Before the Independent Hearing Commissioners on Behalf of the Northland Regional Council (the Council)

under:	the Resource Management Act 1991
in the matter of:	*24 individual applications for new and increased groundwater takes from the Aupōuri Aquifer subzones: Waihopo, Houhora, Motutangi, Paparore, Sweetwater, Ahipara, and Other*
applicant:	Aupouri Aquifer Water Permit Applicants

Statement of evidence of Martell Letica (Planning) for *Aupouri Aquifer Water Permit Applicants*

Dated: 14 August 2020

1. INTRODUCTION

Qualifications and Expertise

1.1. My full name is Martell Letica.

1.2. I am the Principal Planner at Williamson Water & Land Advisory Limited (WWLA), a firm founded in January 2015 specialising in water, rural and contaminated land related resource management.

1.3. I hold the qualifications of Bachelor of Sciences (Geography) and a Bachelor of Arts (Political Studies) from the University of Otago. I have 13 years professional experience in planning and resource management, which includes 7 years in local government (Otago and Hawke's Bay Regional Council) and 6 years in consultancy in Otago, Southland, South Canterbury and now Northland.

1.4. During this period, I have been involved in a range of resource consent matters from both a regulatory and consultancy viewpoint. I have attended numerous Council resource consent hearings as both the reporting officer for Council and as a consultant planning expert. While the range of consenting applications heard have been varied, I have predominantly been involved in the field of water abstractions and use.

1.5. In this matter, I have been engaged by the 24 individual applicants to prepare and present planning evidence.

Background

1.6. During the time that these applications were lodged, I was employed by WSP Opus Limited in Whangarei.

1.7. I was involved in the preparation of applications APP.039859.01.01 and APP.020995.01.04 as a peer reviewer only and then took over responsibility of managing these applications once they were lodged with the Northland Regional Council (the Council) such as responding to requests for further information.

1.8. In November 2019 I took up employment with WWLA and have been involved in the management of all 24 applications since.

Code of Conduct

1.9. I acknowledge that we are not before the Environment Court. However, I have read the Code of Conduct for Expert Witnesses within the Environment Court Consolidated Practice Note 2014 and I agree to comply with that Code. This evidence is within my area of expertise, except where I state that I am relying on the evidence of another person. To the best of my knowledge, I have not omitted to consider any material facts known to be that might alter or detract from the opinions expressed in this evidence.

2. EVIDENCE STRUCTURE

2.1 To avoid repetition of Planning evidence, my evidence has been structured to respond primarily to areas that I consider are deficient within the s42A report. To do this, I turn my attention to;

a. the reasons for the applications;

b. a description of the receiving environment; and

c. s42A report.

3. REASONS FOR APPLICATIONS FOR RESOURCE CONSENT

3.1 The s42A report contains a reasonable summary of the applications and the reasons for them. However, there has been no explanation of the effect of the transition of the Proposed Regional Plan during the period within which these applications were lodged. The following summarises the .

3.2 APP.039859.01.01 was the first application, of the twenty-four to be lodged and accepted for processing by Northland Regional Council (NRC) on 23 February 2018.

3.3 The Proposed Regional Plan for Northland (PRP) was notified on 6 September 2017 and, after a period for submissions and hearings, the Council issued its decisions version of the PRP on 4 May 2019 which essentially replaced the version notified in September 2017. Twenty-three appeals on the decision were lodged with the Environment Court and an initial appeal version of the PRP was released on 29 July 2019. A version of the PRP that incorporates resolution of some appeals through consent orders issued by the Environment Court by was released in June 2020.

3.4 The PRP will not be fully operative until all appeals are resolved. Where a rule in the PRP has not been appealed, in accordance with Section 86F of the RMA, it must be treated as operative (and any previous rule as inoperative).

3.5 All applications were lodged after the PRP was notified and 18 of the applications were lodged and accepted by NRC before a decision on the notified PRP was made. Two applications were received after the decision version of the PRP was notified, while the remaining 4 applications were lodged and received by NRC after the July 2019 appeal version of the PRP was released.

3.6 As a result of the transition of the PRP, the applicable rule number changed from Rule C.5.1.10 to C.5.1.12 and some applications have not referenced this correctly. There were also substantial changes made to the objectives and policies of the PRP from its notified version to the July 2019 version.

3.7 The proposals to take and use groundwater were assessed against rules in the Regional Water and Soil Plan for Northland (operative as at 28 August 2004) (RWSP) due to the status of the PRP and were all assessed as Discretionary activities pursuant to Rule 25.03.01.

4. DESCRIPTION OF THE ENVIRONMENT

4.1 The receiving environment has been described adequately in the s42A and application documents.

4.2 Therefore, the following provides summary descriptions of the spatial planning information which exists within the model domain only.

RPS

4.3 The Council has, for the purposes of Policy 1 of the NZCPS recognised the landward extent of the coastal environment in its RPS with the assistance of spatial planning advice within the report entitled '*Coastal Environment Mapping Methodology - Final Version following Council Decisions*', dated February 2014.

4.4 While there are demarcations of the coastal environment boundary in the RPS, the Environment Court[1] found that the evidence presented to it confirmed that the RPS demarcation of coastal environment was indicative and that the actual physical nature of the environment shall determine the extent to which the coastal environment exists in this setting.

4.5 Other RPS spatial planning information relates to Outstanding Natural Features and Outstanding Natural Landscapes as a means of distinguishing those matters of national importance (Section 6 RMA), and the NZCPS. The mapped features within the assessment area include;

- Henderson Bay and Rarawa Beach;
- Inner Kaimaumau Wetland;
- Perpendicular Point to Greville Point coastal headland; and
- Great Exhibition Bay including Parengarenga Spit.

RWSP & PRP - Groundwater

4.6 Under the RWSP, the groundwater resource is not identified in any Schedules for the taking and use of groundwater. The Aupouri Aquifer is identified in Schedule F as an aquifer sensitive to bore construction however there is no allocation limit set in the RWSP for groundwater in this area.

4.7 Under the PRP, the groundwater resource is identified as the Aupouri aquifer management unit. Sub-aquifers have been identified within this aquifer management unit. The s42A report describes these sub-aquifers sufficiently as do the applications.

4.8 I have no difference in opinion with regard to the status of the allocation situation for these sub-aquifers to that expressed in the s42A report.

RWSP & PRP: Surface Water Resources

4.9 There are no surface waterbodies which have been recognised as significant or outstanding in the RWSP in the model domain area. Schedule E of the RWSP contains a list of dune lakes on the Aupouri Peninsula.

4.10 The Sweetwater Dune Lakes are recognised as Outstanding Natural Features in the PRP.

[1] *A BURGOYNE/ TE TAUMATUA O NGATI KURI RESEARCH UNIT, DIRECTOR-GENERAL OF CONSERVATION v NORTHLAND REGIONAL COUNCIL, MOTUTANGI-WAIHARARA WATER USERS GROUP*, [2019] NZEnvC 137, 16/08/2019

Statutory Acknowledgement Areas

4.11 Statutory Acknowledgement Areas relevant to Te Aupōuri, Te Rarawa, and NgaiTakoto Iwi are contained in Annexure A. There are no Ngati Kuri statutory acknowledgement areas within the assessment area.

5. S42A REPORT

5.1 Council's Consultant Planner and Consultant Hydrogeologist have noted that their assessment and analysis in their s42A report relies on the relevant planning documents to provide them with guidance as to the appropriateness of effects and the matters to be considered when assessing applications to take and use groundwater. The report attends only to those matters which the consent authority must consider under s104 RMA.

5.2 To avoid unnecessary duplication and in order to focus on proposed draft conditions and the Groundwater Monitoring and Contingency Plans, I briefly address the s42A report and indicate where I am in agreement with the analysis and conclusions drawn such that I do not draw my own. Where I believe analysis has not been prepared in accordance with the RMA, or that I have a difference in opinion with the conclusion drawn, I enter that information in the following sub-sections.

Submissions

5.3 Section 3 of the s42A report addresses the submission process, including a summary of the basis for the decision to limited notify and decision-making surrounding acceptance of submissions received.

5.4 I have nothing further to add with regard to the assessment at Sections 3.1, 3.2, and 3.3 of the s42A, except to enter the following documentation at Annexures A and B;

- Assessment of applications against available Iwi Environmental Management Plans and which have been approved by the relevant Iwi Authority to be used in such circumstance; and
- Legal opinion on the matter of strike-out under Section 41D RMA of submissions or part thereof submissions.

Effects Assessment

5.5 The key effects raised by Council's Consultant Planner and Hydrogeologist in Section 4 of the s42A report, are repeated as follows;

- Adequacy of information;
- Reasonable and efficient use of water;
- Long-term aquifer storage;
- Effects on surface water
- Effects on other water users of resource;
- Saltwater intrusion;

Other water quality effects;

- Social and economic effects;
- Cultural, and archaeological effects;
- Ecological and natural character effects;
- Climate change considerations; and

5.6 I am in agreement with the effects assessment and conclusions contained in the s42A report so do not enter any further analysis.

Alternatives

5.7 The Section 42A report contains an assessment of alternatives in light of Schedule 4, Clause 6(1) of the RMA.

5.8 Although an alternatives assessment is contingent on there being significant adverse effects on the environment, I am in agreement with the analysis carried out by the Consultant Planner which highlights the barriers and challenges to security of supply of freshwater on the Peninsula and that taking from the shellbed aquifer is an appropriate use and development of a freshwater resource.

Management and Mitigation Measures

5.9 The framework of management and mitigation proposed at Section 6 of the s42A report is appropriate for the actual and potential effects of the proposals and does not depart significantly from what has been proposed in the applications. Mr Williamson has also concluded that the locations and amount of monitoring is not inappropriate.

5.10 Where I have a difference in opinion, I have made amendments directly in the proposed GMCP's and have included comments to explain the recommended changes and these are appended as Annexure C.

5.11 From discussion with the Council's Consultant Planner, informal 'pre-hearing meeting' type arrangements are being promoted between the Department of Conservation on behalf of the Director-General of Conservation, the Council, and the applicant's representatives to look at management and mitigation collaboratively.

Relevant Statutory Provisions;

5.12 The s42A report contains an assessment of the relevant statutory provisions at Section 7. I am in general agreement with the s42A report analysis and conclusions with the exceptions that;

- The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 (herein referred to as 'Regulations') is relevant. The proposals, in particular the proposed conditions, are consistent with the Regulations;
- Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007 (herein referred to as 'NES-SHDW') is relevant. The proposals are not contrary to the NES-SHDW as a decision to grant, subject to

the GMCP, would not result in a community drinking water supply becoming unsafe for human consumption following existing treatment; and

- The RMA describes an Iwi Management Plan as "*…a relevant planning document recognised by an iwi authority and lodged with the council*". Section 2 of the RMA defines an iwi authority as "*the authority which represents an iwi and which is recognised by that iwi as having authority to do so*". As such, only Te Iwi o NgaiTakoto Environmental Plan 2017 can be considered from a statutory analysis perspective. This does not suggest that other Iwi Management Plans are irrelevant, in fact, they are important for the wider analysis against Part 2 and for assessment cultural effects and I have assessed that the Consultant Planner has done so within their s42A report.

Proposed Draft Conditions

5.13 The proposed draft conditions described at Section 8.2 and appended as Attachment 1 of the s42A report are generally accepted with some minor changes as is demonstrated in the documentation at Annexure D.

5.14 As noted, the changes are minor. However, the proposed change at Condition 5(a) may be considered more substantial. The change has been proposed in recognition that the term 'full irrigation season', unless fully defined elsewhere, would have to be defined as having to have taken water from the 'full irrigation season' as applies to that particular crop. The change recognises that all or part of the volume set out as Stage 1 allocation may be taken during this time. It would also be accepted to revert back to the original wording, provided a clear definition of 'full irrigation season' was given.

5.15 I also am suggesting that the term 'minimum 12-months' in the Condition 5(a) as relates to the 'Middle Group' does not necessarily need to apply given that much of the baseline has been obtained from the monitoring that the current consent holders (known as MWWUG) have carried out as part of their GMCP conditions. That is unless it is difficult to distinguish the baseline needed compared to the baseline that has so far been established.

5.16 From discussion with the Council's Consultant Planner, informal 'pre-hearing meeting' type arrangements are being organised between the Department of Conservation on behalf of the Director-General of Conservation to look at the proposed consent conditions collaboratively.

Term of Consent

5.17 The assessment of consent term contained in Section 8.3 of the s42A report is accepted on the basis that there is a clear policy direction in the planning documentation that consistent consent expiries across freshwater management units is an anticipated environmental management tool for the Council.

5.18 There is however an error with the suggestion that surrender of existing consents are needed for the following applicants;

- Waikopu Avocados Ltd (APP.040610.01.01), Henderson Bat Avocados Ltd (APP.017428.02.01) – These applications are for new consents to support an increase in their existing orchard areas and do not seek to replace their existing consents.

- Avokaha Ltd (APP.008647.01.06) and KSL Ltd (APP.039628.01.04) – These applicants have made applications for a change of condition of consent. Surrender of consent is not available for variations as a decision to grant a change of condition does not result in the issue of a new consent.

ANNEXURE A

Applications to take and use water from the Aupōuri Aquifer

Assessment of Iwi Environmental Management Plan Provisions - Te Rūnanga Nui o Te Aupōuri

Prepared: June 2020

By: Martell Letica

Approved for release by: Geraldine Baker

Glossary of Abbreviations used in Document	
AAGWM-2020	Aupōuri Aquifer Groundwater Model (February 2020)
AEE	Assessment of Environmental Effects
EMP	Ngā Tai e Rua o Te Aupōuri, Environmental Management Plan (June 2018) (EMP).
FNDC	Far North District Council
GMCP	Groundwater Management and Contingency Plan
NPS-FM	National Policy Statement for Freshwater Management 2014 (amended 2017)
NRC	Northland Regional Council
PRP-2017	Proposed Regional Plan (Notified version, September 2017)
PRPMay-2019	Proposed Regional Plan (Decision version, May 2019)
PRPJuly-2019	Proposed Regional Plan (Appeals version, July 2019)
RMA	Resource Management Act 1991
RPS	Regional Policy Statement for Northland 2016

Contents

1. The Proposals

In the period between February 2018 and August 2019, the Northland Regional Council (Council) received 24 applications for new groundwater takes from the deep shell bed aquifer of the Aupōuri Peninsula to service proposed and existing avocado orchards at multiple locations. Table 1 below provides each application number, the applicant's name and the requested volume of water. Locations of each application are illustrated in the figure in Appendix A.

Table 1: Aupouri aquifer water permit applications

Map ID	Application Number	Applicant's Name	Daily volume (m3)	Annual volume (m3)
1	APP.039859.01.01	Te Aupouri Commercial Development Ltd	10,735	1,170,000
2	APP.040601.01.01*	Waikopu Avocados Ltd	736	83,360
3	APP.017428.02.01*	Henderson Bay Avocados Ltd	178	45,000
4	APP.040600.01.01	Far north Avocados Ltd	240	32,000
5	APP.041211.01.01	P McLaughlin	700	78,400
6	APP.040121.01.01	NE Evans Trust & WJ Evans & J Evans	1,675	160,000
7	APP.040231.01.01	P & G Enterprises (PJ & GW Marchant)	350	28,000
8	APP.039644.01.01	MP Doody & DM Wedding	2,375	304,000
9	APP.040397.01.01	A Matthews	95	12,000
10	APP.040652.01.01	SE & LA Blucher	720	96,000
11	APP.040919.01.01	NA Bryan Estate, SG Bryan, CL Bryan, KY Bryan Valadares & D Bryan (Property No 1)	500	80,000
12	APP.040979.01.01	MV Evans (Property No 2)	1,125	126,000
13	APP.040558.01.01	MV Evans (Property No 1)	350	36,400
14	APP.040130.01.01	Tuscany Valley Avocados Ltd (M Bellette)	375	36,000
15	APP.040918.01.01	NA Bryan Estate, SG Bryan, CL Bryan, KY Bryan Valadares & D Bryan (Property No 2)	1,000	160,000
16	APP.008647.01.06*	Avokaha Ltd (c/- K Paterson & A Nicholson)	70	5,600
17	APP.039628.01.04*	KSL Ltd (c/- S Shine)	90	3,600
18	APP.040361.01.01	Tiri Avocados Ltd.	3,876	581,250
19	APP.040362.01.01	Valic NZ Ltd	1,158	173,700
20	APP.040363.01.01	Wataview Orchards (Green Charteris Family Trust)	225	33,750
21	APP.039841.01.02	Mate Yelavich & Co Ltd	450	52,000
22	APP.040386.01.01	Robert Paul Campbell Trust	3,350	360,000
23	APP.040364.01.01	Elbury Holdings Ltd (C/-K J & F G King)	1,875	200,000
24	APP.020995.01.04*	Te Rarawa Farming Ltd and Te Make Farms Ltd	10,705	776,000
		Total	**54,886**	**6,230,662**

2. Northland Freshwater Planning Framework – Cultural Values

Insufficient engagement of tangata whenua and the failure to identify issues and potential impacts on their values can lead to inappropriate management with more than minor adverse effects resulting.

The RMA in Schedule 4 requires an assessment of cultural effects and effects on cultural values. However, the approach to assessing effects of cultural effects and effects on cultural values differs significantly throughout the country.

The PRP contains policies which guide resource developers and Council alike on where particular focus is required to identify the resources/activities for which a full analysis on tangata whenua is required and what this would consist of. These policies are as follows.

Policy D.1.1 states that an assessment of effects of an activity on tangata whenua and their taonga is required if one or more the following is likely;

1) *adverse effects on mahinga kai[163] or access to mahinga kai[164], or*
2) *any damage, destruction or loss of access to wāhi tapu, sites of customary value and other ancestral sites and taonga with which Māori have a special relationship[165], or*
3) *adverse effects on indigenous biodiversity in the beds of waterbodies or the coastal marine area where it impacts on the ability of tangata whenua to carry out cultural and traditional activities[166], or*
4) *the use of genetic engineering and the release of genetically modified organisms to the environment, or*
5) *adverse effects on tāiapure, mataitai or Māori non-commercial fisheries, [167] or*
6) *adverse effects on protected customary rights, [168] or*
7) *adverse effects on sites and areas of significance to tangata whenua mapped in the Regional Plan (refer I Maps |Ngā mahere matawhenua).*

[161] The RMA definition of tangata whenua is "in relation to a particular area, means the iwi, or hapū, that holds mana whenua over that area". For an analysis of effects, the appropriate iwi or hapū will need to be identified. Council officers will be available to assist with this.
[162] An analysis of effects on tangata whenua and their taonga may be necessary in circumstances not outlined in this policy – it will depend on the circumstances.
[163] Food and places for obtaining natural foods and resources. The work (mahi), methods and cultural activities involved in obtaining foods and resources.
[164] This includes, for instance, kai awa (river food) kai repo (swamp food) and kaimoana (sea food).
[165] This includes, for instance, impacts on the quality of water used for ceremonial purposes.
[166] This includes, for instance, use of rongoa (medicinal) plants, and uses for raranga (weaving).
[167] Māori non-commercial fisheries are defined in the Fisheries Act 1996.
[168] As defined by the Marine and Coastal Area (Takutai Moana) Act 2011.

From the criteria set out in Policy D.1.1, (1) and (3) are relevant. As such, an analysis of effects on tangata whenua and their taonga is required and according to Policy D.1.2 must;

1) *include such detail as corresponds with the scale and significance of the effects that the activity may have on tangata whenua and their taonga, and*
2) *have regard to (but not be limited to):*

a) *any relevant planning document recognised by an iwi authority (lodged with the Council) to the extent that its content has a bearing on the resource management issues of the region, and*
b) *the outcomes of any consultation with tangata whenua with respect to the consent application, and*
c) *statutory acknowledgements in Treaty Settlement legislation, and*

3) *follow best practice,[169] including requesting, in the first instance, that the relevant tangata whenua undertake the assessment, and*
4) *specify the tangata whenua that the assessment relates to, and*
5) *be evidence-based, and*
6) *incorporate, where appropriate, mātauranga Māori, and*
7) *identify and describe all the cultural resources and activities that may be affected by the activity,[170] and*
8) *identify and describe the adverse effects of the activity on the cultural resources and cultural practices (including the effects on the mauri of the cultural resources, the cultural practices affected, how they are affected, and the extent of the effects), and*
9) *identify, where possible, how to avoid, remedy or mitigate the adverse effects on cultural values of the activity that are more than minor, and*
10) *include any other relevant information.*

[169] *Best practice can be determined by relevant professional bodies.*
[170] *The full range of effects defined in Section 3 of the RMA need to be considered.*

3. Purpose of this Document

The purpose of this document is to identify and describe Te Aupōuri freshwater values as relates to the activity of taking and using water restricted under Section 14 of the Resource Management Act 1991 (RMA).

While the use of water is often linked with land use[1] and discharge[2] activity, this document only identifies eco-cultural values (highlighted as issues), and policies associated with the direct activities of taking and using groundwater. As such, it is fully acknowledged that, while this document contains an assessment on eco-cultural values, the tangata whenua concept of the environment as a connected whole is not fully incorporated by isolating specific qualities and measures in a scientific approach to freshwater abstraction and use.

Approval of the preparation of this document and its use has been given by Geraldine Baker as the General Manager of Te Aupouri Commercial Development Limited, the commercial arm of the Post-Settlement Governance Entity, Te Runanga Nui o Te Aupōuri on the understanding that it does not constitute a Cultural Impact Assessment but does provide review analysis of the proposals against the following literature sources;

- Deed of Settlement with the Crown (including relevant Statutory Acknowledgements); and
- Ngā Tai e Rua o Te Aupōuri, Environmental Management Plan (June 2018) (EMP).

[1] As restricted under Section 9 of the RMA.
[2] As restricted under Section 15 of the RMA.

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4. Whakapapa

Before conversations around values of freshwater are initiated, knowing where the water comes from and where all values come from is essential. This can often be established through Whakapapa.

The people of Te Aupōuri share a number of well-known ancestors with wider Muriwhenua including:

Kupe of the Mata-whao-rua canoe and Te Ngaki of the Tāwhiri-rangi canoe;

Nukutawhiti of the Ngā-toki-mata-whao-rua canoe;

Ruanui-a-Tāne of the Māmari canoe and his wife Manawa-a-rangi;

Whakatau of the Mahuhu-ki-te-rangi canoe;

Pō-hurihanga of the Kurahaupō canoe and his wife Maieke;

Tū-moana of the Tinana canoe and his wives Pare-waha-ariki and Kahukura-ariki;

Te Parata of the Māmaru canoe and his wife Kahu-tia-nui;

Tōhē and Te Kura-a-rangi;

Tū-mata-hina and Tangi-rere;

Rāhiri, Āhua-iti and Whakaruru;

Ue-oneone and Rei-tū;

Kai-rewa and Wai-miri-rangi;

Toa-kai, Tū-kotia and Tara-whati;

Hāiti-tai-marangai and Puna;

Tū-whakatere, Tū-te-rangi-a-tohia and Tū-poia; and

Moko-hōrea and Uru-te-kawa.

From these ancestors descend two families from which Te Aupōuri as an independent iwi trace their descent. Firstly, the family of Mōre Te Korohunga and Te Awa. The name 'Te Aupōuri' came about from an event in the time of Mōre Te Korohunga and Te Awa's children – Kupe, Whēru, Te Ikanui, Te Kakati and Te Uruhāpainga, and secondly, the family of Te Ihupango and Te Amongaariki II, who had two daughters – Tihe and Kohine. Te Amongaariki II is especially important to Te Aupōuri being the principal ancestress of the Te Kao lands and the southern Pārengarenga Harbour.

The iwi of Te Aupōuri have their primary turangawaewae at Te Kao at the southern end of the Pārengarenga Harbour, with Te Oneroa-a-Tōhē (Ninety Mile Beach) to the west and Tokerau (Great Exhibition Bay) to the east. Te Aupōuri describe the core area in which they have customary rights and associations, of varying types and nature, as running from Ngāpae in the south-west,

east to Ngātū and Waipapakauri Stream, north to the mouth of the Rangaunu Harbour, to Motu-puruhi and Te Rākau-tū-hakahaka (Simmonds Islands) and north to Muri-motu (North Cape), west to Te Rerenga Wairua (Cape Rēinga), encompassing Oromaki, Manawa-tāwhi, Moe-kawa and Ohau (Three Kings Islands), south to Motu-o-Pao (Cape Maria van Diemen), to Kahokawa (Scotts Point), Matapia, Waka-te-hāua (The Bluff), Hukatere and back to Ngāpae. Te Aupōuri also maintain historical associations to Rangitāhua (Raoul Island in the Kermadec Islands) and south to Waimimiha.

Other iwi of Te Hiku o Te Ika also claim customary interests in this area.

5. Settlement with the Crown

The Treaty of Waitangi was signed by Māori rangatira, or chiefs, and representatives of the British Crown in 1840. The Treaty has 3 articles.

The Treaty:

- gave sovereignty in New Zealand to the British Crown
- enabled Māori to keep rangatiratanga, or chieftainship, over their resources, while giving the Crown first rights to any land being sold after that time, and
- guaranteed Māori the rights and privileges of British citizens.

Historical claims are made by Māori against the Crown for breaches of the Treaty — times when the Crown didn't uphold 1 or more of these articles — before 1992.

Historical settlements aim to resolve these claims and provide some redress to claimant groups.

The Te Aupōuri historical grievances against Te Tiriti o Waitangi were settled with the Crown and legislated under the Te Aupōuri Claims Settlement Act 2015.

5.1. Summary of Historical Account

The following summary historical account taken from Section 7 of the Te Aupouri Claims Settlement Act 2015 as follows:

> *The tino rangatiratanga of Te Aupouri extends from Te Oneroa-a-Tohe (Ninety Mile Beach) on the west coast to Tokerau (Great Exhibition Bay) on the east coast, from Ngāpae (Waipapakauri Ramp) in the south to Te Rerenga Wairua (Cape Reinga) in the north. Traditional Te Aupouri life was regulated by their tikanga and whakapapa, and closely linked to the seasonal cycles of their coastal environment.*
>
> *Te Aupouri were signatories of both the Whakaputanga (the Declaration of Independence) and te Tiriti o Waitangi (the Treaty of Waitangi).*
>
> *In 1842, a schooner ran aground at Ahipara and local Māori, according to their tikanga, claimed goods from the wreck as a gift from Tangaroa. When the schooner's owner sought compensation, the Crown insisted that land should be given. Eventually 2 482 acres south of Houhora, far from where the ship grounded, was signed over. In 1861, the Crown granted 1 000 acres to the schooner's owner and claimed the remaining 1 482 acres as "surplus" land.*
>
> *In 1858, the Crown made the largest purchase in the Muriwhenua district, of over 100 000 acres in the Te Aupouri rohe. The Crown agent in charge of the purchase deliberately underestimated the acreage and the Crown was aware that it acquired the block for a very low price. Only one very small reserve was created from this purchase. Te Aupouri protested about the wrongful inclusion of an area at the*

northern boundary for many years but it was not returned to them until 40 years after the purchase.

After the Native Land Court system was established in the 1860s, Māori needed a freehold title from the court in order to sell or lease land, or borrow money for land development. This often left Māori with few options other than selling some of their interests in order to secure and protect an area on which to sustain their families. In the 1870s, the court awarded Te Aupouri interests in various land blocks naming only 10 persons, who were not required to act as trustees for the wider iwi, as owners of each block. This contributed to land alienation and conflict between whanaunga. With the loss of most of their land and limited ability to develop the land that remained, Te Aupouri people became dependent on gum digging and gum traders, caught in a cycle of debt, poverty and deprivation.

Te Aupouri predominantly lived on Pārengarenga lands, which remained in traditional ownership until the mid-1890s. In 1896, the court awarded Te Aupouri the majority of the block but high survey costs left the owners with substantial debt. Following investigation, the Crown agreed to pay off the debt and the land was vested in the Tokerau Māori Land Council (later Board).

The Tokerau Māori Land Board leased out most of the Pārengarenga lands to gum traders and graziers. Although the rents received had repaid the debts on the land by 1910, the lands did not return to owner control for many decades in order to protect the interests of the lessees and Te Aupouri were left with barely enough land to subsist on.

After the gum market collapse in the 1920s, the Native Minister was advised of the impoverished state of Te Aupouri, and "the misfortunes they have suffered through the leases arranged by the Board". The Crown implemented a land consolidation scheme to combine fragmented Māori land titles, which would become whānau dairy units at Te Kao. However, a range of factors including bureaucratic procedures, delays, inadequate supervision, and inappropriate decision making meant that properties were soon loaded with debt, leading to further alienation.

In the 1950s, the Crown proposed to develop the Pārengarenga block into 92 dairy farms for local owners to then purchase. To gain control over the land the Crown compulsorily acquired all interests considered "uneconomic" (valued at less than £25) and actively pursued a policy to purchase additional shares from owners. The 92 dairy farms did not eventuate. Instead the land was partitioned into 2 blocks, which went into forestry and 2 sheep and beef stations. Despite their original ownership of the majority of Pārengarenga block, the individualisation of shareholdings, subsequent successions, and consolidations have resulted in many Te Aupouri people losing their interests, and Te Aupouri as an iwi having little influence over the management of their ancestral lands.

In the 1960s, the Crown and Te Aupouri both contributed land to the development of the Aupouri State Forest. By 1983, forestry had become the main source of local employment. Employment opportunities declined after the commercial arm of the Forest Service became a state enterprise in 1987. Cutting rights were sold and companies contracted their own staff, which meant that many Te Aupouri lost their jobs.

Throughout the twentieth century, Te Hiku o Te Ika was one of the most deprived regions in Aotearoa. There were high rates of infant and child mortality among Te Aupouri, with one-quarter of children born in 1928 dying before the age of five, primarily due to poverty-related illness. The Crown used schools as a means of assimilating Māori into European culture and it was common for Māori children to be punished if they used te reo Māori. The survival of te reo Māori, especially the Te Aupouri dialect, as a living language within Te Aupouri is seriously threatened.

The Crown's actions and omissions left many Te Aupouri without sufficient land for their needs, resulting in many leaving their rohe to survive. Only a few remain to uphold kaitiakitanga responsibilities for their wāhi tapu, wāhi mahinga kai, marae and tikanga. Te Aupouri have lacked opportunities for economic and social development and endured extreme poverty and poor health. This has devastated Te Aupouri social structures, culture, heritage, traditional knowledge and identity.

5.2. Te Aupouri Rohe

The Te Aupōuri area of interest is illustrated in Figure 1 below. Other iwi of Te Hiku o Te Ika also claim customary interests in this area.

Figure 1: Te Aupōuri area of interest.

5.3. Statutory Acknowledgement Areas

Settlement legislation includes redress of grievances through statutory acknowledgements. A statutory acknowledgement is a formal acknowledgement by the Crown recognising the mana of tangata whenua in relation to a specified area. It recognises the particular cultural, spiritual, historical, and traditional association of an iwi or hapū with the statutory area.

Statutory acknowledgements are only over Crown-owned land and may apply to rivers, lakes, wetlands, landscapes, estuaries/harbours and other coastal areas. Where a statutory acknowledgement is noted regarding a river, lake, wetland or coastal area, the acknowledgement only applies to the bed, being Crown-owned.

Te Aupōuri areas subject to statutory acknowledgement and deed of recognition include the following sites;

Manawatāwhi / Three Kings Islands (known to Te Aupouri as Manawatāwhi, Ohau, Moekawa, and Oromaki)	As shown on deed plan OTS-091-01
Raoul Island, Kermadec Islands (known to Te Aupouri as Rangitāhua)	As shown on deed plan OTS-091-02
Simmonds Islands (known to Te Aupouri as Motu Puruhi and Terākautūhaka)	As shown on deed plan OTS-091-03
Paxton Point Conservation Area including Rarawa Beach Campground (known to Te Aupouri as Wharekāpu / Rarawa)	As shown on deed plan OTS-091-04
Kohurōnaki Pa	As shown on deed plan OTS-091-05
North Cape Scientific Reserve	As shown on deed plan OTS-091-06

5.4. Cultural Sites Transferred to Te Aupōuri

Cultural redress properties transferred to Te Aupōuri are listed as follows;

Properties vested in fee simple	**Properties vested in fee simple subject to conservation covenants**
Hukatere Pā	Kahokawa
Murimotu Island	Maungatiketike Pā:
Te Kao School site A	Pitokuku Pā
Waipararíki (Te Kao 76 and 77B)	Taurangatira Pā
	Te Rerepari
Lake and lakebed properties vested in fee simple	**Properties vested in fee simple to be administered as reserves**
bed of Lake Ngākeketo	Te Ārai Conservation Area
Waihopo Lake property	Te Ārai Ecological Sanctuary
	Te Tomo a Tāwhana (Twin Pā) Sites

Mai i Waikanae ki Waikoropūpūnoa (Beach site A) Mai i Hukatere ki Waimahuru (Beach site B) Mai i Ngāpae ki Waimoho (Beach site C) Mai i Waimimiha ki Ngāpae (Beach site D)

5.5. Property rights in freshwater

Property rights in fresh water are the subject of as yet unresolved claims.

Tangata whenua from Taitokerau have been involved in a claim to the Waitangi Tribunal, and iwi in the region are engaged with the issue through the national Freshwater Iwi Leaders Group.

This document focuses on the management of fresh water arising from tangata whenua values and interests as currently legislated and what may be considered under the RMA.

6. Evaluation of Environmental Management Plan

The purpose of the EMP is to set out the strategic key objectives for Te Aupouri for environmental management in Te Hiku o Te Ika and beyond. The key strategic objectives of the EMP include:

- *Upholding and articulating Te Aupōuri identity and integrity;*
- *Clearly defining where Te Aupōuri stands on matters of natural resource management so that there can be no doubt;*
- *Influencing the development of local and na onal resource and environmental policy;*
- *Provide a guide for resource users or developers including how and where development may occur;*
- *Provide for more focussed engagement from external agencies;*
- *To aid and enhance the participation of Te Aupōuri in resource and environmental management; and*
- *To aid and enhance the participation of Te Aupōuri in collaboration with Te Hiku iwi.*

The plan provides Te Aupōuri objectives and policies with respect to environmental management for the benefit of resource and environmental management practitioners and policy makers operating at central government, and local government within Te Hiku o te Ika. Te Aupōuri encourages external agencies to adopt the values and objectives within the plan but being mindful that cooperation with the objectives of the plan in no way substitutes or alleviates the need for external agencies to engage directly with Te Aupōuri.

In evaluating the proposals against the EMP, the work undertaken by the NRC with Ministry for Primary Industries and Ministry for the Environment[3] to identify the tangata whenua freshwater values has been had regard to, in particular the listed operational level values identified as:

- Crystal clear water (in specific water bodies);
- Fish stocks; Tuna; Repo; and
- Safe swimming/safe drinking (in specific water bodies).

These values are referred to as 'default values' in this document as the EMP contains specific direction on eco-cultural values for Te Runanga nui o Te Aupōuri. Therefore, the default values are only used to make assessment in the absence of specific direction in the EMP.

[3] Northland Regional Council, Ministry for Primary Industries, and Ministry for the Environment, August 2015. Northland Tangata Whenua Freshwater Values (Final Draft).

KAITIAKITANGA

Objectives

Te Hiku Iwi co-governance groups are recognised as the best opportunity to achieve long-term prosperity.

In giving effect to Te Tiriti, government agencies recognise and provide for kaitiakitanga and rangatiratanga.

The ancestral and contemporary relationship between Te Aupōuri and the land is recognised.

Te Aupōuri can fulfil their role and responsibility as kaitiaki within planning, management and decision-making processes.

Te Aupōuri are able to lead the way and set an example on the landscape with regard to sustainability and best practice, and cultural, environmental, economic, and social outcomes.

Natural resources are managed as interrelated resources embracing the practice of ki uta ki tai.

Wāhi tapu and places of cultural significance, the multiple values associated with these places (traditional and contemporary), and the relationship of tangata whenua to them are recognised and provided for in district, regional, and national planning and policy, recognised and provided for as a planning tool to protect wāhi tapu and places of cultural importance;

Wāhi tapu and places of cultural importance are protected from inappropriate use, subdivision and development.

Effective recognition of kaitiakitanga in natural resource management and governance processes.

KAITIAKITANGA PRINCIPLES		
Issue	**Policies**	**Comment**
Effective implementation of kaitiakitanga principles in natural resource management and governance processes.	K2.1 Land, water, and air are managed according to *ki uta ki tai* (as interrelated resources). This includes, but is not limited to: • Understanding the relationships between environmental domains; • Accounting for indirect environmental effects; • Accounting for cumulative environmental effects; and	Assessment of the local and cumulative effects of the proposed abstractions was undertaken using a numerical groundwater flow model. A key factor with regard to the application of a numerical model to simulate potential effects of groundwater abstraction is its ability to simulate spatial (and temporal in the case of a transient

	• Addressing environmental issues at their source[4].	model) variation in groundwater levels throughout the model domain (extending from Ngataki in the north to Ahipara in the south). The reasonable and efficient use of the water was assessed using a soil water balance model.
	K2.2 The eco-cultural system is the priority for environmental and resource management in recognising that people are a part of the environment. Therefore, socio-economic problems are environmental problems, and likewise, socio-economic solutions can solve environmental problems.	Socio-economic solutions are anticipated through direct job creation within orchards and processing sheds and secondary benefits through use and reliance on local service industries.
	K2.3 Protecting natural resources *mō ngā uri whakatupu*. Ultimately, what is good for the environment is good for future generations. This means that environmental health always supersedes economic benefits in weighted decision-making.	Environmental health took priority over economic benefits in assessing the proposals. Not only do the applications comply with allocation limits, but they were also assessed using extensive modelling to define actual and potential adverse environmental effects and to distinguish suitable volumes to support the intended uses. A Groundwater Monitoring and Contingency Plan (GMCP) has been proposed to manage residual risk that modelling may have as to the certainty of predictions of environmental effects modelled.
	K2.4 Industrial, agricultural, and civic environmental best practice[5] is directly and indirectly incentivised throughout the region, including but not limited to: • Freshwater management and use;	Bore headwork, pipeline and irrigation systems will be geared to be as efficient as possible as water lost is productivity lost.

[4] The original cause of an environmental issue should be addressed directly, as opposed to addressing the effects of that cause.
[5] Best practice refers to methods that are environmentally sustainable and are reasonably affordable to implement.

		Irrigation Scheduling Plans (ISP) which establish parameters for efficient management of irrigation systems have been proposed. The overall purpose of ISP's are to set out how the irrigation will be undertaken to ensure that at least 80 percent of the annual volume of water applied to the irrigable area is retained in the soil in the root zone of the crop, compared to the average gross depth of water applied to the crop.
	K2.6 Precautionary principle: This means that when the environmental effects of an activity are unknown, precaution should be given in favour of the environment until sufficient evidence can be supplied and a robust assessment of effects to be made.	The proposed adaptive management regime applies a precautionary approach, including staged implementation, monitoring and responding to environmental data.
SPECIES OF CULTURAL IMPORTANCE		
Issue	**Policies**	**Comment**
Current laws and policy fail to protect the kaitiaki relationship of tangata whenua with species of cultural importance with regard to commercial exploitation and use. *NOTE: The EMP contains a list of species of cultural importance.*	K6.1 The protection of species of cultural importance from inappropriate commercial use and development, and impact cultural activities, is critical to the protection of Te Aupōuri culture and identity.	The applications propose adherence with a monitoring and contingency plan that supports the identification and adaptive response to effects on water levels and flows of surface waterbodies. Reduction in use of the resource is required as is complete cessation to ensure changes in surface water flows and levels are minor.
	K6.2 The Crown has a duty under Te Tiriti o Waitangi to provide active protection of the kaitiaki relationship of tangata whenua with indigenous flora and fauna.	This duty of the Crown will not be undermined by the proposals.

RANGINUI

Objectives

Climate change is given appropriate weighting in planning, policy, and decision-making.

CLIMATE CHANGE		
Issue	**Policies**	**Comment**
Climate change will have significant impacts on the relationship of Te Aupōuri as a coastal people to ancestral lands, waters, wāhi tapu and places of cultural importance.	R3.3 To require that local authorities recognise and provide for the potential effects of climate change on resources and values of importance to Te Aupōuri, for example: • Changes to the amount of rainfall, and effects on aquifer recharge and saltwater intrusion; • Lake management regimes; and • Changes to the habitats of indigenous flroa and fauna, including species of cultural importance.	The allocation limits in the PRP were set, taking into account climate change predictions. None of the applications would cause the current allocation limits to be exceeded. The Aupouri Aquifer Groundwater Model 2020 (AAGWM-2020) uses a 60-year historical climate simulation.

Wai Māori

Objectives

Water management effectively provides for the taonga status of water, the Treaty partner status of Te Aupōuri, the importance of water to cultural well-being, and the specific rights and interests of tangata whenua in water.

Water quality and quantity in groundwater and surface water resources in the rohe enables customary use mō ngā uri whakatupu

The Cultural Health Index is recognised as a key indicator of the eco-cultural health of waterways and the relationship of Te Aupōuri to water.

Land and water use in the rohe respects the ecological limits of our land and freshwater resources.

Wetlands and puna are recognised and protected as places of cultural importance, and there is an overall net gain of wetlands in the rohe as wetlands are restored. *Water quality is maintained and improved to a drinkable standard.*		
RIGHTS AND INTERESTS		
Issue	**Policies**	**Comment**
Te Aupōuri have specific rights and interests over freshwater as guaranteed through Article 2 of Te Tiriti o Waitangi. Te Aupōuri are to be recognised as a key partner in the development of any freshwater policy and initiative.	WM1.1 Te Aupōuri, as tangata whenua, have specific rights and interests in how freshwater resources should be managed and utilised in the rohe.	The applications are not inconsistent with the current planning documentation as relates to freshwater management and use. This does not however diminish any rights and interests Iwi seek to have recognised with the Crown, particularly given the Governments identification of the need to address water allocation and use issues through their work programme for improving the quality of freshwater.
	WM1.2 Te Tiri o Waitangi is the basis for the relationship between Te Aupōuri and local authorities (and water governance bodies) with regard to freshwater management and governance in the rohe.	These applications are not inconsistent with the current planning documentation as relates to freshwater management and use.
	WM1.3 To require that local authorities and water governance bodies recognise that: • The relationship of tangata whenua to freshwater is longstanding; • The relationship of tangata whenua to freshwater is fundamental to Te Aupōuri culture and cultural well-being. • Tangata whenua rights and responsibilities associated with freshwater are intergenerational;	Recognition of the relationship of tangata whenua to freshwater resources is made only to those expressed through the deed of settlement and the policies of this EMP. Recognition as is intended under this policy would require a full and comprehensive Cultural Impact Assessment (CIA). It is noted that the commercial development arm of the runanga is an applicant as are two other Iwi authority investment arms. A decision by the

	• Tangata whenua interests in freshwater resources in the region are cultural, customary and economic in nature; • Wai māori is essential to all life and is considered a rongoa (medicine) with the ability to heal, cleanse, and rejuvenate not just the physical, but also the spiritual – this role must be respected and protected; and • Wai māori is a limited resource.	NRC should therefore recognise Te Rūnanga Nui o Te Aupōuri interests as an applicant taking into account this policy.
THE VALUE OF WATER		
Issue	**Policies**	**Comment**
We need to change the way that water is valued.	WM2.1 To consistently and effectively advocate for a change in perception and treatment of freshwater resources: from public utility and unlimited resource to a taonga of great cultural significance.	The proposals recognise freshwater as nationally significant and promote the taking of freshwater under conservative allocation limits. However, the proposals do not address the great cultural significance of freshwater as a taonga. A CIA is required to fully give identify and effect to the freshwater resources as taonga.
	WM2.2 To require that water is recognised as essential to all life and is respected for its taonga value ahead of all other values.	
	WM2.3 To require that decision making is based on intergenerational interests and outcomes, *mō ngā uri whakatupu*	It is anticipated that the proposals will support intergenerational interests and outcomes as they will not exceed current allocation limits and will support the local rural and service industries.
	WM2.4 To continue to assert that the responsibility to protect and enhance *te oranga o te wai* is collective and is held by all those who benefit from the use of water; and that the right to take and use water is premised on the responsibility to safeguard and enhance the oranga of that water.	While modelling demonstrates that the taking of water as proposed is sustainable, a GMCP is proposed which requires consent holders to actively monitor and manage the taking of water.
PRIORITIES FOR USE		
Issue	**Policies**	**Comment**

Priorities for use based on Te Aupōuri values.	WM3.1 To advocate for the following order of priority for freshwater resource use, in that:
	• The oranga of freshwater resources (ground and surface) is protected and sustained in order to:
	  ○ Protect instream values and uses (including) indigenous flora and fauna);
	  ○ Meet the basic health and safety needs of humans, specifically the provision of a potable and reliable supply of drinking water to marae and other communities; and
	  ○ Ensure the continuation of customary in-stream values and uses.
	• Water is equitably allocated for the sustainable production of food, including stock water, and the generation of energy; and
	• Water is equitably allocated for other abstractive uses (e.g. development aspirations).
		Hydrogeologists are fairly confident that connectivity with surface resources is limited such that effects on instream values and uses would be no more than minor. However, where knowledge of connectivity is limited (e.g., areas of the Kaimaumau-Motutangi wetland complex), monitoring and response planning has been proposed through the GMCP.
		Similarly, the effects of saline intrusion have been modelled as being minor but the GMCP has been proposed to manage residual uncertainty of effects of saline intrusion on drinking water quality.
		Most potable bore supplies access shallow groundwater and not the deep shellbed. As such, reliability of supply is dependent on rainfall recharge due to limited aquifer storage in the shallow geological unit. The relationship between the two water-bearing geological units has been modelled and conservative estimates of drawdown in both the shallow and deep aquifers were determined to have minor effects on bore owners. Due to uncertainty with bore records held by NRC, approximately 4,000 property owners/occupiers were given limited notification of the proposals and around 113 submissions were received in response.
		Environmental baseline levels of salinity, groundwater level, and wetland water levels have been set in the GMCP so that if these levels are

		exceeded, a response plan is activated. It is expected that, subject to the GMCP and conditions of consent, the proposals would provide for the values as prioritised.
MANAGEMENT OF WATER		
Issue	**Policies**	**Comment**
Appropriate management scale, principles, tools and processes to deliver Te Aupōuri cultural outcomes.	WM4.1 To require that water governance and management structures, plan, policies and processes are culturally relevant and deliver clear and reliable eco-cultural outcomes. This means: • Te Aupōuri involvement in ongoing management of freshwater resources reflects the spirit of Te Tiriti o Waitangi and the principle of kaitiakitanga. • Policies and rules on taking, use, damming, diversion and discharge of water are designed to protect the relationship of Te Aupōuri values with freshwater as a matter of national importance.	The proposals recognise freshwater as nationally significant and promote the taking of freshwater under conservative allocation limits. The relationship of Te Aupōuri values with freshwater has not been thoroughly assessed as would occur through a CIA process. However, it is anticipated that the value Te Aupouri seek to gain from their water resources be reflected in decision-making by the NRC.
	WM4.2 To require that aquifers are valued and protected. This means: • Ensuring a higher rate of recharge then abstraction and • Continuing to improve our understanding of the aquifer resource, the relationships between aquifers and surface water, and the movement of water within aquifers.	The AAGWM-2020 was developed through collection and analysis of all available data within the Aupouri deep shellbed aquifer area to characterise both catchment and aquifer physical conditions, climate and historical water use. Based on key statistics, the total level of proposed allocation, including current consents, represents only 6% of annual recharge and approximately 0.5% of the water stored in the aquifer. This compares to the proposed national

		standard of 15% of average annual recharge for coastal aquifers[6]. The applications were assessed using the AAGWM-2020 that incorporated all available resource data (at the time) such as bore logs and groundwater levels from revised ground surface elevations. The GMCP requires ongoing monitoring of water chemistry, levels, and of wetland water levels and ecology.
	WM4.3 Water quality and quantity limits must recognise and provide for Te Aupōuri values and interests, and therefore deliver cultural and environmental outcomes. This means flows and limits that are developed and implemented must recognise and provide for: • Oranga and the eco-cultural system as first order priorities; • Kaitiakitanga; • The principle of ki uta ki tai; • A precautionary principle when information about a waterbody is uncertain or incomplete; • The relationship between water quality and water quantity; • The relationship between groundwater and surface water; • The relationship and interactions between aquifers; • The effects of land use on water quality and quantity; • The effects of climate change and saltwater intrusion;	The health of the aquifer will be maintained under the proposed levels of abstraction which cumulatively will not exceed an allocation limit. Furthermore, restrictions on taking are being developed according to environmental monitoring data obtained. Hydrogeologists are fairly confident that connectivity with surface resources is limited such that effects on instream values and uses would be no more than minor. However, where knowledge of connectivity is limited (e.g., areas of the Kaimaumau-Motutangi wetland complex), monitoring and restrictions on taking have been proposed through the GMCP. Similarly, the effects of saline intrusion have been modelled as being minor but the GMCP has been proposed to manage residual uncertainty

[6] Ministry for the Environment. 2008. *Proposed National Environmental Standard on Ecological Flows and Water Levels: Discussion Document* (ISBN: 978-0-478-30214-1).

	• Assimilative capacity of catchments, and associated limits; • Cumulative effects; and • River mouth and lagoon dynamics, including duration and frequency of openings.	of effects of saline intrusion which can affect the quality of drinking water. Most potable bore supplies access shallow groundwater and not the deep shellbed. As such, reliability of supply is dependent on rainfall due to limited aquifer storage. The relationship between shallow and deep groundwater has been modelled and conservative estimates of drawdown in both were assessed as having minor effects on bore owners. As such, a decision to notify all persons who take and use water within the model domain was made by the NRC. Due to uncertainty with bore records held by NRC, approximately 4,000 property owners/occupiers were given limited notification of the proposals and around 113 submissions were received in response. Environmental baseline levels of salinity, groundwater level, and wetland water levels have been set in the GMCP so that if these levels are exceeded, a restriction regime is activated. It is expected that, subject to the GMCP and conditions of consent, the proposals recognise and provide for the values as prioritised.
	WM4.4 To require the use of a range of tools and initiatives to achieve policy WM4.3, including but not limited to: • Consultation with Te Rūnanga Nui o Te Aupōuri about waterways and the flows required to sustain specific cultural values.	TADCL is an applicant. Water meters are proposed for all takes. Cultural monitoring has not so far been included but can be if necessary. Due to the time-sensitive nature of much of the monitoring, it is being delivered by consultants.

	• Stock water not be exempt from flow and allocation plans; and
	• Mandatory water metering on all water takes, as a condition of consent;
	• Recognition and use of indigenous monitoring and assessment tools to compile base line information and assess the state of freshwater resources, including but not limited to:
	  ○ Cultural opportunity mapping, analysis, and response (COMAR) projects; and
	  ○ Cultural health index.
	• Opportunities for local communities and schools to partake in monitoring and assessment of the state of freshwater resources, to inform and educate communities, and exercise kaitiakitanga;
	• An appropriate and effective data and monitoring framework to inform decision-making with a robust evidence base;
	• Ensuring that water-use efficiency criteria applies to all water users – new and existing permit holders; and
	• Supporting activities and strategies to improve the efficiency of water use in urban and rural situations.
		However, Iwi are being approached to undertake monitoring (i.e., Ngai Takoto have been involved in the monitoring of Kaimaumau-Motutangi wetland for the MWWUG consents and NRC State of the Environment reporting).
		The reasonable and efficient use of the water was assessed using a soil water balance model. ISP's which establish parameters for efficient management of irrigation systems have been proposed. The overall purpose of ISP's are to set out how the irrigation will be undertaken to ensure that at least 80 percent of the annual volume of water applied to the irrigable area is retained in the soil in the root zone of the crop, compared to the average gross depth of water applied to the crop.

	WM4.5 To advocate for a maximum of a 15-year duration on water permits, and consent terms to reflect the: • Level of existing knowledge about the resource; • Risk to the resource; • Nature of the activity supported by the take and use of water and discharge to water, and justification for amount of take or discharge applied for; and	Consent durations of 30 years have been proposed for most applicants, with the exceptions of; • TACDL have sought a consent duration of 20 years

	• With conditions to review and revoke the permit if permit conditions are not upheld.	• Te Rarawa Farming Ltd and Te Make Farms Ltd have sought a consent duration of 25 years. The consent durations sought recognise the significant investments required to secure water and capital to develop the land (i.e., bore construction, water supply distribution, irrigation, plant health maintenance, employee wages, etc). The durations also reflect the security of environmental protections proposed through the significant monitoring programme and environmental response restrictions. Review conditions have been proposed.
WATER QUALITY		
Issue	**Policies**	**Comment**
The decline in water quality in the region as a result of point and non-point source pollution, low flows and loss of wetlands and riparian areas.	WM5.1 To require that the improvement of water quality in the rohe is recognised as a matter of regional and immediate importance.	In the context of these applications, saline intrusion is an effect on water quality as a result of taking water. The AAGWM-2020 and current monitoring demonstrates that, while saline intrusion likely occurs under natural conditions in some locations, notably nearer the east coast where the basement rock is shallower, the proposed groundwater takes are likely to have minimal impact in terms of increasing saline intrusion. This has been evident from the groundwater level patterns observed from existing orchard
	WM5.2 To require that water quality in the rohe is of a standard that protects and provides for the relationship of Te Aupōuri to freshwater. This means that: • Marae and communities are supported in having access to safe, reliable, untreated drinking water; • Te Aupōuri and the wider community can engage with waterways for cultural and social well-being.	

	WM5.9 To take a precautionary principle when the full effects or risk associated with activities with the potential to negatively impact on water quality are uncertain or incomplete.	bore water level monitoring where strong water level recovery during the winter recharge period is consistently observed.
	WM5.17 To require that local authorities afford appropriate weight to tangata whenua values when assessing the costs and benefits of activities that may have adverse effects on water quality.	It is anticipated that appropriate weight to tangata whenua values has been given within the applications where environmental health was promoted well above any economic benefits in assessing the proposals. Not only do the applications comply with allocation limits, but they were also assessed using extensive modelling to define actual and potential adverse environmental effects and to distinguish suitable volumes to support the intended uses. Monitoring and contingency conditions have been proposed to manage any residual risk on saline intrusion effects that modelling may have as to the certainty of predictions of effects modelled.
WETLANDS, PUNA, AND RIPARIAN RIGHTS		
Issue	**Policies**	**Comment**
Loss of wetlands, puna and riparian margins, and the eco-cultural values associated with them.	WM11.1 To recognise and protect all wetlands, puna and riparian areas as places of cultural importance that provide important cultural and environmental benefits, including but not limited to: • Mahinga kai habitat; • The provision of resources for cultural use; • Cultural well-being; • The maintenance and improvement of water quality; and	A CIA has not been prepared for these proposals therefore definitive conclusion that places of cultural importance have been recognised for protection cannot be made. What can be verified however is that the proposals are consistent with the RPS policies as relate to the maintenance and enhancement of significant indigenous ecological areas and habitats, including that actual or potential adverse effects

	• Natural flood and drought protection.	are avoided in the coastal environment, and outside the coastal environment, are avoided, remedied or mitigated on; *(a) Indigenous taxa that are listed as threatened or at risk in the New Zealand Threat Classification System lists;* *(b) Areas of indigenous vegetation and habitats of indigenous fauna, that are significant using the assessment criteria in Appendix 5;* *(c) Areas set aside for full or partial protection of indigenous biodiversity under other legislation.* The maintenance of water quality has been discussed against Policies WM5.1, WM5.2, WM5.9, and WM5.17.
	WM11.2 To protect, restore and enhance remaining wetlands, puna and riparian areas by: • Maintaining accurate maps of existing wetlands, puna and riparian margins	
	WM11.7 To require that puna are recognised as places of cultural importance in district and regional plans. This means: • Explicit recognition of the value of puna to tangata whenua; • Effective policies, rules and methods to protect puna from abstraction, stock access, drainage and run-off, including prohibiting any direct discharge and requiring riparian margins to buffer adjacent land use; and • Explicit objectives to restore degraded puna	

Papatūānuku

Objectives:

The oranga of land and soil resources is protected mō ngā uri whakatupu.

Rural and urban land use occurs in a manner that is consistent with land capability, the assimilative capacity of waterbodies and the limits and availability of water resources.

Te Aupōuri has a prominent and influential role in urban and rural planning and development.

Regional policy, planning and decision making in the rohe reflects the particular interest of Te Aupōuri in indigenous biodiversity protection, and the importance of mahinga kai to Te Aupōuri culture and traditions.

The taonga value of indigenous ecosystems as natural capital and provider of essential ecosystem services is increasingly valued in the community.

The protection and enhancement of indigenous biodiversity and mahinga kai occurs through a shared, coordinated effort between tangata whenua, local authorities, conservation groups and communities.		
INTENSIVE RURAL LAND USE		
Issue	**Policies**	**Comment**
Basic principles of land management from a tangata whenua perspective.	P1.1 To approach land management in the rohe based on the following basic principles: • Ki uta ki tai; • Mō ngā uri whakatupu; and • The need for land use to recognise and provide for natural resource capacity, capability, availability, and limits; and • the assimilative capacity of lands and waters. As a means to: • Protect eco-cultural systems; • Promote a holistic approach to managing resources; • Identify and resolve issues of significance to tangata whenua, including recognising the relationship between land use and water quality and water quantity; • Provide a sound cultural and ecological basis for assessments of effects of particular activities; and • Recognise and provide for the relationship between healthy land, air and water and cultural well-being.	While land use consents are not proposed as part of these applications, these policies are still relevant in the context of water quantity management. Water quantity limits, as currently established through the PRP, have been adhered to with no proposal seeking to exceed an allocation limit. The NRC confirms through their evaluative and recommending reports that the PRP water quantity limit setting process Climate change predictions were included in the setting of the PRP allocation limits. It is recognised that the assessment and proposed conditions may not necessarily provide sound cultural basis for assessment of effects of the activities as this would need to be established by tangata whenua.
	P2.4 To require that rural land and water planning, management and use recognise and provide for • Water quality and quantity limits; • The effects of climate change on those thresholds and limits;	

	• The protection of eco-cultural systems and resources.	
	P2.8 To require that land use and water abstraction consents associated with intensive rural land use are assessed and evaluated together as joint consents.	
MAHINGA KAI		
Issue	**Policies**	**Comment**
Loss of mahinga kai and opportunities in the rohe.	P14.5 To require that freshwater management recognises and provides for mahinga kai, by: • Protecting indigenous fish recruitment and escapement by ensuring that waterways flows *ki uta ki tai* and there is sufficient flow to maintain an open river mouth.	Hydrogeologists are fairly confident that connectivity with surface resources is limited such that effects on instream flows, values, and uses would be no more than minor. However, where knowledge of connectivity is limited (e.g., areas of the Kaimaumau-Motutangi wetland complex), monitoring and restrictions on taking have been proposed through the GMCP.
	P14.7 To require that district and regional plans include policy and rules to protect, enhance and extend existing remnant wetlands, puna, riparian margins and native forest remnants in the rohe given the importance of these ecosystems as mahinga kai habitat.	Simulated effects of the groundwater abstractions indicate adverse effects on existing wetlands and puna would be no more than minor. To manage uncertainty in model predictions, conditions of consent and the GMCP impose an adaptive management approach to the proposed development of the freshwater resource.
INDIGENOUS BIODIVERSITY		
Issue	**Policies**	**Comment**

The widespread loss of indigenous biodiversity has significant adverse effects on the relationship of Te Aupōuri with ancestral land, water and sites, and the health of land, water and communities.	P15.1 To require that local authorities and central government actively recognise and provide for the relationship of Te Aupōuri with indigenous biodiversity and ecosystems, and interests in biodiversity protection, management and restoration, including but not limited to: • Importance of indigenous biodiversity to tangata whenua, particularly with regard to mahinga kai, species of cultural importance, customary use and valuable ecosystem services; • Recognition that indigenous biodiversity has significant cultural heritage value for Te Aupōuri as expressed by a healthy eco-cultural system; • Connection between the protection and restoration of indigenous biodiversity and cultural well-being; • Role of mātauranga Te Aupōuri in biodiversity management.	A CIA has not been prepared for these proposals therefore definitive conclusions on the effects on the relationship of Te Aupōuri with indigenous biodiversity and ecosystems, and interests in biodiversity protection, management and restoration cannot be given. However, scientific analysis, supported by adherence to conservative allocation limits an adaptive management regime and proposed consent conditions, demonstrates that the proposals are consistent with the RPS policies as relate to the maintenance and enhancement of significant indigenous ecological areas and habitats, including that actual or potential adverse effects are avoided in the coastal environment, and outside the coastal environment, are avoided, remedied or mitigated on; *(a) Indigenous taxa that are listed as threatened or at risk in the New Zealand Threat Classification System lists;* *(b) Areas of indigenous vegetation and habitats of indigenous fauna, that are significant using the assessment criteria in Appendix 5;* *(c) Areas set aside for full or partial protection of indigenous biodiversity under other legislation.*
	P15.2 To require that criteria for assessing the significance of ecosystems and areas of indigenous biodiversity recognise and provide for the eco-cultural system.	Significant indigenous vegetation and significant habitats of indigenous fauna in terrestrial, freshwater and marine environments would be

	P15.7 To require that indigenous biodiversity is recognised and provided for as the natural capital of Papatūānuku, providing essential and invaluable ecosystem services.	assessed using the Appendix 5 RPS criteria which may not recognise and provide for the eco-cultural system.
Tangaroa Objectives *The connections between land use, freshwater quality, and coastal water quality are appropriately recognised and provided for; The role of tangata whenua as kaitiaki of the coastal environment and sea is recognised and provided for in coastal and marine management;*		
COASTAL AREAS		
Issue	**Policies**	**Comment**
Protecting the eco-cultural values of coastal areas, including the beds and margins of coastal wetlands, estuaries and lagoons.	T2.3 Environmental flow and water allocation regimes must protect the cultural and ecological value of coastal wetlands, estuaries and lagoons. This means: • Sufficient flow to protect mahinga kai habitat and indigenous biodiversity and maintain sea water freshwater balance; • Water quality to protect mahinga kai habitat and indigenous biodiversity; and • Continuous and reliable flow to ensure mahinga kai have unhindered access to the sea.	Hydrogeologists are fairly confident that connectivity with surface resources is limited such that effects on instream flows, values, and uses would be no more than minor. However, where knowledge of connectivity is limited (e.g., areas of the Kaimaumau-Motutangi wetland complex), monitoring and restrictions on taking have been proposed through the GMCP.

Appendix A – Site Map of Applications

Map ID	Application Number	Name (abbreviated)	Daily Volume (m3)	Annual Volume (m3)
1	APP.039859.01.01	Te Aupouri Commercial Development Ltd	10,735	1,170,000
2	APP.040601.01.01	Waikopu Avocados Ltd *	736	83,360
3	APP.017428.02.01	Henderson Bay Avocados Ltd *	178	19,000
4	APP.040600.01.01	Far North Avocados Ltd	240	32,000
5	APP.041211.01.01	P McGlaughlin	700	78,400
6	APP.040121.01.01	NE Evans Trust & WJ Evans & J Evans	1,675	160,000
7	APP.040231.01.01	P&G Enterprises (PJ & GW Marchant)	350	28,000
8	APP.039644.01.01	MP Doody & DM Wedding	2,375	304,000
9	APP.040397.01.01	A. Matthews	95	12,000
10	APP.040652.01.01	SE & LA Blucher	720	96,000
11	APP.040919.01.01	NA Bryan Estate, SG Bryan, CL Bryan, KY Bryan, Valadares & D Bryan (property 1)	500	80,000
12	APP.040979.01.01	MV Evans (Property No 2)	1,125	126,000
13	APP.040558.01.01	MV Evans (Property No 1)	350	36,400
14	APP.040130.01.01	Tuscany Valley Avocados Ltd (M Bellette)	375	36,000
15	APP.040918.01.01	NA Bryan Estate, SG Bryan, CL Bryan, KY Bryan, Valadares & D Bryan (property 2)	1,000	160,000
16	APP.008647.01.06	Avokaha Ltd (c/- K Paterson & A Nicholson) *	70	5,600
17	APP.039628.01.02	KSL Ltd (C/- S Shine) *	90	3,600
18	APP.040361.01.01	Tiri Avocados Ltd	3,876	581,250
19	APP.040362.01.01	Valic NZ Ltd	1,158	173,700
20	APP.040363.01.01	Green Charteris Family Trust (Wataview Orchards)	225	33,750
21	APP.039841.01.02	Mate Yelavitch & Co Ltd	450	52,000
22	APP.040386.01.01	Robert Paul Campbell Trust	3,350	360,000
23	APP.040364.01.01	Elbury Holdings Ltd (c/-K J & F G King)	1,875	200,000
24	APP.020995.01.04	Te Rarawa Farming Ltd and Te Make Farms Ltd *	10,705	776,000
Total			**42,953**	**4,607,060**

Applications to take and use water from the Aupōuri Aquifer

Assessment of Iwi Environmental Management Plan Provisions – Te Rūnanga o NgāiTakoto

Prepared: June 2020

By: Martell Letica

Approved for release by: Craig Wells

Glossary of Abbreviations used in Document	
AEE	Assessment of Environmental Effects, prepared by Williamson Water & Land Advisory Ltd
AAGWM-2020	Aupōuri Aquifer Groundwater Model (February 2020)
CIA	Cultural Impact Assessment
FNDC	Far North District Council
GMCP	Groundwater Management and Contingency Plan
NRC	Northland Regional Council
NTEMP	Ngāi Takoto Environmental Management Plan (June 2018) (EMP).
NPS-FM	National Policy Statement for Freshwater Management 2014 (amended 2017)
NRC	Northland Regional Council
PRP-2017	Proposed Regional Plan (Notified version, September 2017)
PRPMay-2019	Proposed Regional Plan (Decision version, May 2019)
PRPJuly-2019	Proposed Regional Plan (Appeals version, July 2019)
RMA	Resource Management Act 1991
RPS	Regional Policy Statement for Northland 2016
WWLA	Williamson Water & Land Advisory Ltd

Contents

1. The Proposals

In the period between February 2018 and August 2019, the Northland Regional Council (NRC) received 24 applications for new groundwater takes from the deep shell bed aquifer of the Aupōuri Peninsula to service proposed and existing avocado orchards at multiple locations. Table 1 below provides each application number, the applicant's name and the requested volume of water. Locations of each application are illustrated in the figure in Appendix A.

Table 1: Aupouri aquifer water permit applications

Map ID	Application Number	Applicant's Name	Daily volume (m3)	Annual volume (m3)
1	APP.039859.01.01	Te Aupouri Commercial Development Ltd	10,735	1,170,000
2	APP.040601.01.01*	Waikopu Avocados Ltd	736	83,360
3	APP.017428.02.01*	Henderson Bay Avocados Ltd	178	45,000
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22	APP.040386.01.01	Robert Paul Campbell Trust	3,350	360,000
23	APP.040364.01.01	Elbury Holdings Ltd (C/-K J & F G King)	1,875	200,000
24	APP.020995.01.04*	Te Rarawa Farming Ltd and Te Make Farms Ltd	10,705	776,000
		Total	**54,886**	**6,230,662**

2. Northland Freshwater Planning Framework – Cultural Values

Insufficient engagement of tangata whenua and the failure to identify issues and potential impacts on their values can lead to inappropriate management with more than minor adverse effects resulting.

The RMA in Schedule 4 requires an assessment of cultural effects and effects on cultural values. However, the approach to assessing effects of cultural effects and effects on cultural values differs significantly throughout the country.

The PRP contains policies which guide resource developers and Council alike on where particular focus is required to identify the resources/activities for which a full analysis on tangata whenua is required and what this would consist of. These policies are as follows.

Policy D.1.1 states that an assessment of effects of an activity on tangata whenua and their taonga is required if one or more the following is likely;

1) *adverse effects on mahinga kai[163] or access to mahinga kai[164], or*
2) *any damage, destruction or loss of access to wāhi tapu, sites of customary value and other ancestral sites and taonga with which Māori have a special relationship[165], or*
3) *adverse effects on indigenous biodiversity in the beds of waterbodies or the coastal marine area where it impacts on the ability of tangata whenua to carry out cultural and traditional activities[166], or*
4) *the use of genetic engineering and the release of genetically modified organisms to the environment, or*
5) *adverse effects on tāiapure, mataitai or Māori non-commercial fisheries, [167] or*
6) *adverse effects on protected customary rights, [168] or*
7) *adverse effects on sites and areas of significance to tangata whenua mapped in the Regional Plan (refer I Maps |Ngā mahere matawhenua).*

[161] The RMA definition of tangata whenua is "in relation to a particular area, means the iwi, or hapū, that holds mana whenua over that area". For an analysis of effects, the appropriate iwi or hapū will need to be identified. Council officers will be available to assist with this.

[162] An analysis of effects on tangata whenua and their taonga may be necessary in circumstances not outlined in this policy – it will depend on the circumstances.

[163] Food and places for obtaining natural foods and resources. The work (mahi), methods and cultural activities involved in obtaining foods and resources.

[164] This includes, for instance, kai awa (river food) kai repo (swamp food) and kaimoana (sea food).

[165] This includes, for instance, impacts on the quality of water used for ceremonial purposes.

[166] This includes, for instance, use of rongoa (medicinal) plants, and uses for raranga (weaving).

[167] Māori non-commercial fisheries are defined in the Fisheries Act 1996.

[168] As defined by the Marine and Coastal Area (Takutai Moana) Act 2011.

From the criteria set out in Policy D.1.1, (1) and (3) are relevant. As such, an analysis of effects on tangata whenua and their taonga is required and according to Policy D.1.2 must;

1) include such detail as corresponds with the scale and significance of the effects that the activity may have on tangata whenua and their taonga, and
2) have regard to (but not be limited to):
a) any relevant planning document recognised by an iwi authority (lodged with the Council) to the extent that its content has a bearing on the resource management issues of the region, and
b) the outcomes of any consultation with tangata whenua with respect to the consent application, and
c) statutory acknowledgements in Treaty Settlement legislation, and
3) follow best practice,[169] including requesting, in the first instance, that the relevant tangata whenua undertake the assessment, and
4) specify the tangata whenua that the assessment relates to, and
5) be evidence-based, and
6) incorporate, where appropriate, mātauranga Māori, and
7) identify and describe all the cultural resources and activities that may be affected by the activity,[170] and
8) identify and describe the adverse effects of the activity on the cultural resources and cultural practices (including the effects on the mauri of the cultural resources, the cultural practices affected, how they are affected, and the extent of the effects), and
9) identify, where possible, how to avoid, remedy or mitigate the adverse effects on cultural values of the activity that are more than minor, and
10) include any other relevant information.

[169] *Best practice can be determined by relevant professional bodies.*

[170] *The full range of effects defined in Section 3 of the RMA need to be considered.*

3. Purpose of this Document

The purpose of this document is to identify and describe NgāiTakoto freshwater values as relates to the activity of taking and using water restricted under Section 14 of the RMA.

While the use of water is often linked with land use[1] and discharge[2] activity, this document only identifies eco-cultural values (highlighted as issues), and policies associated with the direct activities of taking and using groundwater. As such, it is fully acknowledged that, while this document contains an assessment on eco-cultural values, the tangata whenua concept of the environment as a connected whole is not fully incorporated by isolating specific qualities and measures in a scientific approach to freshwater abstraction and use.

Approval of the preparation of this document has been given by Craig Wells of Te Runanga o Ng āiTakoto on the understanding that it does not constitute a Cultural Impact Assessment (CIA) but does provide review analysis of the proposals against available literature.

In preparing this document, the following have been given regard to;

- Deed of Settlement with the Crown (including relevant Statutory Acknowledgements); and
- Te Iwi o NgāiTakoto Environmental Management Plan (NTEMP).

[1] As restricted under Section 9 of the RMA.
[2] As restricted under Section 15 of the RMA.

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4. Whakapapa

Before conversations around values of freshwater are initiated, knowing where the water comes from and where all values come from is essential. This can often be established through Whakapapa.

NgāiTakoto whakapapa is described in the moteatea – *Tuwhakatere te tangata*;

Tūterangiātohia te wahine tuatahi

i puta a Tamahui, kapakapa te manawa, maranga kei runga i Tutatarakihikihi..

Te wahine tuarua, ko Tūpoia o Ngati Kahu, nāna a Hoka, whakamomori ai tana matua aa puta ai nga uri o NgāiTakoto Iwi e..

Ka huri ki Maunga Taniwha tū ai Tūwhakatere

Ki te Tai Hauauru ki te Tai Rāwhiti atu ki te tai o Te Raki ki muri ko te Tonga e …

Ko te mana moana, ko te mana whenua , ki raro, ki waenganui, ki runga ki te rangi e

Ko nga awa tuku iho ko te noni o te wai ki nga ngāhere ki nga takutai moana Te Tino Rangatiratanga e

Ki Rangi Āniwaniwa, te Pū o Te Wheke

Ko maunga Tohora whakawhiti ki Hukatere anga atu ki Ngāpae e …

Rere atu ki te roto o Ngātu ko Roto Kawau

ki nga repo o Waihārara me Waireka

Titiro atu ki Okiore, Ohutu, Ohinu, Otararau, ki Tangonge kake atu ki Ngākohu, Okahu Kohukohu e …

Taka atu ki te awa Whangatane, heke atu ki Awanui, ki Oinu Maungatakuere …,

Aha Whakakī whakakaka ki Kaitaia Kerekere

Ko Ta Ika Hunuhunu ko Te Tawawhaturoa wehewehe ai

Ka tutataki ki te wahapū o Rangaunu – Houhora – Wharemaru e

Ko Kareponia tena Mahimaru, Waimanoni, ki te Paparore heke atu ki Kaimaumau e

Nga Ahikā, Nga uri whakaheke, nga Patu Harakeke o te rohe hi NgāiTakoto

Hl … Tau ana

(Kai tito - Tame Kahiti Murray)

5. Settlement with the Crown

The Treaty of Waitangi was signed by Māori rangatira, or chiefs, and representatives of the British Crown in 1840. The Treaty has 3 articles.

The Treaty:

- gave sovereignty in New Zealand to the British Crown
- enabled Māori to keep rangatiratanga, or chieftainship, over their resources, while giving the Crown first rights to any land being sold after that time, and
- guaranteed Māori the rights and privileges of British citizens.

Historical claims are made by Māori against the Crown for breaches of the Treaty — times when the Crown didn't uphold 1 or more of these articles — before 1992.

Historical settlements aim to resolve these claims and provide some redress to claimant groups.

The NgāiTakoto historical grievances against the Te Tiriti o Waitangi were settled with the Crown and legislated under the NgāiTakoto Claims Settlement Act 2015.

5.1. Summary of Historical Account

The following account is taken from Section 8 of the the NgāiTakoto Claims Settlement Act 2015[3].

> *Traditionally, the NgāiTakoto rohe is defined by the journeys taken by spirits as they return to their spiritual homeland of Hawaiki, stretching from the southern boundary of Ahipara in the west and Rangaunu in the east, northward to Te Rerenga Wairua (Cape Reinga).*
>
> *Prior to the arrival of Europeans, NgāiTakoto were largely based around various pa and kainga Kapowairua, Parengarenga, Houhora, Waimanoni, Kaitaia, and Te Make. Like other Te Hiku iwi, they were highly mobile, relying on the coast and local waterways for kai and passage.*
>
> *British missionaries were some of the first settlers to establish themselves within the NgāiTakoto rohe. The local iwi initially saw advantages with the arrival of settlers, through the introduction of new technologies and access to the European world, and the benefits these might bring.*
>
> *Numerous land agreements with settlers occurred throughout the 1830's, covering much of the NgāiTakoto rohe. While some of the deeds provided for ongoing use of land by local Māori, they were signed by rangatira from other iwi, and NgāiTakoto had limited involvement in the transactions.*
>
> *NgāiTakoto signed Te Tiriti o Waitangi/the Treaty of Waitangi in Kaitaia on 28 April 1840. After the signing of the Treaty, the Crown appointed land claims commissioners to investigate pre-Treaty land claims. The commissioners' final recommendation*

[3] The EMP, at Section 2.2 (page 21), also contains historical account of Te Tiri o Waitangi breaches.

confirmed the alienation of an initial 32,000 acres of land in the NgāiTakoto rohe: settlers received 17,000 acres and 15,000 acres went to the Crown as surplus land. NgāiTakoto with interests in these lands received 450 acres.

Unlike the terms of the original land transactions, the new Crown grants did not allow for NgāiTakoto to continue to use cultivation areas and kainga in Te Make, Ohotu, Awanui, and numerous other traditional areas. The loss of rights to land along the Awanui River was especially hard as it limited access to river resources and fertile land. Moreover, some of the proposed 450 acres of reserves were never established.

In 1844, NgāiTakoto lost further land rights in the forced cession of almost 2,500 acres at Ruatorara (East Beach) when the Crown demanded another iwi provide compensation to a settler over an incident involving a ship in Ahipara.

In 1858 and 1859, before the pre-Treaty transactions were finalised, the Crown purchased an additional 4 land blocks (Muriwhenua South, Wharemaru, Oinu, and Ahipara), totalling 112,613 acres, in which NgāiTakoto had mana whenua interests. As with previous transactions, NgāiTakoto had no involvement in these arrangements, nor were they able to retain any of the reserves created from these Crown purchases, including the Houhora Peninsula, which totalled 7,500 acres.

By 1859, NgāiTakoto were virtually landless. The loss of their lands severely affected their ability to access and manage traditional natural resources, destroyed their cultural foundations and undermined their tribal structures.

5.2. NgāiTakoto Rohe

The Deed of Settlement and NgāiTakoto Claims Settlement Legislation (2015) recognises two distinct boundaries – the NgāiTakoto Area of Interest (Historical boundary) and the NgāiTakoto Contemporary Boundary as replicated below in Figure 1.

Through the settlement legislation, NgāiTakoto retain their historical claim area whilst recognising the respective Iwi on the peninsula are "connected people" and that past Iwi/tribal boundaries need to be recognised in order to achieve a settlement of the Muriwhenua claims. The peninsular Iwi being; Ngāti Kuri, Te Aupōuri and NgāiTakoto. The Southern Iwi (Te Rarawa) being Ahipara South to the Hokianga region. According to NgāiTakoto, the geographical position of Ngāti Kahu does not require any such accommodation on the peninsula.

In this regard, within the settlement claims process NgāiTakoto undertook to implement processes and protocols with their iwi relatives that sought to achieve resolutions in the areas of "same interests" or in areas of identified dispute on matters pertaining to the traditional NgāiTakoto rohe, NOT however within their contemporary rohe as identified below in Figure 1.

Figure 1: NgāiTakoto rohe.

5.3. Statutory Acknowledgement Areas

Settlement legislation includes redress of grievances through statutory acknowledgements. A statutory acknowledgement is a formal acknowledgement by the Crown recognising the mana of tangata whenua in relation to a specified area. It recognises the particular cultural, spiritual, historical, and traditional association of an iwi or hapū with the statutory area.

Statutory acknowledgements are only over Crown-owned land and may apply to rivers, lakes, wetlands, landscapes, estuaries/harbours and other coastal areas. Where a statutory

acknowledgement is noted regarding a river, lake, wetland or coastal area, the acknowledgement only applies to the bed, being Crown-owned.

NgāiTakato statutory areas subject to statutory acknowledgement and deed of recognition include the following sites;

Lake Rotoroa	As shown on OTS-073-02
Lake Heather (Wai Te Huahua)	As shown on OTS-073-03
Lake Waikaramu	As shown on OTS-073-04
Kowhai Beach	As shown on OTS-073-05
Whangatane Spillway	As shown on OTS-073-06
Awanui River	As shown on OTS-073-07
Rarawa Beach Campground	As shown on OTS-073-08
Southern part of Waipapakauri Conservation Area	As shown on OTS-073-09
Lake Ngatu Recreation Reserve	As shown on OTS-073-01

Statutory acknowledgements include requirements for consenting authorities to:

- have regard to effects on statutory acknowledgment areas when determining notification of resource consent applications, and
- provide summaries of resource consent applications to the iwi or hapū.

5.4. Cultural Sites Transferred to NgāiTakoto

A total of ten properties vested in NgāiTakoto and six jointly vested in one or more Te Kiku Iwi, totalling 1,353 hectares were transferred as detailed in the Deed of Settlement in recognition of the traditional, historical, cultural and spiritual association of NgāiTakoto with these sites.

There are a number of other properties which are sites of significant cultural value to NgāiTakoto in ownership by others - including the Far North District Council (FNDC).

5.5. Other Sites of Significance to NgāiTakoto

NgāiTakoto, as Mana Tangata, have identified the following sites where they have cultural, spiritual, historical and traditional associations to exercise mana whenua/kaitiaki responsibilities over (Figure 2).

Figure 2: NgāiTakoto Sites of Significance.

Site names are listed in Appendix B to this document.

5.6. Property rights in freshwater

Property rights in freshwater are the subject of as yet unresolved claims.

Tangata whenua from Taitokerau have been involved in a claim to the Waitangi Tribunal, and iwi in the region are engaged with the issue through the national Freshwater Iwi Leaders Group.

This document focuses on the management of fresh water arising from tangata whenua values and interests as currently legislated and what may be considered under the RMA.

6. Evaluation of Environmental Management Plan

The purpose of the NTEMP is described as:

1) *Provides the overarching position of NgāiTakoto on the NgāiTakoto environment;*
2) *Consolidates and describes NgāiTakoto values, principles, knowledge and perspectives on, relationship with, and objectives for natural resources and the environment;*
3) *Underpins the development of a consistent and integrated approach to environmental management within the NgāiTakoto rohe;*
4) *Describes NgāiTakoto environmental issues;*
5) *Provides tools to enhance NgāiTakoto Mana Whakahaere and Kaitiakitanga, particularly when participating in resource and environmental management through:*
    a) *Influencing the development of all environmental policies and plans that affect NgāiTakoto;*
    b) *Establishing a framework for resource and environmental management to support iwi members, whether as whanau, marae, hapu, or whatever grouping NgāiTakoto, from time to time, choose to adopt;*
    c) *Providing mechanisms to restore and protect the natural environment of NgāiTakoto, whilst recognising the benefits to local communities;*
    d) *Actively contributing to the co-management of Te Oneroa A Tohe;*
    e) *Actively contributing to the co-management of the Korowai agreement;*
    f) *Influencing local and national decision makers;*
    g) *Providing a guide for resource users, or developers, in the NgāiTakoto rohe;*
    h) *Affecting how and where development may occur; and*
    i) *Providing guidance to external agencies regarding our NgāiTakoto values, principles, knowledge and perspectives on, the relationship with, and objectives for natural resources and environmental management.*
    j) *Providing clear and consistent issue statements, policies, and methods to manage natural resources.*

In evaluating the proposals against the NTEMP, the work undertaken by the NRC with Ministry for Primary Industries and Ministry for the Environment[4] to identify the tangata whenua freshwater values has been had regard to as well, in particular the listed operational level values identified as:

- Crystal clear water (in specific water bodies);
- Fish stocks; Tuna; Repo; and
- Safe swimming/safe drinking (in specific water bodies).

These values are referred to as 'default values' in this document as the NTEMP contains specific direction on eco-cultural values for Te Runanga o NgāiTakoto. Therefore, the default values are only used to make assessment in the absence of specific direction in the NTEMP.

[4] Northland Regional Council, Ministry for Primary Industries, and Ministry for the Environment, August 2015. Northland Tangata Whenua Freshwater Values (Final Draft).

WAI (Water) Objectives	
That the concept of kaitiakitanga as defined by NgāiTakoto is applied to the management of natural and physical resources. *Preservation of the mauri of watercourses.* *Water quality standards for ecosystems, recreational, cultural and water-use values are identified.* *Contaminant discharges to waterways are minimised, controlled and monitored to ensure standards are met.* *Water abstraction is sustainably managed.* *The impact of intensive farming practices is better controlled.* *Traditional knowledge systems are acknowledged.*	*Water allocation is managed in a sustainable manner.* *Active involvement and participation of NgāiTakoto in the water allocation process.* *Traditional knowledge systems are acknowledged and protected.* *Long-term commitment to formal co-management and co-governance of specific freshwater resources.*
Environmental effects	
ISSUES - Underground aquifers must be protected from saltwater intrusion. - The negative impacts on the diversity of Mahinga Kai species due to insufficient flow. - negative consequences of water take or abstraction mean that catchment areas, rivers, streams and underground aquifers are under ever increasing pressure.	BROAD NTEMP POLICIES *1. That Ngāi Takoto identify in conjunction with Council's, water management areas that are most affected by water extraction and promote innovative, sustainable management practices concerning water in these areas.* *4. That the mauri of the awa and stream environment be considered to assist in the development of minimum flow regimes is incorporated into the Regional Fresh Water Plan's.*
Allocation	

ISSUES	BROAD NTEMP POLICIES
- A regime based on first in first served is not sustainable in the long term. Industry and the influence that it wields (i.e. economic development and job creation) mean that environmental concerns are at times seen as secondary or subservient. - Due consideration must be given to the length of resource consents (and their subsequent renewals) and the quantities of water extracted. - NgāiTakoto shall seek to explore co-governance and co-management arrangements for specific waterways, awa and catchment areas.	*1. That NgāiTakoto develop a framework with the relevant Council's where co-management principles of particular awa catchments can be developed and acknowledge in the Fresh Water Plan – Regional Policy Statement.* *2. That those activities that impact significantly on water are monitored by relevant agencies and NgāiTakoto participate in the monitoring feedback process to and policy development cycle (improvements and additions to the Fresh Water Plan)* *3. That NgāiTakoto develop processing steps for resource consents, with regard to specified applications for resource consent relating to identified awa and stream catchments; including and specific to water allocation to Council.*
Specific Water Catchment Areas - Aupouri aquifer, Lake Ngatu Catchment and Awanui River Catchment	
ISSUES	POLICY DIRECTION FOR LOCAL AUTHORITIES
- NgāiTakoto will seek to undertake projects with specific catchment areas when required and as an initial priority seeks to develop a specific catchment plan and strategy for key awa/water bodies potentially affected by the 24 applications seeking to take and use groundwater.	*12. Advocates that any renewal of a resource consent in our NgāiTakoto rohe must demonstrate environmental improvements on the existing conditions.* *17. Resource management, use, and activities within the Awanui River catchment in the NgāiTakoto rohe is consistent with the draft Awanui River Strategy.* *18. The Proposed Awanui River Strategy is used as a guide to resource management, use, and activities in all catchments within the NgāiTakoto rohe.* *(a) Resource management, use, and activities in catchments are consistent with visions and objectives that mana whenua support that have been developed for a river or water body.* *(b) If visions and objectives that mana whenua support have not been developed for catchments, the Proposed Awanui River Strategy is to be used as the baseline for that catchment. In this case resource management, use, and activities should be consistent with The Proposed Awanui River Strategy unless otherwise agreed with Te Runanga O NgāiTakoto.* *(c) In considering the visions and objectives that should be applied to catchments, the use of highest targets and measures are supported.*

NTEMP Methods & Procedures	Comments on Applications
1. *Seek and obtain dialogue from NgāiTakoto iwi in relation to the health of waterways and food sources found within, and work with iwi to respond to resource consent applications.* 2. *Engagement Policy Chapter 3.4, pg 110.* 3. *Meet with iwi representatives on site to discuss resource consent applications where possible.* 4. *Preparation of cultural impact assessments prior to providing written approval to a significant resource consent application.* 6. *Engage with industries and companies to ensure that the NgāiTakoto environmental position is acknowledged and understood and to minimise negative environmental impacts.* 11. *Advocate for best practice approaches and the use of new technologies and processes and seek to have them included in resource consents*	NgāiTakoto, under their rural investment company 'Te Make Farms Limited', is one of twenty-one applicants seeking to take and use groundwater from the deep shellbed aquifer through renewal and increase of a shared groundwater permit with Te Rarawa Farming (known as the 'Sweetwater Farms take'). Collectively they have commissioned the services of 'Williamson Water & Land Advisory (WWLA) to conduct an in-depth and comprehensive Assessment of Environmental Effects (AEE). NRC commissioned the expertise of Brydon Hughes of Land Water People (LWP) to peer review the AEE. In summary, both the AEE prepared by WWLA and the LWP peer review concluded that the potential effects on the environment, effects on existing groundwater users and the risk of saline intrusion to be no more than minor. NgāiTakoto state that they have taken into account the AEE, LWP and GMCP guidance, and is satisfied that effects to the environment and to various cultural aspects, including cultural use, will be no more than minor. Assessment of the local and cumulative effects of the proposed abstractions was undertaken using a numerical groundwater flow model. A key factor with regard to the application of a numerical model to simulate potential effects of groundwater abstraction is its ability to simulate spatial (and temporal in the case of a transient model) variation in groundwater levels throughout the model domain (extending from Ngataki in the north to Ahipara in the south). The reasonable and efficient use of the water was assessed using a soil water balance model. A set of conditions is being promoted which includes the use of water meters. Loggers and telemetry are being proposed for takes above 10 litres per second.
PA REPOREPO (Wetlands / Swamps) **Objectives** *Existing wetlands are protected and enhanced*	
Wetland mauri and condition, hauanga kai, habitat	

ISSUES	POLICY
Many of the remaining wetlands in Northland and their ecological functions are under constant threat due to: *(a) Adjacent land-use practices including drainage and fertiliser application;* *(b) Removal of indigenous wetland margin/riparian vegetation;* *(c) Disconnection of wetlands from their source river systems;* *(d) Unnaturally high sediment and nutrient loads; and* *(e) The impacts of introduced pest plant and animal species.*	*Improvement to the condition of existing wetlands.*
The continued decline in healthy wetland state and function has resulted in losses of important hauanga kai and habitat for natural materials used for cultural purposes and practices (flora and fauna). In turn, this has diminished the ability of NgāiTakoto to maintain conservation practices of whakatupua (growing time) and rāhui.	
NTEMP Methods & Procedures	**Comment on Applications**
To encourage improvements to local hydrology (where possible) and to support healthy wetland functions, and restoration of locally appropriate wetland biodiversity, within local planning and land management practices. *(a) Activities and resource use in, on, and around wetlands support and promote the enhancement of current and / or new wetland habitats.* *(b) Water takes from wetlands are restricted, to promote healthy wetland functions and sustainability.* *(c) Planning rules and policies prevent any further reduction of wetland areas and or reduced quality wetland conditions within the NgāiTakoto rohe.* *(e) Water levels of all significant wetlands shall be maintained and stabilised to prevent further deterioration of wetland ecological conditions and, where possible, wetland water levels shall be restored to enhance habitat and expand wetland areas. Where necessary, this shall be achieved by placing restrictions on the amount of surface and subsurface drainage installed on farmland adjacent to wetlands.*	The consensus between hydrogeologists is that most of the dune lakes and wetland complexes are perched and not hydraulically connected to the shallow aquifer given the reasonable level of monitoring data available on the dune lakes on the Peninsula. However, where uncertainty exists, monitoring will be undertaken to identify any responses to staged implementation of the groundwater takes similarly to what has occurred in the MWWUG. The proposed groundwater extraction has been modelled to have a 4.3% reduction on mean annual (1-year) low flow compared to naturalised condition (i.e., not including the effect of the proposed groundwater takes). WWLA also confirms that the model scenario chosen for assessing impacts on surface water features errs on the side of exaggerating groundwater level reduction in the shallow aquifer and at the surface because of the lack of hard pans in the model. In this regard, the calculated reduction in mean annual low flow can be considered a conservative estimate. Although the reduction in flows can be considered a less than minor effect, model uncertainty is understood to be a concern and therefore an adaptive management regime has been proposed to ensure that adverse effects on

	wetland state and function will be avoided. Ngāi Takoto supports this approach as an adaptive management regime will outline specific requirements for environmental monitoring and establish a framework identifying the mitigation of potential effects on sites of cultural significance.
TATAI TAIAO TE ARAI ITO (Natural Heritage and Biosecurity) **Objectives** *The full range of Northland ecosystem types found throughout the NgāiTakoto rohe are robust and support representative native flora and fauna.* *Cultural, spiritual and ecological features of the NgāiTakoto landscape that are significant to NgāiTakoto are protected and enhanced to improve the mauri of the land.*	
Decreased indigenous biodiversity	
ISSUES *The size, natural health, and ecological integrity of the remaining indigenous areas of vegetation within NgāiTakoto will continue to decline without additional effort to protect, and enhance them.* *The loss of indigenous trees and plants from the productive and human-occupied landscape continues to compromise the health of the natural environment by lessening the area of suitable habitat for taonga species, severing the vegetation corridors that are essential for the dispersal of indigenous species, and reducing the contaminant buffering and cleansing function that indigenous vegetation can perform.*	POLICY *To ensure that the full range of Northland ecosystem types found throughout the NgāiTakoto rohe are robust and support representative native flora and fauna.* *(a) Policies, planning, and best practice ensures no further net losses of 'Priority Ecosystems',4 and a measurable expansion of areas of Regionally and Culturally Significant Vegetation. These are areas of vegetation that NgāiTakoto recognises as regionally, culturally and/or spiritually significant.* *(b) That: Regional Council's and NgāiTakoto work together to apply areas of significance to NgāiTakoto to the Significant Natural Areas baseline to fill gaps (such as for smaller habitats that are difficult to detect at the regional scale).* *(g) NgāiTakoto involvement in local indigenous biodiversity strategies.*
Impacts to the relationship between ngāitakoto and the environment	
ISSUES *NgāiTakoto are concerned that inefficient resource development, use, associated activities and infrastructure risks are compromising and depleting the remnants*	POLICY *To ensure that there is greater protection and enhancement of cultural, spiritual and ecological features of significance to NgāiTakoto.*

of natural vegetation that remain in the region and serve as a reminder of the original natural character of the landscape.	
NTEMP Methods & Procedures	**Comment on Applications**
(a) Landscapes and view shafts that are regionally, culturally and/or spiritually significant shall be identified, protected from the adverse effects of development, and where possible, enhanced. *(g) Statutory instruments and methods promote the protection and restoration of landscapes and landscape values of importance to NgāiTakoto*	Landscape features that have been considered in the AEE have been those associated with hydrological features only, including the natural character of waterbodies and their margins. While modelling suggests less than minor effects on surface waterbodies and their margins, an adaptive management regime is being proposed to ensure adverse effects on the natural character of these features are avoided. Ngāi Takoto supports this approach as an adaptive management regime will outline specific requirements for environmental monitoring and establish a framework identifying the mitigation of potential effects on sites of cultural significance. Land-based features are currently regulated under District Plan rules. These applications do not include proposals for breaches of District Plan rules.
RITENGA TUKU IHO (Customary Activities) **Objectives** ***Ngāitakoto is able to access and undertake customary activities.***	
Access	
ISSUES *Pressures from other resource users have over-ridden traditional customary activities or natural environment characteristics in some locations. For example, the increase in farm production is considered by some to be a higher priority than restoring native and endemic species or the wairua of our waterways.*	POLICY *NgāiTakoto has access to and the ability to undertake customary activities and resource use, of those environs* POLICY - COLLABORATION *To work collaboratively with other resource users to manage competing interests around access to and the ability to undertake customary activities and resource use.*
Customary activities and resources	

ISSUES	POLICY
There has been a significant decline in the diversity and abundance of traditional resources. This, combined with a loss of access to traditional sites and resources has resulted in some loss of knowledge of customary activities. *Customary activities are not recognised in a consistent manner across NgāiTakoto with some activities being provided for whilst others are not.* *Lack of recognition of maatauranga Maaori innovation and engineering solutions to real world physical problems (e.g dune stabilisation).*	*Restore and Protect Customary Activities and Enhance Resource uses.* POLICY - COLLABORATION *To work collaboratively with other resource users to manage competing interests around access to and the ability to undertake customary activities and resource use.*
NTEMP Methods and Procedures	**Comment on Applications**
(a) Maintain a register of regionally and culturally significant sites and customary activities, and the degree of access to those sites or activities *(b) Identify locations of customary activities and fisheries that need protecting* *(d) Restore culturally and/or spirituality significant sites, where required or desired with industry, local and central government.* *a) Manage resource use so that effects on customary activities and resource use is managed appropriately and in accordance with the sought objectives* *c) In the implementation of the policies and methods in this chapter, work to balance competing and conflicting interests.*	The AEE assumes all surface water resources as sites of cultural significance in the context of Te Mana o Te Wai on those matters of operational value to tangata whenua including crystal clear water (in specific water bodies), mahinga kai abundance and access, and safe swimming/safe drinking (in specific water bodies. Aside from the specific waterbodies identified in the NTEMP, a Ngāi Takoto specific perspective has not been applied. Ngāi Takoto, as an applicant, understand that the potential effects on the environment will be no more than minor and that there is a proposal to address residual uncertainties through an adaptive management regime. Ngāi Takoto supports this approach as an adaptive management regime will outline specific requirements for environmental monitoring and establish a framework identifying the mitigation of potential effects on sites of cultural significance.
WHIUNGA TAIAO (Environmental Natural Hazards) **Objectives** ***The cause and effects of climate change are understood and prepared for within the NgāiTakoto rohe***	
Climate change	
ISSUES	POLICY
Climate change is likely to result in sea level rise, more frequent and intense rainfall as well as increased frequency and duration of drought. A shift is needed	

in the way hazards are managed to protect developments in areas that may be at risk in the future. Climate change has the potential to change physical and natural processes. This is of particular concern if climate change is exacerbated by human activity. There is concern that human activity and the cumulative effect of discharges, farming, industry, and commercial practices, and deforestation may adversely contribute to climate change, global warming, and the reduction in the ozone layer.	*Understanding and managing adverse effects of climate change to ensure that the causes and effects of climate change are understood and prepared for within the NgāiTakoto rohe.*
NTEMP Methods & Procedures	**Comment on Applications**
(b) Any known or potential adverse effects of climate change on NgāiTakoto are prepared for and managed.	The allocation limits in the PRP were set taking into account climate change predictions. None of the applications would cause the current allocation limits to be exceeded. The Aupouri Aquifer Groundwater Model 2020 (AAGWM-2020) uses a 60-year historical climate simulation.

Appendix A – Site Map of Applications

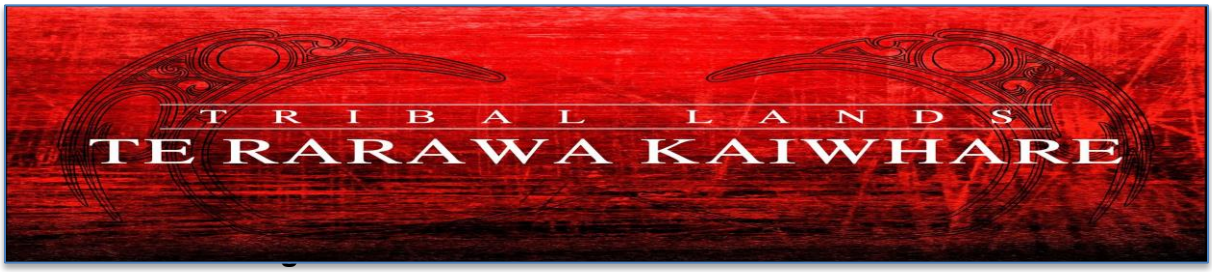
Map ID	Application Number	Name (abbreviated)	Daily Volume (m3)	Annual Volume (m3)
1	APP.039859.01.01	Te Aupouri Commercial Development Ltd	10,735	1,170,000
2	APP.040601.01.01	Waikopu Avocados Ltd *	736	83,360
3	APP.017428.02.01	Henderson Bay Avocados Ltd *	178	19,000
4	APP.040600.01.01	Far North Avocados Ltd	240	32,000
5	APP.041211.01.01	P McGlaughlin	700	78,400
6	APP.040121.01.01	NE Evans Trust & WJ Evans & J Evans	1,675	160,000
7	APP.040231.01.01	P&G Enterprises (PJ & GW Marchant)	350	28,000
8	APP.039644.01.01	MP Doody & DM Wedding	2,375	304,000
9	APP.040397.01.01	A. Matthews	95	12,000
10	APP.040652.01.01	SE & LA Blucher	720	96,000
11	APP.040919.01.01	NA Bryan Estate, SG Bryan, CL Bryan, KY Bryan, Valadares & D Bryan (property 1)	500	80,000
12	APP.040979.01.01	MV Evans (Property No 2)	1,125	126,000
13	APP.040558.01.01	MV Evans (Property No 1)	350	36,400
14	APP.040130.01.01	Tuscany Valley Avocados Ltd (M Bellette)	375	36,000
15	APP.040918.01.01	NA Bryan Estate, SG Bryan, CL Bryan, KY Bryan, Valadares & D Bryan (property 2)	1,000	160,000
16	APP.008647.01.06	Avokaha Ltd (c/- K Paterson & A Nicholson) *	70	5,600
17	APP.039628.01.02	KSL Ltd (C/- S Shine) *	90	3,600
18	APP.040361.01.01	Tiri Avocados Ltd	3,876	581,250
19	APP.040362.01.01	Valic NZ Ltd	1,158	173,700

NgāiTakoto Sites of Significance

(NTEMP Appendix Six)

NGĀITAKOTO SITES OF SIGNIFICANCE
1. Houhora Peninsula
2. Maunga Tuatua (Toitoi)
3. Maunga Tohoraha (Mt Camel)
4. Muriwhenua South Purchase
5. Rangaunu Harbour
6. Walkers Island
7. Puwheke
8. Rangiputa
9. Ngarui O Te Marangai (East Beach)
10. Kaimaumau
11. Waikaramu (lake)
12. Mekerene
13.Wharemaru Pā
14. Kaikino Stream
15. Paa a Parore (Maxwell's Grant)
16. Te Rewa Urupa
17. Waimanoni
18. Awanui
19. Awanui River
20. Mahimaru
21. Pungaungau Pā
22. Whangatane Spillway
23. Wharekakariki and Tutatarakihi Pā

NGĀITAKOTO SITES OF SIGNIFICANCE
24. Te Waionepu
25. Kerekere Pā
26. Tangonge
27. Whangatauatia
28. Te Oneroa A Tohe
29. Te Make
30. Waipapakauri Ramp
31. Waipapakauri
32. Ngakapua (lake)
33. Ngatu (lake)
34. Rotokawau (lake)
35. Rotokawau Settlement
36. Rotoroa and Wai Te Huahua (lake)
37. Waiparera (lake)
38. Hukatere
39. Waka Te Haua
40. Matapia
41. Te Paki
42. Te Rerenga Wairua
43. Takapoukura and Kapowairua
44. Manawa Tāwhi
45. Kareponia Marae



Applications to take and use water from the Aupōuri Aquifer

Assessment of Te Rarawa and Ahipara Takiwā Management Plan

Prepared: August 2020

By Tui Qauqau Te Paa

Approved By:

Contents

1. The Proposal

Between February 2018 and August 2019 the Northland Regional Council (NRC) received 24 applications for groundwater takes from the deep shell bed aquifer mainly of the Aupoūri aquifer to service proposed and existing avocado orchards at multiple locations.

Table 1 below provides each application number, the applicant's name and the requested volume of water. The locations of each application are shown by Figure 1 below.

Te Rarawa Farming Ltd, a commercial entity of Te Runanga o Te Rarawa, are one of the applicants and are applying for a renewal, and an increase of water take from Farm 2, at Sweetwater farms.

Table 1: Aupōuri aquifer water permit applications

Note: Applications identified with '*' are for increased volumes from existing consented takes

Map ID	Application Number	Applicant's Name	Daily volume (m3)	Annual volume (m3)
1	APP.039859.01.01	Te Aupouri Commercial Development Ltd	10,735	1,170,000
2	APP.040601.01.01*	Waikopu Avocados Ltd	736	83,360
3	APP.017428.02.01*	Henderson Bay Avocados Ltd	178	45,000
4	APP.040600.01.01	Far north Avocados Ltd	240	32,000
5	APP.041211.01.01	P McLaughlin	700	78,400
6	APP.040121.01.01	NE Evans Trust & WJ Evans & J Evans	1,675	160,000
7	APP.040231.01.01	P & G Enterprises (PJ & GW Marchant)	350	28,000
8	APP.039644.01.01	MP Doody & DM Wedding	2,375	304,000
9	APP.040397.01.01	A Matthews	95	12,000
10	APP.040652.01.01	SE & LA Blucher	720	96,000
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17	APP.039628.01.04*	KSL Ltd (c/- S Shine)	90	3,600
18	APP.040361.01.01	Tiri Avocados Ltd.	3,876	581,250
19	APP.040362.01.01	Valic NZ Ltd	1,158	173,700
20	APP.040363.01.01	Wataview Orchards (Green Charteris Family Trust)	225	33,750
21	APP.039841.01.02	Mate Yelavich & Co Ltd	450	52,000
22	APP.040386.01.01	Robert Paul Campbell Trust	3,350	360,000
23	APP.040364.01.01	Elbury Holdings Ltd (C/-K J & F G King)	1,875	200,000
24	APP.020995.01.04*	Te Rarawa Farming Ltd and Te Make Farms Ltd	10,705	776,000
		Total	**54,886**	**6,230,662**

Figure 1. Location Map for Applicants

See Table 1 for applicant identification details

2. Purpose of this Document

The purpose of this document is identify and describe the Te Rarawa and the Ahipara Takiwa freshwater values, in the absence of an Iwi Environmental management Plan the Ahipara Takiwā Management Plan has been used a proxy.

This document does not constitute a cultural impact assessment of the proposals for multiple groundwater takes from the Aupoūri aquifer.

In preparing this document the following have been given regard to:

- Te Rarawa Whakapapa and History
- Te Rarawa Settlement
- Ahipara Takiwa Management Plan

3. Northland Freshwater Planning Framework – Cultural Values

Insufficient engagement of tangata whenua and the failure to identify issues and potential impacts on their values can lead to inappropriate management with more than minor adverse effects resulting.

The RMA in Schedule 4 requires an assessment of cultural effects and effects on cultural values. However, the approach to assessing effects of cultural effects and effects on cultural values differs significantly throughout the country.

The PRP contains policies which guide resource developers and Council alike on where particular focus is required to identify the resources/activities for which a full analysis on tangata whenua is required and what this would consist of. These policies are as follows.

Policy D.1.1 states that an assessment of effects of an activity on tangata whenua and their taonga is required if one or more the following is likely;

1) *adverse effects on mahinga kai[163] or access to mahinga kai[164], or*

2) *any damage, destruction or loss of access to wāhi tapu, sites of customary value and other ancestral sites and taonga with which Māori have a special relationship[165], or*

3) *adverse effects on indigenous biodiversity in the beds of waterbodies or the coastal marine area where it impacts on the ability of tangata whenua to carry out cultural and traditional activities[166], or*

4) *the use of genetic engineering and the release of genetically modified organisms to the environment, or*

5) *adverse effects on tāiapure, mataitai or Māori non-commercial fisheries, [167] or*

6) *adverse effects on protected customary rights, [168] or*

7) *adverse effects on sites and areas of significance to tangata whenua mapped in the Regional Plan (refer I Maps |Ngā mahere matawhenua).*

[161] The RMA definition of tangata whenua is "in relation to a particular area, means the iwi, or hapū, that holds mana whenua over that area". For an analysis of effects, the appropriate iwi or hapū will need to be identified. Council officers will be available to assist with this.

[162] An analysis of effects on tangata whenua and their taonga may be necessary in circumstances not outlined in this policy – it will depend on the circumstances.

[163] Food and places for obtaining natural foods and resources. The work (mahi), methods and cultural activities involved in obtaining foods and resources.

[164] This includes, for instance, kai awa (river food) kai repo (swamp food) and kaimoana (sea food).

[165] This includes, for instance, impacts on the quality of water used for ceremonial purposes.

[166] This includes, for instance, use of rongoa (medicinal) plants, and uses for raranga (weaving).

[167] *Māori non-commercial fisheries are defined in the Fisheries Act 1996.*

[168] *As defined by the Marine and Coastal Area (Takutai Moana) Act 2011.*

From the criteria set out in Policy D.1.1, (1) and (3) are relevant. As such, an analysis of effects on tangata whenua and their taonga is required and according to Policy D.1.2 must;

1) *include such detail as corresponds with the scale and significance of the effects that the activity may have on tangata whenua and their taonga, and*

2) *have regard to (but not be limited to):*

a) *any relevant planning document recognised by an iwi authority (lodged with the Council) to the extent that its content has a bearing on the resource management issues of the region, and*

b) *the outcomes of any consultation with tangata whenua with respect to the consent application, and*

c) *statutory acknowledgements in Treaty Settlement legislation, and*

3) *follow best practice,* [169] *including requesting, in the first instance, that the relevant tangata whenua undertake the assessment, and*

4) *specify the tangata whenua that the assessment relates to, and*

5) *be evidence-based, and*

6) *incorporate, where appropriate, mātauranga Māori, and*

7) *identify and describe all the cultural resources and activities that may be affected by the activity,* [170] *and*

8) *identify and describe the adverse effects of the activity on the cultural resources and cultural practices (including the effects on the mauri of the cultural resources, the cultural practices affected, how they are affected, and the extent of the effects), and*

9) *identify, where possible, how to avoid, remedy or mitigate the adverse effects on cultural values of the activity that are more than minor, and*

10) *include any other relevant information.*

[169] *Best practice can be determined by relevant professional bodies.*

[170] *The full range of effects defined in Section 3 of the RMA need to be considered.*

4. Te Rarawa Whakapapa, History and Settlement

According to Te Rarawa tradition, Te Rarawa's historical development can be broken down into three main periods. The first is cosmological, consisting of our Atua Māori. This indigenous understanding of the universe benchmarks our existence as early Polynesians.

Te Rarawa shares a 6,000-year history of traversing the vast southern Pacific oceans. Te Rarawa ancestry flows from tūpuna like Tāwhaki, Toi and Kiwa whose lineages can be traced from numerous Pacific locations to living Te Rarawa communities of today. Perhaps the most important icon of Te Rarawa prehistory is Māui, who is credited with discovering Te Ika a Māui and giving rise to the very first name of our region, Te Hiku o Te Ika a Māui - The Tail of the Fish of Māui. Te Rarawa genealogy descends from Māui and the attributes of Māui are found throughout our culture and cultural institutions. Māui, who was born of people but raised by divine elements, ended an era that we barely understand today by losing a battle with death that cannot now be won.

KUPE

Kupe the explorer ancestor introduces the next period of history. Kupe is a well-remembered and understood ancestor of all Māori people and with one of his wives, Kuramarotini, renamed Te Ika ā Māui, as Aotearoa. Kupe initiated the first rites of manawhenua in Aotearoa. This was achieved by the discovery, installation of tapu and the naming of numerous locations throughout Te Hiku o Te Ika and Aotearoa. Kupe and his descendants brought with them an ancient model of Polynesian social organisation contained in sacred Whare Wānanga and based on values derived from common Polynesian understandings. After circumnavigating Aotearoa and part of Te Waka ā Māui (the South Island), Kupe returned to the North to finally depart Aotearoa after about fifteen years. The naming of Te Hokianga Nui ā Kupe (Hokianga Harbour) commemorates this event and cements the first chapter of Te Rarawa history in Aotearoa between 650 and 950 AD.

NUKUTĀWHITI AND RUĀNUI

Kupe's discovery and mana whenua in the Te Rarawa rohe was consolidated by the arrival of two waka following his directions to return to Hokianga. One of the waka was Kupe's Matahourua re-adzed and renamed Ngātokimatawhaorua; and captained by his grandson, Nukutawhiti. The other, Māmari was purpose built by Nukutawhiti's brother-in-law, Ruānui-o-Tāne. Aboard these waka were people whose names have been remembered in our genealogy as the whānau of Kupe returning to the place he had prepared. These were the next wave of Te Rarawa forebears.

NGĀ WAKA

The third and most significant period in Te Rarawa prehistory began with a number of waka making landfall and contributing to the evolving demographic landscape of communities throughout Te Hiku o Te Ika. The arrivals of these waka were seminal events that set Iwi origins and identities. The bonds that sustain those Iwi identities, and the events and ancestors that gave rise to them, culminated in an alliance of hapū communities that weaves through the history of our region and is shared by all descendants regardless of Iwi. Consequently, all Te Hiku Iwi can claim ancestry from these waka. For Te Rarawa, the foundation stones of our Iwi are represented by key ancestors associated with these waka who have occupied our rohe as tāngata whenua and kaitiaki of our natural environment.

TĪNANA

For Te Rarawa, The most significant of these waka was the Tīnana captained by Tūmoana. The Tīnana arrived at Tauroa from Hawaiki more than 20 generations ago. Tūmoana consolidated a process of establishing manawhenua. The consequential emergence of hapū amongst Tūmoana's descendants entrenched the mana of the Tīnana waka. Two such descendants include Houpure, whose descent lines culminate in Te Rarawa Iwi; and brother Houmeaiti, who was based in Hokianga. The brothers fought with Ngāti Miru and Ngāti Awa who were living further north. Upon their conquest, they took possession of the land, dividing it between themselves. Houmeaiti took the portion from Hokianga to Ahipara, and Houpure took the land north of Ahipara. Houpure was assisted by his son Patito in the battle for Ahipara. Subsequent conquests by his son Toakai, during the

sixteenth century established hapū from the western seaboard, further consolidating the early threads of Te Rarawa manawhenua. However it was the confluence of Hokianga descent lines in the south with Kurahaupo in the north, which fused with the descendants of the Tīnana waka to create a new confederacy.
Te Rarawa tūpuna Ueoneone lived on what became the Whāngāpe Harbour. The name Whāngāpe has its origin in Waikato, and was the name of the place from which famous twin sisters Reitū and Reipae originated. They journeyed north on a bird, that Ueoneone sent to Waikato in pursuit of a wife. On the way north, Reipae asked the bird to land and remained in what became Whāngā-Reipae now Whāngārei. Reitu continued the journey north and became the wife of Ueoneone. They built Te Tomo Pā on the peninsular opposite the entrance of the Whāngāpe Harbour.

REITŪ AND UEONEONE

Te Rarawa tūpuna Ueoneone lived on what became the Whāngāpe Harbour. The name Whāngāpe has its origin in Waikato, and was the name of the place from which famous twin sisters Reitū and Reipae originated. They journeyed north on a bird, that Ueoneone sent to Waikato in pursuit of a wife. On the way north, Reipae asked the bird to land and remained in what became Whāngā-Reipae now Whāngārei. Reitu continued the journey north and became the wife of Ueoneone. They built Te Tomo Pā on the peninsular opposite the entrance of the Whāngāpe Harbour.

NGĀ TAMATĀNE O RUĀNUI

Maukoro Pā on the Hokianga Harbour is an important place in the history of Te Rarawa and the Iwi of the Far North. Ruanui II lived there with his four sons Tarauaua, Tūwhenuaroa, Koromaiterangi and Tangaroatūpō. The brothers were a united group but after a series of raids they agreed to separate and an exodus occurred. Several moved to various strategic locations to the north and south, and out to the coast. They have been identified as important tūpuna across the Hokianga, Te Hiku o Te Ika and beyond.

TARUTARU AND RUAPOUNAMU

The Iwi of Te Rarawa carry a name derived from an event rather than any single ancestor. However, central to the emergence of Te Rarawa as an Iwi was the leadership taken by Tarutaru and Ruapounamu and their descendants. Tarutaru is descended from Moetonga and Tūmoana. These lines extend back to Ruatapu and Manuotehuia, the sons of Ruanui who captained the waka, Māmari. Tarutaru was renowned for his steadfastness in battle. His determination to win manifested itself in an aspect so terrifying to behold that his opponents' courage would often fail them. He lived at Ngāmehaua at Waireia and his pā were Te Pare and Te Ahukawakawa. His hapū is referred to at Te Tāwhiu. All his children were born at Waireia and Tarutaru himself died there, his bones being later moved to Pukepoto. An altercation with Ngāti Whātua united the founding hapū of Te Rarawa under the leadership of Tarutaru from the mid-1700s.

TE RARAWA KAIWHARE

The founding hapū of Te Rarawa were defeated by Ngāti Whātua at Rangiputa pā, in the Whāngāpe area. In this battle an important kuia named Te Ripo was captured and taken to Kaipara. The captors of Te Ripo directed her to recite whakapapa. While she recited her genealogy, one warrior quipped: "Kauwhau roa, kauwhau poto, ka patua a Te Ripo ki Kaimanu" (Whether you recite long or short, Te Ripo is killed at Kaimanu). True to this remark, Te Ripo was cast off a cliff. Although Tarutaru took action for these transgressions, when his sons grew up, they felt that revenge had not been sufficiently exacted. Te Rarawa war parties assembled and invaded their enemy's pā. Only a few old women remained. The invading war party, in their desire for utu, knew there was no mana in killing the old kuia. Instead they turned upon the wāhi tapu and urupā of the local people which they desecrated. There was no wood for their fires so they made use instead of the fence-posts and the ātāmira (platforms) upon which a deceased tohunga and others lay. When the kuia saw the assembled war-party desecrate the burial grounds and sacred places without reprisal, they exclaimed: "Kātahi anō te Iwi kai rārawa" (these are the first people to consume platforms); "Tēnei rā, tō Iwi kai wāhi tapu". This statement is attributed as the meaning behind the name, Te Rarawa-kai-whare. They scattered the remains of the fire and hāngi into the harbour – a gesture to the gods to provide fine weather and calm the agitated waters. When this was done, the war parties were able to advance across the

harbour and take two further pā. The killing of Te Ripo was avenged and the war parties returned home.
These actions brought the name Rarawa into prominence. The designation Te Rarawa-kai-whare subsequently entered common usage and was used to identify the hapū and descendants of the rangatira and toa who avenged the murder of Te Ripo. Tarutaru and his children hold a prominent place within these accounts which establish them among the key progenitors of Te Rarawa. From this broad alliance of people, bonded together by a common goal, Te Rarawa consolidated under one name through the leadership and mana of Tarutaru and Ruapounamu. The emergence of Te Rarawa built on relationships and common whakapapa to tūpuna and land, which predated these events.

THE DESCENDANTS OF TARUTARU

The development of Te Rarawa continued through Tarutaru's children, Pākurakura, Te Tūngutu, Ngāmotu, Kahi, Mānihi, Kahuwhakarewa, and Mōria. A number of Te Rarawa's most prominent leaders descend from these offspring including Pōroa, the son of Ngāmotu. The hapū of Te Rarawa have historically occupied all parts of the rohe of Te Rarawa from Hokianga to Hukatere and across to Kaitāia, Takahue, and Maungataniwha. At the time of the arrival of the Pākehā, Pōroa had senior standing and leadership among the hapū and over the Iwi of Te Rarawa. Pōroa mentored a number of younger Iwi members including Papāhia, Te Hūhū, Te Morenga, Te Ripi Pūhipi, Panakareao and Erenora Kaimumu. As ariki and rangatira they were groomed to take up leadership roles and this was especially important within the volatile early colonial period. From the early nineteenth century these forebears and others affiliated to them engaged with Pākehā and their institutions with the intention of developing entrepreneurial opportunities for their iwi. These leaders forged a future for Te Rarawa which included the provision of the land for the mission at Kaitāia and the signing of He Whakaputanga, and Te Tiriti o Waitangi / the Treaty of Waitangi at Kaitāia.
Te Rarawa is a confederation made up of 23 hapù marae. Te Rarawa and several associated hapù emerged as a confederation prior to the arrival of Europeans in Aotearoa . Traditionally the hapù were part of a dynamic society with well-organized social, cultural, political and economic systems. These systems were built on a network of reciprocal relationships where the considerations of allied communities would come together when necessary to combine their resources as in Iwi. Te Rarawa and affiliated hapù established themselves in and around the Hokianga, Whàngàpe, Òwhata Harbours, Te Oneroa-aTòhè, Tangonge and areas lying inland to the Maungataniwha ranges.

Settlement with the Crown

Te Rarawa historical grievances, regarding the breaches of Te Tiriti o Waitangi were settled with the Crown, and legislated under the Te Rarawa Claims Settlement Act 2015.The Crown apologised to Te Rarawa for its acts and omissions which breached the Crown's obligations under Te Tiriti o Waitangi/the Treaty of Waitangi. Those breaches include the Crown's investigation of pre-Treaty transactions and the taking of land under its surplus lands policy, the failure to set aside sufficient reserves for Te Rarawa in pre-1865 Crown purchases, the impact of native land laws, Crown purchasing after 1865, the compulsory vesting of a large amount of Te Rarawa land in the Tokerau Māori Land Board between 1906 and 1909, Crown purchases of vested land, the failure to protect Te Rarawa interests when the Tokerau Māori Land Board approved the sale of Waireia D, empowering the Māori Trustee to compulsory acquire uneconomic interests in Te Rarawa land, the road survey at Owhata that led to the imprisonment of Maraea Te Awaroa Heke, and the landlessness of some Te Rarawa hapū.

The treaty settlement heralded a new beginning. While it did not come close to covering the losses that the hapù and iwi have suffered, it provided Te Rarawa with a real opportunity to grow its economic base, and to build a better future for the coming generations.

Figure 2 - Map of Te Rarawa Area of Interest

5. Evaluation of the Ahipara Takiwā Management Plan (ATMP)

The purpose of this section is to identify the relevant sections of the ATMP for the purpose of this assessment. The relevant sections of the ATMP relate are described below:

Wai - Water

Ka tikina ake ai he wai hei oranga mo te ao katoa.
He Waiora, he wai Māori, he wai Tai, he wai Tapu, he wai Mate me he Wairua.
Ka rere tonu te Wai mai i nga maunga tae noa ki te Moana ko reira ka hikina ake ki a Ranginui e tu atu nei kia tangihihia mo tana piringa pumau ko Papatūānuku.
Koina te maringinoa o ngā roimata e maturuturu ana hei aroha pūmau mo te tangata. Me ko wai āhau e tū iho nei, he uri whakaheke no te rere o te wai ū o ōku tūpuna ko tōku ū kaipō, tōku turangawaewae e pupuri nei he kainga mōku.

Whakapakeha
We recite the necessity for water which provides sustenance for the entire world.
The Water of Life, natural water, the waters of the oceans, sacred waters, sick water and water for the soul.
Water that flows continually from the mountains to the sea. Skyward where it is raised aloft to Ranginui above and his sorrowful lament for Papatūānuku his female counterpart.
Falling as tears and a representation of the love humankind.
Posing the question of our identity and place.
We are descendants of running water which flows as milk from the breast of our forebears to nurture us and sustain our ability to stand firm on our ancient land and a home for future generations.

Whai Painga – What we value

Wai - Water

Water preservation is central to the iwi position on water as "taonga". Water reflects our role as kaitiaki over resources by safeguarding. protecting and ensuring sustainable use.

The rights and responsibilities of Te Runanga o Te Rarawa in relation to the use and management of water are recognised. Water is protected and managed so that the ecological and cultural values of water are paramount. Water quality is improving throughout the iwi. Wetlands are managed to exclude weeds and pest animals and native flora and fauna flourish there. Waterways, springs and wetlands are protected from livestock and other land uses. Discharges to water and mixing of water from different catchments no longer occurs. Water is at the centre of our lives and our use of water is sustainable governed by sensible and agreed limits and constraints.

The overriding purpose of the Resource Management Act (RMA) as set out in Section 5 of the Act is "to promote the sustainable management of natural and physical resources". This is also the approach enshrined in the kaitiakitanga aspirations of Te Runanga o Te Rarawa.

Section 6 of the RMA identifies seven matters of national importance that must be recognised and provided for in relation to managing the use, development and protection of natural and physical resources. These include: the protection of outstanding natural features and landscapes, the protection of areas of significant indigenous vegetation, significant habitats of indigenous fauna, the

relationship of Māori, their culture and traditions with ancestral lands, waters, sites, wāhi tapu, and other taonga.

Section 7 of the RMA requires all persons exercising functions and powers under the Act have regard for notably, the cultural value of kaitiakitanga, the ethic of stewardship. Section 8 requires that all persons working under the Act shall take into account the principles of the Treaty of Waitangi.

The following examples from the Resource Management Act also apply:

- Section 104 (1)(c) … when considering an application for a resource consent … the consenting authority must have regard to any other matter the consent authority considers relevant… (the content of iwi plans is considered under this section).

Under the RMA a suite of planning documents are required to be prepared, including national policy statements, regional policy statements and regional and district plans as shown in Figure 2. These documents articulate how these matters will be achieved. For example, the purpose of the New Zealand Coastal Policy Statement (2010) is to state policies in order to achieve the purpose of the Act in relation to the coastal environment of New Zealand. Of most relevance to this plan is Objective 3:

To take account of the principles of the Treaty of Waitangi, recognise the role of tangata whenua as kaitiaki and provide for tangata whenua involvement in management of the coastal environment by:

- Recognising the ongoing and enduring relationship of tangata whenua over their lands, rohe and resources.

- Promoting meaningful relationships and interactions between tangata whenua and persons exercising functions and powers under the Act.

- Incorporating mātauranga Māori into sustainable management practices.

- Recognising and protecting characteristics of the coastal environment that are of special value to tangata whenua.0

Whai Painga / What we value

Te Rarawa te iwi value water in all its forms – Wai Māori (fresh water), wai repo (swamps and wetlands), wai tai (sea water), wai whakaika (ritual waters), wai mate (stagnant water), wai nuku (ground water). This includes access to high quality water in sufficient quantity to meet their cultural and social needs. The maintenance of high-quality aquatic habitats and the connections between water in all its forms (streams, aquifers, estuaries, wetlands) are of paramount importance.

Ngā Take, NgāPainga me Ngā Kaupapa Here - Issues, Objectives and Policies

Ngā Take Wai / Issues relating to Wai

The loss and degradation of water through water takes, drainage, discharges to water (pollution) and damming is a significant issue for Te Rarawa te iwi. Water plays a significant role in our spiritual beliefs and cultural traditions and the degradation of water is considered to have resulted in material and cultural deprivation. The condition of water is seen as a reflection of the health of Papatūānuku. Both water quantity and water quality are of concern, the following issues are relevant:

Relevant Issues	**Relevant Objectives**	**Relevant Policies**
The ownership of water resources remains unresolved.	Issues relating to water ownership and fair allocation are addressed in a way which recognises the traditional rights of mana whenua.	To require that water takes are metered and the effects monitored and information be made available on request.
There is an increased demand for water, including rom overseas interests.	The spiritual and cultural significance of water to Te Rarawa te iwi is recognised in all water management. To encourage the use of cultural tools for monitoring waterways. To require that water takes are metered and the effects monitored and information be made available to the iwi on request.	To oppose the granting of water take consents for 35 years.
To develop a monitoring programme for water quality and quantity in the iwi.	Te Rarawa in conjunction with Council would work together to encourage the prioritisation of efficient use of water within the Te Rarawa tribal area. Te Rarawa have invested in water storage is part of a strategy for sustainable economic development, giving the iwi options during high rainfall months for use in drier seasons – taking pressure off the Aupouri Aquifer**.** It also reflects their role as kaitiaki over resources by safeguarding, protecting and ensuring sustainable use of wai (water). To encourage the prioritisation of efficient use of water within the iwi.	To encourage those that extract water for irrigation to use the most efficient method of application.

There is over-allocation of water resources in some catchments. Some bores are running dry and salinization may be an issue in future.	That Te Rarawa identify in conjunction with Council water management areas that are most affected by water extraction and promote innovative sustainable water practices: for example Te Tupehau – water storage pond at Sweetwater Farm.	
Underground aquifers must be protected from salt water intrusion.	Require groundwater monitoring and collection of rainfall data.	
Water take consents are allocated on a 'first come first served basis' and are commonly 35 years in duration.	To require that applications for water take consider the interaction between groundwater and surface, but also the cultural aspects of water within the rohe of Te Rarawa when making decisions relating to water management.	
There is excessive (cumulative) use of water held in aquifers without adequate provision for recharging.		
There continues to be a lack of investigation of the link between ground and surface water.		

ANNEXURE B

13 August 2020

Martell Letica
Principal Planner
Williamson Water & Land Advisory

By email: martell.letica@wwla.kiwi

24 GROUNDWATER TAKES FROM THE AUPOURI AQUIFER – STRIKING OUT SUBMISSIONS UNDER SECTION 41D OF THE ACT

INTRODUCTION

1. We refer to your instructions of 4 August 2020 seeking our opinion regarding striking out submissions to the 24 Aupouri Aquifer groundwater take applications (the **Applications**).

2. This opinion provides the basis upon which certain submissions, either in whole or in part, may be justifiably struck out at first instance.

THE LAW

3. Submissions may be struck out, either in whole or in part, under section 41D(1) of the Resource Management Act 1991,[1] if a consent authority is satisfied that a submission is:[2]

   (a) Irrelevant;

   (b) unsupported by expert evidence;

   (c) frivolous or vexations; or

   (d) contains offensive language.

4. The decision to strike out submissions may be made by the consent authority by direction either before, during or after the hearing. The consent authority must provide reasons for strike out.

5. A person whose submission has been struck out pursuant to section 41D, has the right of objection under section 357(2) of the Act and may file a notice of objection under section

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1 Resource Management Act 1991, section 41D.

2 There are other circumstances where strike out is justifiable, but we consider these to be the most relevant in this particular case.

357C no later than 15 working days after the decision is notified to the objector. The authority may dismiss or uphold the objection in whole or in part. Under section 358 of the Act, there is no right of appeal to the Environment Court from an objection to an authority under section 357(2), if the submission relates to a resource consent, a review of a resource consent, or an application to change or cancel a condition of a resource consent.

6. We note at the outset that council hearings are an opportunity for submitters, including lay submitters, to be heard. This public participatory intent must be balanced against the need to ensure that hearings remain focused upon relevant matters and applicants (as well as consent authorities) are not required to engage in matters that are not appropriate for the forum. The power to strike out submissions should therefore be exercised sparingly and only where the grounds for strike out are clearly made out.

ANALYSIS

Irrelevant Submissions – s41D(1)(b)

7. A submission may be struck out under section 41D(1)(b) of the Act if it discloses no reasonable or relevant case. This may arise where there is no sufficient connection or link between the matter in issue and the point raised by submission. In contrast, a "relevant" consideration is one being, "*so nearly touching the matter in issue as to be such that a judicial mind ought to regard it as a proper thing to be taken into consideration*".[3]

8. In the context of the Applications, that would mean that a submission is only relevant if it raises a point that is sufficiently connected to, or a direct effect of, the proposed take of groundwater. For example, the type or amount of 'irrigation by spraying' used on the Avocado orchards cannot be properly considered to be connected to consent to take groundwater. Those matters would fall to be regulated by any relevant discharge rules or resource consent.

9. It is arguable that submissions claiming adverse effects on the environment such as overallocation and saline intrusion can be considered irrelevant. This is because the Environment Court and, on appeal, the High Court has recognised that such effects are capable of being adequately mitigated through the development of an appropriate adaptive management regime. The Environment Court considered similar applications to take groundwater in *Burgoyne v Northland Regional Council*[4] and concluded that:

> [49] … the Adaptive Management process amended as directed will, in this case, establish in due course an appropriate method for meeting the requirements of the Supreme Court, and NZCPS, NPSFM and the Act in relation to ensuring the avoidance of adverse effects on significant indigenous vegetation, freshwater ecosystem processes and on significant indigenous habitats and fauna…

10. The Court continued:

> [52] We have a high degree of confidence, as do the experts, that with a proper Adaptive Management Regime, and appropriate controls and measurements, the consent can be

3 *Tompkins v Tompkins* [1948] P 170 (CA) at 175.
4 [2019] NZEnvC 028.

> conducted in a way that avoids any adverse effects on the Kaimaumau Motutangi Wetland, and the values and attributes of the area, particularly the Reserve Area. Given the lack of any regime to date, and the existing abstractions, we are of the view that the monitoring and information obtained may result in better outcomes for this area than the current regime.

11. Despite those findings, the consent authority may not accept the acknowledged efficacy of adaptive management as sufficient reason to strike out a submission under section 41D(1)(b) of the Act at first instance. Such effects can be sufficiently connected to the Applications if they were to occur and those findings could be read as limited to that particular case. We consider that submissions in relation to these issues may be justifiably be dismissed (rather than struck out) later in the process by relying on the *Burgoyne* findings.

Unsupported by Expert Evidence – s41D(1)(d)

12. A submission may qualify for strike out under section 41D(1)(d) of the Act if the submission is supported by evidence that has been prepared by a person who is not independent or who does not have sufficient specialised knowledge or skill to give expert evidence on the matter. We consider that this ground is particularly applicable where the submission relates to a matter that is highly technical, as opposed to a submission related to a subjective consideration (e.g. amenity values).

13. Several submitters are making submissions which contain expert or scientific evidence contentions without citing any source. We do not consider this is necessarily sufficient reason to strike out such submissions at first instance. The submissions do not disclose the experience of the submitter and the submissions often reference statements made in the applications and supporting AEE's. If the submissions are in fact unsupported by expert evidence, then they can be filtered out as the process plays out.

Frivolous or Vexatious – s41D(1)(a)

14. A submission can be struck out under section 41D(1)(a) of the Act if it is frivolous or vexatious. A frivolous or vexatious submission is one that any reasonable person could not consider as real or genuine.

15. There are few instances in the submissions received where this is the case, but an example of a frivolous or vexatious submission is one which seeks relief for "free water for Aupouri Residents". This is vexatious because the Far North District is subject to water rates and this application process has no jurisdiction over these matters. The Applications cannot create an exemption to pay water rates, nor would it be legal to do so.

Offensive Language – s41D(1)(e)

16. Submission that contain offensive language can be struck out at first instance under section 41D(1)(e) of the Act.

APPLICATION

17. We **attach** to this legal opinion a table which sets out which submissions or parts of can be struck out at first instance.

Yours faithfully
BROOKFIELDS

Andrew Green / Rowan Ashton
Partner / Senior Associate

Direct dial: +64 9 979 2172
email: green@brookfields.co.nz

ATTACHMEMT ONE: SUMMARY OF SUBMISSIONS FOR STRIKE OUT

NO.	NAME	STRIKE OUT	SUBMISSION	REASON(S)
2	J M Wagener	Part	6. …and a sense that commercial bore users could not be trusted to follow the conditions of their consents. Can some local commercial bore users be trusted to abide by the conditions of their consents? I fear the answer is "No". Over a year ago five bore users were detected exceeding their permitted takes by large margins. They were detected not by the actions of the council, but by information given to the council by the public.	s41D(1)(b) – This submission discloses no reasonable or relevant case. The presumption must be that consent holders will abide their conditions of consent until proven otherwise.
3	H Exley	Full		s41D(1)(b) – Parts of this submission are irrelevant. Insufficient link between the water take applications and property values, spraying and liability for future effects that may not occur. s41D(1)(a). Parts of this submission are also vexatious. Residents of the Far North region must pay water rates – Aupouri residents cannot be the exception because of the water take applications. s41D(1)(e) – Offensive language
4	S Simpkin	Part	5. Sprays – water collection from roofs, leaching into groundwater, chemical trespass. Our bees and native fish are under threat. Property value decline. Clean green Northland – New Spray capital of NZ.	s41D(1)(b) – Parts of this submission are irrelevant. Insufficient link between the applications and property values, the survival of bees and freshwater fish and chemical trespass (also unsupported by evidence that these are 'effects' to be taken into account under the Act – s41D(1)(d)).

NO.	NAME	STRIKE OUT	SUBMISSION	REASON(S)
			6. Who's going to pay to replace everyone's bores that might dry up or the cleaning of our roofs after they are covered in sprays. Who will be responsible or accountable.	s41D(1)(b) – Liability of future effects cannot be taken into account under the RMA and there are insufficient links between the Applications and 'sprays' i.e. the types and amounts of sprays used on the Avocado Orchard cannot be regulated by conditions or management plans attached to the Applications to take ground water.
10	B O'Sullivan	Part	6. That at least some of these applicants are huge development companies, with no interest in the local area, who are developing orchards on behalf of investors for the sole purpose of making money by the resale of the developments. There are individuals who clearly state they have no intention of developing their land but if they get a water allocation their land will be more valuable to the developers.	s41D(1)(b) – Property values are irrelevant considerations. The rise or fall of property value cannot be regulated through conditions of consent or management plans attached the grant of application.
20	J Subritzky	Part	By their own admission these developers have stated many times that the population of Northland will not be big enough to harvest the fruit from these orchards. People will have to be bought in, where they will live, we have a chronic housing shortage, no sewerage systems, little infrastructure, and possibly a water shortage.	s41D(1)(b) – Population growth, housing shortage, sewage systems and infrastructure are irrelevant considerations to the Applications.
23	J Kenderdine	Part	(Additional submission) Chemical sprayed crops will eventually pollute aquifer.	s41D(1)(b) – Parts of this submission are irrelevant. The use of chemical sprays on the avocado orchard is incapable of regulation through conditions of consent and management plans attached to the grant of the applications. Insufficient link.

NO.	NAME	STRIKE OUT	SUBMISSION	REASON(S)
33	J Gray	Part	Even if I could afford bought town water it would provide toxic to many of these rate plants. Plant diversity unquestionably underpins human existence and livelihoods, yet we continue to destroy these sensitive ecosystems.	s41D(1)(b) – Parts of this submission are irrelevant. The effect of 'bought town water' on plant diversity is insufficiently linked to the Applications and is therefore an irrelevant consideration.
41	G & D Stanisich	Part	5. (4) …Chemical infiltration/fertiliser use/spraying	s41D(1)(b) – Parts of this submission are irrelevant. These are all 'effects' that would fall within the ambit of a land use consent application to establish an orchard, not groundwater take applications.
45	W Van Wilsem Vos	Part	6. (7) Intense orchard runoff into Rangaunu - Houhora Harbours	s41D(1)(b) – Parts of this submission are irrelevant. 'Orchard runoff' would fall within the ambit of a land use consent application to establish an orchard, not groundwater take applications.
49	J Johnston	Part	We now have four avocado orchards on the boundary to our protected wetland and historic park, one in particular (Tiri orchard) is within 10 meters of our wetland. As well as the water draw we have issues with chemical runoff directly into our wetland with drains being dug from Tiri directly into our wetland without us knowing and no consent given by us. We have also had numerous incidents with spray drift carried on the prevailing winds out into Rangaunu harbour mangrove forest and into Gumdiggers park ecosystem, on one occasion covering two German tourists with fe1iilizer. The insect population has decreased significantly since the first orchard was established 8/9 years ago, and that has had a major effect on the reduction of birdlife and reptiles that called Gum diggers park home. This is unrelated to the water take, no doubt I will have to put in another submission, but it is just another detrimental effect from these industrial monoculture avocado farms that is effecting our Tourist park and ecosystem, as well as the Rangaunu harbour for future generations. Currently	s41D(1)(b) – Parts of this submission are irrelevant. These are all 'effects' that would fall within the ambit of a land use consent application to establish an orchard, not groundwater take applications.

NO.	NAME	STRIKE OUT	SUBMISSION	REASON(S)
			when helicopters do there spraying I get a txt or phone call the day before they want to spray, no details are given as to what spray is used except for lime and gypsum. I believe that the current clean air plan calls for two weeks written notification, stating what sprays are being used etc and a 200 meter exclusion from any public space or protected ecosystem. None of this has ever happened. Because council imposed a covenant on our property I require council to monitor any spraying that is done, and enforce the owners and helicopter contractors to comply with written notification and all other terms laid out in the clean air act.	
50	K Marhsall	Part	4. I am no mathematician but have been told that equates to approximately 20 cubic metres per day.	S41D(1)(d) – This submission is unsupported by expert evidence.
52	A Nunns	Part	3.5 Avocado orchardists typically break the shallow pan, which raises an additional risk of pesticide, herbicide and fertilizer contamination of the aquifer, which is not addressed in the report.	s41D(1)(b) – Parts of this submission are irrelevant. These are all 'effects' that would fall within the ambit of a land use consent application to establish an orchard, not groundwater take applications.
58	E Matich	Part	10. Health Hazard The use of sprays needed for avocados can present a hazard to health to people with or without bores.	s41D(1)(b) – Parts of this submission are irrelevant. These are all 'effects' that would fall within the ambit of a land use consent application to establish an orchard, not groundwater take applications.
61	K Nikora-Kerr	Part	In other countries, like the Netherlands, there are some positive steps being taken to guarantee good quality water is available to the people, that good practices are being upheld to promote good clean water, air and food. In a drought situation that people have access to water first, then the environment (animals/wetlands) next, and lastly commercial	s41D(1)(b) – Parts of this submission are irrelevant. Resource management laws and policy in other countries are irrelevant to the Applications because they draw from other jurisdictions.

NO.	NAME	STRIKE OUT	SUBMISSION	REASON(S)
			horticulture/farming last. In places like Israel, using alternative water irrigation systems to drip feed, harnessing rainwater etc.	
62	D Kerr	Part	Another concern: chemical trespass. We know avocados require herbicides, pesticides, insecticides etc. We know NRC is responsible for discharges to air. Is NRC going to monitor chemical trespass both in the air and in the soil as the amount of chemical used will increase significantly. Noise pollution – will NRC monitor helicopters / ground sprayers etc in the middle of the night and early hours of the morning?	s41D(1)(b) – Parts of this submission are irrelevant. These are all 'effects' that would fall within the ambit of a land use consent application to establish an orchard, not groundwater take applications. Not sufficiently linked to the Applications.
63	K Kerr	Part	Chemical spray may infect my life	s41D(1)(b) – Parts of this submission are irrelevant. These are all 'effects' that would fall within the ambit of a land use consent application to establish an orchard, not groundwater take applications. Not sufficiently linked to the Applications.
71	L A Carter	Part	Reading through the previous applications and the reports and the submissions, it reminded me of that movie, the Martian. You know, the guy who got stuck on Mars? When faced with the reality of his situation and the limited resources at his disposal, he said: "I'm going to have to science the shit out of this." It seems that the previous applicants and their respective consultants have tried to science the shit out of the Aupouri Aquifer.	s41D(1)(b) – Parts of this submission are clearly irrelevant and based on fictional stories. s41D(1)(e) – This submission also contains offensive language.
			The Martian has more work to do; we still more than ever need to "science the shit" out of this problem – real science with actual empirical evidence to prove (or disprove) that what has been extrapolated by the various consultants is actually borne out by experience.	As above.

NO.	NAME	STRIKE OUT	SUBMISSION	REASON(S)
79	I Stanisich & I F Partnership	Part	Photo – Land contouring Available rooting depth is also a major determinant on PRAW as most of the more mature soils in the Far North prior to horticultural development have a pan or compacted subsoil layer that limits root growth. During development this pan is broken with a large excavator, though this is only on the area immediately below the planted trees, then soil from between the rows are mounded onto the planting row. This results in rooting depth on the mounds of at least a meter deep, but in the hollow between the rows the rooting depth is quite shallow.	s41D(1)(b) – Parts of this submission are irrelevant. These are all 'effects' that would fall within the ambit of a land use consent application to establish an orchard, not groundwater take applications.
83	D Woodcock	Part	Contamination – concerned for potential contamination of aquifer in long term with amount of chemical sprays used now and in the future. Environmental – impacts on environment from the massive increase in use of chemical sprays and fertilisers, waterways, streams and harbours.	s41D(1)(b) – Parts of this submission are irrelevant. These are all 'effects' that would fall within the ambit of a land use consent application to establish an orchard, not groundwater take applications.
86	G Pfaender	Part	Protect marine environment from pesticides	s41D(1)(b) – Parts of this submission are irrelevant. These are all 'effects' that would fall within the ambit of a land use consent application to establish an orchard, not groundwater take applications.
			Use of no sprays / go organic / saline	As above.
			Attachment to submission	s41D(1)(b) – Parts of this submission are irrelevant. The attachment is a submission on MWWUG which is a completely separate proceeding.
102	P Walker	Part	Chemical Sprays / fungicides / herbicides	s41D(1)(b) – Parts of this submission are irrelevant. These are all 'effects' that would fall within the ambit of a land use consent application to establish an orchard, not groundwater take applications.

NO.	NAME	STRIKE OUT	SUBMISSION	REASON(S)
106	J and L Wood	Part	Many householders rely solely on this source for their drinking water and an increasing number have concerns over using their rainwater supplies due to possible contamination from horticultural sprays.	s41D(1)(b) – Parts of this submission are irrelevant. These are all 'effects' that would fall within the ambit of a land use consent application to establish an orchard, not groundwater take applications.
107	A Burgoyne	Part	1) Matters of consent are currently before the high court therefore any further applicants are subjudicae.	s41D(1)(b) – This submission is referring to a Court proceeding that is irrelevant to this case. The applications are different and unrelated.
			3) Some of the applicants which are now petitioning for abstraction are already before the court, therefore this application is duplicate and subjudicae.	As above.
			6) Refer to legal bundle A. Burgoyne versus MWWUG currently before the court.	As above.
			9) The matter before the high court which makes this application subjudicae is covered by the judgement of the Waitangi tribunal WAI 292	As above. The MWWUG High Court proceeding concerns separate and unrelated applications and does not deem these Applications as sub judice.
112	N O'Higgins	Part	4. The health and wellbeing of people and animals will be impacted by the increased use of sprays on the orchards. Neighbouring properties over a considerable area will suffer spray drift. This drift will end up on fruit and vegetables which will be ingested. Spray residue will be absorbed orally and dermally. Increased use of Insecticides could harm honeybees and impact on the honey industry. Spray drift on roofs will end up as residue on water tanks	s41D(1)(b) – Parts of this submission are irrelevant. These are all 'effects' that would fall within the ambit of a land use consent application to establish an orchard, not groundwater take applications.
			5. Spray and fertiliser residues will end up in groundwater which will affect the water quality of bores and could harm aquatic life.	As above.

ANNEXURE C

Groundwater Monitoring and Contingency Plan for the Other, **Waihopo and (northern) Houhora sub-aquifers of the Aupōuri Aquifer Management Unit**

July 2020

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DOCUMENT FIGURES

DOCUMENT TABLES

GLOSSARY OF TERMS

Commented [ML1]: Suggest inclusion of definition of 'irrigation season', and Stage 1/Year 1.

Saline/saltwater intrusion	For the purposes of this Groundwater Monitoring and Contingency Plan, saline/saltwater intrusion refers to changes in salinity at nominated monitoring locations that exceed thresholds established to indicate elevated potential for adverse effects on groundwater quality for potable supply and/or irrigation use
Efficient bore takes	An efficient bore take is when a bore fully penetrates the water bearing layer and takes water from the base of the aquifer.
Sub-aquifer	The Aupōuri Aquifer system is divided into 12 separate sub-aquifer units for the purposes of setting tailored aquifer-specific allocation limits.[1]
First in-first served	Under the Resource Management Act 1991, applications for water take are processed in the order in which they are lodged. The rights of parties associated with this Groundwater Monitoring and Contingency Plan are prioritised according to the order in which their permits are granted and added to this Plan.

[1] Policy H.4.4 of the Proposed Regional Plan for Northland (Appeals Version) June 2020.

1. INTRODUCTION

1.1 Scope and Objective of the GMCP

This document comprises a groundwater monitoring and contingency plan for the groundwater takes in the Waihopo and Houhora sub-aquifers of the Aupōuri aquifer management unit (GMCP) ~~that comprise part of the Aupouri Aquifer Water User Group (AAWUG) application~~. Much of the approach outlined in this GMCP has been informed by the technical assessment presented in the *Aupouri Aquifer Groundwater Model, Factual Technical Report – Modelling – Aupouri Aquifer Water User Group. WWLA0184, Rev 3*, dated 5 February 2020 and prepared by Williamson Water & Land Advisory Ltd (hereon referred to as the Model Report).

The GMCP covers the implementation and monitoring of the groundwater take consents listed in

Commented [ML2]: Seemed relevant to bring this up here as it was sitting in the AEMR section yet it is the foundation of this GMCP.

Table 1 (the Consent Holders) and is a programme of adaptive management that is suitable to provide a platform for the implementation of the abstractions listed in

Table 1.

An adaptive management regime requires reasonably clear objectives against which the effects and management progress may be evaluated against. The objective of this GMCP is that;

Objective 1: **The abstractions must, individually and cumulatively, avoid:**

(a) **Adverse effects of saltwater intrusion into the Aupōouri aquifer;**

(b) **adverse effects on the hydrological functioning of dune lakes and natural wetlands;**

(c) **adverse effects on the significant indigenous vegetation and habitats in dune lakes and natural wetlands; and**

(d) **lowering of the groundwater levels of the Aupouri aquifer such that existing efficient bore takes operating as a permitted activity or in accordance with resource consent conditions cannot access groundwater of the quantity authorised.**

Commented [ML3]: Specificity needed here. The way Section 1.2.3 is worded suggests there are specific sites to reference here.

Extensive environmental monitoring is required to ensure the effects listed above do not result from groundwater abstraction, and to support the proposed 'adaptive management' approach (including the staged implementation of groundwater extraction). The purpose of the GMCP is to formalise specific monitoring requirements, establish groundwater level and groundwater quality monitoring triggers and outline a process for implementation of appropriate mitigation and remediation measures if nominated trigger values are exceeded.

The GMCP is intended to allow the early detection of any adverse impact on the quality or quantity of groundwater resources of the Aupōouri Aquifer management unit, particularly within the Waihopo and Houhora sub-aquifers associated with the exercise of groundwater take consent(s), by:

- Requiring regular monitoring of the groundwater system both on and off-site;
- Setting monitoring criteria (trigger levels) to indicate potential adverse impacts on the groundwater system;
- Implementing mitigation measures including changes to the pumping regime if trigger levels are reached to ensure that Objective 1 continues to be met;
- Reviewing monitoring data before and after a step level increase in pumping rate;
- Ensuring that the monitoring data is available for regular review by the Council;
- Detailing a Contingency Plan to be implemented if an unanticipated impact(s) are identified;
- Providing information to quantify the actual effects of the abstraction on the groundwater resource; and
- Enabling validation of the numerical model by the Consent Holders for any replacement groundwater take consent applications.

1.2 Parties Associated with this GMCP

The parties who have been deemed to be associated with this GMCP at its inception are the Council, the Consent Holders in

Table 1, and the Director-General of Conservation.

The following provides a brief description of the roles and responsibilities of each party associated with this GMCP.

Should any of these parties change during the implementation of this GMCP, either through addition or removal, the process as set out in **Section 1.3** below shall be applied.

The rights of parties associated with this GMCP are prioritised according to the order in which their permits are granted and added to this GMCP, in accordance with the first in-first served approach to water allocation under the Resource Management Act 1991.

1.2.1 Northland Regional Council

The Council will undertake the ongoing monitoring requirements of the GMCP on behalf of the Consent Holders. The actual and reasonable cost of undertaking the ongoing monitoring of these consents for the Consent Holders will be charged in accordance with Council's Charging Policy.

The installation of sentinel bores and monitoring equipment is the responsibility of the Consent Holders.

Commented [ML4]: The applicants have not formed into an entity that could coordinate this work. Would be better if NRC install and charge as per their charging policies. As a sentinel bore, it will be measuring environmental information not just in relation to the takes but also on allocation and FMU management through the PRP (or any future plan changes).

1.2.2 Consent Holders

The Consent Holders identified within this GMCP at

Table 1 are required to exercise their ~~Water Permits~~ consents in accordance this GMCP.

Commented [ML5]: Changed as rest of GMCP refers to consents.

The exercise of the ~~Water Permits~~consents will be in accordance with Council initiated instructions which will be issued once the actions and process established through this GMCP have been undertaken.

The Consent Holders may seek changes to the GMCP through either of the processes set out in **Section 1.3**.

1.2.3 Director-General of Conservation

The Director-General of Conservation is responsible for administering land and waterbodies subject to reserve status under the Reserves Act 1977 and conservation or stewardship area status under the Conservation Act 1987. Within the Waihopo and Houhora sub-aquifers of the Aupouri Aquifer management unit these areas include:

- The Te Ramanuka Conservation Area

The Director-General of Conservation is a party to this GMCP to ensure that the relevant provisions of these Acts, which the Director-General of Conservation administers, in particular that Objective 1(b) and 1(c) matters are to be met.

1.3 Changes to the GMCP

This GMCP may be amended at any time to:

- Incorporate new or replacement water permits, or remove water permits, within the Other, Waihopo and Houhora sub-aquifers of the Aupōuri aquifer management unit that have overlapping and/or additional monitoring requirements or which are subject to different trigger levels or trigger levels based on monitoring described in this GMCP;
- Alter the nature and scope of the required monitoring (i.e. monitoring frequency and intensity (type and number of samples)) and associated trigger levels;
- Incorporate or remove parties who are, or may need to be, a part of this GMCP to ensure Objective 1 is met.

If either the Council or a Consent Holder wishes to amend the GMCP, then it must provide notice in writing of the proposed changes, along with any supporting technical documents, to the other Consent Holders, and the Director-General of Conservation.

Parties, given notice by Council of a change to the GMCP, have 20 working days to provide a response to the Council on the proposed changes to the GMCP.

If no response is received from a party within the stated timeframe, then Council will consider that the party has no concerns with the conclusion of the report.

If any party does not agree with the proposed change, that party shall engage a suitably qualified hydrogeologist and/or an ecologist to prepare a report detailing the reasons for the disagreement

which shall be provided to Council within 30 working days from the date that the written notice of the proposed changes was sent to the party.

Any change to the GMCP will only be authorised by Council if the technical or administrative assessment of the proposed change clearly indicates that the change will meet Objective 1 of the GMCP.

Council will provide a report to the Consent Holders detailing the reasons for its decision, including the identification and discussion of areas of agreement and disagreement. If the change would affect the interests of the Director-General of Conservation, then the report will also be provided to this party.

If any changes are made to the GMCP, then a copy of the amended GMCP will be provided to the Consent Holders and the Director General of Conservation.

2. FRAMEWORK FOR ADAPTIVE MANAGEMENT

In summary, the following adaptive management techniques are applied in this GMCP;

(a) Baseline monitoring – a monitoring programme has been developed for Stage 1 of the

(b) **Table 1** abstractions to establish a robust existing environment baseline. This monitoring programme is containedspecified? in this GMCP, however, some monitoring detail is still required and this is indicated by the acronym 'TBC'.

(c) Early warning systems - Trigger levels (TLs) will be established to set up an early warning system that provides a response mechanism when differences between predicted and actual water levels, and/or salinity concentrations occur. A trigger level is an environmental criterion that if reached or met, requires a certain response to be actioned.

(d) Staged development - Abstraction volumes will progressively be increased in a staged manner, with expansion contingent on compliance with yet to be established trigger levels and on regular reviews of groundwater level, freshwater ecology hydrology, and salinity monitoring results.

It is noted that the consent documentation requires that all development starts at Stage 1 volumes whether or not others have progressed to Stage 2 or further, and that takes must be implemented for the minimum period of Stage 1 before progressing to Stage 2. This is an essential mechanism for staging as an adaptive management response.

(e) Stage 1 / Year 1 mManagement of consents being exercised immediately after commencement – Until such time as there is adequate data to enable adaptive management to commence and for Objective 1 of this GMCP to be achieved, the abstractions during this stagethat will occur immediately after commencement (i.e., in the first year) will need to be be subjected to interim groundwater level and saline trigger levels and Trigger Exceedance Report procedures;

(f) Tiered approach to monitoring – Monitoring effort is proposed to increase if trigger levels are exceeded. Likewise, monitoring intensity may decrease with evidence of sustained compliance and stability or to reflect improved characterisation of the hydrogeological environment by way of the process outlined in **Section 1.3** of this GMCP; and

(g) Ongoing adaptive management – The abstractions will be managed adaptively within the term of consent and, in the event of trigger level exceedance, through the implementation of the recommendations of a Groundwater Trigger Exceedance Report (GTER) prepared by Council.

(h) Suspension of abstractions – Should compliance with Objective 1 of this GMCP not be achieved, then the exercise of some or all of the consents to abstract and use groundwater may be suspended until such time as Council confirms in writing that compliance can be achieved.

The following sections provide detailed information relating to the adaptive management framework to be imposed for the exercise of the consents listed in

Commented [ML6]: This should probably reference a term other than 'Stage 1 / Year 1' as Stage 1 (Year 1) will differ between individuals whereas this aspect of the 'framework' relates to the first 12 months after commencement of the consents while data is still being collected to set longer-term trigger levels.

Table 1.

2.1 Staged Implementation

The uptake of water by the Consent Holders will be over 4 stages in accordance with the following factors:

Level of current orchard development - replaces existing consents held by to take and use water. Other consent holders that have established their orchards have been irrigating their trees under temporary consents issued by the Council.

Rate of orchard development - will occur at differing rates depending on the owner's cashflow and access to plants; and

Tree maturity - approximately nine years to full maturity and plant water usage, hence irrigation requirements commensurately increase with tree growth.

The progressive increase in irrigation requirements on developing orchards, provides an opportunity to apply an adaptive management approach that establishes a baseline and allows the original hypotheses of avoidance of effects to be periodically re-evaluated to ensure Objective 1 of this GMCP continues to be met as development occurs.

The management approach provides a series of responses to be taken based on the monitoring results, including where monitoring shows that Objective 1 of this GMCP is not being met, as discussed in **Section 2.2**.

The uptake by Consent Holders of the consented total allowable water volumes will be permitted in four stages over seven years, as shown in

Table 1 below, unless the outcome of the Staged Implementation and Monitoring Programme Review detailed in **Section 0** shows that there should be a delay in moving to the next stage, or that the next stage should not occur.

The development stages reflect:

- A combination of horticultural and pasture irrigation development for APP.039859.01.01
- Anticipated planting schedules and resultant increases in water demand for horticultural irrigation associated with remaining water permit applications.

Table 1. Summary of staged implementation annual volumes

Application Number	Consent Holder	Indicated year of irrigation start	Allowable Annual Volume (m^3)			
			Stage 1 (Year 1)[1]	Stage 2 (Year 2-3)[1]	Stage 3 (Year 4-6)[1]	Stage 4 (Year 7- full consent term)[1]
Other sub-aquiferWaihopo sub area management unit						
APP.039859.01.01APP.039859.01.01	TE AUPŌURI COMMERCIAL DEVELOPMENT LTDTE AUPŌURI COMMERCIAL DEVELOPMENT LTD	2021/2022	43,750	96,500	152,350	175,000
		Total (m^3/year)	**43,750**	**96,500**	**152,350**	**175,000**
		Total (% allocated per stage)	**25%**	**50%**	**75%**	**100%**
Waihopo sub aquifer						
APP.039859.01.01	TE AUPŌURI COMMERCIAL DEVELOPMENT LTD	2021/2022	120,000[2]	120,000	120,000	120,000
APP.040601.01.01**	WAIKOPU AVOCADOS LTD	2020/2021	20,840	41,680	62,520	83,360
APP017428.02.01[3]**	HENDERSON BAY AVOCADOS LTD	2020/2021	6,840	11,780	14,250	19,000
APP.040600.01.01[3]	FAR NORTH AVOCADOS LTD	2021/2022	8,000	16,000	24,000	32,000
APP.041211.01.01[4]	P MCLAUGHLIN	2022/2023	19,600	39,200	58,800	78,400
		Total (m^3/year)	**175,280**	**228,660**	**279,570**	**332,760**
		Total (% allocated per stage)	**53%**	**69%**	**84%**	**100%**
Houhora sub- area management unitaquifer						
APP.039859.01.01	TE AUPŌURI COMMERCIAL DEVELOPMENT LTD	2021/2022	218,750	437,500	656,250	875,000
APP.040121.01.01	NE EVANS TRUST & WJ EVANS & J EVANS	2021/2022	40,000	80,000	160,000	160,000
APP 040231.01.01[4]	P & G ENTERPRISES (PJ & GW MARCHANT)	2023/2024	7,000	14,000	21,000	28,000

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Application Number	Consent Holder	Indicated year of irrigation start	Allowable Annual Volume (m^3)			
			Stage 1 (Year 1)[1]	Stage 2 (Year 2-3)[1]	Stage 3 (Year 4-6)[1]	Stage 4 (Year 7- full consent term)[1]
APP 040652.01.01	SE & LA BLUCHER	2020/2021	24,000	48,000	72,000	96,000
APP.039644.01.01	MP DOODY & DM WEDDING	2021/2022	76,000	152,000	228,000	304,000
APP.040397.01.01	A MATTHEWS	2020/2021	2,400	6,000	9,000	12,000
APP.040558.01.01[4]	MV EVANS (1)	2020/2021	22,000	26,000	36,400	36,400
APP040979.01.01	MV EVANS (2)	2020/2021	31,500	63,000	93,500	126,000
		Total (m^3/year)	**442,250**	**866,500**	**1,297,150**	**1,717,400**
		Total (% allocated per stage)	26%~~25%~~	50%~~50%~~	76%~~80%~~	100%~~100%~~

Notes:

[1]The staged implementation is based on years when irrigation occurs following the granting of the consents. This differs between individual consent holders.

[2]The allocation from these bores is intended for a mixture of pasture and market gardening which will require the full amount of allocation dependent on the areas planted in each crop.

[3]Well established orchards.

[4] Trees were planted in 2019/2020 or have to be planted in the 2020/2021 period due to ordering system.

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2.1.1 Staging: Implementation and Monitoring Programme Review

A "Staged Implementation and Monitoring Programme Review" (SIMPR) will be required for Council to decide whether Consent Holders proceed to the next allocation stage. The volume of abstraction authorised will be reviewed against the staged implementation outlined in **Section 2.1** at the minimum intervals of:

End of Stage 1: A period where all or part abstraction of the Stage 1 annual volume is taken after commencement of the consent and after which a full 12 months of baseline monitoring data has been collected;

End of Stage 2: 3 irrigation seasons following date of commencement of the consents;

End of Stage 3: 6 irrigation seasons following date of commencement of the consents; and

End of Stage 4: 9 irrigation seasons following date of commencement of the consents.

~~End of Stage 1 – a period of not less than 12 months following date of commencement of the consents during which a full 12 months of baseline monitoring data is collected, and during which Stage 1 abstraction has been implemented over a full irrigation season;~~

~~End of Stage 2 - 3 irrigation seasons following date of commencement of the consents;~~

~~End of Stage 3 - 6 irrigation seasons following date of commencement of the consents; and~~

Commented [ML7]: Recommend term 'full irrigation season' be removed and replaced as the term could be applied as a take occurring for amount from September – April when climate/soil condition does not require this. Instead it should be acknowledged that all or part abstraction may occur over Stage 1 (Year 1) which recognises the practicality of the need (or not) to irrigate.

The main purpose of the SIMPR is to assess whether proceeding to the next stage would comply with Objective 1 of the GMCP.

The SIMPR will be commissioned by the Council and shall be prepared by a suitably qualified hydrogeologist with experience and knowledge of the locality.

The SIMPR shall include a detailed assessment of all environmental monitoring data including groundwater levels, salinity indicators, and water quality, and include consideration of spatial and temporal trends including potential effects of groundwater abstraction on water levels in lakes and surface water bodies administered by the Department of Conservation. If the potential for more than minor effects on surface waterbodies is identified, then the SIMPR will also include assessment of the likely significance of those effects prepared by a suitably qualified ecologist. The SIMPR shall assess whether Objective 1 of this GMCP is being met at the current level of abstraction, and whether Objective 1 will be met at the next stage level of abstraction. The SIMPR may also consider the nature and scope of continued monitoring (i.e. monitoring frequency and intensity (type and number of samples)) and associated trigger levels.

The SIMPR will provide recommendations based on the assessment of the environmental monitoring data to date on:

- the setting or alteration of the trigger levels;
- whether any changes to the monitoring programme are required; and

- whether to advance to the next stage of abstraction or to remain at the current level of abstraction, or to reduce the level of abstraction.

A copy of the SIMPR will be provided to the Consent Holders listed in

Table 1 and the Director General of Conservation a minimum of three months prior to the anticipated commencement of the subsequent irrigation season utilising volumes defined for the subsequent development stage as stated in

Table 1. The Consent Holders and Director General of Conservation have 20 working days to provide a response to the Council on the conclusions and recommendations of the SIMPR.

If no response is received from a party within the stated timeframe, then Council will consider that the party has no concerns with the conclusions of the report.

If any party does not agree with the conclusions and recommendations of the SIMPR, then a report by a suitably qualified hydrogeologist and/or ecologist, both with experience and knowledge of the locality if possible, detailing the reasons for the disagreement shall be provided to Council within 30 working days from the date that the assessment was sent to the party.

An increase in the volume of abstraction to the next development stage and any change to the monitoring programme will only be authorised by Council if the technical assessment of the monitoring data clearly indicates that the increase in the allocation and change to GMCP would meet Objective 1 of this GMCP.

Council will provide a report to the Consent Holders and the Director General of Conservation detailing the reasons for its decision, including the identification and discussion of areas of agreement and disagreement.

If any changes are made to the GMCP, then a copy of the amended GMCP will be provided to the Consent Holders and the Director General of Conservation within 5 working days of the change being authorised as final.

A summary of the above process is also included in the conditions of each consent that is covered by this GMCP.

2.1.2 Stage 1 (Year 1) Management Regime

Stage 1, from a management perspective, is the initial development stage ~~comprising a minimum period of 12 months (comprising at least 1 full irrigation season)~~ following ~~issue~~ commencement of the consents listed in Table 1. During this development stage abstraction will be ~~limited to less than 25% of the~~less than the full volume sought while baseline information is collected to enable monitoring of groundwater levels and quality (at monitoring sites not already established) to enable setting of trigger levels. It is important to note that while Stage 1 volumes in

Table 1 slightly exceed 25% in Stage 1 in some sub-aquifers, actual uptake by consent holders will occur at different times as some consent holders are not looking to develop their land immediately upon commencement of their consents. As such, actual abstraction during the first 12 months of the consents being granted will be much less than that stated in

Table 1.

During Stage 1 interim triggers for groundwater levels and salinity indicators will be established at all monitoring sites following the methodology outlined in Section 2.1.2.1 (for new monitoring bores) and Sections 3.2.5.3 and 3.3.1 below (for existing monitoring bores).

Council is to notify the Consent Holders and the Director-General of Conservation of the interim trigger (and default management parameters) for Stage 1 (Year 1) 3 months prior to the commencement of abstraction. The Consent Holders and Director-General of Conservation have 10 working days to provide responses to the Council on the default management parameters once notified.

The monitoring specified in Table 3 will be undertaken during Stage 1 to ensure interim triggers are not exceeded (i.e., to ensure compliance with Objectives 1(a), (b), and (c)). Exceedance of interim trigger levels during Stage 1 will result in the implementation of the trigger level exceedance measures outlined in **Section 4** below.

2.1.2.1 Saline Intrusion & Groundwater Level: Monitoring and Triggers

Saline intrusion monitoring for Stage 1 (Year 1) is proposed within the sentinel and monitoring bores identified in **Table 3** of this GMCP. As each sentinel or monitoring bore is drilled, groundwater level and salinity indicators will be measured and recorded. This information will be used to set interim trigger levels for these parameters as per the methodology established in **Section 2.2** below. Interim trigger levels must be set prior to exercise of any of the consents.

The saline intrusion and groundwater level monitoring trigger levels for Stage 1 (Year 1) shall be inserted into the GMCP through the process set out in **Section 1.3** of this GMCP prior to the exercise of any consents.

2.1.2.2 Trigger Level Responses

In the event of an exceedance of a Trigger Level applicable in Stage 1 (Year 1), the Trigger Level Exceedance response plan contained in **Section 4** of this GMCP shall apply.

2.1.2.3 Ceasing Interim Stage 1 (Year 1) Management Regime

This interim management regime shall remain in place until such time as Council has given authorisation to proceed to the next stage (Stage 2) as set out under **Section 0** above or where the setting of trigger levels as per **Section 2.2** below has been given effect to through amendment to this GMCP in accordance with the change process established in **Section 1.3** above.

2.2 Trigger Level System

2.2.1 Timeframe for setting of trigger levels

The setting of trigger level values for each parameter (where TBC is indicated in the monitoring plan tables in **Section 3** Monitoring Programme) will be based either on current baseline data (for sites with existing monitoring) or data collected during the first implementation stage after 12 months of

monitoring data has been collected and within 15 months of the date of commencement of these consents. This approach recognises that:

- There is historical monitoring data available for some parameters to characterise the response of groundwater levels and quality to current levels of abstraction.
- In some areas, no baseline data has been established by the consent holder(s) or any of the key stakeholders in the area; and
- The manifestation of any effects from the exercising of these consents will steadily progress with time in accordance with the staged development process outlined in Table 1. The scale of abstraction during the baseline data collection period (i.e. 12 months following ~~granting~~ commencement of consent) will not vary significantly from existing conditions ~~(limited to no greater than 25% of the total volume covered by this GCMP)~~.

2.2.2 *Method for setting of trigger levels*

A two-tier trigger level system will be implemented on the consents:

- **TL1** - The first-tier trigger level establishes when an individual monitoring parameter is exhibiting a [?] departure from baseline conditions. If this trigger level is breached, then additional monitoring will be undertaken by the Council. This additional monitoring will assist characterisation of the nature and significance in changes to the baseline condition of the groundwater resource
- **TL2 -** The second-tier trigger level is set at a threshold defining a 'significant' departure from baseline conditions and/or conditions where the risks of adverse environmental effects are increased. If this trigger level is breached, then the Consent Holders will be required to reduce their daily water take volume in a staged manner over a set period of time.

The TL parameters required under this GMCP for the various suites are summarised in **Table 2.**

Table 2: Summary trigger level parameters by monitoring suite

Monitoring Suite	Parameters
Groundwater level and salinity monitoring	Groundwater level, electrical conductivity
Saline intrusion monitoring	Electrical conductivity, chloride, sodium, total dissolved solids.

2.2.3 *Response to exceeding trigger levels*

The actions required should TL's be exceeded are set out in **Section 4** (Contingency Plan).

3. MONITORING PROGRAMME & TRIGGER LEVEL SETTING

3.1 Bore Locations and Details

A consolidated summary of the schedule of bores that are required to be monitored as part of this GMCP is provided in **Table 3.** Along with the bores identified for monitoring, the table provides key details relating to the bores' physical attributes and parameters to be monitored. The locations of the monitoring bores are shown on Figure 1 The following sections of the GMCP provide the monitoring schedules (frequency and trigger levels) for the bores. The monitoring schedule comprises four components:

- Two sentinel monitoring sites along the coastal margin, seaward of areas where abstraction is concentrated. The sentinel bores will provide the primary reference sites for monitoring and management of potential saline intrusion effects. Each sentinel bore will comprise two piezometers, accessing the shallow unconfined aquifer and the shellbed respectively. Instrumentation in each piezometer will enable continuous monitoring of groundwater levels and electrical conductivity (EC), and provide for telemetry of monitoring data to NRC.
- Groundwater levels in the unconfined and shellbed aquifers will be monitored manually on a monthly basis at selected locations inland of Pukenui and in the Waihopo area. This monitoring will be undertaken either in existing bores (if suitable sites can be identified and access obtained) or in new piezometers. These sites will enable ongoing monitoring of groundwater levels and provide data to characterise both localised and cumulative drawdown in response to abstraction and be used to inform the staged implementation process.
- Salinity indicators will be measured on a quarterly basis in each piezometer at the two sentinel bores, augmented by an additional monitoring bore in the Waihopo area. These sites will be monitored on a quarterly basis for the parameters listed in Table 2 and provide a secondary baseline to characterise any changes in aquifer salinity along the coastal margin.

The locations of the production bores in **Table 3** are also shown in **Figure 1**. An error accuracy level of +/- 50 metres is applicable to these bore locations. Any differentiation in the location by greater than 50 metres will result in a requirement for an application to the Council for a change of consent condition pursuant to Section 127 of the Resource Management Act 1991 (RMA). Assessment of the effects on the environment of the change will be required pursuant to Schedule 4 of the RMA.

Table 3: Schedule of monitoring facility and production bore details.

MONITORING BORES									
Bore Details		Bore Owner	Coordinates (NZTM 2000)		Depth (m)	Dia. (mm)	Piezo. No.	Target aquifer	Purpose*
Name (Fig 1)	NRC ref.		Easting	Northing					
Fishing Club	LOC.200250	NRC	1611411	6146928	79			Shellbed	SI;
Waterfront	LOC.200210	NRC	1611712	6146689	19	32	1	Unconfined	GL_c, EC
Waterfront	LOC.200210	NRC	1611712	6146689	74	32	4	Shellbed	GL_c, EC_c
Houhora Sentinel (shallow)	TBC	NRC	1609900	6149600	<10	50	1	Unconfined	GL_c; EC_c, SI
Houhora Sentinel (deep)	TBC	NRC	1609900	6149600	80-100 (TBC)	50	2	Shellbed	GL_c; EC_c, SI
Lamb Road (shallow)[a]	TBC	NRC	1609750	6147300	<20	50	1	Unconfined	GL_m
Lamb Road (deep)[a]	TBC	NRC	1609750	6147300	80-100	50	2	Shellbed	GL_m
Burnage Road	LOC.200209	NRC	1611325	6145090	17	50	1	Unconfined	GL_m
			1611325	6145090	97	50	4	Shellbed	GL_m
Browne	LOC.200208	NRC	1610733	6144031	16	50	1	Unconfined	GL_m
			1610733	6144031	59	50	4	Shellbed	GL_m
Waihopo Level/Quality[a]	TBC	TBC	1606950	6153600	TBC	TBC		Shellbed	GL_m, SI
Houhora Heads[b]	LOC.200068	Private	1613368	6146558	21.3	100		Unconfined	GL_m, SI
PRODUCTION BORES									
Bore Details		Bore Owner	Coordinates (NZTM 2000)		Depth (m)	Dia. (mm)	Piezo No.	Target	Purpose
Name (Figure 1)	NRC Ref.		Easting	Northing					
Henderson Bay Avocados	TBC	Henderson Bay Avocados	1605623	6154872				Shellbed	GL_m, EC_m
Far North Avocados	TBC	Far North Avocados	1605981	6154581				Shellbed	GL_m, EC_m

Commented [ML8]: Assume these are new facilities and are expected to be implemented by consent holders as per section 1.2.1. Preference is for NRC to be responsible for installation of sentinels and to forward charge to applicants via actual and reasonable charging.

Waikopu Avocados	TBC	Waikopu Avocados	1603347	6153388				Shellbed	GL_m, EC_m
Te Raite Station - Other	TBC	Te Aupōuri commercial development ltd	1603898	6151179				Shellbed	GL_m, EC_m
Te Raite Station - Waihopo 1	TBC		1605333	6151462				Shellbed	GL_m, EC_m
Te Raite Station - Waihopo 2	TBC		1607102	6150752				Shellbed	GL_m, EC_m
McGlaughlin	TBC	McGlaughlin	1606049	6150294				Shellbed	GL_m, EC_m
P&G Enterprises	TBC	P & G Enterprises (PJ & GW Marchant)	1609182	6148952				Shellbed	GL_m, EC_m
Te Raite Station - Houhora 1	TBC	Te Aupōuri commercial development ltd	1608383	6148854				Shellbed	GL_m, EC_m
Te Raite Station - Houhora 2	TBC		1607182	6148084				Shellbed	GL_m, EC_m
Te Raite Station - Houhora 3	TBC		1609287	6148271				Shellbed	GL_m, EC_m
Te Raite Station - Houhora 4	TBC		1609016	6147852				Shellbed	GL_m, EC_m
Te Raite Station - Houhora 5	TBC		1607771	6147949				Shellbed	GL_m, EC_m
Te Raite Station - Houhora 6	TBC		1609655	6147078				Shellbed	GL_m, EC_m
Te Raite Station - Houhora 7	TBC		1609296	6147373				Shellbed	GL_m, EC_m
Evans Trust	TBC	NE Evans Trust & WJ Evans & J Evans	1609492	6148850				Shellbed	GL_m, EC_m
S&L Blucher	TBC	S. & L. Blucher	1610145	6148091				Shellbed	GL_m, EC_m
A. Matthews	TBC	A. Matthews	1611038	6146087				Shellbed	GL_m, EC_m
Wedding & Doody	TBC	MP Doody & DM Wedding	1610297	6145328				Shellbed	GL_m, EC_m
M Evans 1 & 2	TBC	MV Evans	1610554	6145121				Shellbed	GL_m, EC_m

Notes:

[a] Nominal location only

[b] Private bore subject to access agreements

TBC = to be confirmed within 15 months of the date of commencement of these consents.

* Purpose key:

GL_c = Continuous Groundwater Level;

GL_m = Manual (monthly) Groundwater Level;

EC_c = Continuous Electrical Conductivity;

EC_m = Manual (monthly) Electrical Conductivity;

SI = Salinity Indicators (quarterly);

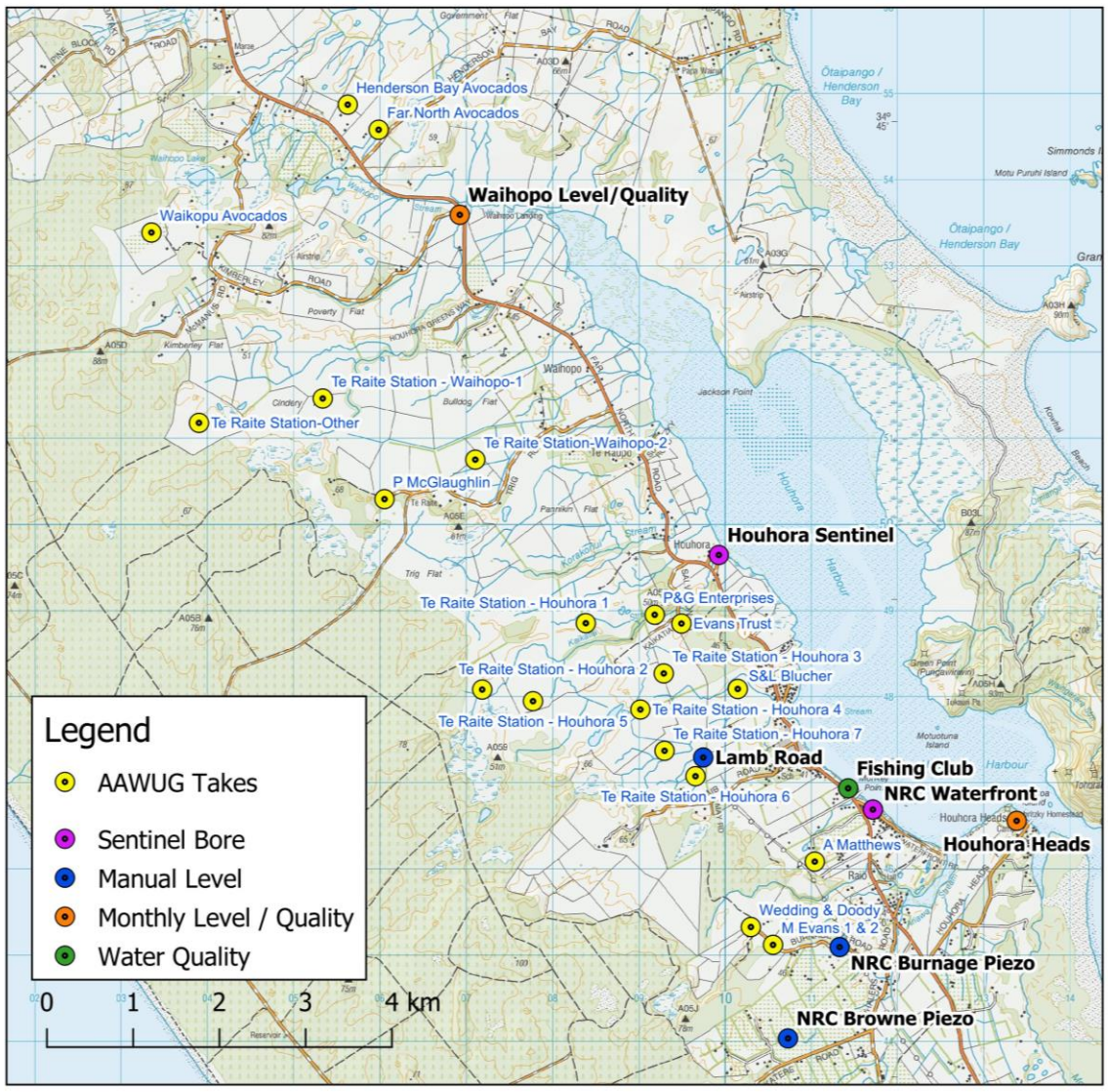

Figure 1. **Monitoring and Production Bore Location Map**

3.2 Groundwater Level and Salinity Monitoring

Commented [ML9]: Suggest this section gets rearranged similarly to that suggested for south-western GMCP.

3.2.1 Sentinel Monitoring Bores

Sentinel bores will be utilised as the primary reference sites for regional monitoring of potential effects associated with saline intrusion. These bores will provide early detection or warning of:

- Groundwater levels around the coastal margin approaching a threshold that could indicate a greater risk of saline intrusion; and
- Any reduction in water quality that could indicate the landward migration of the saline interface.
- Groundwater levels in the shallow sand aquifer lowering and having a potential adverse effect on surface water bodies

Details of the sentinel bores are summarised in **Table 4** below. These sentinel bores will collect data continuously for water levels and electrical conductivity in individual piezometers. This data will be telemetered to NRC. A two-tier trigger level system (TL1 and TL2) for groundwater levels and electrical conductivity will be set in these bores.

TL1 and TL2 trigger levels for groundwater level and EC in the NRC Waterfront piezometers are specified in Table 4 below. The setting of TL1 and TL2 trigger levels values for remaining piezometers will be undertaken during the first implementation stage after 12 months of monitoring data has been collected and within 15 months of the date of commencement of these consents and will replace the interim trigger levels outlined in Section 2.1.2.1 above. The trigger level values that are shown in **Table 4** are based on existing data and will be reconfirmed by Council when the remaining trigger levels are confirmed.

All sentinel monitoring bores listed in **Table 4** will be installed prior to the exercise of the consents.

Checking of the sensors required for continuous monitoring will be undertaken on a monthly basis, and any faults will be recorded and remedied immediately. Data will be collected, processed and managed in accordance with NRC quality standards.

Table 4: Schedule of sentinel monitoring bores for groundwater level and/or salinity indicators

Sentinel Bore Name	Depth (m)	Piezo. No.	Target aquifer	Units	Frequency	Trigger Levels	
						TL1	TL2
Waterfront	19	4	Unconfined	mAMSL	Continuous	2.3maMSL EC TBC	0.5 maMSL EC TBC
	74	1	Shellbed	mAMSL	Continuous	4.4 maMSL EC TBC	1.8 maMSL EC TBC
Houhora	<10	1	Unconfined	mAMSL	Continuous	TBC	TBC
				µS/cm	Continuous	TBC	TBC
	80-100 (TBC)	2	Shellbed	mAMSL	Continuous	TBC	TBC
				µS/cm	Continuous	TBC	TBC

Sentinel Bore Name	Depth (m)	Piezo. No.	Target aquifer	Units	Frequency	Trigger Levels	
						TL1	TL2

Notes:
TBC = to be confirmed within 15 months of the date of commencement of these consents.
GL TL1s (where provided) have been calculated from long term monitoring data.
GL TL2s (where provided) have been interpolated from Table F1, WWA Groundwater Modelling Report.

3.2.2 *Manual Groundwater Level Monitoring*

Groundwater levels will be monitored manually in the shallow sand and shellbed aquifers to:

- Quantify the magnitude of drawdown resulting from the proposed abstraction in the shellbed and unconfined aquifers to ensure it is within the magnitude anticipated in the AEE and does not result in adverse effects on surface water environment, existing groundwater users and long-term aquifer storage volumes.
- Ensure coastal groundwater levels are not adversely affected by the proposed abstraction

Details of the groundwater level monitoring bores are listed in Table x below. The bores include two existing NRC piezometer installations (Burnage Road and Browne) plus new piezometers installed at Lamb Road and Waihopo. An existing private bore at Houhora Heads is also included (subject to access agreement).

The primary value of data collected from manual groundwater level monitoring will be to establish medium to longer-term variations in groundwater levels in response to groundwater abstraction. This information will be utilised to inform the Staged Implementation and Monitoring Programme Review (Section 2.1.1) and Annual Environmental Monitoring Report (Section 3.5).

~~Trigger levels will also be established for groundwater levels in the unconfined and shellbed aquifers at the Lamb Road monitoring site to ensure cumulative drawdown in the shellbed and unconfined aquifers remains within the range predicted in the AEE and ensure the reliability of supply for existing efficient bore takes in the Pukenui area is not adversely affected by the proposed abstraction.~~

Table 5. Schedule of Manual Groundwater Monitoring Bores

Monitoring Bore	NRC ID	Easting	Northing	Depth (m)	Aquifer	Units	Frequency
NRC Burnage Road (shallow)	LOC.200209	1611325	6145090	17	Unconfined		
NRC Burnage Road (deep)	LOC.200209			97	Shellbed		
NRC Browne piezo (shallow)	LOC.200208	1610733	6144031	16	Unconfined		
NRC Browne piezo (deep)	LOC.200208			59	Shellbed		
Lamb Road (shallow)	TBC	1609900	6149600	<20	Unconfined		
Lamb Road (deep)	TBC			80-100	Shellbed		
Houhora	LOC.200068	1613368	6146558	21.3	Unconfined		

Commented [ML10]: Assume these parameters are needed

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Heads							
Waihopo	TBC	1606950	6153600	TBC	Shellbed		

Trigger levels will also be established for groundwater levels in the unconfined and shellbed aquifers at the Lamb Road monitoring site to ensure cumulative drawdown in the shellbed and unconfined aquifers remains within the range predicted in the Model Report and ensure the reliability of supply for existing efficient bore takes in the Pukenui area is not adversely affected by the proposed abstraction.

3.2.3 Setting of Groundwater Level and EC Triggers

As a general guide TL2 for deep shell bed groundwater levels should be no less than 1.0 mAMSL at sentinel monitoring sites (noting that changes in EC are also a key indicator of saline intrusion).

Groundwater level triggers at the Lamb Road monitoring site will be based on measured static water levels prior to exercise of the water permits listed in Table 1 minus the maximum magnitude of cumulative drawdown calculated to result from the proposed abstraction outlined in Aupouri Model Report.

3.2.3.1 Electrical Conductivity Triggers

Electrical conductivity triggers in sentinel bores will be no greater than:

- **TL1** - Median (weekly rolling average) EC from baseline monitoring period +25%
- **TL2** - Median (weekly rolling average) EC from baseline monitoring period + 50%

3.3 Saline Intrusion Monitoring

During the initial 12-month monitoring period, sampling for the following salinity indicators in the bores listed in **Table 6** below will be undertaken at 6 weekly intervals[2]:

- Electrical conductivity;
- Chloride;
- Sodium;
- Total Dissolved Solids.

The samples will be collected in accordance with A National Protocol for State of the Environment Groundwater Sampling in New Zealand (Ministry for the Environment, 2006).

[2] This frequency applies to the initial 12-month monitoring period for the establishment of baseline information. The frequencies specified in Table 6 are for ongoing monitoring specifications.

3.3.1 Setting of Saline Intrusion Triggers

As an initial guide, trigger levels for individual determinants will be established as follows:

- **TL1** - Median concentration from the baseline monitoring period +25%.
- **TL2** - Median concentration from the baseline monitoring period + 50%.

3.3.1.1 Ongoing Monitoring

Sampling at the frequencies specified for the following salinity indicators will take place in the bores listed in **Table 6** below:

- Electrical conductivity;
- Chloride;
- Sodium;
- Total Dissolved Solids.

The samples will be collected in accordance with A National Protocol for State of the Environment Groundwater Sampling in New Zealand (Ministry for the Environment, 2006).

Table 6: Monitoring Schedule – Saline Intrusion

Bore Name	Depth (m)	Piezo. No.	Target aquifer	Parameter*	Units	Frequency	Trigger Levels	
							TL1	TL2
Fishing Club	79	1	Shellbed	EC	µS/cm	Quarterly	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC
Houhora (Sentinel)	<20	1	Unconfined	EC	µS/cm	Continuously	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC
	80-100	2	Shellbed	EC	µS/cm	Continuously	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
Waihopo	TBC	1	TBC	EC	µS/cm	Quarterly	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC
Houhora Heads	21.3	1	Unconfined	EC	µS/cm	Quarterly	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC

Notes:

* Parameter key: GL = Groundwater Level; EC = Electrical Conductivity; SI = Salinity Indicators; TDS = Total Dissolved Solids.

TBC = to be confirmed within 15 months of the date of commencement of these consents.

3.4 Production Bore Monitoring

During the initial 12-month monitoring period, sampling for the following salinity indicators in the bores listed in

Table 7 below will be undertaken at 6 weekly intervals[3].

3.4.1 Trigger levels

Electrical conductivity trigger levels will be established in the production bores listed in

Table 7 below.

During the initial 12-month monitoring period Electrical Conductivity Triggers will be no greater than:

- **TL1** – Departure exceeding 25% of the EC value from the initial monitoring round
- **TL2** – Departure exceeding 50% of the EC value from the initial monitoring round

Long-term EC triggers for individual production bores will be established following the initial 12-month monitoring period based on an assessment of spatial and temporal variation in EC observed during the initial period, in a manner consistent with EC trigger levels established in the sentinel monitoring bores.

No trigger levels will be established for groundwater levels in the production bores as water levels in the production bores can be impacted by well efficiency and pumping schedules so are not necessarily representative of groundwater levels in the surrounding aquifer.

3.4.2 Ongoing monitoring

Monthly water level monitoring will be undertaken in the production bores listed in

Table 7 **d**uring the winter months (nominally May to September). This monitoring will provide information to identify any inter-annual variations in aquifer storage which may be anomalous compared to regional trends.

Electrical conductivity values will also be measured at monthly intervals from the production bores during the irrigation season to check on any changes in salinity induced by the pumping. Requirements to continue monitoring of groundwater levels and electrical conductivity in individual production bores after Stage 1 will be addressed in the Staged Implementation and Programme Review (Section 2.1.1).

Table 7: Monitoring Schedule – Production Bore Water Levels and Electrical Conductivity

Bore Name	Depth (m)	Target aquifer	Parameter*	Units	Frequency	Trigger Levels	
						TL1	TL2

[3] This frequency applies to the initial 12-month monitoring period for the establishment of baseline information. The frequencies specified in Table 6 are for ongoing monitoring specifications.

Bore Name	Depth (m)	Target aquifer	Parameter*	Units	Frequency	Trigger Levels	
						TL1	TL2
Henderson Bay Avocados	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Far North Avocados	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Waikopu Avocados	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Te Raite Station - Other	TBC	Shellbed	GL, SI	mAMSL	Monthly	EC TBC	EC TBC
Te Raite Station - Waihopo 1	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Te Raite Station - Waihopo	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
McGlaughlin	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
P&G Enterprises	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Te Raite Station - Houhora 1	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Te Raite Station - Houhora 2	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Te Raite Station - Houhora 3	TBC	Shellbed	GL, EC	mAMSL	Continuous	EC TBC	EC TBC
Te Raite Station - Houhora 4	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Te Raite Station - Houhora 5	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Te Raite Station - Houhora 6	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Te Raite Station - Houhora 7	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Evans Trust	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
S&L Blucher	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
A. Matthews	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Wedding & Doody	TBC	Shellbed	GL; EC	mAMSL	Monthly	EC TBC	EC TBC
M Evans 1 & 2	TBC	Shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC

Notes:

* Purpose key: GL = Groundwater Level; EC = Electrical Conductivity.

All trigger limit values in this Table to be confirmed by Council.

3.5 Environmental Monitoring Report

At the end of each irrigation season, the Council will commission the preparation of an Annual Environmental Monitoring Report (AEMR) by a suitably qualified hydrogeologist with experience and knowledge of the locality. A copy of the AEMR will be provided to the Consent Holders and the Director General of Conservation by 31 July each year.

The purposes of the Annual Environmental Monitoring Report are to;

- provide a summary of the monitoring results for the previous year, including trends, against Objective 1 of the GMCP;
- assess the monitoring undertaken over the previous year against the standards set out in Objective 1;
- Identify any changes/amendments to monitoring locations/parameters/frequencies that could be incorporated in future SIMPR
- report on any issues apparent with the monitoring and
- identify any improvement that could be made with respect to the monitoring.

The AEMR will also contain an evaluation of whether the observed effects of the groundwater takes are consistent with the predictions of environmental response contained in the Model Report.

4. CONTINGENCY PLAN

Exercise of the consents is subject to compliance with Objective 1 of this GMCP.

As described in **Section 2**, a trigger level system is used to define environmental criteria that signal changes may be occurring outside of what is normal (TL1) or at a point where remedial action is required to avoid Objective 1 not being met (TL2).

This section details the responses that will be undertaken where TLs are exceeded under any of the monitoring suites discussed in **Sections** Error! Reference source not found.**, 2.1.2.1, 3.2, 3.3, and 3.4**.

Where a trigger level is exceeded the Council will commission a Groundwater Trigger Exceedance Report (GTER). The objective of the GTER is to establish the cause of a trigger level exceedance and to recommend a programme of action to end the exceedance.

A GTER shall:

- Include a review of the monitoring results collected including an assessment of why the trigger level exceedance has occurred;
- set out requirements for increased monitoring;
- update the report on a regular basis as more data becomes available; and
- recommend actions to end the trigger level exceedance, which could include;
    - a staged reinstatement of abstraction to pre-exceedance rates and volumes,
    - reduced levels of abstraction for all or some of the consent holders covered by the GMCP, or
    - suspension of abstraction by all or some of the consent holders covered by the GMCP.
    - Amendment of the trigger level exceeded

4.1 Exceedance of TL1

In the event of a TL1 exceedance, which may represent declining groundwater levels or rising salinity indicators, the following actions must be undertaken:

(a) The Council will notify the Consent Holders within two working days of when the TL1 exceedance became known.

(b) If the exceedance is of a salinity indicator in the bores listed in **Table 4**, then sampling of the monitoring bore(s) in exceedance shall immediately be upgraded to a weekly frequency for four weeks following the first exceedance of the TL1. Weekly monitoring shall continue until sample results are consistently below TL1 values for a period of four weeks or as directed by Council.

(c) If after four weeks following the first exceedance of the TL1, the initiation of seawater intrusion and/or water level decline cannot be discounted to the satisfaction of the Council,

then a Groundwater Trigger Exceedance Report (GTER) by a suitably qualified Hydrogeologist shall be commissioned by Council.

(d) The GTER shall assess the significance of the exceedance against the requirements of Objective 1 of the GMCP. The GTER shall assess why TLs have been breached, identify the pumping bores in the area(s) of effect and will review all of the available data collected in the affected area(s), in particular the data collected pursuant to this GMCP.

4.2 Exceedance of TL2

In the event of a TL2 exceedance, which represents a significant departure from normal groundwater conditions, with either continuously declining groundwater levels or rising salinity indicators:

(a). Council will immediately inform the Consent Holders upon a TL2 exceedance becoming known.

(b). Consent Holders reduce their abstraction to 50% of the current average daily quantity, as calculated using the previous month's water use records required to be kept in accordance with the conditions of its groundwater take consent as directed by Council. If the exceedance occurs within one month of a Consent Holder first taking water for irrigation purposes within an irrigation season, then the average shall be calculated using the water use records for this period only. The council will advise the Consent Holder in writing of any breach and the required reduction in the daily water take volume.

Given the geographic distribution of water permits included in this GCMP, direction by Council for individual Consent Holders to reduce their abstraction will be include consideration of:

- The location, nature and extent of the trigger level exceedance.
- State and trends in the same or related indicator parameters at other monitoring sites listed in Table 3.
- The location, rate and volume of abstraction by individual water permits.

(c). A GTER by a suitably qualified hydrogeologist (and ecologist if the exceedance concerns dune lakes or natural wetlands) shall be commissioned by Council. The GTER shall assess why the TL2 has been breached, identify the pumping bores in the area of effect, and include a review of all available data collected for the affected area(s), in particular, the data collected under this GMCP.

(d). Once (b) above has been complied with, the Consent Holder may apply to the Council's Compliance Manager for an alternative reduction in its daily water take volume. Council approval of an alternative reduction value will only be given if it is satisfied that relevant TL2 values will not be exceeded. The Council will use the GTER to inform its decision on any alternative reduction value for a Consent Holder.

(e). If the TL2 exceedance is in a bore(s) that is/are not continuously monitored, then weekly groundwater level measurements and/or sampling of saline intrusion (depending on which trigger level is breached) in all bores where TL2 trigger levels are breached will commence within one week of the TL2 trigger level exceedance. Monitoring will continue until such time as:

- Three consecutive samples in an individual monitoring bore are below all TL2 thresholds established for that piezometer; or
- As directed by Council.

(f). If salinity indicators continue to increase or groundwater levels continue to decline after 21 days following the implementation of (b), then the Consent Holder's abstraction must be reduced to 25% of the current average daily quantity, as calculated for (b) above. The council will advise the Consent Holder in writing of this further reduction and the required reduction in the daily water take volume.

(g). If (f) is implemented, then the Council will commission a review and update of the GTER report by a suitably qualified hydrogeologist with a longer-term programme of recommended responses incorporating observed responses to interim pumping rate reductions. The updated GTER will include a specific programme (including timeframes) of actions which would achieve compliance with Objective 1 of this GMCP. The actions may include, but not be limited to incremental reductions in the daily quantity of groundwater taken as a percentage of the allowable daily pumped volume, as well as testing of domestic/stock water supplies in bores that are efficiently utilising the aquifer and are potentially impacted by saline intrusion, and if necessary, the provision of temporary water supplies to any affected parties (excluding any of the Consent Holders) in the event that Chloride concentrations exceed 250 mg/L (being the guideline value for taste prescribed in New Zealand Drinking Water Standards for New Zealand 2005 (Revised 2008)). The GTER will also identify a methodology which Council will utilise to increase abstraction back to the volumes applicable to the relevant stage of taking (see Section 2.1), where this can be done such that Objective 1 of this GMCP will be met. If it is not possible to increase abstraction back to the relevant stage of taking, then the GTER will identify a methodology to increase abstraction to a lesser volume such that Objective 1 of the GMCP will be met.

(h). Actions arising from the GTER shall continue as long as the issue continues.

(i). Implement additional remedial measures as directed by Council, including the suspension of taking.

5. REFERENCES

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Groundwater Monitoring and Contingency Plan for the Other, Paparore, Waiparera, Motutangi and Houhora sub-~~areas~~ aquifers of the Aupōuri Aquifer Management Unit

July 2020

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GLOSSARY OF TERMS

Saline/saltwater intrusion	For the purposes of this Groundwater Monitoring and Contingency Plan, saline/saltwater intrusion refers to changes in salinity at nominated monitoring locations that exceed thresholds established to indicate elevated potential for adverse effects on groundwater quality for potable supply and/or irrigation use
Efficient bore takes	An efficient bore take is when a bore fully penetrates the water bearing layer and takes water from the base of the aquifer.
Sub-aquifer	The Aupōuri Aquifer system is divided into 12 separate sub-aquifer units for the purposes of setting tailored aquifer-specific allocation limits.[1]
First in-first served	Under the Resource Management Act 1991, applications for water take are processed in the order in which they are lodged. The rights of parties associated with this Groundwater Monitoring and Contingency Plan are prioritised according to the order in which their permits are granted and added to this Plan.

[1] Policy H.4.4 of the Proposed Regional Plan for Northland (Appeals Version) June 2020.

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1. INTRODUCTION

1.1 Scope and Objective of the GMCP

This document comprises a groundwater monitoring and contingency plan for the ~~Waiharara~~Waiparera, Motutangi, Paparore, and Houhora sub-~~areas~~ aquifers of the Aupōuri aquifer management unit (GMCP). Much of the approach outlined in this GMCP has been informed by the technical assessment presented in the *Motutangi-*[Waiparera]*Waiharara Groundwater Model, Factual Technical Report – Modelling. Motutangi-*[Waiparera]*Waiharara Water User Group. WWA0026: Final – Rev. 9*, dated 31 August 2017 (hereon referred to as the MWWUG Model Report) and the *Aupouri Aquifer Groundwater Model, Factual Technical Report – Modelling – Aupouri Aquifer Water User Group. WWLA0184, Rev 3*, dated 5 February 2020 (hereon referred to as the AAWUG Model Report). Both reports were prepared by Williamson Water & Land Advisory Ltd.

The GMCP covers the implementation and monitoring of the groundwater take consents listed in **Table 1**~~**Tables 1**~~ **Table 2**~~**and 2**~~ (hereafter referred to in combination as the Consent Holders) and is a programme of adaptive management that is suitable to provide a platform for the implementation of these abstractions.

The Consent Holders listed in **Table** 1 ~~Table 1 are MWWUG and~~ were granted their consents first. These Consent Holders have been grouped as Priority A consents. The Consent Holders listed in **Table 2**~~**Table 2**~~ are a group of consents that have been jointly granted subsequent to the ~~MWWUG~~ consents listed in **Table 1**~~**Table 1**~~Table 1. These consents have been grouped as Priority B consents.

An adaptive management regime requires reasonably clear objectives against which the effects and management progress may be evaluated against. The objective of this GMCP is that:

Objective 1: The abstractions must, individually and cumulatively, avoid:

(a) Adverse effects of saltwater intrusion into the Aupouri aquifer;

(b) adverse effects on the hydrological functioning of the Kaimaumau-Motutangi wetland;

(c) adverse effects on the significant indigenous vegetation and significant habitats of indigenous fauna in terrestrial and freshwater environments of the Kaimaumau-Motutangi wetland; and

(d) lowering of the groundwater levels of the Aupō~~o~~uri aquifer such that existing efficient bore takes operating as a permitted activity or in accordance with resource consent conditions cannot access groundwater from these sub-aquifers of the quantity authorised.

Extensive environmental monitoring is required to achieve avoidance of the effects listed above, and to support the proposed 'adaptive management' approach including a staged implementation of groundwater extraction. The purpose of the GMCP is to formalise specific monitoring requirements, establish groundwater level and groundwater quality monitoring triggers and outline a process for implementation of appropriate mitigation and remediation measures in the event that nominated trigger values are exceeded.

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The GMCP is intended to allow the early detection of any impact to the ~~Waihārara~~Waiparera, Motutangi, Paparore, and Houhora sub-aquifers of the Aupōuri aquifer management unit and the Kaimaumau-Motutangi wetland (Kaimaumau Wetland) associated with the exercise of groundwater take consent(s), by:

- Ensuring regular monitoring of the groundwater system both on and off-site;
- Setting monitoring criteria (trigger levels) to indicate potential impact(s) on the groundwater system and Kaimaumau Wetland;
- Changing the pumping regime if trigger levels are reached to ensure that Objective 1 continues to be met;
- Reviewing monitoring data before and after a step level increase in pumping rate;
- Ensuring that the monitoring data is available for regular review by the Council;
- Detailing a Contingency Plan to be implemented if an unanticipated impact(s) is identified;
- Providing information to quantify the actual effects of the abstraction on the groundwater resource; and
- Enabling validation of the numerical model by the Consent Holders for any replacement groundwater take consent applications.

1.2 Parties Associated with this GMCP

The parties who have been deemed to be associated with this GMCP at its inception are the Council, the Consent Holders, and the Director-General of Conservation.

The following provides a brief description of the roles and responsibilities of each party associated with this GMCP.

Should any of these parties change during the implementation of this GMCP, either through addition or removal, the process as set out in **Section 1.3** below shall be applied.

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1.2.1 Northland Regional Council

The Council will undertake the ongoing monitoring requirements of the GMCP on behalf of the Consent Holders. The actual and reasonable cost of undertaking the ongoing monitoring of these consents for the Consent Holders will be charged in accordance with Council's Charging Policy.

The installation of sentinel bores and monitoring equipment is the responsibility of the Consent Holders.

Commented [ML2]: The applicants have not formed into an entity that could coordinate this work. Would be better if NRC install and charge as per their charging policies. As a sentinel bore, it will be measuring environmental information not just in relation to the takes but also on allocation and FMU management through the PRP (or any future plan changes).

1.2.2 Consent Holders

The Consent Holders are required to exercise their ~~Water Permits~~consents in accordance this GMCP.

Commented [ML3]: Changed as rest of GMCP refers to consents.

The exercise of the ~~Water Permits~~consents will be in accordance with Council initiated instructions which will be issued once the actions and process established through this GMCP have been undertaken.

The Consent Holders may seek changes to the GMCP through either of the processes set out in **Section 1.3**.

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1.2.3 Director-General of Conservation

The Director-General of Conservation is responsible for administering parts of the Kaimaumau Wetland subject to scientific reserve status under the Reserves Act 1977 and stewardship area status under the Conservation Act 1987.

The Director-General of Conservation is a party to this GMCP to ensure that the relevant provisions of these Acts, which the Director-General of Conservation administers, in particular Objective 1(b) and 1(c) matters are to be met.

1.3 Changes to the GMCP

This GMCP may be amended at any time to:

- Incorporate new or replacement water permits, or remove water permits, in the ~~Waihārara~~Waiparera, Motutangi, Paparore, or Houhora sub-aquifers of the Aupōuri aquifer management unit that have overlapping and/or additional monitoring requirements or which are subject to different trigger levels or trigger levels based on monitoring described in this GMCP:
- Alter the nature and scope of the required monitoring (i.e. monitoring frequency and intensity (type and number of samples)) and associated trigger levels;
- Incorporate or remove parties who are, or may need to be, a part of this GMCP to ensure Objective 1 is met.

If either the Council or a Consent Holder wishes to amend the GMCP, then it must provide notice in writing of the proposed changes, along with any supporting technical documents, to the other Consent Holders, and the Director-General of Conservation.

Parties, given notice by Council of a change to the GMCP, have 20 working days to provide a response to the Council on the proposed changes to the GMCP.

If no response is received from a party within the stated timeframe, then Council will consider that the party has no concerns with the conclusion of the report.

If any party does not agree with the proposed change, that party shall engage a suitably qualified hydrogeologist and/or an ecologist to prepare a report detailing the reasons for the disagreement which shall be provided to Council within 30 working days from the date that the written notice of the proposed changes was sent to the party.

Any change to the GMCP will only be authorised by Council if the technical or administrative assessment of the proposed change clearly indicates that the change will meet Objective 1 of the GMCP.

Council will provide a report to the Consent Holders detailing the reasons for its decision, including the identification and discussion of areas of agreement and disagreement. If the change would affect

the interests of the Director-General of Conservation, then the report will also be provided to this party.

If any changes are made to the GMCP, then a copy of the amended GMCP will be provided to the Consent Holders and the Director General of Conservation.

2. FRAMEWORK FOR ADAPTIVE MANAGEMENT

In summary, the following adaptive management techniques are applied in this GMCP:

(a) Baseline monitoring – a monitoring programme has been developed for Stage 1 of the Table 1 Consent Holders Table 1abstractions to establish robust existing environment baseline. This monitoring programme is contained in this GMCP, however, some monitoring detail is still required and this is indicated by the acronym 'TBC'.

(b) Early warning systems - Trigger levels (TLs) will be established to set up an early warning system that provides a response mechanism when differences between predicted and actual water levels, and/or salinity concentrations occur. A trigger level is an environmental criterion that if reached or met, requires a certain response to be actioned.

(c) Staged development - Abstraction volumes will progressively be increased in a staged manner, with expansion contingent on compliance with yet to be established trigger levels and on regular reviews of groundwater level, wetland ecology and hydrology, and salinity monitoring results. It is noted that the consent documentation requires that all development starts at Stage 1 volumes whether or not others have progressed to Stage 2 or further. This is an essential mechanism for staging as an adaptive management response.

(d) ~~Stage 1 / Year 1 m~~Management of consents being exercised immediately after commencement – Until such time as there is adequate data to enable adaptive management to commence and for Objective 1 of this GMCP to be achieved, the abstractions during this stage will be subject to interim wetland water level and saline trigger levels and Trigger Exceedance Report procedures; and

(e) Tiered approach to monitoring –Monitoring effort is proposed to increase if and when site trigger levels are approached or exceeded. Likewise, monitoring intensity may decrease with evidence of sustained compliance and stability and only by way of the process outlined in **Section 1.3** of this GMCP; and

(f) Ongoing adaptive management – The abstractions will be managed adaptively within the term of consent, in the event of trigger level exceedance through the implementation of the recommendations of a Groundwater Trigger Exceedance Report (GTER) prepared by Council.

(g) Suspension of abstractions – Should compliance with Objective 1 of this GMCP not be achieved, then the exercise of the consents to abstract and use groundwater may be suspended until such time as Council confirms in writing that compliance can be achieved.

The following sections provide detailed information relating to the adaptive management framework to be imposed for the exercise of the consents.

2.1 Staged Implementation

The uptake of water by the Consent Holders will be over 4 stages in accordance with the following factors:

Level of current orchard development – the following orchards are already well established:

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Commented [ML4]: Do these TBC's then apply to the Table 2 consent holders? How is this being managed.

Commented [ML5]: Because Stage 1 / Year 1 starts at various points in time for all 'consent holders' (Table 1 and 2), it seems more suitable to refer to this period based on the first exercise of consents.

Commented [ML6]: This should probably reference a term other than 'Stage 1 / Year 1' as Stage 1 (Year 1) will differ between individuals whereas this aspect of the 'framework' relates to the first 12 months after commencement of the consents while data is still being collected to set longer-term trigger levels.

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AUT.038650.01.01 – Tony Hewitt;

AUT.039345.01.01 – Ian McLarnon & Jason McLarnon;

AUT.038380.01.01 – Damien & Katherine Holloway;

AUT.038589.01.01 – Neil & Alma Violet Thompson, and Steven and Josephine Suzanne Thompson;

AUT.038610.01.01 – Mapua Avocados Limited;

AUT.027391.01.02 – Ivan Anthony Stanisich;

AUT.038471.01.01 – Honeytree Farms Limited

AUT.038420.01.01 – Largus Orchard Limited Partnership; and

AUT.038591.01.01 – Cypress Hills Limited.

Only AUT.027391.01.02, held by Mr Stanisich replaces an existing consent to take and use water. The other holders of consent that have established their orchards have been irrigating their trees under temporary consents issued by the Council.- a number of orchards are already well established

Rate of orchard development - will occur at differing rates depending on the owner's cashflow and access to plants; and

Tree maturity - approximately nine years to full maturity and plant water usage, hence irrigation requirements commensurately increase with tree growth.

The steady progressive development of the orchards, particularly the new large developments, provides an opportunity to apply an adaptive management approach that establishes a baseline and allows the original hypotheses of avoidance of effects to be re-evaluated, specifically that Objective 1 of this GMCP is being met.

The management approach provides a series of responses based on the monitoring results, including where monitoring shows that Objective 1 of this GMCP is not being met, as discussed in **Section 2.2**.

The uptake by Consent Holders of the consented total allowable water volumes will be permitted in four stages over nine years, as shown in **Table 1** below, unless the outcome of the Staged Implementation and Monitoring Programme Review detailed in **Section 0** shows that there should be a delay in moving to the next stage, or that the next stage should not occur.

Table 1. Priority A - Summary of staged implementation annual volumes

~~Application~~ Consent Number	Consent Holder	Allowable Annual Volume (m3)			
		Stage 1 (Year 1)*	Stage 2 (Year 2-3)*	Stage 3 (Year 4-6)*	Stage 4 (Year 7-9)*
Houhora sub aquifer management unit					
~~APP~~AUT.038610.01.01***	MAPUA AVOCADOS LIMITED (3)	34,000	96,000	198,000	209,000
APP.039244.01.01	KEVIN WAYNE THOMAS	34,000	59,600	59,600	59,600

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~~Application~~ Consent Number	Consent Holder	Allowable Annual Volume (m3)			
		Stage 1 (Year 1)*	Stage 2 (Year 2-3)*	Stage 3 (Year 4-6)*	Stage 4 (Year 7-9)*
	AND DANNIELLE O'CONNOR				
APP.039381.01.01	JONATHAN CHARLES BRIEN & CAROL NADINE CARR	14,900	14,900	14,900	14,900
APP.039345.01.01***	IAN GORDON MCLARNON AND JASON IAN MCLARNON	23,520	23,520	23,520	23,520
APP.038732.01.01	KATHERINE YVONNE VALADARES	22,350	22,350	22,350	22,350
Motutangi sub aquifer management unit					
APP.038610.01.01***	MAPUA AVOCADOS LIMITED (1 and 2),	34,000	96,000	198,000	418,000
APP.039332.01.01	LJ KING LIMITED	34,000	78,400	78,400	78,400
APP.038589.01.01***	NEIL THOMPSON, ALMA VIOLET THOMPSON, STEVEN THOMPSON, AND JOSEPHINE SUZANNE THOMPSON	34,000	35,280	35,280	35,280
APP.038591.01.01	CYPRESS HILLS LIMITED	34,000	35,280	35,280	35,280
Waiparera sub aquifer management unit					
APP.038471.01.01***	HONEYTREE FARMS LIMITED	34,000	96,000	198,000	346,425
APP.038410.01.01	GEORGINA TUI COVICH AND MATE NICKOLAS COVICH	34,000	96,000	198,000	223,500
APP.038420.01.01***	LARGUS ORCHARD LIMITED PARTNERSHIP	34,000	96,000	193,700	193,700
APP.038513.01.01	TE RŪNANGA O NGĀI TAKOTO	34,000	96,000	193,700	193,700
APP.038454.01.01	ELBURY HOLDINGS LIMITED	34,000	96,000	113,700	113,700
APP.038650.01.01	ANTHONY WILLIAM HEWITT AND DIANE ELEANOR HEWITT	34,000	39,200	39,200	39,200
APP.038328.01.01	BERNARD KIM SHINE AND SHERYL DIANNE SHINE	34,000	39,200	39,200	39,200
APP.038380.01.01***	DAM~~2~~IEN KENNETH HOLLOWAY AND KATHERINE ANNE HOLLOWAY	14,900	14,900	14,900	14,900

~~Application~~ Consent Number	Consent Holder	Allowable Annual Volume (m3)			
		Stage 1 (Year 1)*	Stage 2 (Year 2-3)*	Stage 3 (Year 4-6)*	Stage 4 (Year 7-9)*
AUT.02391.01.02**	IVAN ANTHONY STANISICH	120,000	120,000	120,000	120,000
TOTAL		517,670	1,034,630	1,655,730	2,060,655
% of Total		25%	50%	80%	100%

Notes:

*The staged implementation is based on years when irrigation occurs following the granting of the consents.

** Staged implementation does not apply to this consent as no change to the original consented annual volume has occurred as a result of the Section 127 of the RMA change of conditions.

*** The orchards receiving water under these consents are already well established.

Table 2: Priority B - Summary of staged implementation annual volumes

Application Number	Consent Holder	Indicated year of irrigation start	Allowable Annual Volume (m3)			
			Stage 1 (Year 1)[1*]	Stage 2 (Year 2-3)[1*]	Stage 3 (Year 4-6)[1*]	Stage 4 (Year 7- 9)[1*]
Houhora sub area management unit						
APP.040919.01.01	NA BRYAN ESTATE, SG BRYAN, CL BRYAN, KY BRYAN VALADARES &D BRYAN (1)	2022/2023	20,000	40,000	60,000	80,000
		Total (m³/year)	20,000	40,000	60,000	80,000
		Total (% allocated per stage)	25	50	75	100
Motutangi sub area management unit						
APP.040130.01.01[2]	TUSCANY VALLEY AVOCADOS LTD (M BELLETTE)	2020/2021	16,200	22,680	29,160	36,000
APP.040918.01.01	NA BRYAN ESTATE, SG BRYAN, CL BRYAN, KY BRYAN VALADARES &D BRYAN (2)	2023/2024	40,000	80,000	120,000	160,000
APP.008647.01.06[**3]	AVOKAHA LTD ~~(c/- K PATERSON & A NICHOLSON)~~	2020/2021	600	1,600	3,600	4,800
APP.008647.01.06 is an increase to current consented volume of 26,400 m³/year to totals as specified here.			*27,000*	*28,000*	*30,000*	*31,200*
APP.039628.01.04[**3]	KSL LTD ~~(c/- S SHINE)~~	2020/2021	3,600	3,600	3,600	3,600
APP.039628.01.04 is an increase to current consented volume of 26,400 m³/year to totals as specified here.			*30,000*	*30,000*	*30,000*	*30,000*
		Total (m³/year)	60,400	107,880	156,360	204,400
		Total (% allocated per stage)	30	53	76	100
Paparore sub area management unit						

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Application Number	Consent Holder	Indicated year of irrigation start	Allowable Annual Volume (m3)			
			Stage 1 (Year 1)[1]~~*~~	Stage 2 (Year 2-3)[1]~~*~~	Stage 3 (Year 4-6)[1]~~*~~	Stage 4 (Year 7- 9)[1]~~*~~
APP.040361.01.01[2]	TIRI AVOCADOS LTD	2020/2021	290,625	377,813	435,938	581,250
APP.040362.01.01[2]	VALIC NZ LTD	2020/2021	43,425	88,850	130,275	173,700
APP.040363.01.012[2]	WATAVIEW ORCHARDS (GREEN CHARTERIS FAMILY TRUST)	2020/2021	8,438	16,875	25,313	33,750
		Total (m^3/year)	342,488	481,538	591,525	788,700
		Total (% allocated per stage)	43%	61%	75%	100%
Aupōuri - Other sub area management unit						
APP.039841.01.02[4]	MATE YELAVICH & CO LTD	2020/2021	13,000	26,000	39,000	52,000
APP.040368.01.01	ROBERT PAUL CAMPBELL TRUST	2022/2023	90,000	180,000	270,000	360,000
		Total (m^3/year)~~TOTAL~~	103,000	206,000	309,000	412,000
		Total (% allocated per stage)~~% of Total~~	25%~~25%~~	50%~~50%~~	75%~~80%~~	100%~~100%~~

Note:

[1]~~*~~The staged implementation is based on years when irrigation occurs following the granting of the consents. This differs between individual consent holders.

[2]Well established orchards with existing consented allocation which now requires further water. The applicant of APP.040361.01.01 indicates that they have an existing consent to take and use surface water but that this expires in 2021 and will not replace it if they have consent to take groundwater of sufficient amount in the first years to irrigate their established crop.

[3]These consents are for variations to increase volumes of existing consented allocation and may be exercised up to their current consented annual volumes meaning that Stage 1 (Year 1) for these consent occurs when the takes exceed their current consented annual volumes.

[4] Trees were planted in 2019/2020 or have to be planted in the 2020/2021 period due to ordering system.

~~2.1.3~~2.1.1 Staging: Implementation and Monitoring Programme Review

A "Staged Implementation and Monitoring Programme Review" (SIMPR) will be required for Council to decide whether Consent Holders proceed to the next allocation stage. At the following times, the volume of abstraction authorised will be reviewed against the staged implementation outlined in Section 2.1 at the minimum intervals of:

End of Stage 1:~~—~~ A period where all or part abstraction of the Stage 1 annual volume is taken after commencement of the consent and after which a full 12 months of baseline monitoring data has been collected~~1 full irrigation season following date of commencement of the consents~~;

End of Stage 2~~—~~: 3 irrigation seasons following date of commencement of the consents;

End of Stage 3~~—~~: 6 irrigation seasons following date of commencement of the consents; and

End of Stage 4:~~—~~ 9 irrigation seasons following date of commencement of the consents.

The main purpose of the SIMPR is to assess whether proceeding to the next stage would comply with Objective 1 of the GMCP.

The SIMPR will be commissioned by the Council and shall be prepared by a suitably qualified hydrogeologist and, in relation to monitoring of the Kaimaumau Wetland, a suitably qualified wetland ecologist. The Council will endeavour to ensure that both the hydrogeologist and the ecologist will have experience and knowledge of the locality.

The SIMPR will include a detailed assessment of all environmental monitoring data including groundwater levels, salinity indicators, and water quality, and include consideration of spatial and temporal trends including potential effects of groundwater abstraction on water levels in Kaimaumau Wetland and the effect of these on the ecology of the wetland. The SIMPR will assess whether Objective 1 of this GMCP is being met at the current level of abstraction, and whether Objective 1 will be met at the next stage level of abstraction. The SIMPR may also consider the nature and scope of continued monitoring (i.e. monitoring frequency and intensity (type and number of samples)) and associated trigger levels.

The SIMPR will provide recommendations based on the assessment of the environmental monitoring data to date on:

- the setting or alteration of the trigger levels;
- whether any changes to the monitoring programme are required; and
- whether to advance to the next stage of abstraction or to remain at the current level of abstraction, or to reduce the level of abstraction.

A copy of the SIMPR will be provided to the Consent Holders and the Director-General of Conservation a minimum of three months prior to the anticipated commencement of the subsequent

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irrigation season utilising volumes defined for the subsequent development stage. The Consent Holders and Director-General of Conservation have 20 working days to provide a response to the Council on the conclusions and recommendations of the SIMPR.

If no response is received from a party within the stated timeframe, then Council will consider that the party has no concerns with the conclusions of the report.

If any party does not agree with the conclusions and recommendations of the SIMPR, then a report by a suitably qualified hydrogeologist and/or an ecologist, both with experience and knowledge of the locality if possible, detailing the reasons for the disagreement shall be provided to Council within 30 working days from the date that the assessment was sent to the party.

An increase in the volume of abstraction to the next development stage and any change to the monitoring programme will only be authorised by Council if the technical assessment of the monitoring data clearly indicates that the increase in the allocation and change to GMCP would meet Objective 1 of this GMCP.

Council will provide a report to the Consent Holders and the Director General of Conservation detailing the reasons for its decision, including the identification and discussion of areas of agreement and disagreement.

If any changes are made to the GMCP, then a copy of the amended GMCP will be provided to the Consent Holders and the Director General of Conservation within 5 working days of the change being authorised as final.

A summary of the above process is also included in the conditions of each consent that is covered by this GMCP.

~~2.1.4~~2.1.2 Table 1 Consents - Stage 1 (Year 1) Management Regime

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Stage 1 is the minimum period of the first full irrigation season after a consent is first exercised. To ensure that Objective 1 is met during Stage 1 (Year 1), this will require the identification of:

- an interim minimum water level trigger for the Kaimaumau-Motutangi wetland; and
- interim trigger levels for minimum groundwater levels and salinity indicators in the Sentinel bores identified in Table 6.

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These baseline figures are recognised as the 'default position' upon which a specific two-tier trigger level and contingency plan system will be implemented during Stage 1 (Year 1) only.

An establishment phase of monitoring will be required to identify default trigger levels for Kaimaumau-Motutangi wetland water level, groundwater levels and saline intrusion. These default trigger level parameters will apply to Stage 1 (Year 1) only.

Council is to notify the Consent Holders and the Director-General of Conservation of the default management parameters for Stage 1 (Year 1). The Consent Holders and Director-General of Conservation have 10 working days to provide responses to the Council on the default management parameters once notified.

Ongoing monitoring will be required to ensure that Objectives 1(a), (b), and (c) are met by implementing trigger level exceedance measures. These trigger level exceedance measures are those which sit in **Section 4** below.

The interim management regime established for Stage 1 (Year 1) will be superseded by the Monitoring and Trigger Level Setting components set out in **Section 2.2** of this GMCP.

~~2.1.4.1~~2.1.2.1 Kaimaumau Wetland: Monitoring and Triggers

In order to provide a baseline management regime to achieve Objectives 1(b) and 1(c) of this GMCP for Stage 1 (Year 1), the following events have been recognised by the Environment Court as being events that will necessitate further investigations by both wetland ecologists, hydrologists, and hydrogeologists.

- Trigger Level 1 Year 1 (TL1Y1) – At any time, a decrease of greater than 25 millimetres from the relative water level.
- Trigger Level 2 Year 1 (TL2Y1) – At any time, a decrease of greater than 50 millimetres from the relative water level.

The relative water level which TL 1Y1 and TL2Y1 reference must be a representative level, taking into account seasonal variation and any existing use and existing development of resources at the time of the grant of consent for the water takes which could affect the water levels in the Kaimaumau wetland. The relative water level which TL 1Y1 and TL2Y2 reference must be confirmed in **Table 3** prior to Stage 1 exercise of any ·of the consents.

The Kaimaumau Wetland standing water level monitoring and trigger levels for Stage 1 (Year 1) shall be inserted into the GMCP through the process set out in **Section 1.3** of this GMCP.

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Monitoring Installation	Depth (m)	Piezo No.	Target	Units	Frequency	Trigger Levels	
						TL1Y1	TL2Y1
Kaimaumau Wetland - South	<5	1	Wetland water levels	mAMSL	Continuous	Water level recession exceeding a weekly average of 5 mm/day	Water level recession exceeding a weekly average of 6.25 mm/day

Due to access constrains at the northern site (helicopter access only), interim wetland water level triggers are for the Kaimaumau Wetland - South monitoring site only. Available data indicates temporal response at both sites are virtually identical. If TL1 is exceeded at the Kaimaumau Wetland – South monitoring site, data will be collected from the Kaimaumau Wetland – North site to confirm trigger exceedance at this site.

~~2.1.4.2~~2.1.2.2 Saline Intrusion & Groundwater Level: Monitoring and Triggers

Saline intrusion monitoring for Stage 1 (Year 1) is proposed within the sentinel bores identified in Table 5~~Table 4~~ of this GMCP. As each sentinel bore is drilled, groundwater level and salinity indicators will be measured and recorded. This information will be used to set interim trigger levels for these parameters as per the methodology established in **Section 2.2** below. Interim trigger levels must be set prior to exercise of any of the consents.

The saline intrusion and groundwater level monitoring trigger levels for Stage 1 (Year 1) shall be inserted into the GMCP through the process set out in **Section 1.3** of this GMCP prior to the exercise of any consents.

~~2.1.4.3~~2.1.2.3 Trigger Level Responses

In the event of an exceedance of a Trigger Level applicable in Stage 1 (Year 1), the Trigger Level Exceedance response plan contained in **Section 4** of this GMCP shall apply.

~~2.1.4.4~~2.1.2.4 Ceasing Interim Stage 1 (Year 1) Management Regime

This interim management regime shall remain in place until such time as Council has given authorisation to proceed to the next stage (Stage 2) as set out under **Section 0~~2.1.1~~** above or where the setting of trigger levels as per **Section 2.2** below has been given effect to through amendment to this GMCP in accordance with the change process established in **Section 1.3** of this GMCP.

2.2 Trigger Level System

2.2.1 Timeframe for setting of trigger levels

The setting of trigger level values for each parameter (where TBC is indicated in the monitoring plan tables in Section 3 Monitoring Programme) will be undertaken during the first implementation stage after 12 months of monitoring data has been collected and within 15 months of the date of commencement of these consents. This approach recognises that:

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- There is historical monitoring data available for some parameters;
- In some areas, no baseline data has been established by the consent holder(s) or any of the key stakeholders in the area; and that
- The manifestation of any effects from the exercising of these consents will steadily progress with time in accordance with the stages of orchard developments and age of the crop. The scale of abstraction during the baseline data collection period (i.e. 12 months following ~~granting~~ commencement of consent) will not vary significantly from existing conditions.

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2.2.2 Method for setting of trigger levels

A two-tier trigger level system will be implemented on the consents:

- TL1 - The first-tier trigger level establishes whether the parameter of concern is approaching outer limits of baseline data (e.g. Median ±2 times the standard deviation, or some other criteria determined with agreement of Council). If this trigger level is breached, then additional monitoring will be undertaken by the Council;
- TL2 - The second-tier trigger level is set at a threshold defining a 'significant' departure from baseline conditions and/or conditions where the risks of adverse environmental effects are increased. If this trigger level is breached, then the Consent Holders will be required to reduce their daily water take volume in a staged manner over a set period of time.

The TL parameters required under this GMCP for the various suites are summarised in Table 4.

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Table 4: Summary trigger level parameters by monitoring suite

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Monitoring Suite	Parameters
Groundwater level and salinity monitoring	Groundwater level, electrical conductivity
Saline intrusion monitoring	Electrical conductivity, chloride, sodium, total dissolved solids.
Kaimaumau-Motutangi Wetland water level	Groundwater level in shallow sand aquifer.

2.2.3 Response to exceeding trigger levels

The actions required should TL's be exceeded are set out in **Section 4** (Contingency Plan).

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3. MONITORING PROGRAMME & TRIGGER LEVEL SETTING

3.1 Bore Locations and Details

A consolidated summary of the schedule of bores that are required to be monitored as part of this GMCP is provided in Table 5. Along with the bores identified for monitoring, the table provides key details relating to the bores' physical attributes and parameters to be monitored. The resultant wetland monitoring location is to be hydrologically connected with the full range of water levels in the open water habitat of the Kaimaumau Wetland. The following sections of the GMCP provide the monitoring schedules (frequency and trigger levels) for the bores.

The locations of the production bores in Table 5 are shown in Figure 1. An error accuracy level of +/- 50 metres is applicable to these bore locations. Any differentiation to the location by greater than 50 metres will result in a requirement of an application to the Council for a change of consent condition pursuant to Section 127 of the Resource Management Act 1991 (RMA). Assessment of the effects on the environment of the change will be required pursuant to Schedule 4 of the RMA.

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Table 5: Schedule of monitoring facility and production bore details.

Bore Name		Bore Owner	Coordinates (NZTM 2000)		Depth (m)	Dia. (mm)	Piezo. No.	Target aquifer	Purpose*
Generic	NRC ref.		Easting	Northing					
MONITORING BORES									
Fishing Club	LOC.200250	NRC	1611411	6146928	79			Deep shellbed	SI; MI
Waterfront	LOC.200210	NRC	1611712	6146689	19	32	1	Shallow sand	GLc, ECc
			1611712	6146689	74	32	4	Deep shellbed	GLc, ECc
Motutangi	TBC	NRC	1615677	6139811	<10	50	1	Shallow sand	GLc; ECc
			1615676	6139821	80-100 (TBC)	50	2	Deep shellbed	GLc; ECc
Norton Road	TBC	NRC	1619875	6134377	80-100 (TBC)	50	2	Deep shellbed	GLc; ECc
Kaimaumau	LOC.316222	NRC	1622445	6134482	20		1	Shallow sand	GLc; ECc; SI; MI
	LOC.315766	NRC	1622426	6134466	72		2	Deep shellbed	GLc; ECc; SI; MI
Kaimaumau Wetland	TBC	NRC	1616379	6140758	<1.5	50	1	Standing water in wetland	GLc
Honeytree	TBC	NRC	1618911	6136120	6	50	2	Shallow sand	GLc
Paparore	TBC	NRC	1619100	6130600	<10			Shallow sand	GLc; ECc
	TBC	NRC	1619100	6130600	80-100 (TBC)			Deep shellbed	GLc; ECc
Kaimaumau Settlement	TBC	NRC	1624250	6135897	<20		1	Shallow sand	GLm, SI
	TBC	NRC	1624250	6135897	>50 (TBC)		2	Deep shellbed	GLm, SI
PRODUCTION BORES									
Brien & Carr	TBC	J. Brien & C. Carr	1610058	6147313	TBC		1	Deep shellbed	GLm, ECm

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Commented [ML10]: These were in the original GMCP where it wasn't stated that the consent holders were responsible for installation of the sentinel bores. Does this mean that these sentinels now become responsibility of consent holders if they haven't been drilled as yet for Table 1 takes?

Commented [ML11]: At section 1.2.1 is states consent holders are responsible for installing these sentinel bores so is NRC the owner?

Commented [ML12]: A lot of these could be updated going forward?

Valadares	TBC	K. Valadares	1612533	6142943	TBC		1	Deep shellbed	GLm, ECm
McLarnon	TBC	I. & J. McLarnon	1611284	6144679	TBC		1	Deep shellbed	GLm, ECm
Elbury Holdings	TBC	Elbury Holdings Limited	1617409	6133139	TBC		1	Deep shellbed	GLm;, ECmSI
Holloway	TBC	Huanui Avocados Ltd	1619886	6134694	TBC		1	Deep shellbed	GLm, ECm
Ngai Takoto	TBC	Te Runanga o Ngai Takoto	1619097	6135520	TBC		1	Deep shellbed	GLm, ECm
			1618987	6135795	TBC		1	Deep shellbed	GLm, ECm
Cypress Hills	TBC	Cypress Hills Ltd	1614898	6138495	TBC		1	Deep shellbed	GLm, ECm
Stanisich	TBC	I.A. Stanisich	1618046	6133608	TBC		1	Deep shellbed	GLm, ECm
			1617839	6133475	95	104	1	Deep shellbed	GLm, ECm
Honeytree	TBC	Honeytree Farms Limited	1618894	6136120	112	310	1	Deep shellbed	GLm, ECm
			1618552	6136318	111	310	3	Deep shellbed	GLm, ECm
Thompson	TBC	N. & A. V. Thompson and S. & J.S. Thompson	1614798	6138773	TBC		1	Deep shellbed	GLm, ECm
LJ King Ltd	TBC	LJ King Limited	1614723	6139203	TBC		1	Deep shellbed	GLm, ECm
Mapua	TBC	Mapua Avocados Ltd	1612579	6141738	111	100	1	Deep shellbed	GLm, ECm
			1613011	6142457	122	100	2	Deep shellbed	GLm, ECm
			1612468	6142348	97	100	3	Deep shellbed	GLm, ECm
Hewitt	TBC	T. Hewitt	1617409	6132267	TBC		1	Deep shellbed	GLm, ECm

Shine	TBC	B. K. & S. D. Shine	1619774	6134083	TBC		1	Deep shellbed	GLm, ECm
Largus	TBC	Largus Orchard Ltd Partnership	1617905	6132480	TBC	100	2	Deep shellbed	GLm, ECm
			1617919	6132263	94	100	1	Deep shellbed	GLm, ECm
Covich	TBC	G.T. & M. N. Covich	1617353	6136859	TBC		1	Deep shellbed	GLm, ECm
			1617128	6136793	TBC		1	Deep shellbed	GLm, ECm
Thomas	TBC	K. Thomas & D. O'Connor	1610222	6147542	TBC		1	Deep shellbed	GLm, ECm
Bryan Estate 1	TBC	NA Bryan Estate, SG Bryan, CL Bryan, KY Bryan Valdares & D Bryan (1)	1613415	6143424	TBC		1	Deep shellbed	GLm, ECm
Bryan Estate 2	TBC	NA Bryan Estate, SG Bryan, CL Bryan, KY Bryan Valdares & D Bryan (1)	1613901	6142132	TBC		1	Deep shellbed	GLm, ECm
KSL	TBC	KSL Ltd	1614333	6138477	TBC		1	Deep shellbed	GLm, ECm
Tuscany Avocados	TBC	Tuscany Valley Avocados Ltd	1614490	6138367	TBC		1	Deep shellbed	GLm, ECm
Robert Campbell	TBC	Robert Paul Campbell Trust	1615813	6135787	TBC		1	Deep shellbed	GLm, ECm
Yelavich	TBC	Mate Yelavich & Co Ltd	1616833	6133996	TBC		1	Deep shellbed	GLm, ECm

Wataview	TBC	Wataview Orchards (Green Charteris Family Trust)	1619441	6132282	TBC		1	Deep shellbed	GLm, ECm
Tiri 1	TBC	Tiri Avocados Ltd	1618056	6130290	TBC		1	Deep shellbed	GLm, ECm
Tiri 2	TBC	Tiri Avocados Ltd	1618856	6130196	TBC		2	Deep shellbed	GLm, ECm
Valic 4	TBC	Valic NZ Ltd	1617589	6129130	TBC		1	Deep shellbed	GLm, ECm

Notes:

TBC = to be confirmed within 15 months of the date of commencement of these consents.

* Purpose key:

GLc = Continuous Groundwater Level;

GLm = Manual (monthly) Groundwater Level;

ECc = Continuous Electrical Conductivity;

ECm = Manual (monthly) Electrical Conductivity;

SI = Salinity Indicators (quarterly);

MI = Major Ions (quarterly).

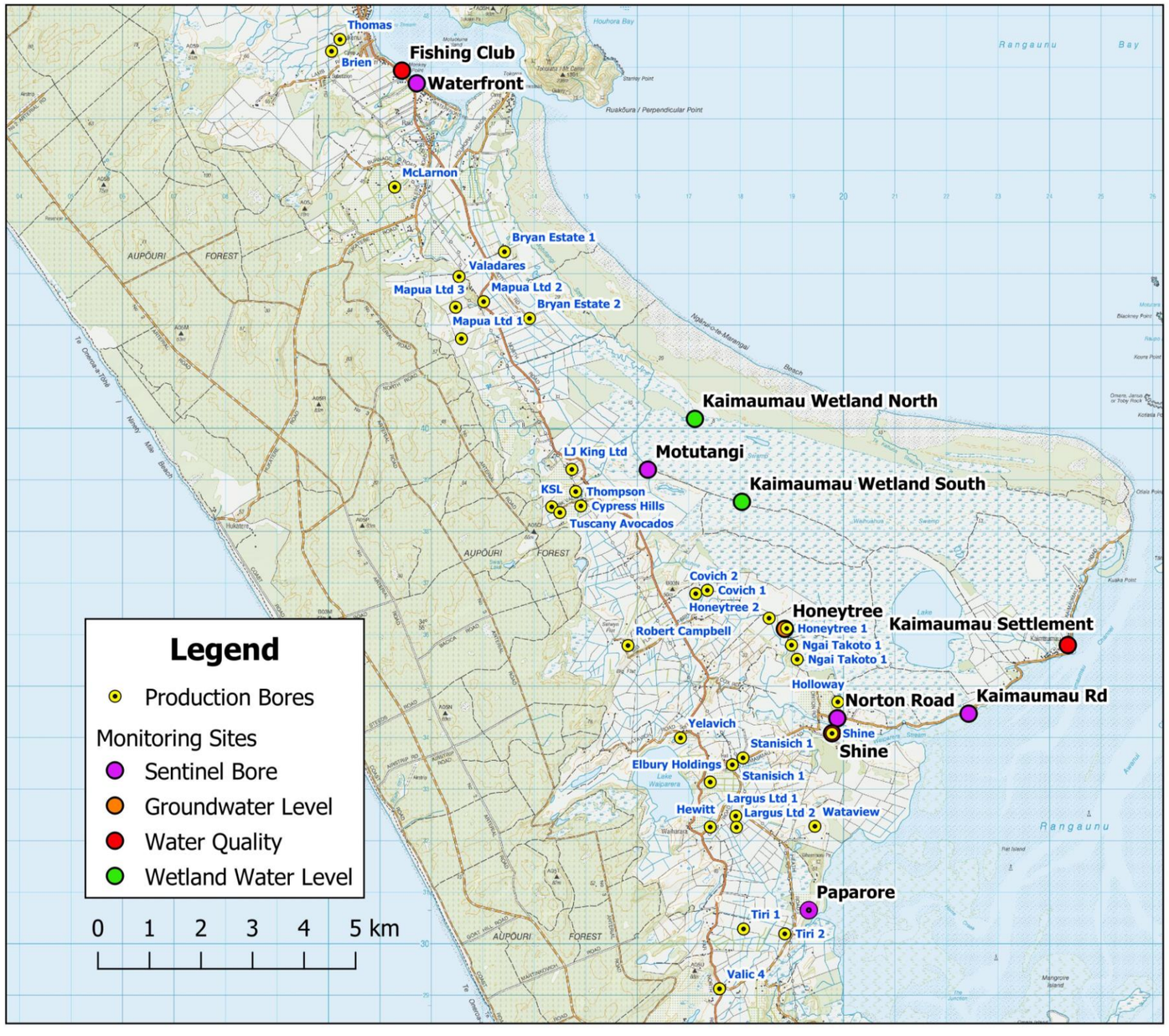

Figure 1. Monitoring and Production Bore Location Map

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3.2 Groundwater Level and Salinity Monitoring

Commented [ML13]: Suggest this section gets re-arranged similarly to the others have as per rationale in my evidence as there is a lot of duplication.

Sentinel bores will be utilised as the primary reference sites for regional groundwater level and salinity monitoring. These bores will provide early detection or warning of:

- Groundwater levels around the coastal margin lowering and approaching a threshold that could indicate a greater risk of saline intrusion; and
- Any reduction in water quality that could indicate the landward migration of the saline interface.
- Groundwater levels in the shallow sand aquifer lowering and having a potential adverse effect on the Kaimaumau-Motutangi wetland due to a decline in standing water level.

Details of the sentinel bores are summarised in Table 6~~Table 5~~ below. These sentinel bores will collect data continuously for water levels and electrical conductivity in individual piezometers. A two-tier trigger level system (TL1 and TL2) for groundwater levels and electrical conductivity will be set in these bores.

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Monitoring of groundwater levels in the "shallow sand" aquifer in bores listed in Table 6~~Table 5~~ will enable identification of the potential for effects on the Kaimaumau-Motutangi wetland due to a decline in standing water level resulting from groundwater abstraction. It is also useful for understanding the overall response of the groundwater system to abstraction effects and to saline intrusion risks.

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The setting of TL1 and TL2 trigger levels values for each parameter will be undertaken during the first implementation stage after 12 months of monitoring data has been collected and within 15 months of the date of commencement of these consents. The current trigger limit values that are shown in Table 6~~Table 5~~ are based on existing data and will be reconfirmed by Council when the other trigger levels are confirmed.

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All sentinel monitoring bores listed in Table 6~~Table 5~~ will be installed prior to the exercise of the consents.

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Checking of the sensors required for continuous monitoring will be undertaken on a monthly basis, and any faults will be recorded and remedied immediately.

Table 6: Schedule of sentinel monitoring bores for groundwater level and/or salinity indicators

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Bore Name	Depth (m)	Piezo. No.	Target aquifer	Units	Frequency	Trigger Levels	
						TL1	TL2
Waterfront	21	4	Shallow sand	mAMSL µS/cm	Continuous	0.75 744	0.65 892
	72	1	Deep shellbed	mAMSL µS/cm	Continuous	2.55 555	2.35 666
Motutangi	8	1	Shallow sand	mAMSL	Continuous	6.35	6.25
				µS/cm	Continuous	412	495
	83	2	Deep shellbed	mAMSL	Continuous	6.10	5.90
				µS/cm	Continuous	681	818
Norton	80-	1	Deep	mAMSL	Continuous	4.25	4.05

Bore Name	Depth (m)	Piezo. No.	Target aquifer	Units	Frequency	Trigger Levels	
						TL1	TL2
Road	100 (TBC)		shellbed	µS/cm	Continuous	572	687
Paparore	<20	1	Shallow sand	mAMSL	Continuous	TBC	TBC
				µS/cm	Continuous	TBC	TBC
	80-100	2	Deep shellbed	mAMSL	Continuous	TBC	TBC
				µS/cm	Continuous	TBC	TBC
Kaimaumau	20	1	Shallow sand	mAMSL	Continuous	1.25	1.15
				µS/cm	Continuous	286	345
	72	2	Deep shellbed	mAMSL	Continuous	1.70	1.50
				µS/cm	Continuous	435	520

Notes:
TBC = to be confirmed within 15 months of the date of commencement of these consents.
GL TL1s (where provided) have been calculated from long term monitoring data.
GL TL2s (where provided) have been interpolated from Table F1, WWA Groundwater Modelling Report.

3.2.1 Setting of Groundwater Trigger Levels

3.2.1.1 Shallow Sand Aquifer

After a period of 12 months of monitoring from the date of commencement of ~~these~~ the **Table 1** consents, the Council will commission an assessment of the potential impact of shallow groundwater decline on the Kaimaumau-Motutangi Wetland by a suitably qualified and experienced Hydrogeologist and a suitably qualified and experienced Ecologist. This assessment shall be undertaken in consultation with Consent Holders and the Director General of Conservation, and shall include, but not be limited to:

- Analysis of a single round of radon samples collected in accordance with https://www.gns.cri.nz/Home/Services/Laboratories-Facilities/Tritium-and-Water-Dating-Laboratory/Introduction-to-Water-Dating-and-Tracer-Analysis/Radon following a two week period of no significant rainfall at four representative points in and around the area of the Kaimaumau Wetland (Figure 1~~Figure 1~~) containing standing water, within six months of the date of commencement of these consents;
- Analysis of temporal groundwater level variations in the shallow Motutangi piezometer and the Kaimaumau Wetland piezometer (**Table 5**~~**Table 4**~~); and
- Analysis of variation in shallow groundwater levels in response to pumping from the Honeytree Farms production bore.
- The results of the wetland vegetation survey required ~~by Section 3.4.3Error! Reference source not found.~~(as set out in **Section 3.5.3** below).

A copy of the above assessment will be provided to the Consent Holders covered by this GMCP and the Director-General of Conservation. The Consent Holders and Director-General of Conservation have 20 working days to provide a response to the Council on the conclusions of the assessment.

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If no response is received from a party within the stated timeframe, then Council will consider that the party has no concerns with the conclusion of the report.

If any party does not agree with the conclusions of the assessment, then a report by a suitably qualified hydrogeologist and/or an ecologist detailing the reasons for the disagreement shall be provided to council within 30 working days from the date that the assessment was sent to the party.

Council will set trigger levels for "shallow sand" groundwater levels in the sentinel bores if the technical assessment of the potential impact of shallow groundwater decline on the Kaimaumau Wetland clearly indicates that adverse effects on the wetland[2] as a result of the groundwater takes cannot be avoided without trigger level response measures. A precautionary approach will be taken to the decision on whether to set trigger levels or not.

If groundwater level triggers are required for the "shallow sand" monitoring bores identified in Table 6~~Table 5~~, then they will be set as follows:

- TL1 – Will be determined based on the median ground water level minus 2 standard deviations of the baseline data. The baseline dataset will comprise 12 months of monitoring data combined with actual historical monitoring data synthesised from an appropriate nearby shallow bore.
- TL2 – Will be determined based on the median ground water level minus 3 standard deviations of the baseline data. The baseline dataset will comprise 12 months of monitoring data combined with actual historical monitoring data synthesised from an appropriate nearby shallow bore. TL2 will be no less than 0.5 mAMSL in the shallow aquifer.

Council will provide a report to the Consent Holders and the Director-General of Conservation detailing the reasons for its decision, including the identification and discussion of areas of agreement and disagreement.

3.2.1.2 Deep Shell bed Aquifer

As a general guide TL2 for deep shell bed groundwater levels should be no less than 1.0 mAMSL (noting that changes in EC are also a key indicator of saline intrusion).

3.2.1.3 Electrical Conductivity Triggers

Electrical conductivity triggers will be no greater than:

- TL1 - Median (weekly rolling average) EC from baseline monitoring period +25%
- TL2 - Median (weekly rolling average) EC from baseline monitoring period + 50%

3.2.2 Ongoing monitoring

Ongoing monitoring of groundwater and electrical conductivity levels will be undertaken continuously via individual piezometers in sentinel monitoring bores.

[2] Assessment of effects on wetland ecology shall be guided by a suitably qualified wetland ecologist approved by NRC, considering such matters as area of wetland impacted due to lowering of wetland water levels (cognisant of the relationship between aquifer porosity and open body water levels).

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3.3 Saline Intrusion Monitoring

During the initial 12-month monitoring period, sampling for the following salinity indicators in the bores listed in Table 7~~Table 6~~ below will be undertaken at 6 weekly intervals[3]:

- Electrical conductivity;
- Chloride;
- Sodium;
- Total Dissolved Solids.

The samples will be collected in accordance with A National Protocol for State of the Environment Groundwater Sampling in New Zealand (Ministry for the Environment, 2006).

3.4 Setting of Saline Intrusion Triggers

As an initial guide, trigger levels for individual determinants will be established as follows:

- TL1 - Median concentration from the baseline monitoring period +25%.
- TL2 - Median concentration from the baseline monitoring period + 50%.

3.4.1.1 Ongoing Monitoring

Sampling at the frequencies specified for the following salinity indicators will take place in the bores listed in **Table 7~~Table 6~~** below:

- Electrical conductivity;
- Chloride;
- Sodium;
- Total Dissolved Solids.

The samples will be collected in accordance with A National Protocol for State of the Environment Groundwater Sampling in New Zealand (Ministry for the Environment, 2006).

Table 7: Monitoring Schedule – Saline Intrusion

Bore Name	Depth (m)	Piezo. No.	Target aquifer	Parameter*	Units	Frequency	Trigger Levels	
							TL1	TL2
Fishing Club	79	1	Deep shellbed	EC	µS/cm	Quarterly	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC
Kaimaumau (Sentinel)	20	1	Shallow sand	EC	µS/cm	Continuously	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC

[3] This frequency applies to the initial 12-month monitoring period for the establishment of baseline information. The frequencies specified in Table 6 are for ongoing monitoring specifications.

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Commented [ML15]: Is Paparore sentinel not needed in this table?

Bore Name	Depth (m)	Piezo. No.	Target aquifer	Parameter*	Units	Frequency	Trigger Levels	
							TL1	TL2
				TDS	mg/L	Quarterly	TBC	TBC
	72	2	Deep shellbed	EC	µS/cm	Continuously	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
Kaimaumau Settlement	<20 (12)	1	Shallow sand	EC	µS/cm	Quarterly	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC
	>50 (TBC)	2	Deep shellbed	EC	µS/cm	Quarterly	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC
Elbury Holdings	TBC	1	Deep shellbed	EC	µS/cm	Quarterly	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC

Notes:

* Parameter key: GL = Groundwater Level; EC = Electrical Conductivity; SI = Salinity Indicators; TDS = Total Dissolved Solids.

TBC = to be confirmed within 15 months of the date of commencement of these consents.

Commented [ML15]: Is Paparore sentinel not needed in this table?

3.5 Production Bore Monitoring

During the initial 12-month monitoring period, sampling for the following salinity indicators in the bores listed in Table 8~~Table 7~~ below will be undertaken at 6 weekly intervals[4].

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3.5.1 Trigger levels

Electrical conductivity trigger levels will be established in the production bores listed in Table 8~~Table 7~~ below.

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During the initial 12-month monitoring period Electrical Conductivity Triggers will be no greater than:

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- TL1 – Departure exceeding 25% of the EC value from the initial monitoring round
- TL2 – Departure exceeding 50% of the EC value from the initial monitoring round

Long-term EC triggers for individual production bores will be established following the initial 12-month monitoring period based on an assessment of spatial and temporal variation in EC observed during the initial period, in a manner consistent with EC trigger levels established in the sentinel monitoring bores.

[4] This frequency applies to the initial 12-month monitoring period for the establishment of baseline information. The frequencies specified in Table 6 are for ongoing monitoring specifications.

No trigger levels will be established for groundwater levels in the production bores as water levels in the production bores can be impacted by well efficiency and pumping schedules so are not necessarily representative of groundwater levels in the surrounding aquifer.

3.5.2 Ongoing monitoring

Monthly water level monitoring will be undertaken in the production bores listed in Table 8. During the winter months (nominally May to September) this monitoring will provide information to identify any inter-annual variations in aquifer storage which may be anomalous compared to regional trends. During the irrigation season, water level measurements will be undertaken a minimum of eight hours following the cessation of pumping.

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Electrical conductivity values will also be measured at monthly intervals from the production bores during the irrigation season to check on any changes in salinity induced by the pumping.

Continuous water level monitoring is required in a shallow observation bore adjacent to the production bore for AUT.038471.01.01 to quantify any localised drawdown effects in the shallow sand aquifer in the vicinity of a relatively large abstraction proximal to Kaimaumau Wetland. This shallow aquifer monitoring will enable comparison between the shallow aquifer impact as modelled in the Model Report and the data from the shallow piezometers in the sentinel bores listed in Table 6.

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Table 8: Monitoring Schedule – Production Bore Water Levels & Electrical Conductivity

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Bore Name	Depth (m)	Piezo. No.	Target aquifer	Parameter*	Units	Frequency	Trigger Levels	
							TL1	TL2
Lamb Road	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Valadares	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
McLarnon	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Elbury Holdings	TBC	1	Deep shellbed	GL, SI	mAMSL	Monthly	EC TBC	EC TBC
Holloway	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Ngai Takoto	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Cypress Hills	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Stanisich	95	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Honeytree	112	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
	6	2	Shallow sand	GL, EC	mAMSL	Continuous	EC TBC	EC TBC
	111	3	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Thompson	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
L J King Limited	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Mapua	111	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
	122	2	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
	97	3	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Hewitt	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Shine	TBC	1	Deep shellbed	GL; EC	mAMSL	Monthly	EC TBC	EC TBC
Largus	94	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Covich	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Thomas	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Bryan Estate 1	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC

Bore Name	Depth (m)	Piezo. No.	Target aquifer	Parameter*	Units	Frequency	Trigger Levels	
							TL1	TL2
Bryan Estate 2	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
KSL	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Tuscany Avocados	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Robert Campbell	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Yelavich	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Wataview	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Tiri 1	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Tiri 2	TBC	2	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Valic 4	TBC	1	Deep shellbed	GL, EC	mAMSL	Monthly	EC TBC	EC TBC
Notes: * Purpose key: GL = Groundwater Level; EC = Electrical Conductivity. All trigger limit values in this Table to be confirmed by Council.								

3.5.3 Wetland Vegetation Survey

3.5.3.1 Initial Survey

Within six months of the date of commencement of ~~these~~ the **Table** 1 Cconsents the Council, in consultation with the Director-General of Conservation and the Consent Holders, will commission a suitably qualified and experienced ecologist to catalogue the values and attributes of the significant indigenous vegetation and significant habitats of indigenous fauna of the Kaimaumau Wetland, including the standing water area of the Kaimaumau Wetland that is being monitored by the standing water level monitoring station required by ~~Table 5~~**Table 5**. Initial survey work should take place in the months of September, October, or early November.

The main plant communities in the standing water shall be delineated on high quality aerial photographs of the wetland area at a suitable scale. The mapped vegetation types shall be classified and. named using an appropriate system of classification such as the Atkinson system (1985).

Following the mapping of vegetation types and plant communities an assessment of the composition and structure of wetland vegetation, and associated wetland soil chemistry, shall be carried out.

The methodology will include an assessment of the overall wetland condition using the Wetland Condition Index described in Clarkson et al. (2004) that includes a semi-quantitative evaluation of the following indicators:

- Changes in hydrological integrity.
- Changes in physiochemical parameters,

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- Changes in ecosystem intactness,
- Changes in browsing. predation and harvesting regimes.
- Changes in the dominance of native plants.

Reference shall also be made to other pressures which may be impacting on the wetland:

- Modifications to catchment hydrology.
- Water quality within the catchment.
- Animal access,
- Key undesirable species.
- % catchment in introduced vegetation.

Detailed assessment of vegetation composition and structure in the standing water area will be undertaken using a series of three vegetation transects established across the standing water area, applying the Scott Height Frequency (SHF) method (Scott, 1965; Rose, 2012) supplemented with wetland soil monitoring.

The vegetation transects must encompass the complete hydrological gradient across the standing water area (littoral zone/shallow water and deep water habitats), and run perpendicular from the dune system at the north of the standing water, in a south west direction. The three vegetation transects must be geographically spaced apart to ensure vegetation monitoring covers all habitats in the standing water area.

Application of the SHF method must ensure that the transects are permanently marked to enable accurate resurvey.

Application of the SHF method must ensure that as a minimum wetland plant composition and height is recorded every 1.0m for a transect distance of 1OOm across the hydrological gradient. In addition, wetland plots of plots (5m x 5m) (Scott, 1965; Rose, 2012) must be undertaken every 20m (5 per transect) to assess variation in vegetation cover abundance.

Within each of the wetland plots, wetland soil cores must be collected for analysis at an accredited laboratory. Wetland soil chemistry analyses must include: pH, conductivity, total carbon, total phosphorus, total nitrogen, and bulk density. These are standard wetland soil analyses for vegetation monitoring (Clarkson et al. 2004) and are required to inform assessment of vegetation changes in relation to water level variation.

The information shall be recorded using standard forms and applying the scoring system, such as that from Clarkson et al. (2004) for the index of wetland condition, and the SHF method templates (Scott, 1965; Rose, 2012).

3.5.3.2 Repeat Survey

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The Council shall commission, in consultation with the Director-General of Conservation and the Consent Holders, a suitably qualified and experienced ecologist to undertake wetland vegetation survey and subsequent reporting every 5 years from the original date of survey at around the same

time of year as the original survey. The repeat survey's must be designed in a way that enables ecologically meaningful and statistically robust scoring of the wetland condition in order to analyse changes to the wetlands condition resulting from the groundwater abstraction.

This repeat survey must be completed once after the initial vegetation survey (to provide an accurate baseline) but thereafter will only take place where technical assessment carried out according to Section 2.1.1 confirms that there is a decline in standing water level of the Kaimaumau Wetland resulting from groundwater abstraction.

A decline in standing water level of the Kaimaumau Wetland attributable to groundwater abstraction will be determined from the monitoring and analysis of temporal groundwater level variations in the shallow Motutangi piezometer in relation to the Kaimaumau Wetland Standing Wetland Water Level facilities as described in Table 4 above.

3.6 Environmental Monitoring Report

At the end of each irrigation season, the Council will commission the preparation of an Annual Environmental Monitoring Report (AEMR) by a suitably qualified hydrogeologist and, in relation to monitoring of the Kaimaumau Wetland, a suitable qualified wetland ecologist. The Council will endeavour to ensure that, if possible, both the hydrogeologist and the ecologist will have experience and knowledge of the locality. A copy of the AEMR will be provided to the Consent Holders and the Director General of Conservation by 31 July each year.

The purposes of the Annual Environmental Monitoring Report are to:

- Provide a summary of the monitoring results for the previous year, including trends, against Objective 1 of the GMCP;
- Assess the monitoring undertaken over the previous year against the standards set out in Objective 1;
- Report on any issues apparent with the monitoring and
- Identify any improvement that could be made with respect to the monitoring.

The AEMR will also contain an evaluation of whether the observed effects of the groundwater takes are consistent with the predictions of environmental response contained in the *Motutangi-Waiharara Groundwater Model, Factual Technical Report – Modelling. Motutangi-Waiharara Water User Group. WWA0026: Final – Rev. 9*, dated 31 August 2017 ~~(hereon in referred to as the 'Model Report')~~and the *Aupouri Aquifer Groundwater Model, Factual Technical Report – Modelling – Aupouri Aquifer Water User Group. WWLA0184, Rev 3*, dated 5 February 2020. Both reports were prepared by Williamson Water & Land Advisory Ltd.

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4. CONTINGENCY PLAN

Exercise of the consents is subject to compliance with Objective 1 of this GMCP.

As described in **Section 2**, a trigger level system is used to define environmental criteria that signal changes may be occurring outside of what is normal (TL1) or at a point where remedial action is required to avoid Objective 1 not being met (TL2).

This section details the responses that will be undertaken where TLs are exceeded under any of the monitoring suite discussed in **Sections 2.1.2.1, 0, 3.2, 3.3, and 3.5**.

Where a trigger level is exceeded the Council will commission a Groundwater Trigger Exceedance Report (GTER). The objective of the GTER is to establish the cause of a trigger level exceedance and to recommend a programme of action to end the exceedance.

A GTER shall include:

- Review of the monitoring results collected and establish why the breach has occurred;
- Set out requirements for more intense monitoring of the breach;
- Update the report on a regular basis as more data becomes available; and
- Recommend actions to end the breach, this could include;
  - A staged reinstatement of abstraction levels to pre-breach levels,
  - Reduced levels of abstraction for all or some of the consent holders covered by the GMCP, or
  - Suspension of abstraction by all or some of the consent holders covered by the GMCP.

4.1 Exceedance of TL1

In the event of a TL1 exceedance, which may represent declining groundwater levels, Kaimaumau wetland water levels, or rising salinity indicators, the following actions must be undertaken:

(a) The Council will notify the Consent Holders within two working days of when the TL1 exceedance became known.

(b) If the exceedance is of a salinity indicator in the bores listed in Table 6, then sampling of the monitoring bore(s) in exceedance shall immediately be upgraded to a weekly frequency for four weeks following the first exceedance of the TL1. Weekly monitoring shall continue until sample results are consistently below TL1 values for a period of four weeks or as directed by Council.

(c) If after four weeks following the first exceedance of the TL1, the initiation of seawater intrusion and/or water level decline cannot be discounted to the satisfaction of the Council, then a Groundwater Trigger Exceedance Report (GTER) by a suitably qualified Hydrogeologist (and ecologist if the exceedance concerns the Kaimaumau wetland) shall be commissioned by Council.

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(d) The GTER shall assess the significance of the exceedance against the requirements of Objective 1 of the GMCP. The GTER shall assess why TLs have been breached, identify the pumping bores in the area(s) of effect and will review all of the available data collected in the affected area(s), in particular the data collected pursuant to this GMCP.

4.2 Exceedance of TL2

In the event of a TL2 exceedance, which represents significant departure from normal groundwater and/or Kaimaumau Wetland conditions, with either continuously declining groundwater levels and/or Kaimaumau Wetland water levels, or rising salinity indicators:

(a) Council will immediately inform the Consent Holders upon TL2 exceedance becoming known.

(b) All Consent Holders must reduce their abstraction to 50% of the current average daily quantity, as calculated using the previous months water use records required to be kept in accordance with the conditions of its groundwater take consent. If the exceedance occurs within one month of a Consent Holder first taking water for irrigation purposes within an irrigation season, then the average shall be calculated using the water use records for this period only. The council will advise the Consent Holder in writing of any breach and the required reduction in the daily water take volume.

(c) A GTER by a suitably qualified hydrogeologist (and ecologist if the exceedance concerns the Kaimaumau wetland) shall be commissioned by Council. The GTER shall assess why the TL2 has been breached, identify the pumping bores in the area of effect, and include a review of all available data collected for the affected area(s), in particular, the data collected under this GMCP.

(d) Once (b) above has been complied with, a Consent Holder may apply to the Council's Compliance Manager for an alternative reduction in its daily water take volume. Council approval for an alternative reduction value will only be given if it is satisfied that relevant TL2 values will not be exceeded. Approval for an alternative reduction will be given to Priority A Consent Holders first. The Council will use the GTER to inform its decision on any alternative reduction value for a Consent Holder.

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(e) If the TL2 exceedance is in a bore(s) that is/are not continuously monitored, then weekly groundwater level measurements and/or sampling of saline intrusion (depending on which trigger level is breached) in all bores where TL2 trigger levels are breached will commence within one week of the TL2 trigger level exceedance. Monitoring will continue until such time as:

- Three consecutive samples in an individual monitoring bore are below all TL2 thresholds established for that piezometer; or
- As directed by Council.

(f) If salinity indicators continue to increase or groundwater levels continue to decline after 21 days following the implementation of (b), then Consent Holder's abstraction must be reduced to 25% of the current average daily quantity, as calculated for (b) above. The council will

advise the Consent Holder in writing of this further reduction and the required reduction in the daily water take volume.

(g) If (f) is implemented, then the Council will commission a review and update of the GTER report by a suitably qualified hydrogeologist (and ecologist if the exceedance concerns the Kaimaumau-Motutangi wetland) with a longer-term programme of recommended responses incorporating observed responses to interim pumping rate reductions. The updated GTER will include a specific programme (including timeframes) of actions which would achieve compliance with Objective 1 of this GMCP. The actions may include, but not be limited to incremental reductions in the daily quantity of groundwater taken as a percentage of the allowable daily pumped volume, as well as testing of domestic/stock water supplies in bores that are efficiently utilising the aquifer and are potentially impacted by saline intrusion, and if necessary, the provision of temporary water supplies to any affected parties (excluding any of the Consent Holders) in the event that Chloride concentrations exceed 250 mg/L (being the guideline value for taste prescribed in New Zealand Drinking Water Standards for New Zealand 2005 (Revised 2008)). The GTER will also identify a methodology which Council will utilise to increase abstraction back to the volumes applicable to the relevant stage of taking (see Section 2.1), where this can be done such that Objective 1 of this GMCP will be met. If it is not possible to increase abstraction back to the relevant stage of taking, then the GTER will identify a methodology to increase abstraction to a lesser volume such that Objective 1 of the GMCP will be met. Any increase in abstraction will be provided to Priority A Consent Holders first.

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(h) Actions from the GTER shall continue as long as the issue continues.

(i) Implement additional remedial measures as directed by Council, including of the suspension of taking.

5. REFERENCES

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Groundwater Monitoring and Contingency Plan for the Sweetwater and Ahipara sub-aquifers of the Aupōuri Aquifer Management Unit

July 2020

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DOCUMENT FIGURES

DOCUMENT TABLES

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GLOSSARY OF TERMS

Saline/saltwater intrusion	For the purposes of this Groundwater Monitoring and Contingency Plan, saline/saltwater intrusion refers to changes in salinity at nominated monitoring locations that exceed thresholds established to indicate elevated potential for adverse effects on groundwater quality for potable supply and/or irrigation use
Irrigation Season	
Efficient bore takes	An efficient bore take is when a bore fully penetrates the water bearing layer and takes water from the base of the aquifer.
Sub-aquifer	The Aupōuri Aquifer system is divided into 12 separate sub-aquifer units for the purposes of setting tailored aquifer-specific allocation limits.[1]
Stage 1 (Year 1)	
First in-first served	Under the Resource Management Act 1991, applications for water take are processed in the order in which they are lodged. The rights of parties associated with this Groundwater Monitoring and Contingency Plan are prioritised according to the order in which their permits are granted and added to this Plan.

Commented [ML1]: If current wording like 'irrigation season' and stage 1 (year 1) are used with respect of staged implementation, then it would be best to include a definition of these terms as they are being used in varying ways across the GMCP's

[1] Policy H.4.4 of the Proposed Regional Plan for Northland (Appeals Version) June 2020.

1. INTRODUCTION

1.1 Scope and Objective of the GMCP

This document comprises a groundwater monitoring and contingency plan for the Sweetwater and Ahipara sub-aquifers of the Aupōuri aquifer management unit (GMCP). Much of the approach outlined in this GMCP has been informed by the technical assessment presented in the Aupouri Aquifer Groundwater Model, Factual Technical Report – Modelling – Aupouri Aquifer Water User Group. WWLA0184, Rev 3, prepared by Williamson Water & Land Advisory Ltd, and dated 5 February 2020 (hereon referred to as the AAWUG Model Report).

The GMCP covers the implementation and monitoring of the groundwater take consents listed in Table 1 (the Consent Holders) and is a programme of adaptive management that is suitable to provide a platform for the implementation of the abstractions listed in Table 1.

An adaptive management regime requires reasonably clear objectives against which the effects and management progress may be evaluated against. The objective of this GMCP is that;

Objective 1: The abstractions must, individually and cumulatively, avoid:

(a) saltwater intrusion into the Aupouri aquifer;

(b) adverse effects on the hydrological functioning of dune lakes and natural wetlands;

(c) adverse effects on the significant indigenous vegetation and habitats in dune lakes and natural wetlands; and

(d) lowering of the groundwater levels of the Aupouri aquifer such that existing efficient bore takes operating as a permitted activity or in accordance with resource consent conditions cannot access groundwater of the quantity authorised.

Extensive environmental monitoring is required to achieve avoidance of the effects listed above, and to support the proposed 'adaptive management' approach including a staged implementation of groundwater extraction. The purpose of the GMCP is to formalise specific monitoring requirements, establish groundwater level and groundwater quality monitoring triggers and outline a process for implementation of appropriate mitigation and remediation measures in the event that nominated trigger values are exceeded.

The GMCP is intended to facilitate the proposed 'adaptive management' approach by enabling early detection of adverse impacts on the quality and quantity of the Aupōuri aquifer, particularly within the Sweetwater and Ahipara sub-aquifers of the Aupōuri aquifer management unit associated with the exercise of groundwater take consent(s), by:

- Requiring regular monitoring of the groundwater system both on and off-site;
- Setting monitoring criteria (trigger levels) to indicate potential adverse impacts on the groundwater system;

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Commented [ML3]: Needs to have distinguishment of what these features are (i.e., mapped dune lakes and natural wetlands).

- Implementing mitigation measures including changes to the pumping regime if trigger levels are reached to ensure that Objective 1 continues to be met;
- Reviewing monitoring data before and after a step level increase in pumping rate;
- Ensuring that the monitoring data is available for regular review by the Council;
- Detailing a Contingency Plan to be implemented if an unanticipated impact(s) is identified;
- Providing information to quantify the actual effects of the abstraction on the groundwater resource; and
- Enabling validation of the numerical model by the Consent Holders for any replacement groundwater take consent applications.

1.2 Parties Associated with this GMCP

The parties who have been deemed to be associated with this GMCP at its inception are the Northland Regional Council (Council), the Consent Holders in Table 1, the Far North District Council, and the Director-General of Conservation.

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The following provides a brief description of the roles and responsibilities of each party associated with this GMCP.

Should any of these parties change during the implementation of this GMCP, either through addition or removal, the process as set out in Section 1.3 below shall be applied.

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1.2.1 Northland Regional Council

The Council will undertake the ongoing monitoring requirements of the GMCP on behalf of the Consent Holders. The actual and reasonable cost of undertaking the ongoing monitoring of these consents for the Consent Holders will be charged in accordance with Council's Charging Policy.

The installation of sentinel bores and monitoring equipment is the responsibility of the Consent Holders.

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1.2.2 Consent Holders

The Consent Holders identified within this GMCP at Table 1 are required to exercise their Water Permits in accordance this GMCP.

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The exercise of the Water Permits will be in accordance with Council initiated instructions which will be issued once the actions and process established through this GMCP have been undertaken.

The Consent Holders may seek changes to the GMCP through either of the processes set out in Section 1.3.

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1.2.3 *Far North District Council*

Far North District Council (FNDC) holds an existing consent (AUT.002538.01.03) to take groundwater from two bores at Sweetwater for the purpose of potable water supply for the Kaitaia community. FNDC is a party to this GMCP to enable discussions regarding demand and potential impacts on the existing municipal supply abstraction.

1.2.4 *Director-General of Conservation*

The Director-General of Conservation is responsible for administering land and waterbodies subject to reserve status under the Reserves Act 1977 and conservation or stewardship area status under the Conservation Act 1987. Within the Sweetwater and Ahipara sub-aquifers of the Aupouri Aquifer these areas include:

- The Sweetwater Dune Lakes Conservation Area
- Lake Ngatu Recreation Reserve
- Waipapakauri Beach ~~Recreation~~ Scenic Reserve[2]
- Scenic Reserve.

The Director-General of Conservation is a party to this GMCP to ensure that the relevant provisions of these Acts, which the Director-General of Conservation administers, in particular that Objective 1(b) and 1(c) matters are to be met.

It is also relevant to note that the NgaiTakoto Claims Settlement Act 2015, and the Te Rarawa Claims Settlement Act 2015 both contain provisions entitled 'korowai redress' which set-out co-governance arrangements for conservation land known as the 'Korowai for Enhanced Conservation'[3]. The Korowai for Enhanced Conservation recognises the historical, spiritual and cultural association NgāiTakoto, Te Aupouri, Te Rarawa and Ngati Kuri iwi have with conservation land and the roles that the hapū and marae of each undertake as kaitiaki of the whenua and taonga of conservation estate.

1.3 Changes to the GMCP

This GMCP may be amended at any time to:

- Incorporate new or replacement water permits, or remove water permits, within the Sweetwater and Ahipara sub-aquifers of the Aupōuri aquifer management unit that have overlapping and/or additional monitoring requirements or which are subject to different trigger levels or trigger levels based on monitoring described in this GMCP;

[2] Pursuant to Section 31 of the NgaiTakoto Claims Settlement Act 2015, Waipapakauri Beach site ceases to be a conservation area under the Conservation Act 1987. The fee simple estate vests in the trustees of Te Runanga o NgāiTakoto. Waipapakauri Beach site is declared a reserve and classified as scenic reserve.

[3] Which also apply to Te Aupouri Claims Settlement Act 2015, and Ngati Kuri Claims Settlement Act 2015.

Commented [ML5]: Assume FNDC has been included in the GMCP due to range of drawdown in their bores comparative to the predicted drawdowns in others bores where submissions have been made outlining concern of effects on their ability to take groundwater too?

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- Alter the nature and scope of the required monitoring (i.e. monitoring frequency and intensity (type and number of samples)) and associated trigger levels;
- Incorporate or remove parties who are, or may need to be, a part of this GMCP to ensure Objective 1 is met.

If either the Council or a Consent Holder wishes to amend the GMCP, then it must provide notice in writing of the proposed changes, along with any supporting technical documents, to the other Consent Holders, and the Director-General of Conservation.

Parties, given notice by Council of a change to the GMCP, have 20 working days to provide a response to the Council on the proposed changes to the GMCP.

If no response is received from a party within the stated timeframe, then Council will consider that the party has no concerns with the conclusion of the report.

If any party does not agree with the proposed change, that party shall engage a suitably qualified hydrogeologist and/or an ecologist to prepare a report detailing the reasons for the disagreement which shall be provided to Council within 30 working days from the date that the written notice of the proposed changes was sent to the party.

Any change to the GMCP will only be authorised by Council if the technical or administrative assessment of the proposed change clearly indicates that the change will meet Objective 1 of the GMCP.

Council will provide a report to the Consent Holders detailing the reasons for its decision, including the identification and discussion of areas of agreement and disagreement. If the change would affect the interests of the Director-General of Conservation, then the report will also be provided to this party.

If any changes are made to the GMCP, then a copy of the amended GMCP will be provided to the Consent Holders and the Director General of Conservation.

2. FRAMEWORK FOR ADAPTIVE MANAGEMENT

In summary, the following adaptive management techniques are applied in this GMCP;

(a) Baseline monitoring – existing environmental and resource consent compliance monitoring in the Sweetwater sub-aquifer provides a baseline for evaluating the potential effects of the proposed abstraction. The monitoring programme developed for Stage 1 of the Table 1 abstractions is intended to continue key components of the existing monitoring programme while also providing greater focus on monitoring and management of groundwater levels and quality along the coastal margin. This monitoring programme is contained in this GMCP, however, some monitoring detail is still required and this is indicated by the acronym 'TBC'.

(b) Early warning systems - Trigger levels (TLs) will be established to set up an early warning system that provides a response mechanism when differences between predicted and actual water levels, and/or salinity concentrations occur. A trigger level is an environmental criterion that if reached or met, requires a certain response to be actioned.

(c) Staged development - Abstraction volumes will progressively be increased in a staged manner, with expansion contingent on compliance with yet to be established trigger levels and on regular reviews of groundwater level, freshwater ecology and hydrology, and salinity monitoring results. The proposed staging recognises that a significant portion of the abstraction covered by this GCMP is already authorised by existing water permit AUT.020995.01.03.

It is noted that the consent documentation requires that all development starts at Stage 1 volumes whether or not others have progressed to Stage 2 or further, and that takes must be implemented for the minimum period of Stage 1 before progressing to Stage 2. This is an essential mechanism for staging as an adaptive management response.

(d) Management of consents being exercised immediately after commencement – Until such time as there is an adequate monitoring record to establish trigger levels in new monitoring bores, the abstractions during this stage will be subject to interim groundwater level and saline trigger levels and Trigger Exceedance Report procedures; and

(e) Tiered approach to monitoring – Monitoring effort is proposed to increase if site trigger levels are approached or exceeded. Likewise, monitoring intensity may decrease with evidence of sustained compliance and stability or to reflect improved characterisation of the hydrogeological environment by way of the process outlined in Section 1.3 of this GMCP; and

(f) Ongoing adaptive management – The abstractions will be managed adaptively within the term of consent and, in the event of trigger level exceedance, through the implementation of the recommendations of a Groundwater Trigger Exceedance Report (GTER) prepared by Council.

(g) Suspension of abstractions – Should compliance with Objective 1 of this GMCP not be achieved, then the exercise of some or all of the consents to abstract and use groundwater

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Commented [ML6]: Because Stage 1 / Year 1 starts at various points in time for consent holders, it seems more suitable to refer to this period based on the first exercise of consents.

Commented [ML7]: This should probably reference a term other than 'Stage 1 / Year 1' as Stage 1 (Year 1) will differ between individuals whereas this aspect of the 'framework' relates to the first 12 months after commencement of the consents while data is still being collected to set longer-term trigger levels.

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may be suspended until such time as Council confirms in writing that compliance can be achieved.

The following sections provide detailed information relating to the adaptive management framework to be imposed for the exercise of the consents listed in Table 1.

2.1 Staged Implementation

The uptake by Consent Holders of the consented total allowable water volumes will be permitted in four stages over nine years, as shown in Table 1 below, unless the outcome of the Staged Implementation and Monitoring Programme Review detailed in Section 2.1.1 shows that there should be a delay in moving to the next stage, or that the next stage should not occur.

The development stages reflect:

- A combination of existing allocation (2,317,000 m3/year) and proposed future development of pastoral and horticultural irrigation activity for APP.020995.01.04; and
- The progressive increase in water requirements for the proposed orchard associated with ~~APP~~AUT.040364.01.01.
- The Stage 1 process applies to any new or additional take beyond that already authorised prior to the granting of these consents. As such, the existing volume of take (2,317,000 m^3/year) at Sweetwater Station authorised by AUT.020995.01.03 is excluded from the requirements of Stage 1.

Table 1. Summary of staged implementation annual volumes

Application Number	Consent Holder	Allowable Annual Volume (m3)			
		Stage 1 ~~-~~(Year 1)*	Stage 2 (Year 2-3)*	Stage 3 (Year 4-6)*	Stage 4 (Year 7- 9)*
Sweetwater sub-aquifer management unit					
~~APP~~AUT.040364.01.01	ELBURY HOLDINGS LTD (C/- KJ & FG KING)	50,000	100,000	150,000	200,000
~~APP~~AUT.020995.01.04	TE RARAWA FARMING LTD AND TE MAKE FARMS LTD	321,000**~~2,317,000~~ (Consent Total 3,093,000)	321,000~~2,317,000~~ (Consent Total 3,093,000)	321,000~~3,093,000~~ (Consent Total 3,093,000)	321,000~~3,093,000~~ (Consent Total 3,093,000)
TOTAL (m^3/year)***		~~371,0002,367,000~~	~~421,0002,417,000~~	~~471,0003,243,000~~	~~521,0003,293,000~~
Total (% allocated per stage)		~~71~~%	81	90	100
Ahipara sub-aquifer management unit					
AUT.020995.01.04	TE RARAWA FARMING LTD AND TE MAKE FARMS LTD	455,000** (Consent Total 3,093,000)	455,000 (Consent Total 3,093,000)	455,000 (Consent Total 3,093,000)	455,000 (Consent Total 3,093,000)
TOTAL (m^3/year)***		3,093,000	3,093,000	3,093,000	3,093,000
Total (% allocated per stage)		100%	100%	100%	100%

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Notes:

*The staged implementation is based on years when irrigation occurs following the ~~granting~~ commencement of the consents.

** APP.020995.01.04 may be exercised up to the current consented volume of 2,317,000 m^3/year without staging meaning that Stage 1 (Year 1) for this consent occurs when the take exceeds 2,317,000 m^3/year.

*** Given that APP.020995.01.04 includes existing un-staged allocation, and that timing of the first exercise of APP.040364.01.01 is not yet known, totals are only indicative.

2.1.1 Staging: Implementation and Monitoring Programme Review

A "Staged Implementation and Monitoring Programme Review" (SIMPR) will be required for Council to decide whether Consent Holders proceed to the next allocation stage. The volume of abstraction authorised will be reviewed against the staged implementation outlined in Section 2.1 at the minimum intervals of:

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End of Stage 1: A period where all or part abstraction of the Stage 1 annual volume is taken after commencement of the consent and after which a full 12 months of baseline monitoring data has been collected;

Commented [ML8]: Recommend term 'full irrigation season' be removed and replaced as the term could be applied as a take occurring from September – April when climate/soil condition does not require this. Instead it should be acknowledged that all or part abstraction may occur over Stage 1 (Year 1) which recognises the practicality of the need (or not) to irrigate.

End of Stage 2: 3 irrigation seasons following date of commencement of the consents;

End of Stage 3: 6 irrigation seasons following date of commencement of the consents; and

End of Stage 4: 9 irrigation seasons following date of commencement of the consents.

~~End of Stage 1 – a period of not less than 12 months following the date of commencement of the consent during which a full 12 months of baseline monitoring data has been collected and the consent has been exercised over a full irrigation season;~~

~~End of Stage 2 - 3 irrigation seasons following date of commencement of the consents;~~

~~End of Stage 3 - 6 irrigation seasons following date of commencement of the consents; and~~

~~End of Stage 4 - 9 irrigation seasons following date of commencement of the consents.~~

The main purpose of the SIMPR is to assess whether abstraction increasing to the subsequent development stage would remain compliant with Objective 1 of the GMCP.

The SIMPR will be commissioned by the Council and shall be prepared by a suitably qualified hydrogeologist with experience and knowledge of the locality.

The SIMPR shall include a detailed assessment of all environmental monitoring data including groundwater levels, salinity indicators, and water quality, and include consideration of spatial and temporal trends including potential effects of groundwater abstraction on water levels in dune lakes and natural wetlands. If the potential for more than minor effects on dune lakes and natural wetlands specified in **Section 1.2.4** is identified, then the SIMPR will also include assessment of the likely significance of those effects prepared by a suitably qualified ecologist. The SIMPR shall assess whether Objective 1 of this GMCP is being met at the current level of abstraction, and whether Objective 1 will be met at the next stage level of abstraction. The SIMPR may also consider the nature and scope of continued monitoring (i.e. monitoring frequency and intensity (type and number of samples)) and associated trigger levels.

Commented [ML9]: There is reference to areas administered by DoC in this section so seems relevant that this is the scope to which this assessment of minor effect should extend to.

The SIMPR will provide recommendations based on the assessment of the environmental monitoring data to date on:

- the setting or alteration of the trigger levels;
- whether any changes to the monitoring programme are required; and
- whether to advance to the next stage of abstraction or to remain at the current level of abstraction, or to reduce the level of abstraction.

A copy of the SIMPR will be provided to the Consent Holders listed in Table 1 and the Director General of Conservation a minimum of three months prior to the anticipated commencement of the subsequent irrigation season utilising volumes defined for the subsequent development stage as stated in Table 1. The Consent Holders and Director General of Conservation have 20 working days to provide a response to the Council on the conclusions and recommendations of the SIMPR.

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If no response is received from a party within the stated timeframe, then Council will consider that the party has no concerns with the conclusions of the report.

If any party does not agree with the conclusions and recommendations of the SIMPR, then a report by a suitably qualified hydrogeologist and/or ecologist, both with experience and knowledge of the locality if possible, detailing the reasons for the disagreement shall be provided to Council within 30 working days from the date that the assessment was sent to the party.

An increase in the volume of abstraction to the next development stage and any change to the monitoring programme will only be authorised by Council if the technical assessment of the monitoring data clearly indicates that the increase in the allocation and change to GMCP would meet Objective 1 of this GMCP.

Council will provide a report to the Consent Holders and the Director General of Conservation detailing the reasons for its decision, including the identification and discussion of areas of agreement and disagreement.

If any changes are made to the GMCP, then a copy of the amended GMCP will be provided to the Consent Holders and the Director General of Conservation within 5 working days of the change being authorised as final.

A summary of the above process is also included in the conditions of each consent that is covered by this GMCP.

2.1.2 Stage 1 (Year 1) Management Regime

Stage 1 is the initial development stage comprising a minimum period of 12 months (comprising at least 1 full irrigation season) following issue of the consents listed in Table 1. This stage is intended to maintain abstraction at similar levels to those currently authorised while trigger levels are established for all sentinel monitoring bores. The Stage 1 process applies to any new or additional take beyond that already authorised prior to the ~~granting~~ commencement of these consents~~; i.e. the existing volume of take at Sweetwater Farms authorised by AUT.020995.01.03 is excluded from the requirements of Stage 1~~.

Council is to notify the Consent Holders, FNDC and the Director-General of Conservation of the default management parameters for Stage 1 (Year 1) 3 months prior to the commencement of abstraction. The Consent Holders, FNDC and Director-General of Conservation have 10 working days to provide responses to the Council on the default management parameters once notified.

Ongoing monitoring will be required to ensure that Objectives 1(a), (b), and (c) are met by implementing trigger level exceedance measures. These trigger level exceedance measures are those which sit in Section 4 below.

The interim management regime established for Stage 1 (Year 1) will be superseded by the Monitoring and Trigger Level Setting components set out in Section 2.2 of this GMCP.

2.1.2.1 Saline Intrusion and Groundwater Level: Monitoring and Triggers

To ensure that Objective 1 is met during Stage 1 (Year 1) interim trigger levels for minimum groundwater levels and salinity indicators will be established in all Sentinel bores identified in . These trigger levels will be established either based on existing baseline data (for existing compliance monitoring bores associated with Water Permit AUT.020995.01.03) or determined from preliminary data once each new sentinel bore is installed, following the methodology established in Section 2.2 below.

Interim trigger levels must be set prior to exercise of any of the consents and apply to Stage 1 (Year 1) only.

The saline intrusion and groundwater level monitoring trigger levels for Stage 1 (Year 1) shall be inserted into the GMCP through the process set out in Section 1.3 of this GMCP prior to the exercise of any consents.

2.1.2.2 Trigger Level Responses

In the event of an exceedance of a Trigger Level applicable in Stage 1 (Year 1), the Trigger Level Exceedance response plan contained in Section 4 of this GMCP shall apply.

2.1.2.3 Ceasing Interim Stage 1 (Year 1) Management Regime

This interim management regime shall remain in place until such time as Council has given authorisation to proceed to the next stage (Stage 2) as set out under Section 2.1.1 above or where the setting of trigger levels as per Section 2.2 below has been given effect to through amendment to this GMCP in accordance with the change process established in Section 1.3 of this GMCP.

2.2 Trigger Level System

2.2.1 Timeframe for setting of trigger levels

The setting of trigger level values for each parameter (where TBC is indicated in the monitoring plan tables in Section 3 Monitoring Programme) will be undertaken based either on current baseline data (for sites with existing monitoring) or data collected during Stage 1. This approach recognises that:

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- There is significant historical monitoring data available to characterise the response of groundwater levels and quality to current levels of abstraction~~.~~;
- The manifestation of any effects from the exercising of these consents will steadily progress with time in accordance with the staged development process outlined in Table 1~~Table 1~~. The scale of abstraction during Stage 1 (i.e. generally 12 months following ~~granting~~ commencement of consent) will not vary significantly from ~~existing conditions~~what is currently considered as the existing environment[4].

2.2.2 *Method for setting of trigger levels*

A two-tier trigger level system will be implemented on the consents:

- TL1 - The first-tier trigger level establishes when an individual monitoring parameter is exhibiting a departure from baseline conditions. If this trigger level is breached, then additional monitoring will be undertaken by the Council;
- TL2 - The second-tier trigger level is set at a threshold defining a 'significant' departure from baseline conditions and/or conditions where the risks of adverse environmental effects are increased. If this trigger level is breached, then the Consent Holders will be required to reduce their daily water take volume in a staged manner over a set period of time.

The TL parameters required under this GMCP for the various suites are summarised in Table 2.

Table 2: Summary trigger level parameters by monitoring suite

Monitoring Suite	Parameters
Groundwater level and salinity monitoring	Groundwater level, electrical conductivity
Saline intrusion monitoring	Electrical conductivity, chloride, sodium, total dissolved solids.

2.2.3 *Response to exceeding trigger levels*

The actions required should TL's be exceeded are set out in Section 4 (Contingency Plan).

[4] ADD EXISTING ENVIRONMENT DESCRIPTION

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3. MONITORING PROGRAMME & TRIGGER LEVEL SETTING

3.1 Bore Locations and Details

A consolidated summary of the schedule of bores that are required to be monitored as part of this GMCP is provided in **Table 3**. Along with the bores identified for monitoring, the table provides key details relating to the bores' physical attributes and parameters to be monitored. The locations of the monitoring bores are shown on **Figure 1**~~Figure 1~~[5].

The following sections of the GMCP provide the monitoring schedules (frequency and trigger levels) for the bores.

The monitoring schedule comprises four components:~~:~~

- Three sentinel bores located along the coastal margin seaward of areas where abstraction is concentrated. The sentinel bores will provide the primary reference sites for monitoring and management of potential saline intrusion effects. Each sentinel bore will comprise two piezometers accessing the shallow unconfined aquifer and the shellbed respectively. Instrumentation in each piezometer will enable continuous monitoring of groundwater levels and electrical conductivity (EC), and provide for telemetry of monitoring data to NRC. All sentinel monitoring bores listed in **Table 5** will be installed prior to the exercise of the consents.
- An existing NRC piezometer with a long monitoring record (Lake Heather No. 1 (105 m)) will be the primary reference site for management of cumulative well interference effects. Instrumentation in the piezometer will enable continuous monitoring of groundwater levels and provide for telemetry of monitoring data to NRC.
- Groundwater levels will be monitored manually on a monthly basis in existing compliance monitoring bores on Sweetwater Station, along with an existing NRC piezometer at Lake Heather (Lake Heather No. 1 (29 m)) and a private bore at Sweetwater Nursery (LOC.201424). These sites will provide ongoing monitoring of groundwater levels and provide data to characterise both localised and cumulative drawdown in response to abstraction and be used to inform the staged implementation process.
- Salinity indicators will be measured on a quarterly basis in each piezometer at the three sentinel bores, augmented by an additional monitoring bore at Waipapakauri Beach (if access to a suitable existing bore can be established). These sites will be monitored on a quarterly basis for the parameters listed in ~~Table 2~~ **Table 2** and provide a secondary baseline to characterise any changes in aquifer salinity along the coastal margin.

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[5] Note: the locations shown for the two new sentinel bores are indicative. Final locations may depend on physical access available for piezometer installation.

The locations of the production bores in **Table 3** are also shown in **Figure 1**. An error accuracy level of +/- 50 metres is applicable to these bore locations. Any differentiation in the location by greater than 50 metres will result in a requirement for an application to the Council for a change of consent condition pursuant to Section 127 of the Resource Management Act 1991 (RMA). Assessment of the effects on the environment of the change will be required pursuant to Schedule 4 of the RMA.

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Table 3: Schedule of monitoring bore details.

MONITORING BORES								
Bore Details		Bore Owner	COORDINATES (NZTM 2000)		Depth (m)	Dia. (mm)	Target Aquifer	Purposeb
Name (Fig 1)	NRC Ref.		Easting	Northing				
MW1a	LOC.210522	Sweetwater Station	1617843	6119772	13.3		Unconfined	GLm
MW1b	LOC.209755	Sweetwater Station	1617597	6119793	94.0		Shellbed	GLm
MW2a	LOC.210523	Sweetwater Station	1620419	6120014	15.0		Unconfined	GLm
MW2b	LOC.210524	Sweetwater Station	1620422	6120015	59.0		Shellbed	GLm
MW4a	LOC.210527	Sweetwater Station	1616386	6119031	25.0		Unconfined	GLc, ECc, SI
MW4b	LOC.209753	Sweetwater Station	1616404	6119040	92.0		Shellbed	GLc, ECc, SI
MW5a		Sweetwater Station	1617811	6114690	6.0		Unconfined	GLm
MW5b	LOC.209759	Sweetwater Station	1617644	6114898	61.0		Shellbed	GLm
MW6	LOC.320452	Sweetwater Station	1617451	6118946	14.4		Unconfined	GLm
Lake Heather No 1	LOC.200226	NRC	1617605	6121325	29		Unconfined	GLm

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(29 m)								
Lake Heather No 1 (105 m)		NRC			105.5		Shellbed	GLc
Waipapapakauri Sentinel (shallow)	TBC	NRC	1616020	6121100	TBC		Unconfined	GLc, ECc, SI
Waipapapakauri Sentinela (deep)	TBC	NRC	1616020	6121100	TBC		Shellbed	GLc, ECc, SI
Waipapakauri Quality[a]	TBC	Private?	1615500	6122500	TBC		Shellbed	SI
Ahipara Sentinel (shallow)	TBC	NRC	1615750	6112150	TBC		Unconfined	GLc, ECc, SI
Ahipara Sentinel (deep)	TBC	NRC	1615750	6112150	TBC		Shellbed	GLc, ECc, SI
Sweetwater Nursery[a]	LOC.201424	Private	1618734	6122288	82		Shellbed	GLm

a Monitoring site equivalent to that specified in Schedule 1 to AUT.25683.01.03

b Purpose Key

GLc = Continuous Groundwater Level (Telemetered)

GLm = Manual (monthly) groundwater level

ECc = Continuous Electrical Conductivity (Telemetered)

SI = Salinity Indicatory (Quarterly)

MI = Major Ions (Quarterly)

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Commented [ML10]: But it is applicant responsibility to install sentinels according to section 1.2.1 of GMCP?

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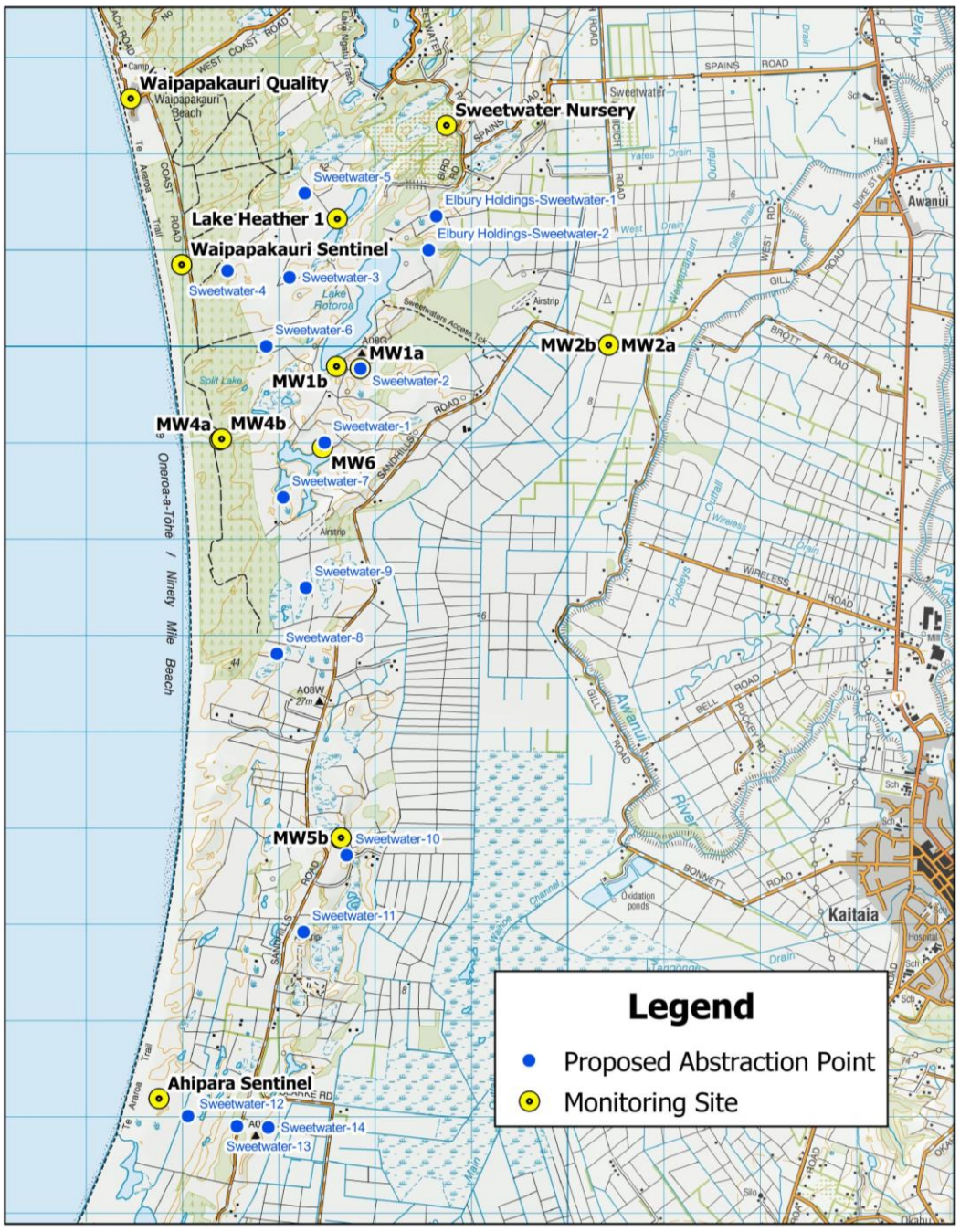

Figure 1. Groundwater Monitoring and Production Bore Location Map

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3.2 Groundwater Level and Salinity Monitoring

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3.2.1 Sentinel Monitoring Bores

Sentinel bores will be utilised as the primary reference sites for monitoring of potential effects associated with saline intrusion. These bores will be positioned between existing/proposed abstraction and the coastline to provide early detection or warning of:

- Groundwater levels around the coastal margin approaching a threshold that could indicate a greater risk of saline intrusion; and
- Any reduction in water quality that could indicate the landward migration of the saline interface.

Details of the sentinel bores are summarised in Table 4 below. These sentinel bores will collect data continuously for water levels and electrical conductivity in individual piezometers. This data will be telemetered to NRC. A two-tier trigger level system (TL1 and TL2) for groundwater levels and electrical conductivity will be set in these bores.

TL1 and TL2 trigger levels for groundwater level and EC in MW4b are specified in Table 4 below. The setting of TL1 and TL2 trigger levels for the remaining piezometers will be undertaken during the first implementation stage after 12 months of monitoring data has been collected and within 15 months of the date of commencement of these consents and replace the interim trigger levels outlined in Section 2.1.2.1 above. The current trigger levels that are shown in Table 4 are based on existing data and will be reconfirmed by Council when the other trigger levels are confirmed.

All sentinel monitoring bores listed in Table 4 will be installed prior to the exercise of the consents.

Data will be collected, processed and managed in accordance with NRC quality standards.

Table 4: Schedule of saline intrusion sentinel monitoring bores

Bore Name	Depth (m)	Target aquifer	Units	Frequency	Trigger Levels	
					TL1	TL2
Sweetwater MW4a	25	Shallow sand	mAMSL	Continuous	TBC	TBC
			µS/cm	Continuous	TBC	TBC
Sweetwater MW4b	92	Shellbed	mAMSL	Continuous	2.5	2.0
			µS/cm	Continuous	500	600
Waipapakauri Sentinel Shallow	TBC	Shallow sand	mAMSL	Continuous	TBC	TBC
			µS/cm	Continuous	TBC	TBC
Waupapakauri Sentinel Deep	TBC	Deep shellbed	mAMSL	Continuous	TBC	TBC
			µS/cm	Continuous	TBC	TBC
Ahipara Sentinel Shallow	TBC	Shallow sand	mAMSL	Continuous	TBC	TBC
			µS/cm	Continuous	TBC	TBC
Ahipara Sentinel Deep	TBC	Deep shellbed	mAMSL	Continuous	TBC	TBC
			µS/cm	Continuous	TBC	TBC

~~Notes:~~
~~TBC = to be confirmed within 15 months of the date of commencement of these consents.~~
~~GL TL1s (where provided) have been calculated from long term monitoring data.~~
~~GL TL2s (where provided) have been calculated from long term monitoring data~~

~~3.2.2~~ Groundwater Level

3.2 Monitoring & Establishment of Trigger Levels

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~~3.2.3~~3.2.1 *Continuous Groundwater Level Monitoring*

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The existing NRC Lake Heather No.1 (105 m) piezometer will be utilised as the primary reference site to determine the magnitude of cumulative well interference effects. Groundwater levels will be monitored on a continuous basis and telemetered to NRC.

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Trigger levels for cumulative drawdown will be established and, if require, utilised to manage cumulative pumping rates to ensure priority access to the groundwater resource by existing groundwater users is not derogated by the proposed abstraction. Trigger levels will be established subject to agreement between parties to this GCMP and FNDC (holders of water permit AUT.25683.01.03).

~~3.2.4~~3.2.2 *Manual Groundwater Level Monitoring*

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Groundwater levels will be monitored manually in the shallow sand and shellbed aquifers to:

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- Ensure groundwater abstraction does not result in a reduction in the reliability of supply for AUT.025683.01.03; and

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- Quantify the magnitude of drawdown resulting from the proposed abstraction in the shellbed and unconfined aquifers to ensure it is within the magnitude anticipated in the AEE and does not result in adverse effects on surface water environment, existing groundwater users and long-term aquifer storage volumes.

Details of the groundwater level monitoring bores are listed in ~~Table x~~ **Table 4** below. The m~~M~~ajority of the bores listed (MW1a to MW6) are existing compliance monitoring bores on Sweetwater Station that have been monitored manually on a monthly basis since 2013 as part of consent compliance for W~~w~~ater P~~p~~ermit AUT.020995.01.03. It is proposed to continue the existing monitoring regime for these bores, with the addition of the existing NRC Lake Heather No 1 (29 m) piezometer and a private bore at Sweetwater Nursery.

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No trigger levels will be established for manual groundwater level monitoring sites. However, data from these sites will be utilised for annual reporting (Section ~~Section x~~**3.5**) and as part of the SIMPR.

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Table 4. Schedule of Manual Groundwater Monitoring Bores

Monitoring	NRC ID	Easting	Northing	Depth	Aquifer	Units	Frequency

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Bore				(m)			
MW1a	LOC.210522	1617843	6119772	13.3	Unconfined		
MW1b	LOC.209755	1617597	6119793	94.0	Shellbed		
MW2a	LOC.210523	1620419	6120014	15.0	Unconfined		
MW2b	LOC.210524	1620422	6120015	59.0	Shellbed		
MW5a		1617811	6114690	6.0	Unconfined		
MW5b	LOC.209759	1617644	6114898	61.0	Shellbed		
MW6	LOC.320452	1617451	6118946	14.4	Unconfined		
Lake Heather No. 1 (29 m)	LOC.200226	1617605	6121325	29.0	Unconfined		
Sweetwater Nursery	LOC.201424	1618734	6122288	82.0	Shellbed		

~~3.2.5 Groundwater Quality (Salinity Indicator) Monitoring~~

~~Monitoring for salinity indicators listed in Table 2 will be undertaken in the monitoring bores listed in Table 6. The purpose of this monitoring is intended to provide additional context for the evaluation of any changes in aquifer salinity resulting from the proposed groundwater abstraction (i.e. to augment continuous EC monitoring).~~

~~Table 6. Schedule of Salinity Indicator Monitoring Bores~~

~~MW4a~~	~~LOC.210527~~	~~Sweetwater Station~~	~~1616386~~	~~6119031~~	~~25.0~~		~~Unconfined~~
~~MW4b~~	~~LOC.209753~~	~~Sweetwater Station~~	~~1616404~~	~~6119040~~	~~92.0~~		~~Shellbed~~
~~Waipapapakauri Sentinel (shallow)~~	~~TBC~~	~~NRC~~	~~1616020~~	~~6121100~~	~~TBC~~		~~Unconfined~~
~~Waipapapakauri Sentinela (shallow)~~	~~TBC~~	~~NRC~~	~~1616020~~	~~6121100~~	~~TBC~~		~~Shellbed~~
~~Ahipara Sentinel (shallow)~~	~~TBC~~	~~NRC~~	~~1615750~~	~~6112150~~	~~TBC~~		~~Unconfined~~

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~~Ahipara Sentinel (deep)~~	~~TBC~~	~~NRC~~	~~1615750~~	~~6112150~~	~~TBC~~		~~Shellbed~~
~~Waipapakauri Qualitya~~	~~TBC~~	~~Private?~~	~~1615500~~	~~6122500~~	~~TBC~~		~~Shellbed~~

3.2.3 Ongoing Monitoring

Monthly water level monitoring will be undertaken in the production bores listed in **Error! Reference source not found.**. During the winter months (nominally May to September) this monitoring will provide information to identify any inter-annual variations in aquifer storage which may be anomalous compared to regional trends. During the irrigation season, water level measurements will be undertaken a minimum of eight hours following the cessation of pumping.

~~*3.2.6*~~

~~*3.2.7*~~*3.2.4 Setting of Groundwater Level Trigger Levels*

~~3.2.7.1~~3.2.4.1 Shallow Sand Aquifer

Council will set trigger levels for groundwater levels in the unconfined aquifer in each of the three sentinel bores. As a general guide TL2 for the shallow sand aquifer should be no less than 1.0 mAMSL (noting that changes in EC are also a key indicator of saline intrusion).

~~3.2.7.2~~3.2.4.2 Deep Shell bed Aquifer

Groundwater level triggers will be established in the deep shellbed aquifer as follows:

In the three sentinel bores TL1 and TL2 will be based on historical groundwater levels, allowing for the predicted magnitude of drawdown resulting from existing and proposed abstraction outlined in the ~~Assessment of Environmental Effects~~ report titled 'Aupouri Aquifer Groundwater Model, Factual Technical Report – Modelling. WWLA0184, Rev 3, prepared by Williamson Water & Land Advisory Ltd and dated 5 February 2020.

If necessary, water level records for individual sentinel bores will be correlated with existing monitoring sites to provide historical context for estimating the trigger levels.

As a general guide TL2 for deep shell bed groundwater levels should be no less than 1.5 mAMSL (noting that changes in EC are also a key indicator of saline intrusion).

~~3.2.7.3 Electrical Conductivity Triggers~~

~~Electrical conductivity triggers in individual sentinel monitoring bores will be no greater than:~~

- ~~TL1 - Median (weekly rolling average) EC from baseline monitoring period +25%~~
- ~~TL2 - Median (weekly rolling average) EC from baseline monitoring period + 50%~~

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~~*3.2.8* Ongoing monitoring~~

~~Ongoing monitoring of groundwater and electrical conductivity levels will be undertaken continuously via individual piezometers in sentinel monitoring bores. Monitoring data will be telemeted to NRC on a twice daily basis. All monitoring data will be collected, managed and processed in accordance with NRC quality standards.~~

3.3 Saline Intrusion Monitoring & Establishment of Trigger Levels

Sentinel bores will be utilised as the primary reference sites for monitoring of potential effects associated with saline intrusion. These bores will be positioned between existing/proposed abstraction and the coastline to provide early detection or warning of:

- Groundwater levels around the coastal margin approaching a threshold that could indicate a greater risk of saline intrusion; and
- Any reduction in water quality that could indicate the landward migration of the saline interface.

Details of the sentinel bores are summarised in **Table 5** below.

During the initial 12-month monitoring period, sampling for the following salinity indicators in the bores listed in ~~Table 7~~ **Table 5** below will be undertaken at quarterly intervals[6]:

- Electrical conductivity;
- Chloride;
- Sodium;
- Total Dissolved Solids.

The samples will be collected in accordance with A National Protocol for State of the Environment Groundwater Sampling in New Zealand (Ministry for the Environment, 2006).

~~*3.3.1*~~3.3.1.1 Setting of Saline Intrusion Triggers

A two-tier trigger level system (TL1 and TL2) for groundwater levels and electrical conductivity will be set in these bores.

As an initial guide, trigger levels for individual determinants will be established as follows:

- TL1 - Median concentration from the Stage 1 monitoring period +25%.
- TL2 - Median concentration from the baseline monitoring period + 50%.

[6] This frequency applies to the initial 12-month monitoring period for the establishment of baseline information. The frequencies specified in Table 6 are for ongoing monitoring specifications.

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TL1 and TL2 trigger levels for groundwater level and EC in MW4b are specified in **Table 5** below. The setting of TL1 and TL2 trigger levels for the remaining piezometers will be undertaken during the first implementation stage after 12 months of monitoring data has been collected and within 15 months of the date of commencement of these consents and replace the interim trigger levels outlined in Section 2.1.2.1 above. The current trigger levels that are shown in **Table 5** are based on existing data and will be reconfirmed by Council when the other trigger levels are confirmed.

All sentinel monitoring bores listed in **Table 5** will be installed prior to the exercise of the consents.

- Data will be collected, processed and managed in accordance with NRC quality standards.

~~3.3.1.1~~3.3.1.2 Ongoing Monitoring

Ongoing monitoring of groundwater and electrical conductivity levels will be undertaken continuously via individual piezometers in sentinel monitoring bores. Monitoring data will be telemeted to NRC on a twice daily basis. Sampling at the frequencies specified for the following salinity indicators will take place in the bores listed in **Table 5** below:

- Electrical conductivity;
- Chloride;
- Sodium;
- Total Dissolved Solids.

The samples will be collected in accordance with A National Protocol for State of the Environment Groundwater Sampling in New Zealand (Ministry for the Environment, 2006).

3.3.2 Schedule of Monitoring & Trigger Levels

The schedule of monitoring and trigger levels as discussed in this section are provided in **Table 5** below.

Table 5: Monitoring Schedule – Saline Intrusion

Bore Name	Depth (m)	Piezo. No.	Target aquifer	Parameter*	Units	Frequency	Trigger Levels	
							TL1	TL2
MW4	25	a	Unconfined	EC	µS/cm	Continuously	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC
				GW Level	mAMSL	Continuous	TBC	TBC
	92	b	Deep shellbed	EC	µS/cm	Continuously	500	600
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				GW Level	mAMSL	Continuous	2.5	2.0
Waipapakauri Sentinel	TBC	1		EC	µS/cm	Continuous	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC

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Bore Name	Depth (m)	Piezo. No.	Target aquifer	Parameter*	Units	Frequency	Trigger Levels	
							TL1	TL2
				GL	mAMSL	Continuous	TBC	TBC
	>50 (TBC)	2	Deep shellbed	EC	µS/cm	Continuous	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC
				GL	mAMSL	Continuous	TBC	TBC
Ahipara Sentinel	TBC	1	Unconfined	EC	µS/cm	Continuous	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC
	> 50 TBC	2	Deep Shellbed	EC	µS/cm	Continuous	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC
				GL	mAMSL	Continuous	TBC	TBC
Waipapakauri Quality	TBC	1	Deep shellbed	EC	µS/cm	Continuous	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC

Notes:

* Parameter key: GL = Groundwater Level; EC = Electrical Conductivity; SI = Salinity Indicators; TDS = Total Dissolved Solids.

TBC = to be confirmed within 15 months of the date of commencement of these consents.

~~Table 7: Monitoring Schedule – Saline Intrusion~~

~~Bore Name~~	~~Depth (m)~~	~~Piezo. No.~~	~~Target aquifer~~	~~Parameter*~~	~~Units~~	~~Frequency~~	~~Trigger Levels~~	
							~~TL1~~	~~TL2~~
~~MW4~~	~~25~~	~~a~~	~~Unconfined~~	~~EC~~	~~µS/cm~~	~~Continuously~~	~~TBC~~	~~TBC~~
				~~Chloride~~	~~mg/L~~	~~Quarterly~~	~~TBC~~	~~TBC~~
				~~Sodium~~	~~mg/L~~	~~Quarterly~~	~~TBC~~	~~TBC~~
				~~TDS~~	~~mg/L~~	~~Quarterly~~	~~TBC~~	~~TBC~~
	~~92~~	~~b~~	~~Deep shellbed~~	~~EC~~	~~µS/cm~~	~~Continuously~~	~~TBC~~	~~TBC~~
				~~Chloride~~	~~mg/L~~	~~Quarterly~~	~~TBC~~	~~TBC~~
				~~Sodium~~	~~mg/L~~	~~Quarterly~~	~~TBC~~	~~TBC~~
~~Waipapakauri Sentinel~~	~~TBC~~	~~1~~		~~EC~~	~~µS/cm~~	~~Quarterly~~	~~TBC~~	~~TBC~~
				~~Chloride~~	~~mg/L~~	~~Quarterly~~	~~TBC~~	~~TBC~~
				~~Sodium~~	~~mg/L~~	~~Quarterly~~	~~TBC~~	~~TBC~~
				~~TDS~~	~~mg/L~~	~~Quarterly~~	~~TBC~~	~~TBC~~
	~~>50 (TBC)~~	~~2~~	~~Deep shellbed~~	~~EC~~	~~µS/cm~~	~~Quarterly~~	~~TBC~~	~~TBC~~
				~~Chloride~~	~~mg/L~~	~~Quarterly~~	~~TBC~~	~~TBC~~
				~~Sodium~~	~~mg/L~~	~~Quarterly~~	~~TBC~~	~~TBC~~

Bore Name	Depth (m)	Piezo. No.	Target aquifer	Parameter*	Units	Frequency	Trigger Levels	
							TL1	TL2
				TDS	mg/L	Quarterly	TBC	TBC
Ahipara Sentinel	TBC	1	Unconfined	EC	µS/cm	Quarterly	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC
	> 50 TBC	2	Deep Shellbed	EC	µS/cm	Quarterly	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC
Waipapakauri Quality	TBC	1	Deep shellbed	EC	µS/cm	Quarterly	TBC	TBC
				Chloride	mg/L	Quarterly	TBC	TBC
				Sodium	mg/L	Quarterly	TBC	TBC
				TDS	mg/L	Quarterly	TBC	TBC

Notes:

* Parameter key: GL = Groundwater Level; EC = Electrical Conductivity; SI = Salinity Indicators; TDS = Total Dissolved Solids.

TBC = to be confirmed within 15 months of the date of commencement of these consents.

3.4 Production Bore Monitoring

During the initial 12-month monitoring period, sampling for the following salinity indicators in the bores listed in Table 8 below will be undertaken at 6 weekly intervals[7].

3.4.1 Trigger levels

Electrical conductivity trigger levels will be established in the production bores listed in **Error! Reference source not found.** below.

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During the initial 12-month monitoring period Electrical Conductivity Triggers will be no greater than:

- TL1 – Departure exceeding 25% of the EC value from the initial monitoring round
- TL2 – Departure exceeding 50% of the EC value from the initial monitoring round

Long-term EC triggers for individual production bores will be established following an initial 12-month monitoring period, based on an assessment of observed spatial and temporal variation in EC in baseline and sentinel bore monitoring data, in a manner consistent with EC trigger levels established in the sentinel monitoring bores.

[7] This frequency applies to the initial 12-month monitoring period for the establishment of baseline information. The frequencies specified in Table 6 are for ongoing monitoring specifications.

No trigger levels will be established for groundwater levels in the production bores as water levels in the production bores can be impacted by well efficiency and pumping schedules so are not necessarily representative of groundwater levels in the surrounding aquifer.

3.4.2 *Ongoing monitoring*

Monthly water level monitoring will be undertaken in the production bores listed in **Table 6**. During the winter months (nominally May to September) this monitoring will provide information to identify any inter-annual variations in aquifer storage which may be anomalous compared to regional trends. During the irrigation season, water level measurements will be undertaken a minimum of eight hours following the cessation of pumping.

Electrical conductivity values will also be measured at monthly intervals from the production bores during the irrigation season to check on any changes in salinity induced by the pumping.

3.4.3 *Monitoring Schedule & Trigger Levels*

The schedule of monitoring and trigger levels as discussed in this section are provided in below.

Table 6: Monitoring Schedule – Production Bore Water Levels and Electrical Conductivity

Bore Name	Parameter*	Units	Frequency	Trigger Levels	
				TL1	TL2
Sweetwater 1	Water Level	mASL	Monthly	TBC	TBC
	Electrical Conductivity	mS/m	Monthly	TBC	TBC
Sweetwater 2	Water Level	mASL	Monthly	TBC	TBC
	Electrical Conductivity	mS/m	Monthly	TBC	TBC
Sweetwater 3	Water Level	mASL	Monthly	TBC	TBC
	Electrical Conductivity	mS/m	Monthly	TBC	TBC
Sweetwater 4	Water Level	mASL	Monthly	TBC	TBC
	Electrical Conductivity	mS/m	Monthly	TBC	TBC
Sweetwater 5	Water Level	mASL	Monthly	TBC	TBC
	Electrical Conductivity	mS/m	Monthly	TBC	TBC
Sweetwater 6	Water Level	mASL	Monthly	TBC	TBC
	Electrical Conductivity	mS/m	Monthly	TBC	TBC
Sweetwater 7	Water Level	mASL	Monthly	TBC	TBC
	Electrical Conductivity	mS/m	Monthly	TBC	TBC
Sweetwater 8	Water Level	mASL	Monthly	TBC	TBC
	Electrical Conductivity	mS/m	Monthly	TBC	TBC
Sweetwater 9	Water Level	mASL	Monthly	TBC	TBC

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Bore Name	Parameter*	Units	Frequency	Trigger Levels	
				TL1	TL2
	Electrical Conductivity	mS/m	Monthly	TBC	TBC
Sweetwater 10	Water Level	mASL	Monthly	TBC	TBC
	Electrical Conductivity	mS/m	Monthly	TBC	TBC
Sweetwater 11	Water Level	mASL	Monthly	TBC	TBC
	Electrical Conductivity	mS/m	Monthly	TBC	TBC
Sweetwater 12	Water Level	mASL	Monthly	TBC	TBC
	Electrical Conductivity	mS/m	Monthly	TBC	TBC
Sweetwater 13	Water Level	mASL	Monthly	TBC	TBC
	Electrical Conductivity	mS/m	Monthly	TBC	TBC
Sweetwater 14	Water Level	mASL	Monthly	TBC	TBC
	Electrical Conductivity	mS/m	Monthly	TBC	TBC
Elbury Holdings Sweetwater-1	Water Level	mASL	Monthly	TBC	TBC
	Electrical Conductivity	mS/m	Monthly	TBC	TBC
Elbury Holdings Sweetwater-2	Water Level	mASL	Monthly	TBC	TBC
	Electrical Conductivity	mS/m	Monthly	TBC	TBC

Notes:
* Purpose key: GL = Groundwater Level; EC = Electrical Conductivity.
All trigger limit values in this Table to be confirmed by Council.

~~Notes:~~
~~* Purpose key: GL = Groundwater Level; EC = Electrical Conductivity.~~
~~All trigger limit values in this Table to be confirmed by Council.~~

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3.5 Environmental Monitoring Report

At the end of each irrigation season, the Council will commission the preparation of an Annual Environmental Monitoring Report (AEMR) by a suitably qualified hydrogeologist. The Council will endeavour to ensure that, if possible, both the hydrogeologist and the ecologist have experience and knowledge of the locality. A copy of the AEMR will be provided to the Consent Holders and the Director General of Conservation by 31 July each year.

The purposes of the Annual Environmental Monitoring Report are to;

- provide a summary of the monitoring results for the previous year, including trends, against Objective 1 of the GMCP;
- assess the monitoring undertaken over the previous year against the standards set out in Objective 1;

- Identify any changes/amendments to monitoring locations/parameters/frequencies that could be incorporated in future SIMPR
- report on any issues apparent with the monitoring and
- identify any improvement that could be made with respect to the monitoring.

The AEMR will also contain an evaluation of whether the observed effects of the groundwater takes are consistent with the predictions of environmental response contained in the Aupouri Aquifer Groundwater Model, Factual Technical Report – Modelling. WWLA0184, Rev 3, prepared by Williamson Water & Land Advisory and dated 5 February 2020 (hereafter referred to as the 'Aupouri Model Report').

4. CONTINGENCY PLAN

Exercise of the consents is subject to compliance with Objective 1 of this GMCP. It is however noted that the exercise of AUT.020995.01.04 is not subject to the measures of the measures set out in this Contingency Plan up until the point at which their annual take exceeds 2,317,000 m^3/year.

As described in Section 2, a trigger level system is used to define environmental criteria that signal changes may be occurring outside of what is normal (TL1) or at a point where remedial action is required to avoid Objective 1 not being met (TL2).

This section details the responses that will be undertaken where TLs are exceeded under any of the monitoring suites discussed in Sections 2.1.2.1, 1.1.1, 3.3, and 3.4.

Where a trigger level is exceeded the Council will commission a Groundwater Trigger Exceedance Report (GTER). The objective of the GTER is to establish the cause of a trigger level exceedance and to recommend a programme of action to end the exceedance.

A GTER shall:

- Include a review of the monitoring results collected including an assessment of why the trigger level exceedance has occurred;
- set out requirements for increased monitoring of the breach;
- update the report on a regular basis as more data becomes available; and
- recommend actions to end the trigger exceedance, which could include;
  - a staged reinstatement of abstraction levels to pre-exceedance levels,
  - reduced levels of abstraction for all or some of the consent holders covered by the GMCP, or
  - suspension of abstraction by all or some of the consent holders covered by the GMCP.
  - Amendment of the trigger level exceeded.

4.1 Exceedance of TL1

In the event of a TL1 exceedance, which may represent declining groundwater levels or rising salinity indicators, the following actions must be undertaken:

(a) The Council will notify the Consent Holders within two working days of when the TL1 exceedance became known.

(b) If the exceedance is of a salinity indicator in the bores listed in , then sampling of the monitoring bore(s) in exceedance shall immediately be upgraded to a weekly frequency for four weeks following the first exceedance of the TL1. Weekly monitoring shall continue until sample results are consistently below TL1 values for a period of four weeks or as directed by Council.

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(c) If after four weeks following the first exceedance of the TL1, the initiation of seawater intrusion and/or water level decline cannot be discounted to the satisfaction of the Council, then a Groundwater Trigger Exceedance Report (GTER) by a suitably qualified Hydrogeologist (and ecologist if the exceedance concerns surface water bodies) shall be commissioned by Council.

(d) The GTER shall assess the significance of the exceedance against the requirements of Objective 1 of the GMCP. The GTER shall assess why TLs have been breached, identify the pumping bores in the area(s) of effect and will review all of the available data collected in the affected area(s), in particular the data collected pursuant to this GMCP.

4.2 Exceedance of TL2

In the event of a TL2 exceedance, which represents a significant departure from normal groundwater conditions, with either continuously declining groundwater levels or rising salinity indicators:

(a). Council will immediately inform the Consent Holders upon a TL2 exceedance becoming known.

(b). All Consent Holders must reduce their abstraction to 50% of the current average daily quantity, as calculated using the previous month's water use records required to be kept in accordance with the conditions of its groundwater take consent. If the exceedance occurs within one month of a Consent Holder first taking water for irrigation purposes within an irrigation season, then the average shall be calculated using the water use records for this period only. The council will advise the Consent Holder in writing of any breach and the required reduction in the daily water take volume.

(c). A GTER by a suitably qualified hydrogeologist (and ecologist if the exceedance concerns dune lakes or natural wetlands) shall be commissioned by Council. The GTER shall assess why the TL2 has been breached, identify the pumping bores in the area of effect, and include a review of all available data collected for the affected area(s), in particular, the data collected under this GMCP.

(d). Once (b) above has been complied with, the Consent Holder may apply to the Council's Compliance Manager for an alternative reduction in its daily water take volume. Council approval of an alternative reduction value will only be given if it is satisfied that relevant TL2 values will not be exceeded. The Council will use the GTER to inform its decision on any alternative reduction value for a Consent Holder.

(e). If the TL2 exceedance is in a bore(s) that is/are not continuously monitored, then weekly groundwater level measurements and/or sampling of saline intrusion (depending on which trigger level is breached) in all bores where TL2 trigger levels are breached will commence within one week of the TL2 trigger level exceedance. Monitoring will continue until such time as:

- Three consecutive samples in an individual monitoring bore are below all TL2 thresholds established for that piezometer; or
- As directed by Council.

(f). If salinity indicators continue to increase or groundwater levels continue to decline after 21 days following the implementation of (b), then the Consent Holder's abstraction must be reduced to 25% of the current average daily quantity, as calculated for (b) above. The Ceouncil will advise the Consent Holder in writing of this further reduction and the required reduction in the daily water take volume.

(g). If (f) is implemented, then the Council will commission a review and update of the GTER report by a suitably qualified hydrogeologist (and ecologist if the exceedance concerns surface water bodies) with a longer-term programme of recommended responses incorporating observed responses to interim pumping rate reductions. The updated GTER will include a specific programme (including timeframes) of actions which would achieve compliance with Objective 1 of this GMCP. The actions may include, but not be limited to incremental reductions in the daily quantity of groundwater taken as a percentage of the allowable daily pumped volume, as well as testing of domestic/stock water supplies in bores that are efficiently utilising the aquifer and are potentially impacted by saline intrusion, and if necessary, the provision of temporary water supplies to any affected parties (excluding any of the Consent Holders) in the event that Chloride concentrations exceed 250 mg/L (being the guideline value for taste prescribed in New Zealand Drinking Water Standards for New Zealand 2005 (Revised 2008)). The GTER will also identify a methodology which Council will utilise to increase abstraction back to the volumes applicable to the relevant stage of taking (see **Section 2.1**), where this can be done such that Objective 1 of this GMCP will be met. If it is not possible to increase abstraction back to the relevant stage of taking, then the GTER will identify a methodology to increase abstraction to a lesser volume such that Objective 1 of the GMCP will be met.

(h). Actions arising from the GTER shall continue as long as the issue continues.

(i). Implement additional remedial measures as directed by Council, including the suspension of taking.

5. REFERENCES

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ANNEXURE D

ATTACHMENT 1A Proposed Draft Conditions – Northern Group

This framework comprises proposed draft conditions applicable to the following applications:

APP.017428.02.01	Henderson Bay Avocados
APP.040600.01.01	Far North Avocados Ltd
APP.041211.01.01	P McGlaughlin
APP.039859.01.01	Te Aupōuri Commercial Development Ltd
APP.040121.01.01	NE Evans Trust & WJ Evans & J Evans
APP.040231.01.01	P&G Enterprises (PJ & GW Marchant)
APP.040652.01.01	SE & LA Blucher
APP.039644.01.01	MP Doody & DM Wedding
APP.040397.01.01	A. Matthews
APP.040558.01.01	MV Evans (Property 1)
APP.040979.01.01	MV Evans (Property 2)

Note: *Pursuant to Section 116 of the Resource Management Act 1991, the date of commencement of this consent is **XX XX 20XX**.*

[CONSENT HOLDER]

AUT.XX **To take and use groundwater from the ~~Aupōuri~~ Waihopo, Houhora and Other sub-aquifers ~~management units~~ of the Aupōuri Aquifer for the purposes of horticultural irrigation purposes.**

LOCATION

Address of Site

[Insert address reference]

Legal Description of Site

Site of take: [Insert legal descriptions]

Sites of use: [Insert legal descriptions]

Map Reference (New Zealand Transverse Mercator Projection)

[Bore 1:XXE XXN]

[Bore 2:XXE XXN]

Note: An error accuracy of +/- 50 metres applies to these map references.

CONSENT DURATION

This consent is granted for a period expiring on **30 November 2033.**

CONDITIONS OF AUT.XX

1 The consent holder shall pay all charges relating to the recovery of cost for the administration, monitoring and supervision of this consent fixed by Council under Section 36 of the Resource Management Act 1991.

2 The exercise of this consent is bound by the Master Consent conditions **attached** as Appendix A. The Master Consent uses an alternate numbering system '1MC, 2MC, 3MC…'.

3 Subject to compliance with the conditions of this consent, the activity authorised by this consent shall be carried out in accordance with the application and documents submitted as part of the application, including the following documents:

(a) Assessment of Environmental Effects prepared by Williamson Water & Land Advisory Ltd: *Aupōuri Aquifer Groundwater Take Consent Applications, Assessment of Environmental Effects – Aupōuri Aquifer Water User Group. WWLA0184: Rev. 2*, dated 27 February 2020;

(b) Model Report prepared by Williamson Water & Land Advisory Ltd: *Aupōuri Aquifer Groundwater Model, Factual Technical Report – Modelling – Aupōuri Aquifer Water User Group. WWLA0184: 3*, dated 5 February 2020.

For the avoidance of doubt, where information contained in the application documents is contrary to the conditions of this consent and those in the Master Consent (Appendix A), or where the information contained in the application documents is internally inconsistent, the conditions of this consent and the Master Consent shall prevail.

4 This consent operates under an adaptive management regime. The detail of that adaptive management regime is set out in the Groundwater Monitoring and Contingency Plan for the Waihopo, Other, and (northern) Houhora sub-aquifers ~~management units~~ of the Aupōuri Aquifer Management Unit, **Dated: [July 2020] ("GMCP")**. The primary purpose of the GMCP is to set out the procedures by which the abstraction will be monitored and managed to ensure compliance with Condition 1MC. For the purpose of this consent, the GMCP is the most recent version of the GMCP which may be changed under Condition 8MC. In the event that any of the provisions of the GMCP conflict with the requirements of these conditions of consent, these conditions of consent shall prevail.

Commented [ML1]: Minor changes to be consistent with PRP naming

5 The consent shall be exercised in a staged manner as follows:

(a) Stage 1, which shall be a minimum, period of 12 months after the commencement of the consent and must include all or part abstraction of the Stage 1 annual volume as set out in Condition #;

(b) Stage 2, which shall be for the minimum period of ~~one~~ two consecutive irrigation seasons;

(c) Stage 3, which shall be for the minimum period of two consecutive irrigation seasons;

(d) Stage 4 which shall be from the irrigation season immediately following written approval to progress from Stage 3 until the expiry of the consent, unless Conditions 9-13 apply.

Commented [ML2]: Recommend term 'full irrigation season' be removed and replaced as the term could be applied as a take occurring from September – April when climate/soil condition does not require this. Instead it should be acknowledged that all or part abstraction may occur over Stage 1 (Year 1) which recognises the practicality of the need (or not) to irrigate.

6 The combined daily volume of water taken across all bores shall not exceed the following:

(a) [XX] cubic metres in any 24 consecutive hours unless Conditions 9(b), 11 or 13 of this consent apply; and

(b) That required to replace soil moisture depleted by evapotranspiration over the irrigated area.

7 The annual volume of water taken from Bore [xx] for each stage shall not exceed the following, unless Conditions 9-13 apply:

(a) Stage 1: [XX] cubic metres between 1 July in a year and 30 June in the following year;

(b) Stage 2: [XX] cubic metres between 1 July in a year and 30 June in the following year;

(c) Stage 3: [XX] cubic metres between 1 July in a year and 30 June in the following year;

(d) Stage 4: [XX] cubic metres between 1 July in a year and 30 June in the following year.

8 Progress to the next stage shall only occur where written approval is given by the Council's Compliance Manager; and

(a) This written approval will only be given if the council is satisfied that the Staged Implementation and Monitoring Review prepared in accordance with the GMCP confirms that the groundwater abstraction complies with Condition 1MC; and

(b) A decision on whether written approval will be given or not will not be made until the Council has consulted with the Consent Holder and the Director-General of Conservation ~~Department of Conservation~~ over the Staged Implementation and Monitoring Review; and

(c) Notwithstanding Condition 8(b), written approval to progress from Stage 1 to Stage 2 will not be considered unless all the monitoring trigger levels required by the GMCP have been set; and

(d) A report detailing the reasons for the Council's decision in regard to progressing to the next stage, including the identification and discussion of any matters raised during the consultation described in Condition 8(b), will be provided to the Consent Holder and the ~~Department~~ Director-General of Conservation.

Commented [ML3]: Same term used in the GMCP

Breaching of Trigger Levels

9 In the event of a Trigger Level 2 (TL2) in the GMCP being exceeded, the following actions and requirements shall be initiated;

(a) The Council will advise the Consent Holder in writing that a TL2 has been reached;

(b) Upon receipt of this notice, the Consent Holder shall immediately reduce their daily abstraction to 50% of the current average daily quantity, as advised by the Council in the notice. The current average daily quantity will be calculated using the previous months water use records required by Condition 19. If the exceedance occurs within one month of a Consent Holder first taking water for irrigation purposes within an irrigation season, then the average shall be calculated using the water use records for this period only;

(c) As required by the GMCP, the Council will commission a Groundwater Trigger Exceedance Report to assess why the trigger level has been breached, identify the pumping bores in the area of effect and review all of the available data collected in the affected area(s).

10 Once Condition 9(b) has been complied with, the Consent Holder may apply to the Council's Compliance Manager for an alternative reduction in its daily water take volume. Council's approval of an alternative reduction value will only be given if it is satisfied that a TL2

exceedance that is attributable to this consent will not occur. The applicable alternative reduction value is the value that is contained in the recommendations made in the Groundwater Trigger Exceedance Report required to be prepared by Condition 9(c).

11 If the TL2 trigger levels are still exceeded after 21 days, then the Consent Holder shall reduce their daily abstraction to 25% of the current average daily quantity calculated for Condition 9(b). The Council will advise the Consent Holder in writing of any breach and the required reduction in the daily water take volume.

12 Once Condition 11 has been complied with, the Consent Holder shall also comply with the recommendations contained in the revised and updated Groundwater Trigger Exceedance Report commissioned by the Council which will be prepared for the purpose of specifying a programme of actions to achieve compliance with Condition 1MC.

13 If the TL2 trigger levels continue to be exceeded after the implementation of the remedial measures required under Conditions 9-12, the Council may require the Consent Holder to suspend the exercise of this consent, or continue their daily abstraction at a specified rate, until such time as the Council issues written notice that the Consent may be exercised again in accordance with the requirements of the revised and updated Groundwater Trigger Exceedance Report.

Notification of Irrigation

14 The Consent Holder shall advise the Council's assigned Monitoring Officer in writing when irrigation is to commence for the first time each season, at least five working days beforehand.

Backflow Prevention

15 Prior to the first exercise of this consent, a backflow prevention system shall be installed on irrigation systems used to apply animal effluent, agrichemical or nutrients to prevent the backflow of contaminants to groundwater.

Metering and Abstraction Reporting

~~15~~16 Prior to the first exercise of this consent, a meter shall be installed to measure the volume of water taken, in cubic metres, from each production bore. Each meter shall:

(a) Be able to provide data in a form suitable for electronic storage;

(b) Be sealed and as tamper-proof as practicable;

(c) Be installed at the location from which the water is taken; and

(d) Have an accuracy of +/-5%.

The Consent Holder shall, at all times, provide safe and easy access to each meter installed for Council to undertake visual inspections and record water take measurements.

~~16~~17 The Consent Holder shall verify that the meter required by Condition 15 is accurate. This verification shall be undertaken prior to 30 June:

(a) Following the first taking of water from each production bore in accordance with this consent; and

(b) At least once in every five years thereafter.

Each verification shall be undertaken by a person, who in the opinion of the Council's

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Compliance Manager, is suitably qualified. Written verification of the accuracy shall be provided to the council's assigned Monitoring Officer no later than 31 July following the date of each verification.

~~17~~18 The Consent Holder shall keep a record of the daily volume of water taken from each production bore in cubic metres, including all nil abstractions, using the readings from the meter required by Condition 15.

~~18~~19 If the instantaneous rate of taking is equal to or greater than 10 litres per second, then the water meter required by Condition 15 shall be telemetered to the Northland Regional Council.

~~19~~20 A copy of the records required to be kept by Condition 17 shall be forwarded to the Council's assigned Monitoring Officer:

(a) On a monthly basis, by the seventh of the following month, if the water meter is not telemetered to the Northland Regional Council; or

(b) Annually by the 31 July, for the previous period 1 July to the 30 June, if the water meter is telemetered to the Northland Regional Council.

In addition, a copy of these records shall be forwarded immediately to the Council's assigned Monitoring Officer on written request. The records shall be in an electronic format that has been agreed to by the council.

Advice Note: *If no water is taken during any calendar month then the Consent Holder is still required to notify the council's Monitoring Manager in writing of the nil abstraction. Water use record sheets in an electronic format are available from the council's website at www.nrc.govt.nz/wur.*

Water Use Efficiency

~~20~~21 The Consent Holder shall prepare an Irrigation Scheduling Plan (ISP) that outlines how irrigation decisions will be made. The purpose of the ISP is to set out how the irrigation will be undertaken to ensure that at least 80 percent of the annual volume of water applied to the irrigable area is retained in the soil in the root zone of the crop, compared to the average gross depth of water applied to the crop. The ISP shall be prepared by a suitably qualified and experienced person and submitted to the Council's Compliance Manager for written certification that it will achieve the purpose of the ISP. The ISP shall, as a minimum, address:

- Water balance and crop water requirements;
- Subsurface drainage; and
- Overall irrigation strategy.

For each irrigation area, the ISP should include:

(a) A description of how water requirements for each irrigation cycle are calculated;

(b) Method(s) for assessing current soil moisture levels;

(c) Method(s) for assessing potential evapotranspiration (PET) and rainfall to date;

(d) Soil moisture target to be maintained in each zone by irrigation;

(e) How measured data will be used to assess irrigation requirements over the next irrigation cycle; and

(f) A description of proposed method(s) for remaining within consent limits at each borehole or group of boreholes.

~~21~~22 The Consent Holder shall not exercise this consent until the ISP required by Condition 20 has been certified by the Council's Compliance Manager.

~~22~~ The ISP certified in accordance with Condition 21 shall be implemented prior to the first irrigation season, unless a later date has been approved in writing by the Council's Compliance Manager.

~~23~~24 The Consent Holder shall, within six months of the first exercise of this consent, undertake an audit of the irrigation system and of the certified ISP. The audit shall be undertaken by a suitably qualified and experienced person. The irrigation system audit shall be prepared in accordance with Irrigation New Zealand's "Irrigation Evaluation Code of Practice" (dated 12 April 2010), and shall include recommendations on any improvements that should be made to the system to increase water efficiencies or any amendments to the ISP. The results of the audit and its recommendations shall be submitted in writing to the Council's assigned Monitoring Officer within one month of the audit being undertaken. Any recommended amendments to the ISP shall be submitted to the Council's Compliance Manager for written certification that it will achieve the purpose of the ISP before they take effect. A follow-up audit shall occur at five yearly intervals throughout the term of this consent with the intent of confirming an irrigation efficiency of at least 80 percent.

~~24~~25 The Consent Holder shall, within three months of notification in writing by the Council's Compliance Manager, implement any recommendations of the audit referred to in Condition 23.

~~25~~26 The reticulation system and its component parts shall be maintained in good working order to minimise leakage and wastage of water.

~~26~~27 The rate at which water is applied to the irrigated area shall not result in ponding of irrigated water within any irrigated area, or runoff from either surface or subsurface drainage to a water body, as a result of the exercise of this consent.

Advice Note: *The ISP seeks to ensure that at least 80 percent of the annual volume of water applied to the irrigable area is retained in the soil in the root zone of the crop, compared to the average gross depth of water applied to the crop.*

Review Condition

~~27~~28 The 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 annually during the month of September 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

(b) To insert trigger level thresholds established in accordance with the GMCP as conditions of consent.

(c) To review the allocation of the resource.

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

Lapsing Condition

~~28~~ This consent shall lapse five years after the date that the consent commences in accordance with section 116(1) of the Resource Management Act 1991, unless the consent has been given effect to before this date.

APPENDIX A – MASTER CONSENT CONDITIONS

General

1MC. The consented activity must not, individually or cumulatively, result in:

(a) saltwater intrusion into the Aupōuri aquifer; or

(b) adverse effects on the hydrological functioning of dune lakes and natural wetlands; or

(c) adverse effects on the significant indigenous vegetation and habitats in dune lakes and natural wetlands; or

(d) lowering of the groundwater levels in the Aupōuri aquifer such that existing efficient bore takes operating as a permitted activity or in accordance with resource consent conditions cannot access groundwater from these sub-aquifers to~~of~~ the quantity authorised.

Prior to the Exercise of Consent

2MC. Prior to the exercise of this consent, new bores required to be installed for the purposes of monitoring the baseline effects in accordance with the GMCP shall be constructed and all required equipment installed by a suitably qualified person(s).

3MC. Where the GMCP requires that the frequency of monitoring for a parameter is continuous, then the monitoring equipment shall be installed as follows:

(a) for groundwater level recording, to the requirements of the National Environmental Monitoring Standards;

(b) for conductivity sensors they must be able to record "Specific Conductance" (corrected to 25 deg Celsius), have available software for field calibration, and be able to record across the whole expected conductivity range for the water body measured;

(c) Sensors must be installed in a secure manner to ensure stationarity over time;

(d) Instantaneous reading recorded every 5 minutes;

(e) Recording to NZ Standard Time (NZST);

(f) Water Level readings compensated for barometric pressure prior to transmission;

(g) Telemetered to Northland Regional Council with a minimum of hourly transmission of data; and

(h) Reference points levelled to One Tree Point datum and New Zealand Vertical Datum.

4MC. Prior to the exercise of this consent, the Consent Holder shall provide to the Council's assigned monitoring officer the installation details from the suitably qualified person of all monitoring equipment that has been installed in accordance with Condition 3MC. This information will be used by the Council's Compliance Manager to determine compliance with Conditions 2MC and 3MC.

5MC. Prior to the exercise of this consent, a suitable approach to detecting and responding to saline intrusion effects during Stage 1 (Year 1) shall be prepared. The Council's Compliance Manager shall certify that the approach to detecting and responding to saline intrusion will give effect to Condition 1MC. The certified information shall be inserted into the GMCP through the process set out in Condition 8MC prior to the exercise of this consent.

Commented [ML4]: Include reference source to ensure clarity.

Monitoring and Contingency Measures

6MC. This consent shall be exercised and monitored in accordance with the most recent revision of the GMCP.

7MC. The Consent Holder shall, at all times, provide safe and easy access to the production bore wellhead(s) for the purpose of undertaking monitoring on the bore(s), as set out in the GMCP.

8MC. Excluding the Staged Implementation and Monitoring Programme Review process, the GMCP may be amended at any time by the following process:

(a) Subject to Condition 8MC(d), the Council may amend the GMCP by providing notice in writing to the Consent Holder that the GMCP has been amended and providing a copy of the amended GMCP to the Consent Holder.

(b) Subject to Condition 8MC(d), the Consent Holder may submit a request for an amendment by giving written notice to the Council of the proposed amendment along with any supporting technical documents.

(c) Prior to making any decision to amend the GMCP or not, the Council will seek input on any proposed amendment from the Consent Holder and from the Director-General of Conservation.

(d) The Council will not approve any amendment to the GMCP unless the technical assessment of the proposed change clearly indicates that the change will not result in a breach of Condition 1MC.

ATTACHMENT 1B Proposed Draft Conditions – South-western Group

This framework comprises proposed draft conditions applicable to the following applications:

APP.040364.01.01	Elbury Holdings Ltd
APP.020995.01.04	Te Rarawa Farming Ltd and Te Make Farms Ltd

Note: *Pursuant to Section 116 of the Resource Management Act 1991, the date of commencement of this consent is* ***XX XX 20XX****.*

[CONSENT HOLDER]

AUT.XX **To take and use groundwater from the ~~Aupōuri~~ Sweetwater and Ahipara sub-aquifers of the Aupōuri-Aquifer management units for the purposes of horticultural irrigation purposes.**

LOCATION

Address of Site

[Insert address reference]

Legal Description of Site

Site of take: [Insert legal descriptions]

Sites of use: [Insert legal descriptions]

Map Reference (New Zealand Transverse Mercator Projection)

Bore 1: XXE XXN

Bore 2: XXE XXN

Note: An error accuracy of +/- 50 metres applies to these map references.

CONSENT DURATION

This consent is granted for a period expiring on **30 November 2033.**

CONDITIONS OF AUT.XX

1 The consent holder shall pay all charges relating to the recovery of cost for the administration, monitoring and supervision of this consent fixed by Council under Section 36 of the Resource Management Act 1991.

2 The exercise of this consent is bound by the Master Consent conditions **attached** as Appendix A. The Master Consent uses an alternate numbering system '1MC, 2MC, 3MC…'.

3 Subject to compliance with the conditions of this consent, the activity authorised by this consent shall be carried out in accordance with the application and documents submitted as part of the application, including the following documents:

(a) Assessment of Environmental Effects prepared by Williamson Water & Land Advisory Ltd: *Aupōuri Aquifer Groundwater Take Consent Applications, Assessment of Environmental Effects – Aupōuri Aquifer Water User Group. WWLA0184: Rev. 2*, dated 27 February 2020;

(b) Model Report prepared by Williamson Water & Land Advisory Ltd: *Aupōuri Aquifer Groundwater Model, Factual Technical Report – Modelling – Aupōuri Aquifer Water User Group. WWLA0184: 3*, dated 5 February 2020.

For the avoidance of doubt, where information contained in the application documents is contrary to the conditions of this consent and those in the Master Consent (Appendix A), or where the information contained in the application documents is internally inconsistent, the conditions of this consent and the Master Consent shall prevail.

4 This consent operates under an adaptive management regime. The detail of that adaptive management regime is set out in the Groundwater Monitoring and Contingency Plan for the Sweetwater and Ahipara ~~Sub-areas~~sub-aquifers of the Aupōuri Aquifer Management Unit, Dated: [**July 2020**] **("GMCP")**. The primary purpose of the GMCP is to set out the procedures by which the abstraction will be monitored and managed to ensure compliance with Condition 1MC. For the purpose of this consent, the GMCP is the most recent version of the GMCP which may be changed under Condition 8MC. In the event that any of the provisions of the GMCP conflict with the requirements of these conditions of consent, these conditions of consent shall prevail.

5 The consent shall be exercised in a staged manner as follows:

(a) Stage 1, ~~which shall be a minimum period of 12 months after consent is first exercised and must include abstraction for a full irrigation season~~ which shall be a minimum period of 12 months after the commencement of the consent and must include all or part abstraction of the Stage 1 annual volume as set out in Condition #

~~(c) ;~~

~~(d)~~(a) Stage 2, which shall be for the minimum period of two consecutive irrigation seasons;

~~(e)~~(a) Stage 3, which shall be for the minimum period of two consecutive irrigation seasons;

~~(f)~~(a) Stage 4 which shall be from the irrigation season immediately following written approval to progress from Stage 3 until the expiry of the consent, unless Conditions 9-13 apply.

6 The combined daily volume of water taken across all bores shall not exceed the following:

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Commented [ML5]: Recommend term 'full irrigation season' be removed and replaced as the term could be applied as a take occurring from September – April when climate/soil condition does not require this. Instead it should be acknowledged that all or part abstraction may occur over Stage 1 (Year 1) which recognises the practicality of the need (or not) to irrigate.

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(a) [XX] cubic metres in any 24 consecutive hours unless Conditions 9(b), 11 or 13 of this consent apply; and

(b) That required to replace soil moisture depleted by evapotranspiration over the irrigated area.

7 The annual volume of water taken from Bore [xx] for each stage shall not exceed the following unless Conditions 9-13 apply:

(a) Stage 1: [XX] cubic metres between 1 July in a year and 30 June in the following year;

(b) Stage 2: [XX] cubic metres between 1 July in a year and 30 June in the following year;

(c) Stage 3: [XX] cubic metres between 1 July in a year and 30 June in the following year;

(d) Stage 4: [XX] cubic metres between 1 July in a year and 30 June in the following year.

8 Progress to the next stage shall only occur where written approval is given by the Council's Compliance Manager; and

(a) This written approval will only be given if the council is satisfied that the Staged Implementation and Monitoring Review prepared in accordance with the GMCP confirms that the groundwater abstraction complies with Condition 1MC; and

(b) A decision on whether written approval will be given or not will not be made until the Council has consulted with the Consent Holder and the ~~Department of Conservation~~Director-General of Conservation over the Staged Implementation and Monitoring Review; and

(c) Notwithstanding Condition 8(b), written approval to progress from Stage 1 to Stage 2 will not be considered unless all the monitoring trigger levels required by the GMCP have been set; and

(d) A report detailing the reasons for the Council's decision in regard to progressing to the next stage, including the identification and discussion of any matters raised during the consultation described in Condition 8(b), will be provided to the Consent Holder and the ~~Department~~ Director-General of Conservation.

Breaching of Trigger Levels

9 In the event of a Trigger Level 2 (TL2) in the GMCP being exceeded, the following actions and requirements shall be initiated;

(a) The Council will advise the Consent Holder in writing that a TL2 has been reached;

(b) Upon receipt of this notice, the Consent Holder shall immediately reduce their daily abstraction to 50% of the current average daily quantity, as advised by the Council in the notice. The current average daily quantity will be calculated using the previous months water use records required by Condition 19. If the exceedance occurs within one month of a Consent Holder first taking water for irrigation purposes within an irrigation season, then the average shall be calculated using the water use records for this period only;

(c) As required by the GMCP, the Council will commission a Groundwater Trigger Exceedance Report to assess why the trigger level has been breached, identify the pumping bores in the area of effect and review all of the available data collected in the affected area(s).

10 Once Condition 9(b) has been complied with, the Consent Holder may apply to the Council's Compliance Manager for an alternative reduction in its daily water take volume. Council's approval of an alternative reduction value will only be given if it is satisfied that a TL2 exceedance that is attributable to this consent will not occur. The applicable alternative reduction value is the value that is contained in the recommendations made in the Groundwater Trigger Exceedance Report required to be prepared by Condition 9(c).

11 If the TL2 trigger levels are still exceeded after 21 days, then the Consent Holder shall reduce their daily abstraction to 25% of the current average daily quantity calculated for Condition 9(b). The Council will advise the Consent Holder in writing of any breach and the required reduction in the daily water take volume.

12 Once Condition 12 has been complied with, the Consent Holder shall also comply with the recommendations contained in the revised and updated Groundwater Trigger Exceedance Report commissioned by the Council which will be prepared for the purpose of specifying a programme of actions to achieve compliance with Condition 1MC.

13 If the TL2 trigger levels continue to be exceeded after the implementation of the remedial measures required under Conditions 9-12, the Council may require the Consent Holder to suspend the exercise of this consent, or continue their daily abstraction at a specified rate, until such time as the Council issues written notice that the Consent may be exercised again in accordance with the requirements of the revised and updated Groundwater Trigger Exceedance Report.

Notification of Irrigation

14 The Consent Holder shall advise the Council's assigned Monitoring Officer in writing when irrigation is to commence for the first time each season, at least five working days beforehand.

Backflow Prevention

15 Prior to the first exercise of this consent, a backflow prevention system shall be installed on irrigation systems used to apply animal effluent, agrichemical or nutrients to prevent the backflow of contaminants to groundwater.

Metering and Abstraction Reporting

~~15~~16 Prior to the first exercise of this consent, a meter shall be installed to measure the volume of water taken, in cubic metres, from each production bore. Each meter shall:

(a) Be able to provide data in a form suitable for electronic storage;

(b) Be sealed and as tamper-proof as practicable;

(c) Be installed at the location from which the water is taken; and

(d) Have an accuracy of +/-5%.

The Consent Holder shall, at all times, provide safe and easy access to each meter installed for Council to undertake visual inspections and record water take measurements.

~~16~~17 The Consent Holder shall verify that the meter required by Condition 1~~5~~6 is accurate. This verification shall be undertaken prior to June 30:

(a) Following the first taking of water from each production bore in accordance with this consent; and

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(b) At least once in every five years thereafter.

Each verification shall be undertaken by a person, who in the opinion of the Council's Compliance Manager, is suitably qualified. Written verification of the accuracy shall be provided to the council's assigned Monitoring Officer no later than 31 July following the date of each verification.

~~17~~18 The Consent Holder shall keep a record of the daily volume of water taken from each production bore in cubic metres, including all nil abstractions, using the readings from the meter required by Condition 1~~5~~6.

~~18~~19 If the instantaneous rate of taking is equal to or greater than 10 litres per second, then the water meter required by Condition 1~~5~~6 shall be telemetered to the Northland Regional Council.

~~19~~20 A copy of the records required to be kept by Condition 1~~7~~8 shall be forwarded to the Council's assigned Monitoring Officer:

(a) On a monthly basis, by the seventh of the following month, if the water meter is not telemetered to the Northland Regional Council; or

(b) Annually by the 31 July, for the previous period 1 July to the 30 June, if the water meter is telemetered to the Northland Regional Council.

In addition, a copy of these records shall be forwarded immediately to the Council's assigned Monitoring Officer on written request. The records shall be in an electronic format that has been agreed to by the council.

Advice Note: *If no water is taken during any calendar month then the Consent Holder is still required to notify the council's Monitoring Manager in writing of the nil abstraction. Water use record sheets in an electronic format are available from the council's website at www.nrc.govt.nz/wur.*

Water Use Efficiency

~~20~~21 The Consent Holder shall prepare an Irrigation Scheduling Plan (ISP) that outlines how irrigation decisions will be made. The purpose of the ISP is to set out how the irrigation will be undertaken to ensure that at least 80 percent of the annual volume of water applied to the irrigable area is retained in the soil in the root zone of the crop, compared to the average gross depth of water applied to the crop. The ISP shall be prepared by a suitably qualified and experienced person and submitted to the Council's Compliance Manager for written certification that it will achieve the purpose of the ISP. The ISP shall, as a minimum, address:

- Water balance and crop water requirements;
- Subsurface drainage; and
- Overall irrigation strategy.

For each irrigation area, the ISP should include:

(a) A description of how water requirements for each irrigation cycle are calculated;

(b) Method(s) for assessing current soil moisture levels;

(c) Method(s) for assessing potential evapotranspiration (PET) and rainfall to date;

(d) Soil moisture target to be maintained in each zone by irrigation;

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Commented [ML6]: No major issue with this condition only that technically it is the data that is recorded on a datalogger that is telemetered not the water meter.

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(e) How measured data will be used to assess irrigation requirements over the next irrigation cycle; and

(f) A description of proposed method(s) for remaining within consent limits at each borehole or group of boreholes.

~~21~~22 The Consent Holder shall not exercise this consent until the ISP required by Condition 20 has been certified by the Council's Compliance Manager.

~~22~~ The ISP certified in accordance with Condition 21 shall be implemented prior to the first irrigation season, unless a later date has been approved in writing by the Council's Compliance Manager.

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~~23~~24 The Consent Holder shall, within six months of the first exercise of this consent, undertake an audit of the irrigation system and of the certified ISP. The audit shall be undertaken by a suitably qualified and experienced person. The irrigation system audit shall be prepared in accordance with Irrigation New Zealand's "Irrigation Evaluation Code of Practice" (dated 12 April 2010), and shall include recommendations on any improvements that should be made to the system to increase water efficiencies or any amendments to the ISP. The results of the audit and its recommendations shall be submitted in writing to the Council's assigned Monitoring Officer within one month of the audit being undertaken. Any recommended amendments to the ISP shall be submitted to the Council's Compliance Manager for written certification that it will achieve the purpose of the ISP before they take effect. A follow-up audit shall occur at five yearly intervals throughout the term of this consent with the intent of confirming an irrigation efficiency of at least 80 percent.

~~24~~25 The Consent Holder shall, within three months of notification in writing by the Council's Compliance Manager, implement any recommendations of the audit referred to in Condition 23.

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~~25~~26 The reticulation system and its component parts shall be maintained in good working order to minimise leakage and wastage of water.

~~26~~27 The rate at which water is applied to the irrigated area shall not result in ponding of irrigated water within any irrigated area, or runoff from either surface or subsurface drainage to a water body, as a result of the exercise of this consent.

Advice Note: *The ISP seeks to ensure that at least 80 percent of the annual volume of water applied to the irrigable area is retained in the soil in the root zone of the crop, compared to the average gross depth of water applied to the crop.*

Review Condition

~~27~~28 The 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 annually during the month of September 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

(b) To insert trigger level thresholds established in accordance with the GMCP as conditions of consent.

(c) To review the allocation of the resource.

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

Lapsing Condition

~~28~~29 This consent shall lapse five years after the date that the consent commences in accordance with section 116(1) of the Resource Management Act 1991, unless the consent has been given effect to before this date.

APPENDIX A – MASTER CONSENT CONDITIONS

General

1MC. The consented activity must not, individually or cumulatively, result in:

(a) saltwater intrusion into the Aupōuri aquifer; or

(b) adverse effects on the hydrological functioning of dune lakes and natural wetlands; or

(c) adverse effects on the significant indigenous vegetation and habitats in dune lakes and natural wetlands; or

(d) lowering of the groundwater levels in the Aupōuri aquifer such that existing efficient bore takes operating as a permitted activity or in accordance with resource consent conditions cannot access groundwater of the quantity authorised.

Prior to the Exercise of Consent

2MC. Prior to the exercise of this consent, new bores required to be installed for the purposes of monitoring the baseline effects in accordance with the GMCP shall be constructed and all required equipment installed by a suitably qualified person(s).

3MC. Where the GMCP requires that the frequency of monitoring for a parameter is continuous, then the monitoring equipment shall be installed as follows:

(a) for groundwater level recording, to the requirements of the National Environmental Monitoring Standards;

(b) for conductivity sensors they must be able to record "Specific Conductance" (corrected to 25 deg Celsius), have available software for field calibration, and be able to record across the whole expected conductivity range for the water body measured;

(c) Sensors must be installed in a secure manner to ensure stationarity over time;

(d) Instantaneous reading recorded every 5 minutes;

(e) Recording to NZ Standard Time (NZST);

(f) Water Level readings compensated for barometric pressure prior to transmission;

(g) Telemetered to Northland Regional Council with a minimum of hourly transmission of data; and

(h) Reference points levelled to One Tree Point datum and New Zealand Vertical Datum.

4MC. Prior to the exercise of this consent, the Consent Holder shall provide to the Council's assigned monitoring officer the installation details from the suitably qualified person of all monitoring equipment that has been installed in accordance with Condition 3MC. This information will be used by the Council's Compliance Manager to determine compliance with Conditions 2MC and 3MC.

5MC. Prior to the exercise of this consent, a suitable approach to detecting and responding to saline intrusion effects during Stage 1 (Year 1) shall be prepared. The Council's Compliance Manager shall certify that the approach to detecting and responding to saline intrusion will give effect to Condition 1MC. The certified information shall be inserted into the GMCP through the process set out in Condition 8MC prior to the exercise of this consent.

Commented [ML7]: Include reference source to ensure clarity.

Monitoring and Contingency Measures

6MC. This consent shall be exercised and monitored in accordance with the most recent revision of the GMCP.

7MC. The Consent Holder shall, at all times, provide safe and easy access to the production bore wellhead(s) for the purpose of undertaking monitoring on the bore(s), as set out in the GMCP.

8MC. Excluding the Staged Implementation and Monitoring Programme Review process, the GMCP may be amended at any time by the following process:

(a) Subject to Condition 8MC(d), the Council may amend the GMCP by providing notice in writing to the Consent Holder that the GMCP has been amended and providing a copy of the amended GMCP to the Consent Holder.

(b) Subject to Condition 8MC(d), the Consent Holder may submit a request for an amendment by giving written notice to the Council of the proposed amendment along with any supporting technical documents.

(c) Prior to making any decision to amend the GMCP or not, the Council will seek input on any proposed amendment from the Consent Holder and from the Director-General of Conservation.

(d) The Council will not approve any amendment to the GMCP unless the technical assessment of the proposed change clearly indicates that the change will not result in a breach of Condition 1MC.

ATTACHMENT 1C Proposed Draft Conditions – Middle Group

This framework comprises proposed draft conditions applicable to the following applications:

APP.040919.01.01	NA Bryan Estate, SG Bryan, CL Bryan, KY Bryan, Valdares and D Bryan (Property 1)
APP.040130.01.01	Tuscany Valley Avocados Ltd
APP.040918.01.01	NA Bryan Estate, SG Bryan, CL Bryan, KY Bryan, Valadares & D Bryan (Property 2)
APP.008647.01.06	Avokaha Ltd
APP.039628.01.02	KSL Ltd
APP.040361.01.01	Tiri Avocados Ltd
APP.040362.01.01	Valic NZ Ltd
APP.040363.01.01	Green Charteris Family Trust
APP.039841.01.02	Mate Yelavitch & Co Ltd
APP.040386.01.01	Robert Paul Campbell Trust

AUT.XX **To take and use groundwater from the ~~Aupōuri~~ Paparore, Waiparera, Motutangi, and Houhora sub-aquifers of the Aupōuri-Aquifer management units for the purposes of horticultural irrigation ~~purposes~~.**

LOCATION

Address of Site

[Insert address reference]

Legal Description of Site

Site of take: [Insert legal descriptions]

Sites of use: [Insert legal descriptions]

Map Reference (New Zealand Transverse Mercator Projection)

Bore 1: XXE XXN

Bore 2: XXE XXN

Note: An error accuracy of +/- 50 metres applies to these map references.

CONSENT DURATION

This consent is granted for a period expiring on **30 November 2033.**

CONDITIONS OF AUT.XX

1 The consent holder shall pay all charges relating to the recovery of cost for the administration, monitoring and supervision of this consent fixed by Council under Section 36 of the Resource Management Act 1991.

2 The exercise of this consent is bound by the Master Consent conditions **attached** as Appendix A. The Master Consent uses an alternate numbering system '1MC, 2MC, 3MC…'.

3 Subject to compliance with the conditions of this consent, the activity authorised by this consent shall be carried out in accordance with the application and documents submitted as part of the application, including the following documents:

~~(e) Assessment of Environmental Effects prepared by Williamson Water Advisory Ltd: *Irrigation Water Supply, Groundwater Take Consent Application – Motutangi Waiharara Water User Group. WWA0026: Final – Rev. 4*, dated 30 August 2017;~~

~~(f) Model Report prepared by Williamson Water Advisory Ltd: *Motutangi Waiharara Groundwater Model, Factual Technical Report – Modelling. Motutangi Waiharara Water User Group. WWA0026: Final – Rev. 9*, dated 31 August 2017.~~

~~(g) Technical Peer Review Letter Report prepared by LWP Ltd: *Water Permit Application – Motutangi – Waiharara Water User Group (MWWUG), Aupōuri Peninsula*, dated 19 September 2017.~~

~~(h)~~(a) Assessment of Environmental Effects prepared by Williamson Water & Land Advisory Ltd: *Aupōuri Aquifer Groundwater Take Consent Applications, Assessment of Environmental Effects – Aupōuri Aquifer Water User Group. WWLA0184: Rev. 2*, dated 27 February 2020;

~~(i)~~(b) Model Report prepared by Williamson Water & Land Advisory Ltd: *Aupōuri Aquifer Groundwater Model, Factual Technical Report – Modelling – Aupōuri Aquifer Water User Group. WWLA0184: 3*, dated 5 February 2020.

For the avoidance of doubt, where information contained in the application documents is contrary to the conditions of this consent and those in the Master Consent (Appendix A), or where the information contained in the application documents is internally inconsistent, the conditions of this consent and the Master Consent shall prevail.

4 This consent operates under an adaptive management regime. The detail of that adaptive management regime is set out in the Groundwater Monitoring and Contingency Plan for the Paparore, Waiparera, Motutangi and Houhora ~~Sub-areas~~sub-aquifers of the Aupōuri ~~A~~aquifer ~~M~~management u~~U~~nit, **Dated: [July 2020] ("GMCP")**. The primary purpose of the GMCP is to set out the procedures by which the abstraction will be monitored and managed to ensure compliance with Condition 1MC. For the purpose of this consent, the GMCP is the most recent version of the GMCP which may be changed under Condition 8MC. In the event that any of the provisions of the GMCP conflict with the requirements of these conditions of consent, these conditions of consent shall prevail.

5 The consent shall be exercised in a staged manner as follows:

(a) ~~Stage 1, which shall a minimum period of 12 months, which must include abstraction for a full irrigation season after the consent is first exercised~~Stage 1, which shall be a minimum period of 12 months after the commencement of the consent and must include all or part abstraction of the Stage 1 annual volume as set out in Condition #;

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Commented [ML8]: Recommend term 'full irrigation season' be removed and replaced as the term could be applied as a take occurring from September – April when climate/soil condition does not require this. Instead it should be acknowledged that all or part abstraction may occur over Stage 1 (Year 1) which recognises the practicality of the need (or not) to irrigate.

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(b) Stage 2, which shall be for the minimum period of two consecutive irrigation seasons;

(c) Stage 3, which shall be for the minimum period of two consecutive irrigation seasons;

(d) Stage 4 which shall be from the irrigation season immediately following written approval to progress from Stage 3 until the expiry of the consent, unless Conditions 9-13 apply.

6 The combined daily volume of water taken across all bores shall not exceed the following:

(a) [XX] cubic metres in any 24 consecutive hours unless Conditions 9(b), 11 or 13 of this consent apply; and

(b) That required to replace soil moisture depleted by evapotranspiration over the irrigated area.

7 The annual volume of water taken from Bore [xx] for each stage shall not exceed the following unless Conditions 9-13 apply:

(a) Stage 1: [XX] cubic metres between 1 July in a year and 30 June in the following year;

(b) Stage 2: [XX] cubic metres between 1 July in a year and 30 June in the following year;

(c) Stage 3: [XX] cubic metres between 1 July in a year and 30 June in the following year;

(d) Stage 4: [XX] cubic metres between 1 July in a year and 30 June in the following year.

8 Progress to the next stage shall only occur where written approval is given by the Council's Compliance Manager; and

(a) This written approval will only be given if the council is satisfied that the Staged Implementation and Monitoring Review prepared in accordance with the GMCP confirms that the groundwater abstraction complies with Condition 1MC; and

(b) A decision on whether written approval will be given or not will not be made until the Council has consulted with the Consent Holder and the ~~Department~~ Director-General of Conservation over the Staged Implementation and Monitoring Review; and

(c) Notwithstanding Condition 8(b), written approval to progress from Stage 1 to Stage 2 will not be considered unless all the monitoring trigger levels required by the GMCP have been set; and

(d) A report detailing the reasons for the Council's decision in regard to progressing to the next stage, including the identification and discussion of any matters raised during the consultation described in Condition 8(b), will be provided to the Consent Holder and the ~~Department~~ Director-General of Conservation.

Breaching of Trigger Levels

9 In the event of a Trigger Level 2 (TL2) in the GMCP being exceeded, the following actions and requirements shall be initiated;

(a) The Council will advise the Consent Holder in writing that a TL2 has been reached;

(b) Upon receipt of this notice, the Consent Holder shall immediately reduce their daily abstraction to 50% of the current average daily quantity, as advised by the Council in the notice. The current average daily quantity will be calculated using the previous months water use records required by Condition 19. If the exceedance occurs within one month of a Consent Holder first taking water for irrigation purposes within an

irrigation season, then the average shall be calculated using the water use records for this period only;

(c) As required by the GMCP, the Council will commission a Groundwater Trigger Exceedance Report to assess why the trigger level has been breached, identify the pumping bores in the area of effect and review all of the available data collected in the affected area(s).

10 Once Condition 9(b) has been complied with, the Consent Holder may apply to the Council's Compliance Manager for an alternative reduction in its daily water take volume. Council's approval of an alternative reduction value will only be given if it is satisfied that a TL2 exceedance that is attributable to this consent will not occur. The applicable alternative reduction value is the value that is contained in the recommendations made in the Groundwater Trigger Exceedance Report required to be prepared by Condition 9(c). Approval for an alternative reduction will be given to Priority A Consent Holders first, as identified in the GMCP.

11 If the TL2 trigger levels are still exceeded after 21 days, then the Consent Holder shall reduce their daily abstraction to 25% of the current average daily quantity calculated for Condition 9(b). The Council will advise the Consent Holder in writing of any breach and the required reduction in the daily water take volume.

12 Once Condition 11 has been complied with, the Consent Holder shall also comply with the recommendations contained in the revised and updated Groundwater Trigger Exceedance Report commissioned by the Council which will be prepared for the purpose of specifying a programme of actions to achieve compliance with Condition 1MC.

13 If the TL2 trigger levels continue to be exceeded after the implementation of the remedial measures required under Conditions 9-12, the Council may require the Consent Holder to suspend the exercise of this consent, or continue their daily abstraction at a specified rate, until such time as the Council issues written notice that the Consent may be exercised again in accordance with the requirements of the revised and updated Groundwater Trigger Exceedance Report. Any increase in abstraction will be provided to Priority A Consent Holders first, as identified in the GMCP.

Notification of Irrigation

14 The Consent Holder shall advise the Council's assigned Monitoring Officer in writing when irrigation is to commence for the first time each season, at least five working days beforehand.

Backflow Prevention

15 Prior to the first exercise of this consent, a backflow prevention system shall be installed on irrigation systems used to apply animal effluent, agrichemical or nutrients to prevent the backflow of contaminants to groundwater.

Metering and Abstraction Reporting

~~15~~16 Prior to the first exercise of this consent, a meter shall be installed to measure the volume of water taken, in cubic metres, from each production bore. Each meter shall:

(a) Be able to provide data in a form suitable for electronic storage;

(b) Be sealed and as tamper-proof as practicable;

(c) Be installed at the location from which the water is taken; and

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(d) Have an accuracy of +/-5%.

The Consent Holder shall, at all times, provide safe and easy access to each meter installed for Council to undertake visual inspections and record water take measurements.

~~16~~17 The Consent Holder shall verify that the meter required by Condition 15 is accurate. This verification shall be undertaken prior to 30 June:

(a) Following the first taking of water from each production bore in accordance with this consent; and

(b) At least once in every five years thereafter.

Each verification shall be undertaken by a person, who in the opinion of the Council's Compliance Manager, is suitably qualified. Written verification of the accuracy shall be provided to the council's assigned Monitoring Officer no later than 31 July following the date of each verification.

~~17~~18 The Consent Holder shall keep a record of the daily volume of water taken from each production bore in cubic metres, including all nil abstractions, using the readings from the meter required by Condition 15.

~~18~~19 If the instantaneous rate of taking is equal to or greater than 10 litres per second, then the water meter required by Condition 15 shall be telemetered to the Northland Regional Council.

~~19~~20 A copy of the records required to be kept by Condition 17 shall be forwarded to the Council's assigned Monitoring Officer:

(a) On a monthly basis, by the seventh of the following month, if the water meter is not telemetered to the Northland Regional Council; or

(b) Annually by the 31 July, for the previous period 1 July to the 30 June, if the water meter is telemetered to the Northland Regional Council.

In addition, a copy of these records shall be forwarded immediately to the Council's assigned Monitoring Officer on written request. The records shall be in an electronic format that has been agreed to by the council.

Advice Note: *If no water is taken during any calendar month then the Consent Holder is still required to notify the council's Monitoring Manager in writing of the nil abstraction. Water use record sheets in an electronic format are available from the council's website at www.nrc.govt.nz/wur.*

Water Use Efficiency

~~20~~21 The Consent Holder shall prepare an Irrigation Scheduling Plan (ISP) that outlines how irrigation decisions will be made. The purpose of the ISP is to set out how the irrigation will be undertaken to ensure that at least 80 percent of the annual volume of water applied to the irrigable area is retained in the soil in the root zone of the crop, compared to the average gross depth of water applied to the crop. The ISP shall be prepared by a suitably qualified and experienced person and submitted to the Council's Compliance Manager for written certification that it will achieve the purpose of the ISP. The ISP shall, as a minimum, address:

- Water balance and crop water requirements;
- Subsurface drainage; and
- Overall irrigation strategy.

For each irrigation area, the ISP should include:

(a) A description of how water requirements for each irrigation cycle are calculated;

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(b) Method(s) for assessing current soil moisture levels;

(c) Method(s) for assessing potential evapotranspiration (PET) and rainfall to date;

(d) Soil moisture target to be maintained in each zone by irrigation;

(e) How measured data will be used to assess irrigation requirements over the next irrigation cycle; and

(f) A description of proposed method(s) for remaining within consent limits at each borehole or group of boreholes.

~~21~~22 The Consent Holder shall not exercise this consent until the ISP required by Condition 20 has been certified by the Council's Compliance Manager.

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~~22~~23 The ISP certified in accordance with Condition 21 shall be implemented prior to the first irrigation season, unless a later date has been approved in writing by the Council's Compliance Manager.

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~~23~~24 The Consent Holder shall, within six months of the first exercise of this consent, undertake an audit of the irrigation system and of the certified ISP. The audit shall be undertaken by a suitably qualified and experienced person. The irrigation system audit shall be prepared in accordance with Irrigation New Zealand's "Irrigation Evaluation Code of Practice" (dated 12 April 2010), and shall include recommendations on any improvements that should be made to the system to increase water efficiencies or any amendments to the ISP. The results of the audit and its recommendations shall be submitted in writing to the Council's assigned Monitoring Officer within one month of the audit being undertaken. Any recommended amendments to the ISP shall be submitted to the Council's Compliance Manager for written certification that it will achieve the purpose of the ISP before they take effect. A follow-up audit shall occur at five yearly intervals throughout the term of this consent with the intent of confirming an irrigation efficiency of at least 80 percent.

~~24~~25 The Consent Holder shall, within three months of notification in writing by the Council's Compliance Manager, implement any recommendations of the audit referred to in Condition 23.

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~~25~~26 The reticulation system and its component parts shall be maintained in good working order to minimise leakage and wastage of water.

~~26~~27 The rate at which water is applied to the irrigated area shall not result in ponding of irrigated water within any irrigated area, or runoff from either surface or subsurface drainage to a water body, as a result of the exercise of this consent.

Advice Note: *The ISP seeks to ensure that at least 80 percent of the annual volume of water applied to the irrigable area is retained in the soil in the root zone of the crop, compared to the average gross depth of water applied to the crop.*

Review Condition

~~27~~28 The 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 annually during the month of September 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

(b) To insert trigger level thresholds established in accordance with the GMCP as conditions of consent.

(c) To review the allocation of the resource.

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

Lapsing Condition

~~28~~29 This consent shall lapse five years after the date that the consent commences in accordance with section 116(1) of the Resource Management Act 1991, unless the consent has been given effect to before this date.

APPENDIX A –MASTER CONSENT CONDITIONS

General

1MC. The consented activity must not, individually or cumulatively, result in:

(a) saltwater intrusion into the Aupōuri aquifer; or

(b) adverse effects on the hydrological functioning of the Kaimaumau-Motutangi wetland; or

(c) adverse effects on the significant indigenous vegetation and significant habitats of indigenous fauna in terrestrial and freshwater environments of the Kaimaumau-Motutangi wetland; or

(d) lowering of the groundwater levels in the Aupōuri aquifer management unit such that existing efficient bore takes operating as a permitted activity or in accordance with resource consent conditions cannot access groundwater from these sub-aquifers to the quantity authorised ~~within the aquifer cannot access groundwater~~.

Prior to the Exercise of Consent

2MC. Prior to the exercise of this consent, new bores required to be installed for the purposes of monitoring the baseline effects in accordance with the GMCP shall be constructed and all required equipment installed by a suitably qualified person(s).

3MC. Where the GMCP requires that the frequency of monitoring for a parameter is continuous, then the monitoring equipment shall be installed as follows:

(a) for groundwater level recording, to the requirements of the National Environmental Monitoring Standards;

(b) for conductivity sensors they must be able to record "Specific Conductance" (corrected to 25 deg Celsius), have available software for field calibration, and be able to record across the whole expected conductivity range for the water body measured;

(c) Sensors must be installed in a secure manner to ensure stationarity over time;

(d) Instantaneous reading recorded every 5 minutes;

(e) Recording to NZ Standard Time (NZST);

(f) Water Level readings compensated for barometric pressure prior to transmission;

(g) Telemetered to Northland Regional Council with a minimum of hourly transmission of data; and

(h) Reference points levelled to One Tree Point datum and New Zealand Vertical Datum.

4MC. Prior to the exercise of this consent, the Consent Holder shall provide to the Council's assigned monitoring officer the installation details from the suitably qualified person of all monitoring equipment that has been installed in accordance with Condition 3MC. This information will be used by the Council's Compliance Manager to determine compliance with Conditions 2MC and 3MC.

5MC. Prior to the exercise of this consent, a suitable approach to detecting and responding to saline intrusion effects during Stage 1 (Year 1) shall be prepared. The Council's Compliance Manager shall certify that the approach to detecting and responding to saline intrusion will give effect to Condition 1MC. The certified information shall be inserted into the GMCP through the process set out in Condition 8MC prior to the exercise of this consent.

Commented [ML9]: Include reference of source

Monitoring and Contingency Measures

6MC. This consent shall be exercised and monitored in accordance with the GMCP.

7MC. The Consent Holder shall, at all times, provide safe and easy access to the production bore wellhead(s) for the purpose of undertaking monitoring on the bore(s), as set out in the GMCP.

8MC. Excluding the Staged Implementation and Monitoring Review process, the GMCP may be amended at any time by the following process:

(a) Subject to Condition 8MC(d), the Council may amend the GMCP by providing notice in writing to the Consent Holder that the GMCP has been amended and providing a copy of the amended GMCP to the Consent Holder.

(b) Subject to Condition 8MC(d), the Consent Holder may submit a request for an amendment by giving written notice to the Council of the proposed amendment along with any supporting technical documents.

(c) Prior to making any decision to amend the GMCP or not, the Council will seek input on any proposed amendment from the Consent Holder and from the Director-General of Conservation.

(d) The Council will not approve any amendment to the GMCP unless the technical assessment of the proposed change clearly indicates that the change will not result in a breach of Condition 1MC.