend
Te Awa Kairangi Lower mainstem	A	Worsening	A	Worsening	A		A	
Te Awa Kairangi urban streams	B	Worsening	B	Worsening	A		A	
Waiwhetū Stream	C	Worsening	D	Worsening	A		B	
Wainuiomata urban steams	B	Worsening	B	Worsening	A		B	

Table 3: Sediment, phosphorus, & dissolved oxygen

Sub-catchment areas	**Sediment (clarity)**		**Sediment (deposited)**		**Phosphorus**		**Dissolved oxygen**	
	Current	Trend	Current	Trend	Current	Trend	Current	Trend
Te Awa Kairangi Lower mainstem	B		A		A		A	
Te Awa Kairangi urban streams	D	Worsening	No data		C		A	

Waiwhetū Stream	A	Worsening	Not applicable		D		B	
Wainuiomata urban steams	D	Worsening	A		C		A	

21 In particular, the Wainuiomata urban streams and Waiwhetū Stream are below the national bottom line set in the NPS-FM 2020 for macroinvertebrates, and the Te Awa Kairangi urban streams and Wainuiomata urban streams are also below the national bottom line set in the NPS-FM 2020 for suspended fine sediment.

22 Urban intensification poses a significant risk to the health of freshwater bodies when the potential effects on the freshwater bodies are not identified and addressed. PC56 as currently conceived provides for potentially significant urban intensification in several catchments that already have poor water quality and health, with no controls on the effects of this intensification. This would not give effect to Policy 5 of the NPS-FM 2020, which requires that the health and well-being of water bodies and freshwater ecosystems is maintained at a minimum and improved where degraded.

23 Therefore, I consider it is crucial to ensure that all future urban intensification and development that PC56 provides for is carried out in a way that is properly integrated with freshwater management. Failing to do so will not give effect to Policy 5 of the NPS-FM 2020 and will it even more difficult for both Hutt City Council and Greater Wellington to achieve the target attribute states that will be set in the regional plan (once Greater Wellington has completed the limit-setting process required to give effect to the NPS-FM 2020).

Amendments sought by Greater Wellington

24 Greater Wellington has requested amendments to PC56 to ensure that it gives effect to the NPS-FM 2020 and has regard to the direction in Proposed RPS Change 1 relating to freshwater.

25 Hutt City Council is required to include provisions in its district plan to manage effects of urban development on the health and wellbeing of freshwater bodies and freshwater ecosystems. District plans are required to give effect to (relevantly) both national policy statements and regional policy statements[5], and must not be inconsistent with regional plans[6].

26 There are six key submission points setting out changes sought by Greater Wellington that I consider necessary to ensure that PC56 adequately integrates urban development and the management of adverse effects on freshwater.

27 Submission point 149.2 seeks the insertion of objectives, policies and rules that ensure adverse effects on the Hutt Valley Aquifer from urban intensification are avoided, as well as provisions or advice notes referring to the probable need for resource consent under the

[5] RMA, s75(3).
[6] RMA, s75(4).

Regional Plan where excavations may penetrate the Hutt Valley Aquifer. The relief sought for this point will be addressed by Mr Loe.

28 Submission point 149.25 seeks the insertion of a policy that requires the use, development, and subdivision of land to consider effects on rivers, lakes, wetlands, springs, and riparian margins, including any relevant water quality attribute targets in a regional plan, ecosystem values and drinking water sources.

29 Submission point 149.26 seeks the insertion of a policy that requires hydrological controls for use, development, and subdivision of land. The relief sought for this point will be addressed by Ms Guest and Mr Farrant.

30 Submission point 149.27 seeks the insertion of a policy which requires the application of water sensitive urban design principles, including sustainable stormwater design to minimises impacts on the natural environment and achieves outcomes additional to stormwater treatment such as providing amenity spaces, ecological habitat. Again, the relief sought for this point will be addressed by Ms Guest and Mr Farrant.

31 Submission point 149.28 seeks the insertion of a policy that seeks to minimise the effects of earthworks, including offsite effects of erosion and sediment loss.

32 Finally, submission point 149.29 seeks the insertion of a policy to manage earthworks and vegetation removal to limit erosion and siltation of waterways and impacts on mahinga kai and restrict earthworks on highly erodible soils and steeper slopes.

33 As **Appendix 1** to my evidence, I have provided a section 32AA analysis of the changes sought by Greater Wellington to provide for integrated management of freshwater and urban intensification.

S42A Officer's Response

34 The officer's section 42A report has recommended the rejection of submission points 149.25-149.29. The rationale provided was that appropriately implementing the NPS-FM is a complex task that largely cannot be progressed through the ISPP, and it is more appropriate to implement the NPS-FM 2020 through the full district plan review.

35 I cannot dispute that appropriately implementing the NPS-FM 2020 is a difficult and complex task. However, I do not agree that it should be separated from the IPI and put to one side. As discussed above in paragraphs 18-23, enabling urban intensification without accounting for the effects of that intensification on freshwater could lead to the disaggregation of the potential effects from their cause, which is contrary to the policy direction in the NPS-FM 2020.

36 Greater Wellington is not seeking full implementation of the NPS-FM 2020 through the IPI. Instead, Greater Wellington is seeking amendments to PC56 that ensure that the adverse effects on freshwater resulting from the intensification it provides for will be appropriately managed. The Te Whaitua Te Whanganui a Tara Whaitua Implementation Programme includes specific recommendations for changes to the district plan aimed at Hutt City Council, so there have already preferred approaches developed.

Conclusion

37 Integrated management of urban intensification and freshwater will be essential to producing better environmental outcomes and achieving a well-functioning urban environment. It is also required by the NPS-FM 2020. The catchments within Hutt City are largely in a poor and degrading state, and without appropriate provision for freshwater in the IPI there will be further degradation.

Appendix 1: Section 32AA assessment of relief sought

Key:

Black text: Existing District Plan wording

Black underlined text: Text added in Plan Change 56

Red underlined text: Amendments made by officers in the s42A report

Green underlined text: Amendments sought by Greater Wellington

Plan change 56 – currently proposed	GW relief sought
Plan change 56 does not currently appear to have any provisions addressing this issue.	Insert new policies into Chapter 1.10.1A as follows: **Policy A** The use, development and subdivision of land must consider effects on: i. gully heads, rivers, lakes, wetlands, springs, riparian margins and estuaries ii. drinking water sources iii. ecosystem values iv. any relevant water quality attribute targets in a regional plan **Policy B** Manage the effects of urban development on freshwater and the coastal marine area by requiring that urban development is located and designed to minimise the extent and volume of earthworks and to follow, to the extent practicable, existing land contours. **Policy C** Manage the effects of earthworks and vegetation removal on water and cultural values by controlling earthworks and vegetation removal to the extent necessary to: (a) achieve the target attribute states for water bodies and freshwater ecosystems, including the effects of these activities on the life-supporting capacity of soils, and

	(b) to provide for tangata whenua and their relationship with their culture, land, water, sites, wāhi tapu and other taonga. Insert new matters of discretion into Rule 4F 4.2.1AA and Rule 4G 4.2.1 as follows: (viii) adverse effects on gully heads, rivers, lakes, wetlands, springs, riparian margins and estuaries, drinking water sources, ecosystem values, and any relevant water quality attribute targets in a regional plan. (ix) extent and volume of earthworks and the degree to which earthworks follow existing land contours. (x) adverse effects on the relationship between tangata whenua and their culture, land, water, sites, wāhi tapu and other taonga.
Benefits Environmental: No environmental benefits. Economic: Moderate to high economic benefits associated with more development and intensification in Hutt City, bringing new residents and businesses. Social: Moderate social benefits associated with the greater provision of housing to meet population growth needs. Cultural: No social benefits.	**Benefits** Environmental: High environmental benefits associated with reduced degradation of water quality and health. Economic: Minor economic benefits associated with potentially lower long-term costs to councils and communities to restore degraded freshwater bodies. Additionally, this may reduce longer-term costs related to "retrofitting" urban areas to reduce adverse effects on freshwater. Social: Moderate to high social benefits associated with increased recreational opportunities that will result from improved water quality and health, as well as the more intangible awareness in the community that water bodies are not being further degraded. Cultural: Moderate to high cultural benefits associated with greater protection and first steps towards eventual restoration of significant sites for Taranaki Whānui. These significant sites include Waiwhetu Stream, the Hutt River mouth, and some reaches of the Hutt River main stem.

Costs Environmental: High environmental costs associated with further degradation of freshwater bodies in Hutt City. Economic: Moderate to high economic costs associated with increased long-term spending needed to improve freshwater quality and health that is likely to degrade further as a result of unintegrated urban intensification. Social: Moderate social costs associated with further reduced recreational opportunities due to degrading water quality, as well as an intangible social cost associated with failing to implement community visions and aspirations for freshwater management. Cultural: High cultural costs associated with ongoing and worsening degradation to significant sites to Taranaki Whānui. These significant sites include Waiwhetu Stream, the Hutt River mouth, and some reaches of the Hutt River main stem.	**Costs** Environmental: No environmental costs. Economic: Moderate economic costs associated with more constrained development and intensification in Hutt City and a potential greater financial cost to developers to meet these provisions. Social: Minor to moderate social costs associated with more constrained housing development in Hutt City, resulting in less housing capacity available for a growing population. Cultural: No cultural costs.

BEFORE THE INDEPENDENT HEARING PANEL APPOINTED TO HEAR AND MAKE DECISIONS ON SUBMISSIONS AND FURTHER SUBMISSIONS ON CITY OF LOWER HUTT DISTRICT PLAN CHANGE 56

IN THE MATTER	of the Resource Management Act 1991 (the Act)
	AND
IN THE MATTER	of Hearing of Submissions and Further Submissions on City of Lower Hutt District Plan Change 56 under Schedule 1 of the Act

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STATEMENT OF EVIDENCE OF BARRY LOE

ON BEHALF OF WELLINGTON REGIONAL COUNCIL

29 MARCH 2023

Executive Summary

1 Hutt District Plan Change 56, to allow urban intensification in the City of Lower Hutt, does not provide for the protection of the Waiwhetū/Hutt Valley Aquifer, a freshwater body that is an essential resource supplying drinking water to the Wellington Region, but which is vulnerable to adverse effects from land use and development.

2 Recognising, identifying and considering the Aquifer in the District Plan will assist to give effect to the integrated management required to prioritise the health needs of people.

Qualifications and experience

3 My name is Barry Loe. I am a contracted policy advisor in the Environmental Policy team at the Wellington Regional Council (Greater Wellington).

4 Since 1985 I have been involved in the investigation and management of effects on the environment, including drinking water sources, of discharges of contaminants, use of water, contaminated land and land use. I was employed earlier in my career by catchment authorities and regional councils, and since 1991 I have undertaken these services as a contract resource management advisor to councils and other clients. Since 2017 I have been engaged by Greater Wellington as a policy advisor on the Natural Resources Plan (NRP) including with particular focus on plan provisions to protect sources of human drinking water.

Code of conduct

5 While this is not an Environment Court proceeding, I have read the Code of Conduct for Expert Witnesses set out in the Environment Court's Practice Note 2023 (Part 9). I have complied with the Code of Conduct in preparing this evidence. My experience is set out above. Except where I state I rely on the evidence of another person, I confirm that the issues addressed in this evidence are within my area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from my expressed opinions.

Scope of evidence

6 My evidence addresses Greater Wellington's submission point that seeks amendments to District Plan Change 56 to ensure that the District Plan appropriately addresses the

management of intensification while avoiding adverse effects on the Waiwhetū/Hutt Valley Aquifer, as a source of drinking water for the Wellington Region.

Te Mana o te Wai, NPS-FM 2020 and RPS

7 The evidence of Mr Sheild for Greater Wellington sets out the integrated management approach for freshwater required by Te Mana o te Wai and the NPS-FM 2020. Further, Te Mana o te Wai has a hierarchy of obligations that prioritises; firstly, the health and well-being of water bodies and secondly, the health needs of people (such as drinking water), ahead of the ability of people and communities to provide for their social, economic and cultural well-being.

8 The operative Regional Policy Statement (RPS) **Objective 12** is that *the quantity and quality of freshwater …meet the reasonably foreseeable needs of future generations*.

9 Proposed RPS Change 1 includes:

Policy FW.3: Urban development effects on freshwater and the coastal marine area – district plans *District plans shall include objectives, policies, and methods including rules, that give effect to Te Mana o te Wai and section 3.5(4) of the NPS-FM, and in doing so must:.. (q) Consider the effects of land use and development on drinking water sources.*

Policy FW.5: Water supply planning for climate change and urban development – consideration *When considering a change, variation or review of a regional or district plan particular regard shall be given to: …(d) protection of existing and future water sources.*

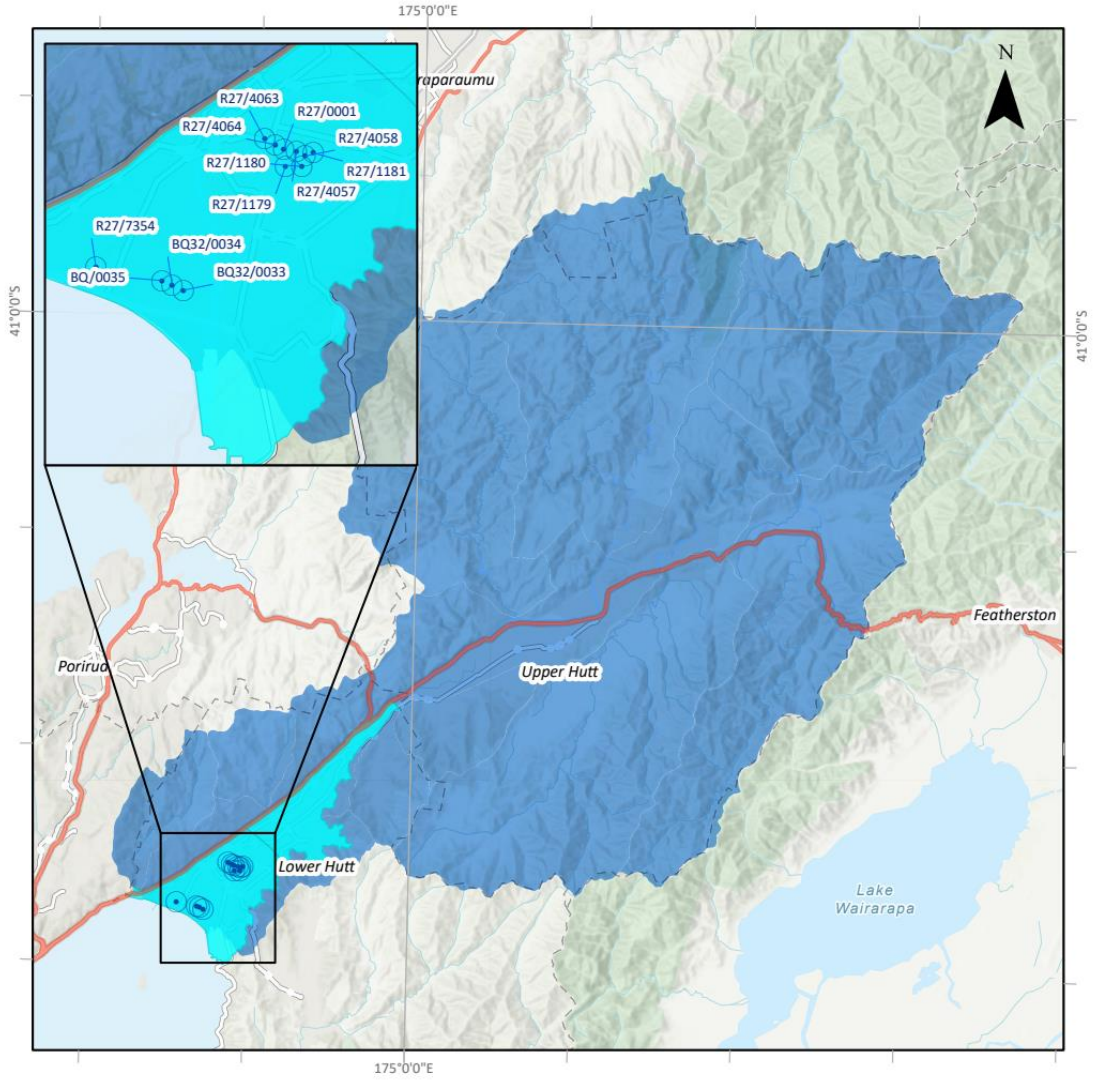
10 The concept of Te Mana o te Wai, and the planning instruments that give effect to it recognise that protecting the health of freshwater will also protect the health and well-being of the wider environment and the community.

Proposed Natural Resources Plan for the Wellington Region (PNRP)

11 The PNRP recognises the importance of the water resources of the Hutt Valley as a major source of drinking water for Wellington, delineating groundwater protection areas and water supply catchment areas, as shown on PNRP Map 41, below.

Groundwater community drinking water supply protection areas - Hutt Valley (incorporates Schedule M2)

Map 41



This version of the map is not complete. The version of this map available online through the online web map viewer shows the complete, detailed information on a GIS overlay that is not shown on this hard copy. The online version is available on the Council's website at https://mapping.gw.govt.nz/gwrc/ (select theme Natural Resources Plan) and can be accessed from the Council offices or public library.

Greater Wellington
Te Pane Matua Taiao

12

13 The Waiwhetū/Hutt Valley Aquifer is an essential and significant water resource for the Wellington Region. Groundwater is abstracted from the Waterloo and Gear Island bore fields, providing drinking water to Lower Hutt City, Upper Hutt City, Porirua City and Wellington City, including up to 70% of the water demand in the summer months.

14 The Waiwhetū/Hutt Valley Aquifer is vulnerable to contamination resulting from ground disturbance activities, discharges and land uses at or near the ground surface. The microbiological contamination event in late 2016 and subsequent investigations of the extent of protection from overlying natural material, indicate that the aquifer is more vulnerable than previously assumed[1]. Land use activities that can result in contamination of the aquifer if not appropriately managed, include earthworks and excavation for constructing or removing building foundations, basements and services, and drilling of site investigation bores.

15 These activities can provide new, and exacerbate existing, flow pathways for chemical and microbial contaminants to enter the aquifer or can create high turbidity in the groundwater. Water treatment at the Waterloo Water Treatment Plant only addresses microbiological contamination, and the treatment effectiveness is reduced if the source water has high turbidity. There is currently no treatment in place for chemical contamination, which would be very difficult to provide at the existing Water Treatment Plant.

16 The PNRP contains policies and rules to avoid, remedy or mitigate the actual and potential adverse effects on the water quality of sources of community drinking water, but the regional plan alone is not the most effective vehicle to achieve the necessary protection. Risks to the water quality of the groundwater sources for human drinking water in the Hutt Valley also come from the use and development of land, including urban development and intensification. The District Plan must recognise these risks and operate together with the NRP to manage the risks from urban intensification to a level that provides sufficient protection to the quality of the source water for the drinking water supply.

[1] *Waiwhetū Aquifer Assessment - Stage 1 Summary Report* Prepared for Greater Wellington Regional Council Prepared by Tonkin & Taylor Ltd December 2017

17 The Government Enquiry[2] into the Havelock North outbreak of campylobacteriosis in 2016 identified six fundamental principles for drinking water safety in Aotearoa New Zealand, including:

Principle 1: A high standard of care must be embraced

Principle 2: Protection of source water is of paramount importance

Principle 6: Apply a preventive risk management approach

18 These principles are now reflected in s104G of the Resource Management Act:

104G Consideration of activities affecting drinking water supply source water

When considering an application for a resource consent, the consent authority must have regard to—

(a) the actual or potential effect of the proposed activity on the source of a drinking water supply that is registered under section 55 of the Water Services Act 2021; and

(b) any risks that the proposed activity may pose to the source of a drinking water supply that are identified in a source water risk management plan prepared in accordance with the requirements of the Water Services Act 2021.

19 It is noted that RMA Section 104G directs 'the consent authority', so is not limited to regional resource consents.

20 The Waiwhetū/Hutt Valley Aquifer is a source of a drinking water supply registered by Wellington Water Ltd, and the risks from earthworks, excavation and drilling are identified in the Wellington Water Ltd source water risk management plan[3] prepared and submitted to Taumata Arowai in accordance with the Water Services Act 2021.

21 Greater Wellington is working to manage these risks more effectively into the future, and one component of the additional protections relies upon integrated provisions in the Hutt District Plan.

22 Greater Wellington's ability to manage adverse effects through the regional consent process is often compromised when a land use consent has already been granted by Hutt City or other territorial authority. One way of avoiding this situation is to advise people early in the process that they also need resource consent from Greater Wellington – which Hutt City's resource consent, building consent (PIM) and LIM teams are well placed to do.

[2] https://www.dia.govt.nz/Report-of-the-Havelock-North-Drinking-Water-Inquiry---Stage-2
[3] *Source Water Risk Management Plan: Wellington Urban* Wellington Water Ltd 2022

What have we been working on together?

23 The RMA policy teams of Hutt City, Greater Wellington and Wellington Water have been working together since autumn 2021 to determine how best to achieve source water protection under the RMA, while respecting the agencies' various legislated functions. This work has identified areas of the Waiwhetū/Hutt Valley Aquifer that are at the highest risk of contamination and are the most susceptible to adverse effects from earthworks and excavation, thereby requiring a higher level of protection from these risky activities.

24 As part of engagement on the Hutt City District Plan draft plan change, Greater Wellington requested that aquifer protection be included as a Qualifying Matter. This was not accepted, and Greater Wellington's submission (Submission point 129.2) sought:

> *Insert objectives, policies and rules that ensure adverse effects on the Hutt Valley Aquifer from urban intensification are avoided. Also insert provisions or advice notes referring to the probable need for resource consent under the Regional Plan where excavations may penetrate the Hutt Valley Aquifer.*

25 The submission point is rejected in the Council Officer Report on the basis that water quality protection relates to a regional council function. While Greater Wellington accepts that primary responsibility for protecting source water rests with the regional council, the NPS-FM 2020, as described in the evidence of Mr Sheild, directs that an integrated approach, ki uta ki tai, is adopted by both Councils to manage freshwater and land use and development.

What outcomes is Greater Wellington seeking?

26 Two outcomes are sought, as set out below:

> **General:**
>
> Water quality in the Waiwhetū/Hutt Valley Aquifer is protected so that Wellington, Hutt City, Porirua and Upper Hutt's water supply can continue to operate safely.
>
> **Hutt City District Plan:**
>
> Provide clear information about the PNRP provisions for source water protection so that potential applicants are aware that they need to engage with Greater Wellington early in the feasibility/scoping stages of all developments.

What are the roles of Greater Wellington and Hutt City?

27 Greater Wellington is seeking that Hutt City play an information sharing and education role relating to land use activities that might affect the Aquifer, rather than be a consenting authority for this matter. Greater Wellington is and will continue to be the consenting authority for activities with respect to source water protection.

28 It is sought that Hutt City will:

28.1 include a map showing the relevant source water protection zones on the planning layers of the HCC District Plan website, and

28.2 through its LIM, PIM, resource consent, pre-application and customer enquiry processes direct potential applicants for earthworks and building piles in the source water protection zones to consider policy and discuss their development with Greater Wellington in the scoping/feasibility stages.

What does Greater Wellington want included in the District Plan?

29 Greater Wellington seeks that the following policy is included in the Hutt City District Plan.

Protect the Waiwhetū/Hutt Valley Aquifer as a drinking water source, by:

- *Delineating Drinking Water Source Protection Areas 1, 2 and 2A on the District Planning Maps, and*
- *Providing information about potential regional resource consent requirements for below ground activities in Drinking Water Source Protection Areas 1, 2 and 2A, particularly the need for early engagement with Greater Wellington Regional Council so that below ground activities can be appropriately designed.*

30 **Attachment A** contains maps that show the location of Drinking Water Source Protection Areas 1, 2 and 2A.

What are the implications of including these provisions in the District Plan?

31 Helpfully, effective implementation of the recommended policy by resource consent planners will enable Hutt City Council to demonstrate that section s104G of the RMA has been addressed.

32 The requested policy also implements the priorities of Te Mana o te Wai as set out in the NPS-FM 2020, by prioritising the water quality of the Aquifer and the health needs of people ahead of other matters.

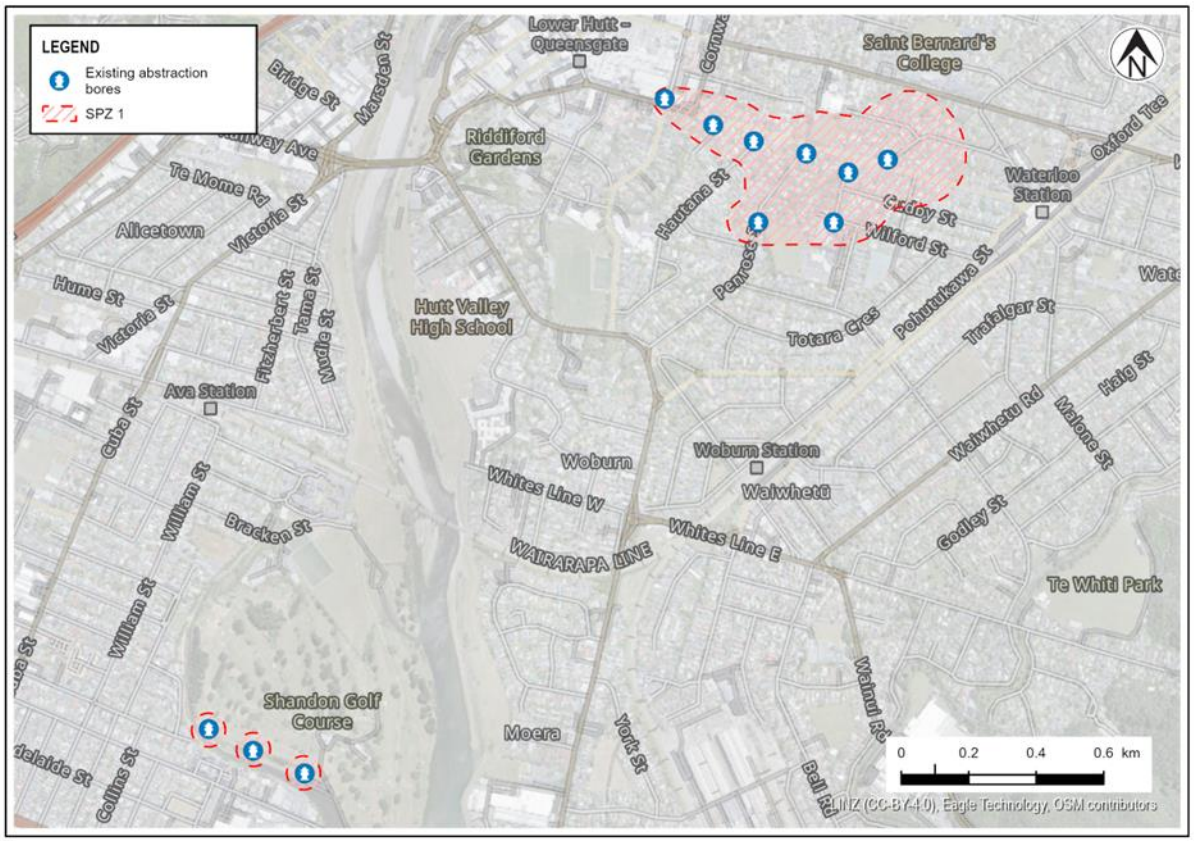
33 It is noted that resource consents from Greater Wellington for various activities on land over the aquifer are required regardless of whether the requested provisions are included in Hutt City District Plan. Accordingly, there is no negative impact on the ability to undertake development of a site as a result of this submission. However, Greater Wellington's experience is that if a developer finds out late in the process about the need for a regional resource consent, particularly if building consent has already been granted, then it is very much harder to effectively implement controls to protect the aquifer. The main forms of control are:

- to change the style of building foundations so that fewer or no deep piles are necessary, reducing the risk of contamination, and/or
- to undertake localised groundworks so that the piles can be shallower, removing the need to penetrate into the aquifer.

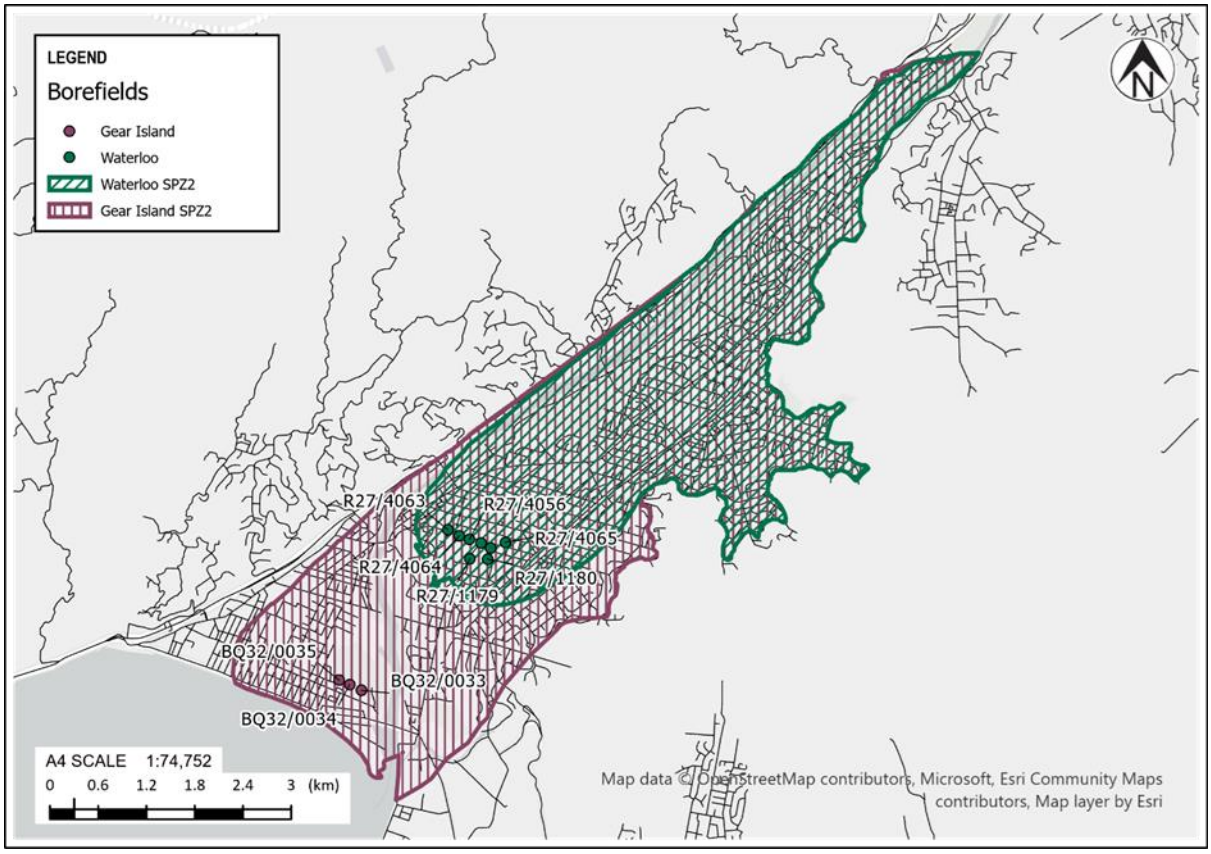
34 Accordingly, Greater Wellington considers it is beneficial to both potential developers and residents of Hutt City (and Porirua, Upper Hutt and Wellington Cities) to include the requested policy and map layers in the District Plan.

29 March 2023

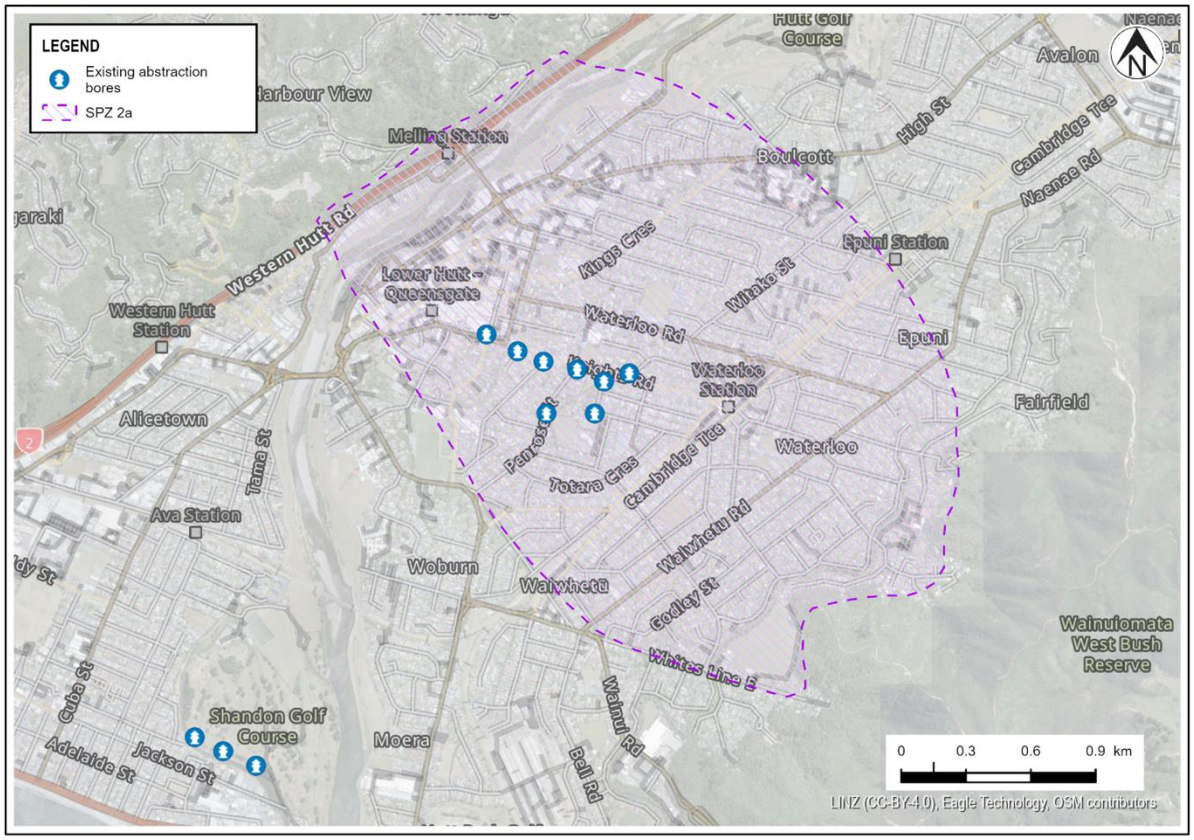
Attachment A – Maps of Drinking Water Source Protection Areas 1, 2 and 2A



Source Water Protection Area: SPZ 1 – Waterloo and Gear Island bore fields



Source Water Protection Areas: Waterloo bore field SPZ2 and Gear Island bore field SPZ2



Source Water Protection Area: Waterloo bore field SPZ 2a

BEFORE THE INDEPENDENT HEARING PANEL APPOINTED TO HEAR AND MAKE DECISIONS ON SUBMISSIONS AND FURTHER SUBMISSIONS ON PROPOSED PLAN CHANGE 56 TO THE HUTT CITY COUNCIL DISTRICT PLAN

IN THE MATTER	of the Resource Management Act 1991 (the Act)
	AND
IN THE MATTER	of Hearing of Submissions and Further Submissions on Proposed District Plan Change 56 to the Operative District Plan under Schedule 1 of the Act

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STATEMENT OF EVIDENCE OF IAIN NICHOLAS DAWE ON BEHALF OF WELLINGTON REGIONAL COUNCIL

29 March 2023

Executive Summary

1 In order to give effect to the MDRS, proposed plan change 56 to the HCC district plan has identified medium and high density residential zones that intersect medium and high hazard overlays that are currently zoned general residential, especially within the coastal areas subject to ongoing impacts of sea level rise and climate change.

2 For the most part, the potential impacts of development in these hazard overlays are dealt with through the objective, policy and rule framework proposed in plan change 56.

3 However, low lying coastal areas in the district are subject to ongoing impacts of sea level rise, tectonic subsidence and climate change. These impacts will be significantly more difficult to manage over the medium to long term and require an approach to reduce the risks through limiting development.

4 Greater Wellington seeks that plan change 56 more strongly employs the qualifying matters for natural hazards available to it in s77I of the RMA, namely the significant risks from natural hazards under section 6 of the RMA and the natural hazard policies in the New Zealand Coastal Policy Statement and further limit development in the high hazard coastal overlays from two to one dwelling per site.

5 This approach is consistent with national and regional policy direction and best practice hazard risk management guidance.

Introduction

6 My full name is Iain Nicholas Dawe. I am a senior regional natural hazards analyst and policy advisor for the Wellington Regional Council (**Greater Wellington**). I have been employed at the Council since 2006.

Qualifications and experience

7 I hold an MSc with 1st class Honours in environmental sciences and a PhD specialising in coastal processes from the University of Canterbury and over 20 years hazard management and resource planning experience.

8 As the natural hazards analyst for the Council I provide scientific analysis, commentary and research into natural hazards that affect the Greater Wellington region and to write and/or provide expert advice and evidence for hearings, the Environment Court and policy that deals with managing the risks from natural hazards. I provide advice to policy

analysts, resource managers, consents officers, engineers and elected councillors in the region, and to businesses and the wider public.

9 I was team leader writing the natural hazards section of the Regional Policy Statement (**RPS**) and was a team coordinator for the review of the natural hazards sections of the Proposed Natural Resources Plan (**pNRP**).

10 Currently I am the chair of the national Hazard Risk Management Special Interest Group that represents regional councils across New Zealand. The group advocates for integrated hazards management across the local and central government sectors in areas of hazards planning and research.

Code of conduct

11 I have read the Code of Conduct for Expert Witnesses set out in the Environment Court's Practice Note 2023. I have complied with the Code of Conduct in preparing this evidence. My experience and qualifications are set out above. Except where I state I rely on the evidence of another person, I confirm that the issues addressed in this evidence are within my area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from my expressed opinions.

Scope of evidence

12 My evidence addresses the Greater Wellington natural hazard submission point [Sub. Ref. 149.6] to plan change 56 of the Hutt City District Plan (**DPC 56**) to give effect to Policies 3 and 4 of the National Policy Statement on Urban Development 2022 (**NPS-UD**) and implement the Medium Density Residential Standards (**MDRS**). In particular, Greater Wellington sought that that coastal hazard overlays be recognised as a qualifying matter to exclude them from intensification under the MDRS.

13 The submission point was rejected on the basis that this was a general district wide matter that is addressed in the policy and rule framework of the natural hazards chapter of the district plan. Furthermore, it was rejected on the basis that there are other considerations besides natural hazards that need to be considered when setting development limits in residential zoned areas.

14 This evidence outlines why coastal hazards need a particular consideration in low lying areas subject to the ongoing impacts of sea level rise and how limiting development in high hazard coastal overlays can be justified for these reasons.

Background – Sea Level Rise and Coastal Hazards

15 Sea level rise is a measurable change occurring in our environment to which will have to adapt. Greater Wellington commissions work on a regular basis (most recently in 2018) to analyse and understand rates and trends of sea level change in the Wellington region. This research shows that sea level has been rising steadily at rates averaging 2.1 mm/yr since records began in 1899, in line with the trend seen globally as measured on tide gauges and with satellite altimetry. This is driven dominantly by a mix of thermal expansion of the oceans as a result of global warming and polar ice cap melt. The trend is not reversing and we are locked into continuing sea level rise for at least the next several hundred years as a result of a lag between the more rapid warming of the atmosphere and the much slower process of heat transfer and uptake by the oceans.

16 Using the two most plausible mid-range scenarios of the latest Intergovernmental Panel on Climate Change (IPCC) report AR6 indicates that, for Hutt City we may expect sea level rise in the order of 0.74 to 0.96 m over the next 100 years with a range of 0.53 to 1.26 m.

17 In addition to this eustatic or bulk change in the volume of the ocean, there are commonly vertical land movements that produce a local relative change in sea level. In the Wellington region, including Hutt City, we are experiencing regional tectonic subsidence that has been measured by GNS Science on its continuous GPS network since the late 1990s and more recently with satellite altimetry as presented in the NZ Sea Rise programme. The data shows that Hutt City is subsiding tectonically at rates in the order of 3.0 mm/yr, effectively adding the current rate of sea level rise. Taking this into consideration and using the same two IPCC scenarios, we may expect *relative* sea level rise for Hutt City over the next 100 years to be in the order of 1.07 to 1.29 m with a range of 0.84 to 1.62 m.

18 One of the difficulties of sea level rise is that it is hazard multiplier, in other words, it compounds a lot of natural and coastal hazards that already occur in the region and locally. The problem this presents is that previous patterns of development and infrastructure in the coastal environment have not been built with this change in mind and have not been designed to deal with the impacts it will bring. These impacts include; coastal erosion; inundation; surface flooding; enhanced storm surge and tsunami impacts due to elevated mean sea level; impeded drainage at storm water outfalls and streams and; groundwater interactions pushing up the water table leading to longer incidences of

pluvial/surface flooding during rain storm events (that will also be exacerbated by climate change).

19 We are dealing with these impacts now. For example witness the regularity with which Marin Drive between Mahina and Lowry Bays is inundated during storm events or the Mansfield family's former summer house in Days Bay that got destroyed in a large storm event in 2013. These problem will only get worse over time and within a few decades will be more than nuisance flooding or just affecting a few houses. The coast is the front line for these changes and intensifying development and investment in these areas is not appropriate in light of the changes we are witnessing in the environment as a result of climate change. Infrastructure and housing is designed to last 50 years at a minimum and usually lasts a lot longer, thus any increase in development in high hazard coastal areas will be affected by sea level rise and this have costs to Council, to infrastructure providers, to the rate payer and ultimately to the community.

20 It might be argued that these hazards can be reduced through mitigation measures. However, mitigating coastal hazards, tsunami and sea level rise and is of scale, complexity and cost that is not an option to developers or individual homeowners especially in areas of pre-existing development. It would require large scale integrated engineered options including a mix of seawalls, coastal protection structures, stopbanks, upgraded stormwater networks, pumping stations and drainage networks to list just a few methods that could only be implemented by a Local Authority. Aside from the environmental impacts that many of these options have on the functioning of natural systems, which are discouraged in the New Zealand Coastal Policy Statement (**NZCPS**) and RPS, the cost alone would quickly become prohibitive in order to develop these schemes in all places subject to high and medium coastal hazards.

21 The best course of action in this situation is to avoid intensifying these areas in the first place and allow adaptation discussions with the community to proceed in order to develop a clearer pathway for how development should be managed in these areas, because over time it may become clear that the only cost effective option involves some form of managed retreat.

District Plan Change 56

22 Hutt City and the Wellington region in general faces many risks from natural hazards. In recognition of the effects that natural disasters have on our communities, HCC has

identified and mapped a number of these, the majority of which are related to coastal hazards, and included them in DPC 56 as map overlays including:

- Flood hazards (stream corridor; overland flow paths; inundation extents);
- Coastal inundation hazards (present day inundation areas with 1% AEP storm-tide event; future inundation areas at 2130 with the 1% AEP storm-tide event and tectonic subsidence of 2.86 mm/yr);
- Tsunami hazards (1:100 yr extents; 1:500 yr extents; 1:1000 yr extents) and;
- The Wellington Fault hazard overlay (in place since 2003).

23 The 100 yr (1% Annual Exceedance Probability – AEP) tsunami and the present day 1% AEP coastal inundation areas are defined as High Coastal Hazard Areas in DPC 56. It is worth noting that Greater Wellington commissioned NIWA to undertake numerical storm surge modelling in 2012 using the 1% AEP storm-tide event. This work is presented in the report "*Assessing the storm inundation hazard for coastal margins around the Wellington region"* and the mapping is available online: https://mapping1.gw.govt.nz/GW/SLR/

24 I believe this information is a more accurate indication of the areas vulnerable to coastal inundation from the present day 1% AEP storm because it models the flooding using a dynamic approach, compared to the static bath-tub inundation model that was used for the mapping overlay included in PC 56. The Greater Wellington mapping extends further inland, particularly along the east Harbour Bays and aligns more closely with the medium coastal hazard area and 100 yr tsunami hazard overlays. Appendix one illustrates and example of this for Lowry Bay.

25 Recognising the impacts that coastal hazards have on the community, Policy 14H 1.11 states:

> "Manage residential units, commercial activities or retail activities within the High Coastal Hazard Areas or any subdivision where the building platform will be within the High Coastal Hazard Area by ensuring:
>
> 1. The activity has an operational or functional need to locate within the High Coastal Hazard Area and locating outside of these High Coastal Hazard Area is not a practicable option
>
> 2. The activity, building, or subdivision incorporates measures that reduce or do not increase the risk to people, and property from the coastal hazard;
>
> 3. There is the ability to access safe evacuation routes for occupants of the building from the coastal hazard; and

4. The activity does not involve the removal or modification of a natural system or feature that provides protection to other properties from the natural hazard."

26 Complicating this is the nationally directed requirement to give effect to the MDRS. Consequently, DPC 56 has identified medium density and high density residential zones (**MDRZ and HDRZ**) that supersede the general residential zones in the existing district plan. Areas that have hazard overlays that are currently zoned general residential are now earmarked for high or medium density residential development, especially within the coastal hazard overlays.

27 DPC 56 recognises this tension and includes rules to *somewhat* limit the MDRS intensification requirements in medium and high coastal hazard areas by using the natural hazard qualifying matters outlined in s77I of the RMA and reducing the number of residential units on lots allowed under the MDRS from three to two in these areas. In coastal areas, Rule 14H 2.9 allows two residential units in the high hazard coastal overlay as a permitted activity.

28 This approach is inconsistent with national and regional policy direction and best practice guidance and makes the district plan internally inconsistent. This is because it looks to constrain housing development high hazard areas, whilst also identifying these same areas as acceptable for housing intensification under the MDRS. This creates conflict within the district plan that will result in development that increases the risk to people and buildings over time in areas where further intensification is inappropriate due to the risk from coastal hazards exacerbated by sea level rise and climate change.

Relief Sought

29 Greater Wellington contends that there is an inconsistency between the policy direction and the rule framework in DPC 56. That is, Policy 14H 1.11 states that activities in the High Coastal Hazard Area must have an operational or functional need to locate in those areas but, rule 14H 2.9 allows two residential units in these same areas as a permitted activity.

30 Greater Wellington seeks that the qualifying matters should go further in the high hazard coastal areas by limiting residential development to one residential unit per lot in rule 14H 2.9(1)(a). This change would reduce the conflict with the hazard polices and reduce the overall risk that would otherwise increase to development due to ongoing investment in these areas.

31 Section 77I of the Resource Management Act (**RMA**) provides for a Council to make modifications to the MDRS and the relevant building height or density requirements under policy 3 of the NPS-UD so that the standards are less enabling of development within residential zones. The modifications can be made if they satisfy one or more of the qualifying matters that are identified in s77I (a) to (j). The clauses of particular relevance to natural hazards are:

a) a matter of national importance that decision makers are required to recognise and provide for under section 6 and;

b) a matter required in order to give effect to a national policy statement (other than the NPS-UD) or the New Zealand Coastal Policy Statement 2010.

32 Section 6 of the RMA states that in relation to managing the use, development, and protection of natural and physical resources, authorities shall recognise and provide for a range of matters of national importance, including clause (h) "the management of significant risks from natural hazards".

33 Saliant to this, areas of Hutt City identified as being in high hazard areas are subject to *significant risks from natural hazards*. Therefore, it is appropriate that properties within these overlays are subject to this qualifying matter further than what has already been employed with this mechanism. This is the direction that Policy 14H 1.11 points to in order to reduce the risks from natural hazards in high hazard areas.

34 There is precedent in the region for a Territorial Authority to limit intensification in coastal hazard areas. The Wellington City Council proposed district plan and section 32A report and for natural and coastal hazards has identified that the MDRS should be limited for high and medium hazard areas. The limitation that has been applied includes; no further development in high hazard areas, which amounts to a removal of the MDRS, and; only allowing one residential unit on a site in a medium hazard area, which is a significant reduction in the MDRS permitted standards.

New Zealand Coastal Policy Statement

35 In recognition of the risks that natural hazards pose to our communities there is a range of national policy instruments guiding and directing local authorities to identify these risks and develop appropriate planning responses to manage these risks and impacts.

36 Policy 3 of the NZCPS outlines adopting a precautionary approach towards proposed activities whose effects on the coastal environment are uncertain, unknown, or little

understood, but potentially significantly adverse with particular regard to the use and management of coastal resources potentially vulnerable to effects from climate change, so that:

a) avoidable social and economic loss and harm to communities does not occur;

b) natural adjustments for coastal processes, natural defences, ecosystems, habitat and species are allowed to occur; and

c) the natural character, public access, amenity and other values of the coastal environment meet the needs of future generations.

37 Allowing intensification in coastal areas subject to natural hazards, as DPC 56 allow, does not give effect to the precautionary approach or properly take into account the direction contained in these three clauses. There is a credible risk from erosion and inundation from both tsunami and storm surge in the high hazard overlays, both presently and from future impacts as a result of sea level rise. Whilst we cannot predict all that the future holds with regards to how climate effects impact our environment, we have a good understanding of the range of possibilities as discussed above. This uncertainty is what the precautionary approach is designed to accommodate.

38 The changes we might expect are well within the lifetime of our housing stock. Building and investing in areas today that face risks from changes to the climate such as increased rainfall and from sea level rise will place a burden on future generations and local authorities to manage these effects. Avoiding this ahead of time and reducing the risk to life and property is a guiding principle of hazard risk management.

39 Policy 25 of the NZCPS addresses subdivision, use, and development in areas at risk from coastal hazards. It states that in areas potentially affected by coastal hazards over at least the next 100 years:

a) avoid increasing the risk of social, environmental and economic harm from coastal hazards;

b) avoid redevelopment, or change in land use, that would increase the risk of adverse effects from coastal hazards;

c) encourage redevelopment, or change in land use, where that would reduce the risk of adverse effects from coastal hazards, including managed retreat by relocation or removal of existing structures or their abandonment in extreme circumstances, and designing for relocatability or recoverability from hazard events;

d) encourage the location of infrastructure away from areas of hazard risk where practicable;

e) discourage hard protection structures and promote the use of alternatives to them, including natural defences; and

f) consider the potential effects of tsunami and how to avoid or mitigate them.

40 The DPC 56 does not give effect to these parts of Policy 25 in that there will be an increase in the risk from coastal hazards and tsunami in coastal hazard areas as a permitted activity. Identifying coastal hazards areas for potential intensification does not encourage the location of infrastructure away from areas of hazard risk.

41 Policy 25 of the NZCPS also singles out managed retreat as a potential option to reduce the risk from coastal hazards. This is an idea that is being increasingly discussed as we deal with the ongoing impacts of major disasters that have affected our communities over the past decade including the Christchurch and Kaikōura Earthquakes and Cyclones Fehi, Gita, Hale and Gabrielle to name a few. Managed retreat becomes immensely more difficult as the density of development and level of investment increases making this option far less palatable and costly to future communities if we continue to develop in areas that we know are facing increasing risks from natural hazards as a result of sea level rise and climate change.

42 Policy 27 of the NZCPS outlines strategies for protecting areas of significant existing development likely to be affected by coastal hazards and provides a range of options for reducing coastal hazard risk that should be assessed including; “(a) promoting and identifying long-term sustainable risk reduction approaches including the relocation or removal of existing development or structures at risk”.

43 In evaluating these options, the policy states that the approaches should focus on risk management that reduces the need for hard protection structures and similar engineering interventions and take into account the nature of the coastal hazard risk and how it might change over at least a 100-year timeframe, including the expected effects of climate change.

44 The DPC 56 does not give effect to these parts of Policy 27 in that there will be an opportunity for an increase in the risk from coastal hazards in identified hazard overlays, both contemporaneously and over the next 100 years that will result in increased demand for engineering interventions to mitigate the risk.

Regional Policy Statement

45 The Regional Policy Statement for the Wellington region (**RPS**) identifies significant resource management issues, including natural hazards, and sets out objectives, policies, and methods to achieve the integrated management of natural and physical resources for the Wellington region.

46 The RPS contains a set of natural hazard provisions that provide local authorities with direction and guidance on hazard management issues that must be given effect to when making changes to city and district plans in accordance with section 75 of the Resource Management Act 1991.

47 Policy 29 of the RPS deals with avoiding inappropriate subdivision and development in areas at high risk from natural hazards directing regional and district plans to:

a) identify areas at high risk from natural hazards; and

b) include polices and rules to avoid inappropriate subdivision and development in those areas.

48 The RPS goes on to say that the process of identifying 'areas at high risk' from natural hazards must consider the potential natural hazard events that may affect an area and the vulnerability of existing and/or foreseeable subdivision or development. An area should be considered high risk if there is the potential for moderate to high levels of damage to the subdivision or development, including the buildings, infrastructure, or land on which it is situated. The assessment of areas at high risk should factor in the potential for climate change and sea level rise, and any consequential effect that this may have on the frequency or magnitude of related hazard events.

49 In providing for the potential for high and medium coastal hazard areas to be intensified, DPC 56 is not giving effect to Policy 29 to avoid inappropriate development in high hazard areas or its direction to consider the vulnerability of future development from climate change and sea level rise.

Civil Defence Emergency Act

50 The Civil Defence Emergency (**CDEM**) Act sets out its Purpose in Part 1 to improve and promote the sustainable management of hazards in a way that contributes to the social, economic, cultural, and environmental well-being and safety of the public and also to the protection of property. To achieve this it outlines 4 principles to require local authorities

to co-ordinate and encourage co-operation and joint action through regional groups, planning and related programmes across the areas of reduction, readiness, response, and recovery.

51 These are known as the 4Rs of hazard risk management and the Reduction R is focussed on policy and planning and land use decision making. It is one of the main levers that regional and local authorities have in helping manage the risks from natural hazards in order to build more resilient communities that are better prepared for natural hazards, including climate change impacts. Whilst the PDP does not have to give effect to the CDEM Act, it must not be inconsistent with it.

52 Employing the qualifying matters for natural hazards and the NZCPS under section 77I is an opportunity to avoid intensifying development in identified hazard areas and reduce the reduce the harm caused by natural disasters on our communities.

Regional Natural Hazards Management Strategy

53 The Wellington Region Natural Hazards Management Strategy was developed in 2019 as a collaboration between all councils in the region including Porirua City Council and was signed up to by Kāpiti, Porirua, Wellington, Hutt and Upper Hutt councils and the Wellington Region Emergency Management Group.

54 One of the core objectives of the Strategy is that planning in the region takes a long-term risk-based approach. As discussed above, this is particularly important in light of the effects that are occurring as a result of climate change and sea level rise.

55 Allowing development to intensify significantly in areas that are recognised as having a high risk from natural hazards now and in the near future due to seal level, is not taking into account a long-term risk-based approach and is contrary to the aims of the regional hazards strategy.

56 There are national best practice natural hazard guidance documents to support a risk-based approach including:

- Preparing for future flooding: a guide for local government in New Zealand, MfE (2010);
- Planning for Risk: Incorporating risk-based land use planning into a district plan, GNS Science (2013);

- Risk Based Approach to Natural Hazards under the RMA, Prepared for MfE by Tonkin & Taylor (2016) and;
- Coastal Hazards and Climate Change: Guidance for Local Government, MfE (2017).

Closing points and conclusion

57 The DPC 56 is internally inconsistent because it simultaneously discourages development in coastal areas prone to natural hazards but also earmarks it for intensification through the rules and standards framework to allow two dwellings per site in High Coastal Hazard Areas.

58 The DPC 56 does not give effect to the NZCPS coastal hazard policies. In particular, the Policy 3 precautionary approach for the use and management of coastal resources potentially vulnerable to effects from climate change, the Policy 25 direction to avoid increasing the risk of social, environmental and economic harm from coastal hazards over at least the next 100 years and Policy 27 to promote and identifying long-term sustainable risk reduction approaches.

59 In allowing intensification in High Coastal Hazard Areas, DPC 56 is not giving effect to RPS Policy 29 to avoid inappropriate development in high hazard areas or the direction of the CDEM Act and the Wellington Region Natural Hazards Management Strategy to take a long-term risk based approach to reducing the exposure of communities to natural hazards.

60 While a certain amount of hazard mitigation can be undertaken to deal with flooding, and erosion at a property level, very little can be done by an individual to mitigate sea level rise. We are locked into at least one metre of sea level rise and probably more over the next 100 years.

61 Greater Wellington seeks that this approach be reconsidered and that the s77I qualifying matters are further used to limit housing intensification in mapped High Coastal Hazard Areas to one residential unit per site. The coastal hazard overlays incorporate coastal erosion and inundation risk from storm-tide and tsunami that is subject to worsen over time as a result of sea level rise and thus, it is appropriate that this mechanism be used to limit intensification in these areas.

Appendix One

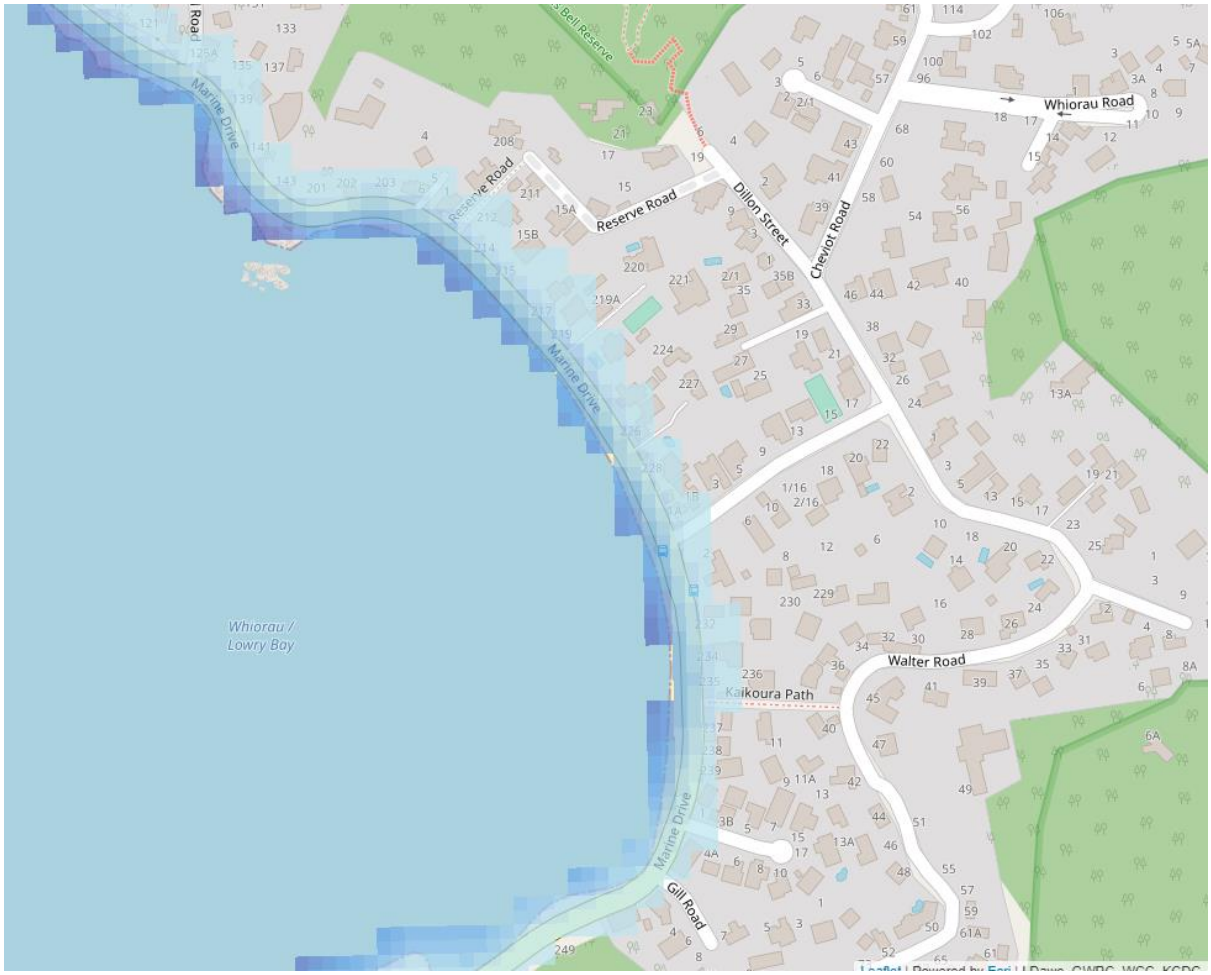

Figure One: Greater Wellington coastal inundation modelling using the 1% AEP storm-tide event showing Lowry Bay. This work is presented in Lane *et al* (2012)[1] and the mapping is available online: https://mapping1.gw.govt.nz/GW/SLR/

[1]Lane, E., Gorman, R., Plew, D. & Stephens, S. (2012), *Assessing the storm inundation hazard for coastal margins around the Wellington region*. Prepared for Greater Wellington Regional Council, Kapiti Coast District Council and Wellington City Council. NIWA Client Report No: CHC2012-073

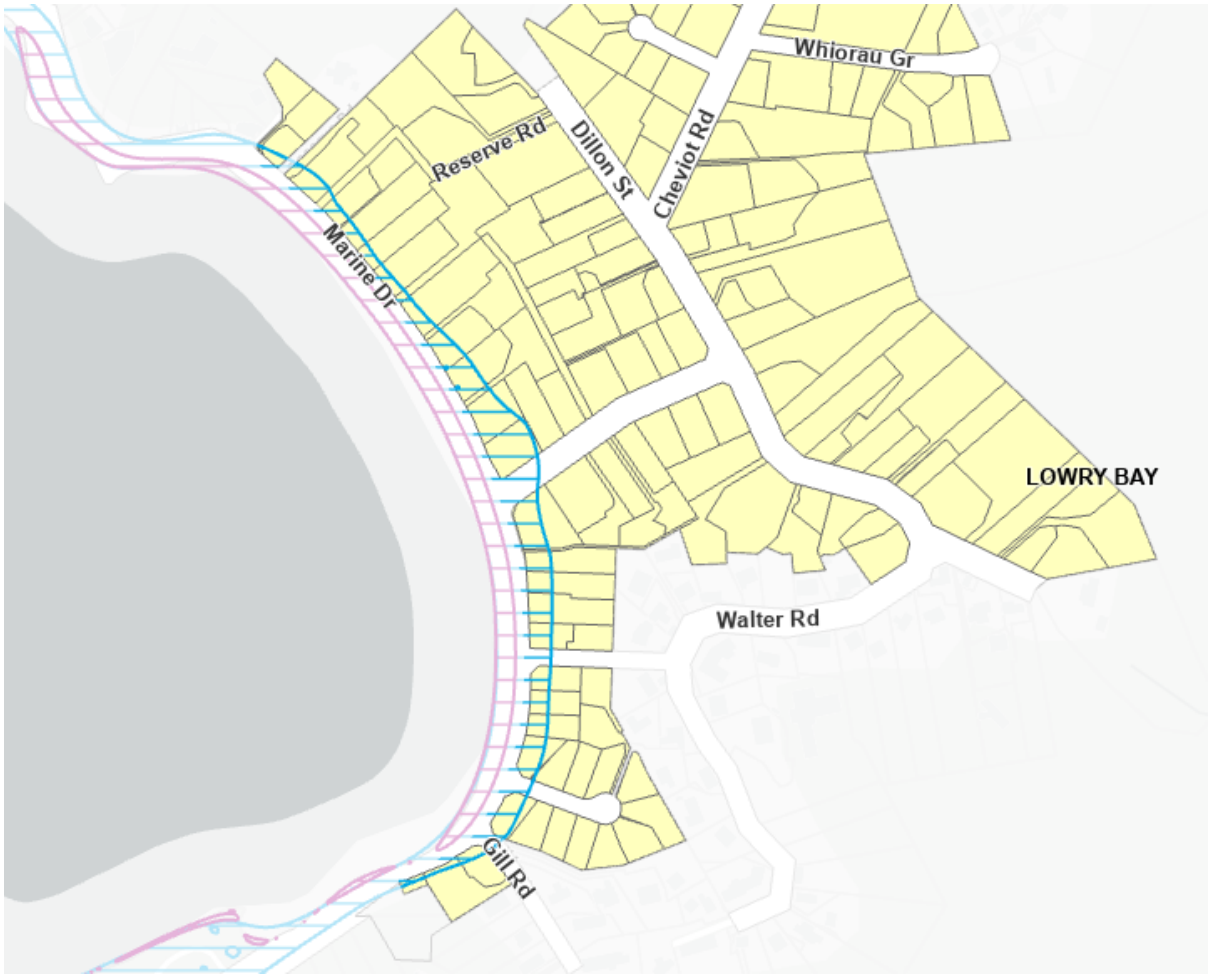

Figure Two: Shows the same area in Lowry Bay as Figure One with the HCC GIS map viewer overlays for the High (pink) and Medium (blue) Coastal Hazard Areas[2]. The pink high hazard overlay is the bath-tub modelled present day 1% AEP storm tide event and the blue medium hazard overlay is the bath-tub modelled future 1% AEP storm tide event in 2130 accounting for sea level rise. It can be seen that the medium hazard overlay aligns more closely with the dynamically modelled present day 1% AEP storm tide event presented in Figure One.

[2]Available at:
https://maps.huttcity.govt.nz/portal/apps/webappviewer/index.html?id=50fc3e90f3934809824d0b29f57ac157

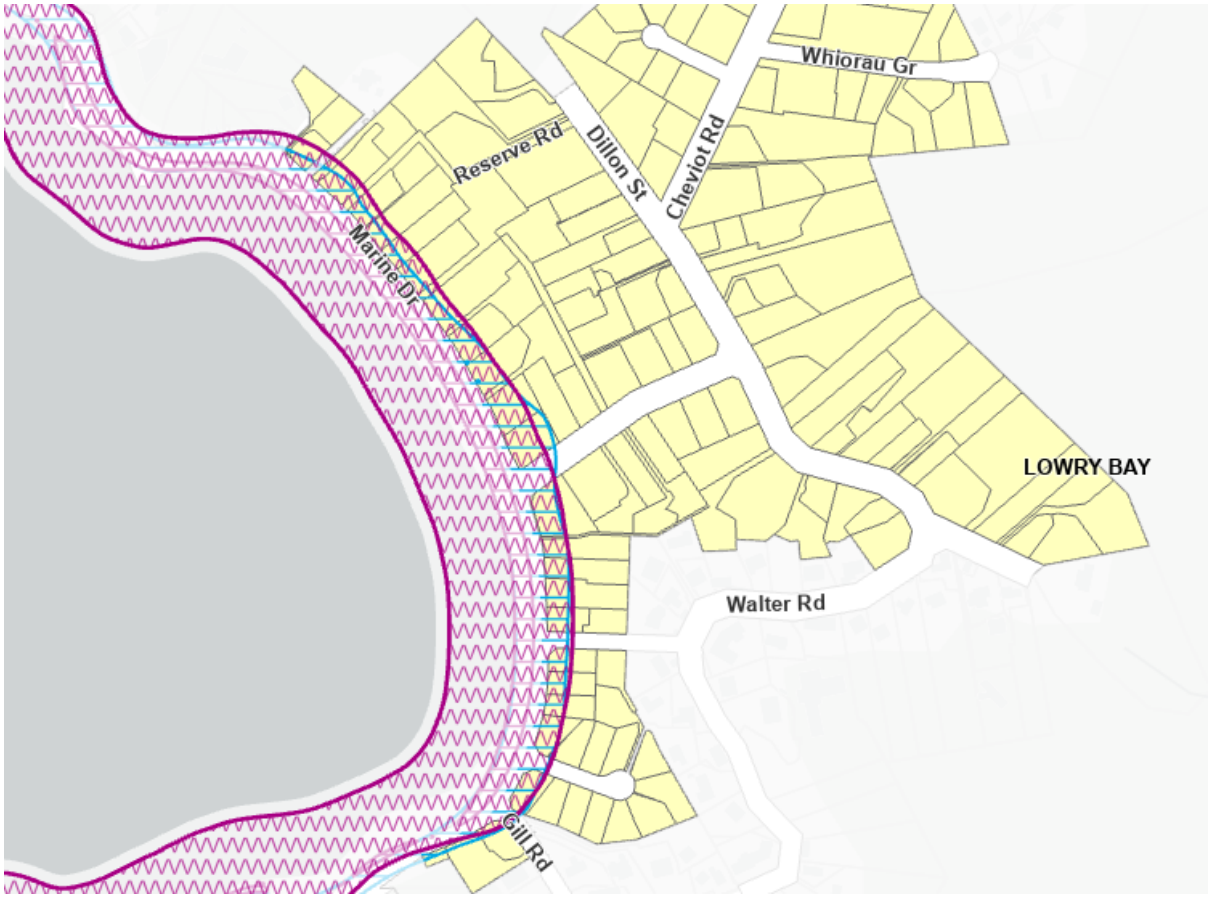

Figure Three: Shows the same Lowry Bay area as Figures One and Two with the 100 yr high hazard tsunami overlay as presented on the HCC GIS map viewer[2]. Overlays for the High (pink) and Medium (blue) Coastal Hazard Areas are also included. Again, it can be seen that the 100 yr tsunami overlay aligns closely with the dynamically modelled present day 1% AEP storm tide event presented in Figure One.

BEFORE THE INDEPENDENT HEARING PANEL APPOINTED TO HEAR AND MAKE DECISIONS ON SUBMISSIONS AND FURTHER SUBMISSIONS ON PROPOSED DISTRICT PLAN CHANGE 56

IN THE MATTER	of the Resource Management Act 1991 (the Act)
	AND
IN THE MATTER	of Hearing of Submissions and Further Submissions on Proposed Plan Change 56 to the Operative District Plan under Schedule 1 of the Act

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STATEMENT OF EVIDENCE OF PAMELA ANNE GUEST

ON BEHALF OF WELLINGTON REGIONAL COUNCIL

29 March 2023

Executive Summary

1 Climate change presents a formidable challenge to the safety and well-being of our communities and natural environment.

2 The increase in housing density and development enabled by Proposed District Plan Change 56 to the Operative City of Lower Hutt City District Plan (Proposed Plan Change 56) increases the exposure of communities to the adverse effects of climate change if development is not carried out in appropriate places and ways.

3 Nature-based solutions provide significant opportunities to increase the resilience of our communities and natural environment to the effects of climate change, while safeguarding biodiversity and improving human well-being.

4 Greater Wellington seeks amendments to embed nature-based solutions into Proposed Plan Change 56 to support Hutt City to transition to a low-emission and climate-resilient city.

Qualifications and experience

5 My full name is Pamela Anne Guest. I am a senior policy advisor in the Environmental Policy team at the Wellington Regional Council (Greater Wellington).

6 I hold a Bachelor of Science with 1st class Honours in geography and environmental sciences from the University of Otago, with post-graduate papers in environmental planning and law, and planning theory from the University of Waikato, and papers in landscape architecture from Lincoln University.

7 I have over 25 years of experience in resource management planning, working at both central and local government levels, with a focus on water and soil management, indigenous biodiversity, and climate change.

8 I have worked at Greater Wellington for 7 years, initially as topic lead for the Natural Resources Plan hearings for wetlands and biodiversity, beds of lakes and rivers, and significant sites. I led the development of provisions in Proposed Change 1 to the Regional Policy Statement for the Wellington Region (Proposed RPS Change 1) for climate change and indigenous ecosystems.

9 I am a member of the Climate Group of Te Uru Kahika – Regional and Unitary Councils Aotearoa, which provides strategic co-ordination and support to increase the effectiveness and efficiency of the regional sector's response to climate change.

Code of conduct

10 I have read the Code of Conduct for Expert Witnesses set out in the Environment Court's Practice Note 2023 (Part 9). I have complied with the Code of Conduct in preparing this evidence. My experience and qualifications are set out above. Except where I state I rely on the evidence of another person, I confirm that the issues addressed in this evidence are within my area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from my expressed opinions.

Scope of evidence

11 My evidence addresses Greater Wellington's submission points that seek amendments to Proposed Plan Change 56 to ensure that nature-based solutions for climate change are an integral part of new and intensified subdivision, use and development, to reduce greenhouse gases and increase the resilience of the communities and natural ecosystems of Hutt City to existing and future climate impacts.

12 Provisions from Proposed RPS Change 1 that are relevant to my evidence are set out in Appendix 1. While I did not prepare the Greater Wellington submission on Proposed Plan Change 56, I led the team that drafted these provisions.

Background – Climate change and urban intensification

13 Proposed RPS Change 1 identifies four significant and urgent resource management issues for the region:

a. impacts of climate change

b. loss and degradation of indigenous biodiversity

c. degradation of freshwater

d. lack of urban development capacity.

14 Proposed RPS Change 1 includes a suite of new objectives, policies, and methods to respond to national direction to address the impacts of climate change in managing freshwater, indigenous biodiversity and urban development as set out in the:

a. Climate Change Response Act 2002

b. National Policy Statement on Urban Development 2020

c. Te Mana o te Taiao - Aotearoa New Zealand Biodiversity Strategy 2020

d. National Policy Statement for Freshwater Management 2020

e. Aotearoa New Zealand's first Emissions Reduction Plan 2022

f. Aotearoa New Zealand's first National Adaptation Plan 2022.

The relevant higher order direction is set out in Appendix 2.

15 Amongst other matters, proposed RPS Change 1 provides new direction to district plans to ensure that urban intensification is not at the expense of indigenous biodiversity, freshwater, coastal environments, the region's transition to being low-emission and climate resilient, and the ability of Māori to express their cultural and traditional norms.

16 Cyclone Gabrielle and the string of increasingly frequent and damaging weather events in New Zealand and across the world bring into sharp focus the need for a step-change in the adoption of climate change mitigation and adaption measures by all sectors.

17 In 2022 the Intergovernmental Panel on Climate Change AR6 summary report for policymakers[1] warned that any further delay in systemic and transformative change, particularly in the way in which we use and develop our natural and physical resources, will miss a brief and rapidly closing window of opportunity to secure a liveable and sustainable future for all. The report also highlighted the global trend of increasing urban growth and intensification as providing a critical opportunity in the near-term to advance climate resilient development ("high confidence").

18 The AR6 report concludes that "Integrated, inclusive planning and investment in everyday decision-making about urban infrastructure, including social, ecological and grey/physical infrastructures, can significantly increase the adaptive capacity of urban and rural settlements."

[1] Intergovernmental Panel on Climate Change (2022): AR6 Summary for Policy makers https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf

19 The recently released AR6 synthesis report[2] stresses the significant risks and costs of any further delay in climate response; of particular relevance to Proposed Plan Change 56 are the costs of locking-in infrastructure (that is not fit-for-purpose) and the reduced feasibility and effectiveness of ecosystem-based adaptation/nature-based solutions as global warming increases.

20 The recent report from the Parliamentary Commissioner for the Environment "Are we building harder, hotter cities?"[3] highlights the vital importance of retaining existing, and promoting new, urban green space. The report highlights the limited direction provided by the MDRS landscaped area standards to improve the quality of private green space and recommends the inclusion of more explicit provisions for urban green space in statutory planning documents, recognising that these provide 'a core service'. The report suggests that landscaped area standards should seek good outcomes, such as minimum tree provision, which aligns with the relief sought by Greater Wellington to give effect to Proposed RPS Change 1, Policy CC.14 which promotes targets for tree canopy cover for urban cooling.

21 In 2019 the Hutt City Council declared a climate emergency, adopting goals to halve city emissions by 2030 and achieve net zero carbon emissions and a climate resilient city by no later than 2050. Climate actions in the Lower Hutt Climate Action Pathway[4] include future city design, nature-based solutions, and planning and continuous adaptation to build community resilience.

22 As Hutt City is approaching a period of significant urban growth and housing intensification, Proposed Plan Change 56 provides a critical opportunity to give regulatory weight to these actions, ensuring that appropriate locational constraints and design features are embedded into new subdivision, use and development decisions to both reduce greenhouse gas emissions and strengthen climate-resilience. This includes:

a. avoiding further development in areas or in ways that will result in a significant natural hazard risk (addressed in the evidence of Dr Iain Dawe),

[2] Intergovernmental Panel on Climate Change (2023): Synthesis report of the IPCC Sixth Assessment Report (AR6) https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_SPM.pdf

[3] are-we-building-harder-hotter-cities-the-vital-importance-of-urban-green-spaces.pdf

[4] https://hccpublicdocs.azurewebsites.net/api/download/f5851bd0c5504c249e193eae900e01f5/_minorproj/6639a19a4531d9924ce7adab424dfcc31c1e

b. integrating natural features into the built environment at a variety of scales, including by requiring good structure planning for greenfield development and as matters of assessment when enabling infill/brownfield development,

c. avoiding damage to and, preferably, protecting, enhancing, or restoring natural ecosystems that can provide significant mitigation and/or adaptation benefits.

Amendments sought by Greater Wellington

23 Greater Wellington has requested amendments to Proposed Plan Change 56 to ensure that nature-based solutions are an integral part of new subdivision, use and development to support climate change adaptation and mitigation and improve the health and resilience of people, biodiversity, and the natural environment.

24 Nature based solutions are actions to protect, enhance, or restore natural ecosystems, and/or that incorporate natural elements into built environments, to reduce greenhouse gas emissions and/or strengthen the resilience of humans to the effects of climate change, while having co-benefits for indigenous biodiversity and the natural environment.

25 Examples include planting and retaining canopy trees to help reduce heat in urban areas, using rain gardens, porous surfaces, and green rooves to support stormwater and flood management, restoring coastal dunelands to provide increased protection to communities from the effects of increased storm surges due to sea level rise, and leaving space for estuarine ecosystems, such as salt marshes, to retreat inland in response to sea level rise.

26 The higher order direction relevant to managing climate change mitigation and adaptation includes clear direction to prioritise the use of nature-based solutions within our planning and regulatory systems to address the climate and biodiversity crises together providing, where possible, for both carbon removals and climate change adaptation (refer to Appendix 3). This direction aligns with similar policy internationally. For example, the United Nations has adopted a multilaterally agreed definition for nature-based solutions and policies that recognise the important role they play in the global response to climate change and its social, economic, and environmental effects[5].

27 The technical evidence of Mr Stuart Farrant on behalf of Greater Wellington (dated 29 March 2023) discusses the risks of continuing with a "business as usual" approach to

[5] https://www.naturebasedsolutionsinitiative.org/news/united-nations-environment-assembly-nature-based-solutions-definition/

development planning and design, especially when combined with the increase in density and development enabled by Proposed Plan Change 56. Mr Farrant describes, and provides examples of, good practice climate-resilient design which integrates nature-based solutions into development at a range of scales.

28 Greater Wellington seeks the following amendments to embed nature-based solutions, including the implementation of water sensitive urban design, into Proposed Plan Change 56:

a. Include objectives, policies, permitted standards and rules in the plan change as a whole that provide for the qualities of well-functioning urban environments, with particular reference to NPS-UD Policy 1, clauses (a)(ii), (e) and (f) [OS149.1]. Note that the focus in my evidence is on additional provisions to give effect to Policy 1 clauses (e) and (f) to support reductions in greenhouse gas emissions and provide resilience to the likely current and future effects of climate change.

b. Insert a policy that requires hydrological controls for use, development and subdivision of land to address the effects of increased stormwater runoff from urban intensification on urban streams [OS149.26]

c. Insert a policy which requires the application of water sensitive urban design principles, including sustainable stormwater design, to minimise impacts on the natural environment and achieve outcomes additional to stormwater treatment, such as providing amenity spaces, ecological habitat [OS149.27]

d. Include policies which seek to improve the climate resilience of urban areas through measures identified in Proposed RPS Change 1 Policy CC.14 [OS149.30]

e. Amend policies to require hydrological controls [OS149.47]

f. Insert a new subdivision policy to encourage subdivision design to achieve efficient water use and require alternate water supplies for non-potable use i.e., roof water capture in new developments [OS149.66]

g. As a matter of control or discretion for subdivision include the extent to which the design protects, enhances, restores or creates nature-based solutions to manage the effects of climate change, or similar [OS.149.71]

h. Insert a policy to require new development to ensure adequate available water supply, including consideration of how climate change may affect existing supplies and the need to develop further water supply sources [OS.149.86]

i. Insert a new policy that seeks nature-based solutions when providing for new infrastructure and in new developments, such as the use of green infrastructure [OS149.90]

j. Insert a new policy that promotes energy efficiency in development, such as layout in design to maximise solar and renewable energy generation [OS149.131]

k. Include, as a matter of control or discretion for subdivision and comprehensive housing developments, how the development provides for solar orientation of buildings to achieve passive solar gain [OS149.133].

S42A Officer's Response

29 The officer's section 42A report has rejected all Greater Wellington's submission points that request amendments to incorporate nature-based solutions and provide for improved climate resilience into Proposed Plan Change 56 for a range of reasons, including that:

a. the plan change already gives effect to NPS-UD Policy 1

b. only standards that support the MDRS and policies 3 and 4 of the NPS-UD are within the scope of the plan change

c. the relief sought is out of scope or only partially relevant to the plan change and better addressed through a plan change that relates to implementation of the NPS-FM, ideally guided by operative RPS provisions

d. Proposed RPS Change 1 is only part way through the RMA Schedule 1 process and therefore has limited weight

e. as there are no supporting objectives, it is not possible to add new policies

f. it is unclear what the higher order direction is.

30 In my opinion, Proposed Plan Change 56 could give broader effect to NPS-UD Policy 1 clauses (e) and (f), including through specific reference in objectives, policies, rules, and

non-regulatory methods, to reduce greenhouse gas emissions and build climate resilience, with a preference for nature-based solutions.

31 Counsel for Greater Wellington will address the issues of scope and weight to be given to Proposed RPS Change 1 in legal submissions.

32 The addition of new objectives to achieve a well-functioning urban environment through Amendments 3, 54 and 107 in this plan change, to give effect to NPS-UD Policy 1, provide a framework for proposing additional policies and methods to ensure that this is implemented, specifically in terms of supporting reductions in greenhouse gases and increasing the resilience to the likely current and future impacts of climate change.

33 I acknowledge that while the use of "nature-based solutions" in development planning is a relatively novel approach for district plans, a number of territorial authorities already require the use of nature-based solutions, such as water sensitive urban design, in some circumstances or pursue these initiatives outside of their District Plan. Recent examples in the Wellington Region include the constructed wetland built to treat stormwater prior to discharge into Te Awarua-o-Porirua and the rain gardens and street trees installed in Cuba St, Wellington City to provide stormwater treatment and shade. Mr Farrant's evidence provides further examples.

34 Greater Wellington has identified a number of provisions across Proposed Plan Change 56 where amendments to better provide for climate change adaptation and mitigation, with preference for nature-based solutions, would contribute to the relief being sought. These amendments are set out in Appendix 3.

35 Amendments sought include adding new and amending proposed objectives, policies and rules to the Urban Environment, Medium and High Density Residential Activity Area chapters to require the use and protection of nature-based solutions for development at a range of scales, including measures described in the technical evidence of Mr Farrant.

36 Greater Wellington would be happy to work with the Hearings Panel and council officers to develop these provisions in further detail.

Conclusion

37 The challenges facing our communities and natural environment in the face of a changing climate are immense. In 2021, He Pou a Rangi the Climate Change Commission issued a call to all New Zealanders to "take climate action today, not the day after tomorrow",

concluding that New Zealand needs to be proactive and courageous as it tackles the challenges our country will face in the years ahead and that bold climate action is possible when we work together[6].

38 Both the Climate Change Commission and central government are clear that local government and the planning system have important roles to play in climate change mitigation and adaptation to complement national policy direction and initiatives.

39 Due to its statutory weight, the district plan provides a powerful tool to ensure that where and how development takes place, especially in relation to the intensification of housing, will support the Hutt City to transition to become a low-emission and climate-resilient city. Proposed Plan Change 56 provides an important opportunity to ensure that the planning framework is fit for this purpose.

40 Not acting now will result in a generation of new housing that locks in the risks associated with "business as usual" development (as discussed in Mr Farrant's evidence), missing a critical opportunity to increase the resilience of Hutt City communities to the current and future effects of climate change. "Kicking the can" further down the road will significantly increase the challenges of adaptation and the associated social, environmental, and economic costs.

41 The United Nations Secretary General called the IPCC 2023 report "a clarion call to massively fast-track climate efforts by every country and every sector and on every timeframe. Our world needs climate action on all fronts: everything, everywhere, all at once.[7]"

[6] New Zealand Climate Change Commission, 2021: Ināia tonu nei: a low emissions future for Aotearoa
[7] United Nations Secretary-General António Guterres' speech to launch the IPCC Synthesis Report 2023 https://press.un.org/en/2023/sgsm21730.doc.htm

Appendix 1: Proposed RPS Change 1 provisions relevant to the evidence of Pamela Guest, GWRC

Objectives	Policy	Method
Objective CC.1: By 2050, the Wellington Region is a low-emission and climate-resilient region, where climate change mitigation and adaptation are an integral part of: (a) sustainable air, land, freshwater, and coastal management, (b) well-functioning urban environments and rural areas, and (c) well-planned infrastructure. **Objective CC.4:** *Nature-based solutions* are an integral part of climate change mitigation and climate change adaptation, improving the health and resilience of people, biodiversity, and the natural environment **Definition – Nature-based solutions** Actions to protect, enhance, or restore natural ecosystems, and the incorporation of natural elements into built environments, to reduce greenhouse gas emissions and/or strengthen the resilience of humans, indigenous biodiversity and the natural environment to the effects of climate change. Examples include: Reducing greenhouse gas emissions (climate change mitigation): • planting forests to sequester carbon • protecting peatland to retain carbon stores Increasing resilience (climate change adaptation): (a) providing resilience for people • planting street trees to provide relief from high temperatures • restoring coastal dunelands to provide increased resilience to the damaging effects of storms linked to sea level rise • leaving space for rivers to undertake their natural movement and accommodate increased floodwaters, • the use of water sensitive urban design, such as rain gardens to reduce stormwater runoff in urban areas (b) providing resilience for ecosystems and species • restoring indigenous forest to a healthy state to increase its resilience to increased climate extremes • leaving space for estuarine ecosystems, such as salt marshes, to retreat inland in response to sea level rise **Objective CC.6** Resource management and adaptation planning increase the resilience of communities and the natural environment to the short, medium, and long-term effects of climate change. **Objective 22:** Urban development, including housing and infrastructure, is enabled where it demonstrates the characteristics and qualities of well-functioning urban environments, which: (a) Are compact and well designed; and (b) Provide for sufficient development capacity to meet the needs of current and future generations; and	**Policy CC.4: Climate resilient urban areas – district and regional plans** District and regional plans shall include policies, rules and/or methods to provide for climate-resilient urban areas by providing for actions and initiatives described in Policy CC.14 which support delivering the characteristics and qualities of well-functioning urban environments. Explanation Policy CC.4 directs regional and district plans include relevant provisions to provide for climate resilient urban areas. For the purposes of this policy, climate-resilient urban areas mean urban environments that have the ability to withstand: • Increased temperatures and urban heat island • Increased intensity of rainfall and urban flooding • Droughts and urban water scarcity and security • Increased intensity of wind, cold spells, landslides, fire, and air pollution The policy is directly associated with Policy CC.14 which provides further direction on actions and initiatives to provide for climate resilient urban areas. It is noted that other policies of this RPS also provide for actions and initiatives to deliver climate resilient urban areas, including Policy FW.3. **Policy CC.7: Protecting, restoring, and enhancing ecosystems and habitats that provide nature-based solutions to climate change – district and regional plan** District and regional plans shall include objectives, policies, rules and/or methods that provide for nature-based solutions to climate change to be part of development and infrastructure planning and design. Explanation Development and infrastructure planning and design should include nature-based solutions as standard practice, including green infrastructure, green spaces, and environmentally friendly design elements, to manage issues such as improving water quality and natural hazard protection. Nature-based solutions can perform the roles of traditional infrastructure, while also building resilience to the impacts of climate change and providing benefits for indigenous biodiversity and community well-being. **Policy CC.12: Protect, enhance and restore ecosystems that provide nature-based solutions to climate change – consideration** When considering an application for a resource consent, notice of requirement, or a change, variation or review of a district or regional plan, a determination shall be made as to whether an activity may adversely affect a *nature-based solution* to climate change and, in determining whether the proposed activity is appropriate, particular regard shall be given to the impact on those climate change characteristics and functions. Explanation Nature-based solutions are critical components of the region's climate change response. This policy seeks to protect the functions that they provide to support climate change mitigation and/or mitigation. **Policy CC.14: Climate-resilient urban areas – consideration** When considering an application for a resource consent, notice of requirement, or a change, variation or review of a district or regional plan, provide for actions and initiatives, particularly the use of *nature-based solutions*, that contribute to climate-resilient urban areas, including: (a) maintaining, enhancing, restoring, and/or creating urban greening at a range of spatial scales to provide urban cooling, including working towards a target of 10 percent tree canopy cover at a suburb-scale by 2030, and 30 percent cover by 2050, (b) the application of water sensitive urban design principles to integrate natural water systems into built form and landscapes, to reduce flooding, improve water quality and overall environmental quality,	**Method UD.1: Development manuals and design guides** Prepare the following development manuals and design guidance: (a) Urban design guidance to provide for best practice urban design and amenity outcomes in accordance with Policy 67(a); (b) Papakāinga design guidance that are underpinned by Kaupapa which is Māori in partnership with Mana Whenua in accordance with Policy 67(f); and (c) Urban design guidance and development manuals to assist developers in meeting Policy CC.14 and Policy FW.3. *Implementation: Wellington Regional Council and city and district councils (via the Wellington Regional Leadership Committee)* **Method CC.6: Identifying nature-based solutions for climate change** By 30 June 2024, the Wellington Regional Council will, in partnership with mana whenua/tangata whenua, identify ecosystems in the Wellington Region that should be prioritised for protection, enhancement, and restoration for their contribution as a *nature-based solution* to climate change, including those that: (a) sequester and/or store carbon (e.g., forest, peatland), (b) provide resilience to people from the impacts of climate change (e.g., coastal dunelands, street trees, and wetlands), (c) provide resilience for indigenous biodiversity from the impacts of climate change, enabling ecosystems and species to persist or adapt (e.g., improving the health of a forest to allow it to better tolerate climate extremes). *Implementation: Wellington Regional Council* **Method CC.9: Support and funding for protecting, enhancing, and restoring indigenous ecosystems and nature-based solutions** Provide support, and seek new sources of funding, for programmes that protect, enhance or restore the priority ecosystems identified by Methods IE.2 and CC.7 for their biodiversity values and/or their contribution as nature-based solutions to climate change. *Implementation: Wellington Regional Council*

(c) Improve the overall health, well-being and quality of life of the people of the region; and (d) Prioritise the protection and enhancement of the quality and quantity of freshwater; and (e) Achieve the objectives in this RPS relating to the management of air, land, freshwater, coast, and indigenous biodiversity; and (f) Support the transition to a low-emission and climate-resilient region; and (g) Provide for a variety of homes that meet the needs, in terms of type, price, and location, of different households; and (h) Enable Māori to express their cultural and traditional norms by providing for mana whenua / tangata whenua and their relationship with their culture, land, water, sites, wāhi tapu and other taonga; and (i) Support the competitive operation of land and development markets in ways that improve housing affordability, including enabling intensification; and (j) Provide for commercial and industrial development in appropriate locations, including employment close to where people live; and (k) Are well connected through multi-modal (private vehicles, public transport, walking, micro-mobility and cycling) transport networks that provide for good accessibility for all people between housing, jobs, community services, natural spaces, and open space.	(c) capturing, storing, and recycling water at a community-scale (for example, by requiring rain tanks, and setting targets for urban roof area rainwater collection), (d) protecting, enhancing, or restoring natural ecosystems to strengthen the resilience of communities to the impacts of natural hazards and the effects of climate change, (e) providing for efficient use of water and energy in buildings and infrastructure, and (f) buildings and infrastructure that are able to withstand the predicted future temperatures, intensity and duration of rainfall and wind Explanation Climate change, combined with population growth and housing intensification, is increasingly challenging the resilience and well-being of urban communities and natural ecosystems, with increasing exposure to natural hazards, and increasing pressure on water supply, wastewater and stormwater infrastructure, and the health of natural ecosystems. This policy identifies the key attributes required to develop climate-resilience in urban areas and requires district and regional councils to take all opportunities to provide for actions and initiatives, particularly nature-based solutions, that will prepare our urban communities for the changes to come. **Policy FW.3: Urban development effects on freshwater and the coastal marine area – district plans** District plans shall include objectives, policies, and methods including rules, that give effect to Te Mana o te Wai and section 3.5(4) of the NPS-FM, and in doing so must: (a) Partner with mana whenua / tangata whenua in the preparation of district plans; (b) Protect and enhance Māori freshwater values, including mahinga kai; (c) Provide for mana whenua / tangata whenua and their relationship with their culture, land, water, wāhi tapu and other taonga; (d) Incorporate the use of mātauranga Māori to ensure the effects of urban development are considered appropriately; (e) Adopt an integrated approach, ki uta ki tai, that recognises the interconnectedness of the whole environment to determine the location and form of urban development; (f) Integrate planning and design of stormwater management to achieve multiple improved outcomes – amenity values, recreational, cultural, ecological, climate, vegetation retention; (g) Consider the effects on freshwater and the coastal marine area of subdivision, use and development of land; (h) Consider the use and development of land in relation to target attribute states and any limits set in a regional plan; (i) Require that Water Sensitive Urban Design principles and methods are applied during consideration of subdivision, the extent of impervious surfaces and in the control of stormwater infrastructure; (j) Require that urban development is located and designed to minimise the extent and volume of earthworks and to follow, to the extent practicable, existing land contours; (k) Require that urban development is located and designed to protect and enhance gully heads, rivers, lakes, wetlands, springs, riparian margins and estuaries; (l) Require riparian buffers for all waterbodies and avoid piping of rivers; (m) Require hydrological controls to avoid adverse effects of runoff quantity (flows and volumes) and maintain, to the extent practicable, natural stream flows; (n) Require efficient use of water; (o) Manage land use and development in a way that will minimise the generation of contaminants, including building materials, and the extent of impervious surfaces; (p) Consider daylighting of streams, where practicable; and (q) Consider the effects of land use and development on drinking water sources. Explanation Policy FW.3 requires district plans to manage the effects of urban development on freshwater and the coastal marine area.	

Appendix 2: Higher Order Direction relevant to evidence of Pamela Guest, GWRC

Resource Management Act 1991

s5 Purpose

s6 Matters of national importance

(h) the management of significant risks from natural hazards

s7 Other matters

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to—

(i) The effects of climate change

s31 Functions of territorial authorities under this Act

s74 Matters to be considered by territorial authority

(2) In addition to the requirements of section 75(3) and (4), when preparing or changing a district plan, a territorial authority shall have regard to—
(a) any—

(i) proposed regional policy statement; or

Climate Change Response Act 2002

3(1) The purpose of this Act is to—
(aa) provide a framework by which New Zealand can develop and implement clear and stable climate change policies that—

(i) contribute to the global effort under the Paris Agreement to limit the global average temperature increase to 1.5° Celsius above pre-industrial levels; and

(ii) allow New Zealand to prepare for, and adapt to, the effects of climate change:

National Policy Statement on Urban Development 2020

Objective 1: New Zealand has well-functioning urban environments that enable all people and communities to provide for their social, economic, and cultural wellbeing, and for their health and safety, now and into the future.

A well-functioning urban environment is defined in Policy 1

Objective 8: New Zealand's urban environments: support reductions in greenhouse gas emissions; and are resilient to the current and future effects of climate change.

Policy 1: Planning decisions contribute to well-functioning urban environments, which are urban environments that, as a minimum: …

(e) support reductions in greenhouse gas emissions; and

(f) are resilient to the likely current and future effects of climate change.

Policy 6: When making planning decisions that affect urban environments, decision-makers have particular regard to the following matters: …

(e) the likely current and future effects of climate change

Te Mana o te Taiao - Aotearoa New Zealand Biodiversity Strategy 2020

Objective 13: Biodiversity provides nature-based solutions to climate change and is resilient to its effects.

Outcome 5 includes: Thriving biodiversity plays a central role in our approach to mitigating climate change.

2025 Goals include: 13.2.1 The potential for indigenous nature-based solutions is understood and being incorporated into planning

National Policy Statement for Freshwater Management 2020

Policy 4: Freshwater is managed as part of New Zealand's integrated response to climate change

3.5 Integrated Management

(1) Adopting an integrated approach, ki uta ki tai, as required by Te Mana o te Wai, requires that local authorities must:

(a) recognise the interconnectedness of the whole environment, from the mountains and lakes, down the rivers to hāpua (lagoons), wahapū (estuaries) and to the sea; and

(b) recognise interactions between freshwater, land, water bodies, ecosystems, and receiving environments; and

(c) manage freshwater, and land use and development, in catchments in an integrated and sustainable way to avoid, remedy, or mitigate adverse effects, including cumulative effects, on the health and well-being of water bodies, freshwater ecosystems, and receiving environments; and

(d) encourage the co-ordination and sequencing of regional or urban growth….

(3) In order to give effect to this National Policy Statement, local authorities that share jurisdiction over a catchment must co-operate in the integrated management of the effects of land use and development on freshwater.

(4) Every territorial authority must include objectives, policies, and methods in its district plan to promote positive effects, and avoid, remedy, or mitigate adverse effects (including cumulative effects), of urban development on the health and well-being of water bodies, freshwater ecosystems, and receiving environments.

Aotearoa New Zealand's first emissions reduction plan 2022

Chapter 4: Working with Nature

Action 4.1: Prioritise nature-based solutions

To address the climate and biodiversity crises together, the Government will:

- prioritise the use of nature-based solutions within our planning and regulatory systems, where possible, for both carbon removals and climate change adaptation
- investigate how to best ensure that a biodiversity lens is applied to climate change policy development and planning in order to prioritise nature-based solutions.

The planning system and infrastructure investment can also support the use of nature-based solutions or blue/green infrastructure – such as water-sensitive urban design, rain gardens and urban trees – which may support carbon removals and improve climate resilience.

Examples of nature-based solutions that remove carbon and support biodiversity include:

► restoring wetlands and coastal ecosystems (eg, peatlands, saltmarshes and mangrove swamps) to sequester carbon and provide natural defences against flooding, drought and sea-level rise, while supporting abundant biodiversity

► restoring and planting native forests in upper catchments to sequester carbon, reduce flooding and sediment flow into downstream rivers and estuaries and improve habitats.

Some nature-based solutions can also reduce emissions indirectly, for example:

► using water-sensitive urban design, which mimics natural processes and uses soil and vegetation to manage stormwater and reduce the need for carbon intensive concrete pipes

► integrating green spaces and natural features into urban areas to help with temperature and flood control, improve air quality and create wildlife corridors. This can also make active transport more appealing, provide recreational opportunities and improve health and wellbeing.

Chapter 7: Planning and infrastructure

How we plan and provide infrastructure can reduce emissions and increase resilience

How we provide infrastructure also affects our emissions. Higher-density, mixed-use developments can have lower operational emissions per dwelling and allow infrastructure to be used more efficiently, avoiding or delaying the need for more infrastructure and associated emissions. Non-built solutions to our infrastructure needs – including nature-based solutions – can also reduce the need for built infrastructure made of materials that carry embodied emissions. They can also help to sequester carbon, improve indigenous biodiversity and create more liveable environments that encourage people to walk or cycle, reducing emissions from transport.

Decisions about investment in infrastructure need to take account of the whole-of-life costs and benefits of that investment, including the cost of emissions associated with that infrastructure. The planning and infrastructure systems can also help to prevent development in areas vulnerable to the impacts of climate change, such as flooding. Avoiding development in these areas will help us reduce the need for additional infrastructure to protect vulnerable land and assets – saving on emissions from building new infrastructure – and avoid the need to replace or relocate existing infrastructure and buildings.

Aotearoa New Zealand's first national adaptation plan 2022

Objective NE3: Support working with nature to build resilience

Action 5.9

- Prioritise nature-based solutions in our planning and regulatory systems to address the climate and biodiversity crises together.

Action 5.16

- Identify options to increase the integration of nature-based solutions into urban form, which will increase biodiversity and natural areas in urban spaces.

Action 8.7

- Embed nature-based solutions as part of the response to reducing transport emissions and improving climate adaptation and biodiversity outcomes.

MFE Guidance to local government to give effect to the National Adaptation Plan and the National Emissions Reduction Plan[1]

How local government can support the five principles in RMA plan development - includes:

- When developing RMA-related plans, local government should consider climate change issues and the role that RMA plans have in reducing greenhouse-gas emissions.
- Prioritise and encourage nature-based solutions that reduce emissions and have multiple co-benefits. Examples include where a coastal environment affected by rising sea levels and severe weather events, restoring coastal wetlands or dunes rather than using a hard engineering solution, such as a seawall; and in an urban environment blue green infrastructure such as urban trees or water sensitive design.
- RMA-related plans should complement other initiatives in the emissions reduction plan, such as emissions pricing; funding and financing; planning and investment; research, science, innovation and technology; and circular economy and bio economy.

[1] **https://environment.govt.nz/assets/publications/national-adaptation-plan-and-emissions-reduction-plan-guidance-note.pdf**

Appendix 3: Proposed amendments to Proposed Plan Change 56 – evidence of Pamela Guest for GWRC

Key:

Black text: Existing District Plan wording

Black underlined text: Text added in Plan Change 56

Red underlined text: Amendments made by officers in the s42A report

Green underlined text: Amendments sought by Greater Wellington

Proposed Amendments
Chapter 1.10.1A Urban Environment: Amend **new Objective** A well-functioning urban environment that enables all people and communities to provide for their social, economic, and cultural wellbeing, and for their health and safety and resilience to the effects of climate change, now and into the future. Add an additional **new Objective** Urban land use, subdivision and development design integrates features, in particular nature-based solutions, that support reductions in greenhouse gas emissions and the risk of natural hazards and that increase the climate resilience of the communities and natural environments of Hutt City. Add **new Policy** Urban land use, subdivision and development design provide for a climate resilient urban environment, including by: (a) maintaining, enhancing, restoring, and/or creating urban greening, including canopy trees (b) the application of water sensitive urban design principles to integrate natural water systems into built form and landscapes, to reduce flooding, improve water quality and overall environmental quality, (c) capturing, storing, and recycling water to achieve hydrological controls, (d) protecting, enhancing, or restoring natural ecosystems to strengthen the resilience of communities to the impacts of natural hazards and the effects of climate change, (e) providing for efficient use of water and energy in buildings and infrastructure, and (f) encouraging buildings and infrastructure that are able to withstand the predicted future temperatures, intensity and duration of rainfall and wind. Add **new Policy**

The design of new development and subdivisions shall adopt water sensitive urban design principles and methods in the control of stormwater.

Add **new Policy**

The adverse effects of stormwater quantity on natural stream flows and indigenous biodiversity shall be avoided as far as practicable by requiring hydrological controls for new development and subdivision.

Amend **new Policy 4**

Enable housing to be designed to meet the day-to-day needs of residents and provide resilience to the current and future effects of climate change.

Chapter 4F Medium Density Residential Activity Area

Add to **4F 1 Introduction / Zone Statement**

If a proposed development does not meet the development standards, resource consent is required in order to:

i. achieve a high quality built environment;

ii. manage the effects of development on neighbouring sites;

iii. contribute to the climate-resilience of the local community;

iv. protect the health and climate-resilience of the natural environment;

v. achieve high quality onsite living environments; and

vi. achieve attractive and safe streets and public space

Amend **Objective 4F 2.1AA**

A well-functioning urban environment that enables all people and communities to provide for their social, economic, and cultural wellbeing, and for their health and safety and resilience to the effects of climate change, now and into the future.

Amend **New Objective 4F2.5**

Built development is of high quality and provides ~~on-site amenity for residents as well as residential amenity for adjoining properties and the street:~~

~~i. appropriate on-site amenity for residents,~~

~~ii. appropriate residential amenity for adjoining sites, and~~

~~iii. a high level of amenity for the street.~~

i. Healthy, safe, attractive, and accessible living environments, ~~and~~

ii. Attractive and safe streets, and

iii. An urban environment that reduces greenhouse gas emissions, is resilient and can adapt to the effects of climate change.

Amend **Objective 4F2.6**

Built development is adequately serviced by network infrastructure or addresses any infrastructure constraints and this infrastructure protects the quality of the natural environment, where practicable, incorporating nature-based solutions.

Add a **New Objective**

Urban land use, subdivision and development design integrates features, in particular nature-based solutions, that support reductions in greenhouse gas emissions, reduce the risk of natural hazards and increase the climate resilience of the communities and environments of Hutt City.

Amend **Policy 4F 3.2A**

Provide for developments not meeting permitted activity status, while encouraging high quality developments that protect the quality of the natural environment and contribute to the climate resilience of the site and surrounding area, including through the use of nature-based solutions.

Amend **Policy 4F 3.9**

Require rainwater tanks (with both detention and retention) and a minimum area of permeable surfaces or alternative design solutions, including the use of nature-based solutions, in order to assist with the management of stormwater runoff created by development.

Amend **Policy 4F 3.10**

~~Encourage medium density residential development to be stormwater neutral.~~

Require development to be ~~stormwater~~ hydraulically neutral and incorporate hydrological controls to provide retention of stormwater volumes.

Add the following **definition for hydrological controls**

For greenfield development:

(a) the modelled mean annual runoff volume generated by the fully developed area must not exceed the mean annual runoff volume modelled from the site in an undeveloped (pastoral) state

(b) the modelled mean annual exceedance frequency of the 2-year Average Recurrence Interval (ARI) so-called 'channel forming' (or 'bankfull') flow for the point where the fully developed area discharges must not exceed the mean annual exceedance frequency modelled for the same site and flow event arising from the area in an undeveloped (pastoral) state.

For brownfield and infill development:

(a) the modelled mean annual runoff volume generated by the fully developed area must be reduced, as far as practicable, towards the mean annual runoff volume modelled for the site in an undeveloped state

(b) the modelled mean annual exceedance frequency of the 2-year ARI so-called 'channel forming' (or 'bankfull') flow for the point where the fully developed area discharges to a stream, or stormwater network, shall be reduced as far as practicable towards the mean annual exceedance frequency modelled for the same site and flow event in an undeveloped state.

Add to **4F 4.2 Development Standards**
(b)… Discretion is restricted to:

(xx) Design elements that contribute to climate change adaptation and mitigation

(vi) The following design elements: …

6. Onsite stormwater management, including the use of water sensitive urban design and hydrological controls

11. landscaping, including the incorporation of indigenous canopy tree species

Amend **Rule 4F 4.2.5 Permeable Surface**

a) Construction or alteration of a building, or new impermeable surfaces, is a **permitted activity**, if:
(i) A minimum of ~~30%~~ 40% of the total site area is a permeable surface.
(b) Construction or alteration of a building, or new impermeable surfaces, that do not meet the above permitted permeable surface requirements is a **restricted discretionary activity**.

Discretion is restricted to:

(i) The effects on the stormwater system and the health and well-being of water bodies, freshwater ecosystems, and receiving environments.
(ii) The potential for increased surface ponding and flooding, including on neighbouring properties.
(iii) The mitigation of additional stormwater runoff volumes through ~~means such as~~ onsite stormwater retention.
(iv) The following design elements:
~~1. Building height~~
~~2. Recession planes and setbacks~~
~~3. Indoor and outdoor living spaces~~
~~4. Open space and boundary treatments~~
~~5. Entrances, carparking and garages~~
6. Onsite stormwater management and water sensitive urban design
~~7. End / side wall treatment~~
~~8. Building materials~~
~~9. Bike parking, storage and service areas~~
~~10. Privacy and safety~~
11. Landscaping

Amend the title of **Rule 4F 4.2.10 Stormwater ~~Retention~~ Detention**

Review the **Medium-Density Design Guide** to ensure that it provides best practice design elements to support the built environment to reduce greenhouse gas emissions and increase the climate-resilience of the natural environment and local community to the current and future effects of climate change.

Chapter 4G High Density Residential Activity Area

Amend **Objective 4G 2.1**

A well-functioning urban environment that enables all people and communities to provide for their social, economic, and cultural wellbeing, and for their health and safety and resilience to the effects of climate change, now and into the future.

Amend **Objective 4G 2.5**

Built development is of high quality and provides:

~~i. appropriate on-site amenity for residents,~~

~~ii. appropriate residential amenity for adjoining sites, and~~

~~iii. a high level of amenity for the street.~~

iv. Healthy, safe, attractive, and accessible living environments, ~~and~~

v. Attractive and safe streets, and

vi. An urban environment that minimises greenhouse gas emissions, is resilient and can adapt to the effects of climate change.

Amend **Objective 4G2.6**

Built development is adequately serviced by network infrastructure or addresses any infrastructure constraints and this infrastructure protects the quality of the natural environment, where practicable, incorporating nature-based solutions.

Add a **New Objective**

Urban land use, subdivision and development design integrates features, in particular nature-based solutions, that support reductions in greenhouse gas emissions and natural hazard risk and that increase the climate resilience of the communities of Hutt City.

Amend **Policy 4G 3.1**

Provide for residential activities, and those non-residential activities that support the community's social, economic and cultural wellbeing, increase resilience to the effects of climate change and manage any adverse effects on residential amenity.

Amend **Policy 4G 3.4**

Provide for developments not meeting permitted activity status, while encouraging high quality developments that protect the quality of the natural environment and contribute to the climate resilience of the site and surrounding area, including through the use of nature-based solutions.

Policy 4G 3.13

Require rainwater reuse tanks and a minimum area of permeable surfaces or alternative design solutions in order to provide retention of stormwater ~~assist with the management of stormwater runoff created by development~~

Amend **Policy 4G 3.14**

Require development to be ~~stormwater~~ hydraulically neutral and incorporate hydrological controls to achieve retention.

Add to **4G 4.2 Development Standards**
(b)… Discretion is restricted to:

(xx) Design elements that contribute to climate change adaptation and mitigation

(vi) The following design elements: …

6. Onsite stormwater management, including the use of water sensitive urban design and hydrological controls

11. landscaping, including the incorporation of indigenous canopy tree species

Amend **Rule 4G 4.2.7 Permeable Surface**

(a) Construction or alteration of a building, or new impermeable surfaces, is a permitted activity, if:

(i) A minimum of ~~30%~~ 40% of the total site area is a permeable surface.

(b) Construction or alteration of a building, or new impermeable surfaces, that do not meet the above permitted permeable surface requirements is a restricted discretionary activity.

Discretion is restricted to:

(i) The effects on the stormwater system and the health and well-being of water bodies, freshwater ecosystems, and receiving environments.

(ii) The potential for increased surface ponding and flooding, including on neighbouring properties.

(iii) The mitigation of additional stormwater runoff volumes through ~~means such as~~ onsite stormwater retention.

(iv) The following design elements:

1. Onsite stormwater management and water sensitive urban design

2. Landscaping

When considering the matters in (iv), the Council will be principally guided by its Medium Density Design Guide.

Chapter 11.1

Add a **new policy** to support efficient water use and alternative water supplies for non-potable use. For example:

Manage the demand for water supply from new subdivision and development by:
(a) encouraging the efficient use of water, including in subdivision design; and
(b) requiring alternate water supplies for non-potable use, such as roof water capture and reuse which also provides retention

Chapter 11 Section 11.2.2.1

As a matter of control or discretion for subdivision include the extent to which the design protects, enhances, restores or creates nature-based solutions to manage the effects of climate change, or similar, for example:

(x) Nature-based solutions

(i) the extent to which the design protects, enhances, restores or creates nature-based solutions to manage the effects of climate change.

Chapter 14

Add a **new policy**
Require new development to demonstrate that there is adequate water supply available, including consideration of how climate change may affect existing water supplies.

Add a **new policy**

Incorporate nature-based solutions, where practicable, when providing for new infrastructure and in new developments, such as the use of green infrastructure.

Amend **Policy 14L 1.1** or add a new policy to promote energy efficient in urban development

Ensure urban design layout maximises to greatest extent practicable the potential for solar and other renewable energy generation.

add to **Matters of Discretion 14L 2.2**

Include, as a matter of control or discretion for subdivision and comprehensive housing developments, how the development provides for solar orientation of buildings to achieve passive solar gain. For example:

(x) Solar orientation

(i) the extent to which the design provides for solar orientation of buildings to achieve passive solar gain.

Section 32AA Assessment of proposed GW drafting

Proposed Plan Change 56	GW relief sought
Proposed provisions that manage the effects of development intensification to contribute to a well-functioning urban environment	Amendments requested to better provide for a well-functioning urban environment as described in NPS-UD Policy 1 clauses (e) and (f) [Resulting in a higher level of stormwater management, increased natural areas in urban areas, improved aquatic habitat and climate resilience]
Benefits Environmental: Benefits for greenhouse gas emissions if housing intensification is appropriately linked to public transport. Economic: Moderate to high economic benefits associated with more development and intensification in Hutt City, bringing new residents and businesses. Social: Moderate social benefits associated with the greater provision of housing to meet population growth needs. Cultural: Low cultural value	**Benefits** Environmental: Moderate-High. Nature-based solutions lead to increased protection/restoration/and expansion of natural and modified ecosystems in urban environments, with benefits for climate change mitigation and/or adaptation, as well as benefits for indigenous biodiversity, ecosystem resilience and ecosystem services. Higher standards required for stormwater management will better protect the health of freshwater ecosystems. Economic: Moderate-high economic benefits from protecting/improving aquatic ecosystems and providing resilience to people and nature from current and future effects of climate change. For example, appropriate stormwater management will reduce the risk of flooding and associated costs. Social: Moderate-High. Nature-based solutions by definition provide benefits for both people and nature. Integration of nature into built environments has significant benefits for human well-being. The integration of nature-based solutions in development will increase the resilience of communities (for example, an increase in canopy trees will provide relief from extreme heat) and the natural environment to the effects of climate change. Cultural: High cultural benefits associated with the protection and enhancement of environmental quality in urban environments, including

	improving the health of aquatic ecosystems and increasing indigenous biodiversity.
Costs Environmental: Moderate to high. Despite mitigations, new development will continue to have adverse effects on aquatic ecosystems, result in a loss of urban green space and indigenous biodiversity (for more detail refer to the evidence of Mr Farrant, e.g. para 29). Economic: Moderate to high. Continuation of existing development practices, combined with high intensity development, without requiring appropriate mitigation measures to address impacts wider than peak flows, will worsen current ecological, human health and cultural outcomes and result in considerable direct and indirect costs to rectify and or remedy in the future. For example, the lack of appropriate stormwater controls results in substantial ongoing financial costs borne by councils to protect assets such as roading and utilities. Social: Moderate to high social costs associated with reduced environmental quality and limited resilience to the current and future effects of climate change. Cultural: Moderate to igh cultural costs associated with ongoing loss of indigenous and taonga species and degradation of the mauri of waterways.	**Costs** Environmental: No obvious environmental costs. Economic: Small increase in cost to developers. For example, the evidence of Mr Farrant is that the solutions required to manage stormwater appropriately are affordable and cost-effective. Social: No obvious social costs Cultural: No obvious cultural costs.

BEFORE THE INDEPENDENT HEARING PANEL APPOINTED TO HEAR AND MAKE DECISIONS ON SUBMISSIONS AND FURTHER SUBMISSIONS ON THE PROPOSED DISTRICT PLAN CHANGE 56

IN THE MATTER	of the Resource Management Act 1991 (the Act)
	AND
IN THE MATTER	of Hearing of Submissions and Further Submissions on Proposed Plan Change 56 to the Operative District Plan under Schedule 1 of the Act

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STATEMENT OF EVIDENCE OF STUART FARRANT

ON BEHALF OF WELLINGTON REGIONAL COUNCIL

29 March 2023

Contents

Qualifications and experience

1 My full name is Stuart James Edgar Farrant. I am a Principal Ecological Engineer and Water Sensitive Design practice lead at Morphum Environmental Ltd; and hold a Bachelor of Engineering (Natural Resources) from University of Canterbury

2 I have over 16 years' experience working in multiple aspects of freshwater management and ecological engineering. I have worked for Morphum Environmental for 9 years establishing the southern sector office (Wellington) in 2014. Prior to that, I worked for 5 years as an Ecological Engineer in Melbourne, Australia.

3 I have experience working in a range of aspects relating to three waters management including design, technical review and auditing of constructed wetlands, vegetated stormwater treatment/conveyance systems, stream restoration and catchment planning. Specifically, I have extensive experience with the design and delivery of integrated stormwater management devices to mitigate adverse water quality effects from urban development at a range of scales.

4 I have contributed to and authored technical design guidelines for Councils/Utilities in New Zealand and Australia (including the Wellington Water 'Water Sensitive Design technical guidelines').

5 I was awarded a 2018 Winston Churchill Fellowship to travel internationally for the purposes of researching leading practice with urban water management in Europe, Scandinavia and USA.

6 I was appointed co-chair of the Te Awarua o Porirua Whaitua committee and the Te Whanganui a Tara Whaitua technical expert group and am familiar with the local context in terms of development typologies, biophysical conditions and ongoing national policy directions.

7 In 2020 I was appointed to the Wellington City Mayoral taskforce charged with investigating the current state of play with the provision of three waters services across the city and informing recommendations for changes to improve long term outcomes for the community and environment.

8 I am a member of Engineering New Zealand and Co-Chair of The Sustainability Society which is a technical interest group of Engineering New Zealand.

Code of conduct

9 While this is not an Environment Court hearing I have met the standards in that Court for giving expert evidence.

10 I have read the Code of Conduct for expert witnesses issued as part of the Environment Court Practice Note 2014 (Part 7). I agree to comply with the Code of Conduct. I am satisfied that the matters addressed in this statement of evidence are within my expertise. I am not aware of any material facts that have either been omitted or might alter or detract from the opinions expressed in this statement of evidence.

Scope of Evidence

11 The purpose of my evidence is to provide context and background on the importance and drivers for adopting policy which will ensure future development integrates Nature Based Solutions (NbS's) to support and deliver a wide range of social and environmental benefits. This includes discussion on the definition of NbS and how this translates into practical measures that should be incorporated into planning tools to ensure improved outcomes in the future. Examples of existing NbS's are provided for context.

Context and Drivers for Nature Based Solutions

12 Climate projections are generally agreed that future climate across the Wellington Region will include increased frequency and intensity of large rainfall events interspersed with prolonged dry periods. Temperatures are projected to increase across the Wellington Region (particularly in summer/autumn) with increased maximum temperatures and increased "Hot" days (Tmax >25). Rising sea levels will affect the coastline and the ability of freshwater (natural streams and stormwater networks) to 'drain' to the sea during peak rainfall and increasing the risk of coastal erosion during storm events.

13 These predicted changes will impact on natural systems and urban areas where the form of development can amplify impacts. Poorly planned and designed urban development will result in outcomes which impact on human health, mana whenua values, resilience of infrastructure and ecological health. Recent events across New Zealand have clearly highlighted many of the risks that urban and rural areas face with regards to extreme rainfall events and the impact on human health, economy and the environment.

14 Unless managed appropriately, modification for urban development (housing and commercial) causes an increased discharge of contaminants (in particular heavy metals,

hydrocarbons, sediments and nutrients), increased runoff volumes during frequent small and moderate rainfall, increased runoff flowrates during less frequent large rainfall, increased air temperatures (urban heat island), increased water temperatures discharging to waterways, reduced indigenous biodiversity and a disconnect with historical ecosystems.

15 Changes in already modified land, such as conversion of rural land to urban (greenfield development) and intensification of existing urban areas (brownfield development or infill), cause a change, and generally a worsening, of existing impacts through increased impervious surfaces, further reduction in vegetation cover/biodiversity, increased vehicle usage and modification to waterways, including piping, bank lining and installation of outfall structures.

16 Any continuation of existing development practices, whereby development yields are maximised through widespread landform modification, combined with high intensity development, without requiring appropriate mitigation measures that address impacts wider than peak flows, will worsen current ecological, human health and cultural outcomes and result in considerable direct and indirect costs to rectify and or remedy in the future.

Risks of continuing Business as Usual

Stormwater drivers

17 Current development practices are typically driven by a desire to optimise housing yields within a given footprint. Housing typologies have in recent years evolved from almost entirely free-standing dwellings to increasing multi-unit developments to increase yield further. Due to the regions variable topography and desire to provide drive-on level access and slab on grade (a structural engineering practice using a concrete slab to provide the building foundation), developments often require extensive earthworks to modify and retain land. Current development practice therefore results in extensive areas of impervious landcover (roofs, roads and hardstand), highly compacted and modified soils, minimal vegetation and disconnect from historical or remaining watercourses.

18 Whilst the intent of regional and district plan provisions is to manage development activity across the region to avoid flood risks, through defining habitable floor levels and requiring detention of peak flows (hydraulic neutrality), these are typically stipulated based on a climate change adjusted 1% Annual Exceedance Interval (AEP) and generally do not consider wider, but linked, cumulative and compounding impacts on urban resilience from the current and future climate. In particular this does not consider the impacts of runoff from smaller more frequent rainfall events which are increasing in intensity and frequency due to climate change.

19 Hydraulic neutrality (as defined by Wellington Water Ltd) is solely focussed on controlling peak flowrates to limit risks of downstream flooding. This is achieved through holding back stormwater in detention tanks or basins and releasing it at a throttled flowrate to match the pre development peak flowrate. Therefore, in the developed case, the risk of flooding should in theory be no greater than the current risk. This does not provide substantive benefit to steam health.

20 In many instances measures to achieve hydraulic neutrality will worsen freshwater outcomes, by extending the duration of stormwater discharges in more frequent rainfall events, resulting in extended adverse conditions for freshwater species in addition to the instability caused by the increased frequency of stormwater runoff as compared to natural stream catchments.

21 Requirements for 'hydraulic neutrality' promote detention of peak rainfall events only and do not achieve the hydrologic controls which are required to support aspirations to protect and enhance Te Awa Kairangi, Te Whanganui a Tara, Wainuiomata River and align with the principles of Te Mana o Te Wai.

22 Hydrologic controls are measures which aim to match the predevelopment flowrates across the full spectrum of rainfall events. This requires measures to match the pre development amount or volume of runoff from a site which represents the natural 'loss' of water from evaporation and transpiration. This is typically termed retention. In reality the widespread application of hydraulic neutrality without hydrological controls will result in ongoing and significant ecological degradation within freshwater streams.

23 It is noted that requirements to include 'rainwater tanks' on private lots **(as in Rule 4F 4.2.10)** does not currently provide for any hydrologic controls as these are not connected to meaningful reuse and are configured as detention tanks to support peak flow control only. Without the inclusion of appropriate pump and internal plumbing the tanks are better suited to be referred to as detention tanks and should not have any inferred environmental benefit.

24 It is also noted that rules to control the amount of permeable surfaces **(as in Rules 4F 4.2.5 and 4.2.7)** will provide marginal benefit in terms of hydrological controls but will not address the fact that the remaining ~70% of the site will remain impermeable and cause significant increased stormwater volumes in frequent small to moderate rainfall.

25 It is noted that the requirement to provide detention storage is compatible with also providing hydrologic controls (retention) through increasing the tank (to provide dual function) and including pump etc. This is considered to be a cost effective means of

protecting downstream environments with costs in the order of $10K - $15K at the time of building.

26 There has also been a historical reliance on infiltration across large parts of the Hutt Valley whereby stormwater is discharged to the ground (via designed infiltration basins/galleries) rather than conveyed in pipes to surface water bodies. This has enabled untreated stormwater to potentially mix with shallow aquifers. Where stormwater contains dissolved contaminants (particularly from roads, carparks and unpainted roofs) this unmanaged infiltration increases the risk of ongoing decline in groundwater quality.

27 Ongoing adverse impacts on waterways due to an absence of appropriate stormwater controls (volume reduction) results in substantial ongoing financial costs for design, consenting and construction of instream retaining structures to protect assets such as roading, utilities and private/public property. These costs are borne by councils without any ability to seek redress from private developers who have directly contributed to the downstream impacts through uncontrolled stormwater discharges. Costs of lost indigenous and taonga species and degradation of the mauri of waterways is not able to be monetised.

28 Provision of greenspace and urban ecology is generally governed by planning requirements and supporting guidance with limited requirements for effective canopy cover, indigenous biodiversity or the integration of water with the public realm.

29 A continuation of existing development practice will accelerate the decline in environmental and social outcomes across the region. In particular, a continuation of Business as Usual will result in the following;

29.1 Ongoing loss of indigenous biodiversity in fresh and coastal waters

29.2 Ongoing loss of terrestrial biodiversity through reducing habitat and fragmented connections or ecological corridors

29.3 Reduced quality of water in waterways and harbour adversely impacting on recreation and mahinga kai values

29.4 Reduced resilience to future climate change including both large shocks (floods/droughts) and changing seasonal patterns

29.5 Reduced resilience to natural disasters such as earthquakes and landslips which will impact water supply and drainage

29.6 Increasing urban temperatures with increased adverse health impacts

29.7 Continuing disconnect between communities and the natural environment

Terrestrial Drivers

30 Urban development often results in the clearance of indigenous vegetation (including regenerating scrub) and continued loss of urban vegetation through intensification. This results in large areas of urban development with low vegetation coverage and high proportions of impervious cover (roads, roofs and hardstand) and highly modified ground (such as grassed lawns and heavily compacted engineered fill). These impacts are worsened on sloping sites where the prevalence of 'slab on grade' building results in extensive earthworks (cut and fill) and limited protection for existing vegetation or provision of planted trees. Lack of greenspace and mature vegetation in urban areas results in;

30.1 Increased ambient temperatures through urban heat island effects whereby unshaded surfaces heat up and contribute to an increased air temperature in urban areas as compared to undeveloped areas. Heat stress on humans (particularly the elderly and young) is increasingly recognised as a contributing factor in poor health and fatalities.

30.2 Loss of biodiversity, and in particular urban ecology, which would otherwise connect communities with the natural environment and support indigenous species to move across and through urban areas to connect remnant areas of reserve land.

30.3 Loss of shading resulting in increased energy demands to cool buildings (commercial and residential) and vehicles.

30.4 Reduction in interception of rainfall during small rain events resulting in increased stormwater volumes and flowrates.

30.5 Loss of amenity and urban greenery contributing to decline in human mental health.

Description and Definition of Nature Based Solutions

31 Nature Based Solutions (NbS's) are those which intentionally use natural ecological systems or mimic natural processes to support changes in landuse whilst ensuring the resilience of ecosystems, communities and cultural values. In 2022, the 5th session of the United Nations Environment Assembly (UNEA-5) formally adopted a definition of NbS as; "actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and

environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services and resilience and biodiversity benefits."

32 NbS's are therefore defined by the ability to respond to more than one driver in a human influenced landscape and utilise natural systems in a manner which provides resilience across a range of spatial and temporal scales for both chronic and acute stressors.

33 Territorial and Unitary Councils across New Zealand have required management of site generated stormwater in line with the intent of NbS's for many years. Hamilton City Council are currently in the process of implementing an amendment to their District Plan (PC12) which includes mandated requirements for all new development (including medium and high density) to achieve hydrologic controls through a combination of both rainwater reuse and infiltration. These rules are supported by practice notes which provide detail on the size of required devices in relation to roof area and lot imperviousness. These dee,ed to comply solutions are intended to support small scale development (such as single dwelling to three) with larger developments being required to provide more comprehensive water impact assessments or comply with Integrated Catchment Management Plans.

34 Rules which are limited to only 'minimum pervious percentage' are intended to achieve comparable outcomes but do not mitigate for the stormwater generated by the remaining impervious cover (roofs and hardstand).

35 Examples of NbS's include;

35.1 Retreat and/or restricted development on coastal margins and floodplains (including allowance for sea level rise) with restoration/reinstatement of coastal and riverine ecosystems such as dune systems, saltmarshes and coastal forest to buffer storm surges, accommodate lowland flooding, reduce risk to infrastructure, sequester carbon and support indigenous biodiversity.

35.2 Integration of water sensitive design elements including raingardens, green roofs, tree pits and vegetated swales with urban development to treat stormwater, retain initial rainfall depths, connect communities with nature, increase urban ecology and provide passive cooling/insulation.

35.3 Construction of urban wetlands to treat stormwater, provide flood detention, connect communities with nature and increase urban ecology.

35.4 Increased planting of urban trees (in particular indigenous street trees) to mitigate urban heat impacts, reduce runoff in small rainfall events, support urban ecology and improve urban amenity/greening.

35.5 Capture of rainwater (at lot or community scale) for non potable uses to retain small rainfall depths (replicate natural flow patterns), avoid contaminant discharge, reduce demand on mains supply, connect communities with water and provide resilience to shock events (such as earthquakes).

35.6 Protection and/or reinstatement of natural urban stream channels to safely pass extreme flood flows whilst supporting urban ecology and biodiversity.

35.7 Protection of shallow aquifers and groundwater through managing the volumes to match natural groundwater recharge rates and ensuring all infiltrated water is appropriately treated.

35.8 Identifying and protecting modified overland flows paths to replicate natural ephemeral hydrology and pass peak flows with managed risk to life and property.

35.9 Management of earthworks volumes and extent through developing with the landform and utilising building typologies which are better suited to the terrain such as timber piles as opposed to slab on grade.

35.10 Municipal collection and composting of organic and biodegradable waste to enable land application to retain organic nutrients, reduce greenhouse gas emissions and improve local soils.

36 Alternatives to NbS's can in some instances provide a similar level of service for some of the drivers but will not typically provide co-benefits and in many instances can result in related negative outcomes such as;

36.1 High embodied carbon in heavily engineered concrete structures

36.2 Increased lifecycle costs from mechanised or bespoke water treatment systems

36.3 Financial impacts on private/public land through engineered solutions causing worsening of conditions such as coastal erosion on adjacent land

36.4 Financial and social impacts from large climatic events such as floods and drought

37 NbS's are therefore recognised as offering cost effective and resilient solutions to a wide range of often complex landuse related problems whilst simultaneously supporting other non financial benefits to communities and indigenous ecosystems.

Examples of Nature Based Solutions

38 **Te Kukuwai o Toa - Urban constructed wetland**

38.1 Following expensive and damaging flooding of Porirua CBD in 2015, investigations initially looked at how to improve flood resilience but were expanded to include water quality in response to the ongoing environmental degradation of Te Awarua o Porirua. Following a city wide options assessment and prioritisation it was recognised that the Elsdon Park site could support multiple benefits through a nature based approach to manage water across all rainfall events. The now completed wetland has transformed a formally underutilised sports field into a thriving and diverse constructed wetland with approximately 45,000 locally indigenous plants (over 30 species) including a mix of aquatic and terrestrial plants which would have once been present in natural wetlands around the harbour. The 1 ha wetland treats urban stormwater from the 40 ha commercial and residential catchment during small to moderate rainfall events and during larger less frequent storms provides detention of stormwater to provide protection up to the 1% AEP event. This is achieved within an urban open space that invites the community in with boardwalks, viewing areas and signage (yet to be completed) to provide education on the cultural, ecological and historical context of the site. Te Kukuwai o Toa demonstrates an NbS which responds to existing landuse and is adaptive to future climate change in a fully accessible public reserve.

39 **Queen Elizabeth Park - Restored natural peat wetland**

39.1 Peat wetlands are recognised for their ability to sequester atmospheric carbon within deep saturated organic layers at and below the surface. They also support a diverse and unique biodiversity including indigenous plants and animals. They are typically located at the lower end of catchments and are often associated with areas subject to flooding with the ability to naturally detain flood waters which are slowly released to the ground and to smaller outlet streams. Draining of peat wetlands for uses including primary production and urban development lower the shallow groundwater table resulting in release of carbon in the form of methane. Drainage also results in a loss in biodiversity with replacement by exotic pasture and opportunistic weed species. Drained natural wetlands will typically remain subject to flooding and are increasingly susceptible as the intensity and frequency of large rainfall events increases. Queen Elizabeth Park (Kapiti) represents a large peat wetland which was previously partially drained initially

for agriculture with roading and urban development on the margins, the majority of the remnant wetland areas is within Regional Park. GWRC are currently undertaking works to manipulate excavated drains to return a more natural wetland hydrology to support improved carbon sequestration, increased indigenous biodiversity and accommodate periodic flood flows. The restoration of the wetland demonstrates a NbS at a landscape scale which can support long term adaptation and mitigation at a regional scale.

40 **Floodable landscapes- Copenhagen Denmark**

40.1 Large urban flooding in 2011 across Copenhagen caused billions of dollars in damage and insurance claims. Described as a 'Cloudbust' the event was categorised as a 1 in 1000 year event (0.1% AEP) which exceeded previous design standards and overwhelmed any pre existing flood management strategies which similarly to Aotearoa were designed to a 1% AEP LoS. These floods, and recognition that climate change was increasing the likelihood of events of similar magnitude, prompted a council led change in focus to shift towards accommodating flood flows within the urban environment as opposed to continued attempts to 'drain' peak flood flows. Through collaboration with water utilities, transport planners, parks planners, private developers/property owners and the insurance industry a city wide strategy has been endorsed and financed to create future urban landscapes which can safely accommodate flood waters. Through initiatives such as the lowering of strategically selected roadways, creation of multi use public spaces (such as sunken urban basketball courts) and integration of high amenity landscape design with flood detention capacity the City of Copenhagen is progressively implementing NbS's at a range of scales which mimic the natural flood attenuation within low lying lands which protecting people and property.

41 **Porirua Park n Ride Raingardens - Water Sensitive Urban Design**

41.1 Carparks are a source of contaminants and contribute to increased stormwater volumes and flowrates due to expansive impermeable surfaces. In 2017 GWRC undertook an expansion and redevelopment of the Porirua Railway park n ride to increase parking capacity in line with increasing patronage of public transport. As part of these works options were developed to mitigate the impact of the carparks on freshwater and the harbour and to increase resilience to future climate change. This resulted in the inclusion of two large agglomerated raingardens which capture and treat stormwater prior to discharge to the

reticulated stormwater network. These are vegetated with locally sourced indigenous vegetation and provide treatment for approximately 85% of the annual rainfall which falls on the carparks. It is noted that whilst this provides a good example of a NbS in a large scale council led project the outcomes could have readily been further improved through the planting of canopy shade trees to reduce thermal impacts on surface and vehicles and the use of permeable pavement where appropriate.

42 **Urban street trees– Melbourne Australia**

42.1 As a city subject to intense summer heat waves, the urban centre of Melbourne recognise the ability of street trees to mitigate existing and future heat days and the intercept initial rainfall to reduce stormwater in small events which would naturally be assimilated without surface runoff. Further co-benefits such as carbon sequestration, urban biodiversity, amenity and air quality are recognised and considered in provision of street trees as part of public and private re-development. In 2012 a city wide urban forest strategy was developed which considered the full range of benefits from increased canopy cover and supported investment in a long term planting strategy. This council led NbS considered benefits at a range of scales and recognised the need to take definitive action now to support long term adaptation to increasingly frequent heat events. Given climate projections across Wellington and the timeframe for locally indigenous canopy species to form effective canopies the opportunity to require well considered urban trees in new development and redevelopment is very well timed.

43 **Residential Rainwater Reuse – Kapiti**

43.1 Capture of rainwater/stormwater at a lot or subcatchment scale supports a wide range of benefits including water quality, retention and resilience. It is an especially cost effective means of mitigating the impacts of urban development and providing adaptation to future climate conditions. In 2009 KCDC adopted the requirement for all new dwellings to include lot scale rainwater capture (10,000L) to be plumbed into internal non potable demands such as toilet flushing and laundry. Whilst initially motivated by aspirations to reduce the demand on increasingly stressed municipal water supply the implementation has diverted substantial volumes of stormwater from the districts urban and natural waterways which support indigenous biodiversity, amenity and flood resilience. This use of developer funded rainwater capture and reuse in turn reduces the

requirements for further stormwater treatment devices within the public realm (roads/reserves) therefore reducing the long term OPEX burden to Council. Rainwater reuse provides a readily scalable example of NbS which can be tailored to mimic the natural undeveloped hydrology through retention whilst supporting co-benefits to reduce impacts from municipal potable water takes, connecting communities with the water 'story' and providing resilience to potable water shortages and/or outages.

44 **Urban residential intensification – Hobsonville Point Auckland**

44.1 Development of the former RNZAF land at Hobsonville Point was planned as a high yield development with performance metrics to ensure that this did not compromise social and environmental outcomes. Initially commence prior to amalgamation, the development was subsequently supported by provisions in the Auckland Council Unitary Plan with clear requirements to manage stormwater, built form and public realm in line with national and international best practices. Largely completed the development has provided an exemplar for doing density well. Of note the development was largely unimpacted by recent intense rainfall (which exceeded 1% AEP) with flood water accommodated within landscape and limited property damage despite the intensity of rainfall in the immediate area. Extensive tree planting, restoration of coastal margins and integrated water sensitive design will continue to support ongoing improved environmental and social outcomes in coming years.

Effective Implementation of Nature Based Solutions

45 The specification or technical requirements to inform the selection and/or design of NbS's need to respond to the specific functional requirement related to the proposed or existing landuse activity. These functional requirements may be triggered by change in landuse or development at a range of scales which in many instances will not trigger regional consents or oversight.

46 Technical requirements/standards related to NbS's could include metrics such as;

46.1 Percentage of effective pervious land on lots whereby effective pervious includes the combination of undeveloped and vegetated land, areas of roof either in green roof or with rainwater reuse tanks and areas of paving/hardstand which connects to an appropriately designed stormwater treatment device.

46.2 Rainfall depth or water quality volume to be captured and treated for stormwater contaminants to protect urban streams, shallow groundwater and waterbodies

46.3 Rainfall depth to be intercepted and retained (through reuse or infiltration) to match natural hydrology in freshwater and tidal streams

46.4 Targets for mature tree canopy coverage for road corridors and car parks

46.5 Proportion of public greenspace dedicated to functional indigenous ecosystems (this could include vegetated buffers and/or vegetated treatment devices)

46.6 Width of riparian margins to be planted in indigenous species (this could include proportion of vegetated treatment devices co-located in riparian corridors).

46.7 Net Carbon emissions to be offset taking into consideration sequestration achieved through vegetated systems and project related re-vegetation.

46.8 Annual Exceedance Probability (AEP) event to be managed to prevent downstream flooding impacts

46.9 Quantum of sea level rise and coastal inundation to be factored into landuse planning

46.10 Proportion of impermeable landcover or public open space within urban areas

47 These metrics need to be understood by land owners (including public ownership), developers and investors at the outset to inform efficient and effective outcomes and ensure that development planning can proceed without undue time or cost.

48 NbS's can result in activities or 'green infrastructure' which remains in either private or public ownership. Where NbS's remain in private ownership there is a need to have some form of mechanism to ensure that the solutions remain in the intended condition and provide the functional outcomes over a realistic timeframe. These performance outcomes must therefore be clearly understood by current and future landowners and be able to be audited or monitored to ensure that the intended function is sustained. Hamilton City Council are currently developing a targeted program for periodic auditing, reporting and rectification notifications for private lot scale water sensitive design devices including Rainwater reuse tanks and lot scale infiltration.

49 Where NbS's are vested into public ownership (or developed by territorial authorities) the councils must have an understanding and adequate resources to maintain NbS's to ensure

that the solutions remain in the intended condition and provide the functional outcomes over a realistic timeframe.

50 It is therefore considered critical that territorial authorities are equipped to support the implementation of NbS's given the importance of these measures to support the growth and development of urban and rural land within their jurisdiction including where solutions are vested to councils and where they remain in private ownership but are maintained to provide a public good.

51 The inclusion of clear policy, rules and means of compliance relating to NbS's in the regions District Plans is therefore an important consideration in supporting long term sustainable development and growth.

Conclusions

52 Legislative and non legislative drivers for improved urban and rural outcomes is best supported by Territorial Authorities providing clear rules and policies through District Planning and associated codes of practice that can be assessed through consenting. This will be increasingly important with urban infill development which does not necessarily trigger Regional Council consents.

53 There remains apparent confusion around the difference between detention and retention with current proposed rules using the terms interchangeably. It is important to recognise the fundamental difference between these terms with detention to support capacity and flood issues and retention to support environmental outcomes and Te Mana o Te Wai.

54 District Plans need to have clear requirements around outcomes and performance to be achieved in future landuse activities/developments within their jurisdiction and specific metrics where NbS's are the optimal means of supporting a suite of environmental, cultural and social outcomes which are resilient to climate and affordable over a realistic timeframe.

55 Existing Policy and Rules within the HCC proposed District Plan need to be amended if future development is to avoid ongoing loss of freshwater values, biodiversity and cultural values/aspirations.

56 It is critical that improved urban stormwater outcomes and proposed NbS's are independent of scale and apply to any change in landuse where impacts occur. This is especially important for future urban intensification and infill development which does not typically trigger resource consent but will result in cumulative impacts that will worsen the current poor outcomes and reduce the ability of communities and ecosystems to withstand current

and future climatic conditions. Future intensification/infill needs to be recognised by territorial authorities as an opportunity to seek improvements on the current status quo.

57 Clarity around what the term resilient means is important to ensure that councils and landowners understand the intention to support environmental and social outcomes in the short and long term.