Comments on a Substantive Application under section 53 of the Fast-track Approvals Act 2024: Stormwater Management

Fast-track project name	**Mt Welcome, Pukerua Bay, Porirua**
Fast-track application number	FTAA-2603-1181
GW file number	FTA260348

Technical area	**Stormwater Management (Stormwater Treatment and Hydrological Control)**
Date	3 July 2026
Author	Andrés Roa Concha Wood & Partners Consultants Ltd
Statement of expertise	My qualifications are BE (Civil), CPEng, CMEngNZ, IntPE, and have circa 30 years of experience in New Zealand and internationally. I joined Woods in 2024 following the acquisition of my firm, AR & Associates Ltd. My expertise spans 3 Waters, stormwater management, water sensitive design, and civil engineering, covering full project cycles from feasibility through to construction. I have advised numerous regional and territorial authorities and have served as expert witness in major consenting and plan change processes. I have contributed to projects of national significance and am an active contributor to the development of industry technical guidance documents and professional development programmes in the Water Sensitive Design field.
Code of conduct	I confirm that I have read and agree to comply with the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023. This technical memorandum has been prepared in accordance with that Code. Unless I state otherwise, the opinions I express are within my area of expertise, and I have not omitted to consider material facts that might alter or detract from the opinions that I express.
Documents considered	As listed in Section 1 below.

Comments

Introduction

1. This memo provides technical review comments in relation to the Fast Track Substantive Application for Mt Welcome, Pukerua Bay, Porirua, by Pukerua Property Group Limited Partnership (FTA134), received on 08 April 2026.

2. The focus of the technical review is stormwater management, specifically stormwater quality treatment and hydrological control measures, and excludes primary flow conveyance, flood control or peak flow attenuation.

3. The following documents were reviewed:

   (a) Mount Welcome – Substantive application and AEE, and appendices that specifically relate to stormwater quality and hydrological control, including:

      (i) Appendix 9 – Infrastructure Report

      (ii) Appendix 11 – Part A - Stormwater Management Plan

      (iii) Appendix 18 – Hydrology Assessment

      (iv) Appendix 19 – Water Quality Assessment

      (v) Appendix 20 – Water Quality Assessment for Roundabout

      (vi) Appendix 30 – Design Drawings

Proposal Overview

4. The Mt Welcome development site encompasses a total area of 205.60 hectares located in a rural area south of Pukerua Bay and north of Plimmerton, within the Porirua City boundaries in the Wellington region. It is bounded by State Highway 59 to the west and three adjoining land blocks to the north, east, and south.

5. The development seeks to deliver infrastructure to enable the establishment of 949 new homes and a 1.3-hectare commercial centre. The project will carry out earthworks to achieve the suitable buildable landforms, across moderately steep and undulating terrain, achieving a cut-fill balance and generally avoiding filling of natural gullies and ecologically sensitive areas.

6. Stormwater management focuses on protecting sensitive downstream environments, including Taupō Swamp and Te Awarua-o-Porirua Harbour, through a combination of underground piped networks, lined raingardens, and attenuation wetlands and basins to manage post development discharge and water quality.

7. Stormwater treatment and attenuation is proposed through centralised devices, in the form of communal raingardens adjacent to the road reserves for water quality treatment, and wetland devices to provide a peak flow attenuation function for the 10- and 100-year ARI storm events, in accordance with Tiaki Wai requirements.

8. The proposed raingardens will receive runoff from both pervious and impervious surfaces across roads and lots. All raingardens will be lined with an impermeable HDPE membrane, to prevent infiltration into the subsoil layers due to geotechnical reasons.

Stormwater Management Comments

General

9. The application does not include an options assessment demonstrating that Water Sensitive Design (WSD) principles have been fully considered. An options assessment is required that as a minimum, addresses the following:

    (a) Treatment train alternatives - comparison of alternative treatment configurations beyond sole reliance on centralised raingardens, including source control measures;

    (b) Rainwater harvesting - consideration of rainwater harvesting as a means of achieving sustainable water use and volume mitigation objectives;

    (c) Raingarden locations - consideration of alternative raingarden locations that could support infiltration where geotechnical conditions permit; and

    (d) Catchment-scale trade-offs - consideration of broader catchment-scale design trade-offs.

    (e) Consideration of opportunities for integration of stormwater functions with non-water project drivers (for example, multi modal transport, public recreational use / open space, amenity, cultural and social initiatives etc).

10. The options assessment must document the alternatives considered and clearly justify the design choices made.

11. Revised stormwater plans showing contours with labels and the labelling on the proposed raingarden devices should be provided, to facilitate the review of the stormwater system. Catchment plans with contours should also be provided for each device.

12. The proposed raingardens and wetlands are located in areas that are space-constrained and in some cases steep, leaving little room for safe maintenance access. The stormwater device design must allow for adequate room for safe maintenance access and operations, including a 3m vehicle access and associate turning areas, stockpiling and loading zones and other requirements.

13. There are parts of the stormwater network that do not discharge to a raingarden, a peak flow attenuation wetland, or both, hence preventing discharges from these networks from being

subject to water quality treatment or peak flow attenuation. Some examples are illustrated below, where networks highlighted in red do not drain to a raingarden or wetland, and those highlighted in blue drain to raingardens but not to wetlands. The design should ensure that both stormwater quality and quantity functions are addressed for all networks involved.

14. The design intends for all flows to discharge to the proposed peak flow attenuation wetlands, which if may result in re-suspension of sediments and associated contaminants, if flow velocities are not appropriately managed particularly during large storm events. It is uncertain how discharges into the various devices will be managed to manage flow velocities and prevent erosion and scour.

15. Sediment forebays / extraction zones should be provided to all stormwater management devices to facilitate maintenance and reduce risk of contaminant release and/or disturbance to plant life during maintenance and cleaning activities. These have not been provided for in the proposed design.

16. An Operation & Maintenance (O&M) Plan has not been provided as part of the application. A draft O&M Plan should be submitted for review, including details of the proposed inspection and maintenance regime frequencies, preventative and periodic maintenance tasks, and ownership and maintenance responsibilities. Maintenance of the stormwater system should be managed by the development for 5 years following construction to allow establishment of these systems prior to any proposed handover of maintenance activities to Tiaki Wai.

Stormwater Treatment

17. The Stormwater Management Plan (SMP) assumes imperviousness levels of 75% for lots and 85% for roads for raingarden design purposes.

18. However, the contributing areas used for raingarden sizing are inconsistent with this assumption. Rather than applying 75% imperviousness, the design adopts fixed contributing areas of 200 m^2 (roof) and 36 m^2 (driveway) per lot - totalling 236 m^2 per lot.

19. For the majority of lots, which range from approximately 500 m^2 to 600 m^2 in area, a 75% imperviousness assumption would yield contributing impervious areas of 375 m^2 to 450 m^2 respectively - significantly greater than the 236 m^2 applied. The raingarden design should therefore be re-visited to account for the assumed lot imperviousness.

20. In accordance with the Wellington Stormwater WSUD Treatment Device Design Guide (Wellington Water, 2019), bioretention devices must have a surface area of approximately 2% of their contributing impervious catchment. A detailed review of all 30 proposed raingardens was undertaken using the drawings and the raingarden table in Appendix 2 of the SMP. The findings of this review are summarised below:

    (a) The review found that nearly all raingardens fall well below the 2% threshold, even when assessed against the lower 236 m^2 per-lot assumption (refer **Table 1**). Non-compliance becomes more pronounced when the 375 m^2 to 450 m^2 impervious areas required under the 75% assumption are applied.

    (b) Additionally, a number of discrepancies were identified, for example with regard to the contributing catchment areas and raingarden labelling used in the "Raingarden Catchment" table in Appendix 2 of the SMP not aligning with the design plans.

21. **Table 1** below shows a full list of the findings for each of the raingardens, with raingarden label discrepancies shown in red font.

Table 1. Raingarden catchment analysis

Raingarden ID		SMP discrepancies when compared with design plans	% area, based on 236m² imp area/ lot
SMP	Drawings		
1	1	Joal A should be added to contributing catchment	1.3%
2	2	OK	1.4%
6	3	Contributing lots assessed as 52, should be 53. Raingarden label discrepancy should be corrected.	2.5%
4	4	OK	1.3%
5	5	Contributing lots assessed as 58, should be 54.	1.3%
7	6	Joal K should be included in contributing catchment. Contributing lots assessed as 25, should be 29. Raingarden label discrepancy should be corrected.	1.1%
8	7	OK	1.3%
9	8	Contributing lots assessed as 17, should be 19.	1.1%
10	9	OK	1.3%
11	10	Raingarden label discrepancy should be corrected.	1.1%
12	11	Raingarden label discrepancy should be corrected.	1.1%
13	12	Contributing lots assessed as 95, should be 94. Raingarden label discrepancy should be corrected.	1.2%
14	13	Raingarden label discrepancy should be corrected.	1.2%
30	14	Raingarden label discrepancy should be corrected.	1.2%
15	15	Raingarden size has changed. Shown as 240m² on the SMP, but plans suggest the size of this raingarden is smaller – this should be checked.	1.0%
16	16	OK	1.2%
17	17	Contributing Road (Road-32). Previously stated in SMP as Road-02.	1.2%
18	18	OK	1.3%
19	19	Contributing lots assessed as 5, should be 7.	1.0%
20	20	OK	1.3%
21	21	OK	1.2%
22	22	OK	1.2%
23	23	OK	1.2%

Raingarden ID		SMP discrepancies when compared with design plans	% area, based on 236m² imp area/ lot
SMP	Drawings		
24	**24**	OK	1.2%
25	**25**	OK	1.2%
26	**26**	OK	1.0%
27	**27**	OK	0.6%
28	**28**	OK	0.9%
29	**29**	OK	1.2%
3	**30**	There is an area along Road 10 that does not appear to drain to any raingarden on the plans; i.e., RG-03 in the SMP, which is called up as a 175m2 raingarden drains Road 10, Joal C and Joal D, could not be identified on any of the plans (we believe it should be located in vicinity of lots 235 and 236). Additionally, the contributing lots assessed for this raingarden should presumably be 44, not 48 as noted on the SMP. Raingarden label discrepancy should also be corrected.	Unknown

22. The stormwater plans do not appear to show a raingarden or alternative treatment device for the 1.3-hectare commercial centre. This information should be provided.

23. Drawing No. 4900 ("Typical Drainage Details – Raingarden Details – Sheet 1 of 5") shows a 450mm deep storage layer below the drainage layer and subsoil pipe, which is contained by an impermeable HDPE liner. Unless the storage layer is intended for stormwater retention through infiltration to ground, clarification is required as to what the purpose of this storage layer is.

Hydrological Control

24. Hydrological controls, which mitigate development-related changes in small but frequent rainfall events that result in stream instability (channelised erosion) and impacts on stream health through reduced infiltration and baseflows, are not specifically proposed. These controls include retention (via infiltration and/or rainwater reuse), and/or extended detention measures, designed in accordance with GWRC's Hydrological Control Guidance Note (Sept 2025).

25. In the context of stream discharge-related effects, the hydrology assessment (Appendix 18) instead focuses on 'hydraulic neutrality' achieved through "retention" wetlands which control peak flow rates from large, infrequent rainfall events to address flood risks and protect downstream infrastructure.

26. Sections 6.7 and 6.8 of the Stormwater Management Plan state that the proposed wetlands will provide retention, extended detention, and peak flow attenuation. However:

(a) Wetlands are not suited to provide a hydrological control retention function (i.e., where an internal water storage is used beneath the drainage layer to promote infiltration to ground and maintain stream baseflows). Retention is better suited to raingardens or infiltration devices.

(b) The SMP does not demonstrate how extended detention will be achieved for hydrological control - no drawings or details are provided showing wetland orifice or live storage configurations for extended detention (as opposed to peak flow attenuation), nor a clear demarcation between the extended detention and peak flow attenuation functions. The SMP appears to combine these two functions, which serve distinct purposes.

27. The Hydrology Assessment (Section 6.3) states that the proposed raingardens will be lined, meaning they will not provide retention or infiltration to protect stream baseflows. Section 8.1.4 also confirms that no rainwater reuse is proposed for roof areas, meaning that no water conservation measures for stormwater volume mitigation are proposed. Together, this indicates that volume mitigation is not currently incorporated into the design.

28. The hydrology assessment notes that most streams in the development site are perennial, with ephemeral sections in the lower catchments where seepages contribute to baseflow recharge. Wetlands in the valley floors also rely on groundwater recharge.

29. The report also notes that receiving streams show evidence of bank slumping and increased sedimentation, and Table 5 of that report estimates a significant rise in daily discharge volumes in the Taupo and Kakaho West streams and tributaries, as a result of the proposed development. Although the Kakaho East and Muri Road catchments were not assessed, they are likely to experience similar impacts. Without mitigation, additional impervious surfaces could further exacerbate existing channelised steam erosion in these systems.

30. The report states that post-development conditions will result in fewer periods of both no flow and high-intensity flow, concluding that “there should not be a negative effect on downstream hydrology.” However, it is unclear how the reduction in no-flow periods will be achieved, as the design excludes groundwater recharge through infiltration (e.g., the proposed lined raingardens) and provides no alternative means to sustain baseflows.

31. Furthermore, as already mentioned, the report omits any reference to hydrological controls aligned with the objectives of PC1, which could address these concerns. The stormwater management design should therefore incorporate hydrological controls for all new impervious areas, consistent with GWRC’s Hydrological Control Guidance Note (Sept 2025).

These should include retention and/or extended detention measures to mitigate stormwater volume and reduce channelised erosion risks.

32. Given the above findings, it is recommended that the design be revisited to incorporate the following hydrological controls for all contributing impervious catchments, including roads, lots and the proposed 1.3-hectare commercial centre, designed in accordance with GWRC's Hydrological Control Guidance Note (Sept 2025):

(a) Stormwater volume mitigation using rainwater tanks in the lots for non-potable water reuse;

(b) Channelised stream erosion protection through the provision of dedicated extended detention within the proposed wetlands.

Summary

33. The design should be revisited and clarification provided to address the following:

General

(a) Provide an options assessment demonstrating that WSD principles have been fully considered, including treatment train alternatives, rainwater harvesting, alternative raingarden locations, catchment-scale trade-offs, and opportunities for integration with non-water project drivers.

(b) Provide revised stormwater plans with labelled contours and catchment plans for each device.

(c) Demonstrate that all stormwater devices allow for safe maintenance access, including 3m vehicle access, turning areas, and stockpiling/loading zones.

(d) Demonstrate that all stormwater networks in the development drain to proposed raingardens and wetland devices, to achieve both stormwater quality and quantity functions across all networks involved.

(e) Clarify how flow velocities into the attenuation wetlands will be managed to prevent sediment re-suspension, erosion, and scour during large storm events.

(f) Confirm that sediment forebays or extraction zones are provided to all stormwater management devices.

(g) Provide a draft Operation & Maintenance (O&M) Plan, including inspection and maintenance regimes, frequencies, preventative and periodic maintenance tasks,

and ownership responsibilities. Maintenance should be managed by the development for 5 years post-construction prior to council handover.

Stormwater Treatment

(h) Raingarden sizing is inconsistent with the SMP's 75% lot imperviousness assumption - fixed contributing areas of 236 m^2 per lot were used, versus 375-450 m^2 required under the stated assumption.

(i) Nearly all 30 raingardens fall below the Wellington Water 2% surface area threshold, even under the lower 236 m^2 assumption; non-compliance worsens under the correct 75% assumption.

(j) Multiple discrepancies were identified between the SMP raingarden catchment table and the design drawings (contributing lot counts, raingarden labels, and catchment areas).

(k) No stormwater treatment device is shown for the 1.3 ha commercial centre.

(l) Clarify the purpose of the 450mm storage layer shown below the drainage layer in Drawing No. 4900, and whether it is intended to provide infiltration/retention.

Hydrological Control

(m) No hydrological controls (retention or extended detention) have been specifically proposed to address stream instability and baseflow impacts from increased impervious areas.

(n) The design relies on lined raingardens and retention wetlands - neither of which provides infiltration or groundwater recharge to sustain stream baseflows.

(o) No rainwater reuse is proposed, meaning stormwater volume mitigation is absent from the design.

(p) The SMP combines extended detention and peak flow attenuation, which serve distinct purposes, without demonstrating how each will be achieved.

(q) Existing streams show signs of erosion and increased sedimentation; post-development discharge volumes are projected to increase significantly, thereby exacerbating these impacts, with no mitigation proposed.

(r) It is recommended the design be revised to provide hydrological control mitigation for all impervious areas in the development, by incorporating rainwater tanks for

non-potable reuse and dedicated extended detention within the proposed wetlands, consistent with GWRC's Hydrological Control Guidance Note (Sept 2025).