IN THE MATTER: of the Resource Management Act 1991(RMA)

AND

IN THE MATTER: of Proposed Plan Change 93 (Te Puna Springs) to the Western Bay of Plenty District Plan under Schedule 1 of the RMA.

STATEMENT OF EVIDENCE OF KEITH HAMILL – ECOLOGY

1 July 2022

EXECUTIVE SUMMARY

1. A stream network with moderate to high value runs through the proposed plan change area. The site is also home to a raupo wetland with '**high'** value reflecting its natural characteristics and rarity in the landscape.

2. The National Policy Statement for Freshwater Management directs the avoidance of loss of stream extent and values. The RMA requires protection of wetlands and areas of significant indigenous biodiversity as a matter of national importance.

3. PC93 as proposed will result in up to 105m of stream and tributary loss and the loss of the raupo wetland. It will also result in the near permanent loss of potential future stream restoration opportunities in light of the encroachment of the commercial zones on what should be retained for adequate buffers from the stream tributaries.

4. In my opinion the ecological effects of PC93 have not been adequately appreciated or addressed by the Structure Plan as proposed.

5. I consider that substantial amendments would need to be made to the Structure Plan to ensure that the ecological effects of the proposal can be adequately addressed and to be consistent with the directions in the NPS-FM and RMA. These would need to be supported by provisions.

I do not support PC93, from an ecological perspective, as it is currently proposed.

INTRODUCTION

Qualifications and experience

6. My full name is Keith David Hamill. I am an Environmental Scientist and Director at River Lake Limited. River Lake Limited is a consultancy that provides research, and environmental science and policy advice for understanding and managing rivers, lakes and estuaries. My technical speciality is in water quality and aquatic ecology

7. I hold a Bachelor of Science degree (Geography) from the University of Auckland (1992) and a Master of Science (1st Class Hons) in Ecology and Resource & Environmental Planning from the University of Waikato (1995).

8. I have 26 years' experience in the area of resource management and environmental science. I have previously worked as a Principal Environmental Scientist at Opus International Consultants Limited, in the United Kingdom as a Senior Environmental Scientist for a consultancy called WRc, and as an Environmental Scientist at Southland Regional Council.

9. My previous experience relevant to this assessment includes:

    a. Member of Rotorua Lakes Technical Advisor Group (TAG) for Bay of Plenty Regional Council (2017-present).

    b. Assessing water quality effects of the Te Ah Turanga Manawatū Tararua Highway project to replace the Manawatū Gorge section of road (2019-2021)

    c. Providing water quality and lake design advice for the Te Awa Lakes Structure Plan, Hamilton (2019).

    d. Assessing freshwater ecological and water quality effects of the Mt Messenger SH3 Road Alignment (2018).

    e. Kaituna River re-diversion and wetland creation project. Led ecological and water quality monitoring of the river and estuary to assess effects before, during and after project implementation (2014 – present).

    f. Member of expert science panel for developing attributes relevant to lakes for the National Objectives Framework as part of the National Policy Statement for Freshwater (NPS-FM).

10. I have been engaged by the Bay of Plenty Regional Council (BOPRC) to provide expert ecological advice on Proposed Plan Change 93. I have been involved in technical feedback to inform submission, undertook a filed visit of

the site on 3 June 2022 and participated in a teleconference meeting to with the Applicant to discuss technical issues on 22 June 2022.

Code of Conduct

11. I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and to the extent that I am giving expert evidence, have complied with it in preparing this evidence. 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 the opinions expressed in my evidence.

Scope of Evidence

12. My evidence will outline the existing environment from an ecological perspective, and the potential effects of PC93 on ecology. To the extent relevant I have also included additional responses to the Planner's Report and evidence. I have also made some recommendations as to how the effects could be addressed.

13. My evidence should be considered together with the evidence of **Mr Nathan Te Pairi**, **Ms Kathy Thiel-Lardon** and **Ms Sue Ira**.

ECOLOGICAL VALUES OF THE SITE

14. The ecological values of the Te Puna Structure Plan site have been broadly described in the Wildland Report (Wildlands 2022) and in evidence provided by Fiona Wilcox. I have also assessed stream values during a site visit. Important ecological features of the site are described below.

15. A stream network runs through the site which appears spring fed via a culvert at the head of the Southern Reach (**Figure 1**). The upper section of the Southern Reach have reasonable riparian habitat conditions, shade and overhanding vegetation to support aquatic life (**Photo 1** and **Photo 2**). The lower section of the Southern reach has a narrow, low quality riparian buffer, and sediment runoff is apparent from nearby tracking. This section flows into a pond adjacent to an area of raupo wetland, and leaves the pond via culverts to form the 'Northern Reach' that flows along the western boundary of the property through privet forest (**Photo 3**). The Northern Reach and the upper section of the Southern Reach are in moderately good condition with a diverse range of instream habitat and riparian vegetation providing a high level of stream shading. Of particular note is that the riparian margin of the upper

section of the Northern Reach still retains good functional values, but this riparian margin will be reduced by the proposed Commercial Zone.

16. The Southern Tributary has a narrow riparian margin but with dense grasses and rushes providing reasonable cover (**Photo 4**). Although the stream is small, it has pools that provide potential fish habitat. The vegetation along the Southwestern Tributary has recently been cleared and it has a narrow, low quality vegetation margin. A track has been cut along the true left bank at about the 17m contour line (2-3m above stream level) (**Photo 5**).

17. Wildlands (2022) detected three native fish associated with the stream and pond/wetland system, these were shortfin eel, longfin eel and banded kōkopu. Longfin eel are classified as 'At Risk – Declining' (Dunn et al. 2018), and their presence also lifts the value of the stream from '**moderate'** (northern reach and upper section of the Southern Reach) to **'high'**, based on criteria used in the Environment Institute of Australia and New Zealand Ecological Impact Assessment guidelines (EcIA 2018).

18. The raupo wetland was identified in the Wildland (2022) report as having '**high'** value, reflecting its natural characteristics and rarity in the landscape. I support this assessment, and more so as it is likely to provide longfin eel habitat. The wetland appears naturally formed as a result of ponding behind the dam. Historical aerial photographs do not show an obvious wetland at this location, but this is not definitive and a wetland could have been supported by seepage from the adjacent hill.

19. If the dam was constructed to form the pond (which is plausible) then the associated wetland would be considered to be "constructed by artificial means" and would therefore be excluded from the definition of "natural wetland" for the purpose of the National Environmental Standards Fresh Water (**NES-FW**), or the National Policy Statement for Freshwater (**NES-FM**) (NES-FN 2020 page 23; MfE 2021 section 5.1).

20. However, the Resource Management Act (**RMA**) has a broader definition of wetlands than the NES-FW or the NPS-FM (MfE 2021 section 2.1), and for the purposes of the RMA, the raupo wetland is a wetland with natural characteristics and high ecological values. It provides a range of natural functions including biodiversity, hydrological, geochemical and aesthetic.

21. Section 6 of the RMA addresses 'matters of national importance' and includes: "*6(a) The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development*". From an ecological perspective, the raupo wetland has natural

character that would, in my view, warrant consideration under Section 6a so as to ensure sustainable management. This should ideally involve avoidance of the wetland (consistent with the mitigation hierarchy approach), and at the least, no-net-loss of the raupo wetland's values and extent.

Figure 1: Te Puna Springs Estate location of stream network, the raupo wetland and the proposed commercial development layout with 1m contours.

Photo 1: Upper section of Southern Reach of Te Puna Springs site (June 2022) showing good riparian cover.

Photo 2: The Southern Reach facing upstream towards the confluence with the Southern Tributary (branching right) of Te Puna Springs site (June 2022).

Photo 3: Northern Reach of Te Puna Springs site (June 2022).

Photo 4: Southwestern Tributary of Te Puna Springs site facing downstream towards the pond and raupo wetland (June 2022).

Photo 5: Southern Tributary of Te Puna Springs site facing upstream and south (June 2022).

Effects of the proposal

22. The proposed commercial development potentially impacts aquatic ecosystems directly through habitat loss or modification, and indirectly through discharges of stormwater effecting the stream water quality and hydraulic regime. **Ms Sue Ira** has provided evidence discussing how urbanisation of a catchment can cause a range of water quality, hydrological and ecological effects on streams and adversely affect the ecological values of urban streams. These cumulative effects are well documented and commonly referred to as 'the urban stream syndrome' (Storey et al. 2013, Walsh et al. 2005). The effects can be minimised by implementing good practice water sensitive design.

23. In order to avoid adverse effects on downstream water quality, hydrology and ecology the proposed development requires systems and devices for the treatment, detention and retention of stormwater. The structure plan currently proposes to manage the water quality and hydrological effects of stormwater from the site by creating a large detention pond, and two treatment wetlands which would also incorporate extended detention (**Figure 2**). With respect to this proposal, **Ms Sue Ira** has provided evidence discussing treatment, and **Ms Kathy Thiel-Lardon** has provided evidence relating to flooding.

24. The potential adverse effects of the proposed structure plan development on aquatic ecological values have not, in my view, been adequately appreciated in the application or the Planning Officers Report. The currently proposed footprint for the commercial zone and pond would result in:

    a. The loss of the raupo wetland because the new pond is intended to be permanently wet and deep;

    b. The loss of at least 65m if stream extent in the Southern Reach as shown under the wet pond extent in **Figure 2**, but more likely a loss of 105m of stream and tributary under the pond, based on likely extent of the current pond when following the contours upstream;

    c. The diversion of a small section of stream in the Southern Reach where it overlaps with the proposed commercial zone footprint;

    d. The near permanent loss of potential future stream restoration opportunities where the commercial zone footprint encroaches on acceptable riparian buffer zones. The commercial zone footprint is only two metres from much of the Sothern Tributary, and only five metres from much

of the Southern Reach – extending over steep topography and onto the gully floor.

25. The Wildlands (2022) report identifies option for mitigation, restoration and enhancement of the site. These include:

    a. Retain a riparian buffer along the streams, consisting of a 10-metre riparian buffer /setback from the Northern Reach, and a 5-metre riparian buffer from the Southern Reach and tributaries.

    b. Plant the buffer zones with appropriate plants species.

    c. Prepare and implement a Riparian Enhancement Plan to manage pest plants, increase indigenous plant diversity and cover, and where appropriate, enhance instream habitat.

    d. Ensure fish passage through the culverts;

    e. Prepare a fish management plan to ensure fish rescue where required;

    f. Plant the margins of the stormwater pond with appropriate wetland and terrestrial species to help with stormwater treatment and amenity purposes;

    g. If the raupo wetland is lost, then give consideration to revegetating the wet detention pond with similar species.

    h. Consider animal pest control.

26. Wildlands (2022) concludes that "*the proposal will retain and enhance the freshwater values within watercourses on the property and will increase biodiversity values of the site*." A similar sentiment was expressed in the evidence of **Fiona Wilcox**.

27. There is considerable potential to enhance the ecological values of the site, but, in my view, there is a high risk that net ecological enhancement may not actually occur. Furthermore, the structure plan, in its current form, will cement in place riparian buffer widths that are not best practice and that limits future restoration potential. This is because:

    a. The effects will likely be more than is reflected in the application. In particular there will be a loss of stream extent due to the wet pond. It would be practical to take a design approach to avoid this effect by using a detention basin. In not doing this the application appears to be inconsistent with requirements of the NPS-FM (2020) to avoid loss of stream extent and values, inconsistent with requirement to follow a mitigation hierarchy, and to have not adequately considered alternatives or the 'best practicable

option' for avoiding or minimising adverse effects on the environment. However, even if the wet pond is avoided, there may not be sufficient space on the non-commercial zone area to fit the required extended stormwater treatment and detention devices without other changes to the structure plan conditions. This is discussed further in evidence by **Ms Kathy Thiel-Lardon, Sue Ira** and **Mr Nathan Te Pairi**.

b. The proposed structure plan would result in the raupo wetland being lost under the wet pond. To achieve no-net-loss of wetland values, the raupo wetland would need to be replaced by a similar quality wetland of the same or greater size (an offset ratio of 1:1 to 1:2 is likely to be reasonable for this type of wetland); which would require greater than 650 m^2 of new wetland creation. It is very uncertain whether this amount of land would be available at a suitable water depth around the pond edge and buffer zones because much of the pond perimeter coincides with steep gradients (**Figure 2**). Furthermore, the structure plan conditions have no requirement to either avoid the raupo wetland (consistent with the NPS-FM direction and the best practicable option within a mitigation hierarchy), or to offset any lost raupo wetland with a minimum equivalent area and quality. Thus, while there may be some wetland planting to offset loss, there is, in my opinion, a high likelihood that there will be a **net loss** of wetland extent and biodiversity values and habitat for At-Risk fish.

c. A riparian buffer zone width of 10m, as recommended in the Wildland report (2022) for the Northern Reach, is reasonable when measured in the horizontal (discussed below). However, a riparian buffer zone width of 5m recommended for the Southern Reach is too narrow. In the upper section of the Southern Reach, a 5m buffer would allow infill to nearly the base of the gully system and result in a loss of vegetated riparian habitat and functional values. In the Southern Tributary a 5m buffer would extend only part way up a steep slope. In my view, all commercial areas should have a minimum 10 metre buffer from the streams.

d. Not allowing sufficient buffer zone widths would place a near permanent constraint on the potential restoration opportunities for the affected streams.

28. I have expressed buffer zone widths as the horizontal width (as viewed from an aerial photo). The on-ground width will be longer where slopes are steeper; this is appropriate because wider buffers are required on steeper slopes to manage water quality effects. Working with horizontal widths is also much clearer for expressing plans, and avoids scenarios where near vertical retaining wall might be considered part of the riparian buffer width.

29. A number of the stream related ecological issues might be addressed by ensuring a minimum of 10m buffer zone around all streams, and replacing the wet pond with a detention basin that allows the stream to run through the base most of the time. However, it may not address the hydraulic issues raised by **Ms Kathy Thiel-Lardon.**

30. Lastly, the proposal does not give consideration to the overall increase in runoff from the site due to increased impermeable surface. This has been discussed by **Sue Ira**, I also note that the current stream has sufficiently steep gradient to be susceptible to erosion through increases in flow volume.

Figure 1: Te Puna Springs Estate location of stream network, the raupo wetland, proposed commercial development layout, ponds and treatment wetlands.

RESPONSE TO PLANNERS REPORT

31. I note that the Planners Report Topic 11 Freshwater and Ecology: "*The Wildlands assessment concluded that the existing stream corridors have low-very low ecological significance but have potential for ecological enhancement. The assessment has confirmed there are also no naturally occurring wetlands*." This assessment is incorrect. The stream has 'moderate' ecological values and potentially 'high' due to it providing habitat for longfin eel. Also, the description of the raupo wetland is inaccurate; it may not meet the definition of a 'natural' wetland for the purpose of the NPS-FM, but is a wetland with natural character for the purpose of the RMA. I note that **Fiona Wilcox** has also corrected the reporting planner on this point (paragraph 28).

SPECIFIC RECOMMENDATIONS

32. If the Te Puna Structure Plan is approved then I recommend the following modifications are made and conditions added:

    a. The area zoned commercial is set back a minimum of 10 metres from all streams, including the Northern Reach, Southern Reach, Southwestern Tributary and the Southern Tributary.

    b. Require ecological enhancement and stream restoration in a minimum 10m margin either side of all streams.

    c. Avoid loss of extent and values of streams and wetland on the site.

    d. Seek to avoid damage to the existing raupo wetland, and require no-net-loss of the existing raupo wetland extent and values.

    e. Restoration to be undertaken in accordance with a stream and wetland restoration plan

RESPONSE TO EVIDENCE

33. While the addition of provisions relating to riparian margins is generally supported, as noted above, I consider the buffers proposed in the Wildlands Ecological report to be undersized. Ms Wilcox has not referred to the NPS-FM and NES-F, and their directions to avoid loss of extent or values, or the RMA directions around protection of wetlands.

34. I do not agree that it is sufficient to address these fundamental issues by requiring, in future, that the stormwater design occur in consultation with a suitably qualified and experienced ecologist.

CONCLUSION

35. The Te Puna structure plan site contains a stream and a small wetland system with moderate to high ecological values. There is opportunity to protect and enhance the ecological values of the site, and the application has expressed an intention that this would occur. However, the there is a high risk that the opposite will occur, and there will be a net loss of ecological values from the site, because of inadequate consent conditions.

36. In my opinion the ecological effects of PC93 have not been adequately appreciated or addressed and cannot be within the Structure Plan as proposed.

37. I consider that substantial amendments would need to be made to the Structure Plan to ensure that the ecological effects of the proposal can be adequately addressed and to be consistent with the directions in the NPS-FM and RMA. These would need to be supported by provisions.

38. I do not support PC93, from an ecological perspective, as it is currently proposed.

REFERENCES

Dunn, N.R.; Allibone, R.M.; Closs, G.P.; Crow, S.K.; David, B.O.; Goodman, J.M.; Griffiths, M.; Jack, D.C.; Ling, N.; Waters, J.M.; Rolfe, J.R. 2018. *Conservation status of New Zealand freshwater fishes, 2017*. New Zealand Threat Classification Series 24. Department of Conservation, Wellington. 11 p.

Environmental Institute of Australia and New Zealand Inc. (EIANZ) 2018. *Environmental Impact Assessment (EcIA): EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems, 2nd Edition*. EIANZ, Melbourne, Australia, May 2018.

Ministry for the Environment (MfE). 2021. *Defining 'natural wetlands' and 'natural inland wetlands'*. Wellington: Ministry for the Environment.

Storey R, Brierley G, Clapcott J, Collier K, Kilroy C, Franklin P, Moorhouse C and Wells R 2013. *Ecological responses to urban stormwater hydrology*. Prepared by NIWA for Auckland Council. Auckland Council technical report TR2013/033.

Walsh CJ, Roy AH, Feminella JW, Cottongham PD, Groffman PM, Morgan II RP 2005. The urban stream syndrome: current knowledge and the search for a cure. *Journal of the North American Benthological Society, 24*(3): 706-723.

Wildlands 2022. *Ecological assessment of waterways within Te Puna Springs Estate, 23 Te Puna Road, Tauranga.* Prepared for Te Puna Springs Estate Ltd by L Funnell, F Wilcox and W Shaw of Willand Consultants, Contract Report No. 6278.