Appendix B3: Technical Memorandum for Potable Water – Alternative to the Brynderwyn Hills

TECHNICAL MEMORANDUM

To:	Stacey Sharp & Blair Masefield, Beca (consultant planners)
From:	Andrew Venmore, Water Services Manager, Whangarei District Council
Subject:	Potable Water Technical Memorandum - Alternative to the Brynderwyn Hills (FTAA-2603-1178)
Date:	12 August 2026

Executive Summary

1. This memo provides Whangārei District Council's final specialist potable water input on the Alternative to the Brynderwyn Hills (FTAA-2603-1178) (the Project) as lodged under the Fast-track Approvals Act 2024.
2. This memo focuses on potential effects on the Ahuroa Water Treatment Plant (WTP), the Ahuroa River source water catchment, and the associated public drinking water supply network serving Waipū, Ruakākā and Marsden Cove. It also considers the Ahuroa trunk water main, which traverses parts of the Project area. As Regionally Significant Infrastructure, the WTP is to be protected and maintained.
3. The key effects identified relate to potential changes in source water quality arising from increased sediment loads, contaminant discharges and hydrological changes associated with construction and operation of the Project. Flooding and associated catchment processes are identified as the most significant issue due to the Ahuroa water source and catchment, being already subject to sedimentation issues, flooding pressures and degraded ecological condition, and the potential implications for treatment plant operations, maintenance requirements and ongoing catchment management initiatives.
4. Potential effects on the Ahuroa trunk water main have also been considered, although these are generally capable of being managed through existing asset protection mechanisms and infrastructure approval processes.
5. Through the suspension period, NZTA adopted the majority of the requested condition amendments relating to erosion and sediment control, stormwater quality management, monitoring and engagement with Council Water Services. The remaining outstanding matter, in my view, relates to flood management and the extent to which the conditions are amended to recognise and protect the Ahuroa Water Treatment Plant and associated water supply infrastructure from project-related flooding effects.

Section 1: Author Credentials

1.1. Statement of Qualifications and Experience

6. My name is Andrew Venmore and I hold the role of Water Services Manager at the Whangārei District Council. I hold a Bachelor of Engineering from the University of Plymouth and a Masters degree in Engineering for Development (Water Supply and Sanitation) from the University of Southampton. I have over 30 years of experience in Water Supply engineering, including 23 years as the Water Services Manager at the Whangārei District Council. I am a Chartered Member of the Engineering New Zealand and an International Professional Engineer.

1.2. Code of Conduct

7. I confirm that I have read the Environment Court Practice Note 2023 – Code of Conduct for Expert Witnesses and agree to comply with it in the preparation of my assessments and participation in any subsequent expert or hearing processes. I confirm that the opinions expressed within are my respective areas of expertise and are my own, except where I have expressly relied on the work of others.

Section 2: Approvals and Application Material Reviewed

2.1 Approvals

8. From a potable water perspective, Council's interests relate to the following statutory approvals sought by the Applicant:

    a. The Notice of Requirement (designation) to construct, operate, maintain, and improve a state highway and associated infrastructure; and

    b. The regional resource consent applications, particularly relating to bulk earthworks, stream works, discharges to water and land (where it may enter water), and flooding.

2.2 Reference Documents

9. The following application documents have been reviewed and inform this technical memorandum:

    a. Substantive Application entitled: Substantive Application under the Fast-track Approvals Act 2024 – Volume A – Main Application, Alternative to the Brynderwyn Hills – Brynderwyn Hills section, prepared by NZTA Waka Kotahi, dated 2 April 2026, Revision A;

    b. Substantive Application entitled: Substantive Application under the Fast-track Approvals Act 2024 – Volume B – RMA Approvals, Alternative to the Brynderwyn Hills – Brynderwyn Hills Section, prepared by NZTA Waka Kotahi, dated 2 April 2026, Revision A;

    c. Assessment of Environmental Effects entitled: Construction Water Assessment, Alternative to the Brynderwyn Hills – Brynderwyn Hills Section, prepared by NZTA Waka Kotahi, dated 2 April 2026, Revision A; and

    d. Assessment of Environmental Effects entitled: Assessment of Effects on Groundwater, Alternative to the Brynderwyn Hills – Brynderwyn Hills Section, prepared by NZTA Waka Kotahi, dated 2 April 2026, Revision A.

Section 3: Existing Environment and Public Water Supply Infrastructure

3.1 Council's Interest in the Project

10. Council has a direct interest in the Project as an owner and operator of public water supply infrastructure. In particular, Council owns and operates the Ahuroa Water Treatment Plant (WTP), located on the western side of the Ahuroa river adjacent to the (northern extent of the) proposed designation – refer **Figure 1** below.

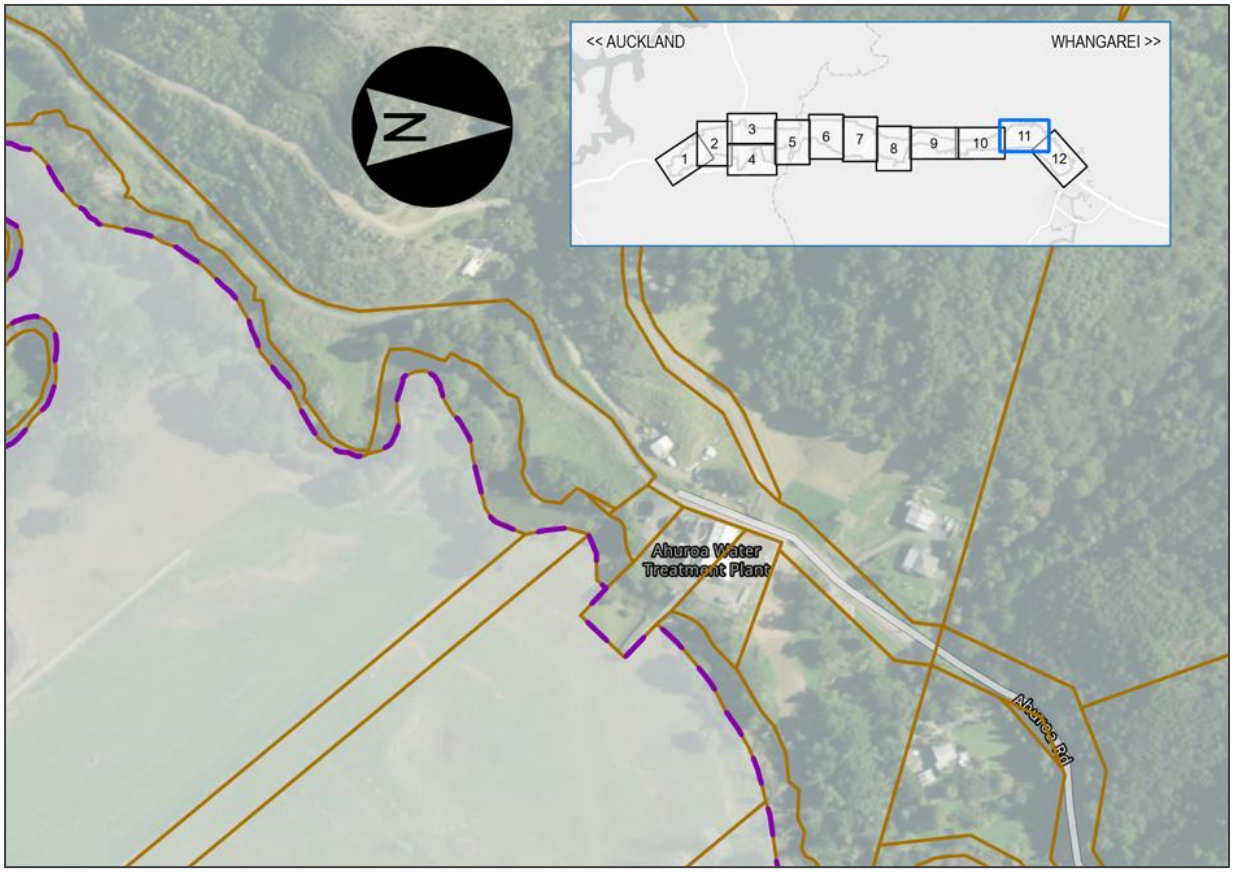
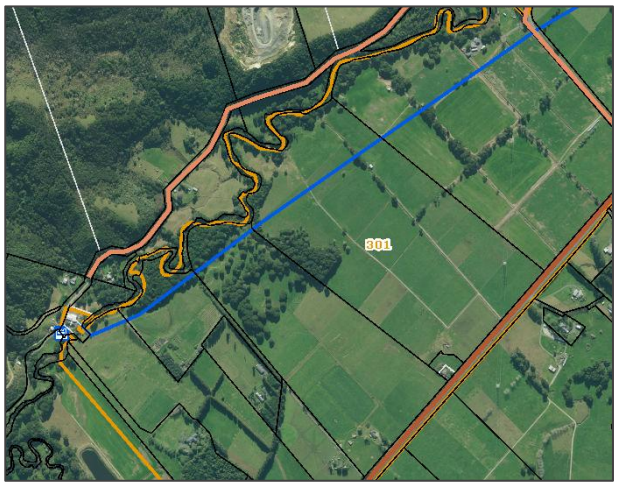


***Figure 1**: Location of the Ahuroa WTP and trunk line (Source: Designation drawing sheet 11 of 12)*

11. Council also owns and operates a trunk water main associated with the WTP which traverses the northern extent of the designation (shown in blue in the adjoining image). The trunk main was installed in the early 1980s and forms a key component of the water supply network. The pipeline is protected primarily through statutory easements relating to network utilities, Local Government Act 2002 via Bylaw provisions, and established approval processes for works undertaken in proximity to Council infrastructure.



12. The WTP and associated trunk line form part of a registered public drinking water supply[1] that

[1] Hinekōrako

provides drinking water to the Waipū, Ruakākā and Marsden Point communities. The infrastructure is identified in the Regional Policy Statement for Northland as Regionally Significant Infrastructure and as a Priority Drinking Water Abstraction Point in the Regional Plan.

13. The existing operation of the Ahuroa WTP is authorised and enabled through resource consent CON20030740501 (attached as **Appendix 1**) held by Council and administered by Northland Regional Council (**NRC**). Among these are requirements for Council to regularly maintain the water intake structures and weir and fish passage structures so to facilitate fish passage and the free flow of water.

14. To provide additional context council is also currently preparing an additional discharge consent associated with operation of the water supply network and is required to follow a Source Water Risk Management Plan (developed under the Water Services Act 2021 framework) for any improvement works. A further resource consent is being prepared for additional flood and erosion protections at the WTP site, as detailed further below.

15. As both a water supplier and consent holder, Council has an interest in ensuring the Project does not adversely affect source water quality, treatment plant operations, or Council's ability to comply with its statutory and consent obligations.

3.2 Ahuroa Water Treatment Plant and Water Supply Network

16. The Ahuroa WTP is a consented public drinking water supply and forms a critical component of Whangārei District Council's water supply network. The WTP supplies potable water to the Waipū, Ruakākā and Marsden Cove communities and is identified as Regionally Significant Infrastructure under the relevant planning framework.

17. The WTP and associated infrastructure are located immediately adjacent to the proposed designation in the north, near the Waipu tie-in. Associated infrastructure includes the water intake, weir, fish pass facilities, treated water storage infrastructure, trunk water supply mains, access infrastructure and other operational assets necessary for the collection, treatment and distribution of public drinking water.

3.3 Existing Catchment Conditions

18. The Ahuroa catchment is highly modified, dominated by pastoral farming and forestry land use, and is considered to be one of the more degraded catchments in Northland, with ecological recovery occurring gradually. Council is actively advocating to improve water quality and aquatic health within the catchment.

19. The Ahuroa River is already subject to a range of environmental pressures that influence the operation and management of the WTP. In particular, the catchment experiences periodic flooding, erosion of river margins and stream banks, and sediment accumulation around the intake structure and fish pass facilities. Accordingly, the WTP already operates within a dynamic environment where natural flood and sediment processes require active management by Council to maintain the security and reliability of the public water supply.

3.4 Flood-Sensitive Infrastructure and Protection Mechanisms

20. While individual components of the WTP have different levels of sensitivity to flooding and water quality effects, as detailed below, Council considers the entire treatment plant site and associated infrastructure to constitute critical public water supply infrastructure requiring protection from adverse effects arising from the Project.

21. Several components of the WTP are particularly sensitive to flooding and changes in flood behaviour. Assets of particular concern are shown in **Figure 2** below (attached in **Appendix 2)** and include:

    a. Water intake screens;

b. The weir and fish pass facilities;

c. Treated (underground) water storage infrastructure; and

d. Lower-lying operational tanks and associated infrastructure, including river protection and flood mitigation structures (rock armour walls and earth bunds).

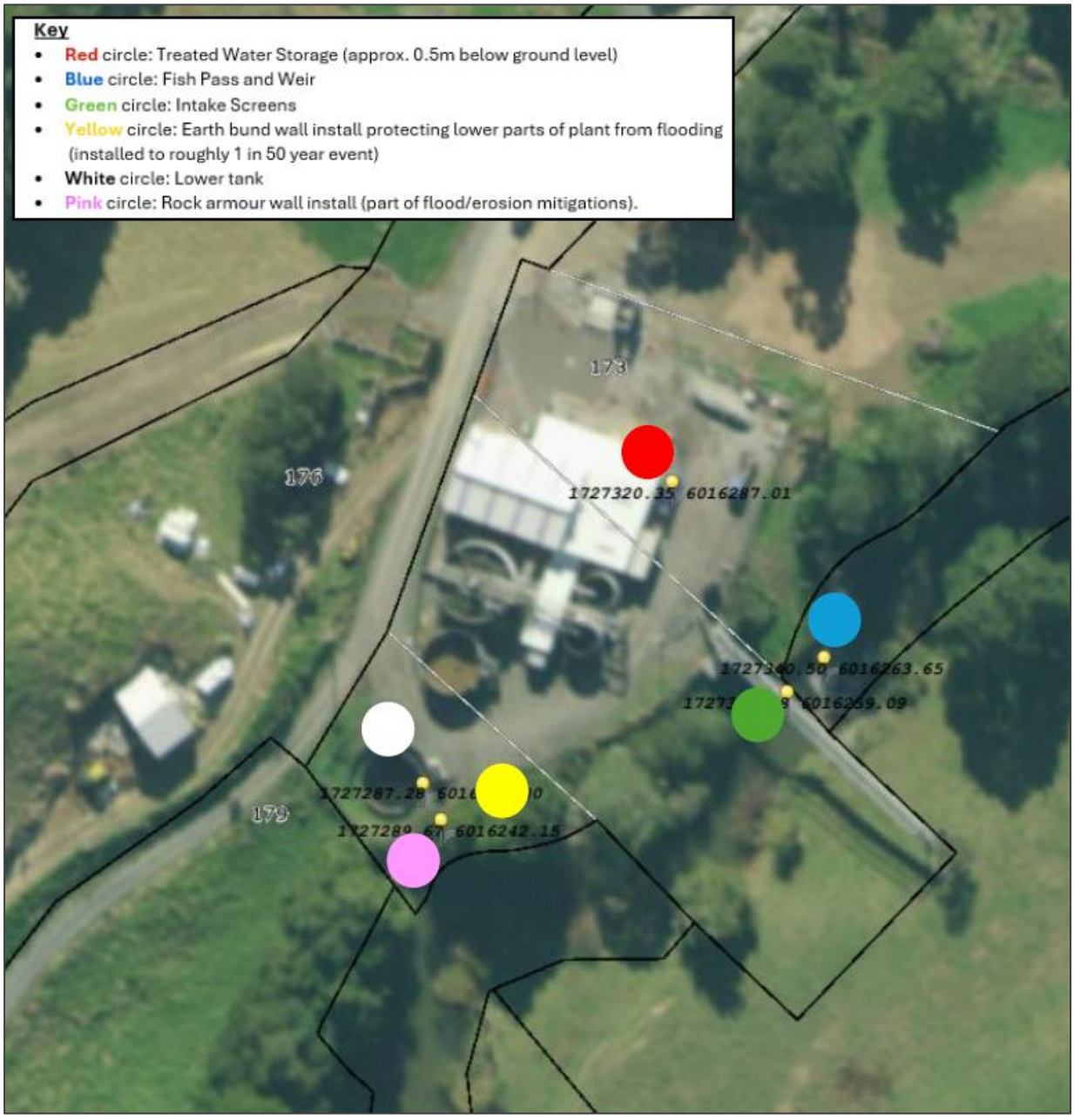


Figure 2: *Approximate location of notable water supply infrastructure at the Ahuroa WTP*

22. With respect to flood-vulnerabilities, of particular concern is the treated water storage infrastructure, portions of which are located at or below existing ground level. Unlike some above-ground infrastructure, these assets are more vulnerable to inundation resulting from elevated flood levels or changes in flood behaviour.

23. Anecdotally, Council has observed floodwaters during previous significant events approaching the level of the treatment plant buildings. While existing flood mitigation measures provide an additional level of protection, the WTP remains sensitive to increases in flood levels and changes in flood behaviour.

24. In the event that floodwaters enter critical treatment infrastructure or treated water storage assets, Council may be required to shut down portions of the treatment plant, empty and disinfect affected infrastructure, and undertake remedial works before the facility can be returned to service. Such events have the potential to affect the resilience and security of the public drinking water supply.

25. The WTP currently accommodates a number of sites features to manage flooding, erosion and sediment-related risks affecting the Plant. These measures are shown in the figure above (attached as **Appendix 2)** and include:

    a. An earth bund located at the southern end of the treatment plant site, which provides protection to lower-lying portions of the site that are susceptible to inundation during significant flood events;

    b. Rock armouring along vulnerable riverbank margins to reduce erosion and bank instability;

    c. Ongoing sediment management immediately downstream of the intake structure and fish passage facilities, including preventative dredging where required to manage sediment accumulation resulting from natural processes and flood events; and

    d. Routine operational management and monitoring of the WTP and associated infrastructure.

26. In addition, Council is currently progressing further erosion protection measures downstream of the weir, including the preparation of a new resource consent application to authorise the construction of an additional rock armour wall below the intake and weir, to further improve the resilience of the site.

27. While these measures provide an important level of protection, they do not eliminate flood risk. The continued operation of the WTP remains dependent on the effectiveness of these structures and ongoing management intervention by Council.

Section 3: Technical Assessment

3.5 Assessment of Effects

Construction and Operational Effects

28. During construction of the Project, the potential effects primarily relate to increased sedimentation, hydrocarbon contamination, vegetation clearance and associated changes to source water quality.

29. During operation of the Project, potential effects relate primarily to stormwater discharges, contaminant runoff, accidental spill events, increased sediment generation, and changes in catchment hydrology that may increase flood risk. These effects have the potential to affect treatment plant operations and increase treatment and maintenance requirements over time.

30. There is also a risk of the potential introduction of nutrient enrichment (algal issues) over time, requiring additional treatment in the future.

Flooding Effects

31. Flooding and associated catchment processes are the principal concern from a potable water perspective and represent the only remaining matter that has not been resolved through engagement between Council and NZTA. The Ahuroa catchment is already prone to flooding, erosion and sedimentation and is highly modified. Increased sediment transport and deposition during flood events has the potential to affect operation of the intake and weir structures, alter channel characteristics, increase sediment removal and maintenance requirements, and further degrade the health of the catchment. Any increase in flood levels or changes to flood behaviour may also have adverse effects on the WTP and the security of the public drinking water supply.

32. Existing measures are in place to manage flood hazards and improve the resilience of the WTP. As shown in above in **Figure 2** these include:

    a. An earth bund at the southern end of the treatment plant site, providing protection to lower-lying parts of the site, particularly the lower tank, which are susceptible to inundation during a 1-in-50-year flood event;

    b. Rock armouring along vulnerable riverbank margins; and

    c. Ongoing sediment management immediately downstream of the intake structure and fish passage facilities, including preventative dredging to manage sediment accumulation from natural processes and flood events.

33. Council is also progressing additional erosion protection works downstream of the weir, including preparation of a resource consent application for a further rock armour wall to improve the resilience of the site. That application has not yet been lodged with NRC.

34. Floodwaters during previous major events have approached the level of the treatment plant building itself. While the existing bund provides additional protection to lower-lying parts of the site, one of Council's primary concerns relates to the underground treated water storage tank (refer **Appendix 2**). This asset is particularly susceptible to floodwater ingress during major flood events. The overflow pipe and the tank lid are the most vulnerable points. Although a non-return valve is installed on the tank overflow, Council remains concerned that inundation under extreme flood conditions could require the plant to be shut down and the storage tanks emptied and disinfected before the facility can be returned to service.

35. Council's concern is that project-related increases in flood levels, changes in flood behaviour, or changes to wider catchment hydraulics could undermine the effectiveness of existing flood protection measures and further exacerbate flood-related risks to the treatment plant and security of the potable water supply. I understand that the Applicant proposed conditions to protect habitable buildings from flood water levels but, as currently worded, the conditions have an exclusion for flood water levels within waterbodies.

36. In this context, Council proposed a flood level threshold of 20mm at the Ahuroa WTP as a practical proxy for no measurable increase in flood levels attributable to the Project. The 20mm allowance reflects an accepted margin for hydraulic modelling uncertainty rather than a level of flood increase that Council considers acceptable.

Potential Implications if Effects Are Not Appropriately Managed

37. If source water quality is adversely affected, implications may include increased treatment requirements at the WTP, including increased chemical use, power consumption, and sludge handling and disposal costs. Increased sediment generation and deposition may also increase maintenance requirements associated with the water intake and weir structures. Sediment removal at the weir is already required on a routine basis, and any increase in sedimentation associated with the Project may require these activities to be undertaken more frequently.

38. In some circumstances, where source water quality conditions exceed treatment capacity, operational constraints or temporary plant shutdowns may occur. Significant or sustained deterioration in source water quality may also require Council to implement additional treatment barriers or upgrades to treatment processes, such as retrofitting carbon treatment systems.

39. If flood levels were increased and the WTP inundated, significant operational, financial and service delivery impacts could occur. These may include shutdown of the plant for an extended period, contaminated sludge entering the waterway, costs associated with reinstatement and cleaning, and the

need to empty and disinfect inundated treated-water storage facilities before the plant can be returned to service.

40. Collectively, these outcomes have the potential to increase Council's operational, maintenance and capital costs and may increase the risk of non-compliance with Council's consent obligations and regulatory obligations as a drinking water supplier.

41. Source water risks are managed through Council's Source Water Risk Management Plans required under the Water Services regulatory framework, and in alignment with CON20030740501. Additional sedimentation, contaminant loading or deterioration in source water quality may affect both operation of the WTP and the catchment improvement outcomes Council is seeking to achieve.

Section 4: Mitigation and Conditions

42. The Applicant proposes a framework of erosion and sediment controls, stormwater treatment measures, flood management measures, riparian planting and environmental monitoring. Based on my review, I generally support the proposed approach and consider it provides an appropriate basis to manage potential effects on the Ahuroa WTP and source water catchment.

43. Through the suspension period, Council engaged directly with NZTA regarding the proposed regional consent conditions as they relate to the Ahuroa WTP. As a result of that engagement, NZTA adopted the majority of Council's requested amendments relating to erosion and sediment control, stormwater quality management, water quality monitoring, incident notification, and engagement with Council's Water Services through design and construction. In my view, these amendments materially strengthen the protection afforded to the Ahuroa source water catchment and improve the framework for identifying, monitoring and responding to project-related effects on the public drinking water supply.

44. Notwithstanding this progress, flooding remains the principal outstanding matter. I recommend further amendments to the flood management conditions that specifically recognise the Ahuroa WTP and associated water supply infrastructure within the flood assessment framework and require project-related flood effects to be appropriately assessed and, where necessary, mitigated.

Appendix 1 - CON20030740501

Appendix 2 - Annotated Image of Ahuroa Water Treatment Plant's Infrastructure

WHANGAREI DISTRICT COUNCIL, WATER DIVISION, PRIVATE BAG 9023, WHANGAREI 0140

To take water from the Ahuroa River on Allots 589 Pts 198 Blk II Waipu SD at or about location co-ordinates 1727339E 6016260N for the purpose of public water supply in the Bream Bay area:

Note: All location co-ordinates in this document refer to Geodetic Datum 2000, New Zealand Transverse Mercator Projection.

Subject to the following conditions:

1 The quantity to be taken shall not exceed 7,000 cubic metres in any consecutive twenty-four hour period, nor shall the rate of taking exceed 81 litres per second.

2 At no time as a result of the exercise of this consent shall the flow in the Ahuroa River, as measured immediately downstream of the point of taking, be reduced to less than 43 litres per second.

3 Notwithstanding Conditions 1 and 2, when river flows, as measured at the Northland Regional Council Hydrometric Station Site No. 6018 "Ahuroa River @ Braigh", location co-ordinates 1727261E 6015017N, are at or below 94 litres per second, the Consent Holder shall not take water at a rate in excess of 50 litres per second.

4 The Consent Holder shall install and maintain a meter with an accuracy of ±5% to measure the instantaneous rate of taking and quantities taken from the river.

5 The Consent Holder shall install and maintain a flow measuring device to measure flows within the Ahuroa River immediately downstream of the take point that is to the satisfaction of the Northland Regional Council.

6 The Consent Holder shall, on days when water is taken, keep a written record of the following:

(a) The quantity of water taken;

(b) The rate at which the water is taken;

(c) The duration of the pumping; and

(d) The flow within the Ahuroa River immediately downstream of the take point while the water is being taken.

The Consent Holder shall supply to the Northland Regional Council by the 15th of each month a copy of this written record for the previous calendar month. In addition, a copy of this written record shall be forwarded immediately to the Northland Regional Council on written request from the Northland Regional Council.

Advice Note: *In the event that no water is taken during a calendar month, the Consent Holder is still required to submit a water use record so that the Northland Regional Council is aware that no water has been taken.*

7 A screening device shall be installed and maintained that shall limit the intake velocity across the screen to less than 0.3 metres per second and the screen shall have no holes or slots with a diameter or width greater than 5 millimetres.

8 The Consent Holder shall maintain the weir and fish pass structure in good working order so as to allow the free flow of water over it.

Advice Note: *It is important that the weir and fish pass structure remain free from any obstruction. This will require regular inspection and clearing of debris and other material that may obstruct flows (such as branches and weeds).*

9 The Consent Holder shall submit to the Northland Regional Council for approval within six months of the date of commencement of these consents, a management plan for this water supply system. The Consent Holder shall implement the management plan following the approval by the Northland Regional Council. The management plan shall include as a minimum the following:

(a) Details of the maintenance programme for the water intake structures, screens and fish pass structure;

(b) Policy to promote efficient use by water users (such as installation of water saving devices, water storage);

(c) Measures undertaken to detect and minimise water losses in the reticulation system;

(d) A contingency plan to be implemented during times of water shortage.

Advice Note: *The Consent Holder may include the management plan for this water take as part of an overall management plan for the public water supply for the Bream Bay area.*

10 The Northland Regional Council may, in accordance with Section 128 of the Resource Management Act 1991, serve notice on the Consent Holder of its intention to review the conditions of these consents annually during the month of December. The review may be initiated for any one or more of the following purposes:

(a) To deal with any adverse effects on the environment that may arise from the exercise of the consent and which it is appropriate to deal with at a later stage, or to deal with any such effects following assessment of the results of the monitoring of the consent and/or as a result of the Northland Regional Council's monitoring of the state of the environment in the area;

(b) To require the adoption of the best practicable option to remove or reduce any adverse effect on the environment;

(c) To provide for compliance with rules in any regional plan that has been made operative since the commencement of the consent;

(d) To deal with any inadequacies or inconsistencies the Northland Regional Council considers there to be in the conditions of the consent, following the establishment of the activity the subject of the consent; and

(e) To deal with any material inaccuracies that may in future be found in the information made available with the application (notice may be served at any time for this reason).

(f) To amend the minimum flow requirements of the Ahuroa River.

The Consent Holder shall meet all reasonable costs of any such review.

EXPIRY DATE: 31 MAY 2038

ISSUED at Whangarei this Thirteenth day of July 2006

S J Savill
Team Leader - Water & Wastes

District Plan Change 2 – General Amendments



Information provided on this map forms part of Plan Change 2 – General Amendments.
To view the maps and see how the changes may affect the property please visit:
https://www.wdc.govt.nz/Services/Planning/District-Plan-changes/Current-plan-changes.

13 October 2026

Scale 1:741

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